

FishLore.com
Saltwater Aquarium
&
Reef Tank Book

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FOREWORD

Thanks for downloading FishLore.com's Saltwater Aquarium e-Book. It is comprised of many of the saltwater articles from the website. You can use it as a guide in setting up your saltwater aquarium or use it as a species reference when visiting the local fish store.

This e-Book is FREE for anyone to download and use. The cool part about making it an e-book means that I can keep it updated when we publish new articles or profiles on the website! Check the download page if you want to get the latest version. I'll be sure to include the last update date so it's easy to tell if you have the latest version.

FishLore's Saltwater Aquarium e-book download page: <http://www.fishlore.com/saltwater-aquarium-reef-tank-book.htm>

Please pardon any typos or grammatical errors. I've been in this document for many hours but I'm sure that some have slipped by. If you find any errors you can let me know by using the contact us form here: <http://www.fishlore.com/fishforum/sendmessage.php>

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FishLore.com receives no compensation for this e-book. It is FREE for everyone. If you find this e-book useful (and I certainly hope you do), you can help out by linking to the download page above or by linking to the main website at FishLore.com. Make a post letting others know about it on aquarium forums, on Facebook, YouTube, Twitter and other social media sites.

Everything on FishLore.com is free. Always has been, always will be. I frequently get emails from visitors asking if they can donate anything to the site to help keep it going and I always decline because there is no need for donations. We generate enough funds from the advertising on the website to keep the servers running. Our life line is the all-powerful link. We have tons of outgoing links on our forum but getting inbound links to the site seems to be near impossible these days. We appreciate any and all links that we get! Visitors to the site are what keeps it going and they will make it possible to continue to provide things like this e-book going forward.

You can find many different premade links to FishLore that you can copy and paste here:

<http://www.fishlore.com/linktofishlore.htm>

If you have questions after reading through this book please join us on the FishLore forum at <http://www.fishlore.com/fishforum/>. Please note that our forum is moderated which means that we have rules that have to be followed such as no cursing, no flaming other members, etc. Read the forum rules here: <http://www.fishlore.com/fishforum/forum-announcements-suggestions/227-fishlore-forum-rules.html>

Our forum has been around for a long time now and there are a lot of great people that post on our forum. We also have a first class group of moderators that can help field forum usage questions should you have them. Be sure to thank the mods because they donate their own time to help keep the forum safe for everyone.

Thanks for reading and I hope to see you on the forum!

Mike

P.S. Be sure to check out the Freshwater Aquarium e-Book too. You can find it here: <http://www.fishlore.com/freshwater-aquarium-book.htm>

WHY SET UP AN AQUARIUM?

You've been to the pet store and noticed the fish tanks and thought "maybe I could do that". Guess what, you can "do that" and it's not nearly as difficult as you may think.

The tropical fish keeping hobby has come a long way over the past decade thanks in part to advances in aquarium equipment and the plethora of readily available information. There are many outstanding fish and aquarium books available as well as an abundant amount of information on the internet, forums and discussion groups. Running your own tank is way easier than it was just 10 years ago.

In the past, folks would go to the pet store and buy the tank, equipment and fish all at once not knowing they were setting themselves up for failure. They would get the aquarium set up and running, put some fish in and everything would be fine for a couple of days but then the fish would start to die. Now we know better. We know about the crucial aquarium nitrogen cycle that must take place in all new tanks. We know how to properly acclimate tropical fish to our tank water and how to periodically use our aquarium test kits to test the tank water to make sure nothing is out of whack. We have better access to fish behavior and can determine which fishes shouldn't be kept together in the same tank. The information is out there, at our fingertips, at libraries, book stores and the search engines.

So, with all this available information we can quickly come up to speed with running a tank in our home. There are many different types of aquarium setups but the most common types are freshwater, saltwater fish only and saltwater reef tanks. Here is a very brief intro:

Freshwater Aquarium

The mainstay of the hobby and the most popular setup, a freshwater tank setup can be a great first tank and it will give you the necessary experience needed for branching out into other types of tanks. This setup is the least expensive in terms of equipment and livestock and is not usually as demanding as the other types. There are literally hundreds of different types of fish available so finding a species you'll like shouldn't pose a problem. You can keep live aquarium plants in your tank as well. Keeping plants may require an upgrade to your lighting system and you may have to add supplements to your tank water. Freshwater aquarium plants add another dimension of beauty to a freshwater tank.

Saltwater Aquarium

Saltwater tanks are perceived to be more difficult than freshwater tanks. In times past, that statement may have been true but I don't think that is necessarily the case today. With the increasing use of live rock as the primary biological filter in a saltwater tank setup, the chances

of successfully running this type of aquarium have dramatically improved. A fish only saltwater tank equipped with live rock will be more expensive than a freshwater tank because you'll need to purchase live rock and a protein skimmer. Marine fish are also more expensive than their freshwater counterparts.

Saltwater Reef Tank

The ultimate tank setup in this hobby has to be the reef tank setup. It's like having a small piece of the coral reef in your living room. The emphasis is on the corals and invertebrates with a limited amount of fish. These tanks are however, more expensive to setup and maintain. Equipment such as metal halide lighting, protein skimmers, live rock, testing equipment, supplements, water purification units (reverse osmosis and deionization) and sumps drive the cost of this setup. Don't forget about the ongoing maintenance costs (electricity) as well. The livestock costs for live corals, fish and invertebrates are also very expensive. This type of tank can be very demanding when first set up because you'll need to monitor the water parameters periodically and take corrective action when necessary. Even though this is the most expensive type of setup, it can also be the most breathtaking. You should do your homework (research) and figure out exactly what you want to accomplish before buying your first piece of reef equipment.

No matter what type of tank setup you choose, as long as you do your homework beforehand you'll enjoy this hobby. Research the equipment and livestock before purchasing them and you will prevent many headaches and keep some of that hard earned money in your wallet!

The satisfaction of watching fish in our home can be relaxing, educational and can be a great conversational piece all at the same time. Many kids are extremely fascinated with tropical fish and you can use this as a great learning tool to teach your children responsibility, biology and science. Teach them about the critical biological cycle that takes place called the Nitrogen Cycle. Teach them how to test the tank water for ammonia, nitrite, nitrate and pH. Show them the proper way to feed and care for the fish. Show them how to do water changes and maybe they can help out with this vital task required for keeping fish in our homes. Explain to them why we can't keep a common pleco in our 10 gallon tank. The educational opportunities abound.

If you're interested in setting up your own tank I encourage you to do some homework beforehand. Go out and purchase an aquarium book on the type of tank you're interested in, subscribe to a tropical fish magazine, browse the internet and join a tropical fish forum to increase your knowledge. This is a fun and exciting hobby that gets better all the time!

AQUARIUM TYPES

Aquariums come in many shapes and sizes. There is surely to be an aquarium type out there that will suit you. Fish tanks can be made out of glass or acrylic and typical sizes are 10, 20, 29, 30, 40, 50, 55 gallons and larger. Some are tall, some are short. Some are rectangular or hexagons and some have bowed fronts.

An acrylic aquarium is going to be lighter, stronger and more durable than a glass aquarium. But an acrylic aquarium will scratch much easier and it can be very difficult to buff out an aquarium scratch on an acrylic tank, if at all.

Generally, the bigger the tank the better it is because a larger aquarium will tend to have much more stable water parameters. For example, take a 5 gallon versus a 55 gallon tank. In the 5 gallon tank the temperature may fluctuate up to 10 degrees Fahrenheit every day whereas the temperature isn't going to fluctuate as much in the 55 gallon. Having more water will usually buy you more time to correct anything that should happen. Check out your local fish store or online for an aquarium that fits your needs.

Another important consideration for your pet fish tank will be the aquarium stand. It will need to be strong enough to hold the finished tank. Roughly, an aquarium will weigh at least 10 pounds per gallon. So a 55 gallon aquarium stand will need to be able to support 550 pounds! Don't skimp on the stand and make sure it's level and strong and make sure that the floor will be able to support the total weight of the tank!

By Mike Owen

First published in Tank Talk, Canberra and District Aquarium Society, Australia

Courtesy: [Aquarticles](#)

Safety around the aquarium, electrical safety in particular, is a subject all aquarists should be concerned about. The possible fatal consequences of the combination of water and faulty electrical equipment is something we all should bear in mind. One of the basic rules of aquarium management that I have seen in several aquarium books is to turn off all electrical power to the aquarium before putting your hand in -the water. However, hands up all those who have ignored this rule; I bet there are not too many hands still down.

The amount of current needed to give a person an electric shock is surprisingly low. With a 240 volt supply, a current of only 10 milliamps through your body to earth can give a painful shock, and a current above 50 milliamps is likely to be fatal. Not very much when a 200 watt beater draws something like 800 milliamps. While the possibility of a dangerous failure in modern commercial aquarium equipment is very, very slight, nevertheless a risk still exists. I've never seen any report of a person being killed by a shock from their aquarium in Australia but I have seen a report in an English newspaper of this happening, and have vague recollections of reading that several people die each year in the U.S.A. by electric shocks from their aquariums.

If your aquarium equipment is plugged into a normal household switchboard, with standard circuit breakers, it is highly unlikely that they will cut-out in the event of a fault in the equipment leading to a possible leak to earth of the low magnitude needed to cause a bad shock. Fortunately there is a simple, but unfortunately fairly expensive, safety measure which can be taken. This is to install a CORE BALANCE EARTH LEAKAGE CIRCUIT BREAKER, or ELCB for short, into the wiring system for your aquariums.

These devices work by continually monitoring the current in both the active and neutral wires of the circuit, and if a fault develops in the circuits leading to the leakage of current to earth, then the device instantaneously breaks the circuit. They are set to break the circuit only above a certain current loss, since some home appliances such as water heaters and freezers naturally have small current losses. The cut-off level ranges from 10 milliamps to 30 milliamps, with 30 milliamps being suitable for the aquarium.

Three types of ELCB are available. The first is wired into the main switchboard of a house and can give protection to all power points in the house, not just the aquarium power point. I'm not

sure of the cost of this in Canberra, but with installation by a qualified electrician, it could be around \$200 or more.

The second is a wall mounted model, which is a straight replacement for a standard wall socket and looks very similar. Installation is straight forward and most would feel confident about doing the work themselves. The only possible complication is if the socket is part of a ring circuit with more than three wires going into the socket. If in doubt, get an electrician to do the installation. The cost of a wall mounted model is about \$80 at one of the specialist electrical shops at Fyshwick. They are rarely to be found at the general hardware stores.

The third type of ELCB are portable models. These are self-contained units which plug into a standard socket and into which you plug your aquarium equipment, similar to an extension cord. They have the advantage of being able to be used wherever needed around the house, for instance with power saws hedge trimmers etc. but are quite expensive. The only one I've seen in Canberra was over \$100. If you would require a wall mounted model to be installed by an electrician they may be worth considering, but their portability is largely wasted in an aquarium setting because it is virtually never free to use for other applications.

The choice of whether to install an ELCB or not is up to the individual. They are expensive; \$80 would buy a nice power filter, let you set up that extra breeding tank, or buy some very nice fish, but what's the point if you aren't around to enjoy it. Me, I've put off buying that Eheim filter I've had my eye on for a while!

AQUARIUM FISH CRUELTY THROUGH IGNORANCE

Courtesy: Andy Gordon of England, and Michelle Stuart of Ontario Canada

Reprinted, with permission, from their web site Fishtanksandponds.net & Aquarticles

There are many different ways to treat animals inhumanly. The easiest to detect is cruelty through violence or neglect. Putting any animal through such treatment is condemned, and rightly so, without question or hesitation. But what about animals that suffer simply because the owners don't know any better? Is that any better fate for an animal to go through? - After all, the owners didn't know they weren't providing the proper care for their animals. So often this issue is brushed aside with a shrug, saying that they really tried to care for the animals, or that they had good intentions!

Fish tanks have been around for so long that one has pretty much become a commonplace fixture in many homes. Nearly everyone can remember a time when they had a tank in the house or visited a friend who had a tank. Since fish tanks are so commonplace, a lot of people tend to underestimate the care and dedication required keeping a tank healthy and thriving. Too many people, who have never had fish, believe that fish keeping is the simplest of hobbies, just add water and go!

The most common time for fish to be placed in inadequate conditions is when hobbyists are starting up their very first tank. They are unaware of the need for cycling the tank and going slowly to allow for the required bacteria to grow in the tank, and the fish seem to die for no apparent reason. They stock the tank too quickly since they want an instant showpiece for their home.

The second most common mistake people make is to overstock their tanks. They want to see huge schools of fish living happily side by side without any room for movement, and don't know that most of the fish they purchase are juveniles that will grow to many times their current size.

Other examples of cruelty through ignorance include common mistakes like:

- Keeping fish in an unsanitary tank.
- Not treating tap water to remove chlorine.
- Not acclimatizing the fish when transferring them to a new tank.
- Adding incompatible species of fish in the same tank such as Oscars in a community tank.
- Using a tank that is too small for the fish once it is full-grown.
- Feeding an unhealthy unvaried diet.
- Little or no water changes.

- Having improper lighting for planted tanks.
- Improper water chemistry for the fish they have.
- Mixing coldwater and tropical fish in the same tank.
- Not treating harmed or diseased fish.

The easiest way to combat cruelty due to ignorance is to learn as much as you can about your tank, the fish you wish to keep, and the requirements to keep the fish healthy, and then share as much information and experiences, whether good or bad, as you can with other hobbyists. There are many different inexpensive, reliable resources available to hobbyists, so that fish should not have to suffer because people didn't know any better! In this hobby a little research goes a long way in keeping fish healthy, and in the end it will greatly increase the enjoyment people find when keeping fish.

THE AQUARIUM NITROGEN CYCLE

The aquarium nitrogen cycle information presented below may be rather boring to most people, but it is absolutely essential to understand this process if you want to be successful at keeping fish!

Steps in the Process:

1. Fish Waste & other biological processes
2. Ammonia
3. Nitrites
4. Nitrates
5. Water changes to remove nitrates and DOC

Some call it the biological cycle, the nitrification process, new tank syndrome or even the start-up cycle. They all are referring to the same cycle - The Nitrogen Cycle. The aquarium nitrogen cycle is a very important process for the establishment of beneficial bacteria in the aquarium and in the filter media that will help in the conversion of ammonia to nitrite and then the conversion of nitrite to nitrates. Check out the aquarium water chemistry page (on the left) for more information on these terms.

This process can take from 2 weeks to 2 months or longer to complete. It is vital for anyone planning on keeping aquarium fish to understand this process. Learning about this process will help you to be successful in keeping fish and it should definitely improve your chances when keeping tropical fish. The best way to monitor the nitrogen cycle is to purchase an aquarium test kit that will test for ammonia, nitrites, nitrates and ph.

Test your aquarium water every other day and write down your readings. You will first see ammonia levels rising. A few weeks or so later you should see the nitrite levels rising and the ammonia levels dropping. Finally, after a few more weeks you should see the nitrate levels rising and the nitrite levels dropping. When you no longer detect ammonia or nitrites but you can detect nitrates you can assume that it is safe to add your tropical fish.

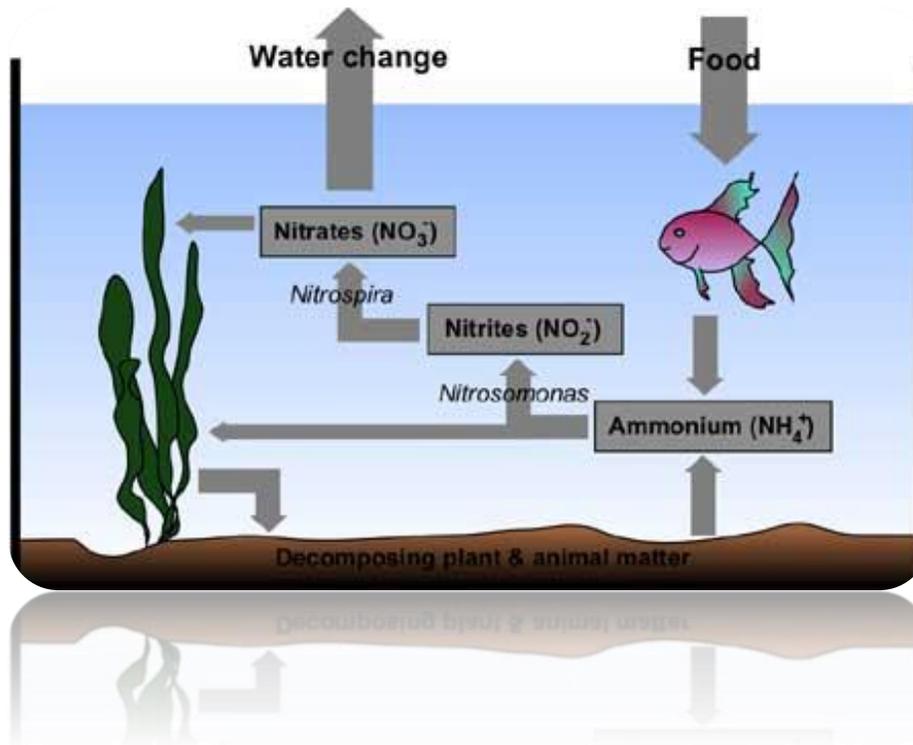


Photo Credit: Ilmari Karonen

Nitrogen Cycle Stages

Stage 1

Ammonia is introduced into the aquarium via tropical fish waste and uneaten food. The tropical fish waste and excess food will break down into either ionized ammonium (NH₄) or un-ionized ammonia (NH₃). Ammonium is not harmful to tropical fish but ammonia is. Whether the material turns into ammonium or ammonia depends on the pH level of the water. If the pH is under 7, you will have ammonium. If the pH is 7 or higher you will have ammonia.

Stage 2

Soon, bacteria called nitrosomonas will develop and they will oxidize the ammonia in the tank, essentially eliminating it. The byproduct of ammonia oxidation is Nitrites. So we no longer have ammonia in the tank, but we now have another toxin to deal with - Nitrites. Nitrites are just as toxic to tropical fish as ammonia. If you have a test kit, you should be able to see the nitrite levels rise around the end of the first or second week.

Stage 3

Bacteria called nitrobacter will develop and they will convert the nitrites into nitrates. Nitrates are not as harmful to tropical fish as ammonia or nitrites, but nitrate is still harmful in large amounts. The quickest way to rid your aquarium of nitrates is to perform partial water changes. Once your tank is established you will need to monitor your tank water for high nitrate levels and perform partial water changes as necessary.

There are other methods to control nitrates in aquariums besides water changes. For freshwater fish tanks, live aquarium plants will use up some of the nitrates. In saltwater fish tanks, live rock and deep sand beds can have anaerobic areas where denitrifying bacteria can breakdown nitrates into harmless nitrogen gas that escapes through the water surface of the aquarium.

Getting The Nitrogen Cycle Started

There are two ways to get the aquarium cycle started, either with fish or without fish.

Starting The Nitrogen Cycle With Fish

This is **not** the preferred way to get the nitrogen cycle started because the fish are being exposed to ammonia and nitrites during this process. Many fish cannot and will not make it through the cycling process. Often times the fish become stressed and fish disease starts to break out. I wonder what percentage of disease is caused by the cycling of new aquariums.

Certain species are hardier than others and seem to tolerate the start-up cycle better than others. For freshwater tanks, the zebra danio is a very hardy fish that many use to get the nitrogen cycle started. For saltwater tanks, some have reported success using damselfish to get the process started. Again, using fish to cycle is not a good idea and you may be throwing your money (on dead fish) out the window. There is a better way. Read on, young grasshopper.

Starting The Nitrogen Cycle Fishless

There are a few different ways to get this process started. To easily get an ammonia reading from your tank water try the Seachem Ammonia Alert. It sticks inside the tank and has a circle that changes color depending on the ammonia levels in the tank.

- **Option 1:**
Using Fish Food
Drop in a few flakes every 12 hours. As the food decomposes it will release ammonia. You will have to continue to "feed" the tank throughout the process to keep it going.
- **Option 2:**
Use a small piece of raw fish or a raw shrimp
Drop a 2 inch by 1 inch chunk of raw fish or a raw shrimp into the tank. As it decomposes it will release ammonia into the tank.
- **Option 3:**
Use 100% pure ammonia.
Using a dropper, add 5 drops of ammonia per 10 gallons of aquarium water. If you don't get an ammonia reading with your test kit, add some more drops until you start to see an ammonia

reading. Keep track of how many drops you've used so you can repeat this process daily. Continue to dose the tank with ammonia until you start to get nitrite readings with your test kit. Once you can detect nitrites you should only add 3 drops of ammonia per 10 gallons of aquarium water, or if you added more drops originally to get an ammonia reading cut the amount of drops used in half. Continue this process daily until you get nitrate readings with your test kit. Do a 30% water change and your tank is ready.

- **Option 4:**

Use gravel and/or filter media from an established and cycled tank

This is the best and fastest way to go. This will seed the tank with all of the necessary bacteria for the nitrogen cycle. "Feed" the tank daily with flake food until you are getting nitrate readings. Depending on how fast you were able to get the gravel and filter media into your tank, you may be getting nitrate readings in only a day or two. There are some drawbacks to this method. Ask your source if they have recently used any copper medications in the tank. If they have and you are planning to have invertebrates in the tank you should probably not use this method. Invertebrates will not tolerate copper. Get a copper test kit to determine if it's safe to use.

- **Option 5:**

Using live rock in Saltwater Tanks

The use of live rock in saltwater tanks has really taken off over the past few years. The reason for this is because it is one of the best forms of biological filtration available for saltwater tanks. The shape the rock is in when you get it will determine how long the nitrogen cycle will take. See step 7 on the saltwater setup page for more information on live rock.

- **Option 6:**

Use Colonize by Dr. Foster and Smith - claims to colonize your water with the necessary bacteria needed to get the cycle going along with detoxifying ammonia so it doesn't harm the fish. To be used at the start of the tank setup and whenever you add new fish to your tank.

- Another bacteria culture product is Tetra SafeStart. People have reported success on the forum with using Tetra SafeStart. Do a quick search on the forum for other members' input.
- Use Instant Ocean BIO-Spira for Saltwater Tanks made by Marineland (the freshwater version may have been discontinued). This product claims to contain some patent pending species of nitrifying bacteria that will cycle your tank in 24 hours. Some of the FishLore forum members have tried it and it sounds like it is legitimate. It is kind of expensive, but if you already have fish in your tank and they are suffering through the cycle, you may want to check this stuff out. 1 ounce of this product is supposed to treat a 30 gallon freshwater tank. There are both

freshwater and saltwater versions of Bio-spira. Please let us know if you use this and if it works for you by submitting comments below.

Once the cycle has started only add one or two fish at a time. Wait a couple of weeks before adding more fish. This will give your tank the time it needs to catch up with the increased bio-load.

Speeding Up the Cycling Process

There are things you can do to speed along the process of cycling your aquarium.

- Increase the temperature of your aquarium water to 80°F-82°F (27°C-28°C)
- Get some beneficial bacteria colonies. Borrow some gravel from an established and cycled aquarium. If you have another tank with an extra filter you can use it. If you have a really nice friend with an established and cycled aquarium, ask if you can have one of their used filter media. It will be loaded with the good bacteria that we are looking for.
- There are products on the market that claim to introduce the beneficial bacteria. For more information, check out products like Bio-spira and Tetra SafeStart in option 6 above. There are many more products entering the market that contain the beneficial bacteria necessary to seed your tank. Between live rock (for saltwater aquariums) and the bottled bacteria being readily available, there really is no excuse to make fish suffer through a cycle.

AQUARIUM FILTER AND FISH TANK FILTRATION

Your aquarium filter helps increase the quality of the water in your fish tank. Most think of mechanical filtration when it comes to aquarium filters but as you will soon see, there are some other filter types that you need to know about.

Mechanical, Biological & Chemical Aquarium Filters

There are three types of aquarium filtration:

Mechanical Filtration

Biological Filtration

Chemical Filtration

Mechanical Aquarium Filtration

Mechanical filtration removes the free floating particles from the aquarium water. The siphoning action of a power filter that hangs on the back of an aquarium does a decent job of this type of filtration.

Biological Aquarium Filtration

Biological filtration is the most important aquarium filtration type because it deals with the growing of the good bacteria in your aquarium filter. The good bacteria is the bacteria that converts ammonia to nitrite and then converts nitrite into nitrate. This establishment of bacteria is essential to your success with keeping tropical fish. For more information please read about the Nitrogen Cycle.

Ammonia -> Nitrite -> Nitrate

Chemical Aquarium Filtration

Chemical filtration involves removing the dissolved wastes from the aquarium water. Often times this is accomplished through the use of activated carbon in the aquarium filter. Activated carbon can also help to reduce odors. Many people dislike using carbon in their tanks due to the fact that the carbon is useful for only a short period and then must be replaced. If it doesn't

get replaced in a timely manner the very wastes that it removed can be released from the carbon back into the aquarium.

Zeolites can also be used in chemical filtration. Zeolite removes ammonia from your aquarium water and can be a fish life saver if you have high ammonia levels. Many first time fish keepers mistakenly add too many fish to a new aquarium before it has cycled and experience the disappointing loss of their fish. Using zeolite during the cycling process in your aquarium filter can help prevent this from happening but it has the side effect of lengthening the time it takes to complete the aquarium nitrogen cycle.

Types of Aquarium Filters

Corner Filter

The corner filter sits inside the aquarium in one of the corners or even sticks on to the glass. It is very low-tech but a corner aquarium filter can be used successfully for mechanical, chemical and biological filtration. The key is not to change out the entire filter material when performing maintenance. Only change out the carbon and part of the filter material. Corner filters require frequent maintenance and are only used in very small tanks these days if at all.

Undergravel Filter (UGF)

Undergravel filters are commonly found with beginner's aquarium kits and the undergravel filter has been around for a long time. Undergravel aquarium filters can provide good mechanical filtration because it forces the water down through the aquarium gravel where particles are trapped. You can then use an aquarium vacuum to clean the detritus.

Biological filtration occurs in the gravel because of the slow flow of water through it. The water is then pushed up through the uplift tubes in the back of the tank where chemical filtration takes place with the activated carbon in the top of the tubes.

The problem with this type of aquarium filter stems from the fact that it can be difficult to thoroughly vacuum the gravel and harmful gas pockets can form under the gravel plates thereby harming your tropical fish. I personally don't use undergravel filters because of this reason. There's a lot of controversy surrounding the use of undergravel filtration. Check out The Undergravel Filter Controversy for more on this subject. Many long time fish keepers still use

the undergravel filter and swear by it. If you do use an undergravel filter try to regularly vacuum your gravel to prevent the harmful gasses from forming.

Sponge Filter



Sponge filters can provide a cheap and effective form of biological filtration. Water flows through the airlift tube allowing a colony of beneficial bacteria to grow in the sponge. There is no chemical filtration with this method and the mechanical filtration is very weak. You must do frequent water changes if this is your only form of filtration. Many breeders use the sponge filter in conjunction with a bare bottom tank. After feeding their young fish they will siphon any remaining food to prevent the water quality from deteriorating. Frequent water changes are performed because it aids in the rapid growth of the young fish. Fish breeders don't have to worry about mechanical or chemical filtration as much because they are performing frequent water changes.

Power Filter

The power filter is probably the most popular filter type for a variety of reasons. They are easy to use and clean and they can be an effective means of mechanical, chemical and biological filtration! The drawback to using power filters is that it is very **inefficient** because of its design. The intake tube for the dirty aquarium water is directly below the lip of the outflowing filtered water. Does this make any sense? Not to me either.

More aquarium kits come with a power filter than any other type of aquarium filter. Try to get a power filter that contains two filter media slots. With two filter slots you can change out one side of the filter and then a few weeks later change out the other side. If you change out the entire set of media cartridges at once you run the risk of having to re-cycle or mini-cycle because you've tossed out much of the beneficial bacteria.

Canister Filter

Canister filters are on the higher end of the price scale but they are pricey for a reason. They work very well. Often there are multiple trays for a canister filter with each tray providing a type

of filtration. The first tray could be a sponge that filters (mechanical and biological) the large particles. The second tray could be filled with zeolite that removes ammonia from the water (chemical). The third tray could be activated carbon which would further filter (chemical) the water. Most canister filters push the water from the bottom of the canister to the top but some work just the opposite. Find out which way yours works to get the most out of the canister filter. This is our personal choice of aquarium filter on most of our freshwater fish tanks.

Protein Skimmer

Protein skimmer models come in a few different styles. There are those made for in tank use (Visi Jet PS, Slim Skim Protein Skimmer), protein skimmers that hang on the back of the tank and those designed for use in a sump.

Those designed for in tank use are usually less desirable because they don't seem to work as well as the other types. Try to get one that hangs on the back of the tank such as the AquaC Remora Protein Skimmer or one for your sump. Also, make sure that you can easily get to and remove the collection cup for daily or weekly cleaning.

This piece of equipment is usually very pricey but it is a critical piece of equipment for saltwater aquarium beginners nonetheless. They are virtually useless in freshwater tanks.

In saltwater tanks, the skimmer will remove dissolved organic material from the water and anyone who has used one can tell you about the smelly brown gunk that gets pulled from the water. In the past, saltwater aquarium keepers would sometimes experience a complete die off of the fish in their tanks. Many believe that it was due to the amount of dissolved organics in the water and by using a protein skimmer they have drastically reduced the chances of this happening. Skimmers completely remove proteins into a collection cup that can be emptied on a regular basis before they break down in the aquarium leading to algae blooms and DOC buildup. Protein skimmers also help increase the dissolved oxygen levels in your saltwater aquarium.

Since this is an expensive piece of equipment you will want to shop around and research the various models out there. It's been our experience that you usually get what you pay for when it comes to skimmers. Get the biggest and best rated skimmer that you can afford.

Powerhead

A powerhead is considered part of the filtration system? Yes, indeed. In freshwater aquariums, powerheads are used for water movement as well as in conjunction with an undergravel filter system. If you're running a system where air stones drive the water flow in your undergravel filter, consider using a powerhead in one of the uplift tubes. The powerhead should help generate much better flow through the UGF, resulting in a more efficient UGF. Many come with a tube that is connected to the powerhead that hangs on the outside of the tank with an air flow valve. This allows you to mix air with the water being pushed out of the powerhead. That can help increase surface agitation and aeration in your tank.

Saltwater hobbyists frequently use multiple powerheads situated in a way that allows them to control the flow of the water in the tank or even better, to create turbulent water flows. Saltwater tanks usually require more water movement than freshwater tanks. Constant water movement prevents dead zones in a tank and keeps uneaten food suspended in the water column so that the fish can eat it or the mechanical filtration and/or protein skimmer can get rid of it.

Refugium

A refugium is an external tank, usually smaller, that is used to house smaller fish and invertebrates for cultivation and/or feeding the fish in the display tank. It can be connected to the main tank and is sometimes apart of or separate from the sump. You can even get a hang on the back of the tank type refugiums or DIY a power filter to use as a refugium. See the DIY refugium setup for more information. A refugium provides isolation for those more delicate specimens that can easily and quickly become food for the larger fish in the display tank.

Aquarium Sump

A sump is also an external tank but one that has water lines connected to the display tank. They can be any size but are often smaller and placed hidden below the main tank in the cabinetry. Sumps can provide many benefits for you. They can help with nutrient export by allowing certain macro algae types (chaetomorpha, for example) to grow uninterrupted from grazing by your herbivores in the display tank. Sumps also increase the total amount of water in the system. For instance, if your aquarium is 55 gallons and your sump is 20 gallons, you essentially have a 75 gallon tank.

This extra tank also gives you the ability to hide ugly equipment (like filters and protein skimmers) that could diminish the look of the display tank. Many saltwater hobbyists add any saltwater supplements to the sump instead of the main tank. Supplements such as iodine, strontium, kalkwasser (lime water) dosing systems and others are often placed into or connected to the sump. Is a sump absolutely necessary for a saltwater aquarium? No, they are not mandatory but they can definitely help in keeping your system (water parameters) stable and they can help hide equipment under the display in the cabinet.

SALTWATER AQUARIUM TYPES - FOWLR, FISH ONLY WITH LIVE ROCK, REEF TANK

This is a general introduction into the three main saltwater aquarium types: Fish Only, FOWLR (Fish Only with Live Rock) and the Reef Tank Setup. When getting started with saltwater it is recommended to get the biggest tank you can accommodate. Bigger tanks give you more room for error when it comes to water quality.

Again, there are basically three types of saltwater aquarium setups:

Fish Only

Fish Only with Live Rock - FOWLR

Reef Tanks

Fish Only

This is the least expensive type to set up because you don't necessarily need the better lighting that the other setups require. Check out the [Saltwater Aquarium Setup](#) page to get an idea of the equipment needed, minus the live rock mentioned in that article.

In my opinion, even though this is the least expensive setup, a saltwater fish only setup is not necessarily the easiest to get started with. Getting started may take a little longer than the other setups while waiting for the [nitrogen cycle](#) to complete. Saltwater fish only tanks also require more frequent tank maintenance than FOWLR tanks. This means that you will need to stay on top of those water changes to remove the nitrates that are constantly accumulating. Having a [water test kit](#) is a necessity when keeping saltwater tanks. You will need to periodically monitor the ammonia, nitrite, nitrate and pH levels. These readings will give you a good indication of the water quality inside your tank. It will also give you an idea of how often you should be performing those water changes.

As the name implies, this saltwater fish only tank setup is really for keeping fish only. You may be able to keep a few snails or hermit crabs to help control any algae problems. There are generally two types of fish only tanks. Community type tanks and semi-aggressive type tanks. The community tanks house species that will get along well with the other species in the tank. Semi-aggressive tanks usually house solitary individuals from different species. Unless you have an extremely large tank, it is normally not recommended to get multiple fish from the same species.

These saltwater fish only setups are rapidly falling off in popularity because of the great biological filtration functions that live rock can provide. We discuss FOWLR setups next.

Fish Only with live rock - FOWLR

This setup is the same as a Fish Only with the addition of live rock and better aquarium lighting. Check out the Saltwater Aquarium Setup page for more detailed information on this type of setup. The use of live rock has really taken off in the past decade because it really is the best form of natural biological filtration for the saltwater aquarium. It is called "live rock" because of the creatures and organisms living on the inside and on the surface of the rock. It can be very interesting to look at the organisms and algae growing on the rock.

Getting good live rock, such as Fiji rock, can be expensive and may even be the most expensive part of setting up a FOWLR tank. A rule of thumb for setting up a tank with live rock is 1 to 2 pounds per aquarium gallon. Currently, live rock is going for about \$7 per pound, so a 55 gallon tank would need approximately 82.5 lbs (using 1.5 pounds/gallon) or around \$578 to get started. This price is just an estimate and the price may be much higher or lower in your particular area.

What makes live rock so good? The porous nature of live rock means that it comes packed with all types of tiny creatures and biological organisms that aid in the nitrogen cycle. The dense, porous material inside the live rock helps rid your aquarium of nitrates. You will still need to monitor your water parameters regularly with a FOWLR aquarium and perform water changes as needed. You will also need to add supplements such as iodine, calcium, strontium, magnesium and others, to the water periodically. Live rock helps maintain stability in a FOWLR saltwater aquarium and it can become a food source for your invertebrates and your fish.

Reef Tank

The reef tank setup is primarily geared towards invertebrates, corals and anemones. The fish in this type of tank are sometimes just an afterthought. "Oh yeah, there's a fish in there". Reef keepers are usually more interested in keeping their corals and anemones growing and this means monitoring water parameters weekly if not daily. These invertebrates, corals and anemones can be very expensive and very hard to keep. It also should be noted that mixing various coral species and motile inverts (like anemones) is usually not a good idea.

Reef tanks are usually set up by more experienced hobbyists because these tanks require excellent water conditions, extremely high lighting levels (expensive), water supplements, reverse osmosis and/or deionized water (expensive), and excellent filtration (usually live rock).

If monitoring your water parameters on a daily basis and spending a lot of money is your idea of a good time, then you should look in to setting up a reef tank. Seriously though, if you are just getting started with saltwater, you should probably leave the reef tank for a future time when you get more experience under your belt. We don't want to discourage you from setting up a reef tank, but we do want to make you realize the amount of research and effort that goes into getting one of these set up. If you've been doing things correctly with your other tanks you are already familiar with researching fish and equipment. Starting with a FOWLR to learn the ropes and seeing if you really like the hobby first before investing in the more expensive reef tank setup can be a good route to take. When buying your FOWLR equipment just keep it in mind that if you like the hobby you will most likely be turning that FOWLR into a full blown reef eventually. Just a warning. :) A reef tank can be very rewarding and breath taking to look at when set up correctly.

You may also come across something called a nano cube setup. These are very small tanks, typically something less than 30 gallons that are used for small reef tanks for housing corals and other saltwater inverts. These are very cool looking but take a lot of work monitoring water quality and correcting as needed.

Finally, to gain a better understanding of the cost differences between running a freshwater, saltwater or a reef tank, check out the Freshwater vs. Saltwater Aquarium page for more information.

FRESHWATER AQUARIUM VS. SALTWATER AQUARIUM

Are you thinking about converting that freshwater aquarium into a saltwater aquarium? We'll shed some light on some of the differences in the setup of a freshwater vs. saltwater aquarium.

There are many differences when it comes to freshwater aquariums versus saltwater aquariums. These setups can be quite different when it comes to initial and ongoing costs, everyday chores and maintenance tasks and care requirements for the fish and inverts.

This article was written for those aquarium hobbyists interested in the main differences in keeping a saltwater tank versus a freshwater aquarium. Let's get started.

Tank types

In the freshwater world you hear people talking about African Cichlid and New World Cichlid tanks, brackish tanks, planted tanks, predator tanks, etc. Well, the saltwater side of the hobby has some different types of tank setups as well. There are the Fish-Only tanks, FOWLR tanks (Fish Only with Live Rock) and Reef Tanks. These three saltwater aquarium types progress in startup and maintenance costs. Fish-Only tanks can be considered on the low end for startup costs while FOWLR tanks are moderately priced and reef tanks could be considered high priced. Refugiums for saltwater aquariums are gaining steam these days as many hobbyists realize the important benefits these refugiums can provide.

Aquarium setup costs

Lets start with the initial setup costs for starting these two aquarium types. To keep it simple, we'll look at fish-only systems, except for the reef tank which is for corals and invertebrates. For a freshwater aquarium you may have the following initial equipment list. Please keep in mind that these are **very rough estimates** on prices and we used a **29 gallon aquarium** for this example. **June 2007 - Added the approximate total cost for setting up a Saltwater Reef Tank.*

Freshwater Aquarium		Saltwater Aquarium		Reef Tank	
Aquarium	\$50	Aquarium	\$50	Aquarium	\$50
Gravel (substrate)	\$20	Sand (substrate)	\$50	Sand (substrate)	\$50
Filter (power filter)	\$50	Filter	\$25	Filter	\$25

Aquarium Light (regular flourescent)	\$50
Test kits (pH, ammonia, nitrite, nitrate)	\$50
Food, Nets, Scrapers and other equipment	\$25
Quarantine Tank	\$25
Approximate Total Cost:	\$270

Power Heads for water movement	\$50
Protein Skimmer	\$150
Hydrometer	\$10
Salt Mix	\$30
Live Rock	\$100
Test kits (pH, ammonia, Nitrite, nitrate, calcium, alkalinity)	\$70
Lights (regular flourescent)	\$50
Food, nets, Scrapers, similar	\$25
Quarantine Tank	\$25
Approximate Total Cost:	\$635

Power Heads for water movement	\$75
Protein Skimmer	\$150
Hydrometer	\$10
Salt Mix	\$30
Live Rock	\$140
Test kits (pH, ammonia, Nitrite, nitrate, calcium, alkalinity, phosphate)	\$90
Lights (power compacts or better)	\$250
Food, nets, Scrapers, similar	\$25
Refugium for culturing live foods for corals and fish	\$150
Quarantine Tank	\$25
Reverse Osmosis Filter Unit	\$200
Approximate Total Cost:	\$1270

As you can see, a saltwater aquarium requires some additional aquarium test kits and some additional equipment not found on the freshwater side of the hobby. You'll need to invest in a good quality protein skimmer and some good quality live rock. Live rock is important from a biological filter perspective and if you're using live rock you don't have to use an external filter on the tank. Let the protein skimmer remove the dissolved wastes. The external mechanical aquarium filter may actually become a source of nitrates if not cleaned often enough since the power filter just traps waste. The protein skimmer on the other hand actually removes the dissolved organics from the water.

Quick note on live rock

I wouldn't recommend that a newbie start a saltwater tank without live rock. There are just too

many benefits to having it in your marine aquarium. It's a great biological filter, provides food for various species, and provides hiding places and homes for others and it looks great. There are other benefits too. Check out the article on [saltwater live rock](#) for more information. Setting up and keeping a marine fish tank stable without live rock can be more difficult than starting one with ample quantities of good quality live rock.

Water changes are easier for freshwater tanks

The periodic [partial water changes](#) are one of the most important tasks that a hobbyist performs on a regular basis and the process is a little different when you move into saltwater aquariums. Freshwater aquarists generally can remove some of the tank water (say 10%) with an aquarium vacuum and then refill the tank with dechlorinated tap or filtered water and your tank could stay in a great shape if you do this regularly. Saltwater hobbyists can't use the same vacuum (python) do this since the saltwater has to be mixed up days before hand in a separate container. You can use a bucket to mix new saltwater or if you have a bigger tank, a larger holding container can be used.

Saltwater fish are generally more expensive than freshwater fish

Cruise through the aisles at any saltwater fish store and your jaw might drop when you notice the price tags on some of the saltwater species. With the exception of some of the really common species such as [green chromis](#) and other small [damselfish](#), most fish are \$15 or higher. [Saltwater invertebrates](#) also come with really high price tags, especially for those hobbyists not living near coastal areas. Shipping and handling will get added to the price tag.

Quarantine all new fish!

Most marine species come from the reef and will need to be quarantined before introducing to your main tank. You don't have to go all out here. A simple bare bones [quarantine tank setup](#) will be fine. Many freshwater species are farm raised since they are (in general) easier to breed than their saltwater counterparts. [Clownfish](#), [dottybacks](#), [dwarf angelfish](#) and some other saltwater species are now being aqua-cultured (farm raised) but their price tags are even more expensive since they are usually hardier than those caught in the ocean. The farm raised species are worth it! We also need to support these breeders so that more species can be raised going forward. Since most saltwater species are coming direct from the wild, they may be carrying various internal or external parasites or diseases.

Lots of invertebrates to choose from

There seems to be an unlimited amount of invertebrates available to keep in a saltwater tank. Freshwater hobbyists certainly have invertebrates available but not to the extent of saltwater. You name it, a local fish store around you probably has it. From corals, clams, shrimps, worms, sea stars, feather dusters, etc. The amount of saltwater invertebrates available to hobbyists is vast and it seems to be growing all the time.

Saltwater fish colors are amazing

While there are some exceptionally colorful freshwater species (bettas, neon tetras, discus, etc.) there are many more saltwater species that are truly breathtaking to view. You've never seen the color yellow until you've seen a school of healthy yellow tangs swimming in a large aquarium or on the reef!

Getting saltwater fish eating can sometimes be challenging

This goes back to most of the species being wild caught. Freshwater species may be second, third, fourth, or Nth generation or more from a fish farm and they are given flakes or other man-made fish preparations. Getting freshwater fish to eat should pose no problems for even the novice aquarist. Saltwater fish on the other hand are from the wild (generally speaking here) and may need to be slowly weaned onto standard aquarium foods over a period of several weeks or months. Specialized diets become even more important with saltwater fish species, since inadequate diets can lead to stress, which can lead to lowered immune systems and disease causing us to lose our \$75 saltwater fish!

Summary

In general, keeping saltwater fish is more expensive and more difficult than keeping freshwater fish. However, once established they do seem to be less demanding and water quality tends to stay better in tanks using live rock. Live plants perform similar (albeit to a lower degree) functions in water filtration in a freshwater aquarium. If you've been keeping freshwater fish tanks for some time now successfully the switch to a saltwater aquarium should not be all that difficult. If you have the desire, the fortitude to do the necessary research before acquiring animals and aquarium equipment and the money necessary to run a saltwater aquarium, then by all means go for it! Once you get started you'll be wondering why it took you so long to get into the saltwater side of the hobby.



INTRO

It seems like we have been getting a lot of new posts on the forum about basic saltwater aquarium setup information. I've written this saltwater aquarium tank guide to hopefully make it easier to understand the startup process for those just getting into marine tanks. I'll make it a step by step article so it is easier to follow.

STEP 1: DETERMINE THE TYPE OF SALTWATER AQUARIUM YOU WANT

There are three common types of saltwater aquarium setups. The Fish Only, the Fish Only with Live Rock (FOWLR) and a reef tank. I really just consider two of those as viable setups. The fish only set up is really kind of difficult in terms of biological control of the filter and (in my opinion) makes it harder to keep a saltwater tank without live rock. Live rock is awesome and will become the primary biological filter in your tank. FOWLR tanks are the way to go for someone new to the saltwater side of the hobby. Reef tanks require a little more precision and can be much more expensive to set up and stock because they require more equipment and more expensive livestock usually.

Size matters. If you want to set up a nano saltwater tank (anything less than 30 gallons usually) then you have your work cut out for you. The upside to a smaller tank is the startup and ongoing maintenance costs. The downside is that smaller tanks are harder to maintain, harder to keep stable and you have less choices in terms of the fish and inverts you can keep.

A saltwater aquarium can definitely be more expensive than a freshwater aquarium. If money is tight, don't set up a marine tank right now. If you start skipping needed equipment like protein

skimmers or good quality live rock, you are just going to be cutting yourself short and making the hobby less enjoyable. Come back to it when the finances loosen up and set things up right.

So we've narrowed down your choice to either a FOWLR or a reef tank. Which will you choose? Your choice will determine what you need in the next step.

STEP 2: SALTWATER AQUARIUM EQUIPMENT

If you chose a **FOWLR tank**, here is a list of equipment needed:

- Aquarium - go with at least a 30 gallon or preferably much bigger. Your chances of success are better and you will get hooked and wish you had a bigger tank.
- Substrate - if you want to have a sand bed there are commonly three options. You can go with a shallow sand bed, a deep sand bed (helps with nitrification) or a bare bottom. Shallow sand beds or bare bottom tanks are the easiest to setup and maintain. Research the benefits of deep sand beds to see if that is something you want to pursue. More info on choosing a substrate: [Substrates 101](#).
- Live Rock - get about one pound per gallon or more of the good, high quality porous rock. Base rock is cheaper but really does nothing other than take up space and allows you to build up your rock structure. I only use the good rock in my tanks. More info on [Live Rock](#).
- Saltwater Mix - the brand doesn't really matter these days.
- Refractometer - to measure the salt content. A hydrometer would work too but are less accurate.
- Protein Skimmer - you need a skimmer. We get this question all the time. You can run a tank without a skimmer but it means you will have to do way more frequent partial water changes to avoid algae issues. Save yourself the headaches and get a skimmer. More info: [Protein Skimmer](#).
- Powerheads - provides water movement which is very important in saltwater tanks. You want to have turbulent flows. The amount of flow you need is around 10 to 20x the tank volume for a FOWLR in my opinion. This will help keep detritus from accumulating on the bottom or behind the rocks and improve the chances that it will be broken down and skimmed out of the system.

- Reverse Osmosis Water Filter - you need this for the initial filling and top offs of your tank. Starting with pure water is very important and will help you avoid many water quality and algae issues.
- Heater - two smaller rated heaters are better than one heater in case of malfunctions. You also need a thermometer to monitor the tank temperature. Digital thermometers are inexpensive and do a fine job.
- Test Kits - get test kits for ammonia, nitrite and nitrates. You will use these during the initial break in of the tank and until the aquarium cycles.
- Lights - the type and size doesn't really matter in a FOWLR. Standard lights that come with aquarium kits are usually fine. A mix of bulbs in the white and blue actinic range provide some nice colors.
- Sump and/or Refugium - is a separate tank under your main display tank that allows you to hide equipment and provides more water volume since it is plumbed into the main system. These are optional upgrades but worth it.

Notice in the list above that I didn't mention a mechanical filter... I haven't run a mechanical filter on my saltwater tanks in years. I use a combination of ample amounts of high quality live rock, turbulent water flows provided by powerheads and the protein skimmer removes dissolved organics as they break down in the water column. Very easy to set up and maintain and you don't have to worry about nitrate build ups in the mechanical filter which can lead to algae issues.

If you chose a **REEF TANK**, here is a list of equipment needed:

- Aquarium
- Substrate - sand or bare bottom
- Salt Mix - there are reef type salt mixes which are usually higher in alk/calc
- Live Rock
- Refractometer
- Protein Skimmer - you need a skimmer. Period.

- Powerheads - how many needed is based on the fish, invertebrates and corals you want to keep
- Reverse Osmosis Water Filter - you definitely need one. More info here: [Reverse Osmosis Filter for Aquariums](#).
- Heater
- Test Kits - get test kits for ammonia, nitrite, nitrates, magnesium, alkalinity, calcium and phosphates. There are reef testing kits which have all of them included. Get the liquid test kits. Salifert makes some good test kits that are easy to read. More info on [Aquarium Test Kits](#).
- Lights - the corals you want to keep will dictate the type of lighting you need. More info on [Aquarium Lighting](#).
- Calcium Reactor - if you plan on having a tank full of hard corals a calc reactor is the way to go. Otherwise you can supplement with the two-part solutions and replenish needed elements via water changes. More info on the [Calcium Reactor](#).
- Sump and/or Refugium - the sump allows you to hide equipment and provides more water volume since it is plumbed into the main system. A refugium allows you to grow macro algae and pods for the benefit of the display tank. These are very good additions but optional.
- Various Reactors - you can set up more reactors in your sump for [Biopellets](#), Phosphate reducers, [Activated Carbon](#), etc. These are optional but can bring some good benefits.

STEP 3: RESEARCH THE FISH, INVERTS AND CORALS

This is the most important part of the entire process since it dictates the equipment and tank that you need. Take your time here and enjoy the research process. It's what makes the hobby so much fun in my opinion.

For a FOWLR your research required is much less. You basically need to research the compatibility of the fish you are interested in keeping. Make a list of the species that catch your interest and then research each of them. Figure out how well they acclimate to the home

aquarium, how they interact with conspecifics and other species, how easy they are to feed and what size tank you'll need.

For a reef tank you have your research cut out for you, but it can be quite fun! First figure out the type of corals you want to keep such as SPS, LPS or soft corals. It is best to stick with one type and avoid mixing coral types since the lighting setup you need is based on the corals you want to keep. Research the fish and inverts too. You want "reef safe" type fish and inverts. Fish and inverts labeled reef safe will not usually harm corals, but research thoroughly. Get your plan of tank inhabitants and write it all down on paper then double check it. Ask other reef hobbyists for their opinions before you buy.

STEP 4: SET UP THE SALTWATER AQUARIUM

Ok, so we have the type of tank we want to set up and we have researched the tank inhabitants. Now we can start buying equipment and setting up. If you want to set up a FOWLR check out the [Saltwater Aquarium Setup](#) article. If you are setting up a reef tank read the [Reef Tank Setup](#) article for a step by step guide. Once everything is set up you want to make sure your tank cycles. More info here: [Aquarium Nitrogen Cycle](#).

STEP 5: SLOWLY INTRODUCE LIVESTOCK AND KEEP UP WITH TANK MAINTENANCE

Once your tank has cycled you can start to slowly introduce livestock. Take your time here and make sure you [Acclimate](#) your new arrivals correctly. This period of time is crucial and mistakes are made when things are rushed.

Develop a daily, weekly and monthly maintenance schedule and stick to it. There are more details in the saltwater aquarium setup and reef tank setup articles linked above on maintenance routines.

CONCLUSION

This article may look kind of short but I did that on purpose to keep it simple. Explore the linked articles provided to get more information on a particular topic. I wanted this article to provide a quick overview of what all is involved and at the same time not scare away newbies with a huge article since there are already lots of articles on most topics needed for research. You can spend many hours or days researching and this is the best way to go. Research everything (fish, inverts, corals, equipment, etc) thoroughly first and you will save yourself some serious cash.

Here are more good articles to get you started:

- [Starting a Saltwater System - Part 1](#)
- [Starting a Saltwater System - Part 2](#)
- [Starting a Saltwater System - Part 3](#)

- [Top 10 For Newbies](#)
- [Tips For Starting A Saltwater Tank](#)
- [Saltwater Acronyms](#)
- [Nana Cube Setup](#)

Setting up a saltwater FOWLR or reef tank used to be way more difficult in the past but these days it really is not difficult at all. It is more expensive than a freshwater but I think that once a saltwater aquarium is set up with the right equipment and stocked wisely it is easier to keep a saltwater tank going than a freshwater tank. Be forewarned, it is extremely addicting.



This is for anyone interested in learning how to set up a saltwater aquarium. A saltwater aquarium setup doesn't have to be difficult. It just takes some effort on your part to learn about and research the necessary topics in order to have a good saltwater aquarium setup. Here we cover the basics of what you need to start that saltwater aquarium.

What do I need to start a saltwater aquarium?

Well, for the type of saltwater fish tank setup (marine aquarium) described in this article you will need the following equipment:

- Aquarium
- Aquarium Photo Background or Paint the background - see [Aquarium Aquascape Design](#) for more info on painting the tank background.
- Aquarium substrate for your saltwater aquarium setup such as live sand or crushed coral
- Live Rock
- Saltwater Mix
- Saltwater Hydrometer or even better a refractometer
- Aquarium filter (not absolutely necessary if running with adequate amounts of live rock, but nice to have if you need to use a mechanical filter or activated carbon, etc.)
- Replacement filter media like filter floss and activated carbon (if you get a filter)
- Multiple Powerheads (2 or 3)
- Heater - be sure to get one large enough for the size tank you're getting
- [Protein Skimmer](#) - See the equipment reviews section for protein skimmer reviews
- [Saltwater test kit\(s\)](#) to test water parameters and monitor the infamous aquarium nitrogen cycle
- Saltwater fish food
- Aquarium vacuum

- Fish net
- Rubber kitchen gloves
- Aquarium Glass Scrubber or make your own [DIY Algae Scraper](#)
- Two, clean, never used before, 5-gallon buckets
- Aquarium thermometer
- Brush with plastic bristles (old tooth brush) - needed for cleaning the live rock
- Quarantine Tank for acclimating new arrivals and monitoring for signs of [fish disease](#)
- Power Strip
- Optional but definitely recommend getting a Reverse Osmosis or RO/Deionization filter for the make-up water.

Realize the responsibility, time and costs involved

A [saltwater aquarium](#) setup is just like having a dog or a cat when it comes to the amount of effort on your part. In order to have a successfully setup saltwater aquarium you will have to work at it. On a daily basis you will need to feed your saltwater fish and monitor the water parameters (temperature, nitrates, etc) and some of the aquarium equipment on your saltwater setup. Once a week, or at most once every month, you will need to perform some kind of [aquarium maintenance](#) on your fish tank. Most of the time you will be performing water changes and water quality testing.

Cost is a very serious factor. Take the list above and research the prices of the various equipment needed to setup a saltwater fish tank. You will soon realize that a saltwater aquarium can cost significantly more to purchase than a [freshwater aquarium setup](#). Not to mention that saltwater fish are usually more expensive than their freshwater counterparts.

You also need to understand that setting up a saltwater aquarium takes time. It often takes 4 to 8 weeks before you can add any marine fish safely to your saltwater aquarium setup.

Read, read and then read some more

There are many great saltwater books out there and we've reviewed a few of them. Some of the better saltwater books are:

[The Conscientious Marine Aquarist](#),
[The Complete Book of the Marine Aquarium](#),
[Saltwater Aquariums for Dummies](#),

Reef Secrets,

Simple Guide to Mini-Reef Aquariums,

Complete Encyclopedia of the Saltwater Aquarium,

Marine Fishes, 500 Essential to Know Aquarium Species, and

The New Marine Aquarium.

There is also a ton of information online on saltwater fish. Do yourself a huge favor by reading as much as you can before you invest any money in your aquarium equipment and fish. You'll be glad you did. To get a general idea of how much it costs to setup a saltwater aquarium, check out the [Freshwater vs. Saltwater Aquarium](#) page for more info.

Decide on an aquarium size and location

It's a good idea to know what kind of saltwater fish you want to keep before you purchase your aquarium. Do a lot of research on the various types of marine fish to determine which fish you would like to get. Some marine fish only grow to be an inch or two, whereas other types can grow to 12 or 18 inches! Knowing what kind of marine fish you want will help you decide the size of the aquarium they will need. Many books stress that you shouldn't get started in the saltwater hobby unless you have at least a 40 gallon. But if you've done your research and thoroughly prepared, there is no reason why you can't start with a smaller tank. Be warned, a smaller tank will pose more challenges and will force you to perform more frequent water testing and maintenance.

You will want to place your aquarium in an area where the light and temperature of the tank won't be affected by external sources such as windows and heater vents. You will also want to place your aquarium on a stand that will be able to hold its total weight. A good rule of thumb for determining the total weight of a full aquarium is 10 pounds per gallon of water. For example, a 55-gallon tank will weigh approximately 550 pounds when filled with **water only!** You also have to account for the total amount of live rock, sand and equipment.



Buy your aquarium and equipment

Now is the time to decide on the type of filtration you will want to use when you setup your saltwater aquarium and the type of protein skimmer. We do not recommend using an undergravel filter. An undergravel filter is not needed and will only cause you headaches down the road. Since we will be using live rock as our biological filter, you really only need a modest filter for the mechanical and chemical filtration. Don't skimp on the protein skimmer. After the live rock, the protein skimmer is probably the next most important piece of equipment. When it comes to protein skimmers you really do get what you pay for. We have posted a few protein skimmer reviews and there are many more out there. Listed below are skimmers that we have reviewed:

Octopus 800s Protein Skimmer - *Very good skimmer

Octopus 200 NW Protein Skimmer Review - *Very good skimmer

AquaC Remora Protein Skimmer - *Very good

Tunze Nano Protein Skimmer - *Very good

Hydor Slim Skim Protein Skimmer - *Ok skimmer

Red Sea Prizm Protein Skimmer - *Ok, needs frequent adjustments

Fission Nano Protein Skimmer - *Don't waste your money

Visi-Jet-PS Protein Skimmer - *Don't waste your money

You will also need to purchase a heater capable of heating the aquarium size you have.

Get the live rock, sand and a power strip. Try to get 1 to 2 pounds of live rock per aquarium gallon. One rule of thumb for the amount of sand that you will need is about 1/2 to 1 pound of sand per gallon of water. Don't use sandbox or playground sand because it can have various unknown particles that may be harmful to your fish. Get either live sand or an aragonite based sand (from caribsea) or crushed coral.

A recent development in the past year or so has been biopellets. These are small polymer based bio-degradable pellets (biopellets) that as they slowly break down in your reactor will begin to feed and grow bacteria that will consume nitrates and phosphates thereby lessening the growth of undesirable algae forms your tank. You have to use a skimmer to get the full benefit of using biopellets and you need to direct the flow from the pellet reactor into the skimmer so that the excess "gunk" (or whatever the waste products of the pellets is called) is skimmed out of the system. Setting up a biopellet reactor will set you back about \$100 dollars or so but it is well worth it, especially if you are fighting algae problems in your display tank. For more information or to get started, check out the biopellet article.

Set up your aquarium, stand and equipment

Wash out your tank with water only! Do not use soap or detergents. Soap residue left behind will be harmful for your saltwater fish. Smoke test your aquarium by filling it with fresh water and check for leaks. If it passes the leak test, drain the fresh water from the aquarium.

Affix your background at this time. Be sure to use tape all across the top back of the background to prevent any salt creep from getting in between the background and tank glass. Alternatively, you can also paint the back tank glass (paint the outside back, not the inside). Painting the back glass can be better than using a background because you won't have to worry about salt creep making its way in between your aquarium background and the back glass. For marine tanks, a black background can help the fish colors stand out more. Deep blue is another popular color choice and it can help create the illusion of depth. After painting, let the tank sit for a day or so to allow the paint to dry.

Install your heater, hook up your filter, protein skimmer and any other equipment you have and be sure to use a drip loop on all of the power cords. For more safety tips, read the [aquarium electrical safety](#) article. **Don't plug in anything yet!**

Add pre-mixed saltwater to the aquarium

All of the marine salt mixes out there are made slightly differently. There is much debate as to which salt mix is the best. Here is a [comparison](#) on some of the available saltwater mixes. Unless you're considering a reef tank, most of the commonly available mixes should serve you fine. You'll soon develop a salt mix preference after you've worked with them for a while.

Use a clean 5-gallon bucket to mix the saltwater. First fill the bucket and then remove the chlorine and chloramine. Use something like Tetra AquaSafe for Aquariums. Read the directions on the salt mix package carefully and then add the salt mix slowly to room temperature water. Stir it well and test it with your hydrometer or refractometer. Once you get a [specific gravity](#) reading between 1.021 and 1.024 you can add the saltwater to your aquarium. Repeat this process until you have filled your tank. If you have a large aquarium you can mix the salt in the tank. Mixing in the tank can be more difficult and messy, so just be sure that you have thoroughly dissolved all of the salt mix before using the hydrometer.

Turn on the aquarium and let the water circulate for a day or two.

Cure the live rock



Live rock is probably going to be the greatest expense with the initial setup of a saltwater aquarium. For a reef tank setup it may be the aquarium lighting. For this reason, you are probably going to treat your live rock like gold once you get it. However, even though it can cost a lot of money, it will probably end up saving you money (in fish) because it is the best form of biological filtration. The curing process can last anywhere from 1 week to 2 months or more depending on the shape the rock is in when you get it.

Drain some of the aquarium water and then place your live rock in the tank. Try to place it in the middle of the tank and aim the powerheads (you should have 2 or 3) at the live rock. Placing the live rock in the middle of the tank will allow you to siphon up the debris that the powerheads will be blowing off.

Every few days turn off the power to the tank so you can perform live rock maintenance. Use some new rubber kitchen type gloves while doing this to protect your hands and the rock. You will need to scrub the live rock with a brush that has plastic bristles (old tooth brush) to remove any obviously dead or dying organisms. You can do this directly in the tank. Siphon up the debris and then refill with pre-mixed saltwater. The day before you perform the live rock maintenance get your saltwater ready. If you have a smaller tank you can use a couple of 5-gallon buckets for this purpose. If you have a larger tank you may want to invest in a large rubber trash can for pre-mixing your saltwater. Whatever you use, you will need to place a powerhead and a heater in the pre-mix container so that the mix dissolves correctly. Test your water throughout the curing process to determine if the tank is cycling.

During the curing process your tank may smell pretty bad and a good indication that your live rock is cured is when it no longer smells bad but more like the ocean. Use your test kits to verify that the tank has indeed cycled. You should have 0 ammonia, 0 nitrite and some sort of reading on the nitrates.

Add your substrate

First, drain some of the saltwater in your aquarium to allow for the sand you're about to add

and turn off the power to the tank. We'll use the 5-gallon bucket to clean the sand. Use the 5-gallon bucket to pre-mix about 2 gallons of saltwater. Add your sand to the bucket and then stir. This will allow some of the dust and dirt to rise so you can then siphon it off. Drain some of the saltwater from the bucket before adding your substrate. Use a plastic cup, ladle or something similar to add the freshly cleaned substrate to your aquarium. Use one of your powerheads to blow off any sand that gets on your live rock during this process.

Allow the tank to settle for a few days

Monitor your water parameters closely during this time. Check the salinity or specific gravity, pH, ammonia, nitrite, nitrate and carbonate hardness levels and correct as necessary. Ideally, you want the following readings for your saltwater tests before you start adding fish to your saltwater aquarium setup:

- temperature: 75°F - 80°F (24°C - 27°C)
- specific gravity: 1.020 - 1.024
- pH: 8.0 - 8.4
- ammonia: 0
- nitrite: 0
- nitrate: 20 ppm or less (especially for invertebrates)
- carbonate hardness: 7-10 dKH

Slowly add saltwater fish after the tank has cycled

I can't stress enough the need to use a quarantine tank for any new marine fish. You are playing a game that you will eventually lose by adding fish directly into the main tank. For more information on using a quarantine tank, please read [How To Setup A Quarantine Tank](#).

Only add one or two saltwater fish at a time. Only adding a couple saltwater fish at a time gives your filtration system the time needed to take on the increased biological load that the new fish introduce. When bringing home new saltwater fish, the acclimation process is a little more involved. Dump the bag contents (fish and water) into a clean 5-gallon bucket and then add about 1 cup of aquarium water to the 5 gallon bucket every 10 minutes. Continue to add 1 cup of aquarium water to the 5-gallon bucket every 10 minutes. After an hour or so your marine fish or invertebrate should be ready to add to the aquarium (qt tank). Following this more involved acclimation process will help reduce the amount of stress imposed on the saltwater fish. Stressed fish often leads to dead fish! Don't feed your saltwater fish on the first day. They probably wouldn't eat any food on the first day anyway. Let them get acquainted with their new home.

Perform Regular Aquarium Maintenance.

Be prepared to spend some time every day to monitor the temperature and salinity levels on your newly setup marine aquarium. You will also need to spend some time once a month to clean your tank and change out some of the saltwater. Try to change 20% of the saltwater in a given month. This could work out to doing small 5% water changes once a week. Performing regular small water changes will reduce the nitrate levels, replenish elements that have been used up and skimmed off and keep your saltwater fish happy and healthy. Remember to never add freshly mixed saltwater to your aquarium because it is fairly caustic freshly mixed. Mix it up the day before you will be doing maintenance.

MARINE REEF TANK AQUARIUM SETUP

INTRO

This marine reef tank aquarium setup article provides information on how to get your saltwater aquarium or reef tank set up. There are many different ways that you could set up a marine reef aquarium. This is but one marine reef tank aquarium setup and it works for us.



Some of the equipment listed below for the reef tank setup is optional, such as the sump and refugium. These are optional pieces of equipment but very nice enhancements to a tank. Please read the setup info below and if you have any questions, comments or critiques, please let us know using the reef tank setup comments form using the link provided below.

Reef Tank Setup Equipment Needed:

- Aquarium
- Lights
- Light Timer
- Salt Mix
- Sand
- Live Rock
- Protein Skimmer
- Power Filter (optional)
- Algae Scraper
- Sump and/or Refugium (optional pieces of aquarium equipment)
- Quarantine Tank

- Power heads (multiple)
- Food (depends on what you plan on keeping in your reef aquarium)
- Thermometer
- Heater
- Test Kits (chlorine, pH, ammonia, nitrite, nitrate, phosphate, calcium, alkalinity, iodine)
- Reverse Osmosis filter for makeup water or even better an RO/DI (deionization) filter.
- Hydrometer or refractometer
- 2 Five Gallon Buckets (clean and for fish tank only use)
- Fish, Corals and other Invertebrates
- Macro Algae such as chaetomorpha or gracilaria, for use in the refugium

RESEARCH

This is the most important part of keeping not just a marine reef tank setup, but any type of fish or animal. Without proper research how can someone determine if they can adequately care for their fish? We as aquarists have a direct impact on the life or death of our fish and invertebrates. Please don't take this responsibility lightly. These are after all, living beings.

If you're one that doesn't like to read or someone that hates doing research, then you may want to rethink the whole marine reef tank thing. I didn't like doing research very much in high school and college, but now I can appreciate it more, since the amount of research done beforehand has a direct effect on my wallet. Meaning that I don't spend money on items that I've found out that I can't adequately care for, or equipment I don't really need.

For example, I've tried to cut corners and save money in the past by buying a cheap inexpensive protein skimmer. After messing with the air flow adjustments for several weeks I realized that this skimmer was a waste of money. It wasn't doing what it was supposed to do, so I got the next skimmer up in price. This turned out to only be marginally better than the first skimmer. So, I was on my third skimmer now. This one turned out to be really good which I only discovered by doing RESEARCH. The morale of this story is that I could have saved a couple hundred bucks by researching thoroughly before laying down my hard earned cash for those crappy skimmers. The information is out there. Did you look for it? Here at Fish Lore, we have a few [aquarium equipment reviews](#) here and on the forum.

I don't mean the kind of research where you have to document/paraphrase/cite sources and such. When I talk about research I'm talking about reading and making a concentrated effort on locating care information for your inverts and marine fish and aquarium equipment. Remember

that doing the research for your marine reef tank setup is supposed to be fun. Learn to enjoy the process because the more you learn, the more you will want to learn.

Also, realize that the set up and running of a marine reef tank can get expensive. For a general idea on the startup costs, check out the [Freshwater vs. Saltwater Aquarium](#) page for more information. That article also now has a cost estimate for a marine reef tank setup.

DECIDE ON WHAT TO KEEP



This should be one of the first things you undertake when planning your marine reef tank setup. The tank setup, size, shape, dimensions (depth) will all be influenced by the animals that you will be keeping. For example, if you want to keep corals, you may need to get a shallow tank so that you can get maximum light intensity to the corals you're interested in keeping. If you're wanting to keep tangs, you would obviously want a much bigger and longer tank.

Deciding on what to keep will have an effect on the lighting setup that you will need to get. Reef tank lighting can be quite confusing. We'll get into lighting soon. You may, while doing your research, discover that there is no way you could care for the animals that interest you. In fact this may happen several times before you end up with a final selection of species for your aquarium.

One piece of advice that we'd like to pass along is that you may have the best results if you try to focus on a particular biotope or niche on the reef. Mixing animals from different parts of the reef can have unknown consequences at the time of setup. Also, you may also have better long term success if you avoid mixing soft corals with hard corals. It's not that it can't be done, it can be more difficult though to mix coral types.

CREATE A LOG

Date	Calcium	PH	SG	Phosphate	Nitrate	Alkalinity (dKH)	Magnesium	Temp	Notes
	NSW = 400 to 450			NSW = .01 to .06		NSW = 7	NSW = 1300 to 1500		
3/2/2011	475	8.3	1.023	0.07	0	8.3			
3/23/2011	430	8.3	1.023	0.09	0	9.3			
4/2/2011	450	8.2	1.025	0.09	0	10			
4/6/2011 11am	450	8.1	1.024		0	9.9	820	78	
4/16/2011	490	8.28	1.027	0.12	0	8.6	1800	80	
4/27/2011	480	8.14	1.025	0.11	0	8.3	1800	79.5	
5/11/2011	475	8.18	1.024	0.14	0	12	1500+	80.5	
5/27/2011	525	8.06	1.026	0.08	0	11	1800	80	
6/11/2011 11pm	485	8.06	1.025	0.15	0	7.7	1800	80.5	
8/20/2011	400	7.88	1.027		0	10.4	1800	80.7	
9/17/2011	440	8.1	1.025		0	10.2		81	
12/29/2011	550	8.2	1.026	0.05	0	13	1500	80.5	
2/6/2012	420	7.85	1.023		0	8.6		79.2	added sa
2/13/2012	475								
3/17/2012	425	7.77	1.026			9.2	1500		
4/22/2012	340	7.9	1.025	0.16	0	8.3 (2.97 meq/L)	1500	80	

A log book (file, notebook, paper, etc) can be extremely helpful when running a reef tank. It can be as simple as a notebook with your notes on the tank parameters. Whenever you test your tank water, write down the date and any test readings. Microsoft Excel or any spreadsheet application makes this task really easy. Create columns across the top of the spreadsheet for the test parameters (i.e. Ammonia, Nitrite, Nitrate, Calcium, pH, etc.) and then have the date in the first column. Here is an example of a [reef tank log](#). The cool part about using spreadsheets is the ability to make a chart of your test numbers. For instance, once you have several months' worth of data on calcium test results, you can create a line graph on this data which will give you a good idea of how fast calcium is being depleted from your system.

Another interesting idea if you have a digital camera is to take a few snap shots of your tank at least once a week. It can be pretty cool to look back at the photos on the development of your marine reef tank and it can help paint a better picture of how fast your corals are growing.

BUY EQUIPMENT

Look around some of the larger online fish and aquarium stores to find some of the better deals on most pieces of equipment. Remember that you have to add shipping to that price tag you see online. Even adding in the shipping though, buying online can shave a few dollars off the price, but the bad part is that you have to wait for several days while it's being shipped to you. You can even buy an aquarium online, but it will most likely be less expensive to buy the fish tank locally.

After deciding on the animals you're interested in keeping, it should be a rather simple matter to determine the absolute minimum amount of equipment needed. In this case, we're talking about setting up a marine reef tank and the list of equipment provided above is all recommended for just starting out. An optional piece of equipment is the [Aquarium Chiller](#). If you're running metal halides or similar, you may very well need one of these chillers to help keep your tank temperatures stable.

One very cool piece of equipment that you should seriously consider from the start is a biopellet reactor. We have had really good results when running biopellets on our marine reef tanks. Biopellets help remove nitrates and phosphates from your aquarium which helps to limit algae growth. Check out the [Biopellets](#) article for more information.

SET UP THE TANK AND EQUIPMENT

First, pick out a spot in the house for your marine reef aquarium. Next, put the tank on the stand and fill the tank with freshwater to determine if there are any leaks. It's much easier to return the tank now for a new one before you have everything in it. Also get out a level to make sure the tank is level. You should also be able to "eye ball" it by looking at the water surface. A small piece of foam placed between the tank and the stand can help reduce minor leveling problems, but for major problems you'll need to adjust the tank stand.

A fish tank weighs between 8 and 12 pounds per gallon, depending on what's in the tank. It's usually easier to use the average of the two, and use 10 pounds per gallon as a very rough guideline. This means that a 100 gallon tank could very well weigh over 1,000 pounds when setup. This also means that you should think twice before placing your marine reef tank on an upstairs floor. If you're unsure about how much weight the floor can hold, at the very least call a professional to come in and assess the situation.

If your tank passed the leak test and the level test, fill it with dechlorinated tap water or even better, [Reverse Osmosis water](#). Tap water can contain dissolved solids that could contribute to algae problems down the road, but for now tap water should be fine. Once the tank is filled about two-thirds full, add in the pre-measured amount of salt mix. Use the directions on the back of the box or check the manufacturers website if you're unsure of how to mix their salt mix.

We use an old algae scraper to stir the water until the salt mix is dissolved. Fill the tank a little more with dechlorinated freshwater or RO water, (not all the way to the top!) and then put in some powerheads to keep the water moving. After several hours, check the specific gravity with your hydrometer. It should be in the 1.023 - 1.025 range. Slightly lower or higher should be ok too. A good range to shoot for is 1.021 to 1.026. If the specific gravity is too high, you can lower

it by removing some of the tank water and replacing it with freshwater only. If the SG is too low you can add more salt mix. Don't worry if you're having trouble mixing the saltwater. After several water changes you should become quite the pro at mixing saltwater.

ADD LIVE ROCK



Add the live rock to your aquarium next. Place the live rock in an interesting arrangement directly on the glass bottom of the tank. Placing it on the glass bottom instead of on top of the sand prevents burrowing inverts from toppling the rock structure. It helps to draw some aquascape designs on paper before placing the rock in your tank. Some things to keep in mind: Don't place the live rock too close to the sides of the tank. Doing so will make it harder to clean the tank glass when algae starts growing. Use plastic cable ties and aquarium safe sealant (glue) to make interesting rock scapes. You can also drill holes in the rock, but be careful and use a dust mask. After drilling small holes you can use plastic ties to fasten different rock shapes together to form interesting shapes. The possibilities are endless and you're only limited by your budget and imagination. Using these tools you can make some really interesting caves, bridges, and overhangs that will enhance the beauty of the system.

If you're starting with "cured" rock direct from your local fish store, you can proceed to the next step. If you're starting with "Uncured" live rock you will need to cure it for the next several days or even weeks. How long depends on the shape the rock is in when you put it in the tank. You will have to use your aquarium test kits to tell you when the rock is done curing. There should be no signs of ammonia or nitrite in the tank.

TYPES OF AQUARIUM SAND

There are many different types of sand available to hobbyists. Some are better than others when it comes to saltwater reef tanks. Grain size can be important, and we like to use sand with a grain size anywhere from 1mm - 2mm in a shallow sand bed. Grains that are too small can trap gases and grains that are too large can trap detritus and lead to organic buildup. You can still have these problems with the grain sizes in the 1mm to 2mm range, but we think it functions well and also looks quite nice.

You may also come across something touted as "live sand". It is often way more expensive than "dry sand". While we don't want to dispute the claims made by the manufacturers that the living beneficial bacteria are included in the live sand packaging, we have a hard time believing it. How can these bacteria possibly stay alive for (sometimes) months at a time in an enclosed package often exposed to extreme temperatures during shipping? The only live sand I'd use is

sand taken directly out of an established tank. Sometimes hobbyists swap a cupful of sand at aquarium club meetings in the hopes of diversifying their sand beds. This can be a nice and inexpensive way to jump start a "dry sand" bed.

CLEAN THE SAND

Use one of your five gallon buckets to clean the sand. Fill the bucket up about half-way. Then fill with tap water. The bath tub is a good place to do this to prevent water from getting everywhere. Slowly swirl the sand around in the bucket. This should release the dry powdery dirt upwards and then you can drain the dirty water from the bucket. Repeat this process several times and then take the clean sand to the tank. Slowly add the sand to your aquarium. Don't worry about the cloudy water that results. This will soon dissipate.

The recommendation nowadays is to either go with a shallow sand bed or a deep sand bed, but not one in between. Well, what exactly is a shallow sand bed? What is a deep sand bed for that matter?

A shallow sand bed is anything under 2 inches. Most of the sand should stay aerated and there most likely will be little to no anoxic conditions present.

A deep sand bed is anything over 4 inches deep. You start to get anoxic (low oxygen) conditions and anaerobic conditions that will aid in denitrification at around 4-5 inches.

Anything between 2-4 inches deep could (theoretically) lead to algae blooms on top of the sand bed since you're getting some anoxic condition in the lower layers along with detritus that builds up in the upper layers. So, it's kind of like the worst of both worlds.

Personally, I like to use a shallow sand bed. I think it simply looks better than a deep sand bed. I also use ample amounts of live rock in our tanks and hopefully it is performing adequate denitrification making the deep sand bed unnecessary.

After adding the cleaned, dry sand to the tank, add any "live" sand to the tank. Mix it in with the dry sand. Hopefully you'll have enough to inoculate the sand bed with many new types of living organisms and bacteria.

Once all the sand is placed in the tank, let everything settle for a couple of days or longer.

SALTWATER REEF TANK WATER MOVEMENT

Think of the reef's natural environment for a minute. There are pounding waves and very high water flows at times. There is not a constant unidirectional flow of water, as is the case with power heads. We can reproduce these conditions on a much smaller scale by using either a

wavemaker (which can be quite expensive and hard on power heads) or by using multiple powerheads placed strategically around the tank to generate these turbulent water flows that corals do well in. Try to direct the flow from one powerhead into another's flow. Bank them off the tank glass, put them in a crossing pattern, anything to create turbulence in the water. Don't direct the output of a powerhead directly on a coral. It could damage the coral's tissue after a while. One thing to keep in mind with powerheads though is that submersed power heads can add heat to the marine reef tank's water temperature. If you add too many that are underpowered, you could have a serious temperature problem on your hands. It would be better to have a fewer amount of larger powerheads than many small ones.

High water flows are important for several reasons. They help keep detritus and uneaten foods suspended for filter feeders, mechanical filters, protein skimmers etc. so they can remove them from the water before they start to break down and effect the water quality. Water flow is also important because it can wash away any slime coatings that corals sometimes form to protect themselves from predators or other corals and the water flows carry food particles to the corals in the currents generated.



If you want to get one of the best pieces of equipment for water movement look at the Ecotech Vortech propeller pumps. These pumps are very expensive but, in my opinion, well worth it for a saltwater reef tank. If you want to find out more on these pumps I wrote a review on the [Ecotech Vortech MP40](#). There are many different water flows you can create with the driver that comes with them, including nutrient export mode and wave mode. I particularly like the long pulse mode and I run two MP40's (wireless anti-sync) at opposite ends of a 120 gallon marine reef tank I have set up and it can create a 1 inch wave. It's pretty cool and the sps corals love it.

SETUP THE SALTWATER REEF TANK LIGHTING SYSTEM

Deciding on the proper [aquarium lighting](#) for a saltwater reef tank can be quite confusing to those just starting out and it is **one** of the most important components to a successful marine reef tank. Most of the corals we as reef keepers are interested in keeping, utilize zooxanthellae that in turn use photosynthesis to supply food to the coral. Certain corals are also filter feeders, but they may get most of what they need from the photosynthesis of the zooxanthellae in their tissues.

I'm going to try and summarize some items that I think are most helpful when selecting a light system for your reef tank. Please keep in mind that these are generalizations - please research every animal you want to keep beforehand to see if you can meet its care requirements with any particular lighting setup:

- Research the corals/inverts before purchase to see if you can meet its lighting needs
- Light intensity drops off significantly the deeper it goes in water, therefore it may be less expensive to light a shallow tank than it is to light a deeper tank. You could also form the correct conclusion (obvious right?) that placing your corals lower in the tank will mean that they will receive less light intensity than those higher up in the tank.
- For soft corals - think Power Compacts for standard depth tanks (24 inches deep) or shallower
- For Large Polyp Stony Corals - think HO or VHO fluorescents. You might be able to use power compacts, but you may need to place the corals in the upper regions of the tank if you do go with PC lighting.
- For Small Polyp Stony Corals - think T5-HO Fluorescents or Metal Halides. A note about T5's: you still may need to place your corals higher in the tank. Metal Halides perhaps are the safest bet, but they can add a significant amount of heat to the aquarium and they can be quite expensive. T5 High Output (HO) lights are gaining favor because they are less expensive, produce less heat than metal halides and the bulbs are reported to last several years before they need to be replaced.

Besides direct sunlight, metal halides are about the most intense light we can get right now over our tanks. Perhaps they will get LED aquarium lights working in the near future, or become more practical, which should hopefully make it cheaper to run our aquarium reef tank lighting systems without any added heat. At any rate, the lighting setup for your saltwater reef tank is going to be one of the largest cash outlays (can get very expensive) and lighting is one area you should spend some serious time on while researching the corals you would like to keep. Look into the purchase price, and ongoing maintenance costs such as how much it will cost to run those lights by looking at how many watts the light use and how much replacement bulbs are going to cost. These are serious considerations and may very well influence your decision to purchase a particular aquarium light setup.

Fortunately, there are many lighting setups to choose from out there and many reports from hobbyists on the success (or not) they are having when running these setups. Look on online forums and learn how to use the search engines to find reviews on these expensive aquarium lighting fixtures. For example, you could use "Metal Halide Aquarium Light Review" in the google search box to pull back reviews on metal halide lights.

LIGHT TIMER

You will also need to get a light timer that will allow you to program when the different bulbs come on. These timers sound like a waste of money, but they really are worth the peace of mind they provide. Not to mention that you can create some really cool effects by staggering the on/off times a bit. They also provide a stable time period over the tank, which can be very important for the health and growth of your coral.

SUMP SETUP

A sump is a separate tank that is usually fed water by gravity using an overflow in the display tank. The water goes over the lip of the overflow, goes into the stand pipe in the overflow and then flows into the sump. A return pump in the sump returns water back to the display tank. Setting up a sump can be a little tricky. You have to make sure the sump will be able to hold as much of the water that will drain from the main tank in the event of a power failure.

The aquarium sump can provide several nice benefits. It can hide/house ugly equipment. It increases the total amount (volume) of water in your system. It can make water changes easier, since the sump is usually lower to the ground. You can also add saltwater aquarium supplements into the sump instead of in the main display aquarium, which should give the supplements more time to dissolve without possible harming the tank inhabitants.

REFUGIUM SETUP

The refugium is another tank that is as a place of refuge for desirable organisms. It is placed in line with the rest of the system. Hobbyists will often setup a refugium with a deep sand bed, some macro algae (such as chaetomorpha) and live rock. The use of refugiums has taken off lately. Companies are now producing quality models that can hang on the back or side of the tank. There are also setups that combine the sump and refugium into the same box. Way cool stuff here.

Why is a refugium important? Well, the macro algae does a great job at extracting nitrates, phosphates, carbon dioxide and other nutrients from the water. You can then export these nutrients by "harvesting" the macro algae. This essentially involves pruning the growing macro algae. The macro algae can also harbor many desirable life forms like amphipods and copepods. These tiny organisms can be used to feed the display fish and corals once their populations

reach significant numbers. Refugiums most likely will need their own light source and power compacts that clip on the refugium work nicely in these applications.

TO MECHANICAL FILTER OR NOT TO MECHANICAL FILTER

You don't have to run a mechanical filter, such as a power filter or canister filter, on your marine reef tank. We only run a mechanical filter, in this case a hang on powerfilter, when we want to run activated carbon in between water changes or if we need to use phosphate removing pads when we start noticing any sort of algae buildup anywhere in the tank.

The main idea here is that the protein skimmer will remove most of the organics once they start breaking down so you really don't need to run a canister filter or power filter. In fact, these very filters could or might contribute to nitrate problems if the filter media is not cleaned and/or replaced on a regular basis, like every two days or more frequently. Speaking of protein skimmers...

PROTEIN SKIMMER SETUP



If you purchased a protein skimmer, either a stand alone, hang on the tank type, or one that is for use in a sump, hook it all up now. Some recommend not running the protein skimmer during the break in stages, but we do. If you're curing live rock and running a protein skimmer, watch the collection cup closely because it may need to be emptied frequently during the break in stages.

We should mention here that it is not absolutely necessary to run a protein skimmer on your saltwater reef tank. Some swear by skimmers and others think that they do more harm than good by skimming off the good with the bad. Frequent partial water changes can be used instead of a protein skimmer for lightly stocked tanks. Running a skimmer might be cheaper in the long run compared to making frequent partial water changes (salt mix isn't cheap). However, I would only recommend not using a skimmer for those with more experience in keeping reef tanks.

Here are some links to skimmers we've reviewed in the past:

[Octopus 800s Protein Skimmer](#) - *Very good

[Octopus 200 NW Protein Skimmer Review](#) - *Very good

[AquaC Remora Protein Skimmer](#) - *Very good

[Tunze Nano Protein Skimmer](#) - *Very good

Hydor Slim Skim Protein Skimmer - *Ok skimmer

Red Sea Prizm Protein Skimmer - *Ok, needs frequent adjustments

Fission Nano Protein Skimmer - *Don't waste your money

Visi-Jet-PS Protein Skimmer - *Don't waste your money

LET EVERYTHING RUN

Ok, so we've added the sand and live rock, setup the sump, refugium, the protein skimmer, and possibly the mechanical filter. Now we need to let the system run for a few days to a week while monitoring the water quality. If after running the tank for several days and you don't detect any ammonia or nitrites but you can detect small amounts of nitrates, you can slowly start stocking the tank. Sometimes live rock that is extremely porous can be excellent at denitrification and you may not get a nitrate reading with fully cured rock.

SLOWLY ADD FISH AND CORAL AFTER QUARANTINE PERIOD



The time soon comes to add the fish, corals and other invertebrates to your marine reef tank setup. Stocking your tank slowly and ALWAYS using a quarantine tank will pay off big time in the end. Saltwater fish and corals can be very expensive. Setting up and running a quarantine is not expensive, just another step in the aquarium acclimation process. Following a strict quarantine protocol will go a long way to ensuring your success within this hobby. Keep the fish and corals in QT for several weeks so you can monitor them for signs of infection, be looking especially for signs of saltwater fish disease such as Amyloodinum and Cryptocaryon (marine ich) and treat at the first signs of disease.

A quarantine tank also allows your fish to recover from shipping without harassment from other tankmates and it gives you a closer look at the fish (QT's are usually much smaller than a display tank) all while getting it to eat the needed foods in order to build up the fish's health.

Corals can also carry disease and sometimes hobbyists will use a dip procedure where they dip the coral in Lugol's Solution (concentrated iodine) for 10 - 15 minutes before putting them in QT. This is thought to be a therapeutic treatment. There are also coral pest dips that you'll want to investigate. You do not want to introduce pests like montipora eating nudibranchs, acropora eating nudis or flatworms (sounds awful and they are) to your tank.

DEVELOP A MAINTENANCE ROUTINE

After having the saltwater reef tank setup for several weeks you will start to see increased

amounts of algae growth on the aquarium walls and maybe on the rock and sand. A magnetic algae scraper can easily rid the tank walls of unwanted diatom algae blooms. Gently using an aquarium vacuum over the top layer of sand will get rid of any algae trying to take hold on the sand.

Daily Reef Tank Setup Maintenance Tasks:

- Tank Temperature
- Watch the Fish, Coral and Invertebrate behavior
- Feed the fish
- Scrape the tank glass of any diatom algae growth - its way easier to take it off daily, instead of letting it grow. You may want to let one of the sides grow algae, especially if you have herbivorous fish such as tangs.
- Empty and clean the protein skimmer collection cup. A dirty collection cup could negatively affect the performance of the skimmer.
- Top of any evaporated tank water with pure (Reverse Osmosis) freshwater or at least filtered tap water.

Weekly Reef Tank Setup Maintenance Tasks:

- Check Nitrate, pH, Alkalinity and Calcium levels, possibly phosphate and silicate
- Once your corals start growing they will consume more calcium from the water. You need a way to replenish the calcium levels and keep the alkalinity levels up for growth to continue. Dosing with Kalkwasser is an easy way to keep these levels where they need to be. You can slow dose kalkwasser when the lights are off to offset any pH rise. Research this subject thoroughly before using kalkwasser. A calcium reactor can be considered a better way to keep these levels up, but a calcium reactor can be very expensive. Great to have if you can afford one.
- Do a partial water change (10 percent)
- Wipe down power cords and any salt creep around or on the marine reef tank.
- Clean the intakes to power heads and/or skimmers.

TESTING YOUR WATER PARAMETERS

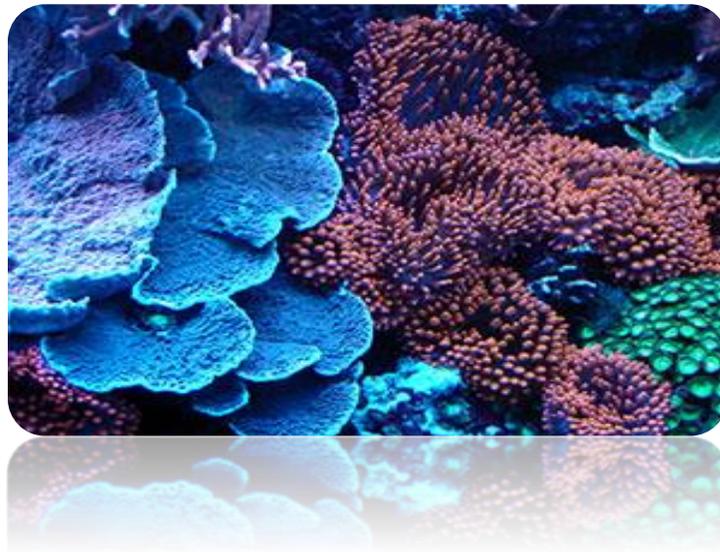
Testing your saltwater reef tank water parameters is crucial to not only the wellbeing of your fish, but it is also important for the health and growth of your corals. Keeping the tank's Specific Gravity, pH, Calcium and Alkalinity levels at optimum levels is very important if you want to see growth out of your corals.

Some recommended test kits to have on hand are Ammonia, Nitrite, Nitrate, Phosphate, pH (automated pH meter is extremely handy), Iodine (if you plan on dosing iodine), Calcium, Alkalinity and of course a hydrometer.

Good water parameters to aim for in your saltwater reef tank setup:

- Specific Gravity 1.023 - 1.025
- Temperature 75 F to 80 F
- Calcium 400 - 450 ppm
- Alkalinity - 2.1 to 2.5 meq/L
- Magnesium - 1200 - 1400 ppm
- Ammonia, Nitrite, Nitrates and Phosphate - 0 ppm
- Iodine - 0.06 meq/L

Remember to test often and write down your results so you can chart your tank's progress. You can come up with some really interesting conclusions about your tank by simply looking at the line graphs produced by the data from your logs.



ENJOY YOUR TANK AND CONTINUE TO LEARN

The aquarium setup stage of your marine reef tank is now over and many new stages are beginning. There is so much to learn about the corals, fish and invertebrates we keep and it can be quite fun learning about these animals while watching our reef tanks thrive. If you didn't use the sump or refugium in your setup, maybe you can start learning more about these systems with the hopes that you could eventually incorporate them into your reef tank. They will add stability to your system.

This article will show you how we set up our 28 Gallon JBJ Nano cube.

Intro to a Nano Cube

This article will show how to set up a nano cube. The reef tank hobby is growing by leaps and bounds as knowledge spreads and information is freely shared amongst hobbyists. This is a wonderful thing for our hobby. Just a few years ago you would be hard pressed to find some of the more experienced hobbyists recommending small saltwater tanks (nano tanks). The water quality can quickly get out of whack with fluctuating temperatures, dissolved organics, salinity increases via fresh water evaporation, etc. While I think that the old advice of "bigger is better" certainly still holds true, you can still be successful with a Nano Cube Setup. It just takes a careful eye, the willingness to monitor water parameters and be ready to correct them as needed.

A big saltwater reef tank can be very expensive to setup and maintain. The equipment and corals can be extremely expensive as well as your monthly electric bill from running those high powered lighting systems on larger tanks. The nano cube setup lets you "get your feet wet" without destroying your bank account or credit cards. I've been saving up for quite some time now for the ultimate reef tank setup and just couldn't take it any longer. I dipped into the reef tank savings account and purchased a JBJ 28 Gallon Nano cube with the 150 watt HQI Metal Halide. I've seen and read about numerous nano cube setups and the idea of setting one up intrigued me. So, I bit the bullet and satiated my desire for immediate gratification but ultimately prolonged the setup of my dream tank.

About the JBJ 28 Gallon Nano cube

The footprint of this nano cube setup is approximately 18 inches wide, 21 inches tall, and 21 inches deep (front to back). The height measurement does not take into account the potential need to raise the included protein skimmer. It is just the measurement from the bottom of the tank to the top of the closed canopy. So, what all does this baby come with? Here you go:

- A 150 watt HQI metal halide, Kelvin rating is 14,000 K, with ballast
- 4 Cooling fans (3000 RPM's) in the canopy (our opinion - it needs more powerful fans, these are not big enough for a totally enclosed hood)
- 4 blue LED night lights - for night time viewing
- 2 powerheads - Accela Powerheads (266 gph each / 16w each), would be nice if these were more powerful
- 2 directional flow nozzles on top right and top left back side of tank
- Ocean Pulse Duo - Alternating Wave-maker for plugging the powerheads into

- Counter current protein skimmer with air pump and wood diffuser. This is old school, but it does work ok.
- Center overflow on top middle of back wall that flows into the integrated sump area
- Filter basket with a handle and sliding door that comes filled with ceramic rings, activated carbon and sponge filter

Nano Cube Setup

Ok, this cube sounds really cool. It gets ordered and shows up a week later. Here's the box:



Here are some photos of this nano cube setup out of the box along with all the equipment it comes with:



Photos of the lid, metal halide and moon lights:



The Setup

After getting it out of the box, rinsing all the equipment and the cube it gets filled with water to test for leaks.



I let everything run on this nano cube setup for a couple of hours just to be on the safe side. So far, so good. At this point I'm realizing how cool this tank looks. From the glitter lines produced by the metal halide to the blue effect from the moon lights to the rounded glass corners. This is a very nice looking tank.

While running the leak test and running the protein skimmer that comes with the nano cube setup kit I'm thinking that there are some things could be improved on. So, off comes the directional flow directors from the water return pumps and they get replaced with Hydor Rotating Deflector. These devices attach to the water outlet and get rotated from the force of the water flowing through them. I've used them in other setups and I really like the way they create turbulent water conditions instead of a one way flow. They do tend to diminish the flow rate. Another reason why I wished that this setup came with higher output powerheads for the water return lines to the tank. Still, I like these rotators better than the flow directors that came with the tank.

The second thing that was replaced was the stock protein skimmer that comes with this nanocube. I think it would work ok for this tank, but I had an aguac remora protein skimmer not being used and that will work much better on this setup. Here are some photos of the stock protein skimmer in action:



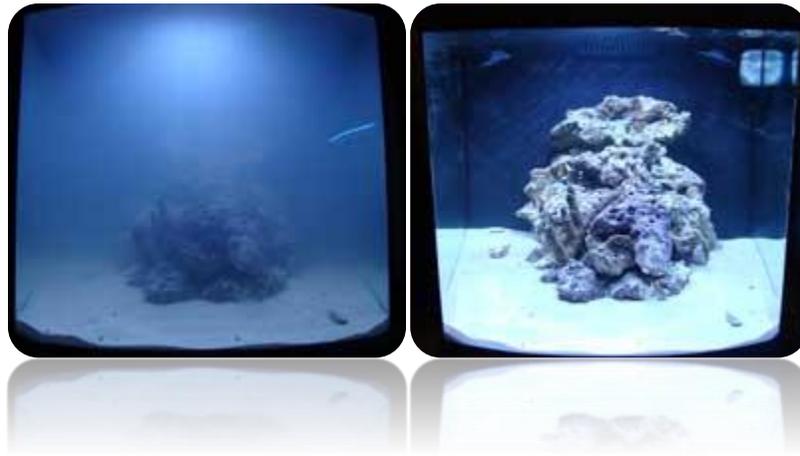
Then a few days later I was doing some online shopping for other stuff that I was needing for my other tanks and I kept coming back to this [Tunze Nano Protein Skimmer](#). Now, I'm very happy with the Aquac Remora skimmer, but I've always wondered if there was something even better out there. So, I bit the bullet and got the Tunze Nano protein skimmer. The Tunze is now running on the tank and doing a pretty good job with the benefit of not producing micro-bubbles. Getting ahead of myself, but here are some pics of the Tunze skimmer:



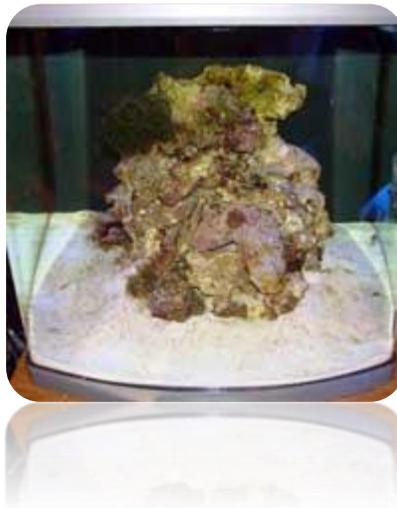
After draining some of the tank water I slowly added in about 25 pounds of [live rock](#). I knew that I wanted a sloping or layered look to the rock work. I even messed around with making some designs with egg crate fastened into different shapes. It just looked too fake though so I pulled out the egg crate and then just stacked the rock into a slope from back to front with a decent sized flat area in the middle for placing coral frags. Haha! Yeah baby! Who says that I don't know how to make a live rock [aquascape](#) look like an Imperial Star Destroyer space ship (Star Wars reference). I can live with it though.

The aragonite sand came next. Slowly, very slowly I used a big ladle to place the sand around the live rock. I ended up going with 20 pounds of sand, probably could have went with less. It's not going to be a nitrate reducing sand bed because it's too shallow. It's just for looks and it will be frequently stirred when sand vacuuming and doing tank maintenance.

Here's what we have now:



After letting the tank settle for a week or so and monitoring water test results on a few different occasions things were looking good, except for the minor hair algae outbreak. Another lesson in patience. When filling the cube with water I used some filtered tap water, not Reverse Osmosis water like I normally use. Doh! Check out the lovely hair algae below.



Aquarium Chiller Needed or at least a fan!

One thing I noticed when running this baby was that the tank temperatures kept rising into the mid to upper 80's °F by mid-day. That is just a bit too high for me. I know reefs are in the low 80's but what I didn't like was the temperature swing from around the mid 70's °F to the mid 80's °F. That is just too much of a swing for my sanity. Well, after running a fan over the back of the tank when the main lights came on for several days the temps did seem to stay in the low 80's °F.

I could have left things alone and been fine with a fan, but I had also gotten a gift certificate to the DrsFostersmith website for Christmas that was burning a hole in my pocket. Next thing I know I have a [Mini Arctica Chiller](#) on order. I had not planned on getting a chiller when

originally planning this setup. The chiller was a snap to set up and it's been running well. It kicks on whenever the tank gets above 79 °F, lowers the temp to around 77.5 °F and then kicks off. I like having a 1 to 2 degree temp swing versus the 5 - 10 degree swing when running without the chiller.

Not using the filter basket

I knew from the start that I wouldn't be using the filter basket with ceramic rings, sponge filter and activated carbon. If I ever need to run activated carbon I'll use a filter bag and place it in the bottom of the middle compartment overflow intake under the skimmer. It's a very nice little filter basket that slides in and out of the sump area with the attached handle on top. But having live rock and a skimmer kind of negates the need for these filter components. The less stuff I have to remember to change or clean, the better.

On with the show!

After letting the tank settle for a couple of weeks a few small frags from the other tanks made their way into the cube. I added 2 frags of *montipora capricornus*, some pulsing xenia and some shrooms (green mushrooms -*actinodiscus* sp.). I'm just testing things out at this point to see how these frags do for a bit and then I'll slowly add more coral frags to the tank. Nanocube parameters are:

- Specific Gravity: 1.025
- pH: 8.3 night to 8.4 day
- Alkalinity: 2.5
- Ammonia, Nitrite, Nitrate, Phosphate, Silicate all 0 (salifert tests)
- Magnesium: 1400
- Temp: 77.5 - 79 °F
- Calcium: 440
- dKH: ~ 8
- Iodine: ~ 0.03 mg/L

Initial Impressions, Things I Like and Things I Don't Like

Overall, this 28 gallon JBJ Nanocube is very nice and I'm glad I bought it. It sits on my desk so it gets lots of viewing time. The rounded corners are very cool and it only breaks up or distorts the angled views slightly. The overflow and attached sump area is nice too. There are 5 separated compartments. Two are for the return lines from the powerheads, two more could be used for a heater or similarly sized piece of equipment. The biggest compartment is in the middle under the overflow. This is where the skimmer sits for my setup. The stock skimmer can fit into one of the other compartments if you decide to use the filter basket. Not sure what you'd do with a something like a tunze 9002 skimmer if you were to use the filter basket too... It would most

likely require some serious modifications to the back compartment. You don't need to replace the stock skimmer. It should do an ok job but you may have to mess with it (raise and lower it) frequently to get it to skim at peak performance. Also, as mentioned previously, you can run your setup with the filter basket in the middle and then an aquac remora hanging on the back of the sump. Just place the powerhead for the remora into one of the 2 smaller sized compartments. You will need to remove the pre-filter to the powerhead to get it to fit.

I'll most likely wind up upgrading the two water pumps to something a bit more powerful if I can find some powerheads small enough to fit in those compartments. The wave maker that comes with this setup is a nice touch too, but since I'm running the rotating water flow devices on the water return outputs it's not being used.

I also like the two arms that prop up the canopy so you can get into the tank and clean or place frags, etc. You can get a 90° rotation on the hood. I have to remove the skimmer collection cup to raise the hood though. Not a big deal though since it also has a feeding lid in the front of the canopy that you can use to feed the fish. If you need to target feed inverts or corals you'll need to raise the main hood most likely. It should also be mentioned that you can completely remove the hood if needed.

A replacement for the 150 watt metal halide HQI bulb runs about \$40 USD. It will need to be replaced every 9 months to a year. Just something to keep in mind. You also need to keep the protective metal halide covering clean on the canopy so that the most light possible reaches the corals. The 4 blue LED moon lights should last for several years before needing replacement.

The Final Price Tag

I made several changes to my cube that you don't really need to make. You can run with what the stock kit comes with along with the addition of a fan that blows air over the back of the tank. So, a regular setup would run something like the following. Please keep in mind that these are approximations and prices change.

Equipment	Price
JBJ 28 Gallon Nanocube w/ 150 HQI	\$500
Clip-On Fan	\$15
20 pounds live rock	\$120

20 pounds aragonite sand	\$15
Digital Thermometer	\$10
Algae scraper for glass	\$10
Total before additions/changes:	\$670
<u>JBJ Mini Arctica Chiller</u>	\$340
Tunze Nano Skimmer	\$150
2 Hydor Flo Deflectors	\$20
New total with additions/changes:	\$1180

This price tag is all before adding a single fish or coral to the tank. I thought it would be helpful for those planning a similar setup. If you are starting completely from scratch you will also need test kits and various other equipment. Check out the [Saltwater Versus Freshwater Aquarium](#) for more prices and comparisons between the setups.

What the Future Holds

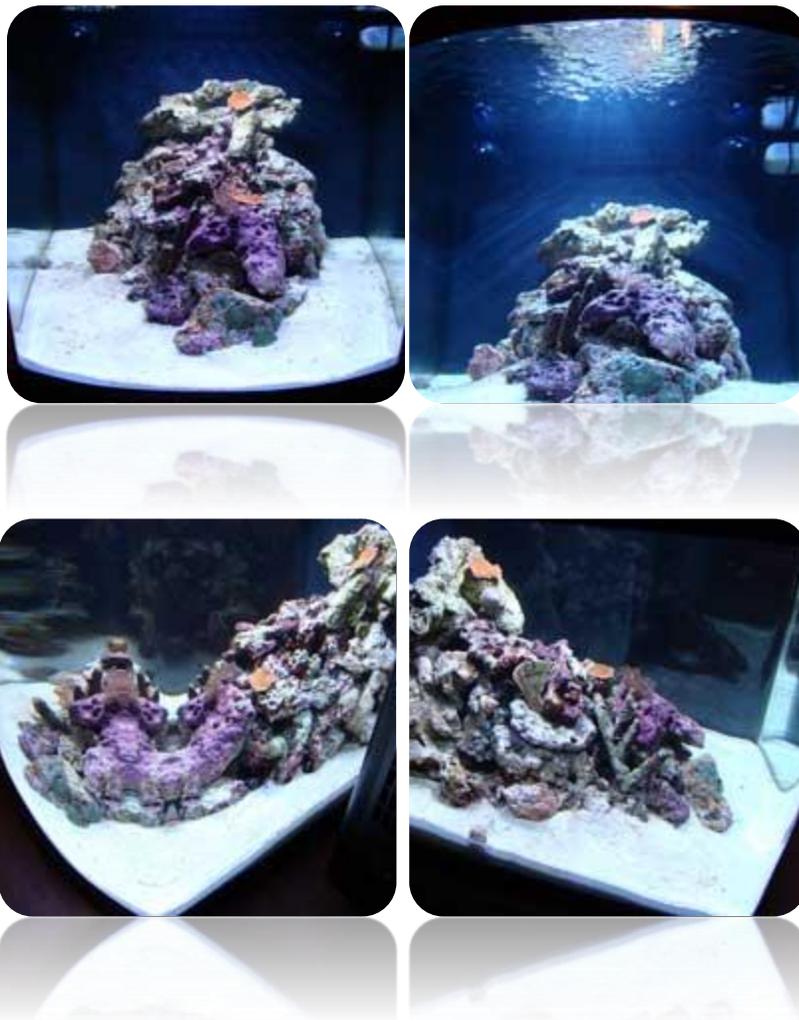
I'd like to really take my time and slowly grow out this reef tank. I'd like to have various mushroom species along the bottom of the live rock and grow some LPS and SPS toward the top of the tank. The only softies I plan on having are the xenia for now. They may get pulled out though.

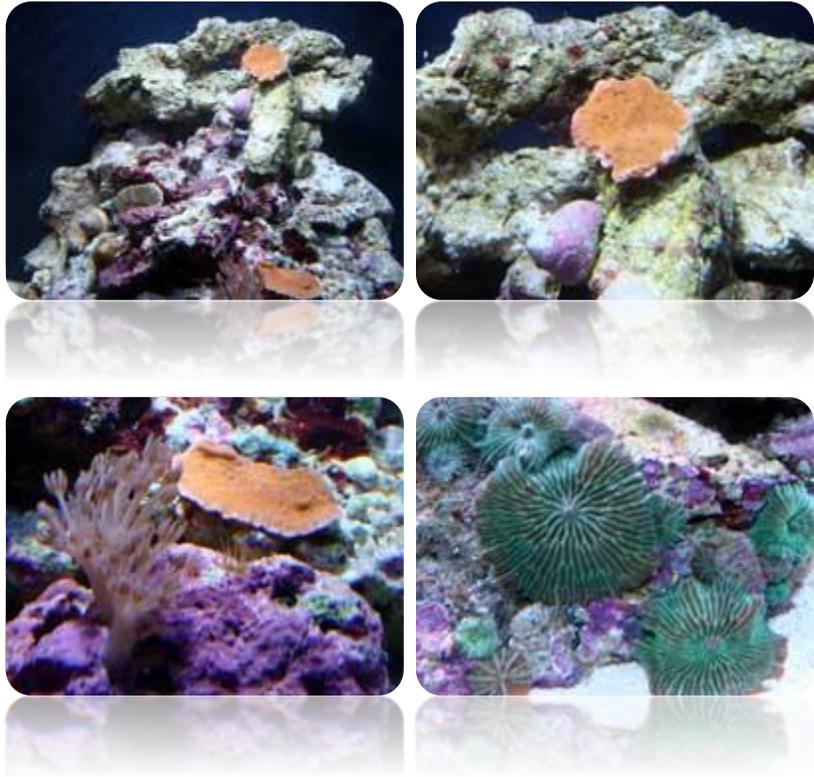
A hang on the back of the sump or plumbed inline refugium is also being planned. Although I'm also looking into having one large refugium to feed both this tank and a 55 gallon reef tank. Don't know yet, but it will be fun that is for sure.

This is a really nice tank that comes with a very nice metal halide that may allow you to grow some of the hardier LPS and SPS if placed appropriately. All the other pieces of equipment it comes with are nice too and I wouldn't hesitate to recommend this nanocube to a friend. Check the DFS website because they sometimes run promotions where they include a free stand with

this nanocube setup kit. I didn't get the stand free. It sits on my desk anyway. See it here if interested: [Check Price on Amazon](#)

More Nano Cube Photos





STARTING A SW SYSTEM - PART 1 - WHERE TO START YOUR RESEARCH

Written By Ryanr on the FishLore forum. This is a 3 part series.

Hi everyone,

So having recently setup my Reef tank, I've taken some time to reflect on my experiences, what I learnt, how did I do it etc.

So I thought I'd take some time to share the experience, and maybe impart some 'wisdom' so to speak. In what I hope will be the first of a few little guides for our community, I hope to be able to take you through some of the topics and things that they don't tell you.

A bit of warning - this is not intended to answer every topic, just to guide or prod the reader to further readings. There are many books and internet sites out there that discuss this in detail.

Introduction

Upon reflection, it's easy to sit back and say "that wasn't nearly as bad as I thought". But in reality it was a struggle, the journey started in January 2011, with the dream of a reef, and thus began my research.

We've all heard the advice "Research, research and then do a little more research", and we've been given the Beginner Guide links etc. Most will have been told to decide what system you want (FO/FOWLR/Reef) and research those setups. But if one hasn't done any research, how do you know what type of system might interest you.

For those interested in SW, it's a common theme, and often a deterring factor is the Research... Why? Well I feel it is because very few will tell you where to start 🤔 It leaves the hobbyist in a bind, reading beginner guides is easy, but it still doesn't really tell you what you want to know.

So where do you start? That's easy, at the beginning of course 🤔

The beginning - The Reefs of the World

Appreciate the Scale of your project

The very first concept any hobbyist needs to get their head around is that of the natural reefs, and develop an appreciation of the scale of the project and the environment we try to replicate.

If we take the Great Barrier Reef (located off the North East Coast of Australia) as our example, the enormity of this natural wonder of the world is mind-boggling. At approximately 2000kms in length (1200 miles) and many kilometres wide, the GBR is simply one of the biggest natural aquatic eco-systems in the world, covering an area estimated to be 344,400 square kilometres, or 133,000 square miles 🤯

The whole eco-system is self-sustaining, it endures tropical cyclones/storms, commercial shipping routes and commercial fishing, yet this beautiful eco-system keeps on going.

2000kms of natural wonder - and we want to take some of it and put it in a 1m (3ft) glass box, or even smaller. Keep in mind that most of the specimens we keep in our small boxes are hand-caught off the reefs, and shipped all over the world 🤯 [yes Finding Nemo is frighteningly representative of the SW trade]

Is the "go as big as you can" concept starting to make sense now?

Whilst I recommend reading about some of the world's reefs, it's not important to know every one of them, but you must take the time to appreciate the scale of the project.

To completely understand a reef is near on impossible - there is so much that happens out there that science still doesn't have all the answers.

What makes a Reef

Next on the list, is understanding the construction of the reef environment. Our reefs are thousands of years old, they have developed over-time. Predominantly formed by dead-corals building up, and allowing more corals to grow on top, and then they die, and so-on and so-forth.

And here's the next comment "Nothing good happens fast in SW". If it took thousands of years to create it, how can we possibly expect to recreate 'overnight' so to speak 🤯

The reef environment is a complex accumulation of a complete life-cycle. It's a dog-eat-dog world on the reef (so to speak).

The reef cleans itself, replenishes itself, feeds itself, and thus is the circle-of-life.

In addition to the foundations, each and every animal on the reef has a purpose. Shrimp, snails, abalone, sea cucumbers all play their part in keeping the reef clean. Some shrimp even have a dual purpose, notably the Skunk cleaner which will also clean other fish of parasites etc.

Certain species of fish feed on inverts like shrimp, others feed on corals, others the algae that grows, and some are carnivores.

So why does this matter to me?

We'll enter the concept of live rock (more on this later) as a foundation for a SW setup (FOWLR or Reef). The live rock as we call it, not only makes a perfect base to build your SW system around, it has the added advantage of being an extremely good biological filter (there's plenty of topics on the net that explains this, and maybe I'll discuss it more detail later when we get to filtration)

If we are to replicate a natural environment, it makes sense to use what Mother Nature uses..... doesn't it?

Next is the fish and inverts - understanding the role the fish, corals and inverts etc play in the reef helps us to determine what we want in our system.

I'll split the rest by phases, it may be easier to follow.

So the next phase in my journey, now that I had a grasp of what a Reef is, and how it all fits together, was to understand how life was sustained on the reef.

Keep in mind, I still hadn't decided what I wanted, other than a reef.

Reef Life - Anemones

So I think we all like and probably want the Nemo in the anemone setup. I had heard anemones and corals are hard to keep, so I thought I'd start with the hardest, and build my knowledge around that - after all, it's the hardest to keep that can dictate what equipment to buy.

I'd encourage any potential reader to check out anemones, and learn about them first. Many people I've spoken to think that anemones are just another type of coral - wrong! An anemone is actually very interesting, they will move around to find an environment that suits them, both on the reef, and in captivity.

They do have particular requirements for feeding, lighting and flow, so it's important you consider these.

Reef Life - Corals

The building blocks of the reef if you will. The biggest thing that struck me was how many different types of corals there are, not just species, but in form, soft, hard, polyps (terms like SPS and LPS). This is still an area of the reef that spins my head.

But again, learning about corals, what they eat (some are carnivores, some are filter feeders), the light they require, and more importantly, for hard corals, I learnt about other requirements like calcium, magnesium, alkalinity.

The other thing I learnt, was that corals are a food source for many fish.

Reef Life - Fish

Normally the first step for most, is to look at the fish, but I chose to look at the fish last.

Having learnt that corals are a food source for some fish, and that the very nature of the reef is a complete system, understanding the behaviour of fish was important.

This is where the concept of "Reef Safe" comes in. Quite often, fish will be considered not safe for reefs because, in the wild (and in captivity), there is evidence that they eat inverts (shrimp) or corals or both.

Ok, so if you're still with me, you've probably been waiting for this bit.....

How do I decide what setup is best for me?

So before we answer this, let's consider what we know:

- We understand the environment we're trying to replicate
- We understand a little about the different life on the reef, and what they require
- We're starting to get an idea of what we want to keep

The decision on a setup, IMO comes down to the answers to the following:

"How much work do I want to do?"

"How much money do I want to spend (invest)?"

"If I want corals, and a coral eating fish, which is more important?"

Reef Setup

The only thing that separates a Reef setup from a FOWLR is the addition of Corals.

If you've taken the time to learn about corals, you'll appreciate that they are not as simple as just putting in the tank. They have specific requirements, that can require the addition of supplements, specific food (phytoplanktons etc), and more precision lighting.

Pros: They look absolutely magnificent. The ultimate in fish-keeping. Constantly evolving ecosystem. Truly rewarding.

Cons: Cost more to setup and run, require more diligence with water conditions/parameters, specific feeding requirements. Can limit choice of fish and inverts.

FOWLR

If you've decided that corals are not for you, then a FOWLR is the next best way to go. FOWLR setups are probably the most versatile when it comes to stocking.

Pros: Cheaper than a reef setup, can still benefit from coralline algae (the amazing purple stuff), provides a great way to mimic the natural reef, and give hiding places for fish, inverts and the like. Can become a reef easily.

Cons: Not many really, other than no corals.

FO

If I'm perfectly honest, I do not see the point of a fish-only SW setup. Considering what we have learnt about the reefs, and that our specimens are generally hand-caught from the wild.

My opinions aside - If you are going to go with a FO setup, please take the time to at least construct a 'fake' reef. Reef fish generally require hiding places, and channels through rocks etc.

Summary

That was my approach to researching my reef setup. Yet still at this stage, I had only decided on a reef setup. There is still more research to come, but I consider it the fun research (choosing equipment, planning etc)

For those that are interested - the above topics probably consumed 6 months of my time, learning, the more I learnt, the more I wanted to learn, as some topics spawned new thoughts, so more reading.

If you are dedicated, you'll find yourself immersed in the reef environment 😊

I hope you've enjoyed the read, sorry for the wall-o-text, but for those interested in starting a SW system, I hope it's helped point you in a direction to start your reading.

Till the next episode..... thanks for reading.

STARTING A SW SYSTEM - PART 2 - BRINGING NATURE HOME (RESEARCHING EQUIPMENT)

In Part 1, I covered the fundamental research that I undertook before starting my tank... To recap, I researched:

The Reefs of the World

- *Appreciating the scale of the project*
- *What Makes a Reef*

Reef Life

- *Anemones*
- *Corals*
- *Fish*

Deciding on a Setup

- *Reef*
- *FOWLR*
- *FO*

So by now, you've probably chosen what sort of setup you would like to keep.

The next step in the process was understanding how to bring this diverse eco-system into the home.

How do we simulate the Reef environment in the home?

Note: By reef, I mean the ocean, but given all marine fish typically come from a reef, it's easier to cover the generics of the reef environment

- Water Chemistry
- Filtration, Nutrient Export & Flow
- Lighting <more important for reefs>

So Step 1, **Water Chemistry**

I put Water Chemistry at the top, because without first understanding this, it's kind of hard to get your head around the rest.

Natural Sea Water is a somewhat complex composition of many elements.

There are the standard elements that most FW keepers are familiar with, pH, ammonia, nitrite, nitrate, and carbonate hardness (KH). KH is often referred to as alkalinity in the marine environment.

But what separates SW from FW is..... SALT, and we're not talking aquarium salt, it's natural salt. Enter terms such as specific gravity (SG), salinity, conductivity <and to be honest, I forget the rest>, but essentially, all of these terms refer to 'how much salt there is'

Specific Gravity - is a 'generic' measurement of how 'heavy' the water is. It is a chemistry term used to measure the weight of any liquid, and is often used as a comparison for quality/purity of a liquid. But I digress, in the marine environment, we use SG to 'measure' how much salt is in the water. But what does it mean?

- Pure water has a specific gravity (SG) of 1.000, it basically means that 1 litre of water weighs 1kg

- Natural Sea Water <typically> has a specific gravity of 1.026 - meaning that 1 litre of NSW actually weighs 1.026kg - Salt water is heavier than pure water!

Salinity - is a 'generic' measurement of the 'concentration' of salt in the water. Measured in ppt (parts per thousand).

- Pure water has a salinity of.... you guessed it... 0

- Natural Sea Water has a salinity of approx 33-34ppt. This means that for each litre of water, there is 33 to 34 grams of salt.

Note There is fairly consistent and accurate correlation of SG to Salinity

Conductivity - is measurement of the water's ability to conduct electricity, but to be honest, I didn't research this too much. SG and salinity were enough for me.

So which measurement is better? Well, conductivity is said to be the ultimate measurement, but it's more expensive to test, salinity is quite accurate, and SG is also a good guide. Ultimately, it comes down to the equipment you use. I highly recommend a refractometer, which can test both SG and salinity.

OK, so now we've covered the basics of SW chemistry, let's look at all the other things you've read about. Most of these, in fact all of these, really only apply to a Reef system.

Corals depend upon 3 primary elements, magnesium (Mg), Alkalinity (KH) and calcium (Ca), and can be sensitive to Phosphates (PO4) as well as some of the trace elements such as Strontium (Sr), Iron (Fe) and a few others - to be honest, I only worry about the 3 primaries (for now). If you've decided on a FOWLR setup, then these are not important to you, but for a reef keeper, understanding your corals requirements for these elements is important

Testing Equipment

Ok, so now we have a base understanding of SW chemistry, what testing equipment do I need?

Well, similar to FW you should have:

High Range ph (must go into the 8's), Ammonia, Nitrite and Nitrates

You will also need some way of measuring salt content. A hydrometer is a good guide, but can be inaccurate, so I recommend a refractometer. Testing conductivity is not necessary for most.

For reef keepers, you should also consider adding to your testing arsenal:

KH, Magnesium, Calcium and High Resolution Nitrate (capable of sub 5ppm) and High Resolution phosphate (for Phosphate, I recommend the Hanna Checker)

So we've figured out our test kits, and we have a base understanding of salt water chemistry. For me, the next step was understanding the filtration of the marine environment.

By filtration, I'm going to focus on the process of the nitrogen cycle in the marine environment, and removal of organics.

Note: For me, coming from a FW background, this was the hardest concept to understand and

get my head my around

Intro

Before we go much further, let's first consider what we know about the ocean, and the reefs. Oceans are the largest bodies of water known to man, they have tides and currents (enter flow) and on a reef, there is a lot of rock work. Waves crash against the rocks, and the large body of water dilutes the concentration of elements, and the currents carry them away.

So how do we replicate this in the home aquarium?

Bio-Filtration

Coming from a FW background, I was stuck on the concept of having bio-media to perform the nitrogen cycle.

I had to change my thinking, and go back to the basics of beneficial bacteria - that is, BB will grow on any surface in the aquarium, the more porous the better.

If we think about the bio-media we have in a FW filter, it is typically highly porous (bio-balls, substrat from [eheim](#), bio-max from [fluval](#) etc)... What about rocks? <ponder this for a bit>

But filters are external to the tank aren't they? ([HOB](#)/Canister) What if I change my thinking, and think of the whole Marine setup as one big filter.... how does that change my perception of a marine filter.

But filters require flow to move water over/through the media don't they? Yes they do 😊 What if we put some powerheads in the tank to create the flow in the tank?

<starting to get it now?>

Enter [live rock](#)..... By having sufficient Live Rock, we effectively have our bio-media, do we not? It's highly porous, great for beneficial bacteria to grow on.

If we add powerheads to the setup, we are now flowing water around and over the live rock, or bio-media, thus we have bio-filtration in our tank..... yes?

Not to mention we are replicating the tides/currents of the ocean (remembering, most specimens are hand caught from these environments)

But what about mechanical and chemical filtration? Well, on a reef, it simply gets washed away with the current, but in the home aquarium it's not quite that way, and we often need to supplement the mechanical filtration with some form of external mechanical filtration, enter the sump (more to come on sumps). But, so far, I have not required any form of mechanical or chemical filtration in my system.

So now we have our bio-filtration, we can safely convert ammonia to nitrite, and nitrite to nitrate.

But what is all this talk of Protein Skimmers?

Ahhh, good question. Have you ever seen waves crash, and the white wash it leaves behind, often leaving a brown residue?

The brown residue is in fact, what is referred to as Dissolved Organic Carbons (DOCs), or for want of a better term, Proteins. A protein skimmer is a device that injects lots of micro bubbles into a water column, the bubbles attract the DOCs and transport them into a collection cup, leaving a brown 'tea' like residue in the cup, called skimmate.

What the protein skimmer does, is help to remove the leftover food and other organics from the water, before they have a chance to decompose and add to your overall nitrate level.

And what about Refugiums/Macro Algae/Nutrient Export?

Ok, the first thing I learnt, a sump is not a refugium.

In a Reef system, corals and to some extent, inverts (Shrimp, Snails etc), can be sensitive to nitrates and phosphates, so the reef aquarist has sought ways to reduce these concentrations without daily water changes.

It is not uncommon to hear a reefer talk of Phosphates at 0.02ppm and nitrates of 1 to 2ppm or less. To help control these parameters, marine aquarists, or more specifically reefers, have used

nature to help 'export' these nutrients from their system. One of the best methods is to use algae, primarily macro (or large) algae such as chaeto. These algae are typically housed in what is known as a refugium. Water from the display tank is fed through the "fuge" to provide nitrate and phosphate to the algae, the algae feeds on these elements, and thus reduces the concentration of these elements.

What is a Sump

A sump, by definition is a low-lying place, such as a pit, that receives drainage. (from the Free Dictionary)

In the aquarium environment, sumps are typically located under the Display Tank (DT). At the top of the DT there will be bulkheads drilled into the tank, or an overflow ledge known as an overflow weir. As the water falls over the weir, it drains into the sump, and is then returned to the DT via a return pump.

Why use a sump?

Well this is an excellent question, with very plausible reasons:

- Increases water volume
- A place to store equipment (heaters, reactors and skimmers)
- A place for the Refugium (if using)
- A place to dose supplements
- Maintains water level in the DT
- A good place to add top-up water
- Provides a way of surface skimming the DT (as distinct from Protein skimming)
- Somewhere to run mechanical filtration

Sumps will typically be divided into sections, using baffles to separate each section. There is no right or wrong way to configure a sump, but the typical arrangement is a Skimmer Section followed by Refugium (if using) and a Return Section. Some sumps may have a fourth and fifth compartment for Nitrate and Phosphate reactors and to propagate coral frags.

Baffles are used to help reduce the bubbles in the water. With the skimmer injecting millions of micro bubbles, without baffles, those micro bubbles would otherwise be returned to the DT, which is aesthetically displeasing and can troublesome fish.

So with this in mind, I designed my sump as a three compartment sump. I have two drainage pipes into it, one drains into the skimmer section, the other into the refugium (which houses extra live rock). The skimmer section has baffles to reduce bubbles flowing into the return section in the middle.

As water evaporates from my system, I simply add more RO water to the return section.

There's plenty of information out there about sumps, and melevsreef is probably one of the best I've seen.

Putting it all together - Total Flow

One of the hardest things to measure in the Ocean is actual flow rate of a Reef.

How does one measure how quickly the water is turned over? The simple answer is we can't, there's too many variables to consider. However, over the years, Reef aquarists have been able to establish a set of *guidelines* on the total flow required for a healthy reef system.

A guide to flow rates required

FO/FOWLR only system - approx 10x turnover per hour

Reef with soft corals, LPS - 20x turnover

Reef with SPS corals - 30x turnover (I have even read of 50 and 60x turnover)

Sump - approximately 5x turnover.

So in my system, a 250L (66G) Display tank, I'm aiming for a total turnover of at least 30x = 7500LPH (1969GPH), thus I have

Return Pump - 1,200LPH

Skimmer - 850LPH

Powerheads - 2 x 5,000LPH

My total turnover is therefore approx 12,000LPH (3,100GPH) or 48x, with a sump throughput of 1200/250 (4.8x)

Ahh, lighting, one of the most diverse topics in reef aquaria.

In the natural environment, the only light source is the sun, so we must aim to replicate the sun in our home aquarium. Over the years, reef aquarists have tried many technologies to achieve this, the most common are T5HO, Metal Halide, LED. Each has its own merits and pros and cons. I'm not going to go into these here, there's plenty of info on the web about lighting systems for reef aquaria.

As with a planted FW system, lighting is referred to in Kelvin temperatures, along with a concept of PAR (or Photosynthetic Active Radiation), or in layman's terms, how deep the light penetrates the water.

Actinic lights

What are Actinic lights? Well simply put, actinic lights replicate the UV spectrum of the sun that is known to benefit the growth of corals and their symbiotic zooxanthellae. They also add a wonderful aesthetic dimension to a tank.

When considering lighting, for a reef setup you should consider your lighting carefully. You want to provide a high quality broad spectrum light combined with actinic lighting to provide the UV. You want to make sure your lights are capable of penetrating the depth of your tank. You should also research the corals you wish to keep, and their specific lighting requirements.

Personally, I opted for a LED 50/50 white/blue fixture with built-in moonlights and a sunrise/sunset timer.

STARTING A SW SYSTEM - PART 3 - DESIGNING, SETTING UP AND RUNNING YOUR SYSTEM

Revision - what we've learnt so far

Part 1 - Environment Research; The Reefs of the World, Reef Life, Deciding on a Setup

Part 2 - Equipment Research; SW Chemistry, Testing Equipment, Filtration and Flow, Sumps, Lighting

So now we know what setup we want, and a bit about the equipment and how it works.

I didn't know whether the next step should be designing a system, or stocking. I figure since most are limited by space, that designing the system should come first, and based on the setup size etc, worry about stocking later.

So where to start?

Size of the Display Tank - the bigger the better in a SW environment. As we've learnt, the ocean is a very large place, and with most specimens hand caught, we want to provide the most natural environment possible, that means size.

Most marine species are not suited to nano setups (sub 30G), so a setup of at least 30G is definitely recommended. Preferably 55G or more.

Next, I would decide on a nutrient export method. We've learnt that nitrate and phosphate levels on a reef are very low (below 1ppm in some cases). We also know that, a by-product of the nitrogen cycle is nitrate. We need to choose how we want to control and reduce nitrates in our system. For this, we can choose from:

*Lots of water changes

*Nitrate and Phosphate Reactors - chemically removes nitrates and phosphates.

*refugium with Deep Sand Bed and Macro Algae - the macro algae feeds on nitrates and phosphates

*Carbon dosing - a more advanced method whereby nitrates are broken down so that nitrate eating bacteria can feed on them. This method is also referred to as Vodka/Sugar/Vinegar dosing.

A sump is recommended for Reactors and Refugium methods, and whilst carbon dosing can be accomplished by directly dosing the display, it is recommended to dose into a sump if available.

*Note: Carbon dosing requires a very efficient protein skimmer.

Lighting - is one of the easier aspects, choosing a system is up to the individual, so long as the said system is suitable for the intended setup (i.e. appropriate lighting for corals if keeping a reef)

What about a water source for Salt Water?

The marine aquarist has two choices when it comes to SW, and can be dictated by distance.

Natural Salt Water - this is water taken straight from the ocean. It is usually sold by marine LFS.

Artificial Salt Water - this is made by mixing marine salt mixes with water, usually RO/DI Water because of its purity.

Both options work fine, and it's up to the individual to decide which way to go.

Quick Checklist

OK, so now that we know the size of our aquarium, we can start planning and choosing equipment.

The Basics

Display Tank

Sump (if using)

Plumbing supplies (to connect DT to Sump if using)

Stand

Hood

Lighting

heater(s) - aim for around 3-4W per gallon, you want to keep this setup at around 26-27C

chiller - if you live in a warmer environment, or where summer temps get high, consider a chiller or other method of cooling for a reef environment, I have recently had a scare with temperature nearly taking out my BTA. Maintaining a stable environment is paramount for a reef. (FO/FOWLR, you should still consider temperature management, but may get away

without it)

Read about my scare here: [Who thinks SW tanks are easy? A tale of how quickly things can go bad](#)

Also: [How to set temp when running a Chiller and Heaters](#)

Test Kits

[refractometer/hydrometer](#) for measuring [salinity](#)

[ammonia](#)

[nitrite](#)

Nitrate

High Range [pH](#)

Thermometer

for reefs

[alkalinity](#)

[calcium](#)

[magnesium](#)

High resolution Nitrate (capable of sub 5ppm)

High resolution Phosphate (capable of sub 2ppm) *I recommend the Hanna digital checker*

*A quick note on test kits, whilst the reagents (liquids) are the same between [FW](#) and SW, the colour charts are slightly different, so it pays to get the SW kits.

Filtration

Return pump (for sump if using) - aim for around 5x turnover of display tank

Protein Skimmer - aim for a minimum of 3x turnover, or 5x if using Carbon dosing

Powerheads - I prefer two to make turbulent water. Based on your setup requirements, make up the difference in required turnover with powerheads

Reactors - if using

Miscellaneous

[algae magnet](#) - you won't regret it

Right, got all that, let's continue, it's not over yet.

Live Rock and Live Sand

OK, so we've got our test kits, and equipment, but we still haven't added our most vital part of the setup... live rock and live sand

Well, for me anyway, this took a bit of research to understand, but by now, we should have a base understanding of the concepts.

Live Rock - there are many recommendations on how much is 'enough'. First we must understand that live rock is not "alive", it is rock. A highly porous material capable of harboring lots of nitrifying bacteria. The term "Live Rock" often refers to a rock that is capable of supporting bacterial life, but technically it means rock that is already "live" with bacteria.

The aquarist can start with dry rock, base rock or rock from the ocean. Over time, the rock will become "live" with bacteria.

When it comes to purchasing live rock, most are referring to rock that has been harvested from the ocean, and is thus already 'live'.

Pros/Cons - if it's fresh, Live Rock from the ocean allows you to benefit from the hitch hikers particularly worms, coralline algae, feather dusters etc and the odd coral.. The con is you inherit the less desirable hitch-hikers such as aiptasia, crabs, mantis shrimp

A word of caution, purchase fresh live rock, not rock that has been in the LFS' tub for a while. It tends to harbour and leach phosphates.

Live Sand - Is technically sand that has been harvested from the ocean. It should be full of critters, but there is also speculation that many of the critters don't survive transport, and as such, you end up with wet sand.

What did I do? I purchased fresh live rock. My rock was picked from the reef at 7:30/8am, put

on a plane and I put it directly into my tank at about 8pm..... I got: bristle worms, coralline algae (good), feather dusters, other worms, a leather coral, macro algae and other filter feeders

I also got, mantis shrimp (annoying with the clicking, but not harmful), aiptasia which is controlled with shrimp.

With sand, I chose to use CaribSea Aragornite sand.

So who's scared yet?

It's getting easier.....

Stocking!

Ok, so for those that have followed the journey, the biggest question is still un-answered..... and guess what.... I can't answer it for you. (sorry)

What can I keep in this tank?

Like I said at the top of this guide, I wasn't sure whether stocking should precede tank, or the other way around....

Put it this way, I knew I had room for a 55G tank, the difference was I was increasing the height to give me 66G. But fundamentally, I have designed a 3 foot tank, so swim space is important to me and the inhabitants of my tank.

The biggest things I have learnt are:

- * Many SW fish do not play nice with their own kind - that means only one of each species
- * The marine environment is a 'dog-eat-dog' world, meaning certain fish are not suitable for a captive reef environment
- * Clean-up crews, and their importance in a reef environment - nature will keep your system clean

Choose your stocking carefully, never impulse buy, and understand what you're putting into your system and the requirements of each species.

Running your System

So now that we know what we're keeping, the last consideration is the ongoing running of the tank/setup.

General Maintenance

Water Changes - it's a must do in a SW setup, but unlike a FW setup where 20%+ is recommended, around 10% a week should put you in good stead.

Feeding - SW fish can be picky. Be sure to allow a varied and frequent feeding. Understand the species you are keeping and their requirements. I currently feed once a day, with a staple of frozen mysis shrimp, coupled with mussels, prawns, whole fish (silversides) and pellets.

Corals need food too - Many corals are filter feeders, meaning a different diet - Reef Roids are a favourite of mine, as well as phyto planktons etc. I feed a mix of Reef Roids and Marine Snow.

Supplements - be prepared to dose a Reef tank with supplements, particularly Alkalinity, Calcium and Magnesium. It may also be necessary to dose trace elements. There are a number of great products on the market, I personally use the Red Sea range of supplements.

Top-off water/evaporation - be prepared. I currently top off about 2 litres (1%) a day. When water evaporates, you need to replace it as the salt doesn't evaporate, meaning an increase in salinity.

So if you've followed the three parts, you'll quickly see that a Saltwater Reef Setup is not "that hard" after all - I mean, we've researched the environment, we've researched the equipment, the live stock, and actively designed an effective system..... RIGHT ?

When you do your research, you learn what to expect, how to handle it, and more importantly, you've started a system on the right foot.

I firmly believe that the SW is not difficult, but it can be if you don't take the time to learn about your little piece of the reef, what it requires, and which species will do well in your captive environment.

There's a reason SW fish are referred to as specimens. They are living examples of the natural reef.

I thank everyone that has followed my series (apologies for the delays in producing them). I don't profess to hold all the answers to reef aquaria, but I'm willing to learn.



The use of a refugium setup is gaining in popularity among saltwater hobbyists, especially the reef tank keepers out there. First, we should try to define what a refugium is and how it can help us with our saltwater aquarium. A refugium is simply a place of refuge for various animals, plants and other organisms such as amphipods and copepods that we want to encourage the growth of for the benefit of the main tank. There are many different uses of refugiums and this one is quite small. The benefit of running this refugium on a 55 gallon aquarium is probably slight but we wanted to set one up to see for ourselves.

There are many posts on forums all over the net about the "hang on" refugium made out of an aquaclear power filter. These aquaclear power filters are nice because the pump assembly is on the left side of the unit and there is a relatively large amount of open space that could be conducive to using it for our purposes. Obviously, this power filter refugium isn't going to be as good as a larger sized aquarium as a refugium. But maybe it will do well for those that are "Financially Challenged" or as a "Poor Hobbyist's Refugium".

We wanted to set this one up to use macro algae with the hopes of improving water quality and as a food source for a Yellow Tang. In years past the popular macro algae that was used in refugiums was caulerpa. It's falling out of favor because it can go sexual causing some serious issues with water quality. Chaetomorpha is probably the most favored right now for use in refugiums because it does much of what caulerpa can do with less side effects. There are many different species of macro algae that you can use in your refugium, Chaeto is a great choice though. We set ours up with both Chaeto and Gracilaria. Not the brightest idea on our part to add both to this small hang on refugium. Chaeto grows really fast and the gracilaria is absolutely devoured by tangs. Gracilaria is one of the foods you could try if you have a finicky tang that is

refusing all other foods. They will rip through this macro algae fast! Many tangs will eat chaeto too, but they won't go after they chaeto like they do the gracilaria.

While thinking about the setup of this refugium we wondered about a few things. Would there be adequate water flow? Would the macro algae (gracilaria in this case) slip out of the top of the power filter if the flow was too fast? What could we do to lower the flow rate if necessary?

Turns out, the flow was just about right in our opinion. Maybe it could be a tad bit faster. To prevent the gracilaria from slipping into the tank, we created "shark teeth" (see photos below) out of some old plastic extenders from an old glass top that we never used and then used aquarium glue to affix it to the inside lip of the power filter. It works fairly well, although some gracilaria slips through sometimes to the delight of the Tang. If we just had chaeto in the fuge it would probably be fine without the shark teeth since it stays wound together pretty well.

For lighting we bought a galaxy desk light that has a screw on clip that attaches nicely to the back of the refugium. It came with a 13 watt power compact light and it works well. The gracilaria seems to be growing well and starting to crowd the chaeto. In the next few days I will be moving the gracilaria to a separate 10 gallon tank and leave the chaeto in the refugium.

We also added a few small pieces of live rock in the bottom of the aquaclear hoping that maybe some other organisms may start growing on the rock in the fuge. We did not add any sand to the refugium, since that would have involved further retrofitting of the aquaclear to prevent blowing the sand back into the tank. The flow starts from the bottom and goes to the top in this power filter. Adding sand would have been a nice enhancement but we were more interested in what the macro algae would do.

It's been just a couple of weeks at the time of writing this article and besides the growth of the gracilaria, I don't really notice any difference in diatom growth or other algae growth inside the tank. Nor do I see any differences in water test results of nitrates, phosphates, calcium, alkalinity, etc. The chaeto seems to be the same size and maybe it's getting out competed by the gracilaria? We'll find out if the chaetomorpha grows faster when we remove the gracilaria from the refugium. Truthfully, it really is too soon to tell if this refugium is really going to be worth it. I'll post an update in a few weeks on this page.

Refugium Photos



References - More Information - Inspired by:

- *Pro, Steven. "Converting a Hagen Aquaclear 500 Power Filter into a Hang-On Refugium." Freshwater And Marine Aquarium Magazine, August 2005. www.wetwebmedia.com/hagenrefugart.htm*
- *Calfo, Anthony & Fenner, Robert (2003). Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility.*
- *Numerous saltwater forum posts on using the AquaClear 110 power filter as a refugium.*

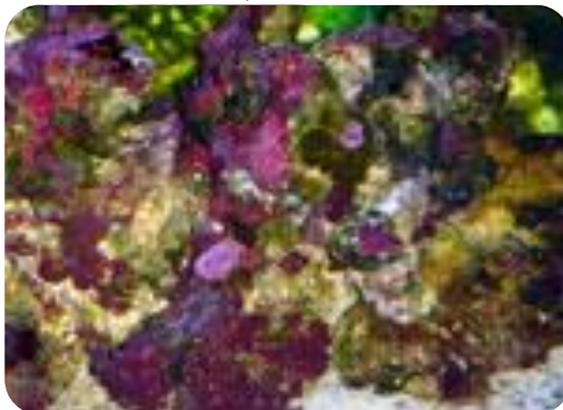
What is Live Rock?

Live Rock is rubble that has broken off a coral reef structure by natural means such as hurricanes and tropical storms. This broken off rubble is called live rock because of all the living organisms that are found on and within the rock. Many types of algae, crabs, marine worms, small crustaceans, bacteria and other life forms make their homes on the reef structures found in the ocean and when you buy saltwater live rock you'll most likely be getting some of these organisms. There are numerous benefits from using live rock in your marine aquarium and we'll explore some of these benefits now.

New rock, curing in the tank



Same rock, 3 months later



Aside from an abundance of saltwater aquarium keeping information, saltwater live rock could be considered one of the primary reasons so many people are successfully keeping saltwater tanks these days.

Live rock is usually extremely porous and is used as the primary biological filter in saltwater tanks that have it. The many holes and crannies in this rock give it a tremendous amount of surface area for the beneficial aerobic (needs oxygen) and anaerobic (does not need oxygen) bacteria to live on. This is what makes saltwater live rock such a great biological filter for your tank. The beneficial bacteria helps convert the ammonia from fish waste and uneaten fish food into nitrite. The second step is when this bacteria converts the nitrite into nitrate. The last step is when the anaerobic bacteria converts the nitrate into harmless nitrogen gas that escapes via the water surface. If you're curious to find out more information on this cycle, please read the aquarium nitrogen cycle page.

How well saltwater live rock can completely cycle the aquarium has a lot to do with how much rock you have in your aquarium. Many hobbyists try to get at least 1 pound per gallon for fish only tanks (FOWLR) and 2 pounds or more per gallon for a marine reef tank setup. You'll definitely need to monitor and test your water quality periodically to check for nitrates. If your readings are out of the acceptable range for your tank inhabitants you will need to perform water changes to bring the nitrate levels within acceptable range.

As your fish grow they will produce more wastes and they may end up producing too much for your rock to adequately filter. Using a protein skimmer is still recommended with live rock tanks.

Saltwater Live Rock Benefits

Some of the benefits that you can expect from using live rock:

- Saltwater live rock is a fantastic biological filter
- Provides many hiding and living spaces for your saltwater fish and invertebrates
- Can be a source of food for your saltwater fish and invertebrates
- Purple and pink Coralline algae that will grow on the rock can be extremely attractive.



- The many organisms that spring to life after your rock has finally cured can be just as fascinating as the fish in your tank. We can't tell you how many hours we have wasted just looking for what's new on our rocks.
- Rock scaped saltwater aquariums are more natural looking. It's kind of like having a heavily planted freshwater aquarium
- You can easily attach corals in a reef tank setup to live rock using aquarium safe glue and you can sometimes even insert the plug corals come on into a natural hole or crevice in the rock.
- You should have a much better experience with keeping saltwater fish if you use live rock because of the biological filter and food source reasons.

3 month old rock



While researching saltwater live rock you're going to come across some different types of rock. There are basically two main types of live rock - cured and uncured.

Pre-Cured or Cured Live Rock

Cured live rock is rock that has been in the retailer's tank for a few weeks, at least. The retailer will scrub off any dead or dying organisms from the face of the rock and then cure it by placing

it in a high-circulation curing tank. They also sometimes spray a continuous mist of saltwater over the rock that helps to remove the dead organisms. After a few weeks or even a month of this process the rock is considered ready to ship.

Getting cured live rock is going to cost much more than getting uncured live rock but it's usually worth the extra expense. Curing live rock in your home can be a very smelly and dirty project.

Even though there can be a significant die off during the curing process, many of the living organisms make it through the pre-curing process at the retailer. You will still need to cure it again once you get it home because some of the organisms will have died during shipment before it reaches your house. It just won't take as long to cure again as uncured live rock. Because of the die off during shipment, you should never place live rock (pre-cured or uncured) into an established tank. Doing so may cause an ammonia spike.

Uncured Live Rock

Uncured live rock is usually a third of the price of cured rock. Hobbyists on an extremely tight budget usually opt for this type of rock. The major drawback is that you're going to see a much greater die off rate than the pre-cured rock and you'll need to get the materials to do the curing process yourself.

If you're setting up a new tank with no other livestock in the tank yet, you can cure the saltwater live rock in the new tank. If not, you can use cheap plastic containers or trash cans as the curing containers. After you scrub off the dead organisms and other debris from the rock, place it in the curing container. An old tooth brush can work fairly well for scrubbing off the dead organisms. Hook up a thermometer, a powerhead and a protein skimmer to the container. Fill the containers with premixed, aged saltwater and you're ready to go. You will need to monitor the water parameters with your test kit(s) for ammonia, nitrite and nitrate and perform frequent water changes during the curing process. Once you no longer detect ammonia and nitrite and there is no longer a foul smell, you can consider the process complete. How long it takes depends on the shape the rocks in when you start the process.

New rock, fresh from dealer



Same rock, 3 months later



Live Rock Types

These are some of the types of live rock you may come across:

- **Base Rock** - This is rock that is usually found "under the pile" and it is usually a little cheaper than the other types of rock because it has less living organisms and algae living on the surface. You can save a few dollars by using this as the base to the rock structure in your tank.
- **Pacific Rock** - This is rock that comes from Fiji, the Marshall Islands, Indonesia and other locations in the Pacific. It is usually the better choice because it is more porous than the other types of rock. It will also usually have more caves and holes in it. Frequently, this is the most expensive type of rock. It can sometimes be labeled as Pacific Rock or Fiji Premium Rock.
- **Atlantic Rock, Gulf Rock and Caribbean Rock** - This is rock that comes from each area as labeled. It is usually not as porous as the other types of rock and might not be the best choice for your tank.
- **Aqua Cultured** - This is porous rock that has been placed in the ocean artificially and left for several years so that beneficial bacteria and other organisms can populate the rock. This is the most environment friendly type of live rock you can get.

Where Can I Get Live Rock?

Once you start looking for saltwater live rock you're going to realize that this stuff can cost some serious money. However, think about what it takes to get this material from the ocean. Divers must collect it, retailers have to pre-cure it and then finally deliver it to your door. If you live in the middle of your country be prepared to pay even more in shipping costs. If you're lucky enough to live in a coastal area or you have access to a really good saltwater pet shop that stocks live rock, you can save a lot of money in shipping costs by picking it up yourself. Use a search engine and enter "buy live rock" or something similar. If you come across a retailer that you've never heard of you should use the search engine and research them or sign up in a saltwater fish forum (we have one here, the forum link is in the left navigation) and get recommendations from other hobbyists before buying.

The best part about all of this is that Saltwater live rock can be a renewable resource if harvesters practice proper collection techniques. Unfortunately, many do not practice proper collection techniques for the sake of money. This is both short sighted and foolish. Check with buddies or check on forums for recommendations for a good retailer. Try to find out how the rock is being collected before you buy it. You may not get a straight answer, but we need to be diligent in not rewarding those that harm the environment and the coral reefs.

Tips on Growing Coralline Algae

- Keep your water parameters in line with regular partial water changes.
- Get a test kit for alkalinity, magnesium, pH and calcium. If these parameters are dropping too much in between water changes, dose these elements and try to keep the pH in the 8.2 - 8.4 range. Kalkwasser works well to keep alkalinity and calcium levels up but be extremely careful dosing with kalkwasser (slow drips), especially in smaller tanks! Kalkwasser is extremely basic and can cause extreme swings in pH. Regular partial water changes should work great for most hobbyists without extensive stony coral growth and should help keep the calcium, alkalinity, pH and magnesium levels where they need to be for good coralline growth.
- Keep your phosphates in check. High phosphates seems to inhibit the growth rates. I'm not sure of any scientific studies on this but just found this to be the case from personal experience. The lower the phosphate levels the better the coralline algae and corals grow.

HOW TO SET UP A FISH QUARANTINE TANK

Do I Need A Quarantine Tank?

The often dismissed but very necessary part of the tropical fish hobby, the infamous quarantine tank. Do you really need one to be successful in this hobby?

For freshwater fish you may be able to get by without having a quarantine tank. Freshwater fish are generally more suited to captivity because they are usually tank raised and don't seem to break out in disease as readily as their saltwater counterparts. However, if newly acquired fish do come down with something such as ich (ick) or velvet, you will surely wish that you had one ready to go. One newly bought fish that is introduced to your main tank can easily wipe out the **entire tank population**. Better safe than sorry, right?

For saltwater aquarium keepers, I would say that you **definitely** need a quarantine tank (sometimes called a hospital tank). Marine specimens are mostly wild caught and not used to being kept in captivity. Their journey to a dealer's tank is usually much longer and much more stressful for them. Stressed out fish will usually come down with some kind of disease if they don't simply die from the whole ordeal. Saltwater fish keepers will usually have other things in the main display tank such as invertebrates and live rock that they don't want to expose to the harsh medicines necessary to treat one or two fish. Some medicines can wipe out all of the invertebrates in a tank, so be sure to research any medicine before using it in your tank.

Quarantine Tank Setup

You don't need to go all out here. A simple tank size of 10 - 20 gallons will suffice for most people. If you have larger fish, then obviously you want to get a bigger quarantine tank. All you really need is a bare bones setup with the following equipment:

- Some type of filtration (a hang on the back of the tank power filter will work, just use filter floss without the carbon since carbon will remove medication from the water, being counterproductive)
- Heater
- A powerhead and/or an air stone for increased surface agitation
- Aquarium test kits for pH, ammonia, nitrite and nitrate
- Fish Net - don't use the same net for your main tank

Fill the quarantine tank with water from the main tank and then turn everything on in the quarantine tank.

Saltwater Fish Quarantine Tank



For newly acquired saltwater fish you will want to acclimate them to the water in the quarantine tank and monitor them very closely for a period of two to three weeks. Monitor the water parameters with your test kits and check for signs of parasites or bacterial infections.

If the newly acquired fish does come down with something you will need to use the appropriate medication and you will need to keep them in quarantine for a further two weeks to make sure that you have indeed treated them effectively. If after a few weeks no problems develop, you can then acclimate them to the main tank water and then introduce them.

If a fish comes down with something while in your main tank, just net them and put them into the quarantine tank. There should be no need to acclimate them because you used water from your main tank. If you didn't use water from the main tank you will need to acclimate them to the quarantine tank water. Diagnose the problem / disease and treat appropriately. After the disease clears up you will still want to keep the fish in quarantine for a week or so monitoring the water parameters with your test kits the whole time.

Always have some extra saltwater ready in case you need to perform an emergency water change. Remember, you want to monitor those water parameters frequently (daily or at least once every two days). Many saltwater hobbyists always have saltwater ready just in case. You never want to mix up saltwater and add it right away. Freshly mixed saltwater can be fairly toxic to fish, in turn causing you more problems. It can also be difficult to get an accurate reading with your hydrometer with freshly mixed saltwater.

Coral Quarantine Tank



Yes, you should quarantine your coral before introducing it the display tank. There are several different pests and diseases that could be introduced including montipora and acropora eating nudibranchs, flat worms, clam eating snails, etc. At the very minimum you should be dipping the coral using something like CoralRx, Tropic Marin Pro Coral Cure or Two Little Fishies Revive. There are several readily available dips to choose from and there are no excuses not to dip your coral.

You don't need to go all out here either when setting up a coral quarantine tank. A 10 gallon tank with adequate flow and lighting will be sufficient. Dip the coral before you put it into quarantine and monitor it for a week or so. If all looks good in QT dip the coral again before putting it into your display tank. If you trade frags with friends I'll just say this - don't trust your friends! Seriously though, don't automatically assume that they are giving you a pest free frag. Dip it and QT it.

Conclusion

Freshwater hobbyists may get away with not using a quarantine tank, but saltwater hobbyists would be crazy not using one. Save yourself some money, headaches and especially the fish by having a quarantine tank. The fish in your main tank will thank you for it.

ACCLIMATING TROPICAL FISH TO YOUR FISH TANK

This article presents information on how to acclimate fish and invertebrates to your aquarium.

So you've went out and bought some fish and the store told you to acclimate the fish by floating the bag in the tank for 15 minutes and then release them into your aquarium. Right? Wrong! The only thing floating the bag accomplishes is that it brings the water in the bag closer to the temperature of the water in your tank. We need to be concerned about more than just temperature. The aquarium water chemistry is just as important as the temperature when it comes to acclimating fish.

Don't be afraid to ask the fish clerk to test the store's tank water for you. They shouldn't mind testing their water right in front of you. They're trying to sell fish right? Ask them for, at minimum, the pH, ammonia, nitrite and nitrate readings. When you get home, test your own water to see how much the two sets of results differ. This can provide you with some insight into how slowly and for how long you should acclimate your fish.

There are a few different recommended methods for how to acclimate fish to your aquarium and we'll talk about each of these methods.

The most common tropical fish acclimation methods are:

- The Floating Bag Method
- The Bucket Method
- The Drip Method

The Floating Bag Method

This is probably the most common fish acclimation method and it works well. You just need to be careful when floating a bag full of unknown water in your tank. Ideally, you're floating the bag in a previously setup quarantine tank but, sadly, many new hobbyists don't use a quarantine tank. After you've been in the hobby for a while and experience any sort of fish disease outbreak you'll soon come to realize the importance of a simple quarantine tank.

After you leave the fish store you will want to go straight home to avoid ammonia accumulating in the bag (in the form of fish waste). Once you get home, open the top of the bag and remove about 25% of the water from the bag. Replace this water with the same amount of water from your tank. Float the bag in your tank and bring down the hood opening on the open end of the bag to help keep the bag secure. Every 10 minutes add about 1 measuring cup (use less if the bag is smaller) of your tank water to the bag. Repeat this process for about an hour. After an hour has passed use a small net to get the fish out of the bag and gently place the fish into your

tank. The main idea here is to slowly get the fish used to your tank water (acclimated). Do not dump the bag water into your tank! If you do, you risk exposing your tank to any parasites or diseases that were in the dealer's tanks.

Some fish may be difficult to net while in the bag and you don't want to damage the fish while trying to net them. If you're having difficulty netting the fish, get a large bowl (large salad bowl works well) and carefully pour the bag water into the net, allowing the bowl to catch the water. You could bypass the bowl altogether and do it over a sink but make sure that the drain plug is in place just in case you miss the fish with the net.

By slowly adding small amounts of water from the tank we are **slowly** acclimating the fish.

The Bucket Method

This fish acclimation method is basically the same as the floating bag method, but instead of floating the bag in the tank you're putting the bag inside a **clean** bucket instead. The bucket method is better than the floating bag method because you don't have to worry about any of the bag water entering your tank.

Open the top of the bag and remove about 25% of the water from the bag. Replace this water with the same amount of water from your tank. Every 10 minutes add about 1 measuring cup of water to the bag. Repeat this process for about an hour. After an hour has passed use a small net to get the fish out of the bag and gently place the fish into your tank.

The Drip Method

The drip acclimation method is recommended for most saltwater fish and invertebrates because they can be more sensitive to pH, specific gravity and other water chemistry changes.

To do the drip method you're going to need a bucket, a vegetable clip with a suction cup for holding the tube in the tank and a length of air pump tubing that is long enough to extend from your tank to the bucket. Place one end of the tube into the veggie clip and then place the veggie clip into your tank. Tie a knot in the tubing to regulate the amount of water flow coming out of your tank. Get the siphon going and place the other end of the tubing into the bag in the bucket. You'll want a slow drip, drip, drip going. Aim for drips every one to two seconds. If you're having troubles using the knot to regulate the drip rate, any type of strong clip should work. Vice-grips (locking pliers) or c-clamps would work as well.

How long you do the drip method depends on what your acclimating to your fish tank. If you're doing this method for most freshwater species you should be ok doing it for an hour or so before introducing the fish to your tank. If you're doing this method on a saltwater invertebrate you may want to take 2 or 3 hours for this acclimation procedure. If you have a good pet shop

and you trust their advice, ask for and follow their recommendations on the amount of time needed for acclimation.

Acclimating new fish to your aquarium is a critical step and should not be taken lightly. Getting into the habit of using proper acclimation methods is a good way to ensure your long-term success in this wonderful hobby!

Time for vacation! You've been working hard all year long and it's finally time for that well deserved vacation. Ah, just to think about it gives me the vacation fever. The time is drawing near and you suddenly realize - what the heck am I going to do about the aquarium and fish care? Who's going to feed the fish? What do I need to do to get my fish tank ready before I leave on my trip? There are several things to keep in mind and we'll try to help you get things in order before you leave so you can have a stress free and relaxing vacation not worrying about your fish and your aquarium!

What about feeding the fish?

Fish can go for several weeks without food. Some believe they can go for 3 or more weeks even. Yes, this is true believe it or not and your fish will be fine while you're away. Your tank may even look cleaner when you get home from vacation since there should be less wastes in the water from the lack of fish food entering the aquarium and less wastes being produced from fish eating that fish food.

If you just can't stand the thought of your fish not eating for the amount of time you'll be gone, invest in an automatic fish feeder. These fish food dispensers are relatively inexpensive and they can actually be put into full time use, even when you are at home. You can fill them with a mix of tropical fish flakes (or other flake or pellet foods, depending on the fish you keep) and it should be several weeks before you need to refill the food container. Most are fully adjustable (you can release as little or as much food as allowed), operate on batteries and will easily attach to the top of the tank.

Another option is to use one of those plastic pill boxes that are composed of small boxes corresponding to the day of the week. You put in the amount of food that day's container that you'd like for your friend, family member or neighbor to give to your fish and then you don't have to worry about them overfeeding and polluting the aquarium water.

Try to do a partial water change right before you leave for vacation. This accomplishes a couple of things. The fish will get some good clean water, which should lower their stress levels and should help keep them healthy in your absence. This also gets the water level topped off so you may not have to worry about a low water level in the tank, but it depends on the rate of evaporation of course.

Rinse out the aquarium filter media, or replace half of it. A clogged filter shouldn't pose a problem since many filters (especially power filters) have an alternate path for the water to return to the tank should the filter become clogged.

You may be concerned about what to do with the aquarium lighting while you're gone. Should I leave it on or leave it off? There is a very simple solution here... The aquarium lighting can easily be turned on and off automatically using an aquarium light timer. If you're keeping freshwater plants or saltwater corals in a reef tank or macro algae in your refugium, you really should have a light timer anyway so that your plants and corals receive adequate amounts of aquarium light.

We try to go on vacation at least once a year (if we're lucky) and we have a neighbor come over several times a day to let our dog out. They have a dog too and we do this favor for each other when we go out of town. It really is extremely beneficial to have a good neighbor you can trust. While they are letting the dog out, I just ask them to check out the aquariums to make sure nothing is leaking and that nothing looks out of the ordinary. I have asked them to rinse out a protein skimmer collection cup before while I was away. If you've never seen a full cup of skimmer gunk, it can be very dark colored, yucky and smelly. They did it for me. I guess I really do have some good neighbors.

Make sure you give the fish sitter a phone number to reach you at while on vacation just in case of an emergency with your fish or tank. A leak could develop, the heater could stick in the on position leading to a rise in temperature, the automatic water top off system could stick in the on position, etc. Remember Murphy's Law here - "Whatever can go wrong, will go wrong at the worst possible time". Write down a small list of tasks you'd like for them to do. Keep it short and don't put anything that is not absolutely essential. Here is a sample aquarium list of things you could ask your fish sitter to take care of:

- Feed the fish daily from that day's slot in the pill box - just that amount and no more please.
- Look at the temperature of the tank and if it's above 84 degrees F, call me.
- Quickly look around the base of the tank and on the floor in the immediate vicinity and inspect for leaking tank water.
- Dump out the contents of the protein skimmer collection cup (saltwater tanks only).
- Thank you for doing this for me while I'm on vacation - I really appreciate it!

Invite the fish sitter over a day or two before you leave and walk them through your list. Show them exactly how to do the various tasks. Don't expect them to know what a protein skimmer collection is or looks like! Show them exactly how to put the food in the water and exactly how to empty the collection cup, etc.

What if I don't have someone to come over?

If you're only going to be away for a week, your fish should be fine without food as mentioned above. If you have a saltwater aquarium you may need to adjust the skimmer collection cup so that it doesn't collect as much since you won't be there to empty it. If you're going to be away

for a longer period of time, than say two weeks, you will be really risking it not having someone come over. This is from a water evaporation and feeding standpoint. Although you're fish should be ok from a food standpoint, your tank water may not be in the best shape after two weeks without your care.

So, plan ahead, take proper pre-cautions and show the fish sitter exactly what needs to be done and rest easy knowing that your fish will be fine. Have fun on vacation and we'll see you when you get back!

AQUARIUM ALGAE CONTROL

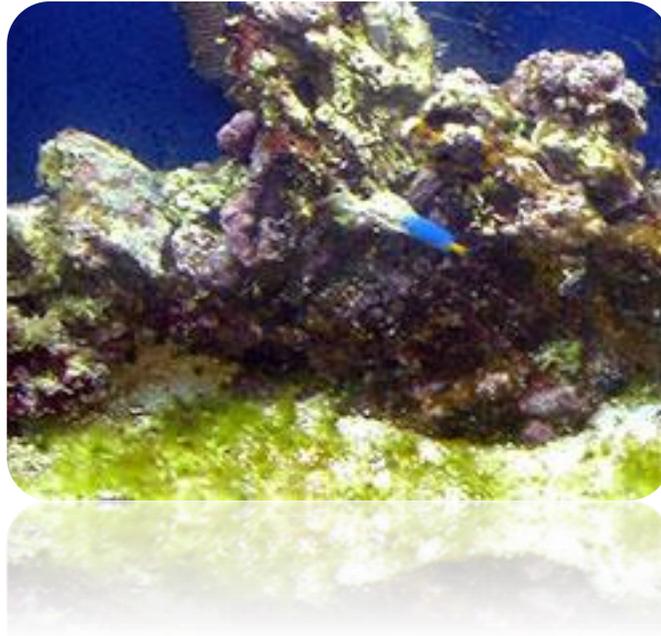
Aquarium Algae Control - So you have had your aquarium set up for some time now and you notice aquarium algae growing on the glass, rocks and ornaments in the tank. Why is this happening and what are some of the methods we can use to control aquarium algae growth in the aquarium?

First, aquarium algae is not necessarily a bad thing. Algae grows very easily when given the right conditions and some day we all may be singing the praises of algae. There is research going on even as you read this article for using algae as an alternative energy source. Cool stuff indeed. But an abundance of algae growth in the aquarium usually means that something is out of whack. Overstocking, not performing enough partial water changes, overfeeding or feeding improperly, not changing out filter cartridges and not using pure water are usually the prime suspects.

Once aquarium algae starts to overgrow plants, corals and decorations it does make the tank look dirty and can distract from the beauty of your aquarium. Let's talk about the things aquarium algae needs to grow and how to eliminate or reduce these things so we are not constantly scrubbing the tank walls and having to clean the tank instead of viewing our fish, plants and inverts! You can use the info in this algae control article for both [freshwater aquarium setups](#) and [saltwater aquarium setups](#).

Phosphate

Get a Phosphate Test Kit. This might be considered one of the most important nutrients for many kinds of aquarium algae growth. Phosphate (PO₄) can enter the aquarium from tap water, fish food and supplements. One of the first things you should look at is how much you are feeding the tank. Are you overfeeding? Only give your fish as much food as they will eat in a minute or two. Are you defrosting and draining the juice from the frozen foods you use? These juices could be loaded with phosphates. Are you using food that are low in phosphates? Test them to see for yourself. At minimum, use a bowl to feed frozen foods and tilt the bowl at an angle so the juices drain to the low side and then spoon feed the chunks to the fish. Dispose of the frozen fish food juices down the drain.



Activated carbon should be mentioned here too. Some brands have been reported to leach phosphates into the tank. Place a few pieces of activated carbon and pure water into a test vial, wait about 20 minutes to an hour and then test the water for phosphates. If that brand of carbon leaches phosphates try a different brand. Replace activated carbon on a regular basis, like every couple of weeks or so.

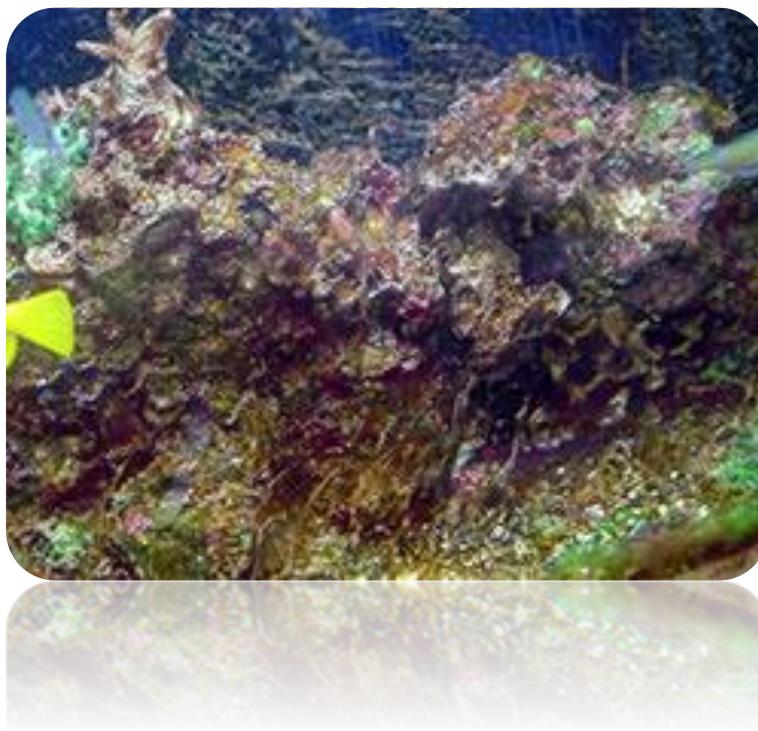
Are you using pure water for your aquarium? Reverse Osmosis (RO) and Deionization (DI) units can work wonders on aquarium algae problems, including reducing the amount of phosphate that enters the aquarium. Many consider RO and RO/DI units to be too expensive to be practical. But if you have several tanks or one large one or a reef tank setup one of these water purification devices are wonderful additions. You can even use RO water for drinking water and some actually prefer the taste of RO water over tap water. Ideally, you want PO₄ to be undetectable with standard test kits.

Nitrate

Get a Nitrate Test Kit. Nitrate (NO₃) is something else that aquarium algae utilizes for growth. Nitrate accumulates over time in the aquarium. It's also used as a rough indicator of dissolved organics. To keep your nitrate levels in check:

- make sure your tank is not overstocked
- use purified water (RO or RO/DI) for water changes and top-offs
- stay on top of gravel and sand vacuuming (unless you have a deep sand bed)
- performing regularly scheduled partial water changes with pure water. Just performing water changes could be pointless if your tap water is loaded with nitrates. Test everything.

- in saltwater tanks you can try adding more high quality live rock (the more porous, the better)
- using macro algae (saltwater tanks) or live plants in freshwater aquariums. These will compete with aquarium algae for nitrates.
- saltwater tridacnid clams can process nitrates
- change out or rinse mechanical filter cartridges as often as possible. As the trapped particles break down in the filter they contribute to the bio load on the tank and provide food for aquarium algae.



Carbon Dioxide

Limiting carbon dioxide (CO₂) can help too. If you have a heavily planted tank, obviously, limiting CO₂ isn't all that desirable. But in fish only freshwater and saltwater tanks you can increase the surface agitation while keeping the tank under stocked and dissolved oxygen levels should stay near saturation. Most of the time the flow rate in our tanks is inadequate, especially in saltwater tanks. Use common sense here. The goal here is to keep particles in suspension so they get picked up by the mechanical filter or protein skimmer, rather than breaking down inside the tank. If your power heads are preventing the fish from swimming properly or if there is a constant sand storm in your tank, you may have too much flow.

Silicates

Get a Silicate Test Kit. Do you have a brown dusting on the glass every couple of days? Most like

these are diatoms that can be the result of silicates in tap water. They (supposedly) can also be leached from silicate based sand. Some authors claim that RO and RO/DI units are only effective for a short period of time at removing silicates from source water. What to do? There are products that have decent reputations on the market for silicate removal. ROWAphos Phosphate Remover and PhosBan are two that come to mind. As you might have guessed from the name of these products they also remove phosphates. You can purchase an inexpensive reactor for using this type of filtration called the PhosBan Aquarium Reactor. It hangs on the back of the tank or in the sump. If you think you have a silicate problem one of these devices may be worth looking into.

More things to do to control aquarium algae...

Get Aquarium Plants or Macro Algae

Freshwater aquarium keepers can use aquarium plants to compete for nitrates and phosphates. Saltwater aquariums can use a macro algae such as chaetomorpha. The plants or macro algae will consume nitrates and phosphates and compete with the undesirable algae forms.

Clean that power filter

Hang on power filters and canister filters can do a fantastic job keeping your tank water appear clean and polished. But if you don't routinely clean out and rinse your aquarium filter media you are just providing foods for the algae to grow out of control. As the trapped particles in the mechanical filter mineralize (i.e. breakdown, decompose) they are providing energy sources for the aquarium algae. If you don't clean out your filter on a regular basis it could become a nitrate factory.

Vacuum the substrate and perform partial water changes

One of the coolest and most useful aquarium products is the Python Aquarium Vacuum. This piece of equipment hooks up to a faucet and lets you easily vacuum the tank with the waste water going down the drain instead of having to haul buckets around. To refill freshwater tanks you can reverse the flow and add fresh water back into the tank. Add the proper amount of dechlorinator into the clean water flow as it goes back into the tank. This is assuming that your tap water is good to go as far as nitrates and phosphates are concerned.

Saltwater keepers can use this tool too even though you should be using premade saltwater for water changes. For saltwater aquariums you will only be able to use the tank water removal part on this type of vacuum. You will still have to use that 5 gallon bucket or whatever you use to pre-mix the saltwater.

Scrub down the glass and then do a water change right afterwards. Vacuum the gravel or top layers of the sand to remove any detritus. If you have a saltwater tank and you have a bubble

algae problem, now is a good time to carefully pull them from the rock work. Create a set schedule, say once a week and then stick to it. You really will enjoy your tank much more when it looks clean. The day after a water change and tank cleaning is a great time to take pictures too.

Get a refugium

A refugium can be a great place to keep competing macro algae or plants. Although primarily saltwater hobbyists utilize refugiums there really is no reason why freshwater hobbyists couldn't use a refugium setup as well. You can go cheap here too. Form a simple aquaclear hang on power filter, to a bucket, to a plastic tote, all make decent refugiums as long as you can easily hook them up to your display tank. Saltwater aquarium keepers often use fast growing chaetomorpha in the refugium to help compete against algae growing in the main tank. Once the chaeto reaches a large size you can prune some of it thereby exporting nutrients from the system. Freshwater aquarium keepers could use fast growing plants to provide a similar service. The plants and macro algae will compete with any algae trying to grow in the main tank and make it harder for algae to grow.

Replace your aging lights

Has it been awhile since you've replaced your fluorescents or metal halide aquarium lighting? As bulbs age they can emit a very different color temperature, frequently emitting light in the spectrum that many species of algae favor. Replace your bulbs every year or so can be a good guideline or even better, follow the manufacturers recommended replacement schedule.

Ultraviolet (UV) Sterilizer

Some use a sterilizer to fight disease outbreaks in the their tanks but they are better at destroying aquarium algae. There are hang on the tank models that are really easy to install too. Get a powerhead for pumping water into and through the unit and that's it, you're in the business of UV sterilization. Sounds far out doesn't it? Pond keepers may be familiar with the pond UV Sterilizers. These sterilizers are on the expensive side but if you have really expensive fish or corals in your tank they may be worth researching. Also, like all aquarium products, some are better than others. More info on aquarium uv sterilizer.

Aquarium Blackout

Hobbyists will sometimes run their tanks with no lights for several days to combat algae problems. This is sometimes referred to as a tank blackout. Obviously, if you have photosynthetic plants, corals or inverts (clams) you don't want to try this. Cyanobacteria, often called red slime algae, is a problem often found in marine tanks. This stuff is a mess and can cause many a headache. Hobbyists will try anything to get rid of this unsightly bacteria that can quickly cover large parts of the tank. Doing a partial water change and vacuuming out as much

of the cyanobacteria as possible and then doing a tank blackout for several days may work. But why did the red slime algae take hold in the first place? Lack of flow, no protein skimmer, overfeeding, overstocked tank, etc. are the usual culprits. Fix these and then see if the problem clears up before performing a tank blackout.

Algaecides, supplements and other products

There are many different products available that will make quick work of ridding the fish tank of algae. These are usually just short term fixes though. If you don't fix the original problem you will be spending a lot of money on these products. Use them with extreme caution, if at all. For example, many hobbyists on forums all over the net talk about some of the red slime removers and getting no adverse effects from using them. Indeed, they usually clear up the slime algae over a period of days. But, some of these products could potentially wreak havoc with the bio-filtration in the tank so research them thoroughly before trying them. I'm not saying that they will destroy your bio-filter, just that the hobbyists needs to be doing the legwork on any products and/or supplements they use on their tanks. The main thing to keep in mind though is did you fix the original problems causing the algae growth? If not, the algae will come back eventually.

There are also tons of supplements, vitamins and cure-alls available to hobbyists too. Are they really worth it? That is for you to decide, but be cautious about adding anything to your tank that you can't test the side effects of using. For example, do you have a strontium or molybdenum test kit? Neither do I and that is why I don't use those supplements in my saltwater aquariums, relying instead on regular partial water changes to replenish these trace elements. Some of these products are useful (buffer, calcium additives, plant foods, etc) but be a smart consumer and research these products before using them in your tanks.

To sum up: under stock, feed appropriately, use purified water when your tap water is suspect, perform regular partial water changes, maintain the filter and vacuum that substrate to help limit the amount of foods available to the algae. Keep your water parameters in line with what you are keeping too. For example, saltwater aquarium keepers should try to keep pH in a range of 8.2 - 8.5, sg at around 1.024 - 1.025, calcium at around 420 ppm and alkalinity at around 2.5 meq/L. If you still have a problem with algae growth test the nitrate and phosphate levels. Figure out why these levels are elevated and then fix them. Even after doing all of the above you will still have algae growth in your tank, but it should be much less than before and more easily maintained.

The infamous bubble algae. If you haven't had to deal with the algae we're about to discuss consider yourself lucky. Green Bubble Algae usually comes in on the live rock and it can be difficult to keep your saltwater aquarium setup free of it once established. There are several different varieties that you might get but they are supposed to all have similar needs and requirements for their growth. So we'll treat them the same for the purposes of this intro article on bubble algae.

Bubble Algae Varieties

Valonia macrophysa - smaller clustered elongated bubble algae

Boergesenia - clustered, though less dense in numbers and elongated bubble algae shapes

Ventricaria ventricosa - can get quite large (around an inch) and grows in clusters and in singles

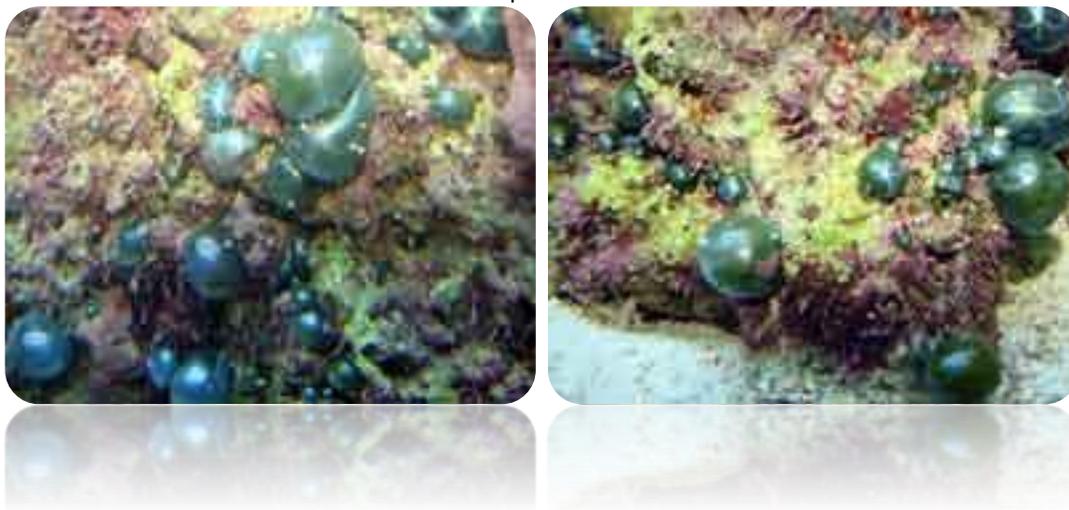
Dictosphaeria ocellata - usually smaller grouping slimey looking bubbles, can be a lighter shade of green

Dictosphaeria cavernosa - encrusting like growth forms with pitted looking bubbles

Some think this bubble algae looks unsightly and if left unchecked it may make your tank look a little odd. The other problem is that they can overgrow neighboring corals in your reef tank setup and you don't want that right?

The variety of bubble algae we've seen the most crop up in our tanks is the *Ventricaria ventricosa* and is the one pictured on this page. It came in on a piece of live rock as a single tiny bubble. Over several months that single bubble algae turned into several smaller bubbles. It didn't look too bad so we let it be. Fast forward a couple of weeks and we now had rock covered in these bubbles that were getting larger. A couple even looked deflated which is an indication that they have released thousands of tiny spores into the tank so that more bubble algae can get a foot hold and grow. Time to do something.

Some pictures ...



Tank Water Conditions

Supposedly this bubble algae, like most others, needs nitrates to grow. Phosphates may play a role too along with a mix of others. Keeping these levels as low as possible means that algae in general should have a hard time growing. We usually run our tanks with 0 nitrates and undetectable levels of phosphates (using a phosban reactor) according to our salifert aquarium test kits. Partial water changes with reverse osmosis water are performed weekly. We also run an attached refugium that is used to grow the macro algae chaetomorpha so this bubble algae shouldn't be growing as fast as it is! But, sigh, it does.

Getting Rid of Bubble Algae

So what do you do when see this stuff in your tank? You have a few options:

- Make sure your water parameters are in line, i.e. 0 nitrates and very low levels of phosphates. Run a protein skimmer if you're not already and keep up with those regular partial water changes.
- Manual Removal - very carefully grab the bubble algae towards the base and use a gentle pulling and twisting motion to free it from the rock without breaking the bubble. *Ventricaria ventricosa* feels like large rubber marbles and they can burst thereby releasing thousands of new bubble algae cells into your tank. If they've already burst remove the bubble sack anyway. Don't let them get too big or you run the risk of them releasing the spores before you can remove them. Keep the upper hand here.
- The Emerald Crab is reported to eat bubble algae, which variety we don't know. They didn't touch *Ventricaria ventricosa* it in our tanks. Perhaps it's not the first thing they are interested in consuming. If there is plenty of other stuff in the tank for them to eat you are out of luck.

- Rabbitfish and some Tangs may eat them. I've noticed our Yellow Tang nibbling at the deflated bubble sacs but not going after the growing bubbles.
- Some species of sea urchins (Diadema) may eat bubble algae. They may wreak havoc on your rock work and coralline algae too though.

Those are some of the ways to help deal with the dreaded bubble algae. The bad news is that once you get it in your tank you may have a regular battle keeping it at bay. We've resorted to removing it anytime we see it starting to crop up. I don't want to remove the rock (as some suggest) and starting over. That would be more of a pain than just simply removing the bubbles by hand.

If you have experience and tips on dealing with bubble algae drop us a note using the link below and we'll post it on this page.

AIPTASIA ANEMONE

The infamous Aiptasia Anemone - notice the smaller ones sprouting up on the right side of the rock pictured below.

Aiptasia is a smaller anemone that can get to be about 1 inch (3 cm) in diameter, sometimes larger, and reproduces rapidly in a saltwater aquarium with abundant nutrients. They are sometimes called aiptasia, glass anemone, tube anemone and rock anemone and there are several different species. This is one anemone that saltwater hobbyists don't purchase, rather this one comes in on the live rock as a hitchhiker.



It can be difficult to see them when they are small and you obviously wouldn't want to knowingly buy live rock if you saw this pest on it at the store. They can hide inside the small crevices and rock pores only to come out weeks or months later if they are given the right conditions.

Why are Aiptasia considered a pest?

Well, they are not the most attractive looking specimen, they multiply rapidly and more importantly they can sting other, more desirable corals and other reef tank inhabitants. It's a typical story... You get some new rock and a few weeks go by and you notice a small anemone starting to grow on the rock. How neat, a free anemone! Well, the honeymoon ends a few weeks or months later when you notice that your live rock starts to become overgrown with them, especially if you have a reef tank with expensive corals!

Ways to Control Aiptasia

Controlling them can be a chore. If you try to smash them or cut them they are thought to

release pieces of themselves into the water, thereby multiplying even more rapidly. Listed below are some natural and chemical methods for controlling aiptasia:

- First, if you can, reduce the amount of nutrients available to the anemone. This may mean limiting the amounts, types and frequency of fish and coral feedings. Do you just drop in a frozen fish food cube? Defrost the frozen food first and then slowly spoon feed it to the fish. Give the fish a little, give them 30 seconds to eat it all and then spoon feed them a little more. This makes for less waste and juices entering the tank and more food for the fish instead of the filter.
- Peppermint shrimp (*Lysmata wurdemanni*) are used by many hobbyists to eat this anemone. It can be hit or miss though. Especially if you get the wrong version of the "peppermint shrimp". There is another peppermint shrimp, *Lysmata californica*, that looks very similar to the wurdemanni but doesn't do the job on aiptasia that wurdemanni does.
- Raccoon Butterfly Fish and the Copperband Butterfly Fish will also eat this pest but they can pose other problems in reef tanks. They may eat and/or pick at corals. The copperband butterfly may be the better choice because it may be less inclined to eat or pick at corals than the Raccoon Butterfly but the Copperband is less hardy and more difficult to feed long-term. However, they may only eat bits and pieces of the aiptasia causing some the aiptasia to scatter and relocate in other places inside the tank.
- Bergia Nudibranch (*Berghia verrucicornis*) are great aiptasia eaters but the problem with them is they might starve once the aiptasia is gone. They can also easily be eaten by tank mates.
- Calcium and Kalkwasser is thought to destroy aiptasia too. The trick is applying it directly into the anemone or on the oral disk using a syringe before it retreats into its hole.
- A sting from an Elegance Coral (*Catalaphyllia jardinei*) is supposed to kill them. If you have one and you can pick up your elegance coral by the base, this may be an option for you.



Close up view of the aiptasia oral disk

Given the various options listed above for controlling or eradicating aiptasia from your tank can take time and there are drawbacks to each method. The favored option for us is to use the peppermint shrimp (*Lysmata wurdemanni*).

Some of these tips apply to both freshwater and saltwater fish.

We've tried to come up with a list of general tropical fish tips and hints for beginners to the fish keeping hobby. Below you will find our compiled list of the items we thought would especially help a newbie. If you have a good aquarium or tropical fish tip that you would like to share, just complete the form at the bottom of the page and we'll post it.

New Fish Tank Tips

- Realize that if you do things correctly, this can be a long-term commitment. Some fish species can live for a very long time if cared for properly.
- Research, research and research some more. It's a really good idea to get as much information as possible on a fish **before** buying it. Try to find out things such as:
 - How big it will eventually get and whether you have a large enough aquarium
 - What are the aquarium water parameters it requires? Find out things such as temperature, pH ranges, etc.
 - What types of fish foods will it eat? Will it take flake foods?
 - The general temperament of the fish species. Will it get along with the fish you already have or plan to get? This is an often overlooked area that needs more attention from hobbyists.
 - Is the species known as a prolific breeder? If so, do you have the equipment needed to keep them or do you have a plan for what happens when your fish has babies? Find out if your local fish store will take the young fish. If you don't have a means of placing them then you should stick with those fish that don't breed as easily in captivity.
 - Is the fish easily susceptible to certain fish diseases?
- Get the biggest tank you can afford. A larger aquarium generally means that your aquarium water parameters will be more stable. A bigger tank gives you some room for error, like when a fish dies and you don't notice it right away. Or, for instance, when your heater breaks and the stores are closed. The water temperature should be more stable in a bigger tank.

- Learn about the fish tank nitrogen cycle. This is a crucial process that you must understand if you want to have long term success with tropical fish.
- Research aquarium equipment before you buy it. Use google (top right of this page) or any search engine, and type in the particular model you are interested in and read what others have to say about it.
- If you enjoy reading, go to the library or buy tropical fish books. Get a couple of books on aquarium information or the species you are interested in getting. Reading a book is probably the fastest way to get up to speed and it provides a great reference for the future. On this site you can find some of the fish books we've reviewed.
- Subscribe to a fish and aquarium magazine. Getting a subscription to a hobby magazine is an easy way to pick up some good tips and it also allows you to stay up to date on anything new in the hobby.
- Give your fish plenty of places to hide. Ironically, it seems the more places they have to hide the less they do hide. Hiding places can be a place of refuge for your fish and it should lower stress levels for them.
- Research the fish you would like to keep and then aquascape your tank for the fish that will be living in it. You want to be able to meet the requirements of the fish you are keeping and modifying the aquascape afterwards is sometimes not an option.
- Get and use an aquarium water test kit to monitor the aquarium nitrogen cycle. The best way to monitor this cycle is to purchase a freshwater or saltwater test kit that will test for ammonia, nitrites, nitrates and ph. Test the water coming out of your tap as well. This will arm you with more information when it comes time for those water changes.
- Don't place your tank next to a window. Sunlight entering your aquarium will cause major headaches in the form of green algae. Direct sunlight will also cause your tank water temperature to increase.
- Don't follow the 1 inch of fish per 1 gallon of water rule. A better guide would probably be 1 inch of fish per 2 or 3 gallons of water. Use the future adult size of your fish when computing how many fish you can keep. Resist the temptation to overcrowd your tank. The more tropical fish you have the more often you will have to perform fish tank maintenance.
- De-chlorinate your tap water before putting it in your tank. There are many de-chlorinators on the market.

- Get an aquarium filter that has multiple (2) media cartridges. This will allow you to change out one at a time. If you swap out all of the filter media with new media you run the risk of having to go through a mini aquarium cycle. Good power filters that hang on the back of the tank usually come with a separate floss system that you never have to change.
- Never rinse out your filter media with straight tap water. Use some of the tank water that you've just siphoned out while doing a water change. The chlorine and chloramine in the tap water will kill the nitrifying bacteria in the filter.

Stocking Fish Tips

- Slowly add fish to your tank. Never go out and buy a bunch of tropical fish because your tank's bio-load won't be able to handle it. Slowly adding fish gives your tanks biological filtration a chance to catch up.
- Slowly acclimate fish to your current setup or preferably a quarantine tank. When bringing home new fish, dump the bag contents (fish and water) into a **clean** (used only for fish) 5-gallon bucket and then add about 1 cup of aquarium water to the 5 gallon bucket every 10 minutes. Continue to add 1 cup of aquarium water to the 5-gallon bucket every 10 minutes. After an hour or so your fish should be ready to add to the aquarium.
- Make sure that any new fish you are planning to add to your tank will be compatible with the current inhabitants. You need to look at temperament, water parameters and tank size requirements. For instance, please don't put a common pleco in anything under 55 gallons.
- For new tanks, be sure the fish that you add to your tank are hardy. After the tank has aged for a few months, less hardy fish can be added. A tank needs to "mature" (complete the aquarium nitrogen cycle) before it can accommodate certain species of fish. *Submitted by: Dahly*

Feeding Your Fish Tips

- Give your fish a variety of tropical fish food and not just flakes. Read the nutritional information on the canister of food to see what vitamins and minerals your fish is getting. Flakes can be the primary diet for many fish because they are packed with the vitamins and minerals your fish needs. However, try to supplement their diet with other types of food every once in a while. You should see better colors and increased vitality by varying their diet.

- Do not overfeed your fish. Try for two small feedings per day instead of one large feeding. Give your fish a small pinch of food and see if they eat it all within a minute or two. If you see flakes floating to the bottom of the tank, then you put in too much food. That is, unless you have bottom feeders. Overfeeding will lead to poor aquarium water quality and will increase the stress levels in your fish.

Fish Tank Maintenance Tips

- Always turn off the electricity before working in or around your tank. Use a power strip connected to a GFCI outlet and all you have to do to turn off the electricity is flip a switch. Also, use drip loops on all of the cords or hang the power strip on the wall, thereby causing the cords to loop before reaching the plug in. Read the [aquarium electrical safety](#) article.
- Try to change some of the water in the tank on a regular basis. Small frequent (weekly or every two weeks) water changes are better than infrequent large water changes. Small water changes will cause less stress and shouldn't interfere with the biological cycle in the tank. If you have a larger tank, get a Python Aquarium Vacuum. These vacuums make doing water changes a breeze. Gravel vac only half of the tank with each water change. Switch sides on the next water change.
- Avoid wide fluctuations in your water parameters such as temperature and pH. Try to refill your aquarium with water that is as close to the current tank water as possible.

Fish Disease Tips

- Set up and use a [quarantine tank](#). This is a small inconvenience that can really save your butt.
- Only medicate your main tank as a last resort. Use the [quarantine tank setup](#) for medicating sick fish and for monitoring new arrivals.
- Figure out what caused the fish disease or problem in the first place. Has your tank completed the [aquarium nitrogen cycle](#)? Did you quarantine the new fish? Have you been keeping up on those water changes? What are the readings on your aquarium test kits?
- Try to accurately diagnose the disease before using medication

- Remove any carbon in your fish tank filters before using medications because the carbon will remove medication that you add to your water.
- Turn off the protein skimmer in saltwater fish tanks while medicating because it can skim off certain medicines.

Aquarium Lighting Tips

- Don't leave the fish tank lights on all of the time. Try for a 8 to 12 hour period of time for lighting. Most want to have the lights on while they are home. You can get the 8 to 12 hours needed by using a timer. For instance, set it to make the lights come on at 10am and off at 10pm. This will let you view your tank when you get home from work.
- If you are wanting to keep aquarium plants, be sure to research their light requirements first. Determine if you can meet those requirements with your existing lights or if you need more wattage, which might require a different and usually more expensive aquarium hood.

Aquarium maintenance or fish tank maintenance is something that absolutely has to be done on a regular basis to get the most out of this hobby. So you've finally got your fish tank up and running but you're noticing that it's starting to look a little dirty. Or, you notice that you need to top off some evaporated water. This is the time for some routine aquarium care or maintenance. Aquarium maintenance or fish tank maintenance can sometimes be a bother for hobbyists but it doesn't have to be that way. Develop a schedule for carrying out these aquarium maintenance tasks and it will make this hobby more enjoyable. Staying on top of those water changes should increase the health of your fish and make your tank look nicer.

It's important to note that you don't need to completely break down the tank every time you have to "clean your tank" or perform aquarium maintenance. Most of the time you will just need to perform a partial water change (20 percent or so) with a good gravel vacuuming and maybe scrape a little algae off the front viewing panel. If you have a major algae problem then something is out of whack. You may be feeding too much, your tank may be overstocked, you're not performing frequent enough water changes, you're feeding the wrong types of foods, etc. Or, it could be a combination of the above. If you have a problem with cloudy water, please read the article on [Cloudy Aquarium Water](#) and be sure to keep up with your fish tank maintenance!

Ok, let's talk about cleaning your fish tank:

Items you will need

- Aquarium Glass Scrubber
 - Aquarium Vacuum
 - 5-gallon bucket
- OR
- Python Aquarium Vacuum (Lee's makes an aquarium vacuum too)

STEP 1: Develop an aquarium maintenance schedule

You will want to clean your fish tank at least once every 2 weeks. Once a week would be even better to take care of your fish tank and it will be easier each time you clean.

STEP 2: Turn off the electricity to the fish tank.

This will be safer for you and it will keep the filter from clogging up with the debris you pull from the gravel. Read this article on [Aquarium Electrical Safety](#) for more information.

STEP 3: Clean your fish tank

Each time you clean your aquarium you will need to replace about 20% of the water. Use your algae scrubber to scrape any algae off the front and maybe the sides of the tank. For acrylic aquariums, make sure that you won't scratch the acrylic with whatever you're using to clean the sides. Some use an old credit card for acrylic tanks.

Check out the filter media (i.e. filter floss). If it needs cleaning you can rinse it in some of the discarded tank water. This filter media will have loads of the beneficial bacteria needed for the aquarium nitrogen cycle and rinsing it in tap water with chlorine and/or chloramine can kill some of the bacteria, so use tank water.

The vacuum and bucket method

- Place the bucket below the aquarium.
- Insert the end of the vacuum hose into the bucket and the vacuum completely into the aquarium. Use an up and down motion or a 45° angled up and down motion with the vacuum until the water starts flowing into the bucket. Clean as much of the gravel as possible until 20 percent of the water is drained.

The Python vacuum method

- Hook up the python to the sink.
- Insert the vacuum completely into the aquarium. Turn on the faucet to begin the siphoning process. Clean as much of the gravel as possible until 20 percent of the water is drained.

STEP 4: Refill aquarium with de-chlorinated water.

Before adding water to the tank you should add the proper amount of chemicals that will remove the chlorine and chloramine from the incoming water. Prime is a great additive to remove chloramines but there are several available for hobbyists to use. Try to add water that is the same temperature as your tank water. High temperature swings would be very stressful for your tropical fish.

For Saltwater aquariums you will want to have some saltwater mixed up and ready to go at least the day before you plan on doing water changes. Freshly mixed saltwater can be fairly toxic to fish and you need to allow a day or so to allow the salt mix to properly dissolve. Many use new and clean 5-gallon buckets or rubber trash cans for this purpose. Mix up the salt, pop in a powerhead and maybe a heater and you have saltwater ready for when you need it.

Once a week, clean out the skimmer collection cup, scrape off any salt creep back into the tank if possible. If you don't have saltwater snails you'll need to use an algae scrubber to remove any algae that has built up on the front and sides of the glass. See the note above if you have an acrylic tank (scratches easily!). This is also a good time to test the tank water salinity with your hydrometer. Top off any evaporated tank water with dechlorinated fresh water.

My regimen for doing water changes on my reef tank, once a week:

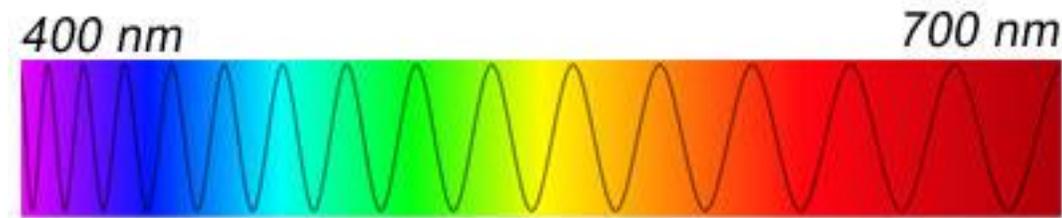
- Make two 5 gallon buckets of saltwater using RO water, put in a powerhead and let it sit for 12 to 24 hours. Sometimes I just let it mix for a few hours if I'm in a hurry.
- After the mix has totally dissolved, I remove 10 gallons of saltwater (using two more 5 gallon buckets). I use a 1 gallon popcorn container to remove water by hand from the tank. It goes really fast.
- Slowly pour in new saltwater from the two 5 gallon buckets with new saltwater.
- That is it! Takes about 10 minutes total time, including mixing up the new saltwater.

AQUARIUM LIGHT - FISH TANK LIGHTING

The aquarium light or fish tank lighting is another important aspect when keeping an aquarium. The aquarium light is an often overlooked area that can sometimes be confusing for a beginner to aquariums. The confusion may come from the many available types of fish tank lighting that you can use to light your aquarium. The main types of aquarium light are:

- regular fluorescent lights,
- compact Fluorescent,
- high output (ho) or T5-HO Fluorescent,
- very high output (vho) Fluorescent
- metal halide
- LED - Light Emitting Diodes

The type of light you need for your fish tank really depends on what you plan on keeping in your aquarium. This article is a very general introduction into aquarium lighting and below we discuss the various types of lighting needs based on aquarium type. These are very general recommendations and we encourage you to research your livestock's lighting requirements for best results.



Spectrum of visible light expressed in nanometers (nm).

Aquarium Light Types



Regular Fluorescent Light

These are the type of lights that come with most starter tanks and are very affordable. They typically range from 15 to 40 watts and have Kelvin ratings from 3,000° to 10,000°. Kelvin is the scale used to measure the color temperature. They are very cheap to run and replace. These are the often the stock lights that come with aquarium kits.



Compact Fluorescent Light Bulb

These are a step up from the regular Fluorescent lights. They typically range from 10 to 100 watts and have Kelvin ratings from 5,000° to 10,000°. They offer really bright and intense light but they do put off some heat that may raise the tank water temperature. Running power compact lights will require special hoods and because of the heat produced, they often come with installed fans in the hood.



High Output (HO) or T5-HO Fluorescent Light

HO Fluorescent lights typically range from 20-60 watts and have Kelvin ratings from 6,000° to 11,000°. They are more expensive than regular Fluorescents and usually last longer. These lights require a T5 light fixture. T5-HO lights can be used to grow some of the most demanding SPS corals if placed in the middle to upper regions of the tank. I've been running reef tanks for years with T5-HO's with very good results. They provide lots of light and run much cooler than metal halides. Fixtures often have fans incorporated into them to keep the bulbs operating at optimum levels. Planted tank keepers may find that T5-HO's are good to use for their plated tanks as well.



Very High Output (VHO) Fluorescent Light

VHO Fluorescent lights typically range from 75-160 watts and have Kelvin ratings from 10,000° to 20,000°. These lights are very expensive and produce a lot of heat. They require a ballast and/or special fixture especially for VHO lights. They have fans incorporated into the aquarium lighting unit to help keep the lights and aquarium cool. Even though they come with fans you may need to equip your tank with an aquarium chiller to prevent your tank water from overheating. These are not as common as many of the other forms of aquarium lighting.



Metal Halide Light Bulb

Metal Halide lamps typically range from 175-1000 watts and have Kelvin ratings from 5,000° to 20,000°. This type of light is closest to the sun in terms of luminosity but they are very expensive to buy, operate and replace. They produce a lot of heat and usually must be fan cooled. Ballasts with fan units included are widely available. Metal Halides were often the preferred method of lighting a reef tank setup with anemones and corals that need higher intensity lighting but they are losing favor in place of T5-HO's and LEDs.



LED Aquarium Light

Are LED aquarium lights what we have in store for the future of aquarium lighting systems? Prices are still very high and they will need to drop significantly in price before more hobbyists will transition to them. The prices are coming down, just not fast enough. They offer many advantages over previously mentioned lights. Some of the advantages of LED lights over conventional Fluorescents and metal halides include:

- LED aquarium lights run much cooler than standard Fluorescents and metal halides
- LED aquarium lights consume less energy than the other lights
- They have a much longer life span
- There is no filament to break, so they could be considered more durable
- They can be configured in many ways due to their small size.
- Many of the top end LED fixtures come with modes that let you totally customize lighting colors and intensity on repeatable schedules.

Many of the light fixtures being sold now include moon lights which are LEDs. So we're starting to see them more often, but even though these LED aquarium lights are very promising we are probably still a few years away from using them as the primary light source on most home aquariums. Check out the ecotech radion LED lighting fixture which is getting really good reviews from hobbyists.

Freshwater Aquarium Light - Fish Only

For a freshwater tank with no live plants you can get by with the low watt Fluorescent lights. These lights are typically between 18 and 40 watts and should last for a year or longer before they burn out. You mainly want light bulbs that will bring out the best colors in the fish you are keeping.

Freshwater Aquarium Plant Lighting

Live plant keepers will need to upgrade their lighting system. The light type you need depends on several factors:

- Depth of the tank
- Plant species you plan on keeping
- Growth rate desired

Typically, plant keepers try to provide anywhere from 2-5 watts per aquarium gallon. Research

the plants you want to keep beforehand to determine if you can provide the light needed. T5-HO's can be a good option for plant keepers.

Aquarium Photo Period - How long do you leave the lights on?

How long should the fish tank lights stay on for? We get this question frequently. A good range to aim for would be anywhere from 6 to 12 hours. Remember that fish like and need to rest just like other animals.

Fish only setups could range from 6 to 12 hours, reef tank setups and freshwater planted aquariums could range from 10 to 12 hour photo periods. Leaving the lights on for longer time periods could contribute to nuisance algae growth (just one of the factors with algae growth), higher tank temperatures and quicker tank water evaporation. Be consistent and if you can afford it, invest in a light timer.

Aquarium Light Timer

You may also want to get an aquarium light timer. A light timer can help make running an aquarium that much more enjoyable because it's one less thing you have to mess with. Higher end fish tank hoods and fixtures have multiple power cords that are tied into the multiple light sockets within the hood. This allows you to setup your timer to turn on the various lights at different times.

For instance, a popular hood nowadays is the compact Fluorescent hood incorporating an actinic bulb, a full spectrum bulb and a moon light. You could set up the timer to turn on the actinic bulb to go on first and stay on for 12 hours, then have the full spectrum bulb come on an hour or so later and stay on for 10 hours. This could simulate dawn and dusk by having the actinic bulbs come on an hour early and stay on an hour later. Finally, you could have the moon lights turn on when the actinics turn off. Who knows, you may even start to see breeding behavior in certain species that may be more in tune with the light of the moon in this type of setup. Another side benefit of using a moon light is the super cool effect it creates in the aquarium when all the other lights in the room are off.

Conclusion

As you can see, the type of light you need really depends on the type of tank your running. Freshwater and Saltwater fish only tanks can usually get by with the regular Fluorescent lights whereas the freshwater plant keepers and saltwater reef tank keepers will need to invest in better light sources.

Please practice good aquarium electrical safety and be sure to use drip loops and GFCI outlets!

AQUASCAPE AQUARIUM DESIGN IDEAS

For many fish tank hobbyists, aquascaping or aquarium aquascape design can be one of the most enjoyable parts about setting up a fish tank. Decorating your aquarium can be quite fun, but coming up with a good aquarium aquascape is not just about making the tank look nice. You really should take into account the tank's future inhabitants when figuring out what you need to do. This is where you get to exercise both sides of your brain to try and come up with something that is not only nice to look at but something that is functional as well.

Research Fish and Animals First

Ideally, you should research and decide on the fish and any other animals you want to keep before you even buy a tank. Many freshwater hobbyists think the common pleco is a cool fish to have and indeed it is. But, the common pleco really has no place in a tank smaller than 55 gallons as adults.

Many saltwater hobbyists are really taken by many of the tangs (surgeonfish). Without research, they have no clue that tangs really need a large tank for adequate swimming space. Dottybacks are another popular species and one that needs hiding spaces to feel secure. Creating hiding places for your dottyback is an important consideration in your aquarium aquascaping plans.

For the future reef tank keepers out there, some corals need intense aquarium lighting whereas others prefer less lighting. Figuring out which corals you would like to keep may dictate your aquarium aquascape and the arrangement of the saltwater live rock in your tank. For instance, if you want to keep some light loving corals you may need to build up the rockwork so that you could place these corals with the intense lighting requirements higher in the tank.

Hopefully you can start to see the importance of figuring out what you want to keep **before you** buy your first piece of fish tank equipment.

Keep Aquarium Maintenance In Mind

You've got your tank setup and your aquascape looks fantastic! Everyone compliments you on how nice it looks and you're feeling really good. However, a week or two goes by and it's time for some routine fish tank maintenance tasks. Namely, scraping the tank glass to get rid of some unsightly algae that is starting to grow on the front viewing panel of the tank. But wait, aah man, I've put the rock too close to the front glass and I can't get the scraper in between the rock and the glass. Doh!

Another favorite task of many aquarists is gravel vacuuming or cleaning the sand. Yeah! Don't you just love vacuuming the gravel? Just kidding. However, what must be done, must be done. It's time for another - doh! I've grouped too many of these plants together and it's going to be darn near impossible to effectively clean the gravel in that part of the tank. Looks like the beginnings of a small nitrate factory in the making, which may be a big headache down the road.

The point here is that you want to aquascape effectively. Arrange the fish tank so that future tank maintenance tasks remain as easy and efficient as possible.

Saltwater Tank Decorations

Fake Coral or Dead Coral

Fake or Dead Coral will look nice (depends on who you ask) for a very short period of time in your aquascape and can be a major pain in the butt to clean and will make you wish you never shelled out the money for it. Try the more natural route (live rock - see below) and avoid fake corals and dead coral skeletons altogether.

Live Corals

The ultimate aquarium decoration that is actually a living animal! Corals are not for the beginner and should be thoroughly researched beforehand because of their often hefty price tag and demanding water, lighting and feeding requirements.

Live Rock

The great part about live rock, aside from the biological importance of using it, is that you can use aquarium silicon sealant to shape the rocks into any type of design you desire for your aquascape. We now have a new term - "rockscaping". You can also use a drill to create small holes in the rock and use pvc pipes to hold them together to make columns or archways. The rockscaping possibilities are endless. Another thing you'll probably need to do is place the rock directly on the tank bottom and not on top of the sand. Sand burrowing species could get injured or worse if you place the rock on top of the sand.

Here are some typical saltwater live rock layouts to help kick-start your creative genius.

Front View of Island Aquascape Design



Front View of Slope Aquascape Design



Front View of Cove Aquascape



Aquarium Background

The tank's background can sometimes really set off the aquascaping in a tank. You have many options here. There are tons of ready-made tank backgrounds that are of picturesque nature scenes, coral reefs, etc. Choose one that you like and one that won't clash with what's going to be in the tank.

Another option is to paint the outside back glass of the tank a solid color such as black, dark green, deep blue, slate blue, etc. Appliance spray paint sticks to the glass well. Many hobbyists like painting the outside back glass better than using a tank background because you don't have

to worry about water getting in between the background and the back glass. Believe me, it will happen and then it can be a pain to clean it. It's not as big a problem for freshwater tanks as it is for saltwater tanks. In marine tanks, salt creep will eventually make its way in between the background and the glass causing unsightly salt creep on the glass.

More Cool Ideas

For more ideas and to get those creative juices flowing, it can be really helpful to check out what other hobbyists are doing. Check out the fish tanks in the FishLore [fish and aquarium picture gallery](#) to get some ideas. Once you get your tank set up, show it off by signing up to become a [FishLore member](#) (completely FREE) and you can then upload photos of your masterpiece. Have Fun!

What is an Aquarium UV Sterilizer?

The aquarium UV Sterilizer is a water filtration device that uses an ultraviolet light bulb to kill microscopic organisms that are free floating in the water. Parasites, viruses, algae and bacteria (good and bad) are the type of things that are "killed" after passing through the ultraviolet sterilizing unit. UV sterilizer devices can be used on swimming pools, in liquid factories (think beer) and in the home aquarium using an aquarium UV sterilizer. Some large water purification centers employ some sort of UV sterilization on the outgoing water. These sterilizer units are also sometimes used in outdoor ponds to help control algae growth and they seem to do a decent job.

When using a UV Sterilizer in a home aquarium, the UV unit should be placed last in the filtration line. You want to first filter the aquarium water through your mechanical filter and then run the water through the UV device before returning the water to your fish tank. By first removing the solids in the aquarium water with your mechanical filter (canister filter, etc.), you are helping your UV unit to attain maximum operational efficiency.

The effectiveness of any UV sterilizer is determined by the UV bulb wattage, the age of the UV bulb, how clean the quartz sleeve is and the flow rate of the unit.

Aquarium UV Sterilizer Light Bulb

The effectiveness of the bulb will diminish with time and use. Manufacturers usually recommend replacing the bulb after 6 months. You can find units with bulbs anywhere from 8 watts up to as high as 130 watts. The higher the wattage of the light, generally the more effective it is. If you have a unit with a lower wattage then you will want to have a lower flow rate to get the most out of the unit.

Aquarium UV Sterilizer Flow Rate

The flow rate of the unit is an important consideration. Flow rate is measured in gallons per hour (gph) or liters per hour (lph). While higher flow rates may be acceptable for killing algae and some bacteria, you will usually need a much slower flow rate to kill parasites. For example, a 15 watt bulb will usually kill algae and bacteria with a 120 gph flow, but you will need to lower the flow rate to around 75 gph for it to effectively kill parasites. Read the manufacturers recommendations for your particular unit for effective bulb wattage and flow rates.

Keep the Quartz Sleeve Clean

One thing that some hobbyists forget about is the quartz sleeve that the UV bulb slips into. You must clean this quartz sleeve periodically to remove any buildup in order to keep your sterilizer

operating at peak efficiency. The better sterilizer units have a wiper with a handle outside the unit that allows you to quickly and easily clean the sleeve without taking the sterilizer apart.

Where can I get a UV Sterilizer?

Nowadays Ultra Violet sterilizers can be found in local pet stores and they can definitely be found online. Look on eBay or similar auction sites for good deals on second hand and even brand new units. Since they are very expensive, you will want to research the unit you're interested in getting before investing in one. Use a search engine to find reviews on tropical fish forums and discussion boards. Since you will usually need to change out the bulb every 6 months or so, find out how much a replacement bulb costs. The replacement bulb price may help when comparison shopping.

Do I really need an Ultra Violet Sterilizer for my aquarium?

For indoor freshwater fish tanks that are well filtered and properly maintained, you really don't need one. Saltwater hobbyists may have a good excuse for getting one because of the high price tags for many of the saltwater species. However, most hobbyists really don't need one if they are doing things properly. Doing things properly would mean using a quarantine fish tank for new arrivals and performing frequent fish tank maintenance.

Outdoor pond keepers may want to invest in a UV sterilizer to help control algae problems in their outdoor ponds.

What is a Reverse Osmosis Water Filter System and should I use it for my aquarium?

Reverse Osmosis and Deionization is a process whereby water is purified as the water gets pushed through some sort of membrane. The membrane traps the impurities and they can remove 90% - 99% of the impurities from the water. The type of membrane you use determines the amount of impurities that the Reverse Osmosis unit will remove.

Our drinking water often includes minerals, heavy metals (mercury, copper), phosphates, nitrates, pesticides and herbicides (from farming and lawn fertilizers), chlorine and chloramine. These can all be potentially harmful to your fish. However, most municipalities do a decent job of eliminating most of these impurities from our drinking water. Water treatment plants add chlorine and chloramine to the water to kill any harmful bacteria or other "bad stuff".

One side effect from using a Reverse Osmosis unit is that they will remove some of the "good stuff" along with the "bad stuff". Because of this you will need to add the "good stuff" (minerals and other essential elements) back into the water before using it in your aquarium. There are products on the market called RO Conditioners which are made specifically for this process. R/O Right is one product that contains the essential minerals and other elements that your fish need. It should be noted that these are only used for freshwater tanks because saltwater mixes already contain the essential elements you need.

Is a Reverse Osmosis Water Filter Really Necessary?

If you are planning on keeping a saltwater reef tank with various corals and anemones or a particularly challenging freshwater species such as Discus, it may be a good investment. If you live in an area where you can only get well water or your water source is suspect, it may also be a good investment. It really depends on the water coming out of your tap. Some water treatment centers will send out annual reports of the water quality in your area. If they don't, there are places that you can send your water off to be tested, all for a fee of course.

For most hobbyists these Reverse Osmosis units probably are not all that necessary. Many tropical fish hobbyists have been keeping fish successfully for years without using a Reverse Osmosis Unit. If you're a reef tank keeper though you will probably need to invest in one. RO units are usually fairly expensive and you probably don't need one if you have decent water quality. Research your tap water to determine the amount of impurities your water contains and then make an educated decision on whether or not you really need to purchase one of these units.

Reverse Osmosis Water Filter Maintenance

You will need to perform maintenance on your RO unit periodically. How often hinges on how hard your water is and/or how many impurities are included. You can get an RO flush kit that removes some of the lodged deposits in the membrane and potentially prolong the useful life of the membrane. These flush units are usually inexpensive and can save you some money by prolonging the life of the membrane.

What is Deionization?

Deionization is another type of water purification. The deionization unit works by utilizing a process known as "ion exchange". Without getting too technical, this basically means that it removes the impurities and replaces them with pure water. Do you really need to know exactly how it works? No, not really.

Deionization units are usually used in conjunction with RO units to give you 99.9% pure water. The tap water is usually first pushed through the RO unit and then sent to the Deionization unit for further purification.

Periodic Testing

You will need to test the output water from these units periodically to determine if they are still producing pure water. Get water test kits that will test the General Hardness and the Alkalinity of the water. You want both readings to be 0. If the test readings start to trend higher you will know that you soon need to replace the membrane and/or cartridge. The easiest and quickest way to tell when your Reverse Osmosis filter needs to be changed is to use a Total Dissolved Solids (TDS) meter. I like to change my cartridges out when the TDS measures over 10 ppm or so for my reef tank water.

What is a Protein Skimmer?

A protein skimmer, also sometimes referred to as a foam fractionator, is a piece of aquarium equipment that is primarily used in saltwater aquariums in order to remove dissolved organic compounds (DOC) and other harmful substances that if not removed can breakdown in the aquarium or filter adding to the biological load on an aquarium. Protein skimmers remove these hydrophilic substances completely from the water using air bubbles that are collected in a collection cup. As air and water are mixed in the skimmer chamber the bubbles rise and take with them the dissolved organics that are attracted to the bubble surface. When the bubbles with the proteins, amino acids and other nasty stuff bubble up the tube into the collection cup they are completely removed from the aquarium. Unlike a mechanical filter that just traps solids but still exposes them to the aquarium as the water continues to flow over them all the while these solids are breaking down and adding to the total bio-load on a tank. Skimmers could possibly be consider one of the most significant advances for the saltwater hobbyist.

Think about the ocean for a minute. You know how as the waves crash on shore you will sometimes notice sea foam? This is similar to the way protein skimmers function. Air is mixed with water and then the dirty bubbles (foam) are placed on shore, only with a protein skimmer this foam is removed from the system via the collection cup.

Protein Skimmer Benefits

- Skimmers increase the dissolved oxygen levels and redox potential in an aquarium
- They remove dissolved organics before they get a chance to breakdown and become a food source for nuisance algae
- By removing dissolved organics the aquarium water clarity does not age or yellow as quickly since the DOC buildup is less allowing light to penetrate deeper into the tank for the benefit of corals and other inverts.
- Can help lead to a more stable pH since less dissolved organics are in the system.
- Overall improvement in the health and vigor of the animals in the aquarium since their wastes are being removed from the system via the collection cup.

Although it is my opinion that a protein skimmer's positives far outweigh the negatives I still have to mention that there are some drawbacks to using a skimmer.

Protein Skimmer Drawbacks

- Can be very to extremely expensive
- They can remove beneficial bacteria as well as phytoplankton and other desirable organisms from a system.
- They can remove trace elements that may need to be replenished or supplemented, such as Iodine. Other elements are most likely removed as well and if partial water changes are not practiced on a regular basis your system could become unbalanced chemically, i.e. not have the proper proportion or ratio of trace elements to major elements. Regular partial water changes with properly mixed saltwater will prevent this from happening.

Do I really need a protein skimmer?



One of the first questions new saltwater hobbyists seem to ask is whether they really need a protein skimmer for their first setup. Especially when they start to shop for a skimmer. The short answer is NO, you don't have to run a protein skimmer on your setup. There are many hobbyists that run successful systems without them. However, these hobbyists also realize the importance of regular partial water changes for the aquarium and how important water changes are to the health and wellbeing of the animals in their care.

By not running a protein skimmer you really do need to stay on top of those water changes. Otherwise you will start to see nuisance algae growths cropping up all over the place, especially if you have high output lighting like metal halides, T5's or VHO fluorescents. The initial expense of getting a **good** protein skimmer is justified in the peace of mind it gives the hobbyist and the overall water quality improvement it can provide. I'm telling you, once you see and smell your first collection cup full of gunk that is removed from your aquarium you will be hooked on skimmers. The way most systems are stocked nowadays (rarely are they understocked) skimmers should be pulling out at least a cup full of skimmate from the system daily. Do you

really want that amount of dissolved organics accumulating in your tank in between water changes? Me neither.

Running a system without a skimmer and without live rock would seem to be someone that is just trying to A) set themselves up for failure or B) they like bashing their heads against walls. If you're planning on a system without live rock and no protein skimmer I would simply ask, why? Make the system as easy to maintain as possible and chances are you will be able to enjoy it more.

Skimmer Types

Really? You want to cover this? Ok, if you say so. If your mind starts to glaze over mid-read, you've been warned. Basically, the object here is to find the best way to create lots of tiny bubbles and to provide the optimal contact time with the organics so they can attach to the bubbles and then rise as a foam into the collection cup. The body style of the skimmer can be an important design consideration when utilizing any of the methods of creating bubbles. Here are a few ways to make bubbles:

Co-current skimmers: These were some of the first used and they had an air stone at the bottom of the chamber providing the air bubbles. The air bubbles rose vertically and were collected into a cup. Actually, these skimmers even today are good skimmers. The wooden air stones (finer bubbles) just have to be replaced regularly.

Counter Current skimmers: The air/water mixture is forced through a counter-current of aquarium water in the body of the skimmer. This is supposed to give a longer contact time for the bubbles to attract the organics.

Venturi skimmers: These use a venturi valve to mix in air with the water. These valves are usually situated on the intake tube coming into the skimmer.

Needle Wheel Skimmers: These use a spoked wheel that spins and chops up the incoming water producing fine bubbles. There are also mesh wheel skimmers that function in a similar way.

Spray Induction: As the aquarium water comes into the skimmer it is forced through a spray nozzle that creates a lot of tiny bubbles.

Downdraft and Beckett: These skimmer types use proprietary parts to mix the air and water to create the glorious bubbles we love. Some of the larger protein skimmers are these types of skimmers.

Knowing how a skimmer creates its bubbles could be a consideration for the hobbyist. Some are more popular than others. It really comes down to doing your research, just like everything else in this hobby. Are you going to pick a skimmer just because it's a downdraft skimmer? Of course not. You are going to come to a decision based on reviews from other hobbyists or firsthand experience with a unit.

Skimmer Maintenance

When shopping for a protein skimmer it is very important to include in your decision making the methods and ease of maintenance on the product before buying one.

-How easy is it to empty and clean the collection cup? This is a daily task and collection cup design is a very important factor.

-How easy is it to get into the skimmer with your arm for scrubbing the walls? You won't be cleaning the walls except maybe every 6 months to annually.

-How easy is it to clean the bubble creation device? Can you easily get to it with a small bottle brush?

Cleaning the collection cup should be done daily for optimum performance. As residue builds up on the neck of the cup it can impede the rising of the foam and ultimately the amount of gunk that you remove from the system.

To Skim Wet or Dry?

Another thing to consider is whether you want to skim wet or skim dry? Skimming wet is simply lowering the collection cup and/or increasing the air flow so that it removes more skimmate albeit less dense and lighter colored organics from the system. Skimming dry is raising the collection cup and removing only the nastiest stuff from the system. Skimming wet means more freshwater water top-offs, more salinity checks with the refractometer and possibly testing more often for depleted iodine levels. Skimmer dry means less water top-offs but possibly more dissolved organics left in the system.

There are even those hobbyists out there that utilize wet skimming as a part of their water change schedule. Skimming wet lets them remove the most dissolved organics and as they are monitoring their salinity levels they may notice that it will start to drop as they skim wet. When doing water top-offs you will want to make up for the lost salinity by using pre-mixed and aged saltwater to make up for what was lost via the wet skimming. A bonus to skimming wet is that

the neck doesn't accumulate as much protein gunk around the inside of the neck on the collection cup, so a little bit less maintenance on a day to day basis.

The decision is totally up to the aquarist. Only you know how well your skimmer works on your particular system and you know your own maintenance habits. Some find a good middle ground between wet and dry skimming. There is no right answer here that covers all situations.

Parting Thoughts...

Protein skimmers can be a valuable asset for your saltwater aquarium. They can help create a more stable environment for your animals and a healthier one too. If you just can't afford a decent protein skimmer you should honestly rethink the whole saltwater thing, at least for now. Especially for a beginner to the hobby our goal here is to make sure you have all the tools you need to succeed while having fun. Save up enough money until you can afford one a later date. You will be glad you did.

One last thing, protein skimmers are very expensive and the old saying that "you get what you pay for" certainly has some merit with skimmers. Trying to go the inexpensive route will often end up costing you more in the long run. I've been there and done that. Don't waste your money on a cheap skimmer. This piece of aquarium equipment is just too important. Get a good one from the start after researching them thoroughly.



GEO calcium reactor

The calcium reactor is sometimes referred to as a kalkreactor, kalkreaktor, or even just a lime reactor. Although many other hobbyists have developed DIY versions of these reactors, Daniel Knop is often credited with producing the first commercial unit.

If you have a reef tank setup you're going to be getting into maintaining your calcium and alkalinity levels. Keeping these levels up where they need to be is very important for the growth of your corals. There are several ways to keep the calcium and alkalinity levels up in your reef tank, including:

- Slow dosing with kalkwasser
- Using saltwater aquarium supplements like buffers and turbo calcium
- Using a calcium reactor

Each of these calcium dosing options have their own pros and cons. Using supplements can get expensive, especially if you have a very large reef tank. Dosing with kalkwasser can raise the aquarium pH to dangerous levels if not added correctly and a calcium reactor can be quite expensive initially to set up.

What is a Calcium Reactor

A calcium reactor is a piece of aquarium equipment that allows you to semi-automate the

addition of calcium to your reef tank. Connected to the aquarium, it works by pumping CO₂, Carbon Dioxide, into a chamber containing a calcium carbonate substance and saltwater. The CO₂ lowers the pH in the chamber and dissolves the calcium carbonate thereby releasing calcium, minerals and trace elements into the connected aquarium. Using a calcium reactor may actually be more beneficial because not only does it raise the calcium and alkalinity levels but it also adds minerals and trace elements into the tank as well.

This sounds really neat. What all do we need to get one of these reactors running you're wondering?

Equipment Needed

- Chamber for the reactor calcium carbonate based media
- CO₂ regulator with two CO₂ gauges - one for measuring the amount of CO₂ in the CO₂ tank and one for regulating how much CO₂ goes into the reactor chamber.
- Bubble Counter - this is used to eyeball how much CO₂ is being added to the chamber.
- Pump or powerhead to get the water from the tank to the reactor and back. Some also utilize a second powerhead to keep the water moving within the reactor chamber.
- pH controller and probe for monitoring the pH levels and a solenoid to turn off the CO₂ valve should the pH drop below a certain threshold.
- Connecting pvc or flexible tubes for attaching it to the tank or sump.
- A To dissolve aragonite based media it is commonly recommended to run the pH in the reactor chamber in the low to mid 6 range (6.1 - 6.5 pH).

How Much Will This Cost?

It depends. If you're a Do It Yourselfer you could save some money setting up a DIY reactor. If you're mechanically challenged (like me) then buying these components and hooking them all up is the way to go, albeit more expensively. Look for deals online at the major saltwater aquarium equipment stores and on ebay. You could find a good deal on all the equipment you need.

Using a calcium reactor for a smaller (say less than 55 gallons) could take a while to recoup the initial purchase price of all this equipment. If you're running a larger reef tank though, a calcium reactor will definitely save you money and be potentially less labor intensive than dosing calcium, alkalinity and trace elements manually. Even a tank full of growing corals should have their calcium needs adequately met with a calcium reactor.

Calcium Reactor Setup

Although we'd love to give steps on how exactly to set yours up, there are many different

reactors out there. Nor can we tell you what CO₂ bubble rate or flow rate on the output effluent that you should use. It depends on the calcium demands in the system, size of the aquarium, etc. Start off slowly, test and then tweak your bubble rate until you get the levels you need. It should go without saying, but you need to have alkalinity and calcium test kits to monitor these parameters. Keep a chart in Microsoft excel of your test readings (while holding off on dosing) over a period of two weeks or so and you can get a good idea of the calcium and alkalinity demands of your system.



Biopellet aquarium filters are one of the more recent new products to hit the market for saltwater aquarium keepers. The manufacturers claim that these biopellets will reduce the level of nitrate and phosphates in your aquarium. Why do hobbyists want reduced nitrates and reduced phosphates? Primarily to keep nuisance algae from growing in their tanks and because nitrates and phosphates can negatively impact the growth rates of some corals.

How do biopellets work? Well, basically the manufacturers claim that these pellets provide places for bacteria to grow which consume nitrates and phosphates. As the bacteria multiply and grow they consume the carbon in the biodegradable biopellets. Kind of cool huh? Supposedly, these bio degradable polymers were first used in sewage treatment plants.

Saltwater reef keepers have utilized a carbon dosing regimen called vodka dosing for years. The problem with vodka dosing is that you have to do it all the time! With biopellets you put them in a reactor and they will slowly dissolve over time. About the only maintenance you will perform on a daily basis is to look at the reactor and make sure the pellets are tumbling correctly. So, running with the pellets is less time consuming and potentially less error prone than vodka dosing.

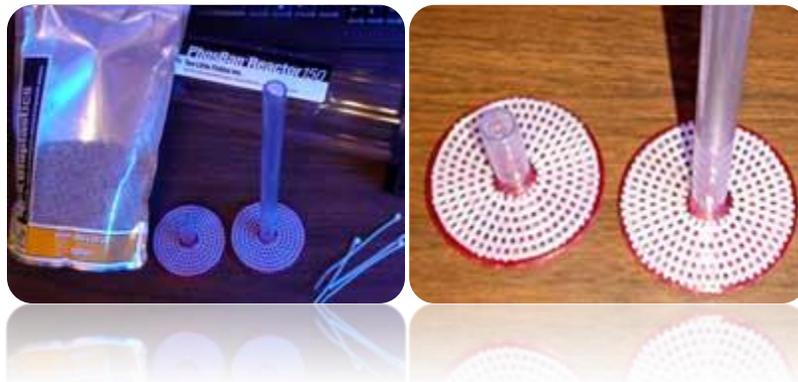
As these biopellets catch on, more and more manufacturers are making them. As of June 2011 here are some of the biopellet brands available:

- Two Little Fishies NPX Biopellets
- Sea-slug Phosballs

- Warner Marine Eco bak
- Brightwell Katalyst
- NP Biopellets (the original and first biopellet manufacturer?)
- Reef Dynamics NOPO Biopellets
- Aqua Vision Aquatics
- Reef Octopus Bio Spheres
- ATB HQ Biopellets

Biopellets are made to be used in a fluidized filter. The Two Little Fishies Phosban reactor is an ideal first choice for many hobbyists to run these biopellets because it is inexpensive and readily available. There are other reactors (reef octopus, warner marine, brs, geo, nextreef, etc) out there and they can be quite costly but some of the more expensive models come with added features that you don't get with the TLF reactors. However, for our purposes the TLF reactors will work just fine.

Testing the biopellets!





To test these biopellets out I started with a phosban 150 reactor made by two little fishies. You can use a maxi-jet 1200 powerhead to pump the water thru the reactor. The reactor comes with a nozzle to let you adjust the flow of water entering the reactor. To set up the reactor here is what I did:

- Soaked the pellets in RO water for about 2 hours. I had heard that this would prevent them from clumping and floating in the reactor.
- While waiting for the pellets to soak I added the mesh screens to the red plates of the reactor. I am not and do not recommend using the sponges that come with the reactor. They will clog up too fast and really limit the flow.
- Tested my water for phosphates using a hanna digital phosphate checker and tested my nitrates using a Salifert test kit.
- Slowly and carefully added the biopellets to the reactor. You have to cover the middle tube of the reactor so you don't get any pellets in it.
- Cut your rubber tubing to the lengths you need and hook up your powerhead to the input line and direct the output line to the protein skimmer (very important) so that your skimmer has first crack at the water exiting the biopellet reactor.
- Plug in the powerhead and slowly open the valve on the reactor to slowly let water enter it. Doing this slowly will help keep the pellets toward the bottom of the reactor. You are aiming for a tumbling action for the pellets.

For the pellets I picked up one bag of the Two Little Fishies NPX Biopellets and one of the NP Biopellets bags. I wanted to see the differences in how the different brands would tumble in the reactors.

Troubleshooting:

- Biopellets not tumbling? If your pellets are not tumbling but your valve is all the way open you either have too many pellets in the reactor or you need a more powerful powerhead.
- No noticeable decrease in algae growth? Make sure you have enough pellets for a system your size and that you are directing the output to the skimmer before it re-enters the tank.
- pH decreasing? Probably due to the influx of bacteria - is your protein skimmer pulling out the gunk the reactors are producing. Is your skimmer powerful enough?
- Algae growing in the main tank? If so, are you directing the reactor output line to the skimmer first? Are you using enough pellets?
- Cloudy water? Could be attributed to a bacterial bloom. Give the system a couple of days to stabilize before doing anything drastic. Things should settle down over a couple of days and the cloudiness will go away. If it won't go away make sure you are doing all of the other things mentioned above and maybe slow the flow thru the reactor or even remove the amount of pellets you are using.
- Not getting good results? Nitrates and/or phosphates not going down? Have you given the pellets a long enough chance to work? Leave them running for several months. It takes time for these pellets to really start working and for your tank to stabilize.

How much is this going to cost?

A 500 ml bag costs around \$40 dollars. Manufacturers recommend 250 ml per 50 gallons. I would not put more than 200 to 300 ml in a TLF 150 reactor in order to get the biopellets tumbling nicely so you will need multiple reactors. Let's use a 120 gallon for an example:

Using multiple TLF 150 reactors

- Need 2 bags of pellets in order to run 750 ml of pellets on the system per the mfg recommendations = \$80
- Need 3 reactors @ \$40 a piece = \$120
- Need 3 maxi-jet 1200 powerheads to run the reactors = \$60 (3 x \$20 apiece)
- Total comes out to about \$260.

OR

Using one TLF 550 reactor

- 2 bags of pellets = \$80
- TLF 550 reactor = \$60
- 1/2 inch ID Powerhead to run the 550 = \$60

- Total comes to \$200 and you have 1 reactor in your sump

The only problem I had when using just the TLF 550 reactor was the flow rate. I've used both the 150 and the 550 and totally prefer several 150's over one 550 due to the better tumbling action of the pellets in the TLF 150 reactor.



I have been running the biopellets since January 2011 on a 120 gallon tank that is very heavily stocked for a reef tank. I also feed my fish and anemones very heavily twice a day. I can say without a doubt that these biopellets are working very well at keeping my nitrates and phosphates at very low levels and my tank has little to no algae growing in it. I test my water weekly and my nitrates are always nil, while the phosphates fluctuate between .03 and .08 ppm on the Hanna meter. Before the introduction of the pellets the Hanna meter would display phosphate readings double and triple what I'm getting now. I do a quick wipe down of the front and side glass about twice a week with the mag-float. The gunk collected in my skimmer is gag inducing and some of the nastiest looking, smelly stuff that I've seen my octopus skimmer pull out of my tank. The sps frags look phenomenal and have great polyp extension. Saltwater hobbyists all over the net are reporting similar success stories. Time will tell, but these pellets just might be the biggest thing since the protein skimmer for reef tank keepers.

What is an aquarium chiller?

As the aquarium hobby continues to advance more gadgets are making their way into the market for hobbyists. The aquarium chiller or water chiller has been around for some time now but chillers are slowly starting to become more affordable for your average aquarist. Many are starting to get into saltwater reef tanks and this side of the hobby seems to be growing rapidly. Reef tanks are primarily geared towards coral keeping and these corals often times require intense lighting. This lighting is usually supplied by metal halides, VHO fluorescents, T5 fluorescents or compact fluorescent lighting.

It's fantastic that we are able to use these lighting fixtures to get the necessary light over these light loving corals, but there is a downside. The aquarium water temperature will often start to creep up into the mid to high 80's °F (high 20's - low 30's °C), sometimes even the low 90's °F. While natural reefs can be in the mid to low 80's °F they don't have the temperature swings as often and as extreme as the swings in the home aquarium.

For instance, when the lights are off, the tank temp will probably hover around the mid 70's °F. Obviously the temperature of the room the tank is located in will have an effect on the tank temperature. But, once they main lights come on in the morning the tank temperature will slowly start to climb to possibly uncomfortable levels in the afternoon. It's this swing from the lower temps to higher temps that could be cause for concern. Particularly if you're keeping corals and sensitive species of fish or other inverts. Temperature swings can be stressful on the fish, corals and any other invertebrates in the tank.

There are other downsides to running a "Hot" tank. As the aquarium water heats up it can hold less and less dissolved oxygen. So, running your tank in these upper extremes can prove fatal for your livestock if you don't have a protein skimmer (excellent at oxygenating the water) or surface agitation from power heads or return flows from sumps breaking the water surface. If you've just set up your tank and it's winter time and you notice your tank temperature creeping up, just imagine what it's going to be like in the spring or summer when the house temperature could be a few degrees warmer. Yikes!

Do I really need to an aquarium chiller?

The first thing you should do before spending your hard earned cash on an expensive water chiller is to run a fan or two over the top of the tank or sump. Fans can do a nice job of lowering the temp a couple of degrees. The downside is the increased levels of evaporation which means doing water top offs more frequently. This can be a pain in the you know what, and it can be expensive if you factor in the cost of the Reverse Osmosis and Deionization filters along with

the cost of running the fans. Aquarium chillers can use lots of electricity too though, especially if they are undersized for the aquarium they are trying to cool down.

If you're keeping a FOWLR (Fish Only with Live Rock) saltwater aquarium setup you probably won't be running metal halides or the very high output fluorescents. Why waste the electricity on animals that may only marginally benefit from the higher output lights, if at all? So, you most likely won't need an aquarium chiller. Try a fan to bring down the temperature a degree or two.

A reef tank setup or aquarists keeping coldwater species may need to invest in one of these units if their aquarium temperatures are getting too high. Or, if running the fan works, but the frequent water top offs (usually daily) are getting old, you may want to invest in an aquarium chiller.

Aquarium water chiller options

Chillers are usually rated based on horsepower and BTU (British Thermal Units). BTU's are the measurement units used to describe the amount of energy required to change one pound of water one degree Fahrenheit. Manufacturers will usually recommend the maximum aquarium size that the aquarium chiller can be used on. Use that as your guide. If your tank is on the borderline size wise and you're having a hard time deciding between two similar units, go with the higher capacity unit. It should save you in energy costs.

Below is a table of sample aquarium chiller sizes. This is just for example purposes. Of course, sizes and capacities may vary depending on the unit. This is just to give you a general idea of what's available.

Horsepower	BTU	Max Aquarium Size	Temperature Range	Price Range (USD)
1/3	~ 4,000	360 gallons (1363 liters)	60 - 85 °F (16 - 30 °C)	\$600 plus
1/4	~ 3,500	260 gallons (984 liters)	60 - 85 °F (16 - 30 °C)	\$500 plus
1/5	~ 2,500	180 gallons (680 liters)	60 - 85 °F (16 - 30 °C)	\$500 plus
1/10	~ 1,500	70 gallons (265 liters)	60 - 80 °F (16 - 27 °C)	\$400 plus
1/15	~ 800	50 gallons (190 liters)	60 - 80 °F (16 - 27 °C)	\$300 plus
1/20	~ 600	25 gallons (95 liters)	60 - 80 °F (16 - 27 °C)	\$200 plus

You will usually see two different styles of chillers as well. There are "drop-in" and "inline" chillers. The drop-ins have a cooling coil that is placed in the sump. The upside to these drop-in units is the fact that you don't have to run any plumbing and you don't need a separate pump to get the aquarium water to the aquarium chiller and back. They are not in favor as much nowadays though.

The inline units are more frequently available. You will most likely need an aquarium pump and some flexible tubing to run back and forth from the tank or sump to the chiller. It stinks to get the chiller delivered and then have to wait until the next morning or the weekend to go out and purchase a pump! So, keep that in mind.

Research!

These are pricey pieces of aquarium equipment. Do your homework and don't get burned on a crappy unit. Hobbyists on forums will gladly share their experiences with you. Go to your favorite search engine and type in the name of the chiller along with the word "Review" and see what comes back. There may be published reviews for you to read. Just be warned though that sometimes these published reviews may be a little sketchy. Perhaps the merchant is trying to make sales or the manufacturer is doing some "marketing". Be careful and pay attention to what you are reading and you'll be sure to pick out an aquarium chiller you'll like.

Some things to keep in mind when shopping for a chiller:

- Obviously, the price
- Energy consumption
- Noise level, these units can be noisy, especially the bigger ones
- Ease of maintenance
- Is it going to be big enough to use for your aquarium?

The main thing an aquarium chiller can do for you and your tank is to keep those temps stable. A stable temperature is one component that can help lead to healthy fish and corals. If you are one of those crazy marine fish breeders (wink) perhaps you could use a chiller to perform manual temperature swings to help trigger spawning events. Also, don't forget to help your fellow hobbyists. Let them know if you have a good one. Give them the pros and cons and help them make a better decision when they go to buy an aquarium chiller.

Written By: Sirdarksol for the FishLore Magazine



An Aquarist's Guide to Blue-Green "Algae"

Your tank is running well, except for a light dusting of an intense green algae on parts of the glass. All of the sudden, sheets of bluish-green stuff are spreading across the decor. Still, it's just an algae outbreak. Easily dealt with. You step up your water changes and manually remove the algae. Day after day, however, it comes back. You buy a cleaning crew of shrimp, snails, and/or fish known to eat algae, and yet nothing seems to change. Worse, you think your fish are getting sluggish. You check the fish disease charts, and they don't seem to fit any of the profiles. They sometimes hover near the top of the tank, at other times the bottom. They never seem to gasp for breath, but always are languid. The more tender inhabitants may even be dying without apparent reason. You bring out the big guns. You go out and buy a bottle of algaecide. And still, nothing happens, other than the death of any inverts and live plants that happen to live in the tank.

This is not an uncommon occurrence, nor are these actions unreasonable, given the information that most aquarists have. For all intents and purposes, this seems to be some sort

of algae outbreak. Even its name, "blue-green algae" says so. However, it isn't an algae. It's actually a strain of bacteria known as cyanobacteria (its name derived from its vivid color, which would be beautiful if it didn't signal so much trouble for an aquarium). In addition to blue-green, cyanobacteria can be black or even red.

What Is Cyanobacteria?

Some cyanobacteria is beneficial, being an important part of the nitrogen cycle. Spirulina, which is hailed as a "super food," being rich in all of the amino acids, as well as other important nutrients, is a form of cyanobacteria. Others, however, produce various forms of neurotoxins, hepatotoxins, cytotoxins, and endotoxins. All forms of cyanobacteria seem to be somewhere between plant and bacteria. They have a gel-like cell wall (cell walls are usually reserved for plants) and are fed partially by photosynthesis. They also possess bacterial traits. Some are free-floating, some form threads, or sheets, or even hollow spheres. Thankfully, it seems that most of the harmful cyanobacteria take the form of brilliant sheets, making it easy to identify.

A few things contribute to the beginning of a cyanobacteria outbreak. Too much light, too much phosphate, and general poor water quality can begin an outbreak. Introducing plants that have not been quarantined can bring on an outbreak in a seemingly healthy tank. Once it has begun, however, cyanobacteria can be much harder to get rid of than an algae outbreak.

What to Do?

If you are facing an outbreak of cyanobacteria, there are a couple of options for treating the tank:

Antibiotics for Cyanobacteria

The first is a fairly simple remedy. Dosing the tank with an antibiotic will kill off the infestation pretty quickly. This has several downsides that offset its ease and speed. The first is that every use of antibiotics has the potential to create a strain of antibiotic-resistant bacteria. You may get rid of the cyanobacteria only to find that your tank has been infested with a strain of fish TB that doesn't respond to the antibiotics. The second is that some fish and inverts don't deal well with certain antibiotics. The third is that dosing a tank with antibiotics is a good way to completely un-cycle the tank.

A good way to at least partially bypass the loss of your tank's cycle is to pull the media out of your filter and store it in another tank. If you don't have another tank, you can seal it in a bag with some tank water and keep it in the refrigerator. After you have set aside the filter media, treat the tank. Once treatment is done, run fresh activated carbon in the tank for an hour, then replace the filter media. This should leave your tank with a significant portion of its nitrifying bacteria intact.

Starve the Little Buggers

The second method, while more work and time intensive, has no real negative effects on the tank itself. In fact, it is, in general, good for the fish. The first thing to do is to thoroughly clean every surface of the tank. Second, step up water changes to lower the phosphorous levels in the tank. If your water supply normally contains phosphates, you may want to invest in some phosphorous-removing filter media. Third, kill the lights for several weeks. Fourth, feed your fish less. Most fish food contains phosphorous, which ends up in the water, feeding the cyanobacteria. Combined, these actions should starve the cyanobacteria out of the tank. This procedure takes time, of course, which is its greatest downside.

During either procedure, it is a good idea to remove the bacteria as it appears. You can often get it with the vacuum if you lightly scrape at the sheets with the edge of the vacuum attachment.

Preventing Cyanobacteria

As with most tank problems, the best way to deal with a cyanobacteria outbreak is to not let it happen. Frequent water changes will help keep phosphorous levels down. Quarantining all new livestock and plants for several weeks will minimize the chance of introducing a virulent strain of cyanobacteria to your tank. It is far easier to treat a quarantine tank, or even just break it down, than it is to do so to a fully set up aquarium. Feed your fish only what they can eat in a minute's time to further limit phosphorous as well as waste products.

Although it is a pain to get rid of, if you know about cyanobacteria, and if you react properly to it, this does not have to be a tank killer. The main reason it is so difficult is that many aquarists don't know how to deal with the issue. Once that hurdle is behind you, it should be no problem to deal with an outbreak of cyanobacteria, if one does happen.

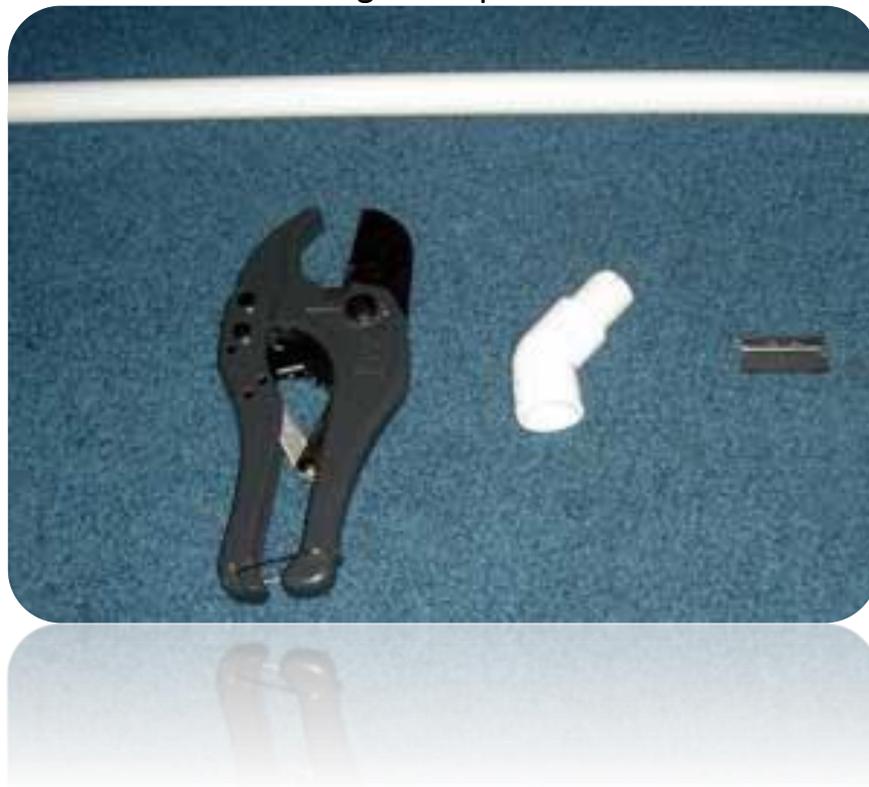
AQUARIUM ALGAE SCRAPER DIY

If you're looking for a homemade DIY Aquarium Algae Scraper you've come to the right place. Are you trying to get that encrusting coralline algae or the red algae off the front viewing panel of your aquarium? Sometimes even the green algae can be tough to scrape off. No matter how many times you go over it with that magnetic algae scraper it just won't come off! Grrr. Sounds like it's time to come up with your own device for algae control. This DIY tool works on red marine algae, green algae, brown algae or any others that will grow on the fish tank glass. This tool is only recommended for glass tanks. **Do not use this on an acrylic tank!**

This algae scraper is a very easy DIY (do it yourself) project and should only take about 20 minutes or less to make one of these homemade algae scrapers. Granted, this tool isn't very pretty, but it does a great job on that hard to scrape algae! You will need the following parts:

- 1/2 inch size pvc pipe, comes in 10 foot long pieces - approximately \$1.50
- 1/2 inch size 45° angle elbow joint - approximately 50 cents
- pvc pipe cutter or a hacksaw - pipe cutter is approximately \$10
- razor blade - pack of 100 is \$5
- Total Cost: approx. \$17

DIY Algae Scraper Parts



DIY Algae Scraper Directions:

1. Measure off about a 36 inch piece of pvc pipe and make the cut with your pvc cutters or hacksaw. You could make this piece shorter than 36 inches if you have a smaller tank. We made ours this long to prevent our hands from getting wet and possibly polluting the tank water.
2. Measure off a 3 inch piece of pvc pipe and make the cut.
3. Stand the 3 inch pvc on end and use a knife to make a 1/2 inch cut in the middle of the pvc pipe. We made this cut by placing an old pocket knife on the end of the pvc and hammered the pocket knife blade down into the pvc until it was about 1/2 of an inch deep. The trick is to make this cut with the right size blade. You don't want to make the cut too wide or the razor blade won't stay secured. **Be careful doing this!**
4. Assemble the parts together. Plug the 45° elbow joint into one end of the 36 inch pvc and then connect the uncut end of the 3 inch pvc into the other end of the elbow joint.
5. Place a razor blade into the cut end of the 3 inch pvc.
6. Scrape off that algae! Be very careful around the aquarium sealant that holds the glass walls together. You don't want to compromise the glue that holds your tank together! Take your time and gently use an up and down motion to scrape off that marine algae. Don't push too hard, in fact you shouldn't even need to with the razor blade.



The good thing about this algae scraper is that you can change out the razor blade easily once it becomes dull. A 100 pack of razor blades is fairly inexpensive and should last a long time. **Do not use this scraper on an acrylic tank. You will scratch the tank.**

Anyone wanting to be successful at the tropical fish and aquarium hobby must put forth the time necessary to understand some basic fish tank water chemistry. Understanding aquarium water chemistry will help your fish to not only survive but thrive!

I recommend that you get a good aquarium water testing kit or many individual kits. You will need kits that will test for the following:

- Ammonia
- Nitrite
- Nitrate
- pH
- Water Hardness
- Chlorine / Chloramine

Definitions

Aerobic Bacteria

This is bacteria that requires oxygen to live.

Anaerobic Bacteria

This is bacteria that can live without the presence of oxygen, or bacteria that does not require oxygen.

Ammonia

This chemical is the result of fish waste and decomposing food in the aquarium. Ammonia is the leading killer of tropical fish. New tanks that are going through the aquarium cycle or heavily stocked tanks will show ammonia readings with your test kits. Ideally, we want the ammonia reading to be 0 ppm.

Chloramine

Chloramine is a combination of chlorine and ammonia. It is a stronger disinfectant than chlorine alone and is used in areas where this extra disinfectant is needed. As with chlorine, you must eliminate this chemical from your tap water before adding it to your aquarium or it too will kill your tropical fish.

Chlorine

This chemical is found in most tap water and it is used to kill the bad bacteria in our drinking

water. Chlorine must be eliminated before entering your aquarium or it will kill your tropical fish.

Copper

This heavy metal can come in with the tap water if you have older copper pipes. It can also get introduced to your tank if you've used any copper based medications. Copper can be very harmful to fish and invertebrates.

Nitrate

Nitrites are converted to nitrates during the cycling process. Nitrates are not as toxic as ammonia or nitrites but they are harmful and will stress your fish at high enough levels. The only way to remove the nitrates is through a partial water change. Ideally you want to have test kit readings of less than 20 ppm in freshwater tanks and even less in saltwater tanks.

Nitrite

Ammonia gets converted to nitrite by the bacteria in your tank. Nitrite levels will soar in new tanks that have not yet been cycled. Nitrite is just as toxic to tropical fish as ammonia and the only way to quickly reduce nitrite levels is through a water change. Nitrites will eventually be converted to nitrate by the bacteria growing in the tank and filters. Ideally, in established tanks you want this reading to be 0 ppm with your aquarium test kit.

Nitrogen Cycle

This cycle usually takes from 2-8 weeks to complete and will happen in all new aquariums. You could speed up the process by using the filter material or gravel from an established tank. Even then it could still take a few weeks for the tank to cycle. This is the cycle whereby Ammonia is converted to Nitrites and Nitrites are converted to Nitrates. Please read the Aquarium Nitrogen Cycle article for more information.

Ammonia > Nitrite > Nitrate

pH

pH is the scale used to measure the acidity or alkalinity of water. The scale ranges from 0 to 14 with 0 being the most acidic, 7 being neutral and 14 being the most alkaline. It is possible to raise or lower your pH levels with water changes or chemicals from your local pet store.

Phosphate

Phosphate can be introduced to your aquarium mainly from tap water, dead plants and fish food. High phosphate levels can cause algae outbreaks. There are products on the market to remove phosphates and you can do your part by keeping up with your aquarium

maintenance and performing regular water changes. Saltwater reef tank keepers and freshwater plant keepers may want to invest in a phosphate test kit.

Salinity

This is the amount of dissolved salts in water and is measured using a hydrometer.

Specific Gravity

This is a density measurement for the amount of dissolved salts in saltwater compared to freshwater. Explained another way, saltwater is composed of many more elements than freshwater. The specific gravity measurement shows us how much heavier or denser saltwater is compared to freshwater.

Water Hardness

The hardness level of water has to do with the amount of minerals that are dissolved in the water. Calcium and magnesium are the primary minerals that are dissolved in tap water. "Soft" water has relatively few dissolved minerals whereas "hard" water has many dissolved minerals. Water hardness is not really an issue unless your water is excessively soft. Then you may have problems with runaway pH levels. For saltwater aquariums this is especially true. The carbonate hardness of saltwater can give you a good indication of how stable your pH is. KH is aka as alkalinity in Saltwater.

An aquarium water test kit is needed if you want to be successful in the tropical fish hobby (freshwater or saltwater). You will need to know how to test your fish tank water with an aquarium water test kit during the cycle and whenever problems arise.

There are many aquarium test kits that you can use on your aquarium including:

- Ammonia
- Nitrite
- Nitrate
- Salinity/Specific Gravity
- pH
- Carbonate Water Hardness
- Alkalinity
- Chlorine and Chloramine
- Copper
- Phosphate
- Dissolved Oxygen
- Iron and Carbon Dioxide
- And a few others

Buying these aquarium test kits individually can get expensive. You can usually save a few dollars by getting a master test kit. For most hobbyists these master test kits will be sufficient. Live plant keepers and saltwater reef tank keepers may need to invest in additional specialized mini test kits such as copper, phosphate, dissolved oxygen, etc.

Some aquarium test kits come as dip strips that you dip in a test tube filled with water from your tank. You then compare the color with the card that came with the kit to get your final reading for each particular test. The other type of test kit has liquid droppers. You dispense the liquid (certain number of drops) into a test tube with tank water. You usually need to shake the tube and wait a few minutes for the test to develop. You then match the color of the water in the test tube against a test card to get your final reading. It can be a good idea to ask someone else in your house to compare the colors and give you a second opinion. Don't tell them what it means, just ask them to match up the colors. As hobbyists, we may tend to skew the results in our favor, so a second opinion may help keep us honest.

The Freshwater Master Aquarium Test Kit usually contain tests for ammonia, nitrite, nitrate and pH. Saltwater Liquid Master Test Kit usually contain tests for ammonia, nitrite, nitrate, pH and sometimes alkalinity. See below for more information on these terms.

Alkalinity Test

This test determines how stable your tank water is relative to a shifting pH. It can be thought of as your tank's buffering capacity or it's ability to keep the pH level stable. In most saltwater tanks you want this reading to be in the 7-12 dKH range.

Ammonia Test

This chemical is the result of fish waste and decomposing food in the aquarium. Ammonia is the leading killer of tropical fish. You want this reading with your test kit to be 0. Read about the [Nitrogen Cycle](#).

Calcium Test

Primarily for saltwater aquariums, a Calcium test kit is important to use when dosing calcium in reef tanks. Calcium is a primary element that corals need to grow and dosing calcium may be a necessity for the health of these animals. You need a test kit to determine how much and how often to dose. For more information on dosing calcium, please read [Saltwater Supplements](#).

Chloramine Test

Chloramine is a combination of chlorine and ammonia. It is a stronger disinfectant than chlorine alone and is used in areas where this extra disinfectant is needed. As with chlorine, you must eliminate this chemical from your tap water before adding it to your aquarium or it too will kill your tropical fish.

Chlorine Test

This chemical is found in most tap water and it is used to kill the bad bacteria in our drinking water. Chlorine must be eliminated before entering your aquarium or it will kill your tropical fish.

Copper Test

This heavy metal can come in with the tap water if you have older copper pipes. It can also get introduced to your tank if you've used any copper based medications. Copper can be very harmful, even lethal, to fish and invertebrates.

Iodine Test

An iodine test kit is needed for saltwater hobbyists that keep corals or invertebrates that require iodine. Iodine is used up quickly by the aquarium inhabitants and skimmed out with the protein skimmer. I wouldn't recommend dosing iodine without using a test kit.

Magnesium Test

Another important parameter to keep an eye on for saltwater fish keepers is magnesium. You want to keep this in the range of natural saltwater which is 1200 to 1400 ppm. I try to keep mine in the middle around 1300 ppm. Magnesium is depleted over time and will need to be replaced through water changes and maybe even dosing, but not until you get a test kit for it.

Nitrate Test

Nitrites are converted to nitrates during the cycling process. Nitrates are not as toxic as ammonia or nitrites but they are harmful and will stress your fish at high enough levels. The only way to remove the nitrates is through a partial water change. Ideally you want this reading to be less than 20 ppm, in reef tanks you want this to be as close to 0 as possible. Read about the Nitrogen Cycle.

Nitrite Test

Ammonia gets converted to nitrite by the bacteria in your tank. Nitrite levels will soar in new tanks that have not yet been cycled. Nitrite is just as toxic to tropical fish as ammonia and the only way to quickly reduce nitrite levels is through a water change. Nitrites will eventually be converted to nitrate by the bacteria growing in the tank and filters. You want this reading to be 0.

pH Test

pH is the scale used to measure the acidity or alkalinity of water. The scale ranges from 0 to 14 with 0 being the most acidic, 7 being neutral and 14 being the most alkaline. It is possible to raise or lower your pH levels with water changes or chemicals (use extreme caution!) from your local pet store. Different fish species require different pH levels. Try to keep fish that all require relatively similar levels of pH. Here is an article with an interesting take on pH: [pH : To be or not to be considered?](#)

Phosphate Test

Phosphate can be introduced to your aquarium mainly from tap water, dead plants and fish food. High phosphate levels can cause algae outbreaks and can slow coral growth rates. There are products on the market to remove phosphates (check out [biopellets](#)) and you can do your part by keeping up with your [aquarium maintenance](#) and performing regular water changes with a [Reverse Osmosis Water Filter](#). Saltwater reef tank keepers and freshwater plant keepers may want to invest in a Phosphate Test Kit.

Water Hardness Test

The hardness level of water has to do with the amount of minerals that are dissolved in the water. Calcium and magnesium are the primary minerals that are dissolved in tap water. "Soft"

water has relatively few dissolved minerals whereas "hard" water has many dissolved minerals. Water hardness is not really an issue unless your water is excessively soft. Then you may have problems with runaway pH levels. For saltwater aquariums this is especially true. The carbonate hardness of saltwater can give you a good indication of how stable your pH is.



What is a Activated Carbon?

Activated carbon for the aquarium is a form of carbon that is usually made from bituminous coal, lignite or wood. It is often abbreviated as AC on the forum. The primary use of activated carbon, or AC, is to filter the aquarium water of foul odors, yellowing compounds (DOC) and to remove medications from the water column. Some hobbyists use it regularly and some don't use it at all. Some swear at it and some swear by it. I'll try to give you the basic info to get you started and you can decide for yourself whether or not you think it's something you will want to use.

Activated carbon comes in various shapes and sizes and not all activated carbon is equal. The most common shapes are granules and pellets. There are powder forms as well, but those are not used in aquariums. Generally speaking, the more porous and lighter the carbon the more surface area it has for adsorption thereby making it more effective at filtering the water. Many tap water filters are made to use activated carbon and it does a great job at removing odors from the water. This can apply to your aquarium as well.

What Does Activated Carbon Do?

AC is mostly used to:

- Remove odors from the aquarium water

- Remove yellowing compounds
- Remove medications, supplements and plant fertilizers

If you go several weeks in between water changes you or your significant other may start to notice a smell coming from your aquarium. Pop some AC in your filter and the smell will go away rather quickly.

If you're running a reef tank or planted aquarium and you want to get the most out of your lighting you can also run AC to remove yellowing compounds from the water to increase light penetration. Use with caution though. You don't want to start using a bunch AC in your sump or filter because it could lead to light shock for your corals. This would depend on how yellow your water was to begin with. AC can really make a big difference in the clarity of the aquarium water. Try looking into the side of your aquarium. Can you easily see through the other side? If not, you may have a lot of dissolved organics or yellowing compounds in the water and AC can clear that up for you.

If you have recently purchased fish and you are medicating them in quarantine you may want to run some AC to remove the medicine from the water column after a treatment period. You should also keep this in mind when starting medicinal treatments. Remove the AC from the filter beforehand, otherwise it will remove the medicine from the water column doing you no good. Freshwater planted tank keepers that use fertilizers with their plants sometimes refrain from using AC because it is thought to remove the fertilizer from the water column. Some say that the plants will use up the fertilizer before the AC will. But, how do they know that for sure? I would personally take the AC offline when using any kind of supplements to get the most benefit from that supplement. Bring the AC back online once a period of time has passed and you think the supplement has done it's job or you think enough time has passed.

What Is A Good Activated Carbon?

I'm not going to recommend one brand over another. I will however tell you what I personally look for after having used AC for years in all of my aquariums. The first thing I look at is the particle size. Too small (less than 2 mm) in size should be used with a media bag of some sort, otherwise the small particles will be all over your sump or aquarium. I use AC in my media reactors (TLF phosban reactors). I usually buy acid washed (hydrochloric acid washed) carbon because it has the smallest amount of phosphate and it has the smallest effect on pH. I've used both pellets and granules and both work well. The pellets allow for better flow through the reactors but the granules supposedly have more surface area making them last longer.

When comparing multiple brands of activated carbon you'll want to compare weight for a given volume. The lighter the AC, the more porous and the better it will be. The lighter acid washed carbons are more expensive too. There are some good videos on youtube that will show how effective one type or brand of AC is over another. Research them before buying because some brands/types are significantly better than others.

How Long Does Activated Carbon Last or Remain Useful?

This is probably the hottest topic and most often debated when it comes to the use of AC. Some think it lasts only a few days while others think it lasts months. To me though, it really depends on the application. The dirtier the water the less the lifespan of the AC will be. Each aquarium is going to be different. If you have a reef tank full of corals there is a constant release of biochemicals by the corals (allelopathy) that can have an adverse effect on the other corals in the tank. The same goes for macro algae. Macro algae can release biochemicals that can have a negative effect on corals too and running activated carbon can help diminish this effect. There are several good articles on google scholar on this topic.

I'm not a chemist and I don't have the testing equipment available that would allow me to determine if the activated carbon is still working after a given period of time. I would recommend changing out the AC after using it for a few weeks for most tanks but it totally depends on the bio load in your tank. The lighter the bio load the longer the AC is going to last. If you leave it in the filter too long all the pores eventually become clogged and it then becomes more of a bio filter because bacteria will start growing on the carbon.

The Negatives of Using Activated Carbon

As mentioned already, AC doesn't necessarily discriminate when removing compounds from the water column. If you're using plant fertilizers while running AC in your filter, the AC may be removing the fertilizers before the plants get the full benefit from them. Same goes for using saltwater aquarium supplements.

Activated carbon dust has also been implicated as one of the causes of HLLC in fish. However, to my knowledge this has not been scientifically proven. Someone please point me to the study if one has been documented and I'll update this article accordingly. HLLC is more commonly thought to be related to a dietary deficiency.

Another drawback can be phosphates. AC that has not been acid washed might leach phosphates into the water which can lead to nuisance algae blooms. You can test your AC for phosphates if you have a phosphate test kit or the Hanna phosphate meter.

How To Use Activated Carbon

I have TLF reactors on standby if I need to use AC on my reef tank. With the TLF reactors you also need a pump and possibly a media bag if the carbon is smaller in size. I place the activated carbon in the media bag and rinse it thoroughly under Reverse Osmosis water until all of the carbon dust is washed away. I then listen to the AC fizz for a while because I think it sounds cool. Next, I place it into the reactor and turn the flow on at about 300 gph through the reactors. Setting the flow too high through the reactors will lessen the contact time, making it less effective in my opinion.

You can also put it into a media bag and then place it in an area of high flow and let it passively filter the water. This isn't going to be as effective as putting it into a dedicated reactor though. Power filters often have AC incorporated into the actual filter floss making it a breeze to change out as needed. You can run AC in media bags inside canister filters too. The reactors and canister filters are probably the most effective ways to run AC in your aquarium since it actively (rather than passively) forces water through the carbon. I would recommend starting with about 200ml of AC per 50 gallons of water and replace it every two to three weeks. If you have a higher bio load use more carbon or replace it more often.

About the best advice I can give you if you've never used activated carbon is to try it out for yourself. If you have an aquarium odor problem or yellow water issue, use AC for a couple of days and see how it works for you. If you have a tank full of corals, especially lots of different coral species, try running a "good" acid washed activated carbon for a period of time and see what kind of results you get. You don't know until you try.

There are many different saltwater aquarium supplements on the market now. Which supplements are worth it? Which are snake oil?

Saltwater is comprised of many elements at different concentrations or Parts Per Million (PPM). Most saltwater mixes strive to replicate these ratios in their mix, although the various salt mixes have slightly different concentrations of certain elements. All of these elements that make up saltwater are vital to the health of the fish and corals we keep. Through the course of running your aquarium some of these important elements are depleted and will need to be replenished through water changes and possibly saltwater aquarium supplements.

How do you know if you need to supplement your saltwater aquarium? Well, it is our opinion that if you primarily keep fish and you perform frequent small water changes, then you may not need to supplement. Those frequent partial water changes are replenishing these depleted elements. However, if you're keeping corals or other invertebrates that need constant, high calcium levels for example, then you may need to supplement. This is where [aquarium test kits](#) are a necessity.

We recommend using a test kit if you plan on using **any** of these saltwater supplements. How can you know if you're adding too much or not enough without testing? Overdosing with one of the elements can be a serious matter, stressing your fish and corals. To rectify an overdose you would need to perform a large water change which could further stress these animals. Test, test, test. You never want to just start supplementing willy-nilly. It would be far better to just perform a partial water change to replace these used up elements. The salt mix will have these elements in the proper proportions.

Now, whether using these supplements is of any great benefit is up for you to decide. Is it just another way for companies to nickel and dime us? If you're running a fish only or fish only with live rock (FOWLR) tank, then you may not need to supplement if you're staying on top of your water changes. However, if you're keeping corals or other inverts that need constant and steady high calcium and alkalinity levels, then you very well may need to supplement with Calcium, Magnesium and/or Kalkwasser.

Here is a summary of some of the most common supplements:

Calcium Supplement

The primary element needed for clams, corals and some algae, Calcium (Ca) is needed for these organisms to grow. Natural Saltwater has a range of approximately 380 - 450 mg/L and it can be

difficult to keep this level up in an aquarium with calcium consuming corals, clams and algae. There are various ways to keep the calcium levels up. Some popular ways include the use of Kalkreactors that dose kalkwasser and Calcium reactors to dose calcium. You can also purchase diluted calcium chloride (easier but kind of expensive) and dose that way. The problem with dosing liquid calcium is that you have to also use a buffer (carbonate or bicarbonate) when you dose calcium or you risk lower the alkalinity levels. There are two part calcium/alkalinity solutions and you should look into these products if dosing this way interests you.

Alkalinity Supplement

Why is alkalinity important? Well, alkalinity is basically a measurement of how well the water in your aquarium can buffer against a drop in pH. The alkalinity test will measure the levels of elements such as carbonates, bicarbonates and some other elements. Carbonate Hardness is often used interchangeably with the term Alkalinity, but the two are really not quite the same. Carbonate Hardness measures just the carbonates and bicarbonates while Alkalinity measures those elements and a few others. Natural saltwater measures at an alkalinity of approximately 2.5 meq/L and carbonate hardness measures at 6 - 7 dKH. You may be wondering about the two different units of measurement being used here. Alkalinity is usually measured in milliequivalents per Liter (meq/L) and carbonate hardness is usually measured in degrees of carbonate (dKH). You can convert meq/L to dKH by multiplying meq/L by 2.8.

For example, 2.5 meq/L alkalinity = approximately 7 dKH, using the conversion $2.5 \text{ meq/L} \times 2.8 = 7 \text{ dKH}$.

Kalkwasser Supplement

This is a German word, that translated means "lime water". Kalkwasser is calcium hydroxide that is usually administered using a dosing system. The dosing system can be automated whereby the dose is controlled by the pH levels in the aquarium or it can be a manual process of dosing kalkwasser during water-top offs or slow-dripped into the aquarium. The good thing about kalkwasser is that it will supplement both calcium and help keep the alkalinity level and the pH stable.

You need to be careful when working with kalkwasser because the powder is fairly caustic. Gloves and an inhalant protector is a good idea when working with this product. It is recommended to use "purified water" which is basically water treated via Reverse Osmosis. You then mix about a tablespoon of dry kalkwasser to 1 gallon of water. Certain powders call for different amounts, so read and follow the directions carefully. After mixing, let the solution sit for a few hours so that the solution settles and any undissolved powder settles to the bottom of the container. You can then begin dosing the clear kalkwasser at a very slow rate, such as 1 drop every 4 or 5 seconds. You need to dose slowly because the pH of kalkwasser is around 12 and it could cause shock to the tank inhabitants.

How much you need to dose depends on how much calcium is being used in your tank. You need to get a calcium test kit and test the calcium level every day for several days in order to get a clear picture as to how much is needed. Test the pH, Alkalinity and Calcium levels while dosing too. After several treatments you'll develop a good idea as to how much and how often you'll need to dose kalkwasser. Some folks use it in all their top-offs and others do it a couple times a week. It really depends on the needs of your tank water.

Magnesium Supplement

In natural saltwater, Magnesium is in the range of 1200 - 1300 ppm. It is important to maintain a level similar to this range because magnesium helps maintain higher levels of alkalinity and calcium. Frequent use of kalkwasser reportedly lowers magnesium levels.

Strontium and Molybdenum Supplement

These two saltwater supplements, Strontium and Molybdenum, come in the same bottle. In natural saltwater, Strontium is in the 8 ppm range and Molybdenum is around 0.01 ppm. Strontium is important because it helps the growth of coralline algae and Molybdenum is an important element because it used in the growth of the symbiotic algae in corals.

Iodine and Iodide Supplement

In natural seawater, Iodine occurs at 0.06 ppm. It is important to supplement iodine because it is quickly used up by the tank inhabitants and the protein skimmer. Invertebrates use it to molt and it helps corals with calcification. Lugol's Solution is a concentrated form of iodide and iodine and you usually administer 1 drop per 25 gallons of water. Lugol's is usually cheaper in the long run to use than the diluted forms of iodine supplements. Iodine supplementation can be controversial. Some hobbyists swear by it and some swear at it. We use it primarily for the benefit of the cleaner shrimps in our tanks and we tend to under dose. Lugol's calls for 1 drop per 25 gallons, so in a 55 gallon tank we'd only use 1 drop.

Again, please get a test kit and test for the concentrations of these elements before you dose with these saltwater supplements. Remember, if you only have a fish-only or a fish-only with live rock tank (FOWLR) you may not need to use these supplements since you are replenishing them via the water changes. Reef tank keepers may have to seriously consider using them.

AQUARIUM FISH FOOD

Aquarium fish food is one of the most important topics to know about when keeping fish and a proper diet is essential. If you want to get the most out of your aquarium fish it is important to give them a variety of fish food. While you can give them just flake food, you should try to vary their diet with some of the different types of tropical fish food described below. Two or three small feedings a day is better than one feeding per day. Only put in as much fish food that the fish will consume within 2 minutes. Overfeeding your fish will lead to poor water quality and stressed fish.

Freeze-dried fish foods are a safe alternative to live fish food due to the treatment of these foods before the freeze drying process. Be extremely careful when using live foods (especially feeder goldfish) due to the diseases that they may carry.

Automatic Fish Food Feeder



These are good to use because they will dispense the same amount of food at specified intervals, usually every 12 hours. They can also be utilized while you are away on vacation.

Flake Fish Food



Flakes are easy to use and your fish will like it. Flakes usually float on the surface while the fish eat. If you have bottom dwelling fish like Cory Cats, you will want to use something like algae wafers or pellets that sink to the bottom. You can use flakes as the primary food source because it contains most of the vitamins, minerals and other nutrients that your fish need. They are also easy on your fish's digestive system. Start off by using just a pinch or two. If your fish gobble it up in less than 2 minutes, try another tiny pinch. Avoid overfeeding because this can lead to poor, cloudy water.

Also keep in mind that flake food does get bad if you've had it for a long time. Just imagine eating from a 6 month old box of cereal. So, it's probably best to go for the smaller flake food containers instead of the jumbo containers that will last for 5 years.

Brine Shrimp



Brine shrimp is a great fish food for getting your fish ready for fish breeding. It can also be used as an excellent treat for your fish. Use it as a supplement to the daily diet of flake fish food.

You can also create your own brine shrimp rather easily. Check out the [brine shrimp hatchery](#) page for details on how to create a DIY hatchery.

Blood Worms



If you have carnivorous fish you may want to supplement their diet with some blood worms. Your other fish will love these as well. Blood worms are high in protein and only feed them to your fish occasionally.

Krill

Krill are small crustaceans that are often used to enhance the colors in tropical fish. It is not recommended to feed krill daily to your fish. Use it as an occasional supplement to their diet.

Shrimp Pellets



Made from brine shrimp and because these pellets usually sink to the bottom, they can be used to feed your bottom dwelling fish. Brine shrimp is a great fish food and is often used to stimulate breeding in tropical fish.

Spirulina

Spirulina is a type of blue-green algae that can be a great supplement for your fish that are primarily herbivores. What is the benefit of spirulina? It contains many amino and fatty acids that are the building blocks for proteins. It is also usually vitamin enriched. Fish such as Plecos, Silver Dollars and Mollies will really benefit from a diet supplemented with **spirulina** fish food. It should help make your fish more regular with their bowel movements.

Algae Wafers



These fish food wafers were specifically developed for the hard to feed plecostomus and other algae eating bottom feeders. Cory cats and Silver Dollars will go after these sinking wafers as well. It can be really funny to watch Silver Dollars chase each other around the tank when one gets the algae wafer. This food can be a great supplement for the aforementioned species as well as other herbivorous fish. Drop one or two in at night when the tank lights go off for your bottom feeders. This way they won't have to compete with the top dwelling species for the wafers.

Frozen Fish Food

Frozen fish foods are great for getting high quality, fresh food to your fish. These foods are usually high in proteins and fats so check the label to see exactly what you're giving your fish. Manufacturers are making frozen varieties of the many tropical fish food types, including brine shrimp, beef heart, bloodworms, daphnia, krill, plankton, silversides, etc. You can sometimes get the frozen fish food in cube packs that really makes it easy to dispense.

Using frozen fish food can be messy, to cut down on the amount of pollution added to your tank you may want to thaw the frozen food in a bowl and then slowly spoon feed it to your tank. Only put in as much food as your fish will eat as soon as it touches the water.

Feeding your fish high quality, frozen foods will really do wonders for them. You may start to notice that your fish have improved colors and they may even start breeding.

Freeze Dried Fish Food

Freeze dried fish foods are great foods as well. However, they are one of the most expensive types of tropical fish foods per ounce. There are benefits to using freeze dried foods. They are

not very messy, they tend to float at the top of the tank for a very long period of time and they have been decontaminated (free from fish disease) by the manufacturer before the freeze drying process. If you've used freeze dried fish food you know how fish go after them. Freeze dried food is a very good way to supplement your pet's diet.

Live Fish Food

Live tropical fish food is exactly what you think it is. The food is still alive when you introduce it to the tank. Brine shrimp, Daphnia, Feeder Goldfish and worms are usually the main live foods given to tropical fish. Many give feeder Goldfish to their Piranhas and Lionfish. If you plan on using live foods, caution is advised because feeder fish can bring fish disease along with them.

Earth worms can be a great supplement for your fish but don't feed them to your fish too frequently. Finding earth worms can be fairly easy but make sure you don't collect them from soil that may have contaminants such as lawn fertilizer.

BRINE SHRIMP

Live brine shrimp (*Artemia*) can be a fantastic fish food that can be utilized for many purposes. After you have been in the fishkeeping hobby for a while you may become interested in brine shrimp because you'll start to hear about it all the time. There are mainly two different varieties out there. One is the San Francisco brine shrimp and the other is the Great Salt Lake brine shrimp. The San Francisco shrimp is smaller than the Salt Lake variety and can be used to feed small fry in the early stages of development. You could then transition to the Salt Lake variety.

Live brine shrimp serves an important purpose:

- You can give them to your tropical fish as a high quality treat
- Feed them to your fry (baby fish) for quicker growth rates
- Can be used to trigger spawning and breeding behavior in certain fish species

Brine Shrimp for Breeding Fish

Brine shrimp is packed with good stuff for your fish. These small shrimps are approximately 50% protein and 20% fat. If you're trying to breed your fish, whether it is freshwater or saltwater, brine shrimp can be an excellent food source for any successful larvae you produce. If you're having difficulty breeding fish, and assuming you have a pair, try giving them live brine shrimp for a few days or even a week and see if it helps.

How to Set Up a Brine Shrimp Hatchery

Now that you've heard about some of the benefits of this great food source, let's talk about how to make some for your own fishes. The best part about raising your own brine shrimp is that it is fairly easy to do. First, you will need the following equipment:

- Empty, clean 2 liter soda bottle with lid
- Rigid airline tubing with air stone
- Small air pump with flexible airline tubing
- Light source
- Turkey baster
- Coffee Filter
- Brine Shrimp eggs

Set up your hatchery

The amount of water to put into the soda bottle depends on the directions that come with the shrimp eggs. The San Francisco Bay brand of brine shrimp eggs is very popular and commonly found in pet shops. We'll use this product in the setup of our hatchery. According to the

directions you will want to use 1 liter of water for each 14 oz. package of brine shrimp. So, fill up the soda bottle half way with room temperature dechlorinated tap water. Empty the contents of the brine shrimp package into the soda bottle.

Next, you will need to poke a hole into the top of the soda bottle lid. Use a nail or screw slightly larger than the rigid airline tubing to poke the hole in the bottle lid. A slightly larger nail will create a hole that will allow air to escape from the bottle once we plug in the air pump. Push the rigid tubing through the newly created hole in the lid and then attach the air stone to the bottom of the rigid tubing. Then hook up the flexible airline tubing to the top of the rigid airline tubing. Finally, hook up the flexible airline tubing to the air pump, place the air stone end of the rigid tubing into the soda bottle and screw on the lid. Plug in the air pump and ta da! You have your very own brine shrimp hatchery.

Setup the hatchery near a light source to keep the water in the soda bottle warm. The warmer the water the faster the eggs will hatch. You don't want it too warm though. Try for a temperature range between 80-90° F (27-32° C). Let it sit for 24 to 48 hours and you should have a fresh hatch of brine shrimp. They are extremely small and can be hard to see. The water should look more red than brown. You may need to hold the bottle up to a source of light and watch for the tiny shrimp swimming around.

Congratulations on your first hatch. Now it's time to use the turkey baster to siphon out the brine shrimp. If you have a larger size turkey baster, you may need to cut off the top of the soda bottle to get it in there. Once you do you will want to siphon out the small shrimp and then slowly expel them into a coffee filter sitting in the sink. The water should drain through the filter leaving only the shrimp behind. Be sure to stick the turkey baster towards the bottom of the soda bottle before siphoning. The empty shrimp shells should float to the surface of the bottle. If you place a light under the bottle while doing this the live shrimp should be drawn towards the light, making it easier to collect them.

Once you've siphoned out most of the water from the bottle into your coffee filter, you should have a decent amount of brine shrimp for feeding your fish. Spoon them to your fishes and they will love you for it. If you produce too much for one feeding just put them into some dechlorinated, warm temperature water until you're ready to feed your fish. Their nutritional value does diminish as they get larger.

Obviously, this was a quick, cheap and dirty way to get your own brine shrimp hatchery setup and you'll no doubt want to experiment and modify this technique to fit your own needs. There are many, many ways you could enhance this setup. For instance you could rig a second soda lid so that it is water tight (use aquarium sealant) around a short length of rigid tubing. Then use a

airline valve that will be used to regulate the flow of shrimp. Put this new lid on the soda bottle, close the airline valve, tip the bottle upside down next to a light source and over a collecting container and then open the airline valve. Watch all the live brine shrimp flow into the collecting container. Then you could use the turkey baster to feed your fishes from the collecting container. The setup possibilities are only limited to your imagination.

SALT MIX PRICE COMPARISON

One of the most important components in a saltwater aquarium or reef tank is the salt mix. These days you will not have significant issues when choosing a salt mix. More than likely it is going to come down to availability and price for most hobbyists. Some brands are definitely more popular than others with some having been around for a long time and they do have very good reputations. There have also been a few newcomers to the salt mix market recently.

Of particular note is the price per gallon when buying already made saltwater or ocean water. Often times this is way higher in price per gallon than just mixing up your own. However, if you don't have a Reverse Osmosis filter or if you have a nano tank, the premade saltwater may work out better for you in the short run. Long term though you will save a lot of money just mixing your own using pure water from a Reverse Osmosis or RO/DI filter.

These are prices as found on Amazon in August, 2013 and I didn't include shipping costs. If you are an Amazon Prime member you get free 2 day shipping. Local prices will likely be somewhat higher due to shipping and handling to get to your local reef shop.

The best indicator here is the **\$ Per Gallon** column. The lowest comes in at \$0.25 (25 cents) per gallon while the highest is the premade saltwater coming in around \$6.14 per gallon! Also, the columns below are sortable.

Brand	Price	Bucket Size	\$Per Gal.	Quick Details	Store
Brightwell Aquatics	\$65.49	150 gallons	\$0.33	Composed of ACS-and USP-grade ingredients 	Amazon

Brand	Price	Bucket Size	\$Per Gal.	Quick Details	Store
Coralife	\$50.99	150 gallons	\$0.34	Provides the proper pH and optimal levels of calcium and magnesium	Amazon
					
D-D H2Ocean	\$79.99	150 gallons	\$0.53	Produced by a solar evaporative process	Amazon
					
hW Marine	\$69.99	150 gallons	\$0.46	Boasts natural calcium and magnesium concentration	Amazon
					
Instant Ocean	\$38.99	160 gallons	\$0.25	Number 1 choice of hobbyists, public aquariums and scientific research facilities	Amazon
					
Kent Marine	\$52.99	200 gallons	\$0.27	Elevated levels of calcium, magnesium,	Amazon

Brand	Price	Bucket Size	\$Per Gal.	Quick Details	Store
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strontium and other elements



Kordon	\$55.55	100 gallons	\$0.55	Contains AmQuel water purifier in mix	Amazon
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Nutri Seawater	\$26.99	4.4 gallons	\$6.14	100% natural live ocean saltwater with natural bacteria	Amazon
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Oceanic	\$59.99	200 gallons	\$0.30	Triple tested for quality and verified by an independent testing lab	Amazon
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Brand	Price	Bucket Size	\$Per Gal.	Quick Details	Store
Red Sea	\$64.99	175 gallons	\$0.37	Natural solar evaporated salt (NaCl) 	Amazon
Reef Crystals	\$52.99	160 gallons	\$0.33	Extra calcium and trace elements , metal detoxifiers to neutralize heavy metals 	Amazon
Seachem	\$48.99	160 gallons	\$0.31	Enhanced calcium and alkalinity stability 	Amazon
Tropic Marin	\$69.99	200 gallons	\$0.35	Contains all 70 trace elements in the natural concentrations 	Amazon



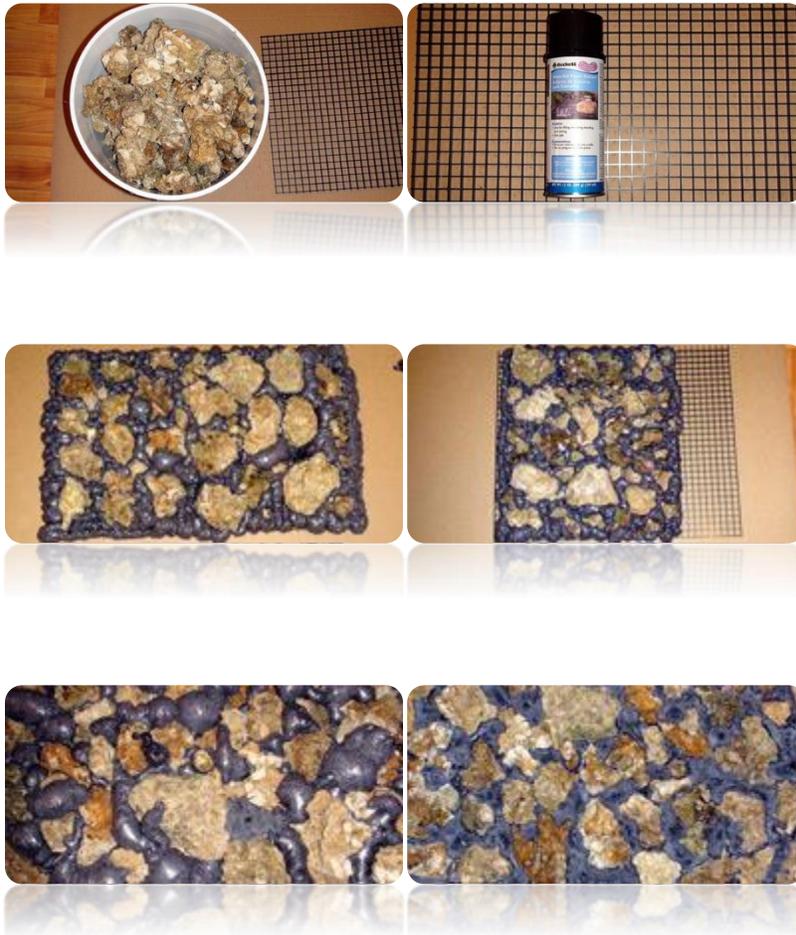
I've always wanted to try building a live rock wall for one of my reef tanks and thought that now was as good a time as any to build a rock wall. I've been to various aquariums and have seen some really good fish tank displays made with full rock wall backgrounds and they always looked good. I made the live rock wall build in this article over a period of 2 to 3 days and spent approximately 8 hours on it total.

Just a heads up, this DIY aquarium project cost more than I was initially thinking. After all was said and done it cost about \$300 to build this wall for a 120 gallon tank (2x4 feet back wall dimensions). Also, I built it for a tank that was already set up which makes it a little more challenging. The 120 gallon reef tank has been running for about a year.

Materials needed:

- Egg crate (light diffuser). It comes in white and black usually. I used the black egg crate and it was \$15 per 2x4 feet sheet. Black egg crate is really hard to find locally so I bought a couple sheets on ebay. The egg crate will be the base for the wall.
- Beckett's Black Waterfall Pond Foam. I bought 3 cans for this project [on Amazon](#). This stuff is really cool. It expands to about 3 times its size as it dries. Use gloves and old clothing when working with it because it's hard to remove.
- Live rock or live rock rubble. I couldn't get any good pieces of live rock rubble locally so I picked up about 45 pounds of good reef rock and broke it up with a 3 foot crow bar. It felt so wrong breaking up \$6 per pound live rock but I think the pieces turned out pretty good. This was the biggest cost for this DIY project.
- Aquarium silicone sealant or something similar that is non-toxic, safe for aquarium use that will be used to affix the rock wall to the tank. The foam makes the finished rock wall want to float.

Building the Rock Wall



After getting the necessary materials together and cutting the egg crate to the sizes needed, I started to build. I was working with three sections/pieces of egg crate (left, middle, right). My overflow is in the middle of my tank, so working with 3 sections made the most sense and I didn't want any of the pieces to be too big to manipulate into the tank since the tank is already set up.

I placed a sheet of card board on the floor and used that as my work surface. Starting with the right section of wall, the black egg crate was placed on top of the card board and then I started applying the black foam. I wanted to get my first piece done and put into the tank to see how it looked before I continued with the project. If the first piece didn't meet my expectations I didn't plan on finishing this project. Once the egg crate was covered with foam I placed the pieces of live rock on top of the foam. Go slow on the foam trigger! Remember that this foam increases in size as it dries. At first I was applying too much foam and soon found out that I could use half as much as I was using. One can of foam was used for each of the three sections.

I set the first piece of wall aside and let it dry overnight. You should let it dry for about 20 to 24 hours. The next day I trimmed the excess foam off. I created pits and grooves, primarily trying to get rid of the shiny bubble look of the foam. An exacto razor blade knife worked really well in trimming the foam.

The next step was to get the egg crate off the card board. This proved to be kind of a pain and was slow going in getting the tiny pieces of card board off the back of the rock wall. The first piece was ready for the tank. I reached into the tank and moved some of the rock and corals around so I could easily place the first piece into the tank without messing anything up. My measurements were spot on and the first section of rock wall fit in perfectly. It looked even better in the tank than I thought it would. Check out the picture that shows the right side rock wall inserted into the tank and you can see what my purple coralline coated back wall used to look like on my over flow (pic below).

That night I started on the middle section and right section of egg crate. Three cans of foam proved to be just enough for my 4x2 foot wall. I let these sections dry overnight again and the next night trimmed them and then placed them into the tank.

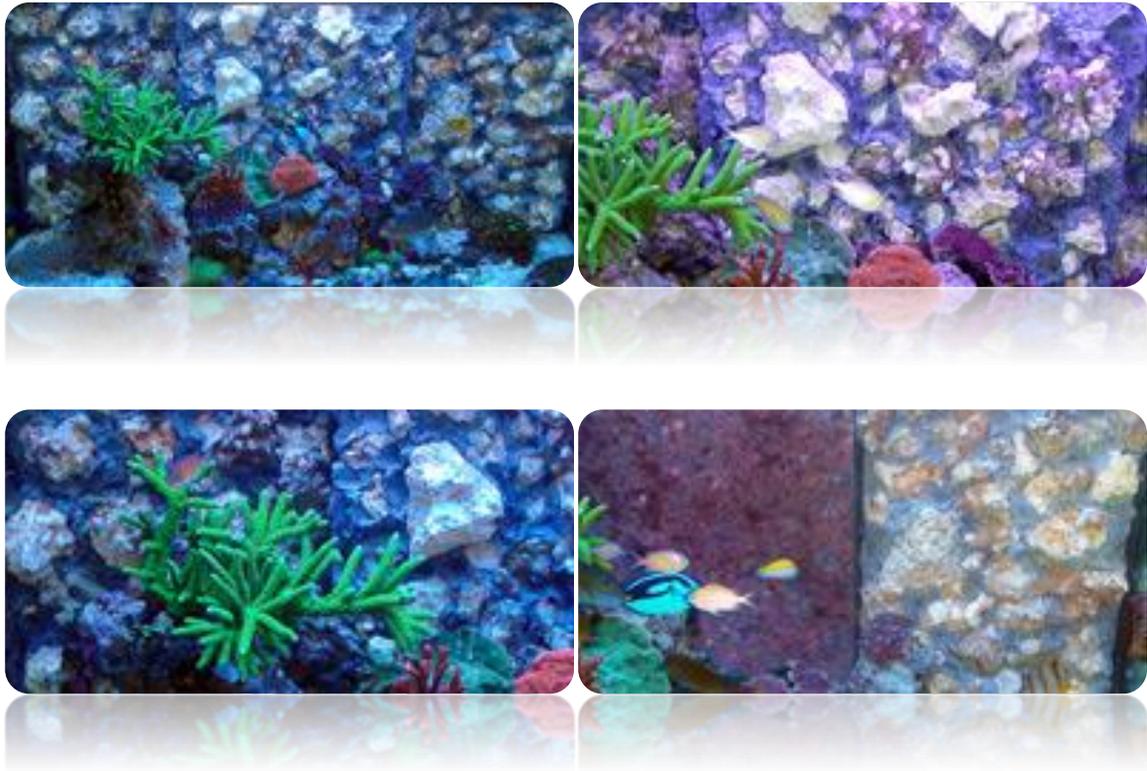
The left and right wall sections were really easy to insert because I have a rim around the top of my tank. The center over flow does not have a rim so the rock wall kept wanting to float. I used some plastic clamps as a short term hold but will use aquarium sealant for a long-term fix. If you're starting off with a brand new tank your job is much easier since you don't have to mess with re-arranging the aquascape and using aquarium sealant to affix the rock wall to the back wall.

Things to watch out for

Depending on how much live rock you use and how good your filtration system is you may need to monitor the nitrogen cycle again for a couple of weeks if you do this on a tank that is already set up. Go slow, do it in sections if you can and only add a section at a time if you think it will trip the cycle. Set your protein skimmer to skim wet for the next few weeks to remove any organics introduced by the new rock work. Don't trim off too much of the foam! Although the foam is really strong and a little bit works well, if you trim off too much you risk rocks dropping off the wall. Also, make sure the rock is dry before you place it on the wet foam.

I think it turned out rather well and makes the reef tank more "natural" looking. When I first set this reef tank up about a year ago I told myself that I didn't want to overcrowd the tank with corals. I wanted a few select corals ([acropora coral](#) and [montipora](#)) to dominate the tank. It seems that I don't have the patience I thought I had in letting these corals grow and to me the tank still looks empty. They are growing fast, just not fast enough (lol). So, one of the things I

really look forward to doing is placing coral frags on the rock wall towards the top so it fills it in more. I plan on having more acropora coral towards the top of the tank. It will look like they are growing out of the back wall. Good stuff!



SALTWATER FISH DISEASE SYMPTOMS AND TREATMENT

Here you will find some of the more common saltwater fish diseases along with their symptoms and treatment.

This is the saltwater fish disease page which provides a listing of the more common marine fish diseases, ailments and problems with symptoms and treatments. Before you use any medication on your tank be sure to properly diagnose the disease and try to figure out why your fish have the disease. Many diseases are brought on by the fish being stressed due to transport, water quality issues or being acclimated incorrectly. If you've just set up your tank, please read about new tank syndrome in the articles section.

Always use a quarantine tank or at minimum do a freshwater dip that is pH and temperature adjusted for a few minutes. If the fish shows signs of extreme distress, such as jumping or becoming inverted, remove them from the dip immediately.

Whenever you use any type of medication on your saltwater fish, first remove any carbon in your filtration system. If left in, the carbon will remove the medication from the water, doing you no good. If you have invertebrates in your tank, make sure that the medication is safe to use with invertebrates (another good reason to have a quarantine tank). Read the directions on the medication bottle very carefully!

Get Some Cleaner Species

Another good idea is to include some of the "cleaning" species in your aquarium. Use caution if you plan on keeping them with Lionfish, Triggerfish or any other predatory species. There are both fish and shrimps that can perform a cleaning function in the saltwater aquarium. Some are better than others when it comes to the task of removing external parasites and dead tissue.

Some of the better ones that you'll hear about a lot are the Skunk Cleaner Shrimp and the Neon Goby. The skunk cleaner shrimps do a very good job. See the photos on the shrimp's profile page of them cleaning a Yellow Tang. Some authors have reported that the coral banded shrimp is a cleaner shrimp. We've kept them for several years and have never witnessed them cleaning hide nor hair. Maybe they only do it when the lights are off. Another fish that cleans other fishes as a juvenile is the Longfin Bannerfish. The bannerfish doesn't seem to do as good a job (and not as often) as the cleaner shrimp or the neon goby. It's really something to see a larger fish slowly approach the cleaner shrimp and allow the shrimp to climb on board to start cleaning.

Ammonia Poisoning

Red or inflamed gills. Fish are gasping for air at the surface.

Ammonia poisoning is easily preventable. Avoid adding expensive and less hardy tropical fish until the aquarium has cycled. For more information on cycling your aquarium please read about the [nitrogen cycle](#). You can use a substance called zeolite to help absorb ammonia but the best solution is to ensure that your aquarium has cycled and that your tank is not overcrowded. If your tank has not yet completed the nitrogen cycle, you will need to perform frequent [water changes](#) to keep the ammonia levels down.

Dropsy

Bloated fish, scales are raised

This is not really a disease, but a symptom of a bacterial infection. There are medications available but try to increase the quality of the water by performing a 25% water change. Do this once every 3 days. If your fish's condition doesn't improve, try the medication. Your local pet store should have medication for this disease. Remove any carbon filtration before using medication because the carbon will absorb the medication.

Hole in the Head - HITH, sometimes referred to as Head and Lateral Line Erosion - HLE

Small holes or indentations on the head of fish, advanced cases may show markings along the lateral line of the fish

There are many theories out there, but no conclusive scientific evidence as to what exactly causes this disease. However, it may be attributed to poor water quality, lack of proper nutrition and/or the use of activated carbon for prolonged periods. Be sure to give your fish the best water that you can by performing frequent water changes. Give them vitamin enriched foods and change out, rinse activated carbon thoroughly to remove dust or stop using activated carbon for a period of time to see if conditions improve.

Marine Ich or Ick (Cryptocaryon)

Small white spots showing up mainly on the fins or in advanced cases it may look like your fish has salt all over it. The fish may seem to "flash" or rub against objects in the tank.

This is a fairly common fish disease and your local pet store or online store should have medication you can use. Ich usually arises due to stress. Many believe that you can increase the temperature of your water to 82 degrees Fahrenheit to speed up the cycle time of this parasite. Remove any carbon filtration before using medication (rid-ich) because the carbon will absorb the medication. Try to prevent this from happening by quarantining your fish in a separate tank before introducing them into your main tank. Saltwater ich is treatable if caught in the early stages. Move the fish to quarantine and medicate according to the directions on the bottle.

Nitrite/Nitrate Poisoning

Tropical fish are lethargic or resting just below the water surface and you are getting high readings on your nitrite/nitrate test kits.

Nitrite / Nitrate poisoning is not a disease but will kill your tropical fish. It results from having a large bio-load on the filtration system or from not performing enough water changes. Perform a partial water change immediately and monitor the nitrite and nitrate levels closely until the situation is resolved. You may have too many fish in the tank and will need to perform more frequent water changes.

Oxygen Starvation

Most or all of the fish are usually found at the water surface. They may be gulping at the surface with their mouths.

Check the temperature of the water. Higher water temperatures require higher levels of oxygen. You will need to increase the aeration in the tank with air stones or increase the flow rate with your filters. Try to decrease the temperature of the water by floating ice cubes in plastic baggies and turning off the tank light. If sun light is entering the tank from a nearby window, try closing the shades. Also, if you have an overcrowded aquarium you will definitely need to increase the aeration in your tank.

Velvet (Oodinium)

Velvet looks similar to ich but velvet shows up as smaller white or gray dusty spots on the fish. Tropical fish with velvet will have rapid gill movement and may be rubbing on surfaces in the tank.

There are a lot of products out there to treat this disease. For example, Aquarisol works on ich and velvet.

Black Ich

Saltwater Tangs showing small black spots on their sides.

Get a cleaner shrimp and keep your water parameters in line. Ammonia or nitrites high? Shame on you. Your tank isn't cycled and you have a whole mess of issues ahead. Wait until the tank has cycled before adding fish. High nitrates? Vacuum the sand and clean out the filters, empty protein skimmer more frequently. Also give those tangs more seaweed in their diet.

CLOWNFISH ANEMONE COMPATIBILITY CHART

The Clownfish Anemone Compatibility Chart on this page lists some of the various anemone species along with compatible clownfish species that they can form a symbiotic relationship with. This relationship is called "symbiotic" because both species benefit. The clownfish can protect the anemone from predation from certain anemone eating fish species (Raccoon Butterfly Fish) and the anemone can protect the clownfish from predation as well. Clownfishes may also provide food in a roundabout way for the anemone. Any food that the clownfish doesn't eat (bits and scraps) may be consumed by the anemone. They are also thought to feed off of the clownfish waste products, i.e. ammonia.

There are various theories trying to explain why clownfishes can enter anemones while other fish species cannot, but there is no widely accepted scientific explanation for why clownfish can do this. Some scientists think clownfish can live with anemones because they build up a thick layer of mucus, thereby protecting them from the nematocyst stings. Another group believes that clownfishes are covered in anemone mucus that makes it difficult for the anemone to recognize them as a stingable item.

Whatever the reasoning is behind this remarkable phenomenon, it makes a spectacular sight in a saltwater aquarium. Beginners to the saltwater hobby need to be advised that most anemones need intense lighting provided by metal halide lighting systems. They also need trace element supplements added periodically and certain species even need to be feed. Even though there isn't alot of information out there on all the anemone species, try your best to thoroughly research any species before buying them.

If you have a clownfish species that is not listed in the clownfish anemone compatibility chart below and it is hosting with one of these anemones, please let us know.

Anemone	Compatible Clownfish Species
<u>Bubble Tip Anemone</u> (Rose Anemone) <i>Entacmaea quadricolor</i>	<i>Amphiprion akindynos</i> - Barrier Reef Clownfish <i>A. clarkii</i> - Clark's Clownfish <i>A. frenatus</i> - <u>Tomato Clownfish</u> <i>A. melanopus</i> - Red and Black Clownfish <i>A. ocellaris</i> - <u>Ocellaris Clownfish</u> <i>A. percula</i> - <u>Percula Clownfish in Bubble Tip Anemone</u>

	<i>Premnas Biaculeatus</i> - <u>Maroon Clownfish</u>
Long Tentacle (Corkscrew) Anemone <i>Macrodactyla doreensis</i>	<i>A. clarkii</i> - Clark's Clownfish <i>A. perideraion</i> - Pink Skunk Clownfish <i>A. polymnus</i> - Saddleback Clownfish <i>Premnas Biaculeatus</i> - <u>Maroon Clownfish</u>
Pizza or Carpet Anemone <i>Cryptodendrum adhaesivum</i>	<i>A. clarkii</i> - Clark's Clownfish <i>A. frenatus</i> - <u>Tomato Clownfish</u> <i>Premnas biaculeatus</i> - <u>Maroon Clownfish</u>
Sebae Anemone <i>Heteractis malu</i>	<i>A. clarkii</i> - Clark's Clownfish <i>Premnas biaculeatus</i> - <u>Maroon Clownfish</u>
Magnificent Anemone (Ritteri Sea Anemone) <i>Heteractis magnifica</i>	<i>A. akallapisos</i> - Skunk Clownfish <i>A. clarkii</i> - Clark's Clownfish <i>A. melanopus</i> - Red and Black Clownfish <i>A. ocellaris</i> - <u>Ocellaris Clownfish</u> <i>A. percula</i> - Percula Clownfish <i>A. perideraion</i> - Pink Skunk Clownfish
Leathery Sea Anemone <i>Heteractis crispa</i>	<i>A. chrysopterus</i> - Orange Fin Clownfish <i>A. clarkii</i> - Clark's Clownfish <i>A. melanopus</i> - Red and Black Clownfish <i>A. percula</i> - Percula Clownfish <i>A. perideraion</i> - Pink Skunk Clownfish <i>A. polymnus</i> - Saddleback Clownfish
Giant Carpet Anemone <i>Stichodactyla gigantea</i>	<i>A. clarkii</i> - Clark's Clownfish <i>A. ocellaris</i> - <u>Ocellaris Clownfish</u> <i>A. percula</i> - Percula Clownfish <i>A. perideraion</i> - Pink Skunk Clownfish
Saddle Carpet Anemone (Haddon's Sea Anemone)	<i>A. chrysopterus</i> - Orange Fin Clownfish <i>A. clarkii</i> - Clark's Clownfish

<i>Stichodactyla haddoni</i>	<i>A. ocellaris</i> - <u>Ocellaris Clownfish</u> <i>A. percula</i> - Percula Clownfish
<u>Condy Anemone</u> <i>Condylactis gigantea</i>	Maybe... See this post: <u>Condy Anemone hosting clownfish</u>
Haitian Reef Anemone <i>Condylactis spp.</i>	No reported relationship with clownfishes
Tube Anemone <i>Ceranthus membranaceus</i>	No reported relationship with clownfishes
Rock Anemone <i>Epicystis crucifer</i>	No reported relationship with clownfishes

The chart above is by no means an exhaustive list and should only be used as a rough guide. Some clownfish species not listed may in fact host with an anemone species that is represented above. Some anemone species can be difficult for even advanced aquarists and we strongly urge you to research, research, and research before acquiring them.

CORAL REEF ZONES

Ahhhh, the coral reef. The beautiful coral reefs of the world are often the primary motivators for people getting into the saltwater aquarium hobby. So, let's talk more about coral reef zones and start with some of the different areas of the coral reef. When researching the corals you're interested in keeping in your home reef tank you'll often come across various terms explaining coral reef zones. There are several to know about for our purposes. We don't cover all the zones here, just the ones where most of the corals we're keeping are found most often on the reef.

Knowing which part of the reef your coral comes from can give you some insight into **some** of the captive care requirements, or helpful hints if you will, of what you need to do to get a particular coral to grow and thrive in the home aquarium. As always, please research all corals before you buy them for your reef tank setup to determine if you can adequately provide for them.

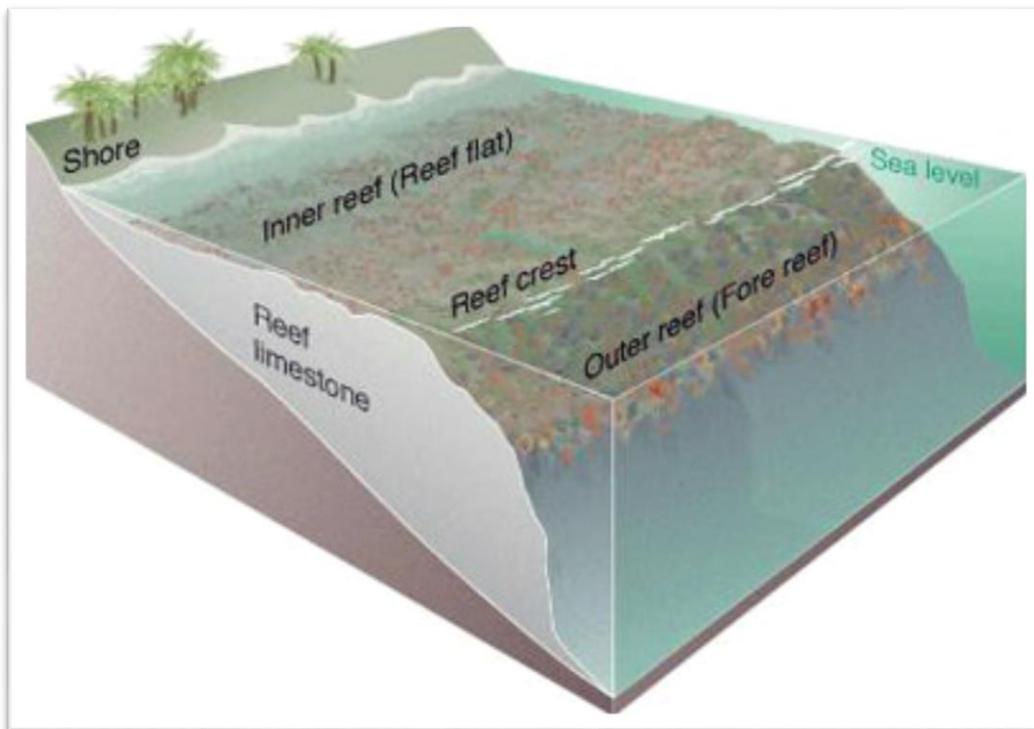


Photo courtesy of the U.S. Geological Survey

Let's talk about some of these reef terms.

Coral Reef Types

- Fringing Coral Reef - these are coral reefs that form alongside the shore or coast line. These reefs often have high flow rates and often intense sun light due to the shallower water depths.
- Patch Coral Reef - this is a small coral reef often isolated from other reefs. They can form as a result of a sunken ship or they could even be what is left of an older reef structure.
- Barrier Coral Reef - this type of coral reef is one that runs parallel to the coastline with a lagoon between it and the shore. Think of the Great Barrier Reef.
- Atoll - is a coral reef that forms a circular or mostly circular shape and encloses a lagoon. These can form around submerged volcanos or small islands that have fallen below sea level.

Coral Reef Zones

- Inner Coral Reef or Reef Flat - sometimes used when referring to the shore side part of a coral reef. The water is sometimes quite shallow with some corals even being exposed to the air with the changing of the tides. Water motion is usually lower than the reef crest or outer reef. Nutrients can be high here due to land based run offs.
- Coral Reef Crest - the area where corals experience high water energy/flow from breaking waves. Corals found here are used to high light levels too.
- Outer Coral Reef or Fore Reef Slope - this is the side of the coral reef facing the ocean and it is the wall that rises from the depths. This part of the reef also has very high water flows and towards the top of the coral reef slope, high light intensity. Corals lower on this reef wall often lack zooxantellae which means they get most of their nutrients from the water rising from the oceans depths or the corals above them.
- Lagoon - a lagoon can form between land and the coral reef. These are associated with Barrier Reefs and Atolls. Some can be quite calm and water temps can climb higher here too.

Armed with this information we can sort of figure out what type of conditions may be helpful to replicate in our reef tank for the corals we keep. Now, go research those corals!



Keeping coral in a reef aquarium. Some consider keeping a saltwater reef tank full of coral the ultimate set up in the hobby. It can definitely be one of the most expensive aquarium setups and also one that requires lots of research before you buy your first piece of equipment. If you're not interested in the doing the leg work by researching these animals before you buy them you should probably reconsider what you want to get out of keeping a reef tank setup. Keeping corals in the home aquarium can be extremely rewarding although challenging at times. The decline of the world's reefs makes it even more important that we gets things right the first time.

You'll hear some people argue that keeping corals is unethical or as harming the reef. While the aquarium trade certainly has an impact on the reefs, we feel that the knowledge and appreciation gained from keeping these animals far outweighs the very minor impacts from collection of these species for the aquarium trade.

As more hobbyists become reef tank keepers, more will come to appreciate the fascinating habitats found on the coral reefs and perhaps we can help educate others of the reef's importance. Captive propagation is really gaining steam and hopefully someday soon we'll be trading in mostly captive raised corals. There are even some scientific institutions/organizations that are revitalizing areas on damaged reefs with captive raised corals! There are also scientific and medicinal advances from corals currently being researched. That's another article altogether though.



Although the investment in your reef tank and corals can be significant, there is the possibility that you could recoup some of your costs by fragging and selling to other hobbyists or trading in frags at local shops for store credit. Again, captive propagation or fragging your own corals is also great for the real reefs because it places less demand on them from the aquarium hobby.

This is a very general article on coral keeping to "get your feet wet". More articles will be coming in future magazine issues on more detailed topics. Ok, let's talk about some of the main topics and things to keep in mind when venturing into coral keeping.

Water Parameters

You will need to keep the reef tank water parameters at optimal levels in order to keep corals in your aquarium. Generally speaking this means keeping the water near the following levels:

- specific gravity at 1.023 - 1.025
- temperature in the range of 76 - 82 °F
- alkalinity around 2.1 to 2.5 meq/L
- calcium 400 - 450 ppm
- magnesium 1200 - 1400 ppm
- ammonia, nitrite, nitrate and phosphate at 0 ppm



This may mean that you have to perform regular partial water changes and/or supplement with various saltwater aquarium additives. It's usually more economical to perform partial water changes on a regular basis though. You also don't want to be adding saltwater supplements if you cannot test for them. How will you know how much is too much or not enough when you're dosing these supplements? If you wind up with a tank packed full of corals you will probably have to dose kalkwasser or use a buffer and calcium additive of some sort to meet the needs of the ever growing corals. Get used to testing aquarium water parameters more often than you would with a basic saltwater aquarium setup.

Water Flow

Corals need turbulent water conditions to bring food to them and to wash off mucus that can develop due to aggravation from others and/or to whisk away sediment that has fallen into or on the coral. High turnover in the tank is definitely recommended. 20 or 30 times per hour is a good flow rate to aim for with some reef hobbyists having even higher flow rates in bare bottom tanks. You also want "turbulent" water conditions. A uni-directional, linear or one way flow could damage your corals. Configure the power heads or closed circulation outlets so that their outflows point in different directions to create the turbulent effects. Or point them in a way that makes their outflows smash into each other. There are quite a few devices you can buy for the output nozzle on powerhead to create a circular or wave type motion for the outflowing water. Also keep in mind that submerged power heads can add heat to the tank water.

Lighting



The amount of aquarium light needed for keeping corals depends on what you want to keep. Corals that host zooxanthellae need light to live and grow and these are called hermatypic corals. Corals without zooxanthellae are called ahermatypic and these are often found in places where not a lot of light reaches in the ocean. They get most of their energy needs from filter feeding and capturing living organisms. So, deciding on a particular lighting setup needs to come after you decide on what you are wanting to keep. Here are some general recommendations to get you started:

- Hard or Stony corals - generally these corals need high intensity lighting provided by metal halide or T5-HO lights.
- Soft corals - these can be a mixed bag, some need high lighting levels others not so much. Regular full spectrum fluorescents to T5's and Metal Halides.
- Mushroom corals - mostly do fine in lower lighting levels. Regular fluorescents.
- Corallimorphs - seem to do better under higher lighting levels. T5's and Metal Halides.
- Zoanthids - also do well under higher intensity lighting levels. T5's and Metal Halides.

Again, it all **depends on the corals** you're wanting to keep. Lighting a reef tank may be one of the most expensive parts of keeping corals. Not only the initial purchase of the lights but also the ongoing costs of electricity for running them 8 - 12 hours per day. These high output lights can also add significantly to the tank temperature. An aquarium chiller (expensive) might be needed with high output lights.

Coral Food - To Feed or Not To Feed?



You'll often hear folks brag about how they don't feed their corals anything and they grow like crazy. Maybe this is true, maybe not so much. Hermatypic corals get much of their needed energy from the zooxanthellae living within them. Zooxanthellae primarily need light, so the theory goes that if you give them enough light they'll be fine. But, some swear that by feeding your corals you will see a nice increase in growth rates. We fall in with those that feed their corals. Target feed large polyp stony corals very small quantities of coral food when the lights are off and their polyps are extended. You don't want to pollute the tank with wasted foods.

Ahermatypic corals will almost always need to be fed and they could be considered some of the most difficult to keep for the average hobbyist.

Coral Aggression

Some may not know this, but corals can be aggressive with other corals. There are many different ways that corals compete with one another over territory. Some have sweeper tentacles that can reach out several inches or longer from the coral and they can sting other corals. These sweeper tentacles have things called nematocysts that will burn other corals. Some are more harmful than others.

Some corals can release chemical compounds into the water that can damage other corals. One of the reasons so many reef hobbyists use activated carbon (in addition to clarifying the water) is to filter these compounds from the water and perform regular partial water changes.

So, the main point here is to find out the behavior of the corals you plan on keeping and if they'll do well with other corals you're considering. Mixing dissimilar coral species in the same tank is not the best idea. I know, you see these types of tanks mixing soft and stony corals everywhere you look. It's sort of like when you see a tank packed full of fish on the cover of a

book or magazine. It makes a pretty picture but can be quite the headache to try and maintain long term. At the minimum, give your corals plenty of space in between them.

Attaching Corals



So after you've **researched thoroughly** the corals you want to keep you get out your wallet, fork over the money and bring them home. They will most likely be a coral frag on a plug of some sort. That's unless you have a ton of money to buy a full sized specimen. Either way you'll need to secure it in the tank. There are several products on the market for affixing corals. Super glue works well on hard corals. You have to remove the piece of rock you'll be attaching it to from the tank, dry off the area on the rock you're wanting to place the coral on and then attach the plug or coral to the rock using the super glue. Let it sit for a minute or so and then place it back into the tank. If you're lucky you may have some holes just the right size already in the live rock to place the coral plugs.

There is a new product out from Echotech Marine called Cg Coral Glue. That glue works rather well for attaching stony corals. It is just like super glue but in more of a gel form that makes working with it really hassle free. Good stuff.

Soft corals can be a little trickier. Sometimes these frags come in on small shells instead of the frag plugs. You can attach them to the rock work using tooth picks or something similar. Or wedge the item it's attached to already in between a couple pieces of rock.

Where exactly in the tank they belong you should already know from your research. Right? The depth they should be placed at depends on their lighting needs and the lighting system you have. It's always a good idea to slowly acclimate the coral to your lighting. If you have metal

halides or T5's you may want to place hard corals toward the bottom of the tank and slowly move it up over a period of a week or so to get it used to your lighting setup.

Conclusion

There are tons of corals available out there. They are also very expensive and can be quite delicate in the home aquarium. Is it difficult to keep corals? Yes, some are quite hard to keep but some are not at all difficult. If you're really interested in keeping corals you will need to get used to doing research on the corals you're interested in keeping. While finding detailed information on the exact species you're interested in keeping can be challenging at times, usually finding out about the "family" in which it belongs can give you many clues on it's upkeep. Pick up a book on corals from the library or book store. We've reviewed some really good books here on FishLore. See the book reviews here:

- [Aquarium Corals](#)
- [Coral Reef Aquarium](#)
- [Book of Coral Propagation](#)
- [Reef Secrets](#)
- [Natural Reef Aquariums](#)
- [The Conscientious Marine Aquarist](#)
- [Reef Keeping Basics](#)

If monitoring test results on a semi-frequent basis (at least at first) and keeping a watchful eye on the tank water sounds like too much, then you may want to rethink keeping corals.

However, it is quite fun and rewarding to frag your first coral after it has grown enough to be fragged. Then placing those frags in other locations in your tank or someone else's tank and seeing them flourish is the ultimate.

The reef tank side of the saltwater aquarium hobby is quite fun if you do your homework!

CORAL PROFILES

Aquarium coral comes in all shapes, types and sizes. A reef tank full of growing coral could be considered the pinnacle of aquarium keeping success. Some SPS corals have extreme water requirements whereas some of the LPS corals can be kept in less than perfect conditions.

Some have high lighting requirements and others will do better under moderate or even low lighting. Figure out what kind of tank you want to keep before buying your equipment. Your equipment will dictate which types of corals you can keep in your reef tank setup.

You should also plan on using a coral dip on any new corals before you place them into your reef tank. There are several coral dip brands currently on the market. Using a quarantine procedure is an even better idea though because eggs can sometimes make it past a simple dip. I promise that you will not want to deal with the headache that coral pests can cause once they get into your display tank.

ACANTHASTREA CORAL - ACAN CORAL - ACANTHASTREA SPP.

The Large Polyp Stony (LPS) coral *Acanthastrea* spp. is still expensive even as of 2012. We've been watching the prices on these acans corals for years and for some reason they are still one of the more expensive out there even though they are fragged relatively easily.

Although individual specimens of *Acanthastrea* coral can vary, in general they require moderate water flow and moderate lighting. Being photosynthetic they need light. For T5's, VHO's and metal halide owners, when you first get them it's a good idea to acclimate them to the bottom of the tank and slowly work them up the rock work until you find the right spot for them. You could probably keep them with power compacts too if you placed them towards the top of the tank. Again, this being a general care profile on *Acanthastrea* some species may want different lighting levels. Experiment and see what works best for your coral.

Along with the right lighting, *Acanthastrea* coral will do well when kept fed. You can feed them tiny pieces of marine origin foods. Foods like mysis, brine shrimp, minced oysters or clams fresh from the seafood bar are just a few ideas. Turn off the powerheads and use a feeding device such as the sea squirt or a turkey baster to slowly release the food over their polyps.

Acanthastrea coral can expel mesenterial filaments for defensive or offensive actions upon neighbor corals. Give them space with stable water conditions, i.e. calcium, alkalinity, pH, salinity, magnesium and temps, offer them appropriate foods periodically and they should do fine. Once they are growing nicely for you consider fragging some and trading or giving them to friends in the hobby. See the notes on how to frag *Acanthastrea* below.

Acanthastrea Coral Pictures



Acanthastrea Coral Profile and Care Information

Scientific Name : Acanthastrea spp.

Common Names : Acans, Moon coral

Care Level : Easy to moderate. Although still pricey, this could be a good first LPS coral. Moderate lighting and moderate flow with supplemental target feedings periodically will work well.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific, Australia

Acanthastrea Coral Temperament / Behavior : A Large Polyped Stony (LPS) coral that will grow when fed and given moderate flow and moderate lighting. Give them plenty of space to grow and so they are not bothered by more aggressive tank mates. They can also be aggressive as they get larger and grow more polyps.

How to Frag Acanthastrea Coral : Although the initial price tag of this coral can make you wince or induce a case of the dry heaves at the thought of fragging it, it can be quite easily propagated when kept in good conditions and fed frequently with tiny pieces of marine meaty foods. You can cut the corallite below the polyp and then attach to a frag plug. Some have even halved polyps with a razor blade with success. Keep the frags in optimal saltwater conditions, feed them and they should start growing nicely.

Acanthastrea Coral Food : Will grow faster and do much better when kept well fed. Target feedings with very small (tiny) pieces of fresh marine origin foods offered when lights are out and the feeding tentacles are extended. Gently push the food towards the feeding tentacles.

Acanthastrea Coral Light : Moderate light levels are usually fine. Adjust as needed though. Seems to do well under power compacts, T5's and Metal Halides. If you are using power compacts you may have to place it higher in the tank.

Water Movement : Moderate flows are good to keep the polyps expanded. Too much flow could make it more difficult for them to feed at night.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.
- Acanthastrea Coral on CoralLore.com
- Good Lordhowensis! - nice article by Calfo and Borneman on the ridiculous price tags of some acans.

ACROPORA CORAL

Acropora corals are one of the primary reef builders in world's oceans and they are highly sought after by reef tank hobbyists for their remarkable growth rates and intense colors. Fragging acropora can be a fairly lucrative hobby if you have a good base to start with. You can trade acropora coral frags in at the store for credit, trade with other reef tank keepers and even sell them online. There is a demand for acropora, especially tank grown acropora since it helps lessen the burden on the reefs and most educated hobbyists nowadays will pay a little more knowing that it was captive grown.

There are literally tons of different species of Acropora (pronounced ah-crop-or-ah or ak-roh-pohr-ah). You can find them sporting colors all across the board such as baby blue, green, purple, brown, yellow, etc. Care wise the majority of the different acropora species require the following:

- High lighting levels
- High, variable and turbulent water flow
- Stable water temperature - 75°F - 82°F (24°C - 28°C)
- Very low levels of nitrate and phosphate - these two can really decrease the growth rates in acropora
- Stable and high levels of calcium (400 - 450 ppm), magnesium and alkalinity
- Keep marine pests such as crabs and acropora eating nudibranchs to a minimum

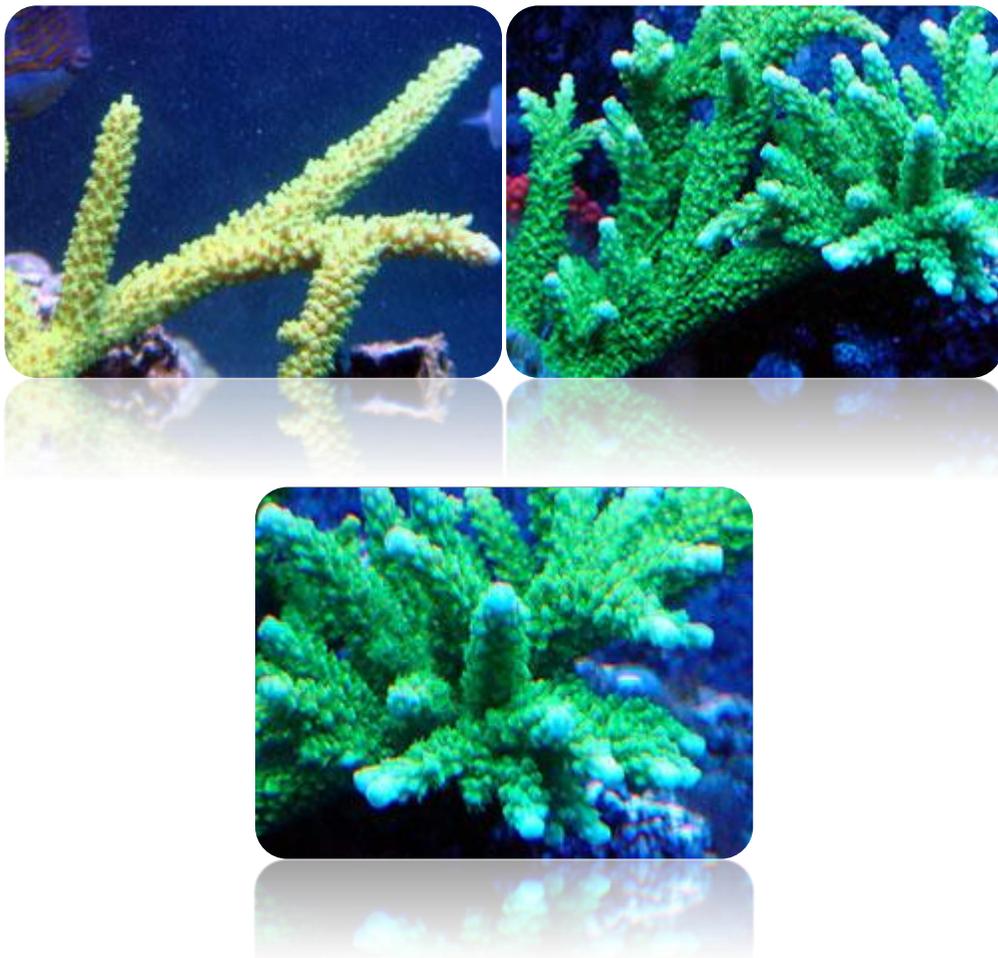
Keeping your water parameters in line and stable using the above recommendations will help increase the growth rate of your sps corals. Along with good flow, high lighting levels, proper calcium and alkalinity levels, keeping nitrate and phosphate levels low have really helped increase the rate of growth in the acroporas I've personally kept. You need good water flow to both wash away waste and bring food to your corals. Light helps the zooxanthellae living within the coral provide food/energy which helps convert calcium and carbonate ions into new coral. So keeping all of these where they should be is vital.

It goes without saying, but keeping marine pests such as acropora eating nudibranchs and invertebrates such as hermit crabs out of the tank will help in growth rates. When buying acro frags try to get the biggest one possible. Tiny frags (like 1 cm sized) take forever to start growing and I personally avoid any frags under 3 to 4 inches. Another tip is to place your acros on their sides to get better growth. Many hobbyists will place them vertically but that can limit the amount of direct light that they receive. Positioning them horizontally in my own tanks I've noticed a noticeably higher rate of growth.

Try to keep your Acropora Coral in sps only tanks. If you mix them in with anemones and lps corals you may have trouble getting them to grow and color up. Although unseen with the eye, chemical warfare amongst the corals is happening inside the tank and the corals may be using energy just to survive. Running activated carbon can help remove these chemicals released by the corals and the AC will help clean the dissolved organics out of the water which in turn will help increase light penetration.

Once these acropora coral establish themselves in your tank and provided that you have the correct water parameters they can be very fast growers. You will have no troubles unloading some of your frags to friends.

Acropora Coral Pictures



Acropora Coral Profile and Care Information

Scientific Name : Acropora spp.

Common Names : tons of different common names such as staghorn, green slimer, etc.

Care Level : Moderate to high. SPS coral often require more specialized equipment such as high output lighting, calcium reactors and increased water flow. In general, high water flow, high lighting levels and optimal water conditions are required.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific, Australia, Indian Ocean, Pacific Ocean, etc

How to Frag Acropora Coral : SPS corals are some of the easiest to frag. Even though many reef tank keepers just simply break off frags it's a better to idea to make a clean break using sharp pliers or other suitable coral tools.

Acropora Coral Food : Weekly feeding sessions of rotifers and dissolved marine organics have proven beneficial.

Acropora Coral Light : High light levels are usually required. Adjust as needed though. Seems to do well under T5's and Metal Halides. If you are using T5's or power compacts you may have to place it higher in the tank. We've grown them for years in the middle to upper levels of the tank under T5 lights.

Water Movement : High turbulent flows are needed. Too much flow in one direction is not good. Check the vortech pumps which can provide a really good turbulent and varied flow pattern.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

BIRDSNEST CORAL - SERIATOPORA HYSTRIX

The Birdsnest Coral is a small polyp stony (SPS) coral that can be challenging to keep if you have never kept sps corals before. The Pink Birdsnest takes the shape of its common name as it grows. There are also a couple of color variations being marketed as Birdsnest corals but not sure if they are just different species. Water requirements are most likely the same. Many hobbyists will start out with just a frag of it and it will grow well for them provided they can meet a few preliminaries. Price wise, they can be purchased anywhere from \$20 - \$60 for a small frag and much more for larger coral frags.

Let's get to the conditions needed to keep them. For the water flow in the aquarium you will need moderate (when small) to high indirect or turbulent flow as it grows. Not giving them enough flow can lead to algae growing on the branches or branch tips. Don't blast the pump outputs or powerheads directly at them though. You could damage them. Keep the alkalinity (2.5 meq/L), pH (8.2 - 8.4), salinity and calcium (400 to 450 ppm) on target at all times. Some also dose strontium. But unless you have a test kit for strontium, how do you know if what you are dosing is working or doing any good? Also, I wouldn't even try to keep them if I didn't have a protein skimmer. Keep the dissolved organics as low as possible.

For the lighting requirements, Birdsnest Coral will do great under metal halides and should do fine too under VHO and T5 fluorescent lights. Power compacts **might** be ok in smaller tanks and placed higher in the water column so that the most light can reach them. They have photosynthetic algae (zooxanthellae) growing in their tissue so lighting is critical. The use of activated carbon may be needed to keep the water polished so that the maximum amount of light can penetrate deeper into the water column. Yellowing compounds (which activated carbon removes) can limit the amount of light that reaches the corals.

Once your Birdsnest Coral starts growing nicely for you consider fragging it and trading with other hobbyists at your local aquarium club or online. This SPS coral usually has fairly good demand for it.

Birdsnest Coral Picture



Birdsnest Coral Profile and Care Information

Scientific Name : Seriatopora hystrix

Common Names : Pink Birdsnest Coral

Care Level : Moderate to Difficult. Only get a birdsnest frag if your water parameters are in great shape and you can meet all the other requirements mentioned in this article.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Buy Aquacultured frags when you can. They originate from Tonga, the Red Sea, the Indo-Pacific, Fiji, etc.

Birdsnest Coral Temperament / Behavior : It can sting and be stung by other corals and will grow nicely if given the right conditions, so give it plenty of space to grow.

How to Frag Birdsnest Coral : Rather easy to frag. Many hobbyists simply break off a piece of it to frag it, but it's better to make a clean cut and then glue it to a frag plug.

Birdsnest Coral Food : Direct feeding is not completely necessary. Some do try to target feed them and if you plan on doing this use caution and feed sparingly. It can be difficult to feed the coral while not polluting the tank, especially with high output lights. This can bring on algae headaches.

Birdsnest Coral Light : High Lighting Levels - T5's or Metal Halides are recommended. Generally speaking, with metal halides you could place them in the middle regions. With T5 you would need to place them towards the top for faster growth rates and better coloration.

Water Movement : Moderate to High indirect flow is required. While they are small frags it can be easy to get them the flow they need but as they get large it becomes more difficult to give them enough flow. Sometimes you will start to get hair algae growing on the branches. Up the flow and see if it helps.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

BLASTOMUSSA CORAL - BLASTOMUSSA WELLSI

The Blastomussa coral is a Large Polyp Stony (LPS) coral has fleshy like corallites that extend from a calcareous skeleton. Mantles can be various shades of gray, pink, red and green. The Blastomussa coral is considered a good starter coral for new reef tank keepers given that it is relatively an undemanding coral. In general, low to moderate and mixed directional water flow along with moderate lighting will be fine for this coral. Blasto frags can be quite expensive these days with a frag being sold anywhere from \$50 to hundreds of dollars depending on color. Given this coral's easy care requirements these prices will hopefully be coming down in the future.

The Blastomussa coral gets most of it's energy requirements from photosynthesis via the zooxanthellae living in it's tissues. Target feeding is not all that necessary but if you want it to grow faster you can try to target feed them filter feeder type foods such as Marine Snow, Phytoplex, DT's phytoplankton, etc.

The Blastomussa coral is not considered aggressive either. They need to be given space to grow and kept away from more aggressive corals. Give them low to moderate water flow and lighting levels, keep your alkalinity, sg, magnesium and calcium levels where they need to be and you'll soon be able to frag them and send unwanted frags my way.

Blastomussa Coral Picture



Blastomussa Coral Profile and Care Information

Scientific Name : Blastomussa wellsi

Common Names : Blastomussa Coral, Blasto Pineapple Coral

Care Level : Easy to moderate.

Water Parameters : pH 8.2 - 8.4 | Temperature 75°F - 82°F (24°C - 28°C) | Water Hardness 8° to 12° dKH | Calcium 400 - 450 ppm

Origin / Habitat : Red Sea and Australia - buy aqua cultured frags when available. Found in low flow environments on upper reef slopes.

Blastomussa Coral Temperament / Behavior : It's not all that aggressive with other corals but still give it enough space to grow and so that it's not being bothered by other more aggressive corals. Let it use it's energy stores to grow rather than to defend.

How to Frag Blastomussa Coral : Rather easy to frag. Many hobbyists break off a piece of the blastomussa skeleton with a polyp or two but it's a better idea to use a sharp dremel or similar and make a clean cut.

Coral Food : Direct feeding is not really necessary. They get most of what they need from their zooxanthellae and from filter feeding. If you want faster growth rates feeding is a good idea with a filter feeder type food (phyto).

Blastomussa Coral Light : Moderate Lighting Levels - you can place this LPS coral on the bottom of the tank if you have T5's or Metal Halides. If you think it's getting too much light, try shading it under a rock overhang.

Water Movement : Low to moderate fluctuating flow is good. Too much flow and they may stay retracted.

Author : [Mike FishLore](#)

References :

- Borneman, Eric (2004). [Aquarium Corals](#), Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, [Book of Coral Propagation](#). Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

CANDY CANE CORAL - CAULASTREA FURCATA

The Candy Cane Coral gets its common name from the alternating stripes on its polyps. This candy cane coral has a striped pattern on top of the polyp with usually a solid colored interior part of the polyp. There are a few different color variations including brown, green and cream colors, usually with alternating white stripes. Candy cane corals fluoresce magnificently under blue moon lights, making it look like something from outer space when viewing the tank at night when the aquarium lights are off.

Candy Cane Coral Care is fairly straight forward. Provide moderate to high intensity lighting, give it moderate water flows and feed it on a regular basis. They are known to be remarkably tolerant of hobbyist mistakes (i.e. low salinity, low calcium levels) and usually bounce back from these mistakes well.

Provided that you can give it the light it needs the limiting growth factor could become food. When the lights go off are when the little feeder tentacles come out and that is when you want to try and target feed. Turn off the power heads or other wave making devices and then with your sea squirt feeder (or turkey baster) slowly push the foods over the feeding tentacles. You can try mysis, brine shrimp and smaller saltwater origin meaty type foods. Don't overdo it and pollute your tank. Just try to give them a little bit per feeding at a rate of a couple to several times per week should be fine.

This Candy Cane Coral is true beauty and can be recommended as a good beginner LPS (Large Polyp Stony) coral assuming that you can meet its care requirements.

Candy Cane Coral Picture



Candy Cane Coral Profile and Care Information

Scientific Name : *Caulastrea furcata*

Common Names : Trumpet coral, torch coral, candy cane coral, bullseye coral

Care Level : Easy to moderate. This could be considered a decent candidate if you're interested in LPS coral keeping. Moderate lighting and moderate flow with supplemental target feedings periodically needed.

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific, Fiji, Solomon Islands, etc.

Candy Cane Coral Temperament / Behavior : This Large Polyp Stony (LPS) coral is not all that aggressive and has relatively short sweeper tentacles. Keep it away from more aggressive corals and give it room to grow.

How to Frag Candy Cane Coral : This is one of the easier corals to frag. You can frag the branches as low as possible and then affix it to a frag plug or live rock.

Candy Cane Coral Food : Will grow faster and do much better when kept well fed. Target feed with very small (tiny) pieces of fresh marine origin foods offered when lights are out and the feeding tentacles are extended. Gently push the food towards the feeding tentacles.

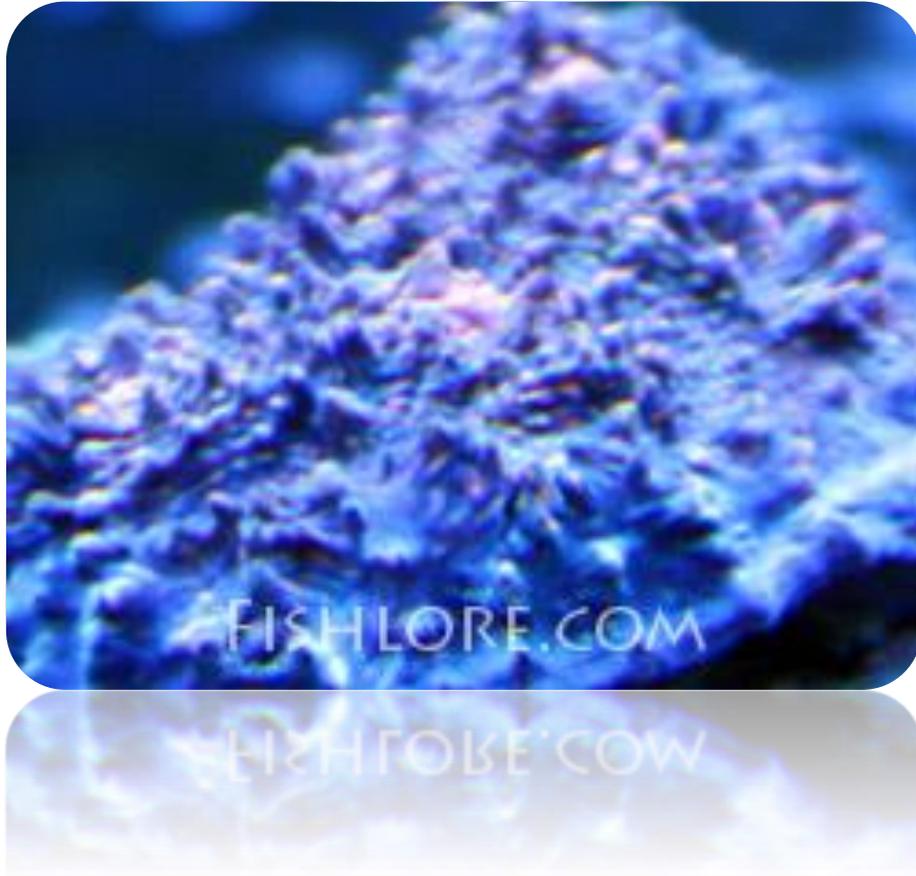
Candy Cane Coral Light : Moderate to High lighting levels, with moderate being fine. T5's, VHO's or Metal Halides are recommended. Power compacts maybe, if you can place it higher in the tank.

Water Movement : Moderate but not too much and turbulent flows are what you're after. You don't want too much flow as it could be more difficult for them to feed at night.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.



The Chalice coral is one of the more popular corals (as of 2013) due to the amazing colors they have. There are all sorts of color morphs out there and several different coral species that are commonly called Chalice corals. *Echinophyllia* sp, *Enchinopora* sp., *Oxypora* sp, *Pectinia*, and several others. You will often find chalice frags with names like Mummy Eye, Miami Hurricane, Acid Rain, etc. These are various color morphs that certain frag traders and sellers have come up with as a way to keep the various color morphs straight and there is a little bit of marketing to this as well.

If you are interested in them and want to buy Chalice coral frags be prepared to put out some serious cash. Frags are priced based on their colors and size. I've seen several frags going for anywhere from \$40 all the way up to \$500 for a frag! Just plain crazy. If you have a stable reef tank that has been set up for a while, the tank has stabilized and you can provide the proper requirements this could be one coral that could help supplement your hobby, at least until prices even out as more chalice frags come into the market.

The Chalice coral is considered semi-aggressive and they may have sweeper tentacles that will harm neighboring corals. They also will actively feed at night after the lights are out. Wait about an hour or so after lights out and look in on them and you will see what I'm talking about. You can target feed them mysids or brine shrimp using a modified two-liter soda bottle. Cut the bottom out and then place it over the chalice and then using a turkey baster, gently squeeze in some food while keeping the two-liter bottle there for a few minutes allowing them time to grab the food. Don't over feed them and risk polluting your tank, especially in smaller setups. They will get most of what they need from the water and lighting. The more often you feed them though they faster they will likely grow.

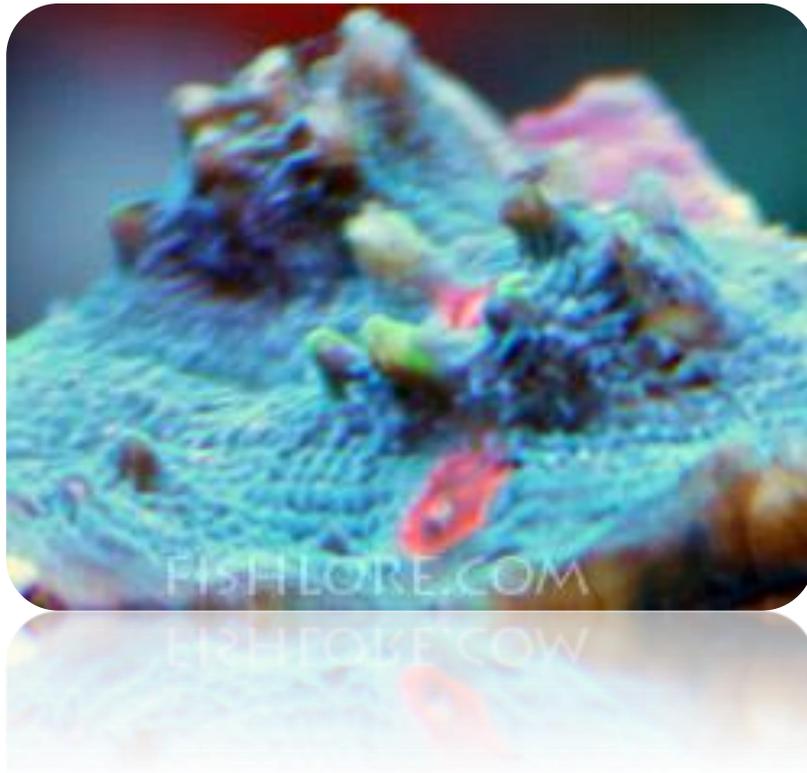
Regarding recommended water flows, many hobbyists are having good results keeping them in moderate water flows. Make sure it is turbulent water flows (vortechs are good for this) and not one way water flows that could lead to tissue damage. I keep mine on the bottom of the tank under moderate to high water flows in a predominately SPS reef tank.

They also will do fine under moderate lighting levels. If you have metal halides or T5-HO's they will likely do fine near the bottom half of the tank. Just be sure if placing them in the sand that no burrowing species are kicking up sand on them. If so, try to keep them off the sand and place them a little higher in the tank.

General Chalice Coral Care Requirements

- Moderate lighting levels
- Moderate and turbulent water flow
- Water temperature - 75°F - 82°F (24°C - 28°C), keep a steady temperature
- Very low levels of nitrate and low phosphate levels
- Maintain calcium levels (400 - 450 ppm) and magnesium around 1300 (nsw levels)
- Feeding them a few times per week will lead to faster growth rates.

Chalice Coral Picture



Chalice Coral Profile and Care Information

Scientific Name : Echinophyllia sp., Enchinopora sp., Oxypora sp.

Common Names : Too many common names to list for the Chalice coral.

Care Level : Moderate - Considered an LPS coral and will do well in moderate lighting with moderate but turbulent water flows.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific to the Red Sea, the northern and eastern coast of Australia. They are actually considered quite common.

How to Frag Chalice Coral : You can score the underside of the coral with a dremel and then use bone cutters to break off a frag, being sure to include an "eye" in the frag. Rinse the new frag in tank water in a separate container, apply coral glue to bottom of frag and place on a flat frag plug and then re-rinse in saltwater before placing back into the tank for healing. Let them heal up for a couple of weeks before trading or selling. Try to keep frags at least an inch in size for best results.

Coral Food : You can target feed using the two-liter bottle method mentioned above but don't over feed. Feeding twice a week will be fine. Mysis shrimp, brine shrimp and Rod's foods will work well.

Coral Light : Moderate lighting levels. If running Metal halides, T5-HO and high output LEDs, place them towards the bottom half of the tank.

Water Movement : Moderate and turbulent flows are preferred. Avoid one-way flows into this coral because it cause the polyps to stay retracted and eventually cause damage. Check the [vortech pumps](#) for a good pump to create some dynamic water movement in your reef tank.

Author : [Mike FishLore](#)

References :

- Borneman, Eric (2004). [Aquarium Corals](#), Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, [Book of Coral Propagation](#). Reading Trees Publications.
- Sprung, Julian (1999), [Corals: A Quick Reference Guide](#). Ricordea Publishing.

FROGSPAWN CORAL - EUPHYLLIA DIVISA

The Frogspawn coral is a very cool looking Large Polyp Stony coral that is easily aquacultured is *Euphyllia divisa*. The Frogspawn coral needs moderate to high lighting levels, moderate water flow levels and will need to be fed periodically to experience better results. Their growth rates are comparable to other LPS corals. SPS coral keepers will find them to be slow growers.

Frogspawn coral can be quite aggressive like most other *Euphyllia* species and they should be given a lot of space between themselves and other corals. 8 to 10 inches of space is not unheard of and allows for growth of the coral. Sweeper tentacles can be very long (6 to 8 inches) and very damaging to other coral species. Give them plenty of room. Placement wise, you can put them in the bottom of the tank if you have high output lighting like T5's or Metal Halides. Put them up higher if you have moderate lighting.

Fragging Frogspawn is not very difficult and hopefully most frogspawns are purchased as frags at the local retailer or online. Expect to shell out around \$30 to \$50 for a small or medium sized frag. To acclimate them to your tank perform a 1 to 2 hour drip acclimation to get them ready for your tank's parameters. Keep the calcium and alkalinity levels up, ph stable, keep them well fed and they should grow nicely.

Frogspawn Coral Picture



Frogspawn Coral Profile and Care Information

Scientific Name : Euphyllia divisa

Common Names : Frogspawn coral, Grape Coral and sometimes called the Octopus Coral? Not sure where the Octopus common name comes from?

Care Level : Moderate. This could be considered a decent candidate if you're interested in LPS coral keeping.

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 420 ppm

Origin / Habitat : Red Sea, Samoa, Indo-Pacific, Solomon Islands, etc.

Temperament / Behavior : This Large Polyp Stony (LPS) coral can be quite aggressive with other coral species. Give them lots of space because they have very long sweeper tentacles that are reported to pack quite a punch.

How to Frag Frogspawn : Most of the frogspawns nowadays are hopefully captively propagated, i.e. fragged. They are not very difficult to frag. Use a dremel tool to cut off a branch, leaving as much branch as possible. Attach them to live rock rubble but make sure it is a big enough piece of rock to keep the frag from toppling over. You can attach it to the rock using super glue gel or a coral epoxy putty or similar.

Frogspawn Food : Will grow faster and fare better when kept well fed. Very tiny pieces of minced seafood works great as do foods such as Rod's fish food (good stuff) or the like.

Frogspawn Light : Moderate to High lighting levels are needed due to the zooxanthellae in their tissue. T5's, VHO's or Metal Halides are recommended.

Water Movement : Moderate but not too much and turbulent flows are good. Too much flow will prevent them from extending.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H.

Publications

- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
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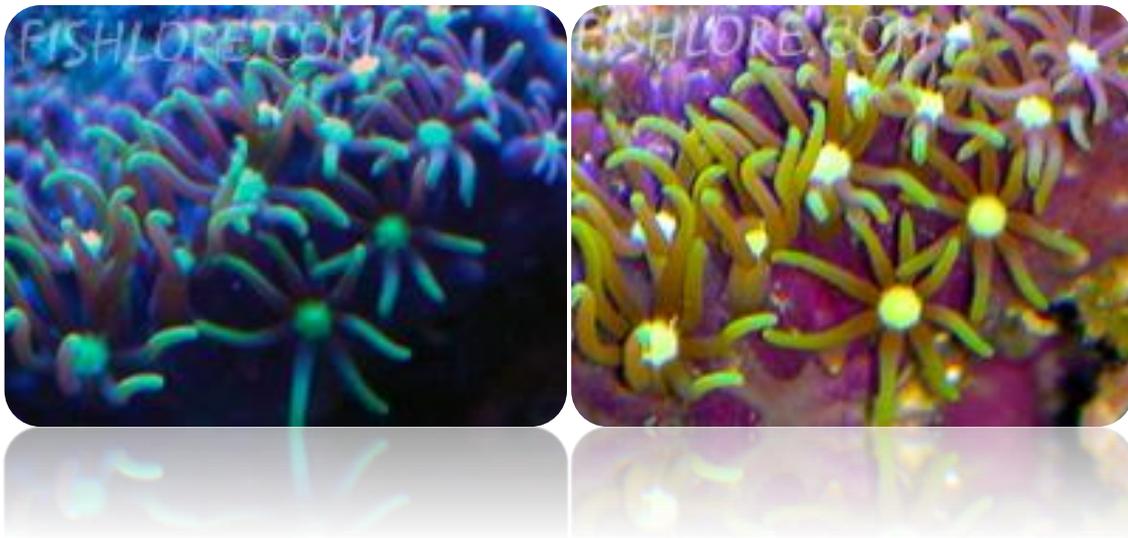
GREEN STAR POLYPS - BRIAREIUM SP.

The Green Star Polyp is a good coral to start with if you're a beginner to keeping a reef tank. Green Star Polyps sport small star-like green polyps and encrust the substrate (live rock, walls) as their purple mat increases in size. They have several common names including Starburst Polyps, Daisy Polyps and the more common Green Star Polyps.

These star polyps will do well when given moderate to high lighting and moderate to high and turbulent water flows. Keep your water parameters within standard reef tank requirements (see below for more details) and you'll be able to make your own GSP frags in no time. They are quite popular but still command a decent price for a frag, anywhere from \$30 to \$60 depending on the size of the frag. Your local reef shop should at least allow you to trade your frags in for store credit if they aren't overrun with them already since they are rather good sellers. To frag them get a new and clean razor blade and carefully slice them off the rock they are growing on. Then rubber band the newly sliced GSP on a frag plug. After it has encrusted the frag plug you can safely remove the rubber band, usually after a few days.

Placement wise, keep them away from other corals since they don't have any offensive weapons other than claiming territory by encrusting it. Other corals with stinging nematocysts will sting them causing them to remain retracted and slowing their growth rates. That also causes both corals to lose in a situation like that since they are expending energy on defensive purposes rather than growth. Give your corals plenty of room to grow!

Green Star Polyps Pictures



Green Star Polyps Profile and Care Information

Scientific Name : Briareium sp.

Common Names : Green Star Polyps, Starburst Polyps, Purple Mat Polyps, Daisy Polyps

Care Level : Easy to moderate. Moderate to high turbulent flows and moderate to high aquarium lighting is needed to get good growth rates. Along with standard reef tank water parameters, calcium, alkalinity, sg, and pH.

pH : 8.2 - 8.4

Temperature : 75°F - 84°F (24°C - 29°C)

Water Hardness : 7° to 11° dH

Calcium : 420 - 500 ppm

Origin / Habitat : Indo-Pacific, Fiji

How to Frag Green Star Polyps : Use a razor blade and carefully slice a piece of the purple mat and then rubber band it to a frag plug or rock. Remove the rubber band once the mat has attached to the frag plug or live rock.

Coral Food : Not really needed. They should get most of what they need via photosynthesis. Symbiotic zooxanthellae provide most of their energy requirements. You can try feeding tiny foods like phyto but don't pollute your tank.

Green Star Polyps Light : Moderate to high light levels are needed for good growth rates. They do well under T5's and metal halides.

Water Movement : Moderate to high turbulent water flows are needed. Avoid blasting them with powerheads or they may stay retracted.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications

- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

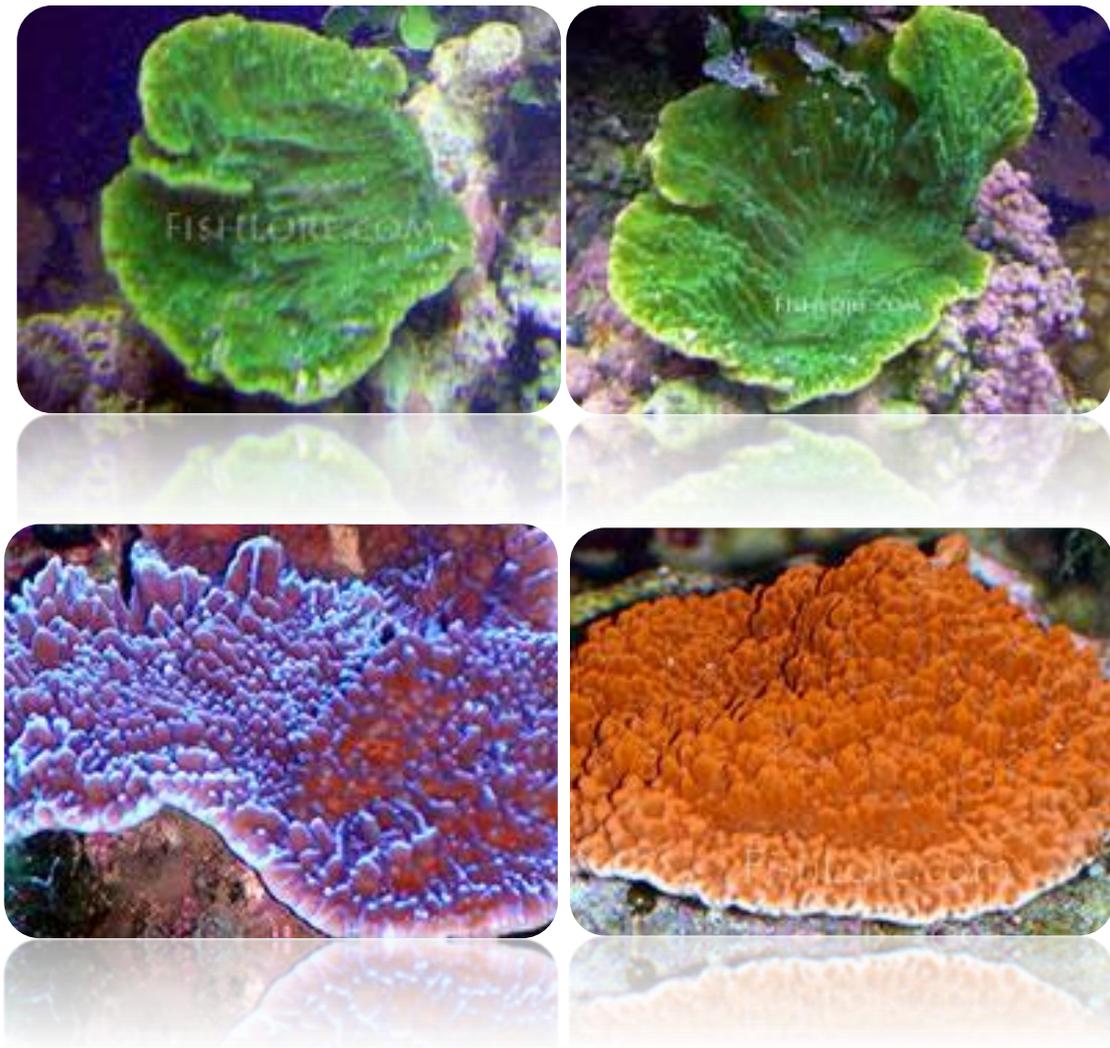
MONTIPORA CAPRICORNIS

The Montipora Capricornis coral is one of the most sought after Small Polyp Stony corals for various reasons. Montipora Capricornis can be quite hardy once acclimated and they come in several color variations ranging from green (pictured) to pink or red to purple to tan. The greens and red montis seem to be the most popular and they do look fantastic under lighting systems incorporating actinic lights. Montipora can take on various forms depending on water flow and the conditions in the tank, but generally the Monti Cap will eventually grow into a whirling vase like appearance.

Like most all SPS corals, this Montipora Capricornis coral needs excellent water conditions as well. Keep the calcium, alkalinity and pH levels up and nitrates low and phosphates at or as close to zero as possible. Some hobbyists have reported that the supplementation of strontium may also accelerate the growth rate of frags. Keep them under metal halide, T5's or VHO bulbs for best results. We've experimented with several monti frags in a 55 gallon tank under T5-HO's at various depths. They definitely grew faster the closer they were to the top of the tank. Growth rates in the middle levels were definitely nice though.

Fragging Montipora Capricornis is rather easy. Simply break off a piece and affix it to a reef plug or a piece of rock, give it optimum water conditions, proper lighting levels and you could have a small frag farm going in no time.

Montipora Capricornis Picture



Montipora Capricornis Coral Video

Montipora Capricornis Coral Profile and Care Information

Family | Genus | Species : Acroporidae | Montipora | capricornis

Common Names : Leaf coral, Vase coral, Leaf Plate Coral, Whorled Montipora, Monti Cap

Care Level : Could be considered easy to moderately difficult to keep. This could be considered a good candidate for a first venture into SPS coral keeping.

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 420 ppm

Origin / Habitat : Indo-Pacific, Fiji, Solomon Islands, often found in mid to shallow water levels.

Montipora Capricornis Temperament / Behavior : Rather peaceful but grows relatively quickly and may end up shading corals placed below it.

How to Frag Montipora Capricornis : Easy to frag. You can break off a piece (using your hands with gloves on) and affix it to a reef plug with super glue or other saltwater aquarium safe bonding material. The donor coral should recover just fine after fragmentation if kept in good conditions. After fragging, provide good to excellent water conditions with similar lighting and the coral frags should grow at a nice pace.

Montipora Capricornis Food : Feeding is not necessary. It should get most of what it needs from the water column and via the zooxanthellae in its tissues.

Montipora Capricornis Light : Moderate to High lighting levels are required. T5's, VHO's or Metal Halides are recommended.

Water Movement : Moderate to high and turbulent flows are good.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

MONTIPORA DIGITATA CORAL

Montipora Digitata is a rather fast growing coral that is different from other montipora species in that it grows finger like branches instead of encrusting or whirling vase-like patterns. This Montipora Digitata coral is considered to be a rather fast growing species when given the right aquarium water conditions. Keep all of your parameters within the recommended ranges (see below) along with the proper lighting and you will be pleased with your monti's growth rate.

Montipora Digitata go by a couple different common names such as the Velvet Finger or Velvet Branch Coral. There are several different color morphs as well. The growth pattern of the branches can be influenced by the water conditions in which they are found. Lower flows vs. turbulent flows can produce some different growth forms as well as their proximity to light. High light levels and turbulent flows produce some really good growth rates for this species in my experience.

You can try feeding them tiny plankton foods but don't overdo it because you don't want to pollute your tank.

- Similar requirements as other sps corals
- Moderate to high lighting (T5's or Metal halide)
- Turbulent water flows
- Give them plenty of room to grow, keep them away from other species of coral so they can use their energy reserves for growth instead of defense
- Try to keep frags larger than an inch in size, the bigger the better obviously
- Calcium 400-450 ppm, Temperature 75°F - 82°F (24°C - 28°C), etc, more details below

Montipora Digitata Pictures



Montipora Digitata Coral Profile and Care Information

Scientific Name : Montipora Digitata

Common Names : Montipora digi, monti digi, velvet branch, velvet finger

Care Level : Moderate to high. SPS coral often require more specialized equipment like calcium reactors, high output lighting, increased water flow, etc. In general, high water flow, high lighting levels and optimal water conditions are required.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific, Australia, Indian Ocean

How to Frag Montipora Digitata : These monti's are very easy to frag. Many hobbyists simply break off a piece and super glue it to a frag plug. I use shears to make a quick and clean cut then glue it to the frag plug. They will start encrusting the frag plug within a couple of weeks and you will see nice white growth tips soon.

Montipora Digitata Food : Many reefers don't actively feed their sps corals but some do and several authors (calfo, borneman,etc) have talked about how feeding corals the proper foods can be beneficial. There are several food choices available at your local reef store or online. Don't pollute your tank though with too much food!

Montipora Digitata Light : Moderate to High lighting levels are needed. T5's and Metal halide

Water Movement : High turbulent flows are needed. Check the vortech pumps which can provide very good turbulent and varied flow patterns. Since using these pumps I've noticed a definite increase in growth rates in my sps.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

MONTIPORA SPONGODES CORAL

The Montipora Spongodes (Montipora sp.) is starting to gain in popularity it seems with more and more hobbyists trading it at reef club meetings and online. These montipora spongodes were going for around \$60 per frag not too long ago but you can usually find them for around \$20 to \$30 now due to the increase in supply.

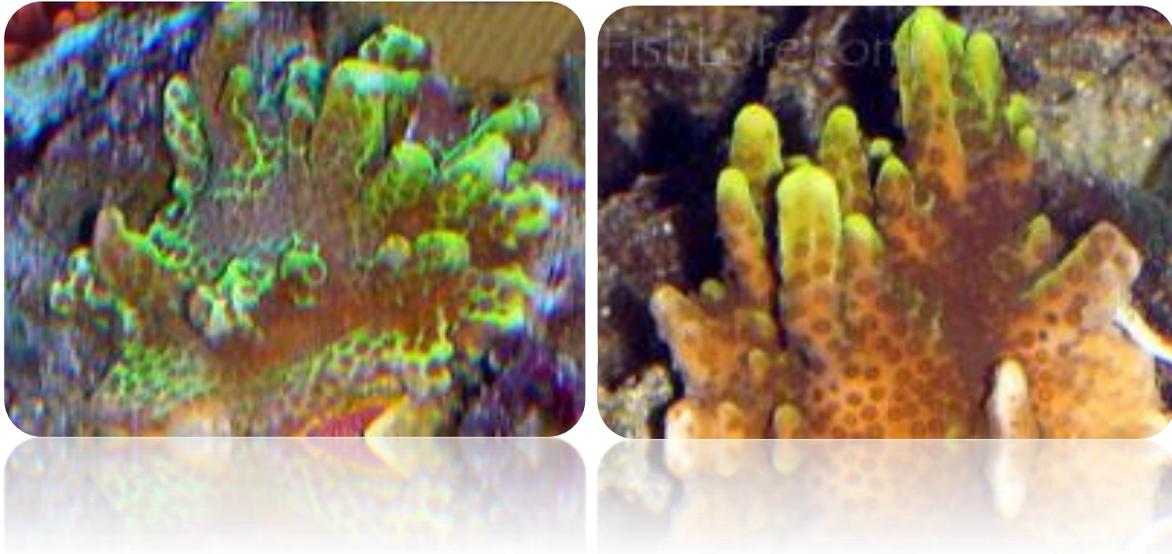
The montipora spongodes is not all that difficult to care for in a reef tank running T5's or metal halides. Place it in the middle to upper regions of the tank, give it some good turbulent water flows and it will grow rather quickly. ORA's spongodes is supposed to have purple tips when placed under metal halides. Unlike some of the whirling montiporas, this is an encrusting species that grows finger like projections which gives it a rather unique appearance. Make sure you give it plenty of room around it to encrust or it could quickly start encroaching on other corals.

Standard reef tank water parameters are needed such as high salinity, alkalinity, magnesium and calcium levels for best growth.

Make sure that you quarantine any new coral arrivals or at least dip them with a preventative treatment to kill any Montipora eating nudibranchs or other pests. Most dips will not kill any eggs though so using a quarantine tank is the best way to go here. These Montipora eating nudibranchs will make short work of your prized montis! You do not want to introduce these pests into a tank full of corals because once they get in they are very difficult (if not impossible) to completely remove without adversely affecting the other species in the tank. A dip of potassium permanganate at a volume of 25 to 50mg/l for about an hour has been reported to be an effective dip (ref. E. Borneman) to kill both the nudibranch and any eggs without adversely affecting the coral. This is not reef tank safe, so please do not attempt to treat an entire tank with this potassium permanganate solution. Just use it as a dip. After quarantine or the dipping period, drip acclimate the coral over a period of an hour or so before introducing it to the reef tank.

Many of the wrasses, including the six line wrasse, the white belly wrasse and the pencil wrasse can be a natural control for these pests but they most likely won't completely rid the tank of the eggs. QT or dip as a first line of defense.

Montipora Spongodes Coral Pictures



Montipora Spongodes Coral Profile and Care Information

Scientific Name : Montipora sp.

Common Names : tons of different common names such as staghorn, green slimer, etc.

Care Level : Moderate - needs moderate to high output lighting and moderate to high water flow with good water quality.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

SG : 1.023 to 1.025

Origin / Habitat : Captively grown, purchased by the frag, usually around \$20

How to Frag Montipora Spongodes Coral : Wait until it is at least 6 inches in size or larger before fragging it. Once it has acclimated to the tank for a period of several weeks and provided that it is a suitable size, break off an inch sized piece, dry the bottom side of the coral with a towel and then use super glue to glue it to a frag plug.

Coral Light : Moderate to high lighting levels. T5's and Metal Halides will provide the best results.

Water Movement : Moderate to high turbulent flows are needed. Too much flow in one direction is not good. Read the article on the [vortech pumps](#).

Author : [Mike FishLore](#)

References :

- Borneman, Eric (2004). [Aquarium Corals](#), Selection Husbandry and Natural History. T.F.H. Publications

PAVONA CORAL

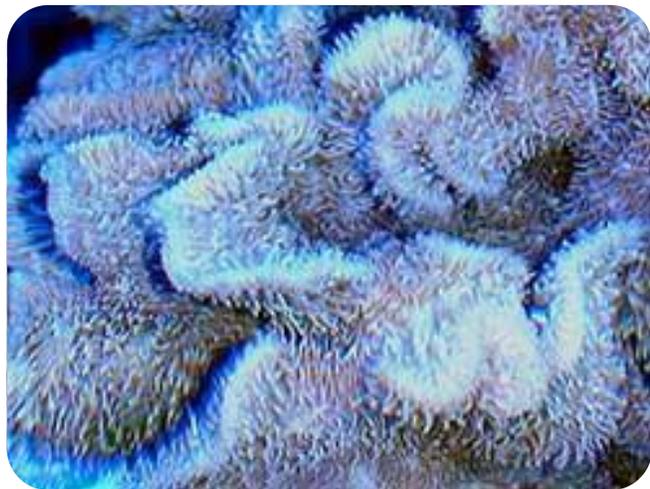
The Pavona coral is an SPS coral that has similar requirements to acropora. The pavona pictured below is Pavona decussatus. They encrust what they are originally attached to and form fuzzy plates which sort of makes them look cactus like and one of the common names it has - cactus coral. This coral is usually sporting green, brown or light brown colors. They are fairly common and are easily fragged.

If you are used to keeping SPS corals then this will be an easy coral for you. If your water parameters are not in excellent condition or if you don't have the proper lighting or water movement devices you will want to pass on this coral. Give it plenty of room to grow when placing the frag in your reef tank. I have one that is slowly taking over a montipora digitata and appears to be more aggressive and potent than the montipora.

General Pavona Coral Care Requirements

- Moderate to High lighting levels
- High, variable and turbulent water flow
- Water temperature - 75°F - 82°F (24°C - 28°C)
- Very low levels of nitrate and undetectable phosphate levels (get a hanna phosphate checker) - these two can really decrease the growth rates
- Maintain calcium level (400 - 450 ppm), magnesium and alkalinity

Pavona Coral Pictures



Pavona Coral Profile and Care Information

Scientific Name : Pavona decussata

Common Names : Cactus coral, Cabbage coral

Care Level : Moderate to high. Considered an SPS coral and will do well in moderate to high lighting with moderate to high turbulent water flows.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 450 ppm

Origin / Habitat : Indo-Pacific, Australia, Indian Ocean, along the middle to upper East coast of Africa

How to Frag Pavona Coral : Very easy, you can break off a piece and super glue it to a frag plug. Place the frag back into the same water it was in on the mother colony and let it heal up and encrust the frag plug if you plan on moving it to another tank.

Coral Food : You can try target feeding special SPS coral foods, but don't over feed and pollute the tank. They will get most of their nutritional needs from their symbiotic zooxanthellae.

Coral Light : Moderate to High light levels are needed. Metal halides, T5-HO and high output LEDs. If the coral is coming from a lower lighting environment acclimate it slowly to higher lighting levels by placing it lower in the tank and slowly raising it over a period of weeks.

Water Movement : High turbulent flows are preferred. Avoid one-way flows into this coral because it cause the polyps to stay retracted and eventually cause damage. Check the vortech pumps which can provide excellent turbulent and varied flow pattern.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications

- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

The Pulsing Xenia or Pulse Coral, is a fascinating soft coral because of the pulsing action of the polyps. Pulsing Xenia can be fairly hardy once acclimated to your tank and provided that you can provide a suitable environment, they grow rapidly for a coral. Their polyps will pulse or, in other words, open and close. Picture your hand slowly opening and closing and you'll get a good idea of what we're trying to describe. There are many species of Xenia with many different colors such as white, pink, brown and cream colored.

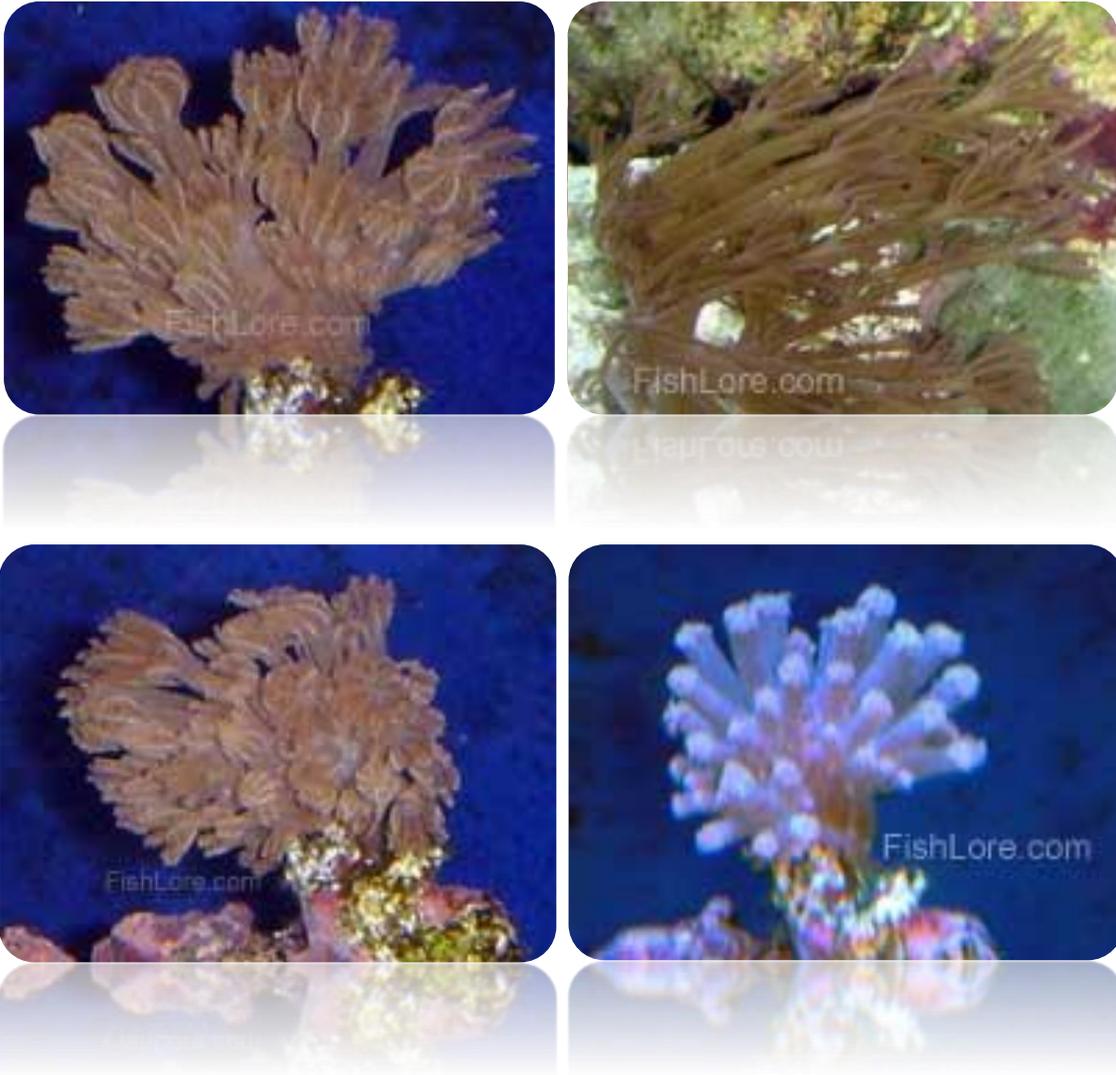
Lighting is important with Xenia. They get most of the nutrients they need via the photosynthesis in their zooxanthellae. They will also feed on the dissolved nutrients in your tank and actually seem to do even better in tanks with higher than normal dissolved nutrients. If you keep these corals in tanks with lower lighting levels (such as power compacts) you may need to place them in the upper half of the tank. Metal Halide, VHO and HO light owners could get by with keeping them in the lower part of standard depth (36 inches or less) aquariums.

There are many theories out there regarding the pulsing action of the Pulsing Xenia. Some think it is related to oxygen/gas exchange and some feel that it is for the filter feeding. Whatever the reasoning is, they are neat to watch. Slower flowing water usually provides better pulse rates. One thing you don't want to do is keep a steady blast of current on them. They may fail to open their polyps and stay retracted. The good thing to know is that just because it's not pulsing doesn't necessarily mean that they are on the decline health wise. You'll usually read that natural seawater levels of iodine (0.03 - 0.06 mg/L) is needed for this pulsing action, but please have an iodine test kit on hand before you start a dosing regimen.

The xenia species you see in your local reef store are usually captively propagated or aquacultured. However, even given their relatively quick growth rates, Pulsing Xenia can still be expensive to acquire. One idea for getting some of the more expensive corals is to join a local aquarium or reef club. These clubs usually have frag swaps where you can trade or buy corals from club members inexpensively.

A word of caution is worth noting here. Some xenia corals can release chemicals that are thought to cause "significant damage to stony corals" (E. Borneman, [Aquarium Corals](#)). Given this information, you may want to reconsider keeping them in your tank if you also keep stony corals.

Pulsing Xenia Pictures



Pulsing Xenia Profile Facts and Care Information

Scientific Name : Xenia sp., many different species

Common Names : *Pulsing Xenia, Pulse Coral, Hand Coral*

Pulsing Xenia Care Level : Moderate to Difficult

Life span : These corals are believed to live anywhere from 5 - 10 years in the wild.

pH : 8.2 - 8.5

Temperature : 75°F - 80°F (25°C - 27°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Calcium Levels : 300 - 420 mg/L

Tank Light Requirement :

Minimum recommended lighting levels would be power compacts in tanks with standard depth (24 inches) with the Xenia placed in the top half of the tank. For tanks deeper than 24 inches you'll need High Output (HO), VHO or Metal Halides.

Origin / Habitat : Aquacultured nowadays, found all over reefs.

Temperament / Behavior : It's believed that they may release chemicals or toxins that may damage stony corals and some reef keepers avoid keeping them in their tanks for this reason. If you do keep them in your reef tank, be on the safe side and leave a good amount of space between them and your stony corals.

Breeding / Mating / Reproduction : Reproduces asexually, forming new branches and extending the coral base. If they favor your system, they may grow rather quickly.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : May be considered reef tank safe (sans stony corals), but avoid keeping known coral nibblers such as many of the crab species, starfish (sea stars), and some butterfly species.

Diet / Feeding : Primarily gets what it needs from photosynthesis but it also does well in reef systems with higher than average dissolved nutrients.

Tank Region : They can move around if they want to using their branching stalks. They may very slowly pull themselves to different locations.

Author : Mike FishLore

RICORDEA FLORIDA

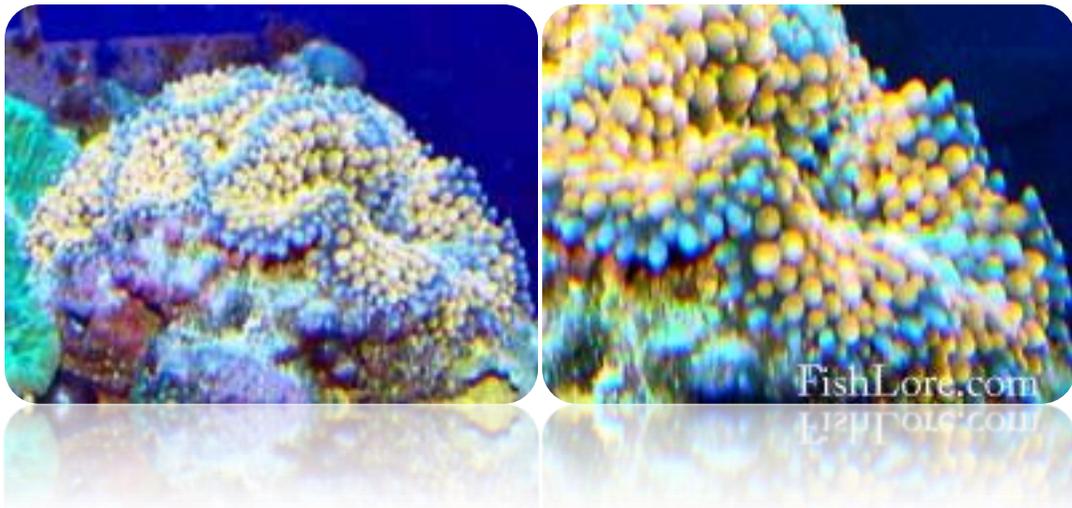
The Ricordea florida mushroom coral comes from the Caribbean and they often sport amazing corals making them a hobbyist favorite. Ricordea florida often show up in shades of blue, green, purple, red and pink and look absolutely fantastic with the way they fluoresce under moon lights.

Keeping the Ricordea florida coral is not too difficult since they require very little other than the proper lighting and water parameters. Supplemental feeding can be attempted but do not overfeed the tank which will just foul the water.

Ricordea florida are not overly aggressive and make very good tank mates in a reef tank. However, avoid placing them too closely to other coral species. It's always a good idea to give all the corals in your tank plenty of space to grow and to avoid chemical and physical aggression among species.

Place your Ricordea florida on the live rock so they can attach. They usually come pre-attached to some live rock rubble. You can glue or use epoxy to bond them to the rock work in your aquarium. Fragging them is actually fairly easy. Use a razor blade to slice them in half and then affix them to some small pieces of rock rubble or frag plugs. Give them low to moderate water flow to help wash slime and mucus away and keep the water conditions in line and they should heal in a matter of weeks.

Ricordea florida Picture



Ricordea florida Coral Profile and Care Information

Scientific Name : Ricordea florida

Common Names : False Coral, Mushroom coral, Corallimorph

Care Level : Considered easy to care for assuming that you have the proper aquarium set up.

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Water Hardness : 8° to 12° dH

Calcium : 400 - 420 ppm

Origin / Habitat : Caribbean

Ricordea florida Temperament / Behavior : Fairly harmless mushroom coral chemically, the Ricordea florida is not overtly aggressive but be sure not to place it next to other corals that could sting or agitate them. They are reported to be somewhat harmful to other species when touching.

How to Frag Ricordea florida : Since these false corals can be rather slow growing, fragging by using a razor blade and slicing them in half works pretty good and it's easy to do. Cut them in half and the affix them to some live rock rubble. Some even slice them into quarters, but this can be more risky.

Ricordea florida Food : Phytoplankton and zooplankton foods can be offered but the majority of their feeding requirements comes from the zooxanthellae, so adequate lighting levels are needed.

Ricordea florida Light : Moderate to High lighting levels are needed due to the zooxanthellae in their tissue. T5's, VHO's or Metal Halides are recommended. If using metal halides, slowly acclimate them to the light intensity over a period of days or weeks.

Water Movement : Moderate but not too much and turbulent flows are favored. Avoid having too much water flow around Ricordea.

Author : Mike FishLore

References :

- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H.

Publications

- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.

ZOANTHIDS, BUTTON POLYPS, ZOAS

Zoanthids are some of the coolest things to keep and also some of the hardiest. These zoanthid button polyps fall into this category of being both hardy and incredibly beautiful. Some refer to zoanthids as simply zoas or button polyps. They are not all that demanding and will do fine in most saltwater aquarium setups. You will get better growth rates when you keep them in optimal conditions though.

There is a broad range of zoanthid colors available and the price tag is tied to the color morph and the size of the frag you're buying. The cool part is that once you've acquired a small frag it's fairly easy to get them to grow. Don't waste money on the larger frags. A polyp or two will soon turn into four which turns into eight and on and on.

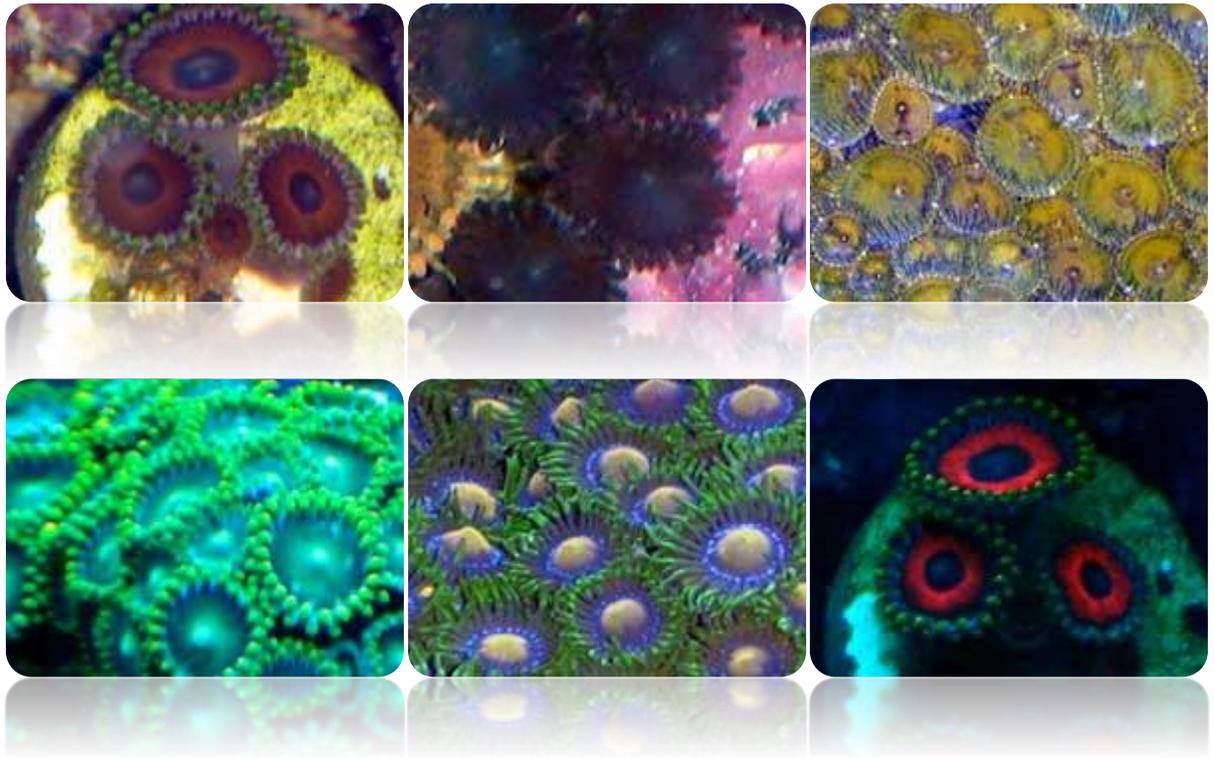
What kind of water conditions do these zoanthids require? Give these zoanthids moderate to high alkalinity, calcium and salinity levels and they should grow well. Moderate to high lighting levels are good for better growth rates. These colonies grow in colonial mat like growths and with time can cover a rock completely.

Fragging zoanthids couldn't be easier. It does take a little time for them to spread, but once they do you can trade zoanthid frags with friends, at club meetings or even try to sell them back to the local shop for store credit or even cash. See the how to frag section below for fragging ideas.

There is a warning when keeping them. Some species of zoanthids can be toxic to humans, notably the palythoas. Wear gloves when handling them or if your hands and arms have to be in the tank for whatever reason. Wash your hands thoroughly after you're finished working with them.

These are really interesting looking reef organisms and there is sure to be a color morph out there that suits you.

Zoanthid Pictures



Zoanthids, Button Polyps, Zoas Coral Profile and Care Information

Common Names : Zoanthids, Button Polyps, Zoas, Zoos

Care Level : Could be considered easy to keep and good for saltwater beginners. Keeping these as a first "coral" is a good way to get your feet wet keeping corals.

pH : 8.2 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Alkalinity : 8° to 10° dKH

Calcium : 400 - 420 ppm

Origin / Habitat : All over.

Zoanthid Temperament / Behavior : They are peaceful but can grow fast, sometimes encroaching on space needed or planned for other corals.

How to Frag Zoanthids : These button polyps are easy to frag. If you have some smaller pieces of live rock rubble you can group the rubble together and place the frag of polyps in the middle then wait for it to spread to the pieces of live rock rubble. You can also get some of that plastic grid looking stuff used in ceiling lighting to propagate these zoanthids. Place some aragonite frag plugs next to each other using the grid squares to hold the frag plugs then place the zoas in the middle and let them grow.

Zoanthid Food : Should get most of what they need from tank lighting and possibly filter feeding on bacteria and other items in the water.

Zoanthid Light : It's commonly thought that brighter colored specimens come from shallower water and the darker colored ones come from slightly deeper water.

Water Movement : Moderate to high and turbulent flows are good. High flow may make them contract their stalks or shorten, lighting may play a role in this too.

Author : Mike FishLore

References :

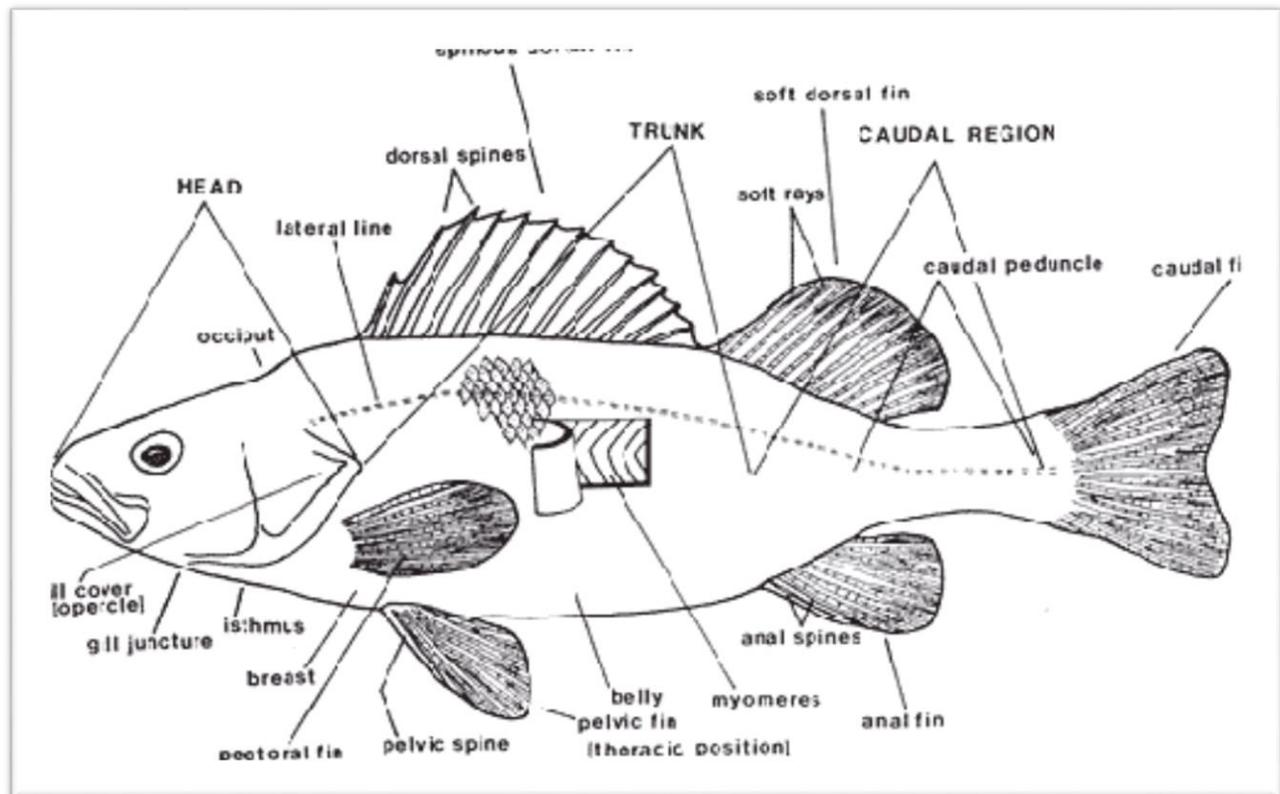
- Borneman, Eric (2004). Aquarium Corals, Selection Husbandry and Natural History. T.F.H. Publications
- Calfo, Anthony (2007), Second Edition, Book of Coral Propagation. Reading Trees Publications.
- Sprung, Julian (1999), Corals: A Quick Reference Guide. Ricordea Publishing.

SALTWATER FISH & INVERTEBRATE PROFILES

FISH ANATOMY

Below you will find the typical anatomy of a tropical. Knowing the names of the various body parts or fish anatomy can be very beneficial when troubleshooting issues or disease such as fin rot, pop-eye or ich.

Typical Tropical Fish Anatomy



ANEMONES

BUBBLE TIP ANEMONE - ENTACMAEA QUADRICOLOR

The Bubble Tip Anemone (*Entacmaea quadricolor*), aka BTA, has the reputation of being one of the easier sea anemones to keep and comes in a few different colors or varieties. There is a brown bubble tip, green bubble tip and even a pink colored variety which is commonly known as the Rose Bubble Tip Anemone. The signature of this Bubble Tip Anemone is the bulb tips that form towards the ends of the anemone's tentacles. There is much debate and speculation as to why these tips form. Some think that very high lighting levels are required or even that more actinics are required in the lighting scheme and other hobbyists feel that frequent and varied feedings are required. Whatever the reasoning for these bulbs forming, for long term success with this anemone you'll need to provide high output lighting such as VHO, HO or Metal Halides. Power Compact lighting might work in shallow tanks. Supplemental feeding is a good idea too.

There are many clownfish species that will host with the Bubble Tip Anemone (see below), with the most common being the Maroon Clownfish. You don't need to have a clownfish to keep an anemone, though watching the symbiotic relationship between the clownfish and the anemone is one of the most fascinating aspects of aquarium keeping. The opposite holds true as well. You don't have to keep an anemone if you want to keep clownfish.

As mentioned previously you will want to feed your Bubble Tip Anemone once or even twice a week with either fresh, raw shrimp, clams, mussels, etc. Chop or slice this fresh seafood into very small pieces and use a feeding stick or tank tongs to give the anemone the food. We like to use a homemade feeding stick that is 3 chop sticks taped together. Place the food on the end of the feeding stick and then gently place it on the tentacles of the anemone. They should grasp at it or show some other feeding response.

As far as water quality goes, aim for a higher specific gravity (1.023 - 1.025) and keep the water parameters in good condition via partial water changes. The water changes should help replenish needed elements but you may also want to use an iodine supplement in between water changes.

Anemones can live for a very long time and like your fish, they are a major commitment.

Bubble Tip Anemone Pictures



This photo makes a cool computer desktop background:



Bubble Tip Anemone Profile Facts and Care Information

Scientific Name : Entacmaea quadricolor

Common Names : *BTA, Bubble Tip Anemone, Bulb Tentacle Anemone, Rose Bubble Tip Anemone, Maroon Sea Anemone*

Care Level : Moderate to Difficult

Size : up to 12 inches (30 cm)

Life span : Extremely long life spans in the wild.

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Tank Light : **Minimum** recommended lighting levels would be 50/50 (actinic/10,000k daylight bulbs) power compacts in tanks with standard depth (24 inches). For tanks deeper than 24 inches you'll need HO, VHO or Metal Halides.

Origin / Habitat : Fiji, Singapore

Bubble Tip Anemone Temperament / Behavior : They can move around the tank to find a suitable location. Ledges in live rock up off the sand substrate are often preferred locations. They can sting tank inhabitants with their tentacles, although it seems that it may be less potent than other anemone species.

Breeding / Mating / Reproduction : Both asexual and sexual breeders. They most often will clone themselves by splitting. You can also cut them yourself into halves as long as a piece of the mouth and foot are attached to each half they will heal up quickly.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Can be considered for reef tanks.

Clownfish that may be hosted by this Bubble Tip Anemone :

Amphiprion akindynos - Barrier Reef Clownfish

A. clarkii - Clark's Clownfish

A. frenatus - Tomato Clownfish

A. melanopus - Red and Black Clownfish

A. ocellaris - Ocellaris Clownfish - our Ocellaris clowns do not host with our bubble tip...

A. percula - see Ryan's post: Percula Clownfish in Bubble Tip Anemone

Premnas biaculeatus - Maroon Clownfish

Also see: Clownfish Anemone Chart

Anemone Disease : Can be difficult to diagnose symptoms and corresponding diseases in anemones. Tanks with insufficient light and insufficient anemone feeding will often see them wither away after a few months. They prefer saltwater higher in specific gravity. Aim for water in the 1.023 - 1.025 range. Beware that anemones that are dying are believed to release toxins into the water that can harm or even kill tank inhabitants.

Bubble Tip Anemone Diet / Fish Food : Supplemental feedings (twice per week) have been anecdotally reported to induce cloning. Feeding can play an even more important role in tanks with lower lighting levels.

Tank Region : Slow moving, but often stationary in the tank once they find a suitable location.

Author : Mike FishLore

CONDY ANEMONE - CONDYLACTIS GIGANTEA

Condy Anemone profile information. Many marine hobbyists long to keep an anemone in their saltwater tanks. The Condylactis Anemone is often recommended to beginners because Condy Anemones are usually less demanding than many of the other anemones and because they are inexpensive (\$5 - \$10). Don't let the cheap price tag fool you into thinking that they don't have special requirements because they certainly do. The Condy Anemone needs a well-established tank that has been set up for several months (preferably longer) and an aquarium that is showing stable and good water parameter readings.

The Condy Anemone is photosynthetic and it also needs to eat frozen or fresh fish food preparations. At a minimum, we would recommend at least power compacts with 50/50 bulbs (full spectrum/actinic) along with supplemental feedings every other day, or twice a week. Fresh seafood from the local market such as shrimp and clams work well. Cut the fresh, uncooked seafood into very small pieces and use tank tongs or a turkey baster to deliver the food to the anemone's mouth.

You should be warned that Condy Anemones can move around the tank, albeit slowly. This means that you will need to use foam filters over any power head intakes. Many hobbyists have lost anemones because of an unprotected power filter intake! You will probably not want to keep them in a reef tank with corals because they have a sting that can harm corals, fish and other anemones.

The Condy Anemone is not a "natural" host for the clown fishes. However, some hobbyists have reported success with keeping clown fishes with their Condylactis Anemone, whereas others have reported the demise of either the clownfish or the anemone after the introduction.

The Condy Anemone can be an interesting anemone to keep and it can be a good one to start with provided that you can meet some of this animal's demands detailed above. Remember that they can live extremely long lives in the ocean and we need to do our utmost to provide the best possible care for them. Some folks think that the key to success for this animal is performing frequent partial water changes (10 - 20% every 2 weeks), supplementing with iodine, having the right light intensity over the tank (at minimum - Power compacts in short tanks and HO, VHO or Metal Halides in tanks deeper than the standard 24 inches) and supplemental feedings with a variety of fresh marine foods.

Share your thoughts below and help others keep this fascinating anemone.

Condy Anemone Picture



Condy Anemone Profile Facts and Care Information

Scientific Name : Condylactis gigantea

Common Names : *Condy Anemone, Haitian anemone, Pink tipped anemone*

Condy Anemone Care Level : Difficult

Size : 6 - 10 inches (15 - 25 cm)

Life span : Anemones are thought to live perpetually, or in other words, they can live for an extremely long time in the wild.

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Tank Light : Minimum recommended lighting levels would be 50/50 (actinic/10,000k daylight bulbs) power compacts in tanks with standard depth (24 inches) and HO, VHO or Metal Halides in deeper tanks.

Origin / Habitat : Caribbean, Western Atlantic

Condy Anemone Temperament / Behavior : They can move around the tank to find a suitable location. Corals, fish and other anemones can be harmed by the sting of the condy anemone.

Condy Anemone Breeding / Mating / Reproduction : Asexual breeders.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Not a good choice for reef tanks because they can sting other sessile animals in the tank. They can also sting and harm smaller fish.

Fish Disease : Can be difficult to diagnose symptoms and corresponding diseases in anemones. Anemones that are dying are believed to release toxins into the water that can harm or even kill tank inhabitants.

Diet / Fish Food : Fresh seafood from the local grocery store in the form of shrimp and clams cut up into very small, fine pieces can be given to your anemone every other day. They are also photosynthetic, which means that they get some of the energy they need from the tank lights. Please don't try to keep these anemones with sub-standard lighting systems.

Tank Region : Slow moving and may affix themselves to a location for weeks at a time only to move to a new spot when they feel like it.

Author : Mike FishLore

DWARF ANGELFISH

BICOLOR ANGELFISH - CENTROPYGE BICOLOR

The Bicolor Angelfish (Two Color Angelfish) is yellow on the front half, the back half is a royal blue and they have a saddle like blue over the eye region. The Bicolor Angelfish is a dwarf angelfish that is commonly available at the saltwater fish store and is usually in the \$20-\$30 price range. Although this fish is not as colorful as the Flame Angelfish it is still quite striking and will make a beautiful addition to the right saltwater tank setup.

The Bicolor Angelfish has a reputation as being difficult to keep and are deemed not as hardy as some of the other dwarf angelfishes. It may depend on the location the Bicolor Angelfish are coming from because some of the fish collectors may have questionable collecting practices. With that little tidbit in mind you may want to take some extra time when acclimating them to your saltwater aquarium. Only add them to well-established tanks, preferably an aquarium that has been setup up for at least 6 months.

In the wild Bicolor Angelfish can be somewhat reclusive, not venturing far from their hiding places in the rock. It is a good idea to provide plenty of hiding places in your tank as well since it should help make them feel more secure. Providing live rock has a secondary benefit of being a food source that will allow them to graze in between meals. Feeding them is not difficult since they should go after most fish foods including frozen and flakes but some hobbyists have reported that this is not the case. If you have difficulty getting yours to start eating, try frozen or live foods at first and then slowly wean them onto other fish food. Try to give them foods enriched with spirulina. Some frozen cubes are enriched with spirulina.

Only one of the dwarf angels per tank! Even though they are seen in pairs or even small groups in the ocean, they will not tolerate each other in the small confines of the home marine aquarium. If you have a sufficiently large tank you may be able to get away with multiples if they are introduced at the same time and if they have plenty of hiding places.

Dwarf Bicolor Angelfish Picture



Bicolor Angelfish Profile Facts and Care Information

Scientific Name : Centropyge bicolor

Common Names : Bicolor Angelfish, Gold and Blue Angelfish, Oriole Angelfish, Boray-boray, Two color angel

Bicolor Angelfish Care Level : Moderate

Size : Up to 6 inches (15 cm)

Life span : 5 - 10 years or longer in the wild

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific near Japan down to Australia

Temperament / Behavior : They can be aggressive with others, especially other dwarf marine angelfishes. It's not the best choice for a reef tank because they are known to nip lps corals.

Breeding / Mating / Reproduction : Very difficult to breed in captivity partly due to their aggressive nature with members of their own species. They are hermaphrodites and practice harem breeding.

Tank Size : 30 gallon (113 liters) minimum, preferably larger to provide adequate swimming room.

Bicolor Angelfish Compatible Tank Mates : Only one dwarf angelfish per tank, unless the aquarium is extremely large. They may nip lps corals and sometimes pick on smaller invertebrates.

Reef Tank Compatible? : Can help control algae if in small amounts, but can nibble at corals, clams and other invertebrates.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Frequent (2 times per day) and varied feedings. Try to give them a variety of marine foods but predominantly marine algae and spirulina. [Live rock](#) is a welcome addition to the tank since it will provide grazing opportunities in between meals. They are not very picky and should go after flakes and frozen fish food.

Tank Region : Usually middle to bottom

Gender : No reliable way to determine the differences between males and females.

Author : [Mike FishLore](#)

Forum : [Saltwater Angelfish Forum](#)

CORAL BEAUTY ANGELFISH - CENTROPYGE BISPINOSUS

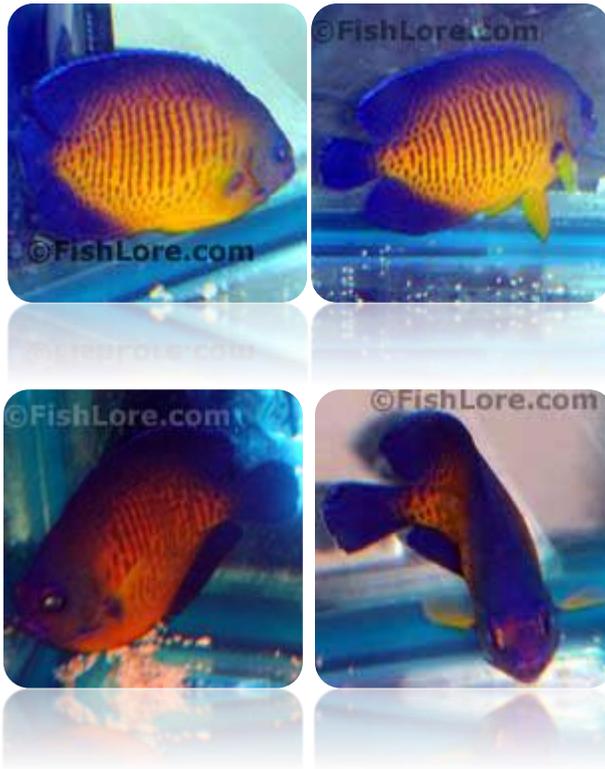
The Coral Beauty Angelfish (*Centropyge bispinosus*) is a dwarf marine angelfish that only reaches about 4 inches (10 cm). The Coral Beauty is commonly available and is relatively inexpensive when compared to other saltwater fish. They can be fairly hardy and are known as one of the hardiest of the dwarf angels.

The Coral Beauty Angelfish is usually fairly peaceful but can be belligerent with tank mates. Unless you have a very large tank, they will fight with other dwarf angels over territory. They may also be aggressive with smaller tank mates (fish and invertebrates) if kept in a smaller tank. Provide them with lots of live rock for hiding places and they may spend most of their time out in the open.

Feeding the Coral Beauty Angelfish can be difficult and it's usually hit or miss with this species. Some hobbyists have no problems getting them to eat flake and frozen foods whereas others report that they can't get them to eat standard aquarium foods. Either way, having a good amount of live rock in your tank will provide them with not only places for hiding but it will also give them a food source. They primarily eat algae and will graze on the algae growing on your live rock. For those reef aquarium keepers out there, this fish may not be the best choice for your reef tank. They have been known to nip at lps corals. If you're worried that they are not getting enough to eat, get some dried marine seaweed and use a veggie clip to place it in the tank. There are special marine angelfish foods out there as well and you may want to try them.

These dwarf angelfish can come down with the usual saltwater fish diseases and using a quarantine tank is a must. Keep them in quarantine for 2 - 3 weeks before introducing them into your main tank.

Coral Beauty Angelfish Picture



Coral Beauty Angelfish Profile Facts and Care Information

Scientific Name : Centropyge bispinosus

Common Names : Two Spined Angelfish, Dusky Angelfish

Care Level : Moderate

Size : Up to 4 inches (10 cm)

Life span : 10 - 15 years or longer in the wild, but not likely in captivity

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Great Barrier Reef

Temperament / Behavior : They can be aggressive with others, especially other dwarf marine angelfishes. It's not the best choice for a reef tank because they are known to nip lps corals.

Coral Beauty Angelfish Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 30 gallon (113 liters) minimum, preferably larger - tanks on the smaller side will surely bring out territory problems with other fish.

Compatible Tank Mates : Use caution when selecting tank mates. You may have better results if this is the last fish placed in the tank. You may still see some aggression with other fish that are the same size or smaller. These fish are not necessarily reef aquarium safe because they will nip lps corals and may pick on smaller invertebrates.

Reef Tank Compatible? : Use caution if you have clams since it has been reported that they may nip at them. Otherwise, they could be a nice addition to help with algae control in a small way.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Frequent (2 times per day) and varied feedings. Try to give them a variety of marine foods but predominantly marine algae and spirulina. Having plenty of live rock for them to graze on goes a long way. They may accept vitamin enriched flake foods, frozen and definitely live foods although it may take time for them to go after flake foods.

Tank Region : Usually middle to bottom

Gender : No reliable way to determine the differences between males and females.

Forum : Saltwater Angelfish Forum

Author : Mike FishLore

EIBLI ANGELFISH - CENTROPYGE EIBLI

The Eibli Angelfish is often available and not all that expensive either. The Eibli Angelfish has a variety of common names including the Blacktail Angelfish, the Orangeline Angelfish and in some circles it's called Eibl's Angelfish. They are found on the reef at depths of 1 to 30 meters (3 - 90 feet) and are often found among groups of Halfblack Angelfish (*C. vrolikii*) which they may inter-breed with. You'll read several places that say you can keep them in tanks as small as 30 gallons (114 liters) but a 55 gallon would work out better given their potential adult size of 6 inches (15 cm). The Eibli is one of the bigger of the dwarf species.

Like the other dwarf angels you'll want to keep only one of these Eibli Angelfish per tank because they will fight with other dwarf angelfish. Provide plenty of hiding places for them and they should be out and about more often. They have the reputation of being very shy, but ours is extremely inquisitive and does not shy away from our hand when doing tank maintenance. Keeping them in a reef tank setup may not be a good idea. They might nip clam mantles and corals.

Feeding Eibli Angelfish can be a little challenging at first. Try introducing a variety of foods several times a day. Two small feedings a day would be good. Ours went after defrosted mysis shrimp right away, but didn't take to the algae on the veggie clip at first. Placing a small piece of dried algae sheet under a rock did the trick. After it was used to nipping at the algae under the rock we tried the veggie clip again and it worked. You may need to get creative trying to get them to eat.

All the dwarf angelfish can easily get the common saltwater fish diseases so a quarantine tank is a good idea.

Eibli Angelfish Picture



Eibli Angelfish Profile Facts and Care Information

Scientific Name : Centropyge eibli

Common Names : Blacktail Angelfish, Orangeline Angelfish, Orange Stripe Angel, Eibli Angelfish

Eibli Angelfish Care Level : Easy to Moderate, take your time acclimating the Eibli to your aquarium.

Size : Up to 6 inches (15 cm)

Life span : 5 - 7 years, maybe longer

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (25°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Pacific, Indonesia to Northwest Australia in water depths of 1 - 30 meters (3 - 100 feet) and often found on the reef slope.

Eibli Angelfish Temperament / Behavior : They will fight with other dwarf angelfish in the home aquarium. They do best kept one dwarf per tank.

Breeding / Mating / Reproduction : Considered extremely difficult to breed in captivity, the Eibli Angelfish are protogynous hermaphrodites (females turn into males). Breeding tanks are usually taller because of the interesting way in which they breed. The dwarf angels are harem breeders with one male for several females. They circle each other and then rise simultaneously to the surface releasing gametes. The male then moves on to the next female. Getting them to spawn may not be all that difficult (for professional breeders) but raising the Eibli Angelfish eggs is an entirely different matter, requiring super tiny (plankton like) foods as they advance through their various growth stages.

Tank Size : 30 gallon (114 liters) minimum for one dwarf angel, much larger if you plan on keeping multiples. The Eibli Angelfish would do better in a 55 gallon tank since it can get a bit bigger than other dwarf angelfish.

Compatible Tank Mates : Avoid keeping them with larger eels, lionfish or any fish large enough to eat them. Keeping them in a reef tank seems to be hit or miss, use caution. They might nip clam mantles, soft corals and zoanths. It's not recommended to keep more than one dwarf angelfish per tank because of aggression.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. A quarantine tank is a must! They can easily get cryptocaryon when stressed. Provide stable water parameters, highly nutritious foods and a uv sterilizer might help.

Diet / Fish Food : Omnivorous, but try to give them a balanced diet of algae and meaty marine foods. They should eventually accept vitamin enriched flake foods, frozen and live foods. Having live rock is a great idea because it will provide grazing opportunities. Try for at least two small feedings every day.

Tank Region : All over the tank, likes to have hiding places in the rock work.

Eibli Angelfish Gender : Considered difficult to determine external differences between males and females.

Forum : Saltwater Angelfish Forum

Author : Mike FishLore

References

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FLAME ANGELFISH - CENTROPYGE LORICULA

The Dwarf Flame Angel fish is perhaps one of the most colorful and attractive of the commonly available marine angelfishes. The Dwarf Flame Angel fish has a striking red or orange body with vertical black bars in the mid-section. The good news is that the Flame Angel fish only gets to be about 4 inches (10 cm) or so and can be the prize specimen in any tank. The bad news is that they can be fairly expensive, they don't ship very well, and may bully other dwarf angelfishes or smaller tank mates.

Flame Angel fish need a tank with moderate to high water circulation, better than average water quality (very low or zero nitrates) and plenty of live rock. They will graze on the live rock in between meals and use any hiding places provided by the live rock when they feel threatened.

When it comes to eating, they are not as picky as some other saltwater fish. They seem to really like the frozen marine foods, live and flake foods. Definitely plan on using some dried algae supplements if not enough is present on the live rock in your tank to avoid any nutritional disorders.

Unfortunately, Flame Angels are often shipped with some type of saltwater fish disease and the use a quarantine tank before introducing them into your main tank is a must. Because Flame Angel fish can be quite expensive (though not as expensive as some of the larger saltwater angelfish) it is a good idea to ask the fish store to hold them for a couple of weeks before you bring them home.

As far as reef tank compatibility goes, some reefers have kept them with no problems at all and some had to remove them because they were picking at the corals or clams.

Flame Angel fish Picture



Dwarf Flame Angel fish Species Profile Facts and Care Information

Scientific Name : Centropyge loricula

Common Names : Dwarf Flame Angelfish, Dwarf Angel, Flame Angel

Flame Angelfish Care Level : Easy to Moderate, acclimate this fish slowly to your tank.

Size : Up to 4 inches (10 cm)

Life span : 5 - 7 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (25°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : South Pacific and Western Pacific, Hawaii, Australia, Coral Sea, Great Barrier Reef, Christmas Islands

Flame Angel Temperament / Behavior : May become territorial and aggressive towards other dwarf angelfish and may even bully other, smaller tank mates. You may have better luck introducing them last into the tank.

Breeding / Mating / Reproduction : It's very difficult to breed them and there are very few reported successes of breeding in an aquarium.

Tank Size : 30 gallon (114 liters) minimum for one dwarf flame angel, much larger if you plan on keeping multiples.

Compatible Tank Mates : Avoid keeping them with larger eels, lionfish or any fish large enough to eat them. Keeping them in a reef tank seems to be hit or miss, use caution.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. A quarantine tank is a must.

Diet / Fish Food : Omnivorous, but try to give them a balanced diet of algae and meaty marine foods. They should accept vitamin enriched flake foods, frozen and live foods. Having live rock is a good idea because of the food it can provide in between meals.

Tank Region : All over the tank.

Gender : It can be very difficult to determine any external differences between male and female flame angel fish. Males might be larger and slightly more colorful.

Author : Mike FishLore

Forum : Saltwater Angelfish Forum

LEMONPEEL ANGELFISH - CENTROPYGE FLAVISSIMA



The Lemonpeel Angelfish (*Centropyge flavissima*) is a brilliant yellow lemon color with a blue ring around the eyes. It is one of the dwarf angels and gets to around 5 inches when fully grown. They need to be slowly acclimated to your tank and need to be fed several times per day. They will go after mysis shrimp, brine shrimp as well as algae or spirulina based foods. Offer them some nori (seaweed) attached to a veggie clip. These angels are not considered reef tank safe because they have been known to nip at LPS corals and clam mantles.

You can pick these dwarf lemonpeel angels up for around \$20 to \$30 locally or online.

Lemonpeel Angelfish Profile Facts and Care Information

Scientific Name : *Centropyge flavissima*

Common Names : Yellow Angelfish, Lemonpeel Angel

Care Level : Moderate - not as hardy as some of the other dwarf angels.

Size : Up to 5 inches (14 cm)

Life span : 5 years, likely longer (fishbase has them listed as living up to 11 years)

Water Parameters: pH : 8.1 - 8.4 | Temperature : 72°F - 80°F (22°C - 27°C) | Specific Gravity : 1.020 - 1.025 | Carbonate Hardness (dKH) : 8 - 12°

Reef Tank Safe? No - might nip at LPS and clam mantles

Origin / Habitat : Indo-Pacific - in lagoon areas and seaward reef areas with heavy coral cover

Temperament / Behavior : They can be aggressive with other dwarf marine angelfishes and might get harassed by larger angelfish.

Breeding / Mating / Reproduction : Very difficult to breed in captivity. Pelagic egg scatterer.

Tank Size : 30 gallon (113 liters) minimum

Compatible Tank Mates : Keep them with similar sized fish, nothing too large or aggressive to eat them (e.g. lionfish)

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Having a lot of live rock in the tank for them to pick at in between the several small feedings per day will help. Give them lots of algae, nori attached to a veggie clip. Mysis shrimp, brine shrimp thrown in periodically to help supplement their diet.

Tank Region : Middle to bottom

Gender : No external differences between males and females that we know of.

Forum : Saltwater Angelfish Forum

Photo Credit : Haplochromis (wikimedia)

Author : Mike FishLore

References

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POTTER'S ANGELFISH - CENTROPYGE POTTERI



The Potter's Angelfish (*Centropyge potteri*) at first glance may be sort of drab looking in appearance but under T5 actinics they really show off well. They are like the other dwarf angelfish and may fight with conspecifics and other dwarf angel species. A tank of 30 gallons or larger with lots of live rock for cover and grazing opportunities in between meals will be helpful. The Potter's Angelfish is not considered reef tank safe because it may nip at stony corals, clam mantles and maybe even zoanthids (ref: S. Michaels).

Getting them to eat aquarium foods like pellets or flake foods can be a challenge. Start with thawed or live foods like mysis and brine and wean them onto the other foods you want to feed them. Try giving them nori (seaweed) attached to a veggie clip too. Two or three small feedings per day is recommended.

You can buy the Potter's Angelfish for around \$60 to \$120 locally or online.

Potter's Angelfish Profile Facts and Care Information

Scientific Name : *Centropyge potteri*

Common Names : Potter's Angelfish, Russet Angelfish, Potter's Angel

Care Level : Moderate - acclimate them slowly to the quarantine tank or display tank

Size : Up to 4 inches (10 cm)

Life span : 5 years, likely longer

Water Parameters: pH : 8.1 - 8.4 | Temperature : 72°F - 80°F (22°C - 27°C) | Specific Gravity : 1.020 - 1.025 | Carbonate Hardness (dKH) : 8 - 12°

Reef Tank Safe? No - might nip at LPS and clam mantles

Origin / Habitat : Hawaiian Islands, Johnston Atoll - lives at depths of 5 to 140 meters among rocky and areas with coral growth.

Temperament / Behavior : These dwarf angels will fight with conspecifics and other dwarf angelfish species.

Breeding / Mating / Reproduction : Difficult to breed in captivity. Forms pairs and is an open water egg scatterer.

Tank Size : 30 gallon (113 liters) minimum

Compatible Tank Mates : Keep them with similar sized fish, nothing too large or aggressive to eat them like larger Lionfish

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Give them mostly algae based foods, spirulina, nori, marine algae. Add in mysis shrimp, brine shrimp and other meaty marine origin foods. Needs to eat several times per day and will graze on the live rock in your tank in between feedings.

Tank Region : Middle to bottom

Gender : Don't know of any external differences between males and females.

Forum : Saltwater Angelfish Forum

Photo Credit : T. Sherlock (wikimedia)

Author : Mike FishLore

References

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DWARF PYGMY ANGELFISH (CENTROPYGE ARG1)

The Dwarf Pygmy Angelfish is even smaller than the dwarf angelfishes and the pygmy angels are becoming quite popular. One of the most popular is the Dwarf Pygmy Angelfish which is also known as the Atlantic Pygmy or sometimes the Cherub Angelfish. They only get to be about 3 inches (8 cm) as adults and have an orange or yellow color to the head and throat area. The photo on this page doesn't do this fish justice. All of these Dwarf Angelfish are quite beautiful.

Dwarf Pygmy Angelfish can be pugnacious and will fight with other dwarf angelfish including those from their own species. They have been bred in captivity although it is extremely challenging to raise them due to fighting, aggression and feeding the larvae. If you're interested in breeding pygmy angelfish this could be an ok one to start with. Introduce a group of small sized fish into the tank at the same time. There will be aggression while they establish a dominance hierarchy. The largest most dominant Dwarf Pygmy Angelfish will develop into a functional male. How long this takes is difficult to say. Getting them to spawn is the easy part (and that's not all that easy). The hard part is raising the larvae and finding the proper foods to feed the very small mouthed larvae.

Dwarf Pygmy Angelfish can be added to fowlr tank setups but use caution if you want to add them to a reef tank setup. They have been known to nip at soft coral, stony coral and even clam mantles.

Provide frequent small feedings of a variety of foods, but primarily foods of marine algae origin. Try a lettuce clip with nori. Using Live rock is a good idea too and it should provide grazing opportunities in between meals.

As always, use caution when introducing these angels to your tank. A quarantine period of several weeks is recommended.

Pygmy Angelfish Picture



Dwarf Pygmy Angelfish Profile Facts and Care Information

Scientific Name : *Centropyge argi*

Common Names : Dwarf Pygmy Angelfish, Cherubfish, Pygmy Angelfish, Atlantic Pygmy Angel

Care Level : Moderate

Size : Up to 3 inches (8 cm)

Life span : 5 years, maybe longer

pH : 8.1 - 8.4

Temperature : 72°F - 82°F (22°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Found in deeper waters of the Western Atlantic, Gulf of Mexico, Florida, Bahamas and the Caribbean

Temperament / Behavior : These pygmy angels can be very aggressive with others, especially other dwarf pygmys. Introducing multiples at the same time may help aggression levels, but they will establish a pecking order. Remove tank mates that get overly bullied or pestered.

Dwarf Pygmy Angelfish Breeding / Mating / Reproduction : They have been bred in captivity but it is challenging partly due to their aggressive nature with members of their own species and because of the small larvae. They are protogynous hermaphrodites and practice harem breeding. If a group is raised together from a very small size a hierarchy should form and the largest most dominant one may turn into a male. If two pygmy angelfish constantly fight it may be due to both of them being males and they will need to be separated.

A spawning rise is indicative of the breeding process whereby a male and female will release fertilized eggs at the top of the rise. The eggs are carried in the water currents. Taller breeding tanks are recommended for better results for the pelagic spawners.

Dwarf Pygmy Angelfish eggs should hatch around 20 hours and will survive on the yolk sac for 2 - 3 days at which time they need to be fed microscopic algae. Feeding the larvae is one of the most challenging aspects to raising these species.

Tank Size : 30 gallon (113 liters) is recommended.

Compatible Tank Mates : Only one dwarf angelfish per tank, unless you introduce them all at the same time or the aquarium is very large with plenty of hiding places. They may nip lps corals and sometimes pick on smaller invertebrates.

Reef Tank Compatible? : Can help control algae if in very small amounts, but can nibble at corals, clams and other invertebrates.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Frequent (2 or 3 times per day) small and varied feedings. Try to give them a variety of marine foods but predominantly marine algae and spirulina. Live rock is a great addition to the aquarium since it will provide grazing opportunities in between meals as well as hiding places.

Tank Region : Usually middle to bottom and around the live rock.

Gender : No reliable way to determine the differences between males and females from external differences other than males may be larger than females. No known color differences between the sexes.

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

References

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LARGE ANGELFISH

BELLUS ANGELFISH (GENICANTHUS BELLUS)



The Bellus Angelfish (*Genicanthus bellus*) is one of the smaller saltwater angelfish species that is not considered a dwarf species. The males and females are easy to differentiate with the males having an orange dorsal fin and an orange horizontal band near the lateral line. In females the dorsal and lateral line band will be black. The Bellus Angelfish gets to about 7 inches (18 cm) as adults and seems to adapt well to the aquarium. They are not all that commonly available at fish stores or online and if you do see one available be prepared to pay anywhere from \$100 to \$200 depending on the size.

Bellus Angelfish Profile Facts and Care Information

Scientific Name : *Genicanthus bellus*

Common Names : *Bellus Angelfish, Ornate Angelfish*

Queen Angelfish Care Level : Moderate, needs a bigger tank

Size : Up to 7 inches (18 cm)

Life span : 10 years, possibly longer

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 76°F (22°C - 24°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Eastern Indian Ocean at depths of 20 to 100 meters

Temperament / Behavior : Males may fight with other males and with other angelfish species. Keep only male to a tank, but a single male can be kept with multiple females in large enough aquariums.

Breeding / Mating / Reproduction : Females can change sex to males and are open water egg scatterers. Many spawnings have taken place in the home aquarium but no successful larvae have been raised.

Tank Size : 120 gallon (450 liters) minimum

Compatible Tank Mates : Other large fish species. May fight with other saltwater angelfish.

Fish Disease : [Saltwater Fish Disease](#)

Diet / Fish Food : Omnivores and primarily a plankton eater. A varied diet with live or thawed marine foods offered frequently. There are even frozen foods made especially for large angelfish now.

Tank Region : All over the aquarium.

Gender : Males look very different from females. The females will have dark colors and a dark band on the dorsal fin and near the lateral line. Males will have an orange or yellow dorsal fin and an orange band near the lateral line.

Forum : [Saltwater Angelfish Forum](#)

Photo Credit : Aquafanatic (wikimedia)

Author : [Mike FishLore](#)

References

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

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BLUE ANGELFISH (HOLACANTHUS BERMUDENSIS)



The Blue Angelfish (*Holacanthus bermudensis*) is an angelfish that looks very different as juveniles. They have much darker black shadings with white vertical stripes. As they grow into adults they transform into magnificent looking fish like the one pictured above. The Blue Angel is often confused with the Queen Angelfish but the two are easily differentiated. The Queen Angel will have a "crown" or circle on it's head. As juveniles the Blue Angels are cleaner fish.

The hard part about keeping this angelfish is their diet. As juveniles they will eat algae and sponges and as they grow they develop a preference for sponges over the algae. You need to get them on standard aquarium foods and marine angel foods with sponges (comes in frozen cube packs) as soon as possible for long term success in keeping them.

The Blue Angelfish is being sold for around \$150 to \$300 depending on size.

Blue Angelfish Profile Facts and Care Information

Scientific Name : *Holacanthus bermudensis*

Common Names : *Blue Angelfish, Blue Angel, Bermuda Blue Angelfish*

Queen Angelfish Care Level : Moderate, needs a big tank, eats sponges

Size : 15 inches (40 cm)

Water Parameters : pH 8.1 - 8.4 | Temperature 70°F - 76°F (21°C - 24°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : North Carolina down to South Florida and then south to Bermuda. Gulf of Mexico - often found near rocky reef-like areas

Reef Tank Safe? No - may nip at LPS, SPS and clam mantles.

Temperament / Behavior : May fight with other marine angelfish.

Breeding / Mating / Reproduction : No reports of successful breeding attempts in the home aquarium.

Minimum Tank Size : 180 gallons (680 liters)

Compatible Tank Mates : May fight with other saltwater angelfish.

Fish Disease : [Saltwater Fish Disease](#)

Diet / Fish Food : Feed them several times per day with specialized marine angelfish formulas heaving in sponges. They will pick at the live rock throughout the day.

Tank Region : All over the aquarium.

Gender : Don't know of any external differences between males and females.

Forum : [Saltwater Angelfish Forum](#)

Photo Credit : Aquafanatic (wikimedia)

Author : [Mike FishLore](#)

References

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

"*Holacanthus bermudensis*". *FishBase*. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

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BLUEFACE ANGELFISH (EUXIPHIPOPS XANTHOMETOPON)



The Blueface Angelfish (*Euxiphipops xanthometopon*) is also known as the yellow face angelfish and is found in the Indo Pacific at depths of 5 to 25 meters near reefs and caves. They will need at least a 220 gallon tank or larger with lots of live rock for them to graze on. Some hobbyists have found it difficult to get them eating some of the more common aquarium foods like pellets. There are frozen marine angelfish cube packs made now that can be offered and they have a high concentration of foods eaten by marine angelfish.

Blueface Angelfish Profile Facts and Care Information

Scientific Name : *Euxiphipops xanthometopon*

Common Names : *Blueface Angelfish, Yellowface Angelfish*

Queen Angelfish Care Level : Moderate, needs a big tank, sponge eater. It might be difficult to get them eating.

Size : Up to 15 inches (38 cm)

Life span : 10 years or longer

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 76°F (22°C - 24°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo-Pacific, 5 to 25 meters, near caves and reefs

Reef Tank Safe? No - may nip at LPS, SPS and clam mantles.

Temperament / Behavior : May fight with other angelfish

Breeding / Mating / Reproduction : Open water egg scatterers. No reports of breeding in the home aquarium.

Tank Size : 220 gallon (832 liters) minimum

Compatible Tank Mates : Other large fish species. Will fight with other saltwater angelfish.

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : In the wild they eat sponges, tunicates and other encrusting organisms. In the home aquarium make sure there is plenty of live rock for them to graze on and there are frozen marine angelfish foods you can give them as a main diet.

Tank Region : All over the aquarium.

Gender : No external male/female differences

Forum : Saltwater Angelfish Forum

Photo Credit : Aquafanatic (wikimedia)

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Euxiphipops xanthometopon*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

Michael, S. W. (2004) Angelfishes and Butterflyfishes. T.F.H. Publications

ANNULARIS ANGELFISH - BLUE RING ANGELFISH (POMACANTHUS ANNULARIS)



The Blue Ring Angelfish is also known as the Annularis Angelfish and the Blue King Angelfish. They are called the Blue Ring Angelfish because of the blue ring near their head. They are also called the Annularis Angelfish because of the scientific name (*Pomacanthus annularis*). Juvenile Blue Ring Angelfish look quite different than adults. The juveniles are black with blue and white vertical stripes whereas the adults have an orange-yellow body with horizontal blue stripes, a yellow tail and a blue ring near the head area. They are sold anywhere from \$50 to several hundreds of dollars depending on age and size.

The angelfish in *Pomacanthus* spp. are (generally speaking) less aggressive than the angelfish from *Holocanthus* spp. but use caution when stocking. It's best to keep annularis angelfish in large fish only type setups. The Blue Ring Angelfish needs lots of open swimming space, needs to be fed often (3 or 4 times per day) and will pick at clams, corals (sps, lps, zoanthids) and other invertebrates in the tank. This angelfish also will appreciate having hiding places or caves to retreat into when they feel threatened or for when they hunker down at night.

Feeding the Blue Ring Angelfish can be an issue since they primarily eat sponge in the ocean. They will pick at the live rock in the tank frequently and may even go after dried seaweed. Look for a good saltwater angelfish food with sponge in it. Hikari and Ocean Nutrition have a food specially developed to feed marine angelfish that is composed primarily of sponge. Small pieces of fresh or thawed marine origin foods like fish, squid, scallops, etc. should be offered occasionally.

The Blue Ring Angelfish would make an awesome centerpiece fish in a fish only type setup.

Blue Ring Angelfish Profile Facts and Care Information

Scientific Name : Pomacanthus annularis

Common Names : *Blue Ring Angelfish, Annularis Angelfish, Blue King Angelfish*

Queen Angelfish Care Level : Difficult, needs a large tank, can be hard to get them to eat and they can get more aggressive as they get larger.

Size : Up to 18 inches (45 cm), most get up to about 12 inches (30 cm)

Life span : 15 - 20 years, possibly longer

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 76°F (22°C - 24°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : East Africa, Indo West Pacific, Indonesia, New Guinea, New Caledonia, Southern Japan. Found at depths of 3 to 200 feet (1 to 60 meters)

Temperament / Behavior : May be shy at first but after they get used to the tank they should settle in. As they grow they may become more aggressive with tank mates, especially other angelfish.

Breeding / Mating / Reproduction : Don't know if it's been bred in an aquarium to date. Pelagic egg scatterer. The Blue Ring Angelfish may form monogamous pairs.

Tank Size : 180 gallon (680 liters) minimum

Compatible Tank Mates : Other large fish species that can take care of themselves. Would be fine in larger fish only type setup. This angelfish gets more aggressive the bigger it gets. It will fight with other angelfish species.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. Make sure you drip acclimate them over a period of an hour or longer depending on differences in the source water and your water. Get them eating as soon as possible.

Diet / Fish Food : In the ocean Blue Ring Angelfish are found eating filamentous algae, tunicates and sponges. There are saltwater angelfish foods on the market now that contain sponge. They may show a feeding response with fresh finely chopped pieces of fish, squid, shrimp, thawed mysis shrimp and brine shrimp.

Tank Region : Once this annularis angelfish settles in they should be on the move all over the tank.

Gender : Not possible to use external characteristics to differentiate males from females.

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

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Michael, S. W. (2004) Angelfishes and Butterflyfishes. T.F.H. Publications

EMPEROR ANGELFISH - POMACANTHUS IMPERATOR

The Emperor Angelfish is also known in some parts of the world as the Emperor or Imperial Angelfish and is one of the more expensive marine fish to purchase. Because of the price of the Emperor Angelfish and because they are not necessarily as hardy as some of the other marine angels you will need a completely cycled tank before you even think of introducing one. They can get quite large, 15 inches (38 cm), and need to be kept in at least a 100 gallon (568 liters) aquarium. A very large tank with plenty of live rock that can provide hiding places is a good setup for Emperor Angelfish.

This Emperor Angelfish is a fish where the juveniles look very different from the adults. It should also be noted that many hobbyists complain that the colors of their Emperors not being very brilliant. This is most likely due to a nutritional issue. In the wild Emperor Angelfish frequently eat sponges and a steady diet of sponges can be difficult to reproduce in the home aquarium. Providing a varied diet consisting of vitamin enriched and color enhancing fish food may help with the coloration issues.

Use caution if you plan to have one of these Emperor Angelfish in your reef aquarium. They are known to nip at some soft and stony corals. You will also need to use caution when selecting tank mates because this fish can be very territorial and because it may grow to be very large.

On the disease front, they are prone to some of the more common parasites and should definitely be kept in a quarantine tank for a few weeks before introducing them into your main tank.

Emperor Angelfish Picture



Emperor Angelfish Profile Facts and Care Information

Scientific Name : Pomacanthus imperator

Common Names : *Emperor Angelfish, Imperator Angelfish, Imperial Angelfish*

Care Level : Moderate

Size : Up to 15 inches (38 cm)

Emperor Angelfish Life span : 10 - 15 years or longer in the wild, but not likely in captivity

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Emperor Angelfish Temperament / Behavior : They can be aggressive with others and may quickly become the dominant fish in the tank.

Emperor Angelfish Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 100 gallon (568 liters) minimum

Emperor Angelfish Compatible Tank Mates : Use caution when selecting tank mates. You want to avoid anything small enough for them to eat, which would include smaller fish and crustaceans. These fish are not necessarily reef tank safe.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : An omnivore, try to give them a variety of marine foods but predominantly marine algae, spirulina. In the wild, they frequently eat sponges. Having plenty of live rock for them to graze on goes a long way. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually middle to bottom

Gender : No reliable way to determine the differences between males and females.

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

FRENCH ANGELFISH - POMACANTHUS PARU

The French Angelfish is one of the marine specimens that changes colors as it ages. When they are young the French Angelfish will be black with five vertical yellow bars. When French Angelfish mature they will lose those vertical stripes. As juveniles in the wild they perform a cleaner role, but stop doing this after they grow past 4 inches (10 cm) or so.

A fairly hardy fish, the French Angelfish can live for a very long time if given proper care. They will eat most aquarium food including smaller fish and invertebrates. It is important to provide them primarily with marine algae. A large tank with lots of live rock, algae and sponges makes it easier to care for this species.

Temperament can be an issue with this angelfish. They are considered semi-aggressive and may quickly become the dominant fish in your tank. Given their potential adult size of 15 inches (38 cm) and their intolerance of their own kind, you should plan on keeping only one of them in your aquarium.

The French Angel has been noted to be fairly disease resistant but you still need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank.

French Angelfish Picture



French Angelfish Profile Facts and Care Information

Scientific Name : Pomacanthus paru

Common Names : *French Angelfish, Black Angelfish*

Care Level : Moderate

Size : Up to 15 inches (38 cm)

Life span : 15 years or longer

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Caribbean

French Angelfish Temperament / Behavior : They can be aggressive with others and will quickly become the dominant fish in the tank.

French Angelfish Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 100 gallon (568 liters) minimum

French Angelfish Compatible Tank Mates : Use caution when selecting tank mates. You want to avoid anything small enough for them to eat, which would include smaller fish and crustaceans. These fish are not considered reef safe.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : An omnivore, try to give them a variety of marine foods but predominantly marine algae. Having plenty of [live rock](#) for them to graze on goes a long way. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually middle to bottom

Gender : No reliable way to determine the differences between males and females.

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

KORAN ANGELFISH (POMACANTHUS SEMICIRCULATUS)



The Koran Angelfish (*Pomacanthus semicirculatus*) is also sometimes called the Semicircle Angelfish (from the scientific name) and is one of the better suited marine angelfish for hobbyists because it adapts well to aquarium life. They are often kept in community type FOWLR setups but can become territorial as they mature. They will eat most foods given but need a staple diet heavy in algae based foods. Live rock can provide feeding opportunities in between meals. Mysis shrimp, brine shrimp, clams on the half shell, etc. will be accepted as well. Feed them several times a day for best results.

The Koran Angelfish is being sold for around \$40 to \$100 depending on size.

Koran Angelfish Profile Facts and Care Information

Scientific Name : *Pomacanthus semicirculatus*

Common Names : *Koran Angelfish, Semicircle Angelfish, Koran Angel*

Queen Angelfish Care Level : Easy to moderate - adapts well but needs a big tank.

Size : 14 inches (37 cm)

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 80°F (22°C - 27°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo-Pacific at depths of 1 to 30 meters, found in singles or sometimes pairs near heavy coral cover.

Reef Tank Safe? No

Temperament / Behavior : Introduce them last to the tank. They will adapt well and claim the tank as their own.

Breeding / Mating / Reproduction : No reports of successful breeding attempts.

Minimum Tank Size : 240 gallons (900 liters)

Compatible Tank Mates : It will fight with other angelfish.

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Feed them several times a day with foods heavy on algae. Look for a good marine angelfish food (sponges) - comes in frozen cube packs now. Author Scott Michael writes that they may even eat slime algae (cyanobacteria)!

Tank Region : All over the aquarium.

Gender : No external differences between males and females.

Forum : Saltwater Angelfish Forum

Photo Credit : Stan Shebs (wikimedia)

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Pomacanthus semicirculatus*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

Michael, S. W. (2004) Angelfishes and Butterflyfishes. T.F.H. Publications

QUEEN ANGELFISH (HOLACANTHUS CILIARIS)



The Queen Angelfish is found on the coral reefs of the Western Atlantic Ocean. The Queen Angelfish is usually found alone or sometimes as a pair. These queen angelfish can get quite large, up to 18 inches (45 cm) and are not recommended for the saltwater beginner simply because most folks don't have a large enough tank to keep them in. You would need at least a 200 gallon tank to adequately care for them!

The coloration and markings on the Queen Angelfish as a juvenile are very different from the adults. Juveniles have a darker body with white vertical bars towards the back of the body. They lose these bars as adults and develop a sort of "crown" on top of the head, which is probably why they have the common name "Queen Angelfish". The dorsal and anal fins will grow past the tail fin (caudal fin).

They can be relatively hardy once acclimated into a well-established, large tank that is 6 months or older. Since this fish is quite expensive (approximately \$80 - \$200 USD) you don't want to add them to a new tank going through the nitrogen cycle or one without sufficient amounts of live rock. Live rock may provide grazing opportunities for them in between meals as well as hiding places to help make them feel more secure. Don't plan on keeping multiple Queens in the same tank or territorial aggression may ensue. They may also pick fights with other saltwater angelfish species, but that may be less likely. Be prepared to separate them if necessary.

The biggest issue you'll most likely encounter is feeding them. In the wild they mostly eat sponges. This can be near impossible to reproduce in the home aquarium, but fortunately we

can buy frozen marine foods containing sponges. In fact, there are frozen cube packs now made especially for saltwater angelfish and butterfly fish. Try to supplement their diet with dried marine algae and/or vitamin enriched herbivorous fish foods.

This fish is usually the show piece or prized specimen for hobbyists with the right tank setup and they are truly an awesome fish.

Queen Angelfish Profile Facts and Care Information

Scientific Name : *Holacanthus ciliaris*

Common Names : *Blue Angelfish or Yellow Angelfish*

Queen Angelfish Care Level : Moderate to Difficult, need a large tank and they can sometimes be difficult to feed.

Size : Up to 18 inches (45 cm)

Life span : 15 - 20 years, possibly longer

pH : 8.1 - 8.4

Temperature : 72°F - 76°F (22°C - 24°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Atlantic, Gulf of Mexico, Caribbean to Brazil, South America

Queen Angelfish Temperament / Behavior : They can be aggressive with other angelfish, especially other queen angelfish.

Breeding / Mating / Reproduction : Very difficult to breed in captivity. Egg scatterer.

Tank Size : 200 gallon (757 liters) minimum

Queen Angelfish Compatible Tank Mates : Obviously, given the large potential size of this fish as an adult you'll want to avoid keeping it with smaller species. Avoid other Saltwater Angelfish species. The vast majority of hobbyists don't have the proper setup to house more than one of these.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment. They don't seem to get afflicted with the usual saltwater fish diseases, but you still should quarantine any new arrivals.

Queen Angelfish Diet / Fish Food : In the wild the Queen Angelfish primarily eats sponges and sometimes marine algae, spirulina and dried marine algae needs to be fed to them. Look for angelfish foods with sponge matter included. San Francisco Bay Brand has frozen cube packs made especially for Angel fish and Butterfly fish. A tank with [live rock](#) will be much better for your angelfish than one without it.

Tank Region : All over, but mostly middle to bottom

Gender : It can be hard to tell the difference between adult male and female specimens. Males may grow to be larger.

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

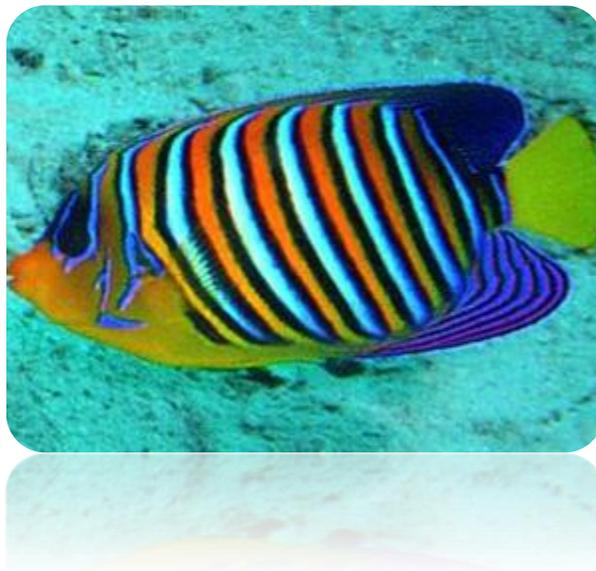
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Michael, S. W. (2004). [Angelfishes and Butterflyfishes](#). T.F.H. Publications

REGAL ANGELFISH (PYGOPLITES DIACANTHUS)



The Regal Angelfish (*Pygoplites diacanthus*) is also known as the Royal Angelfish. It is one of those species that is highly sought after by more advanced saltwater aquarium keepers. It comes with a long track record of being known as hard to keep. They are also highly sought after because of their looks. They are jaw dropping beautiful. However, they should be avoided by most hobbyists because they do not adapt well to aquarium life. If you do decide to get one of these regals make sure you see them eating in the store first! Try to get one originating from the Indian Ocean instead of the Indo-Pacific. The Indian Ocean species seem to be able to adapt better to aquariums and feeding than their Indo-Pacific counterparts.

The Regal Angelfish is being sold for around \$75 to \$250 depending on size and location collected. Since the Indian Ocean regals are adapting better they are going for higher prices.

Seriously consider taking a pass on this species unless you feel completely confident in your abilities to get them eating.

Regal Angelfish Profile Facts and Care Information

Scientific Name : *Pygoplites diacanthus*

Common Names : *Regal Angelfish, Royal Angelfish*

Queen Angelfish Care Level : Difficult, does not adapt well to the aquarium, hard to get eating.

Size : 9.8 inches (25 cm)

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 80°F (22°C - 27°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo-Pacific and Indian Oceans - found at depths of 1 to 48 meters in areas with high coral concentrations

Reef Tank Safe? No - may nip at LPS, SPS and clam mantles.

Temperament / Behavior : May get bullied by other large angelfish species

Breeding / Mating / Reproduction : No reports of successful breeding attempts.

Minimum Tank Size : 120 gallons (450 liters)

Compatible Tank Mates : Introduce first to the tank and let it claim a territory if you plan on stocking it with other large fish species. Fish only and FOWLR type setups.

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Feed them several times per day with specialized marine angelfish formulas heaving in sponges. Mix in live foods such as mysis shrimp, brine shrimp, etc. Clams on the half shell, scallops or tiny bits of fresh fish may help get them eating. Feed them often.

Tank Region : All over the aquarium.

Gender : Don't know of any external differences between males and females.

Forum : Saltwater Angelfish Forum

Photo Credit : Aquafanatic (wikimedia)

Author : Mike FishLore

References :

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Pygoplites diacanthus*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

Michael, S. W. (2004) Angelfishes and Butterflyfishes. T.F.H. Publications

SCRIBBLED ANGELFISH (CHAETODONTOPLUS DUBOULAYI)



The Scribbled Angelfish (*Chaetodontoplus duboulayi*) gets their common name from the scribble like markings on their fins. They are not available all that often and when they do become available they can be quite pricey. This marine angelfish has a decent track record of getting on standard angelfish foods like marine angel foods, nori, mysis shrimp, brine shrimp and maybe even pellets. Try to feed them several times per day with heavier amounts of algae and sponge based foods.

The Scribbled Angelfish is sold for around \$250 to \$800 depending on size and location collected.

Scribbled Angelfish Profile Facts and Care Information

Scientific Name : *Chaetodontoplus duboulayi*

Common Names : *Scribbled Angelfish*

Queen Angelfish Care Level : Moderate

Size : 11 inches (28 cm)

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 80°F (22°C - 27°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo-West Pacific: northern Australia and parts of Indonesia - found near reefs with heavy coral growth, sometimes found in pairs or groups

Reef Tank Safe? No

Temperament / Behavior : May become more aggressive as they get older.

Breeding / Mating / Reproduction : No reports of successful breeding attempts in the home aquarium.

Minimum Tank Size : 180 gallons (680 liters)

Compatible Tank Mates : It will fight with other angelfish. Should be fine with similar sized non angelfish species.

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Eats sponges, algae and tunicates in the wild. There are prepackaged and affordable cube packs now available online and at your local fish store made especially for marine angelfish.

Tank Region : All over the aquarium.

Gender : Males reportedly have the horizontal scribbles not only on the fins but on their body as well. Females will have no scribbles on their body, just the fins and instead have a dark blue body.

Forum : Saltwater Angelfish Forum

Similar Species : Large Saltwater Angel fish - Bellus Angelfish, Blue Angelfish, Blue Ring Angelfish, Blueface Angelfish, Emperor Angelfish, French Angelfish, Koran Angelfish, Queen Angelfish, Regal Angelfish

Photo Credit : Michael K. Oliver (wikimedia)

Author : Mike FishLore

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ANTHIAS

PEACH ANTHIAS, PEACH FAIRY BASSLET

The Peach Anthias is a fantastic looking saltwater fish, but unfortunately, may not be the best choice for most marine aquarium keepers. Anthias can be quite finicky when first introduced and are susceptible to most saltwater fish diseases. Proper acclimation and the use of a quarantine tank is a must with Anthias.

To help make them feel secure you should provide lots of live rock for hiding. In the ocean, they are commonly found on the outer reefs where there is very strong water movements and providing strong water movement using multiple powerheads in your aquarium will most likely be rewarded with increased activity from this fish. Open tops could spell trouble with these beauties because they will jump when frightened.

These anthias may do alright with multiple peach anthias but may get aggressive with other smaller sea basses. They should be able to handle being kept singly if needed. Avoid keeping them with larger, more aggressive species such as Lionfish and Eels. They may become snack food for these predators.

When first introduced to your marine tank, you may have problems getting them to start eating. Try frozen brine shrimp cubes or live foods. Once acclimated, try to give them a varied diet of live, frozen, freeze-dried and vitamin-enriched flake foods.

Peach Anthias Picture



Peach Anthias Profile Facts and Care Information

Scientific Name : Pseudanthias dispar

Common Names : *Peach Anthias, Peach Fairy Basslet, Orange Anthias, Redfin Anthias, Fancy Sea Bass*

Care Level : Moderate to Difficult

Size : Up to 4 inches (10 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Red Sea, Indo-Pacific, Australia, Great Barrier Reef

Peach Anthias Temperament / Behavior : Can get aggressive with other anthias. May get bullied by damselfish and eaten by larger, more aggressive tank mates.

Breeding / Mating / Reproduction : Not sure, but haven't heard any reports of this species breeding in captivity. May need a species only tank with optimal water quality.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other anthias species. If you do, introduce them at the same time to limit territorial aggression. May get harassed or eaten by larger tank mates. Utilize live rock to help make them feel secure at night.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivorous and feeds on plankton in the ocean. Try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and live foods. May have to start with frozen or live foods such as mysis or brine shrimp.

Tank Region : Middle to top.

Gender : Have the ability for a female in the harem to change into a male if the male dies. Males have a brighter red dorsal fin.

Author : Mike FishLore

BLACKCAP BASSLET (GRAMMA MELACARA)



The Blackcap Basslet (*Gramma melacara*) is a rich purple color with a black head. Looks like they are sporting a black cap. They get to about 4 inches in size (10 cm) and are considered hardy. They acclimate to aquarium life well and may even be mostly captive raised nowadays. They were one of the original species to have been bred in captivity. Provide plenty of cover in the form of live rock and feed them a couple times per day with meaty type marine origin foods or micro pellets.

You can usually buy a Blackcap Basslet for around \$40.

Blackcap Basslet Profile Facts and Care Information

Scientific Name : *Gramma melacara*

Common Names : Blackcap Basslet, Blackcap Gramma

Care Level : Easy

Life span : 2 - 4 years, possibly longer

Size : 4 inches (10 cm)

Water Parameters : pH : 8.1 - 8.4 | Temperature : 72°F - 80°F (22°C - 27°C) | Specific Gravity : 1.020 - 1.025 | Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Central Atlantic: West Indies including the Bahamas - found near steep drop-offs or cliffs, stays near cover.

Temperament / Behavior : May fight with other basslets or similar looking (blennies) species.

Breeding / Mating / Reproduction : Forms pairs, egg guarder. Males build nest and both male and female guard the eggs until hatching. They have been bred in aquariums.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Keep with similar sized species, one to a tank except in larger setups.

Reef Tank Safe? : With Caution - may pick at inverts (hermit crabs)

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Mostly carnivores - small meaty marine origin foods like mysis shrimp, brine shrimp, etc.

Tank Region : Stays close to cover, live rock.

Gender : No external characteristics to go on.

Photo Credit: Aquaimages (wikimedia)

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Gramma melacara*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

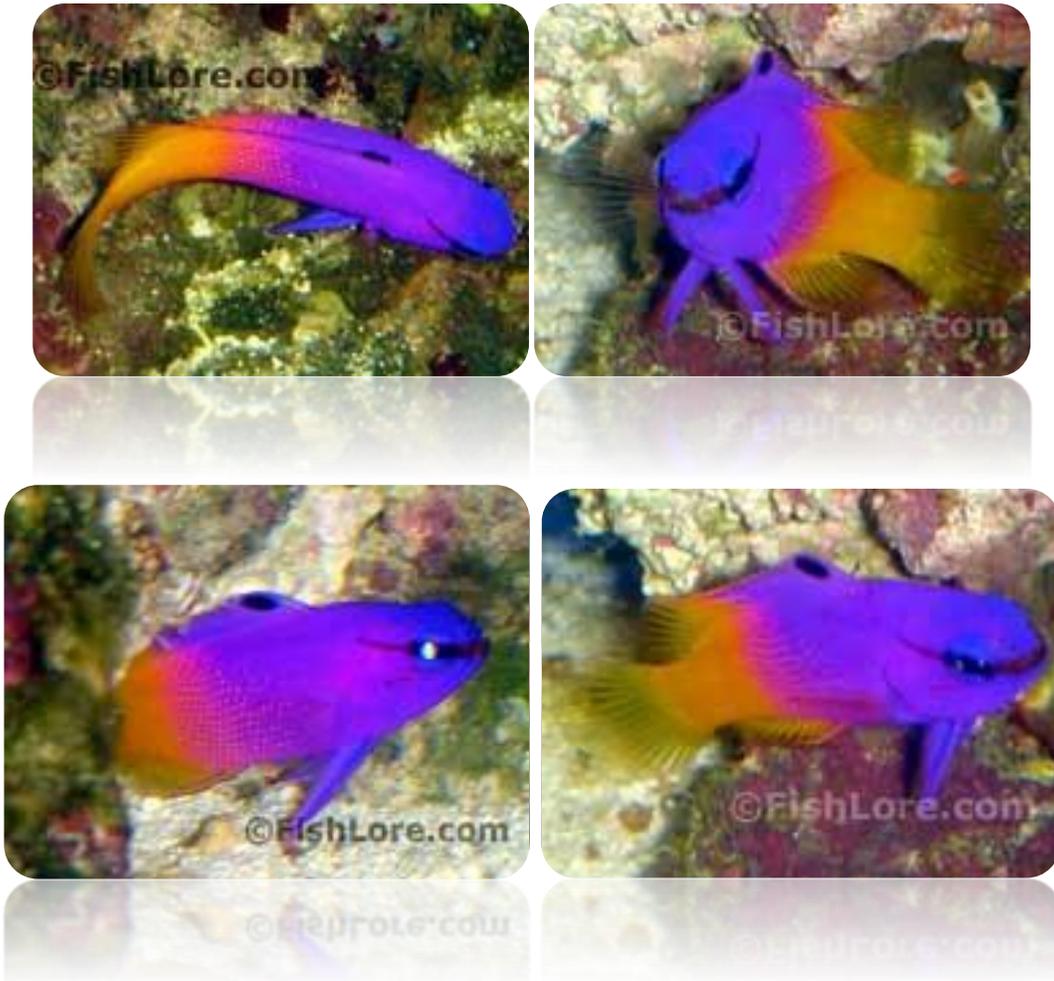
The Royal Gramma or Fairy Basslet is a true beauty and originally comes from deeper waters in the Caribbean but many are now being tank raised. The Fairy Basslet (Royal Gramma) can usually be found at prices ranging from \$10-\$30 USD. The front half of their body is purple/orchid and changes midway to a vibrant yellow.

The Royal Gramma is a good saltwater beginner's fish because of their hardiness and are excellent community tank mates but can become aggressive with other royal grammas. You need to give this fish many hiding places to help make them feel secure. They can be quite active and are great to watch if given the proper tank environment.

Royal Grammas may not make a good choice for a reef tank because they will nip at smaller invertebrates such as red and blue leg hermit crabs and turbo snails.

For fish food, the Royal Gramma will accept vitamin enriched flakes, pellets and live foods. Try to vary their diet for best health and coloration.

Royal Gramma Pictures



Fairy Basslet, Royal Gramma Profile Facts and Care Information

Scientific Name : Gramma loreto

Common Names : *Royal Gramma, Fairy Basslet*

Care Level : Easy to moderate, can be a good fish for saltwater fish beginners.

Size : Up to 4 inches (10 cm)

Life span : 3 - 5 years

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Caribbean, tank raised is becoming more common.

Fairy Basslet Temperament / Behavior : They can be somewhat aggressive with other royal grammas when defending their territory. Because of this, keep only one of this species per tank to avoid the territorial aggression. Be sure to provide plenty of hiding places to help make them feel secure.

Fairy Basslet Breeding / Mating / Reproduction : Many breeders are reporting success tank raising this fish.

Tank Size : 30 gallon minimum

Fairy Basslet Compatible Tank Mates : Avoid keeping them in an aquarium with Lionfish, Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them. Only one of this species per tank, unless you have a very large aquarium with lots of hiding places. Can be good in a reef tank.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily a carnivore but try to give them a variety of foods. They will take vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Middle to bottom, need plenty of hiding places.

Gender : All are born females but can change sex to males. Males are more colorful than the females and will darken when they are ready to mate. Males may also become slightly larger than females.

Author : Mike FishLore

BICOLOR BLENNY (ECSENIUS BICOLOR)

The Bicolor Blenny is also known as the Two Colored Blenny and they go for about \$20 online and slightly higher locally. The Bicolor Blenny has a brown front half of the body fading into a yellow-orange in the middle half of their body. This blenny is a cute little fish that will bring some personality to your tank but may fight with other blennies in smaller tank setups.

The Bicolor Blenny is considered hardy but you still need to do a drip acclimation of about an hour or so, depending on the differences in source and tank water. Don't introduce them to new tanks without sufficient micro algae growth for them to graze on in between meals. They are omnivores and will accept small meaty foods such as thawed mysis and brine shrimp. Make sure you have lots of live rock though which will provide food in the form of micro algae and it will provide shelter for them. You won't see them swimming the tank, out and about like other active fish species. The Bicolor Blenny will hop from rock to rock, picking at bits and pieces and then swim to it's next chosen spot. They do seem very inquisitive.

Have a good fitting aquarium hood because they have been known to carpet surf. This holds true for a lot fish species that get spooked, blennies and wrasses more so it seems.

They have been bred in an aquarium and they are considered nesters/egg guarders. Males may be slightly larger than the female Bicolor Blenny.

Bicolor Blenny Pictures



Bicolor Blenny Profile Facts and Care Information

Scientific Name : Ecsenius bicolor

Common Names : *Bicolor Blenny*, *Two Colored Blenny*

Care Level : Easy

Life span : 2 - 4 years, possibly longer

Size : 4 inches (10 cm)

pH : 8.1 - 8.4

Temperature : 70°F - 82°F (21°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Maldives, Ryuku Islands, Micronesia, Great Barrier Reef

Temperament / Behavior : In general, the Bicolor Blenny is peaceful with tank mates but may scarp with other blennies.

Breeding / Mating / Reproduction : These blennies are nesters and egg guarders and they have been bred in the aquarium.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Does well with most other species, except other blennies or fish large enough to eat them.

Reef Tank Compatible? : If kept well fed, they could be considered safe. But, there are reports of them picking at clam mantles and LPS corals.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : These Bicolor Blennies are omnivores and will eat foods that are small enough in size. They will also pick at micro algae growing on the live rock. Thawed mysis shrimp, brine shrimp and thawed herbivore marine blends would be good to give them. Try to get them on a

good pellet food like New Life Spectrum (1 mm) too. Getting them to eat pellets could be considered difficult.

Tank Region : Normally found perched on a rock or in a cave or crevice. These fish are not active swimmers.

Gender : There may be a size difference in males vs. females with males being slightly larger.

Forum : [Blenny Forum](#)

Author : [Mike FishLore](#)

References

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

"*Ecsenius bicolor*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

LAWNMOWER BLENNY, ROCKSKIPPER BLENNY

The Lawnmower Blenny (*Salarias fasciatus*), also known as the Jewelled Blenny or Rock Skipper, is a saltwater utility fish that is used as part of a cleanup crew to keep hair algae at a minimum. In our opinion, using the Lawnmower Blenny as a means of controlling algae should only be considered as a short-term fix to a bigger issue. Accumulating nutrients that feed the algae growth need to be diluted through better aquarium husbandry. The lawnmower blenny will hop from rock to rock rasping at the algae growth and they do a great job on "hair algae". However, once this algae is reduced supplemental feeding may become necessary to prevent starvation.

The Lawnmower Blenny can usually be purchased locally or online anywhere from \$10 to \$20 US dollars. They do ship well but buying one sight unseen can be risky. Use a local supplier as your first option.

This Lawnmower Blenny is quite endearing and has a very curious personality. They may remind you of an iguana or similar lizard the way they look at you with those orbital eyes. A healthy and well adapted specimen will be very aware of it's surroundings and observant of other fish and the aquarium keeper. If you walk by the tank while they are eating, they will stop and take notice of you for a bit and then continue on with what they were doing. Very cool little fish.

Use caution if you plan on keeping one of these lawnmower blennies in a reef tank setup. They have been reported to become more aggressive as they grow and will not tolerate same or similar species in smaller tanks. Obviously, you don't want to keep them with much larger species either that may view them as food (Lionfish, Triggers, etc.). Nipping at coral polyps and clam mantles is sometimes reported, so again, use caution if you have a reef tank and be prepared to remove them if this becomes a problem. Since the Lawnmower Blenny likes to stay around the live rock, removing them can be quite difficult. A fish trap may be necessary in this case. Author Scott Michael advises not to keep these Jewelled Blennies with seahorses and pipefishes "which it will harass".

Lawnmower Blenny Pictures



Lawnmower Blenny Profile Facts and Care Information

Scientific Name : *Salarias fasciatus*

Common Names : *Lawnmower Blenny, Algae Blenny, Jewelled Rockskipper Blenny, Rock Blenny*

Care Level : Easy

Life span : 2 - 4 years, possibly longer

Size : 4 - 6 inches or larger (10 - 15 cm)

pH : 8.2 - 8.4

Temperature : 70°F - 82°F (21°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Red Sea, Great Barrier Reef

Lawnmower Blenny Temperament / Behavior : These blennies can be quite peaceful with most tankmates, but may get belligerent with similar looking species or it's own species. They may get more aggressive with other tankmates as they mature.

Breeding / Mating / Reproduction : Egg layer - they lay eggs that are sticky and attached to the substrate. Can be difficult since they might be aggressive with their own species unless they are a mated pair. Getting the pair is the hard part.

Tank Size : 30 gallon minimum, preferably much larger with lots of filamentous algae growth for food.

Compatible Tank Mates : As mentioned previously, one to a tank is advised unless you have a mated pair or a sufficiently large enough aquarium with lots of algae for them to eat.

Reef Tank Compatible? : Not really considered reef tank safe. They have been known to nip at corals and clam mantles.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - although this blenny is very hardy, they can still succumb to the usual fish diseases if you don't practice proper quarantine procedures.

Diet / Fish Food : You need lots of live rock with algae growth to sustain your Lawnmower Blenny long-term. You can try to supplement with dried algae sheets (nori) using a veggie clip or placed under some live rock in the tank for them to eat. Make sure they are getting enough to eat or trade them with someone that does.

Tank Region : Usually on, in or around the live rock or sand substrate. They are known as rock skippers because of the way they kind of hop from rock to rock on the reef.

Gender : Hard to determine differences between male and female.

Forum : Blenny Forum

Author : Mike FishLore

References

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

"*Salarias fasciatus*". *FishBase*. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: *FishBase*, 2005.

MIDAS BLENNY (ECSENIUS BICOLOR)



The Midas Blenny is also known as the Golden Blenny and the Lyretail Blenny. They can be a little aggressive with other blennies and maybe with even some of the other fish in smaller setups. They get to around 5 inches or so and will accept thawed, live foods and eventually micro pellet foods.

They are usually sold for around \$30 to \$50 depending on their size.

Midas Blenny Profile Facts and Care Information

Scientific Name : Ecsenius bicolor

Common Names : Blenny, Golden Blenny, Lyretail Blenny

Care Level : Easy

Life span : 2 - 4 years, possibly longer

Size : 5 inches (13 cm)

Water Parameters : pH : 8.1 - 8.4 | Temperature : 72°F - 80°F (22°C - 27°C) | Specific Gravity : 1.020 - 1.025 | Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific: Gulf of Aqaba and southeast coast of Africa - lives near coral reef areas in moderate currents.

Temperament / Behavior : This blenny may fight with other blennies.

Breeding / Mating / Reproduction : Forms pairs, egg guarder.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Keep with similar sized species, one blenny to a tank except in larger setups. Don't keep with fish large enough to eat them.

Reef Tank Compatible? : Yes

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Feed them small meaty marine origin foods like mysis shrimp, brine shrimp, etc. There are some really good frozen pre-made foods like Rod's foods that have all sorts of good food items.

Tank Region : Usually stays close to cover, live rock.

Gender : No external characteristics to go on.

Forum : Blenny Forum

Author : Mike FishLore

References :

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"Ecsenius bicolor". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

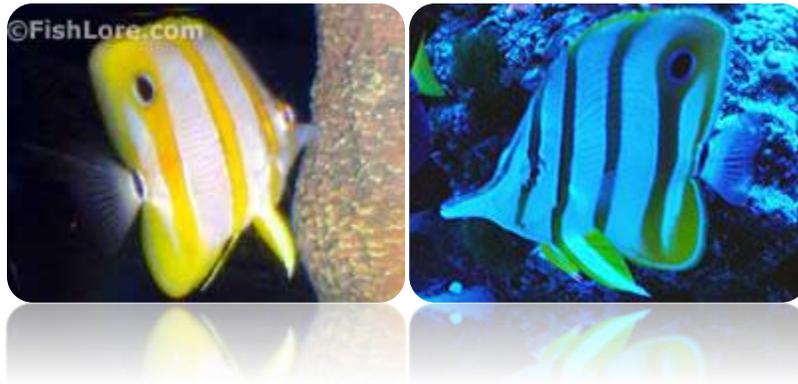
COPPERBAND BUTTERFLY FISH - CHELMON ROSTRATUS

The Copperband Butterfly Fish is one of the more difficult marine fish to keep in the home aquarium and is definitely not recommended for a saltwater beginner. Only introduce a Copperband Butterfly Fish to a long established tank (6 months or more) with peaceful tank mates. If you have a new tank and it is still going through the aquarium nitrogen cycle, you can kiss this baby good bye. Copperband Butterfly Fish are very delicate and it can be very difficult to get them eating. Always ask to see this fish eating in the store before you buy it! You may need to experiment with various live foods, including brine and mysis shrimp. Some hobbyists have reported success using fresh clams on the half shell placed in the bottom of the tank to get them to start eating.

Physically, the Copperband Butterfly Fish is a very beautiful white with copper bands running vertically on the sides of the body. They have a "false eye" towards the back of the dorsal fin and can get up to about 8 inches (20 cm). They should play nicely with other, peaceful tank mates but will not tolerate other butterfly fish in the same tank.

Since they are so delicate they come down with the typical saltwater fish diseases and you need to take proper pre-cautions by using a quarantine tank before introducing them into your main tank. Take your time while acclimating them to the tank. Keep your Copperbanded Butterflyfish in the hospital tank for two weeks or so and watch for obvious saltwater diseases, like marine ich. This will also give them time to recuperate from transport and it may be easier to get your Copperbanded Butterfly eating without competition from other tank mates.

Copperband Butterfly Fish Picture



Copperband Butterfly Fish Profile Facts and Care Information

Scientific Name : *Chelmon rostratus*

Common Names : *Copperband Butterfly Fish, Beaked Coralfish, Copper-banded Butterfly Fish*

Copperband Butterfly Fish Care Level : Difficult

Size : Up to 8 inches (20 cm)

Life span : 4 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indian Ocean, Indo-Pacific, Australia

Copperband Butterfly Fish Temperament / Behavior : They can be aggressive with other butterfly fish.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 75 gallon (284 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping a Copperband Butterfly Fish with other butterfly fish and they may not be a good choice for saltwater reef tanks. May nip at soft corals. Try to keep them with some of the more peaceful marine species.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily carnivorous, try to give your Copperband Butterfly Fish a variety of marine foods, including brine and mysis shrimp. They will eat aiptasia (glass anemones). It can be very difficult to get them to start eating. You may need to feed live foods exclusively until well acclimated to your tank and then try to wean them onto frozen and flake foods.

Tank Region : Usually middle to bottom

Gender : Difficult to determine the differences between males and females.

Forum : Saltwater Butterfly Fish Forum

Author : Mike FishLore

LINED BUTTERFLY FISH - CHAETODON LINEOLATUS

The Lined Butterflyfish can get up to 12 inches (32 cm) in size and is one of the larger of the butterfly fish species. Lined Butterflyfish are found near areas of heavy coral growth on reef slopes and sometimes travel in groups, pairs and in singles. If you can even find them in your local shop (rarely caught for the hobby), you may want to pass on this butterfly fish. Their potential adult size and their eating habits would keep them out of most aquarium setups. The lined Butterflyfish is a coral eater, feasting on soft and stony coral polyps and mushroom anemones.

Acquiring a good specimen is usually hit or miss and some recommend getting smaller sized specimens because they should acclimate more easily. Frequent small feedings several times a day may be required and once they are acclimated they should do well in the proper setup.

Obviously, feeding a Lined Butterflyfish coral polyps could get rather expensive. Try to offer a varied diet of meaty foods such as mysis, brine shrimp, carnivorous frozen marine foods, etc. A large tank (at least 150 gallons) is needed given their potential adult size.

If you have the right setup, this could be a nice addition to your live rock only tank with maybe faux corals used as decorations.

Lined Butterflyfish Picture



Lined Butterflyfish Profile Facts and Care Information

Scientific Name : Chaetodon lineolatus

Common Names : *Lined Butterflyfish, New Moon Coralfish*

Care Level : Moderate, take your time acclimating them to the tank.

Size : Up to 12 inches (32 cm)

Life span : 10 years is the longest reported.

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Reef face, reef slopes in heavy coral growth areas in the Indo-Pacific from the Red Sea to Hawaii and south to the Great Barrier Reef.

Lined Butterflyfish Temperament / Behavior : Even though they are sometimes found in groups in the ocean, only keep one to a tank. They may scarp with similar colored/marked fish.

Breeding / Mating / Reproduction : To our knowledge this species has not bred in captivity.

Tank Size : 150 gallon (570 liters) minimum given their adult size of 12 inches, one of the biggest butterfly fish.

Compatible Tank Mates : Lined Butterflyfish can be fairly hardy and may do well with similarly sized non-butterfly species. Keep them out of saltwater reef tanks. May nip at corals and smaller invertebrates. This is known as one of the more aggressive butterflies.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment.

Diet / Fish Food : Besides the acclimation period, feeding them may present one of the most challenging aspects of keeping them. Frequent small feedings per day of marine origin meaty type foods should be given.

Tank Region : All over, can be a very active swimmer.

Gender : No externally distinguishing characteristics to determine the differences between males and females.

Forum : Saltwater Butterfly Fish Forum

Author : Mike FishLore

References :

"Chaetodon lineolatus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

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Similar Species : [Butterfly Fish](#) - [Copperband Butterfly Fish](#), [Raccoon Butterfly Fish](#), [Longfin Bannerfish](#)

LONGFIN BANNERFISH - HENIOCHUS ACUMINATUS

The Longfin Bannerfish can be a good choice given the proper aquarium setup. The Heniochus species are often lumped in with the Butterfly fishes but the Heniochus species are usually much easier to care for than most of the butterfly species. We too have grouped them in with the butterfly species for convenience. The Longfin Bannerfish is also known as the "Poor Man's Moorish Idol" since it sort of resembles the Moorish Idol but the bannerfish is better suited to aquarium life. They are striped white and black with yellow dorsal and caudal fins along with the signature long white banner fin that can extend out past the caudal fin (tail fin). The body shape of this fish reminds us a little of the freshwater angelfish.

The Heniochus acuminatus and the Heniochus diphreutes are extremely similar looking and it can be difficult to determine the difference in adolescents. The H. diphreutes has more of a stub mouth and a more rounded anal fin. In the H. acuminatus the anal fin forms more of an angle at the tip.

It is possible to keep multiple Longfin Bannerfish in the same tank. In the ocean they form small schools and pairs. They do need a larger tank when keeping multiples given their adult size and their need for adequate swimming space. They are quite passive and rarely bother tank mates. They may get bullied by larger fish species such as tangs and triggers.

Assuming that you've picked out a good specimen with no visible signs of illness or disease, Longfin Bannerfish should easily acclimate to your tank. They are not at all picky (usually) about the foods they are given and should eat most fish foods presented to them. Get and use a good flake food and supplement with fresh and frozen foods. If you do get one that is finicky, try the frozen brine shrimp cubes (thawed first) and slowly get them on flakes. The live rock in your tank can provide places of shelter and can also be a food source that the Longfin Bannerfish may pick at in between meals.

It is reported that H. acuminatus should not be considered reef safe whereas the H. diphreutes is reef safe (S. Michael 2001).

Longfin Bannerfish Picture



Longfin Bannerfish Profile Facts and Care Information

Scientific Name : Heniochus acuminatus

Common Names : *Longfin Bannerfish, Black and White Butterflyfish, Poor Man's Moorish Idol, Bannerfish, Pennant Coralfish, Wimple fish*

Care Level : Easy

Size : Up to 10 inches (25 cm)

Life span : 5 years or longer

pH : 8.2 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, North and South Japan, Micronesia, sticks close to the reef slope and often seen in lagoons.

Temperament / Behavior : This bannerfish is very peaceful with other fish species, but may pick at reef invertebrates.

Breeding / Mating / Reproduction : Very difficult to breed in captivity. They do form pairs.

Tank Size : 100 gallon (379 liters) minimum given that they like to school and need lots of swimming room.

Longfin Bannerfish Compatible Tank Mates : Since this species is fairly passive, you'll want to stock them similar minded fish species. You may have issues if you plan on keeping them with other butterfly fish and they should be kept out of saltwater reef tanks. May nip at soft corals and smaller invertebrates. May get bullied by tangs.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. Relatively hardy but can still contract marine ich (cryptocaryon) and Amyloodinium.

Diet / Fish Food : Longfin Bannerfish mostly eat zooplankton in the ocean, but will and should go after most foods offered. Try to feed them a varied diet of fresh meaty foods, frozen foods (thawed first) and a good quality and balanced flake food. They may also pick at algae growing on tank surfaces and live rock.

Tank Region : All over, but usually the middle to the top regions of the aquarium.

Gender : No externally distinguishing characteristics to determine the differences between males and females.

Author : Mike FishLore

References :

"Heniochus acuminatus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

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RACCOON BUTTERFLY FISH - CHAETODON LUNULA

The Raccoon Butterfly fish is one of the hardier of the butterfly species. In the wild the Raccoon Butterfly fish is primarily nocturnal, meaning that it is most active at night. Provide plenty of hiding places to help make your Raccoon Butterfly feel secure.

The Raccoon Butterfly Fish can reach up to 8 inches (20 cm) so you will need a fairly large (55 gallon, 208 liters) tank to keep one. Unless you have a really large tank, you should avoid keeping them with other butterflyfishes because they can become territorial. However, they should get along well with most other species in the home aquarium.

Disease can be a problem with the Raccoon Butterfly Fish. They seem to be especially prone to saltwater ich (cryptocaryon) and for this reason you should definitely quarantine this fish before introducing it to your main tank. They also need highly oxygenated water. Add some air stones along with a few powerheads for water movement to your tank.

The Raccoon Butterfly Fish is not as picky as some of the other butterfly fishes when it comes to food. They are primarily carnivores so try to give them live and frozen foods as much as possible. They may also go after some of your invertebrates and are not considered safe for reef tanks.

Raccoon Butterfly Fish Picture



Raccoon Butterfly Fish Profile Facts and Care Information

Scientific Name : Chaetodon lunula

Common Names : *Moon, Half Moon, Red Striped Butterfly Fish*

Care Level : Easy to moderate

Life span : 5 - 7 years, maybe longer

Size : 8 inches (20 cm) or larger.

pH : 8.2 - 8.4

Temperature : 74°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Fiji, Hawaii

Raccoon Butterfly Fish Temperament / Behavior : Generally peaceful except with other butterfly fish.

Raccoon Butterfly Fish Breeding / Mating / Reproduction : Not common in the home aquarium.

Tank Size : 55 gallon (208 liters) minimum and preferably larger.

Raccoon Butterfly Fish Compatible Tank Mates : Generally peaceful but avoid keeping them with other Butterfly fish unless you have a really large tank (100 gallons or more). Triggers and Lionfish may pose some compatibility problems. Use caution when stocking them with saltwater invertebrates.

Fish Disease : Saltwater Fish Disease Important to quarantine new arrivals for a week or two and watch for marine ich.

Diet / Fish Food : Primarily a carnivore and prefers live foods. Try to get them on frozen or fresh foods quickly.

Tank Region : Middle to bottom

Gender : Difficult to determine

Author : Mike FishLore

Forum : Saltwater Butterfly Fish Forum

BANGGAI CARDINAL FISH (PTERAPOGON KAUDERNI)

The Banggai Cardinal Fish, sometimes referred to as Kaudern's Cardinal Fish is a remarkable looking specimen having a silver body with vertical black stripes. The Banggai Cardinal Fish body is covered in small white spots that are more easily seen on the dorsal, pelvic, anal and caudal fins. It is interesting to note that these Banggai Cardinal Fish are only found in a rather small area around Banggai Island off Sulawesi. This fish is very close to being placed on the endangered species list because of over collection. Before you purchase a Banggai Cardinal Fish, ask the retailer where they come from. If they say that it was wild caught, please don't buy them. Only buy captive raised or aquacultured specimens. Doing so will help those wanting and willing to aqua culture this species and we definitely want to reward these breeders. Another benefit from getting captive raised Banggai Cardinals is that they usually acclimate much easier than wild caught fish.

The good news is that these little guys are one of the easier saltwater species to breed. The male Banggai Cardinal Fish are mouth brooders which should increase the chances of successfully raising the young. The difficult part is figuring out if you have a pair. You may only be able to accurately tell once they've paired off. If you're really interested in breeding this fish and you have the appropriate equipment and tank setups you can buy a group of 3 and see if 2 of the 3 start to pair off. If they do, you may also notice them going after the third cardinal fish. If this happens and they are in a smaller tank, you will need to remove the third before it is hassled to death.

If your Banggai Cardinal Fish end up breeding you may notice that the mouth on the male will be bulging at the jawline and they aren't eating anything. They won't even go after their favorite foods! The male will mouth brood the fish and then release them after 20 days or slightly longer.



Take your time when acclimating these cardinal fish to your tank water. Once introduced they may hide out for a day or two but should come out once food hits the water. Give them lots of security by providing hiding places (think live rock) and they may be out in the open more.

Feeding Banggai Cardinal Fish can be challenging when first introduced to your tank. They can be quite finicky and will probably not go after flakes or pellet foods. You may need to start with frozen or live fish food and then try to get them onto vitamin enriched flake foods. Aqua cultured specimens should be a little easier to feed.

You may be able to keep multiple Banggai Cardinal Fish in the same tank if it is sufficiently large enough. If you cramp multiples into a smaller tank you will probably see aggression among them, especially once a pair has formed.

Banggai cardinal fish seem to be fairly disease resistant but you still need to take proper precautions and use a quarantine tank before introducing them into your main tank. Keeping them in quarantine can also give you a chance to get them eating without any competition from others.



Banggai Cardinal Fish Profile Facts and Care Information

Scientific Name : Pterapogon kauderni

Common Names : *Banggai Cardinal Fish, Kaudern's Cardinal Fish, Longfin Cardinalfish*

Banggai Cardinal Fish Care Level : Easy to Moderate

Size : Up to 3 inches (8 cm)

Life span : 5 years, perhaps longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, specifically around Banggai Island

Temperament / Behavior : Avoid keeping more than mated pairs in smaller tanks. May be able to keep more in larger aquariums. Watch for aggression among individuals and remove some if necessary.

Banggai Cardinal Fish Breeding / Mating / Reproduction : This fish has been bred in the home aquarium and among saltwater fish, this is one of the easier ones to breed. They are mouth brooders, or more specifically, the male will mouth brood the fry until they are ready to be released. You will need to separate the adults from the young once released. Do a search on "Frank Marini" who has written some excellent articles on the breeding of this fish. His cardinal fish breeding articles are well worth the read if you are the least bit interested in breeding this fish.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : May be able to keep a small school of these in larger aquarium setups with peaceful tank mates. Could be considered a reef safe fish.

Reef Tank Compatible? : We've kept them in a reef aquarium with snails and shrimps and anemones and they shouldn't pose a problem with corals.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily a carnivore, they are thought to feed on smaller crustaceans in the ocean. Getting them to eat can be a problem when first introduced. You may need to start with frozen foods and maybe even live foods to entice them. Try to get them on vitamin enriched flake foods and supplement with frozen fish food. That may be easier said than done though. They may need a steady supply of frozen and live foods for some time.

Tank Region : Mid to top levels mostly

Gender : It can be difficult to determine the sexual differences between male and female banggai cardinalfish until they are ready to breed. The male's lower jaw may be more rounded (for mouth brooding?) whereas the female's jaw may be more straight lined. Another sign may be a much longer second dorsal fin on males. You may only be able to determine that you have a male/female combination when they pair up.

Author : [Mike FishLore](#)

Forum : [Cardinalfish Forum](#)

PAJAMA CARDINALFISH (SPHAERAMIA NEMATOPTERA)

The Pajama Cardinalfish is one of the most unique looking of all fish species. Why exactly do Pajama Cardinalfish have a solid vertical black bar mid-body with the red polka dots on a white body that looks like pajama bottoms? It's surely their way of adapting to their environment, but what in the world... A study of their pattern/coloration would be interesting to read. The Pajama Cardinalfish is favorite with nano reef tank hobbyists due to their small size and temperament. They should get along with most other species (don't keep them with tank mates large enough to scarf them) and will leave the invertebrates in the tank alone.

Pajama Cardinal Fish get to be about 3 inches (8 cm) in size and should do well in at least a 30 gallon tank or larger. You can keep them in groups but watch for aggression amongst them as they grow and start to pair off for breeding. For the intrepid aquarists they are candidates for breeding in the home aquarium because they are mouth brooders. The males get the mouth brooding duties.

Feeding them can be slightly challenging at first. They may not go after flake foods and if that is the case try giving them defrosted or live brine shrimp or mysis shrimp. Try to get them on a good high quality flake food and feed them frequent small amounts of various foods to maintain health and vigor.

Overall, this is a fascinating little cardinalfish species that really grows on you. Check them out and if you get them to breed send us some pictures or post in the forum and tell others about it. The more Pajama Cardinal Fish tank raised specimens out there for hobbyists to purchase the better!

Pajama Cardinalfish Pictures



Pajama Cardinalfish Profile Facts and Care Information

Scientific Name : *Sphaeramia nematoptera*

Common Names : *Pajama Cardinal Fish, Spotted Cardinalfish*

Care Level : Easy to Moderate

Size : Up to 3 inches (8 cm)

Life span : 5 years, perhaps longer

pH : 8.1 - 8.4

Temperature : 72°F - 80°F

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Found throughout the Western Pacific, South to the Great Barrier Reef

Pajama Cardinal Fish Temperament / Behavior : You should be able to keep multiples in the same tank but watch them closely as they pair off and be ready to separate or remove the pairs because they can get somewhat aggressive with others when breeding.

Breeding / Mating / Reproduction : The Pajama Cardinal fish doesn't seem to be as popular for breeding as the Banggai Cardinal but they should be just as "easy". They are mouth brooders like the Banggais. Getting a pair can be achieved by purchasing 4 to 6 pajamas and then letting them pair off as they grow into adulthood. It can take several months of feeding them high quality foods to get them ready to spawn. If you do get a successful spawn you'll want to be ready with enriched rotifers and after a week or so, live brine shrimp. These could be a good first fish to try and breed for those ambitious marine hobbyists out there.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : A favorite fish for reef tank setups because they are mostly peaceful with tank mates. You may see some bickering with conspecifics at times.

Reef Tank Compatible? : Yes, they should leave the invertebrates in the tank alone.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - These cardinalfish are usually fairly rugged. Watch them closely at the fish store and skip any that are in a tank with other infected fish. Ask to see them eating before you buy them. Ask how long they've been in the tank and if it's been a couple of weeks and they look good, they should be fine for selection.

Diet / Fish Food : Mostly carnivorous, Pajama Cardinal Fish need frequent small feedings of meaty marine foods. Like other species a varied high quality diet will go a long way toward keeping them healthy and vibrant.

Tank Region : Seems to like to congregate in the middle levels near overhangs or crevices in the live rock.

Gender : It can be difficult to determine gender at the store. It should become easier as they mature to tell them apart. Males should become slightly larger and females should swell with eggs. The telltale sign is when the males is mouth brooding the fry.

Author : Mike FishLore

Forum : Cardinalfish Forum

Similar Species : Cardinalfish - Banggai Cardinalfish

CLOWNFISH

OCELLARIS CLOWNFISH, ANEMONE FISH

The Clownfish is probably the most popular saltwater fish species today and one of the reasons that many people want to get into the saltwater hobby. The Disney movie Finding Nemo probably has a lot to do with the incredible popularity of the clownfish. Clownfish have a somewhat unique way of swimming. They don't swim like other fish, they waddle and it kind of reminds you of a happy dog when it comes up to greet you. The orange, white and black coloration on the Ocellaris is strikingly beautiful. The Ocellaris Clown is often confused with the True Percula Clownfish because the two species look very similar. The Ocellaris has very thin black bands around the white stripes whereas the True Percula has much wider black bands on the white stripes. They will take almost every type of marine food available and can be very easy to keep.

Many believe that you can't keep a Clownfish without their host anemone. This is not true. You can keep them without their host anemone and many have reported success with breeding them even without having their host anemone present. Because many breeders are having success breeding them, tank raised clowns are readily available. In fact, you are generally much better off buying a tank raised clownfish than a wild one because the tank raised fish tend to have better survival rates and should acclimate more quickly. Tank raised clowns usually cost slightly more than the wild ones but if they adapt better and live longer, it's worth it.

The host anemones that are found in their natural environment of the clownfish can be difficult to care for in captivity and are not recommended for the saltwater novice. Very high output aquarium lighting such as metal halides is often required.

Clownfish Pictures



Clownfish Profile Facts and Care Information

Scientific Name : Amphiprion ocellaris

Other Common Names : *Clownfish, Anemone Fish, Orange Anemone Fish, Nemo*

Clownfish Care Level : Easy, very hardy and good for saltwater beginners, especially the tank raised clowns which should acclimate easier than their wild caught counterparts. Also, keeping them with anemones is not necessary. Only keep anemones if you have the proper aquarium lighting.

Size : 3 - 4 inches (10 cm)

pH : 8 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Specific Gravity : 1.020 - 1.024

Clownfish Lifespan : 3 - 6 years generally, but see comment below from Dudley who has a pair of percula clowns that has been alive for 27 years!

Origin / Habitat : Indo-Pacific to Oceania

Clownfish Temperament / Behavior : Usually they are a very peaceful marine fish. Avoid mixing the various clown species though. If you have a mix of different clown species in your tank, they will fight. If you have a host anemone in the aquarium with them, they will defend it. It usually works out best if you have only one or a pair of clowns in your tank.

Clownfish Breeding / Mating / Reproduction : They have been bred in captivity and it is usually better to buy a tank raised fish because they will adapt better in the home aquarium. More information on [breeding clownfish](#).

Tank Size : 30 gallon minimum

Clownfish Compatible Tank Mates : Avoid keeping them in an aquarium with [Lionfish](#), Snappers, Groupers, Triggers, [Eels](#) or any other predatory fish large enough to eat them. Keep only one clown species in your aquarium. Do not mix the various clown species.

Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivore - provide a varied diet with live food, frozen food and they will also accept flake food.

Tank Region : All over

Clownfish Gender : All are males when they are born. As they mature and start to pair off the dominant one will change into a female. The female is usually larger than the male and will be the primary defender of their territory.

Forum : [Clownfish Forum](#)

Compatible Anemones : [Bubble Tip Anemone](#) (Rose Anemone) (*Entacmaea quadricolor*)

Magnificent Anemone (Ritteri Sea Anemone) (*Heteractis magnifica*)

Giant Carpet Anemone (*Stichodactyla gigantea*)

Saddle Carpet Anemone (Haddon's Sea Anemone) (*Stichodactyla haddoni*)

[Clownfish Anemone Chart](#)

Recommended Book : [Clownfishes Guide to Captive Care and Breeding](#)

Author : Mike FishLore

MAROON CLOWNFISH - PREMNAS BIACULEATUS

The Maroon Clownfish (*Premnas biaculeatus*) has a maroon body with 3 vertical white stripes or lines on its body. There is also a gold stripe Maroon Clownfish variety that comes from Sumatra and the gold stripe is usually a little more expensive. This fish may be one of the most aggressive of the clownfishes. They will not get along well with any other clownfish in the same tank unless they are a mated pair. Even hobbyists keeping them in very large aquariums have reported aggression amongst the maroon clown fish and the other clowns in their tank. They do have the same characteristic swimming style as other clowns and are really interesting to watch.

The Maroon Clownfish is reportedly one of the easier marine fish to breed and they have been successfully breeding in home tanks even without a host anemone present. This is good to know because their host anemone (*E. quadricolor*) requires intense aquarium lighting (metal halides) to be kept alive for prolonged periods of time. Many hobbyists can't afford the metal halides needed for the anemone but should be able to afford a maroon clown which can range anywhere from \$15 - \$25 USD.

Getting Maroon Clownfish to eat standard aquarium fish foods shouldn't pose a problem because they are fairly good eaters. In the wild they eat zooplankton and sometimes algae. Give them a nice variety of marine fish foods such as vitamin enriched flakes, frozen marine preparations and every once in a while, live foods.

Unfortunately, Maroon Clownfish are not all that saltwater fish disease resistant and you will need to use a quarantine tank before introducing them into your main tank. Keep them in the qt tank for two weeks or so and watch for obvious saltwater diseases, like marine ich. Be especially careful with any medications you use with this fish. They will not tolerate high levels of copper based medications!

We have a maroon clown fish pair that hosts with a bubble tip anemone. At feeding time, they will bring back food (usually flake fish food) to the anemone. If you have shrimp, such as the cleaner shrimp, be advised that these shrimp are good at taking food from the anemone. The clownfish would bring the food to the anemone and then the shrimp would scamper up into the anemone and remove the food! When this happens we drop in a few more flakes for the clowns to give to their host anemone. It's very cool to watch the clownfish feeding their anemone.

Maroon Clownfish Picture



Maroon Clownfish Profile Facts and Care Information

Scientific Name : *Premnas biaculeatus*

Common Names : *Maroon Clownfish, Maroon Anemone fish, Spine Cheek Anemone fish*

Care Level : Easy to Moderate

Size : Up to 6 inches (15 cm)

Maroon Clownfish Life span : 5 - 7 possibly much longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Temperament / Behavior : Maroon Clownfish may be aggressive with other Clownfishes in most tank setups and might bully smaller tankmates. They will defend their host anemone (if included in tank) aggressively.

Breeding / Mating / Reproduction : This fish has been successfully bred in captivity with many tank raised specimens being offered for sale. Once paired off, the pair will clean off a suitable spot (flat rock) and then place the eggs in this location and defend the area aggressively.

Tank Size : 30 gallon (1144 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. It's probably not wise to keep them with Lionfish or Triggers large enough to eat them. Also avoid keeping them with smaller more peaceful tankmates because the maroon clowns may bully them.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Maroon Clownfish primarily feed on zooplankton in the ocean but they generally are not very picky when it comes to food. Try to give them a variety of marine preparations. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : All over

Gender : Males are generally smaller, more red and less aggressive than the female. This fish has the ability to change it's sex when the top female dies. A larger male will turn into a female.

Author : [Mike FishLore](#)

Forum : [Clownfish Forum](#)

Compatible Anemones : [Bubble Tip Anemone](#) (Rose Anemone) (*Entacmaea quadricolor*)
Long Tentacle (Corkscrew) Anemone (*Macroactyla doreensis*)
Pizza or Carpet Anemone (*Cryptodendrum adhaesivum*)
Sebae Anemone (*Heteractis malu*)
[Clownfish Anemone Chart](#)

Recommended Book : [Clownfishes Guide to Captive Care and Breeding](#)

The Pink Skunk Clownfish gets their common name because they have pink bodies with a white, skunk like stripe running the top length of their body from mouth to tail. As adults they get to about 4 inches (10 cm) in size and will do fine in aquariums 30 gallons or larger. The pink clownfish doesn't really require all that much swimming room, especially if they have an anemone present. They are not quite as aggressive as some of the other clownfish species and may even get bullied by some species such as damselfish. Also, they do **not** need an anemone present in order to survive. They will do just fine without an anemone in your aquarium.

They can usually be purchased for \$20 to \$30 online if you can't find them locally. Look for tank raised or aquacultured specimens and help support the captive breeding programs in your area or online. When buying pink clownfish from your local saltwater fish store make sure they are eating and ask if they are captive raised. This is very important! Tank raised clownfish are often times more expensive but definitely worth the premium given that they will do much better acclimating to your tank than those pulled from the ocean.

Overall, tank raised species are fairly hardy and will go after most foods placed in the tank. Feed them a good pellet based food (1 mm in size) and supplement with thawed saltwater fish foods as treats from time to time.

Like other clownfish they are considered easy to breed as far as saltwater fish species go. If you are interested in breeding them an excellent resource is the Clownfish book by Joyce Wilkerson linked below.

Pink Skunk Clownfish Pictures



Pink Skunk Clownfish Profile Facts and Care Information

Scientific Name : Amphiprion perideraion

Common Names : *Pink Skunk Clownfish, Pink Anemone Fish, Salmon Clownfish*

Care Level : Easy to Moderate, can become territorial and aggressive.

Size : 4 inches (10 cm)

pH : 8 - 8.4

Temperature : 72°F - 82°F (22°C - 28°C)

Specific Gravity : 1.020 - 1.024

Lifespan : 6 - 8 years or longer

Origin / Habitat : Western Pacific, the Great Barrier Reef and New Caledonia, often found in shallow lagoons near their host anemones in shallower water.

Pink Skunk Clownfish Temperament / Behavior :

Pink Skunk Clownfish Breeding / Mating / Reproduction : They are protandrous hermaphrodites, which means that they are born males but can change sex into a female. In many clownfish species the females are much larger, but with the pink skunk clownfish the differences in size between the male and female is not quite as big.

Tank Size : 30 gallon minimum

Pink Skunk Clownfish Compatible Tank Mates : They will do fine in tanks with other peaceful fish species. Avoid keeping them in tanks with fish large enough to eat them or fish that may harass them such as other clownfish species or damselfish.

Reef Tank Compatible? : They do just fine in reef tanks and will leave the corals, inverts and clams alone.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment. As with all new purchases, use a [quarantine tank](#).

Diet / Fish Food : They are omnivores which means that they will go after both meaty and vegetable/algae based foods. A good quality pellet food (like NLS) can form the base of their diet and you can supplement with occasional feedings of thawed marine origin foods like mysis shrimp, brine shrimp, etc.

Tank Region : If an anemone is present and is hosting the clownfish they won't usually stray far from it. But without an anemone they can sometimes be more active and swim more often around the tank.

Gender : All are males when they are born. As they mature and start to pair off the dominant one will change into a female. The female is usually larger than the male and will be the primary defender of their territory. Once a paired is formed they will place the eggs on a hard surface like the live rock or a piece of tile and then tend to the eggs until hatched. The fry need to be feed very small foods multiple times per day and be provided with excellent water quality if you plan on raising them into the juvenile stage. Check out the Clownfish breeding book by Joyce Wilkerson linked below.

Forum : [Clownfish Forum](#)

Author : [Mike FishLore](#)

Compatible Anemones : Long Tentacle Anemone (Macrodactyla doreensis)
Magnificent Anemone (Heteractis magnifica)
Leathery Sea Anemone (Heteractis crispa)
Carpet Anemone (Stichodactyla gigantea)
[Clownfish Anemone Chart](#)

Recommended Book : [Clownfishes Guide to Captive Care and Breeding](#)

References :

"Amphiprion perideraion". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Wilkerson, Joyce (2003). Clownfishes, A Guide to Their Captive Care, Breeding and Natural History. T.F.H. Publications.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

Photo Credits : NOAA

More Clownfish Species :

[Clownfish Species](#)

[Ocellaris Clownfish](#)

[Maroon Clownfish](#)

TOMATO CLOWNFISH - AMPHIPRION FRENATUS

Tomato clownfish are readily available and are very hardy, making them a great choice as a beginner fish. You can usually find tomato clownfish at local pet stores for \$10 - \$20 and even cheaper online. Breeders are breeding this fish in captivity which should (hopefully) lower this price even more.

A quarantine tank is a necessity as this fish is susceptible to most saltwater disease, especially marine ich (cryptocaryon) and brooklynella. Use extreme caution before using copper medications because clownfish are very sensitive to copper.

The tomato clownfish will eat most fish foods that you place in the tank. Flakes, freeze dried, frozen and live foods are eaten with gusto. Try to provide a variety of foods for optimum health and coloration.

The Tomato Clownfish can be territorial with other fish that approach their space in the tank. They may also scrap with other clownfish species in the same tank and for this reason it is advisable to only keep one species in your tank. If you have an extremely large tank you may be able to keep more than one clown species in your aquarium. They may also fight with other tomato clownfish in the same tank.

Tomato Clownfish do not need an anemone to survive in the home aquarium. Anemones can be beneficial for the clownfish but the host anemones that are found in their natural environment can be difficult to care for in captivity and are not recommended for the saltwater novice.

Tomato Clownfish Pictures



Tomato Clownfish Profile Facts and Care Information

Scientific Name : Amphiprion frenatus

Common Names : *Tomato Clownfish, Anemone Fish, Red Clownfish, Bridled Clownfish*

Care Level : Easy to Moderate, can become territorial and aggressive.

Size : 5 inches (13 cm)

pH : 8 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.024

Lifespan : 6 - 8 years

Origin / Habitat : Indo-Pacific to Oceania

Tomato Clownfish Temperament / Behavior : Can be peaceful but will become aggressive with other fish that approach it's space. Avoid mixing the various clown species. If you have a mix of different clown species in your tank, they will fight. If you have a host anemone in the aquarium with them, they will defend it. It usually works out best if you have only one or a pair of clowns in your tank.

Tomato Clownfish Breeding / Mating / Reproduction : They have been bred in captivity and it is usually better to buy a tank raised fish because they will adapt better in the home aquarium.

Tank Size : 30 gallon minimum

Tomato Clownfish Compatible Tank Mates : Avoid keeping them in an aquarium with [Lionfish](#), Snappers, Groupers, Triggers, [Eels](#) or any other predatory fish large enough to eat them. Keep only one clown species in your aquarium. Do not mix the various clown species.

Reef Tank Compatible? : The clownfishes should do well in reef tanks. They may pose a problem with other clownfish species, so watch closely.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment, use a [quarantine tank](#).

Diet / Fish Food : Omnivore - provide a varied diet with live food, frozen food and they will also accept flake food.

Tank Region : All over

Gender : All are males when they are born. As they mature and start to pair off the dominant one will change into a female. The female is usually larger than the male and will be the primary defender of their territory.

Forum : [Clownfish Forum](#)

Author : [Mike FishLore](#)

Compatible Anemones : [Bubble Tip Anemone](#) (Rose Anemone) (*Entacmaea quadricolor*)
Pizza or Carpet Anemone (*Cryptodendrum adhaesivum*)
[Clownfish Anemone Chart](#)

Recommended Book : [Clownfishes Guide to Captive Care and Breeding](#)

More Clownfish Species :

[Clownfish Species](#)

[Ocellaris Clownfish](#)

[Maroon Clownfish](#)

DAMSELFISH

AZURE DAMSELFISH - CHRYSIPTERA HEMICYANEA

The Azure Damselfish (*Chrysiptera hemicyanea*) is a nice looking little damselfish with a half blue and half yellow body. The Azure Damsel gets to be about 3 inches and are usually sold for \$3 to \$10 each. The colors on this damselfish really are amazing and they look awesome under actinic lighting.

Like most damselfish species, the Azure Damselfish is considered very hardy and often recommended to new hobbyists as a good first fish in new tanks. While it is true that they are hardy, damselfish are not always a good choice because of their temperament. They may fight with themselves and with less aggressive fish in your tank. However, the Azure Damsel is considered one of the less aggressive species of damselfish and hobbyists sometimes keep them in groups in a larger saltwater aquarium setup. In the aquarium, keeping a group of them might be a problem because of constant fighting for territory. But if you get a big enough group of them the fighting may be spread out enough so that one fish isn't the lone target.

In the ocean they like to live amongst acropora coral heads in shallow waters. They feed on plankton and then retreat back to the safety of the coral or live rock. They will go after smaller pellet foods and flake foods. Thawed foods like the cube packs that can be thawed and fed in small amounts work really well. You should be able to find the frozen cube packs of mysis shrimp, brine shrimp, etc. at your local chain store or reef shop.

Please don't use them to cycle a new aquarium. The most humane method is to use live rock that is cured already and then slowly stock the tank.

Azure Damselfish Pictures



Azure Damsel Fish Profile Facts and Care Information

Scientific Name : *Chrysiptera hemicyanea*

Common Names : *Azure Damsel fish, Azure demoiselle, Half Blue Damsel fish, Yellow Dipped Damsel*

Care Level : Easy, good for saltwater beginners but keep in mind that they can be aggressive for a smaller fish.

Life span : 4 - 5 years and likely longer

Size : Up to 3 inches (8 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Eastern Indian Ocean. Found in lagoons and near shore often in small groups amongst acropora coral.

Azure Damselfish Temperament / Behavior : Much like other damselfish, this one can be moderately aggressive. They may harass fish that encroach upon their perceived territory.

Breeding / Mating / Reproduction : these damselfish are egg layers and they form pairs for mating. The eggs are sticky and stick to the substrate where the males guard them until hatch.

Tank Size : 30 gallon minimum for one and larger tanks when keeping them in multiples. Be ready for aggression amongst themselves when keeping them in groups.

Compatible Tank Mates : Don't keep them with predatory fish that are big enough to eat them.

Reef Tank Compatible? : Should be fine with corals and invertebrates.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - damselfish are some of the hardiest of saltwater fish species available to the hobby. People even used to use them to cycle new tanks. But it is no longer necessary to cycle a new aquarium with live fish.

Azure Damselfish Diet / Fish Food : In the ocean they primarily feed on plankton. In the aquarium they will do fine with flakes and smaller pellet foods (spectrum thera-A small fish size) and fresh and finely chopped pieces of marine origin foods.

Tank Region : Middle to bottom and don't usually venture far from their rock, coral or hiding place.

Gender : No known external characteristics to differentiate males from females.

Forum : Damselfish Forum

Author : Mike FishLore

References / Recommended Reading :

"Chrysiptera hemicyanea". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

BLUE DAMSELFISH (CHRYSIPTERA CYANEA)

The Blue Damselfish, also known as the Blue Devil Damselfish, is an extremely popular marine fish because it is readily available and because it is very hardy. Although we don't recommend it, many hobbyists use the Blue Damselfish to cycle new saltwater tanks. There are better, more humane ways to cycle a tank such as using live rock to cycle your saltwater aquarium.

They get the nick name Blue Devil because of their personality. They can be very belligerent with other fish in the tank, especially new arrivals. They are very bold and can hold their own with larger fish and may even go after your hand if it approaches their territory. They didn't get the memo about them only being a few inches in size. We'll call it the mighty mouse syndrome.

As mentioned previously, Blue Damsel fish will develop their own territory in the tank. Having live rock in your aquarium will help make them comfortable and it will provide them with hiding places. You can get away with keeping multiple Blue Damselfish in the same tank if you introduce them at the same time. Because of their "anger management" issues it is a good idea to introduce them last into your setup.

Blue Damselfish are not very picky when it comes to fish food and should accept most foods that you give them. Try to give them a varied diet of live, frozen, freeze-dried and vitamin-enriched flake foods.

They seem to be very resistant to most saltwater fish disease but you still need to take the proper pre-cautions and use a quarantine tank before introducing them into your main tank. After they've been in quarantine for two weeks or so and you notice no signs of illness you can acclimate them into your display tank.

Blue Damselfish Picture



Blue Damselfish Profile Facts and Care Information

Scientific Name : *Chrysiptera cyanea*

Common Names : *Blue Damselfish, Blue Devil Damsel*

Care Level : Easy - although it can be a very hardy fish and some use them to cycle their tanks, we don't recommend this practice and it's easier and quicker to cycle a tank with live rock.

Size : Up to 2.5 inches (6 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Australia, Pacific

Temperament / Behavior : Can be very aggressive with other fish that encroach upon their territory. Even much larger fish can get harassed when swimming past their territory. Use caution when introducing new tank mates in a tank already populated with blue devils.

Breeding / Mating / Reproduction : This fish has been bred in the home aquarium.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other damsels but if you do, introduce at the same time to limit territorial aggression. May harass other tank mates that come into their territory.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivorous, try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and live foods.

Tank Region : Usually stays close to its chosen territory in the live rock or any other tank decor that can provide shelter.

Gender : Females have the black spot on the dorsal fin, whereas males may not have the black spot.

Forum : Damselfish Forum

Author : Mike FishLore

Fish Lore Forum : Blue Damselfish Forum

GREEN CHROMIS (CHROMIS VIRIDIS)

The Green Chromis (*Chromis viridis*) is another damselfish but don't let that scare you away from keeping these little beauties. Green Chromis colors seem to change based on the aquarium lighting levels, sometimes appearing white and sometimes blue with hues of green. The pictures on this page don't do them justice.

Green Chromis are sometimes confused with *Chromis atripectoralis* because the two do look very similar. However, the *Chromis atripectoralis* has a small black area above the pectoral fin and they are a little bigger as adults. They can usually be found in local saltwater fish stores anywhere from \$5 USD to \$20 USD depending on their size.

For a damselfish, Green Chromis are relatively peaceful and it is preferred to keep them in small schools (shoal) of 6 or more. They will get along with each other and should establish some sort of pecking order within the group. Once they mature and are ready to breed they may become slightly more aggressive with tank mates, but given their relatively small size, they shouldn't do much harm. Some hobbyists who keep saltwater reef tanks will sometimes witness spawning of this fish. Male Green Chromis can turn more yellow in color and will build small nests in the sand and court various females. The males then guard the eggs until they hatch a few days later.

The Blue Green Chromis is a very active fish once acclimated and should be given frequent small feedings. They will accept most saltwater fish foods including flakes, frozen, freeze dried and live foods. Give them a varied diet for best results.

Even though they are really hardy and a great fish for a saltwater beginner, Green Chromis may come down with most of the common saltwater fish diseases and using a quarantine tank is a must. Keep them in quarantine for 2 - 3 weeks before introducing them into your main tank so you can monitor for any sign of a potential outbreak.

Picture



Green Chromis Profile Facts and Care Information

Scientific Name : Chromis viridis

Common Names : *Blue Green Chromis, Blue Green Damselfish, Green Chromis, Green Puller*

Green Chromis Care Level : Easy, good fish for a saltwater beginner.

Size : Up to 3.5 inches (9 cm)

Green Chromis Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Coral Reef Areas

Temperament / Behavior : This fish is not like other damsels in that it is relatively peaceful, except maybe when spawning.

Green Chromis Breeding / Mating / Reproduction : Sometimes bred in saltwater reef tanks. Need a small school (shoal) and good water conditions. Get them ready by giving them live foods.

Males will turn slightly yellow and should build a nest in the sand and court various females. The male will then watch the eggs until they hatch a few days later.

Tank Size : 30 gallon (113 liters) minimum, preferably larger since they are fairly active and like to be in schools.

Compatible Tank Mates : Generally considered "reef safe" they should be able to handle themselves well in saltwater reef tanks, however, you may not want to put them in with fish large enough to eat them.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Frequent (2 times per day) and varied feedings. Try to give them a variety of marine foods. They may accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually middle to top

Gender : Males will develop a yellowish hue when ready to breed.

Forum : Damselfish Forum

Author : Mike FishLore

Fish Lore Forum : Green Chromis Forum

BLUE CHROMIS (CHROMIS CYANEUS)

The Blue Chromis is a member of the damselfishes and given their hardy nature they can be a good choice for a saltwater beginner. In fact, many hobbyists use the Blue Chromis to cycle new tanks (not recommended). They need to be in small schools (shoals) of 6 or more and are a very active fish.

They are a brilliant blue color with a black outline along the bottom of the dorsal fin and around the caudal fin.

Blue Chromis should do well in most tank setups, but you don't want to keep them with overly aggressive tank mates or fish large enough to eat them. Keep them in a small school and they should do fine. You may notice a pecking order develop among the Blue Chromis school and that is normal behavior. The Blue Chromis is sometimes sold as a "dither fish" because it is out in the open so much and it makes the shy fish in your tank more at ease.

Blue Chromis eat zooplankton in the wild and will accept most types of marine fish food including frozen, freeze dried, vitamin enriched flakes and live foods. Give them a variety of foods for optimal coloration.

They seem to be fairly disease resistant but you still need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank.

Blue Chromis Picture



Blue Chromis Profile Facts and Care Information

Scientific Name : Chromis cyaneus

Common Names : *Blue Chromis, Blue Reef Chromis*

Care Level : Easy to Moderate, good for a saltwater beginner.

Size : Up to 5 inches (13 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Atlantic, Caribbean

Blue Chromis Temperament / Behavior : They like to be in small schools (shoals) of 6 or more and can take care of themselves with larger, more aggressive tank mates. However, tank mates much larger, like Triggers, may make a snack out of them. They are extremely active and will make an interesting addition to the top of the tank. This fish is considered reef tank safe.

Breeding / Mating / Reproduction : Sometimes bred in saltwater reef tanks. Need a small school (shoal) and good water conditions. Get them ready by giving them live foods. Males should build a nest in the sand and court various females. The male will then watch the eggs until they hatch a few days later.

Tank Size : 30 gallon (114 liters) minimum

Blue Chromis Compatible Tank Mates : They can make an excellent addition to most tanks with smaller species.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Blue Chromis Diet / Fish Food : In the wild, they feed on zooplankton so try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually top

Gender : Difficult to determine the differences between males and females.

Forum : [Damselfish Forum](#)

Author : [Mike FishLore](#)

Fish Lore Forum : [Blue Chromis Forum](#)

YELLOWTAIL BLUE DAMSELFISH - CHRYSIPTERA PARASEMA

The Yellowtail Blue Damselfish is sometimes confused with the Azure Damselfish (*Chrysiptera hemicyanea*) because they do look very similar. The *Chrysiptera hemicyanea* has more yellow on its body than the *Chrysiptera parasema*, which just has the yellow on its tail. This damsel is usually better kept in groups of 3 or more because they can become very territorial if kept singly. This is probably one of the least aggressive of all the damsels, but can still be aggressive nonetheless. Try putting your arm in the tank to perform tank maintenance and you'll see what we're talking about.

The Yellowtail Damselfish is particularly hardy and many hobbyists will use them to cycle a new tank. Using them to cycle your tank is not recommended because it is very cruel to the fish. A better, more humane way to cycle your saltwater tank would be to use live rock. As always, do not keep them with fish large enough to view them as a nice snack.

Yellowtail Blue Damselfish will go after most fish food including vitamin enriched flake food, frozen, freeze dried and live foods.

Yellowtail Blue Damselfish Pictures



Yellowtail Blue Damselfish Profile Facts and Care Information

Scientific Name : *Chrysiptera parasema*

Common Names : *Blue Yellowtail Damselfish, Goldtail Demoiselle*

Yellowtailed Blue Damsel Care Level : Easy, good for saltwater beginners, but don't use them to cycle your tank. This is not needed with the use of live rock as the primary biological filter.

Life span : 4 - 6 years, possibly longer

Size : Up to 3 inches (8 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Yellowtail Blue Damselish Temperament / Behavior : Much like other damsels, this one can be moderately aggressive. Aggression can be lessened or spread out if you have 3 to 7 in your aquarium.

Breeding / Mating / Reproduction :

Tank Size : 30 gallon minimum

Compatible Tank Mates : Avoid keeping them in an aquarium with Lionfish, Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them.

Reef Tank Compatible? : They shouldn't bother the corals and/or anemones but can sometimes be little jerks to the other fish in a reef aquarium setup.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Yellowtail Blue Damselish Diet / Fish Food : Omnivore - try to give them a variety of foods. They will take vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Middle to bottom

Gender : Difficult to determine

Forum : Damselish Forum

Author : Mike FishLore

Fish Lore Forum : Yellowtail Damsel Forum

THREE STRIPE DAMSELFISH - DASYLLUS ARUANUS

The Three Stripe Damselfish is readily available and often quite inexpensive compared to other saltwater fish species. Three Stripe Damsels usually go for about \$3 to \$7 at the fish store. Online they might be even cheaper, but after you factor in shipping costs maybe not so much. They are easily confused with the *Dascyllus melanurus* which is more commonly known as the Four Striped Damselfish. This one has 3 vertical black stripes, the other has 4 black stripes running vertically.

Similar to many other damselfish species, the Three Stripe Damselfish too have been used to cycle an aquarium or two. This is not an advisable practice nowadays though. It's so much easier (and better for the fish) to cycle with live rock or even some of the formulations containing the necessary bacteria. Besides, after cycling your tank with these fish you may realize that you didn't really want to keep them (due to their aggressive nature) but you find out too late how hard these little boogers are to catch. Especially in a tank with live rock. Forget about it. You will be removing some rock to get these guys out of the tank.

As alluded to previously the Three Stripe Damselfish can be quite aggressive. They definitely have the "little man" syndrome and will nip at much larger fish to keep them away from "their" territory. This is definitely not a community type fish. Choose tank mates wisely. Tank mates that are too big and these Three Stripe Damselfish become a nice snack. Stock them in with tank mates too little and they will pester the smaller tank mates.

Feed them a variety of foods and they should live a nice long time for you. This is definitely an interesting species in its own right but needs to be kept in a stocking scheme that is well thought out beforehand. Be ready to remove them if needed.

Three Stripe Damselfish Pictures



Three Stripe Damselfish Profile and Damselfish Care Information

Scientific Name : Dascyllus aruanus

Common Names : Banded Humbug, Zebra Humbug, Domino Damselfish, White Tailed Damselfish

Damselfish Care Level : Easy, good for saltwater aquarium beginners, but don't use them to cycle your tank! Using live rock is currently one of the best ways to cycle a tank fishless.

Life span : 3 - 5 years, possibly longer

Size : Around 4 inches (10 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : From the Indo West Pacific and to South Japan.

Three Stripe Damselfish Temperament / Behavior : Much like other damsels, this one can be aggressive and even more so as it matures. They may not tolerate other damselfish in the same tank and less aggressive tank mates may get bullied.

Breeding / Mating / Reproduction : Males form nests in the substrate and entice females to breed. Afterwards the males guard the eggs until they hatch and enter the water column.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Avoid keeping them in an aquarium with Lionfish, Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them.

Reef Tank Compatible? : They shouldn't bother the corals, anemones and other invertebrates. Some have reported that they will nip at hermit crabs and shrimp species.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - This is a fairly hardy species like many of the other damsels. Using damselfish to cycle a tank used to be one of the advised ways of cycling marine tanks.

Diet / Fish Food : Omnivore - they will do best with a variety of foods. Small marine origin meaty foods along with some herbivore rations will be good for them. Frequent small feedings everyday are advised.

Tank Region : Middle to bottom and usually near cover of some sort.

Gender : Difficult to determine from external features.

Forum : Damselfish Forum

Author : Mike FishLore

Fish Lore Forum : Damselfish Forum

DOTTYBACKS

ORCHID DOTTYBACK - PSEUDOCROMIS FRIDMANI

The Orchid Dottyback originally comes from the Red Sea and it used to cost much more to acquire one. In the past few years breeders have had success getting the Orchid Dottyback to breed in captivity, thereby lowering the price to around \$25-\$35. A true beauty in the marine trade, the lowered price tag should enable more hobbyists to enjoy Orchid Dottybacks.

If you are planning on getting an Orchid Dottyback be sure to provide plenty of hiding places to help make it feel secure. A tank containing a lot of live rock is best because they like to stake out a claim on a "cave" or a similar hiding place. Because they like to hide so much, you may only see them around feeding time. It is important to note that these Dottybacks can be aggressive when tank mates approach their "space". It is probably a good idea to only keep one of this species in your tank but many have reported success keeping them in pairs that were introduced at the same time.

For food, the orchid prefers meaty food such as brine shrimp or krill and they also will go after and eat bristle worms. They will also take flake, frozen and pellet foods.

This Orchid Dottyback is often confused with the Magenta Dottyback (*Pseudochromis porphyreus*) because the two do look very similar. However, the Orchid will have a black stripe through the eye while the Magenta will not.

Orchid Dottyback Pictures



Orchid Dottyback Profile Facts and Care Information

Scientific Name : Pseudochromis fridmani

Common Names : *Orchid, Purple, Magenta and Strawberry Dottyback*

Care Level : Easy to moderate, provide plenty of hiding spaces which you can easily get by using live rock.

Life span : 5 - 7 years, possibly longer

Size : Up to 3 inches (8 cm)

pH : 8.1 - 8.4

Temperature : 74°F - 82°F (22°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Red Sea, tank raised is becoming more common.

Orchid Dottyback Temperament / Behavior : They can be somewhat aggressive with their tank mates when defending their territory. Be sure to provide plenty of hiding places to help make them feel secure.

Orchid Dottyback Breeding / Mating / Reproduction : Many are reporting success tank breeding this fish.

Tank Size : 30 gallon minimum

Orchid Dottyback Compatible Tank Mates : Avoid keeping them in an aquarium with Lionfish, Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily a carnivore but try to give them a variety of foods. They will take vitamin enriched flake foods, frozen and definitely live foods such as mysis and brine shrimp.

Tank Region : Middle to bottom

Gender : Difficult to determine

Author : Mike FishLore

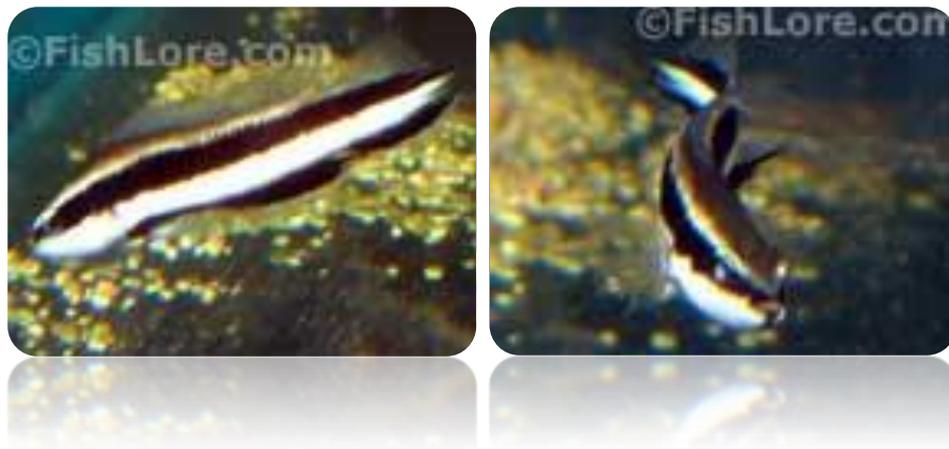
STRIPED DOTTYBACK - PSEUDOCROMIS SANKEYI

Striped Dottyback Information - Also known as Sankey's Dottyback, the black and white Striped Dottyback comes from the shallower areas of the Red Sea. Many breeders are now tank raising the striped dottyback which should lower the price tag which is currently between \$20-\$30 USD.

Striped Dottybacks live in small groups in the wild so it may be possible to keep more than one in your tank if you introduce them at the same time. They are one of the least aggressive of the dottybacks so keeping multiples may be acceptable. Hiding places in the form of live rock or caves of some kind are recommended to make them feel more secure.

This Striped Dottyback is primarily carnivorous so you should try to supplement their diet with live or frozen foods such as shrimp or krill. They will go after vitamin enriched flakes and small pellets. We've never witnessed it, but it has been reported that they go after bristle worms too.

Striped Dottyback Pictures



Striped Dottyback Profile Facts and Care Information

Scientific Name : Pseudochromis sankeyi

Other Common Names : *Sankey's Dottyback*

Care Level : Easy to moderate

Striped Dottyback Life span : 3 - 5 years, possibly longer

Size : Up to 3 inches (8 cm)

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : In shallow waters in the Red Sea. Tank raised are becoming more common.

Striped Dottyback Temperament / Behavior : In the wild they live in small groups and is one of the least aggressive of the dottybacks.

Striped Dottyback Breeding / Mating / Reproduction : Many breeders are tank raising this fish.

Tank Size : 30 gallon minimum

Striped Dottyback Compatible Tank Mates : Avoid keeping them in an aquarium with Lionfish, Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them. If you want to have multiple striped dottybacks in the same tank, it is important to introduce them at the same time to avoid aggression.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Striped Dottyback Diet / Fish Food : Primarily a carnivore but try to give them a variety of foods. They will take vitamin enriched flake foods, frozen and definitely live foods. Shrimp and/or frozen or live foods should be given to supplement their diet.

Tank Region : Middle to bottom, like to hide in live rock.

Gender : We don't know of any external markings that could be used to identify male from female. Females can change to males, but not the other way around.

Author : Mike FishLore

GREEN MANDARIN (SYNCHIROPUS SPLENDIDUS)

The Green Mandarin is one of the most colorful of all marine fish species. These mandarin fish are sometimes called the psychedelic mandarin due to their coloration and markings. At first glance you might be thinking that a Green Mandarin, which only gets to a couple of inches in size, is the perfect fish for a nano tank. However, they are considered quite difficult to keep because it is difficult to get them eating standard marine aquarium foods. In the wild they hunt for pods (amphipods and copepods) throughout the day and in the aquarium they often slowly starve to death because there is not an abundance of these foods in the tank. A well established and larger tank of 55 gallons plus with lots of live rock and live sand is recommended before trying your hand at keeping a Green Mandarin.

The Green Mandarin will make good tank mates with most other species except for conspecifics. If keeping multiple mandarins in the tank aggression will be amplified in the absence or limitation of pods. A well fed mandarin is usually a more peaceful mandarin. They are also considered very resistant to most diseases because of their heavy slime coatings. This slime is also considered noxious to larger fish species that might otherwise consider a mandarin a nice snack.

Overall this is an amazing looking fish that should only be kept by the more advanced hobbyists that can give them the proper foods on a regular basis. In smaller tanks without enough live rock, live sand and pods they will slowly starve to death. It is essential to get them eating normal aquarium foods like thawed mysis shrimp, brine shrimp, a good pellet food, etc. Feed them often and keep the aquarium water in top shape through regular partial water changes. They are considered reef tank safe but use caution since some hobbyists have reportedly caught them nipping at coral polyps. An attached refugium growing chaetomorpha will provide a good source of pods for your fish. Periodically shake or stir up the chaeto to release some pods into your display tank.

Green Mandarin Picture



Mandarin Photo Credit: Luc Viatour

Green Mandarin Profile Facts and Care Information

Scientific Name : *Synchiropus splendidus*

Common Names : *Green Mandarin, Striped Mandarinfish*

Dragonet Care Level : Difficult

Size : Up to 2.5 inches (6 cm)

Life span : several years

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 80°F (22°C - 27°C) | Specific Gravity 1.020 - 1.025 | Carbonate Hardness (dKH) 8 - 12°

Origin / Habitat : Western Pacific, Ryuku Islands to Australia found at depths of 1 to 18 meters (1 to 60 feet) near inshore lagoons. Often near coral rubble hunting for food items.

Temperament / Behavior : Males may fight with other male mandarins but is quite peaceful to other fish species. Other fish will leave it alone because of its noxious slime coating and maybe because of its markings and coloration.

Green Mandarin Breeding / Mating / Reproduction : They have been bred in the aquarium. Females will pick the largest male and breed with them nightly. They are open water egg scatterers. The pair will rise to the water surface together (while remaining in very close contact with each other) releasing sperm and eggs.

Tank Size : 55 gallon (113 liters) minimum, preferably much larger tanks with lots of live rock. This recommendation is not due to their adult size, it's because of their feeding habits.

Compatible Tank Mates : Should do fine when kept with most other species except conspecifics - may fight with other male green mandarinfish.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - very resistant to cryptocaryon due to their slime coating.

Diet / Fish Food : The hardest part about keeping them... they need lots of live rock that will provide amphipods and copepods because they will hunt constantly for them throughout the day. Target feeding pods is a good idea too while trying to get them on standard aquarium foods like smaller pellets and thawed mysis, brine, etc.

Tank Region : Mostly bottom dwellers.

Gender : Males become larger than females and have a much larger dorsal fin.

Author : Mike FishLore

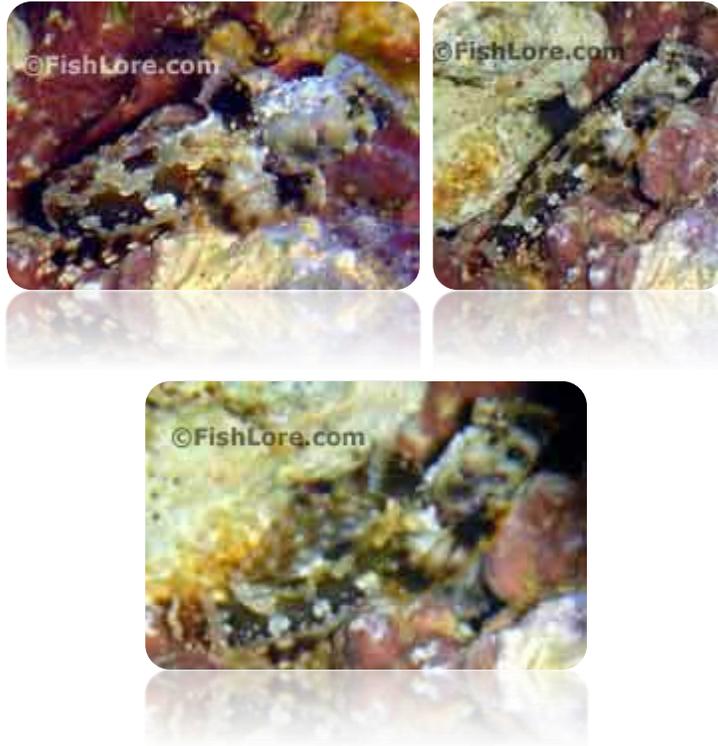
OCELLATED DRAGONET, SCOOTER DRAGONET

The Ocellated Dragonet or Scooter Dragonet fish can make a very interesting addition to a well-established saltwater tank with plenty of amphipods and copepods. The scooter dragonet can be very difficult to feed and many slowly starve to death in tanks that can't provide enough live foods to sustain them. You should have a tank with a fairly deep sand bed and live rock to increase your chances of success with keeping this fish. Male Scooter Dragonets may co-exist peacefully with females of the same species if introduced at the same time. However, as mentioned above, feeding the Scooter Dragonet can be very difficult and unless you have an extremely large tank that can provide enough live foods, refrain from keeping multiple in the same aquarium.

These Dragonets are fairly docile (except maybe with other dragonets) and should only be kept with fish that are similar in temperament. You also want to avoid keeping them with some of the larger and more aggressive marine species.

If you're worried that your Dragonet is not getting enough to eat, you can try using rigid aquarium tubing to deliver food directly to where they are in the tank. This can be a challenging thing to do though, as they will often scoot away and hide. Keep trying and they may become used to seeing the tube delivering their fish food.

Ocellated Dragonet Picture



Ocellated Dragonet, Scooter Dragonet Profile Facts and Care Information

Scientific Name : Synchiropus ocellatus

Common Names : *Scooter Dragonet, Ocellated Dragonet and sometimes incorrectly labeled as a scooter blenny.*

Dragonet Care Level : Moderate - Difficult

Size : Up to 4 inches (10 cm)

Life span : 2 years or longer

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Pacific

Ocellated Dragonet Temperament / Behavior : They are usually quite docile. They may not get along well with other males of the same species in the same tank.

Ocellated Dragonet Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 30 gallon (113 liters) minimum

Ocellated Dragonet Compatible Tank Mates : Use caution when selecting tank mates. Avoid some of the larger and more aggressive species such as: Lionfish

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Can be challenging to feed these little guys. Put them in a tank with an established live sand bed that can provide food for them.

Tank Region : Bottom and all over live rock

Gender : Not clear - but males may be slightly larger and have more color than females of the same age.

Author : Mike FishLore

SNOWFLAKE MORAY EEL - ECHIDNA NEBULOSA

Snowflake Moray Eel Information - A fascinating specimen that many saltwater aquarist desire, the snowflake moray eel is not recommended for everyone. These Snowflake Moray Eels can get very large (24 inches, 61 cm) and are very good at escaping from the tank. A large tank (75 gallons or more) with a tight fitting hood with no possible escape points is a necessity.

You will often hear others talking about how they hand feed their Snowflake Moray Eel. This is not a good idea since this animal has teeth and depending on the size of the animal, can inflict a serious wound. Use a feeding stick or Tank Tongs to place the fish food. They will accept most live and frozen foods.

Avoid keeping the them in a tank with crustaceans and fish small enough to eat.

Snowflake Moray Eel Pictures



Photos Credit: G. Larabee

Snowflake Moray Eel Profile Facts and Care Information

Scientific Name : Echidna nebulosa

Common Names : *Snowflake, Bosch's, Clouded, Floral, Starry, White and Zebra Moray Eel*

Care Level : Moderate

Size : Up to 24 inches (61 cm)

Life span : 4 years or more in captivity

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Snowflake Moray Eel Temperament / Behavior : They like to hide in small caves in the live rock. They will probably get along well with larger fish but will try to eat smaller fish if the opportunity arises.

Snowflake Moray Eel Breeding / Mating / Reproduction : Very difficult to breed

Tank Size : 75 gallon minimum with a **tight fitting hood**

Snowflake Moray Eel Compatible Tank Mates : Avoid keeping them in an aquarium with small fish and crustaceans.

Reef Tank Compatible? : Not recommended for reef aquariums since they will eat most shrimps, snails, smaller fish and can be heavy water polluters.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Snowflake Moray Eel Diet / Fish Food : Primary diet in the wild is crustaceans and fish small enough to eat. Frozen and freeze dried foods may be accepted.

Tank Region : Bottom, need plenty of hiding places.

Gender : No noticeable differences between males and females.

Author : Mike FishLore

BLUEBANDED GOBY, CATALINA GOBY

The Catalina Goby is a really awesome looking saltwater fish. The Catalina Goby is sometimes commonly called the Bluebanded Goby because of the blue bands it sports. *Lythrypnus dalli* is sometimes seen in the shops but fish keepers should think twice before picking one of these out for taking home. They are considered a sub-tropical fish since they come from cooler waters where the temperatures range from the mid 60's F to 71 F. Keeping them in warmer temps, such as a reef tank where the temps can be in the low to mid 80's F can really shorten their lives. Ideally the Catalina Goby should be kept in a cooler water set up with similar sub-tropical species. They are often found near zebra gobies (*Lythrypnus zebra*).

An interesting thing to note about the Catalina Goby is that they can change sex. Males will lure the females into a cave where she will place the eggs on the wall for fertilization and then the males will guard them until they hatch. Males can become quite territorial with other Catalinas, especially during this time period.

Feeding them should not be an issue. Frozen mysis shrimp and brine shrimp can be used to entice them to eat and you can even get them eating flake foods in time.

Picture



[Catalina Goby Fish Species Profile and Care Information](#)

Scientific Name : *Lythrypnus dalli*

Common Names : *Catalina Goby, Bluebanded Goby*

Care Level : Easy

Size : Up to 2.4 inches (6 cm)

Life span : 2 to 3 years, likely longer if kept in the right conditions (i.e. correct temp range)

pH : 8.1 - 8.4

Temperature : 64°F - 71°F (18°C - 22°C) - temps that are too warm will drastically shorten the lifespan of this fish. You will most likely need an aquarium chiller to keep your tank in the proper temperature range for this species. For smaller tanks we've reviewed the JB Mini Arctica Chiller.

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Eastern Pacific, Gulf of California

Temperament / Behavior : Can be quite territorial with other catalina gobies, but peaceful with other species but use caution if housing with other gobies.

Breeding / Mating / Reproduction : The Catalina Goby can change sex, with females preferring larger males. Males will guard the eggs until hatched.

Tank Size : 55 gallon (208 liters) minimum, with a live sand bed. They build burrows usually near the live rock in the sand bed.

Compatible Tank Mates : Sub tropical tank mate species should be selected with similar temperament and care requirements.

Reef Tank Compatible? : Most "reef" tanks are too warm for this species.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - usually considered somewhat hardy when kept in the proper temperature range. Temps that are too warm could lead to stress which could lead to disease and shortened lifespan.

Diet / Fish Food : Zooplankton, amphipods, copepods. Most meaty marine origin foods should be accepted including frozen mysis and brine shrimp. Try to vary their diet and incorporate a good quality flake food.

Tank Region : Usually claims a spot in the tank as it's territory where it will stick close to for the most part.

Gender : Can change genders.

Similar Species : Diamond Goby, Neon Goby, Purple Firefish, Yellow Watchman Goby

References - Recommended Reading

- Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

- "Lythrypnus dalli". *FishBase*. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: *FishBase*, 2005.

DIAMOND GOBY, ORANGE SPOTTED SLEEPER GOBY

The Diamond Goby (*Valenciennea puellaris*) has a few different common names. In some circles the Diamond Goby is also known as the Maiden Goby or the Orange Spotted Sleeper Goby. The Diamond Goby can get to be about 6 inches (15 cm) in total length and are considered a peaceful utility fish. They have orange dashes and dots running the length of the body with cyan colored markings on the jaws. Their heads are quite large and their jaws must be quite strong because they have to sift in the sand for their food.

On the reef the Diamond Goby is often found in pairs that are thought to be monogamous. They will create a burrow in the sand bed where they can retreat to at night or at signs of danger. It can be quite entertaining to watch these gobies do their thing. They take mouthfuls of sand and build mounds around their burrows. Some recommend that you keep them in tanks with sugar fine sand and to avoid the larger particle sands because the thought is that they can damage their mouths.

A large live sand bed is very important since these gobies rely on it for food. A benefit of their sand sifting is that they keep the sand looking very clean because they are constantly turning it over. There is a downside to this behavior though. They have no regard for your prized clams or mushrooms along the bottom of the live rock. They will form mounds or even cover smaller corals. You will have to do some "redecorating" often if you plan on keeping the diamond goby in your aquarium. It can be well worth the effort with the sparkling white sand. Ahh, that's nice.

The Diamond Goby should be able to live for several years if you can keep them well fed. This can be a little challenging at first, but it's really not hard to make sure they are getting enough to eat. Use a feeding stick or similar device to place some fish food such as mysis or brine shrimp or even fresh finely chopped shrimp from the grocery store under the sand near their burrow. They should be able to smell it and will go looking for it. Eventually they should be able to associate the feeding stick with dinner and may start to take the food directly from the stick before you can place it under the sand. Try it and see for yourself. Very cool indeed.

These orange spotted sleeper gobies have a good reputation as being very hardy and disease resistant, but don't risk your display tank with new acquisitions. Always use a quarantine tank for a few weeks at least!

Finally, if you have a functioning deep sand bed (for nitrate reduction) you will not want to keep these gobies. They will disturb deep sand beds by sifting the sand.

Diamond Goby Picture



Diamond Goby, Orange Spotted Sleeper Goby Profile Facts and Care Information

Scientific Name : Valenciennea puellaris

Common Names : *Diamond Goby, Orange Spotted Sleeper Goby, Orange Dashed Goby, Maiden Goby*

Care Level : Easy

Size : Up to 6 inches (15 cm)

Life span : 3 - 5 years, likely longer

pH : 8.1 - 8.4

Temperature : 72°F - 79°F (22°C - 26°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Red Sea, Samoa, Great Barrier Reef - found in the sand bottom near reefs at depths of 2 - 30 meters (6 - 100 feet).

Diamond Goby Temperament / Behavior : Usually quite peaceful but may scarp with other gobies. Fishbase states that they are found in monogamous pairs in the wild.

Breeding / Mating / Reproduction : They have reproduced in the home aquarium. The male/female pair will place the fertilized eggs on the top surface of their burrow. The male will guard the nest while the eggs are developing. In 3 to 4 days the larvae should hatch and become pelagic (released into the currents). It can be quite challenging to feed the larvae the very fine foods (plankton) they need to develop.

Tank Size : 55 gallon (208 liters) minimum, with a live sand bed. They build burrows usually near the live rock in the sand bed.

Compatible Tank Mates : The Diamond Goby should do just fine with most fish tank mates and invertebrates such as snails and clams, but don't keep them with fish large enough to view them as food such as lionfish, triggers, etc.

Reef Tank Compatible? : Depends on who you ask... We consider them a good fish for a reef tank setup. If you have a deep sand bed that you don't want disturbed then pass on this fish.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - generally speaking they are considered very hardy and disease resistant, but don't risk your main tank - quarantine first!

Diet / Fish Food : The Diamond Goby feeds on pods and other tiny invertebrates in the sand bed. They shovel or scoop sand into their mouth and then sift the sand in their mouth and then pass it through their gills. They are sifting for food and a large live sand bed is very important to maintain them long term. You can also use a feeding stick, turkey baster or similar and place food in the sand near their burrows. You can wean them onto most foods. Tiny pieces of defrosted frozen mysis and brine shrimp, clam and other meaty marine foods should be offered.

Tank Region : Often found near it's burrow in the sand bed.

Gender : To our knowledge, there is not a way to determine external differences between male and females of this fish species. Some think the females will be larger.

Forum : Gobies Forum

Author : Mike FishLore

References - Recommended Reading

- Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

- "*Valenciennea puellaris*". *FishBase*. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: *FishBase*, 2005.

NEON GOBY - ELACATINUS OCEANOPS

The Neon Blue Goby is a fish that has the function of cleaning other fishes in the wild. This little neon goby removes small parasites from the other fish and perhaps that keeps them from being eaten by larger fish. The larger fish recognize the service the Neon Goby provides and usually leave them alone. They have black bodies with an electric neon blue stripes running the length of their body.

The Neon Goby can get aggressive with other gobies in smaller tanks but you may get away with keeping multiples in larger tanks, especially mated pairs. If you do have a mated pair and good water conditions you may be able to breed them in your tank. Both parents will guard the nest and protect the eggs from the other fish in the aquarium. It may be a good idea to separate the parents and eggs into their own tank if this happens. Because they are relatively easy to bred, many places are now offering tank raised gobies for sale.

In the home aquarium it is unlikely that the Neon Goby will get the sustenance they need from cleaning their tank mates and they will need to be fed. They should accept most carnivore (meaty) marine fish foods and may even be conditioned to go after flakes.

As mentioned previously, Neon Gobies will develop their own territory in the tank. Having live rock and/or live sand in your aquarium will help make them comfortable and it will provide them with hiding places and maybe even food sources.

Many of the Neon Gobies are coming from aqua-culture facilities and saltwater fish disease may not be an issue with this fish. However, take the proper pre-cautions and use a quarantine tank before introducing them into your main tank. You never know how many tanks your fish has passed through before you buy it!

Neon Goby Picture



Neon Goby Profile Facts and Care Information

Scientific Name : Elacatinus oceanops

Common Names : *Neon Blue Goby*

Care Level : Easy

Size : Up to 2 inches (6 cm)

Life span : 2 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Atlantic, Gulf of Mexico, Sometimes tank bred varieties are offered for sale

Neon Goby Temperament / Behavior : Can get aggressive with other gobies but should leave other fish alone.

Breeding / Mating / Reproduction : This fish has been bred in the home aquarium. Parents will defend the eggs / nest.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Avoid keeping them with other gobies.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivorous, try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and live foods. Frozen marine carnivore mixes that come in cube packs work well.

Tank Region : Usually stays close to its chosen territory in the [live rock](#) or substrate.

Gender : Difficult to distinguish between male and female.

Forum : [Gobies Forum](#)

Author : Mike FishLore

YELLOW WATCHMAN GOBY - CRYPTOCENTRUS CINCTUS

The Yellow Watchman Goby is an interesting specimen that forms a very cool symbiotic relationship with the pistol shrimp. The yellow watchman goby watches out for predatory fishes and warns the shrimp. The shrimp has limited eye sight and needs the goby to alert them of predators while the goby uses the shrimp's hole as shelter. They both benefit.

The Yellow Watchman Goby should do fine in most setups but may get eaten by larger, more aggressive tank mates. They do like to hide a lot and live rock should help make them feel secure. Some have reported that this fish has jumped from the tank so a good tight fitting aquarium hood with no escape points is needed.

You may be able to keep mated pairs but it is not advisable to keep more than a mated pair of Yellow Watchman Gobies in smaller tanks. They may fight over territory with other goby species.

They are not very picky when it comes to fish food and should accept most foods that you give them. Try to give them a varied diet of live, frozen, freeze-dried and vitamin-enriched flake foods. Make sure they are getting their share around feeding time.

The Yellow Watchman Goby seems to be very resistant to most saltwater fish disease but you still need to take the proper pre-cautions and use a quarantine tank before introducing them into your main tank. After they've been in quarantine for two weeks or so and you notice no signs of illness, slowly acclimate them into your display tank.

Yellow Watchman Goby Picture



Yellow Watchman Goby Profile Facts and Care Information

Scientific Name : *Cryptocentrus cinctus*

Common Names : *Yellow Shrimp Goby, Banded Prawn Goby, Gold Shrimp Goby*

Care Level : Easy

Size : Up to 3 inches (8 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Yellow Watchman Goby Temperament / Behavior : Usually does well with most other fish, except overly aggressive species. Should leave most invertebrates alone and may form a close bond with a pistol shrimp.

Breeding / Mating / Reproduction : This fish has been bred in the home aquarium.

Tank Size : 30 gallon (114 liters) minimum

Yellow Watchman Goby Compatible Tank Mates : Avoid keeping them with other gobies unless you have a very large tank.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivorous, try to give them a variety of marine foods. The Yellow Watchman Goby should accept vitamin enriched flake foods, frozen and live foods. Make sure they are getting enough to eat.

Tank Region : Usually stays close to its chosen territory in the live rock, substrate or any other tank decor that can provide shelter.

Gender : Hard to distinguish between the male and female.

Forum : [Gobies Forum](#)

Author : Mike FishLore

PURPLE FIREFISH (NEMATELEOTRIS DECORA)

The Purple Firefish (*Nemateleotris decora*) is also known by various common names such as the Decorated Firefish and even the Fire Goby. The colors on this fish are simply amazing. Purple Firefish have a white or yellow body that fades to black towards a multi-colored caudal fin, and a purple face along with red/orange fins lined in streaks of black. This fish likes to hover in the water column just outside it's hang out or over the sandy substrate. While hovering they flick their dorsal and pectoral fins in unison, perhaps for stability. The Purple Firefish is considered a very good if not great beginner's fish because they are very hardy, should eat most fish foods offered, and should remain disease free if kept in optimal conditions. Just because they are listed as a "hardy" fish, doesn't mean that they can't or won't come down with a disease. Quarantine ALL new arrivals.

The Purple Firefish only gets to be about 3.5 to 4 inches when fully grown and can be kept in saltwater nano tanks as small as 10 gallons. Obviously, with a small tank you need to be extra diligent with your water quality. Behavior wise, they should do well with most species of similar size and temperament. If you're planning on keeping them in multiples, you may have issues. Some say it can be done (in very large setups) others say you should only keep one per tank. According to Scott Michael, "they (*N. decora*) are the most aggressive of the firefishes, it should be housed singly or in male-female pairs". Determining gender is very difficult if at all possible. Be on the safe side and only stock one per tank. Also, given their size, you don't want to keep them in tanks with Triggers, Lionfish, etc.

You should also know that they are accomplished tank jumpers. Having an open top tank may not work out for you with this species. A fitted aquarium hood with limited escape points is a necessity. Live rock or other suitable items that can provide shelter for the Purple Firefish are also needed. These hiding places may help them acclimate quicker and lessen the chances of tank jumping.

Feeding them shouldn't be much of a problem. This firefish should accept fresh or frozen (thawed) marine fish foods, live foods (brine shrimp, mysids) and even flake foods. If you're having difficulty getting them to eat, check your water parameters and try a variety of foods until they start eating. You may notice a behavior that looks like they are biting at the water. This is how they eat, picking at swimming zooplankton in the water column.

Purple Firefish Picture



Purple Firefish Profile Facts and Care Information

Scientific Name : Nemateleotris decora

Common Names : *Purple Firefish, Purple Dartfish, Flame Firefish, Decorated Dartfish, Elegant Firefish, Fire Goby*

Care Level : Easy

Size : Up to 4 inches (12 cm)

Purple Firefish Life span : 3 years, maybe longer in captivity

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Mauritius, Samoa, Ryukyu Islands

Temperament / Behavior : This is considered a good nano reef tank fish. They should leave most other animals alone, except if you're keeping multiples of this dartfish. Actually, it can depend on who you talk to. Some say you can keep multiples with no problems in sufficiently large

tanks, others disagree. We have kept ours one to a tank. Fishbase has them listed as being found in pairs occasionally in the wild.

Breeding / Mating / Reproduction : Very difficult to breed in the home aquarium because the young are thought to go through a planktonic stage. Paired off couples will build a nest and may take turns guarding this nest.

Tank Size : 10 gallon (38 liters) minimum, since they are not the most active fish. They do need hiding places, caves, some sort of shelter to help make them feel secure.

Purple Firefish Compatible Tank Mates : Use caution if you plan on keeping multiple dartfishes, especially multiple *N. decoras* in the same tank. Should do well with invertebrates, corals, etc. Obviously you'd want to avoid keeping them with larger saltwater fish, such as Lionfish, Triggers, etc.

Reef Tank Compatible? : Yes, they are good fish for a reef tank setup.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - they are one of the better species for beginners because of their hardiness and for those that are just starting out.

Diet / Fish Food : Believed to feed on copepods and zooplankton in the ocean, but should do well with frozen marine preparations, flake fish food, brine shrimp, etc. Try a variety of foods to keep your fish active, healthy and vibrant.

Tank Region : Often found near it's preferred territory in the tank, near overhangs and caves in the lower half of the tank.

Gender : To our knowledge, there is not a way to determine external differences between male and females of this fish species.

Forum : Gobies Forum

Author : Mike FishLore

References - Recommended Reading

- Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

- "*Nemateleotris decora*". *FishBase*. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: *FishBase*, 2005.

GROUPERS

CORAL HIND GROUPER (CEPHALOPHOLIS MINIATUS)

The Coral Hind Grouper sometimes goes by the common name of just the Coral Grouper and sometimes even the Miniatus Grouper. This grouper is quite colorful with a red or orange looking body with lots of light blue colored spots. When they are small they may be shy and will appreciate lots of hiding places but as they grow, things change. They get big and can be aggressive with other fish species.

To keep a Coral Grouper you are going to need a tank that is 180 gallons or larger for long term success and plan on feeding them feeder fish, larger shrimp, pieces of chopped up fresh fish, thawed fish, etc. If you want to keep them with other large fish then you're going to need an even bigger tank and plan on having an oversized protein skimmer along with regular partial water changes.

This grouper should adapt well to the aquarium provided that the tank is a suitable size and you are feeding it appropriate foods. Do a drip acclimation over an hour or so. Plan on a longer acclimation time if the water chemistry (pH, SG) from the source is much different from your tank.

Overall this is an awesome looking saltwater fish and can make a great pet for the person willing to give it what it deserves. But given its temperament and it's requirements, most saltwater home hobbyists should take a pass on this species.

Coral Hind Grouper Picture



Coral Hind Grouper Species Profile Facts and Care Information

Scientific Name : *Cephalopholis miniatus*

Common Names : *Coral Hind Grouper, Coral Grouper, Miniatus Grouper, Blue-spot Rockcod*

Care Level : Moderate

Size : 18 inches (45 cm)

Life span : 20 plus years

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Red Sea and most islands in the Indian and west-central Pacific oceans at depths from 6 to 490 feet (2 to 150 meters).

Temperament / Behavior : The Coral Hind Grouper is considered very aggressive and will not tolerate a conspecific in the same tank and will chase off other species that enter its "turf".

Breeding / Mating / Reproduction : Open water egg scatterers. In the ocean they form harems comprised of one dominant male and 2 to 12 females (ref. Fishbase). Not sure of any successful aquarium breeding attempts.

Tank Size : 180 gallon (681 liters) minimum, preferably much bigger since they can be big and messy eaters.

Compatible Tank Mates : The coral grouper should be kept with similar sized species and it should be given plenty of territory to lay claim to.

Reef Tank Compatible? : Likely will not bother the corals, but may eat the smaller fish and inverts.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Will need to be fed larger marine foods like silversides, squid, krill, shrimp, chopped up fresh and frozen foods. etc. In the ocean they eat a lot of Pseudanthias squamipinnis (Anthias) (ref. Fishbase)

Tank Region : Likes to swim the middle to bottom portions of the aquarium but will move/swim to wherever it wants because it's a Coral Grouper!

Gender : Unknown how to tell male from female using external characteristics.

Similar Species : [Panther Grouper](#)

Author : [Mike FishLore](#)

References

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

"*Cephalopholis miniatus*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

PANTHER GROUPEL (CROMILEPTES ALTIVELIS)

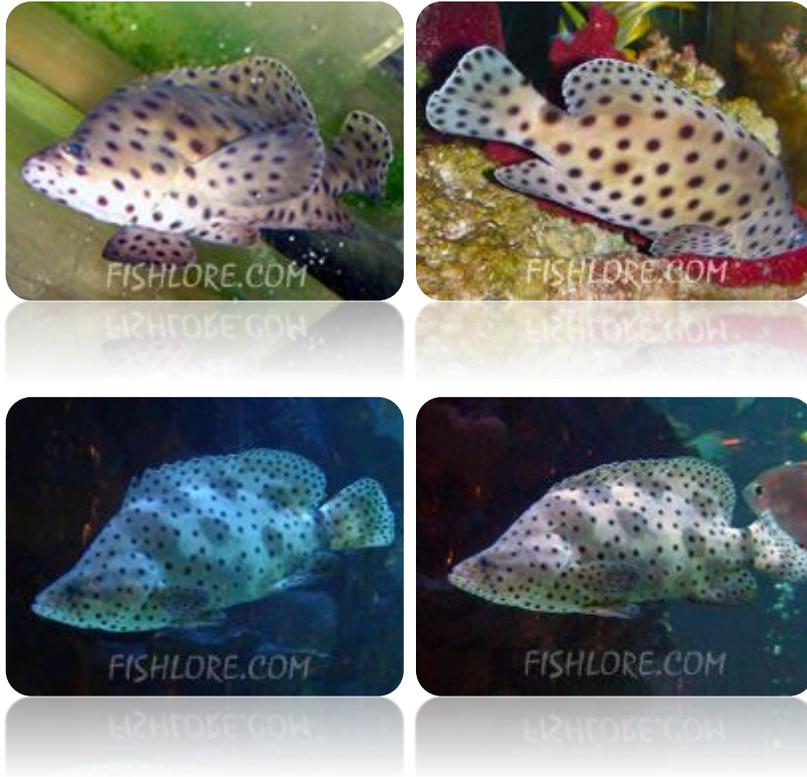
The Panther Grouper is one of those species that look really cool with their white bodies sporting black polka dots, but don't get sucked in! The Panther Grouper gets way too big for 99 percent of home aquariums. When you see them in the store's tank, just keep walking Pedro.

The Panther Grouper can get to be about 27 inches (70 cm) when fully grown and they eat like it's going out of style. To adequately keep them you should be thinking about a 300 plus gallon aquarium (1135 liters). The juvenile groupers around 3 or 4 inches are collected on the reef and sold to stores but they can quickly outgrow most tanks. The larger groupers are a food fish and sold in Asian markets.

They will eat most meaty type foods such as silversides, crustaceans, squid, etc. This grouper is considered hardy but may be quite shy when first introduced to the tank. So lots of cover (live rock) will be needed to help make them feel secure. As they grow they will become bolder but for the most part will leave other similarly sized fish alone, including other Panther Groupers. Smaller fish may be on their menu though.

If you have anything less than 300 gallons then please don't even consider a large species like this one. These are best left for the serious home hobbyist with a large aquarium, public aquariums or even better, left on the reef.

Panther Grouper Pictures



Panther Grouper Species Profile Facts and Care Information

Scientific Name : *Cromileptes altivelis*

Common Names : *Panther Grouper, Polka Dot Grouper, Pantherfish, Humpback Grouper, Highfin Grouper, Seabass*

Care Level : Moderate

Size : 27 inches (70 cm)

Life span : 20 plus years

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Southern Japan to Palau, New Caledonia and southern Queensland, Australia. Eastern Indian Ocean, Nicobar Islands. Normally found in lagoons and seaward reefs. Found near coral reefs and tide pools as well.

Temperament / Behavior : The Panther Grouper is a big fish and will eat smaller fish and crustaceans. You can keep them in multiples provided that you have a tank in the several hundred/thousands of gallons range.

Breeding / Mating / Reproduction : Fishbase reports a spawning event in 1979 but the eggs died. Not sure of any further attempts to breed them in aquariums. These groupers are open water, substratum egg scatterers.

Tank Size : 300 gallon (1135 liters) minimum, preferably much bigger if you plan on keeping multiples

Compatible Tank Mates : This grouper needs to be in a tank with similar sized fish and kept in the largest of aquariums.

Reef Tank Compatible? : Will eat crustaceans and smaller fish but should leave the corals alone.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Needs bigger meaty pieces of marine origin foods like silversides, squid, krill, shrimp, etc.

Tank Region : Likes to swim in the middle to upper sections of the tank but will patrol all over the aquarium.

Gender : Don't know how to tell male from female using external characteristics.

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Cromileptes altivelis*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

HAWKFISH

LONGNOSE HAWKFISH (OXYCIRRHITES TYPUS)

The Longnose Hawkfish is a red fish with a white checked body. Or is it a white fish with a red checked body? Either way the Longnose Hawkfish is a neat little fish that can bring some personality to your tank. This Hawkfish can usually be bought for \$30 to \$50 online and they stay relatively small, reaching a potential adult size of around 5 inches. The Longnose Hawkfish is kept in aquariums 30 gallons or larger and in singles. Keeping multiple hawkfish in most home sized aquariums is asking for trouble.

The Hawkfish needs a bit of rock work to perch itself upon and watch life go by. Sometimes something will catch their eye and then they pounce, only to retreat back to their perch. Avoid keeping Longnose Hawkfish in tanks with small invertebrates because they can and will go after the inverts. Snails, Hermit Crabs and Sea stars are all fair game to the Hawkfish.

The Longnose is a known tank jumper so a good tight fitting hood or canopy will be needed.

It's interesting to note that all of these hawkfish are females at first and then one will change into a functional male when needed. They are harem spawners in the wild and are considered pelagic spawners. Although in the home aquarium it was reported that they are nesters/guarders. The difficult part is getting them to pair, spawn and raise the larvae past metamorphosis.

Longnose Hawkfish Picture



Longnose Hawkfish Species Profile Facts and Care Information

Scientific Name : *Oxycirrhites typus*

Common Names : *Longnose Hawkfish*

Care Level : Moderate

Size : 5 inches (13 cm)

Life span : 5 to 7 years or longer in the wild

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Red Sea, Hawaiian Islands to Southern Japan, south to New Caledonia. Found on the outer reef slope where it inhabits gorgonians and black corals.

Temperament / Behavior : Might be considered reef safe if kept well fed. Remove it though if it shows signs of going after any invertebrates such as shrimps or snails.

Breeding / Mating / Reproduction : Reportedly has spawned in the home aquarium but the larvae have not survived for long. Male hawkfish may be slightly larger with black markings on their dorsal fins.

Tank Size : 30 gallon (113 liters) minimum, preferably bigger

Compatible Tank Mates : Use caution when selecting tank mates. You may have better results if this is the last fish placed in the tank. You may still see some aggression with other fish that are the same size or smaller. These fish are not necessarily reef aquarium safe because they will nip lps corals and may pick on smaller invertebrates.

Reef Tank Compatible? : Not necessarily, see above and use caution if you have clams since it has been reported that they may nip at them.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Small frequent carnivore type foods a couple times per day. Rod's foods or thawed shrimp such as brine or mysis work well. Give them a thawed clam on the half shell from your local supermarket. Simply rinse the clam under room temperature water until the shell opens up and then give the meaty side to your fish. The clam meat is usually gone by the time the shell hits the bottom of the tank!

Tank Region : Found sitting on it's perch somewhere

Gender : Males may be slightly large than females with black markings on their dorsal fins.

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

"*Oxycirrhites typus*". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

JAWFISH

YELLOW-HEAD JAWFISH - OPISTOGNATHUS AURIFRONS

The Yellowhead Jawfish is a wonderful looking fish with a bright yellow head and a white or light blue body. The Yellowhead Jawfish likes to burrow in the substrate and prefer a deeper sand bed with crushed coral and various grades of sand, at least 3 to 5 inches. They have the incredible ability to quickly dart back into their burrow tail first when spooked. You usually won't see them swimming around alot. They like to hang vertically above the burrow or in the burrow with only their yellow heads poking out. It's really neat to see a colony of them in a tank hanging vertically above their holes watching you.

The Yellowhead Jawfish should do well with other peaceful marine fish and you should be able to keep multiple yellow jawheads in the same tank, provided that there is enough territory for each. However, the different jawfish species may not co-exist peacefully in the same tank. They have been known to jump out of tanks when first introduced, so you'll need a good tight fitting hood with no possible escape points.

The Yellowhead Jawfish is primarily a carnivore and need meaty foods in their diet. At first, you may need to deposit the food near the burrow opening to entice them to eat. After they become acclimated they may become less shy and may come out of the burrow to eat. Be warned, they may nip at and eat small crustaceans.

They seem to be fairly disease resistant but you still need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank.

Yellow-head Jawfish Pictures



Yellowhead Jawfish Profile Facts and Care Information

Scientific Name : *Opistognathus aurifrons*

Common Names : *Yellowhead jawfish, Pearly Jawfish*

Yellow Head Jawfish Care Level : Easy to Moderate

Size : Up to 4 inches (10 cm), sometimes slightly larger

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Bahamas, Caribbean, Western Atlantic

Yellow-head Jawfish Temperament / Behavior : They should be kept with peaceful tank mates. You can keep multiples in the same tank. Take your time getting them acclimated to your tank.

Breeding / Mating / Reproduction : These fish are mouth brooders, meaning that the males incubate the eggs in their mouths. It has been bred in captivity.

Tank Size : 30 gallon (114 liters) minimum

Yellow-head Jawfish Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with larger more aggressive saltwater species. Multiples can be kept in the same tank.

Reef Tank Compatible? : Possibly, watch closely because they may nip at smaller crustaceans and smaller hermit crabs.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - always use a quarantine tank for new arrivals.

Diet / Fish Food : Primarily carnivorous, try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually bottom, inside substrate and sometimes directly above their burrow.

Gender : Males will mouth brood the eggs.

LIONFISH

LIONFISH - PTEROIS VOLITANS

Lionfish are also known as the common lionfish, the turkey fish, the butterfly cod fish and the red fire fish. There are a few varieties of the Lionfish (antennata, fu manchu, radiata and russell's) with two primary types. The common (Pterois) and the dwarf (Dendrochirus). The common lionfish variety can grow to 12 inches (30 cm) or larger whereas the dwarf varieties usually only grow to half that size.

Take note that the spines on this fish are **venomous** and if you get pricked it may be fairly painful and you should probably seek medical attention. Be very careful when handling them (with a net) and while performing tank maintenance.

They are very efficient at polluting the water in your tank, so it is probably wise to give them no more than 1 small feeding per day. They require a good filtration system and highly oxygenated water. This means that you may need to have air stones in your tank in addition to the power heads for water movement.

Dwarf Lionfish varieties could probably be kept in 30 gallon (114 liters) tanks or larger whereas the common lionfish should be kept in a 55 gallon (208 liters) or larger given their potential adult size.

Avoid putting them in a community tank with fish small enough to fit in their mouths. Otherwise, they will quickly rid your tank of the smaller fish. They will also go after some invertebrates so they are probably not a good choice for reef tanks.

Pictures



Lionfish Profile Facts and Care Information

Scientific Name : Pterois volitans

Common Names : *Turkey fish, Fire Fish, Butterfly Cod, Peacock and Scorpion Fish*

Care Level : Easy to moderate, needs a good aquarium filter to keep wastes at a minimum.

Life span : 10 - 12 years, possibly longer

Size : The common variety can get to be 12 inches (30 cm) or larger. Dwarf varieties usually get to be about 6 inches (15 cm)

pH : 8.1 - 8.4

Temperature : 74°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Red Sea and the Pacific Ocean

Temperament / Behavior : They are not usually overtly aggressive and can make decent tank mates with fish of the same or larger size. They are hard wired to go after smaller fish and invertebrates such as shrimps. They should be kept in a semi-aggressive tank and should probably be left out of the community tank.

Breeding / Mating / Reproduction : The only reported successes have been in a few public aquariums.

Tank Size : 30 gallon minimum for the dwarf varieties, 55 gallon for the common (pterois).

Compatible Tank Mates : Avoid keeping them in an aquarium with smaller fish which they may view as a snack.

Reef Tank Compatible? : Not a good choice because of the pristine water conditions required in a reef aquarium setup. They can introduce large amounts of waste and they are predators that will go after and eat smaller fish and possibly saltwater invertebrates.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily a carnivore and prefers live foods. Try to get them on frozen or fresh foods quickly.

Tank Region : Middle to bottom

Gender : Difficult to determine

Author : Mike FishLore

Fish Lore Forum : Lionfish Forum

RADIATA LIONFISH (PTEROIS RADIATA)

The Radiata Lionfish is not available in the shops as often as other lionfishes and because of this is more expensive and highly sought after by saltwater hobbyists. Radiata Lionfish are very similar looking to the Antennata Lionfish (*Pterois antennata*) but is distinguished by the horizontal lines on the caudal peduncle. Lionfish in general are usually fairly hardy but they do need excellent filtration and highly oxygenated water provided through the use of powerheads and airstones.

Radiata Lionfish are nocturnal in the wild and like to hang out in caves and crevices so it's a good idea to try and replicate this in the home aquarium. Create a cave with the live rock in your tank to make them feel secure. Once they are acclimated to the tank and more comfortable with their surroundings they should come out more and hide less.

You may have a difficult time getting your Radiata Lionfish to start eating. Entice them with live or frozen meaty foods (mysis shrimp, crab pieces). They will go after the smaller fish, shrimps and crabs in your system, so they are not considered reef tank safe. As you can tell, you need to be careful when selecting tank mates. Only house them with larger fish that will leave them alone. Triggers may pester them. Keeping multiple lionfish in the same tank can be done, provided that the tank is sufficiently large enough to accommodate multiples.

Use extreme caution when handling the Radiata Lionfish because the rays or spines are venomous. If you get stung you should seek medical attention. Don't mess around with this fish and please respect their spines!

Radiata Lionfish can be kept in pairs in larger aquariums with excellent filtration and water quality.

Radiata Lionfish Picture



Radiata Lionfish Profile Facts and Care Information

Scientific Name : Pterois radiata

Common Names : *Radiata Lionfish, Radial Firefish, Clearfin Lionfish, Scorpion radiata, Dragonfish*

Radiata Lionfish Care Level : Moderate - Difficult, utilize your live rock to create suitable hiding places for your lionfish.

Size : Up to 9 inches (23 cm)

Life span : 8 - 10 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Red Sea

Temperament / Behavior : Will eat smaller fish, crustaceans and shrimps if the opportunity arises. They should be ok with fish larger than them provided that the larger fish don't pester them too much.

Radiata Lionfish Breeding / Mating / Reproduction : This fish has been bred in public aquariums, but not sure if they've been successfully bred in the home aquarium.

Tank Size : 55 gallon (208 liters) minimum, preferably much larger.

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with smaller fish such as clownfish, damselfishes, crustaceans, shrimps, etc. May be able to keep them with fish larger than them but watch out for the larger fish nipping at the rays of this fish. This fish is not considered reef tank safe.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Carnivore, try to give them a variety of marine foods. They should accept vitamin enriched flake foods, frozen and live foods.

Tank Region : Slowly swims all over the tank.

Gender : Difficult to determine physical differences between males and females.

Author : Mike FishLore

PUFFERFISH

PORCUPINE PUFFER FISH (DIODON HOLACANTHUS)

The Spiney Porcupine Puffer Fish is an odd looking fish that has the obvious ability to inflate with water when threatened. Porcupine Puffer Fish can also inflate with air if removed from the water and this can damage them internally. To prevent this from happening try to scoop or direct them into a bag when moving them. Try not to use a net to move them.

In the ocean Porcupine Puffer Fish can often be found in small groups but replicating this in the home aquarium can be foolish because of their potential adult size and because they can be one of the dirtier fishes to keep. They can reach 12 inches (30 cm) or more so you'll need to have a larger tank, preferably 100 gallons (380 liters) or larger. For most hobbyists, keeping multiple Porcupine Puffers would not be a good idea.

For tank mates for your Porcupine Puffer Fish, look into the tangs and wrasses. Smaller fishes and crustaceans may become Porcupine Puffer dinner. So that eliminates them as a choice for the reef tank setup.

Porcupine Puffer Fish eat crustaceans in the wild and will accept most types of marine fish food including frozen, freeze dried, vitamin enriched flakes and live foods. Small pieces of fresh shrimp and clam can be chopped up and given. Give them a variety of foods but mostly meaty items for optimal health.

They can be particularly prone to getting saltwater ich (cryptocaryon) so you will need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank. It can be a good idea to let them sit in the dealer's tank for a week or two before bringing them home. This will give you them a chance to recuperate from the sometimes long journey to the dealer's tank and it gives you a chance to watch for any sort of outbreaks before you buy them.

Porcupine Puffer Fish Picture



Photo Credit: NOAA

Porcupine Puffer Fish Profile Facts and Care Information

Scientific Name : Diodon holacanthus

Common Names : *Balloon Porcupine Fish, Spiny Puffer*

Porcupine Puffer Fish Care Level : Moderate

Size : 12 inches (30 cm), sometimes even larger

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Atlantic, Eastern Atlantic, South Africa, Red Sea

Temperament / Behavior : This can be a cool fish in the right setup. They may nip at and eat smaller fish, invertebrates and crustaceans. This fish is NOT considered reef tank safe.

Breeding / Mating / Reproduction : We don't believe that this fish has been bred in captivity yet.

Tank Size : 100 gallon (380 liters) minimum

Compatible Tank Mates : Tangs and wrasses would make good tank mates. Anything smaller could become puffer snacks. Not suitable for a reef tank setup.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / [Fish Food](#) : Porcupine Puffer Fish like to eat crustaceans so frozen meaty marine cubes work well as well as small pieces of fresh shrimp. Give them some of the herbivore frozen foods a few times per week and try to get them to eat vitamin enriched flake foods too.

Tank Region : All over

Gender : Very difficult to determine the differences between males and females.

Author : [Mike FishLore](#)

Fish Lore Forum : [Puffer Fish Forum](#)

MAGNIFICENT FOXFACE RABBITFISH - SIGANUS MAGNIFICA

The Magnificent Foxface Rabbitfish doesn't seem to be as common as some of the other rabbitfish species but it is just as hardy. The Magnificent Foxface Rabbitfish can tolerate a varying range of water parameters and may be a good saltwater beginner fish. They do have venomous dorsal spines so you'll need to use caution when using a net to catch them. Magnificent Foxface Rabbitfish can easily get tangled in the net and if that happens gently move the net back and forth in the tank until they relax their fins. Better yet, chase them into a plastic container with the net. Then you don't have to worry about getting them caught in the net.

In the wild these Magnificent Foxface Rabbitfish are often found swimming in pairs but it is not advisable to keep multiple rabbit fish in the home aquarium. Other than other rabbitfish, they should get along with most other fish species, even the more aggressive ones. The more aggressive fish should respect those venomous spines.

Magnificent Foxface Rabbitfish primarily eat algae and having lots of live rock in your aquarium will help make them comfortable, provide them with grazing opportunities and hiding places. Magnificent Foxfaces are not very picky when it comes to fish food and should accept most foods that you give them. Try to give them a varied diet of live, frozen, freeze-dried and vitamin-enriched flake foods. Use a veggie clip with marine seaweed every other day or so. Many believe that this fish is reef tank safe, but if you don't keep it fed it may nip at corals and invertebrates.

They appear to be resistant to most saltwater fish disease but it's wise to be careful and use a quarantine tank before introducing them into your main tank. After they've been in quarantine for two weeks or so and you notice no signs of illness and they are eating well, you can acclimate them into your display tank.

Magnificent Foxface Rabbitfish Picture



Magnificent Foxface Rabbitfish Profile Facts and Care Information

Scientific Name : *Siganus magnifica*

Other Common Names : *Magnificent Foxface Rabbitfish, Andaman Foxface*

Rabbitfish Care Level : Easy, can be recommended as a saltwater beginner fish for someone with a large enough aquarium.

Size : Up to 9 inches (22 cm)

Life span : 5 - 7 years, often longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Indian Ocean

Temperament / Behavior : Magnificent Foxface Rabbitfish are often found in pairs in the wild but will probably not tolerate other rabbit fish in most tanks unless they are mated pairs and the tank is really large. Should play nicely with most other fish but may nip at crustaceans and other invertebrates. More aggressive tank mates should respect them because of their venomous dorsal spines and so should the hobbyist.

Breeding / Mating / Reproduction : Not sure, but they may have been bred in captivity by aquaculture farms.

Tank Size : 75 gallon (284 liters) minimum

Compatible Tank Mates : Probably best to keep only one rabbit fish to a tank unless it is really large (150 gallons or more). Can handle themselves around more aggressive tank mates. Use caution if you're planning on keeping them in a reef tank

Reef Tank Compatible? : Rabbitfish will do fine in a reef tank and like the tangs, they may help control some forms of algae when grazing on the live rock in between meals.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Give them a variety of marine foods but mostly marine algae type foods. They should accept vitamin enriched flake foods, frozen and live foods. They may sample some corals.

Tank Region : All over

Gender : Females are usually larger than males of the same age.

Author : Mike FishLore

ONE SPOT FOXFACE RABBITFISH (SIGANUS UNIMACULATUS)

The One Spot Foxface Rabbitfish is a member of the Rabbitfishes and can be a good choice for a saltwater beginner with a large enough tank. This does not mean that you can put a One Spot Foxface Rabbitfish into a new tank still going through the aquarium nitrogen cycle. One Spot Foxface Rabbitfish look very similar to *Siganus vulpinus*, the more common foxface rabbitfish, but this fish has a dark spot or "blotch" towards the tail.

The dorsal fins on this fish are venomous so we need to handle them with care. Be careful when netting them so that their fins don't get caught in the net. If this happens, gently move the net slowly back and forth until the fish relaxes the fins and you can release it into the tank. Seek medical attention if the venomous fins puncture your skin.

Foxface Rabbitfish should play nicely with other fish but will probably not tolerate other rabbitfish in the same tank. You may be able to keep multiples (especially if they are of the opposite sex) in very large tanks. However, given their potential adult size of 8 inches (20 cm) and their intolerance of their own kind in the cramped confines of most home aquariums, you should probably plan on keeping only one of them in your aquarium.

This rabbitfish primarily feeds on marine algae and having lots of live rock in your tank will provide plenty of grazing opportunities in between meals. Try to give them a varied diet and supplement their diet with marine seaweed using a veggie clip. Reef tank keepers may not want them in their reef tanks because they may nip at some corals.

One Spot Rabbitfish seem to be fairly fish disease resistant but you still need to take proper precautions and use a quarantine tank before introducing them into your main tank. Keep them in the hospital tank for two weeks or so and watch for obvious saltwater diseases, like marine ich.



One Spot Foxface Rabbitfish Profile Facts and Care Information

Scientific Name : *Siganus unimaculatus*

Common Names : *One Spot Rabbitfish Foxface, One Spot Foxface Lo, Blotched Rabbitfish*

Foxface Care Level : Easy to Moderate, can be a good choice for a saltwater beginner with a big enough tank.

Size : Up to 8 inches (20 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Pacific, Western Australia, Phillipines

Temperament / Behavior : They can be aggressive with other rabbitfish but may be able to co-exist with a member of the opposite sex. Other fish should leave them alone because of their venomous dorsal fins.

Breeding / Mating / Reproduction : Very difficult to breed Foxface Rabbitfish in captivity.

Tank Size : 75 gallon (284 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other rabbitfish and keep them well fed in reef tanks. They will nip at soft corals when hungry.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily an herbivore, try to give them a variety of marine foods but predominantly marine algae. Having plenty of live rock for them to graze on goes a long way. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : Usually middle to bottom

Gender : Difficult to determine the differences between males and females.

Author : Mike FishLore

SEAHORSES

SEAHORSE, COMMON SEAHORSE

The Seahorse is a fascinating aquarium specimen that is sought after by many hobbyists. There are about 35 known seahorse species in the wild and all of the species numbers are dwindling due to commercial fishing and medicinal purposes in the Far East. People use Seahorses as medicine for nearly every common ailment under the sun in the Far East. Because of this practice and because they can be difficult to keep, they are only recommend for the advanced and committed saltwater hobbyist.

In the wild the Seahorse primarily feeds on crustaceans and small shrimp. In the home aquarium this diet can be difficult to maintain. Many that are kept in home aquariums often perish from malnutrition, starvation or fish disease brought on by these triggers. Feed them often with live fish food such as brine shrimp, mysis shrimp and vitamin enriched frozen foods. They are slow eaters that must be fed often, usually 2 to 3 times per day. Since they are slow eaters it is best to keep them in a species only tank so they don't have to compete with the faster swimming fish for the food.

Commercial breeders are having some success with tank raised seahorses. If you can find a tank raised specimens they will probably cost a little more but it will definitely be worth it. Tank raised specimens should readily accept frozen foods and they should be more hardy and less stressed than those collected in the wild.

In summary, it's best to keep Seahorses in a species only tank with very stable water parameters in a fully cycled tank. Provide them with a high quality and varied diet.

Seahorse Picture



Seahorse Profile Facts and Care Information

Scientific Name : Hippocampus kuda

Common Names : *Common Seahorse, Spotted, Black and Yellow Seahorse*

Care Level : Difficult, don't even think about adding them to a tank that has not completed the aquarium nitrogen cycle.

Size : Up to 11 inches (28 cm)

Seahorse Life span : 2 - 4 years or slightly longer

pH : 8.1 - 8.4

Temperature : 72°F - 76°F (22°C - 24°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Seahorse Temperament / Behavior : Very peaceful

Seahorse Breeding / Mating / Reproduction : Difficult to breed in the home aquarium and difficult to feed the babies if you do get them to breed. The male carries the fry in his brood pouch until they are ready to be released, usually 2 to 3 weeks.

Tank Size : 55 gallon minimum

Seahorse Compatible Tank Mates : Since they are such slow eaters it is probably best to keep them in a species only tank.

Fish Disease : Saltwater Fish Disease Section - Diagnose, Symptoms and Treatment

Seahorse Diet / Fish Food : Primary diet in the wild is crustaceans and small shrimp. They can be trained to eat frozen foods. Give them a high quality and a varied diet with mysis shrimp and brine shrimp.

Tank Region : They like to cling to stationary items in the tank.

Gender : No noticeable differences until about 6 months old. More noticeable during mating, the female's anal fin will be a little larger than the male and you should be able to see the brood pouch on the male.

Author : Mike FishLore

GREAT SEAHORSE (HIPPOCAMPUS KELLOGGI)

The Great Seahorse is not often available for sale in the saltwater aquarium trade. When you do find a Great Seahorse, expect to pay a modest price for them (\$25 to \$50 USD). They are found in parts of the Western Pacific, from the Red Sea up to Japan. We believe this species was listed in the CITES II but upon searching the database, we could not pull back any information on this species. The Great Seahorse can be a pretty good species if kept in the right tank setup, meaning a seahorse only tank.

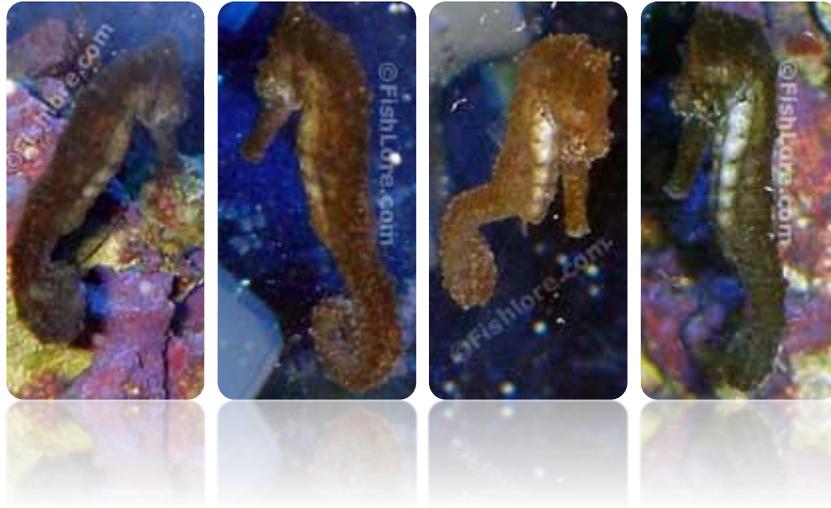
Like most seahorse species, the Great Seahorse is also heavily used in East Asian cultures for folk remedies and this practice has a dramatic impact on the population numbers. They use it to treat a variety of ailments, including kidney problems, urination problems and impotence. Millions of seahorses are captured and used annually for medicinal purposes.

Setting up and running a seahorse tank is a goal of many in the hobby. You'll need plenty of live rock, adequate skimming, low water currents and plenty of places for them to hold onto. *Hippocampus kelloggi* can grow to almost 11 inches (28 cm), so it needs a larger tank.

The biggest problem you'll probably have with keeping the Great Seahorse is getting them to eat. They are very slow eaters and shouldn't have to compete with other fish in the tank for food. Wild caught species will be very difficult to care for because they will usually only go after live foods. Tank raised species should be trained to eat frozen foods. There are manufactured seahorse feeding stations you can buy which may help in delivering food to them. If you're handy, you could even try to make one of these on your own.

Seahorses are fascinating species that need to be respected more and cared for properly. Please research your species thoroughly **before** you get one to determine whether you can meet its needs.

Seahorse Picture



Great Seahorse Profile Facts and Care Information

Scientific Name : Hippocampus kelloggi

Common Names : *Great Seahorse, Kellogg's Seahorse, Offshore Seahorse*

Great Seahorse Care Level : Moderate to Difficult

Size : May get up to 11 inches (28 cm)

Great Seahorse Life span : 2 - 4 years or slightly longer

pH : 8.1 - 8.4

Temperature : 72°F - 76°F (22°C - 24°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Western Pacific, from Red Sea to Japan

Temperament / Behavior : Very peaceful

Great Seahorse Breeding / Mating / Reproduction : Eggs are kept in the male's pouch for a couple of weeks and then released. Can be expensive to acquire a mated pair and/or male/female pairs.

Tank Size : 55 gallon minimum

Compatible Tank Mates : There are not many compatible tank mates that quickly come to mind... They are such slow, methodical eaters that other fish will simply eat all the food before they get a chance to eat. They are best kept in a tank with other seahorses.

Fish Disease : [Saltwater Fish Disease](#) Section - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primary diet in the wild is crustaceans and small shrimp. Wild caught seahorses will usually only go after foods they recognize, i.e. live foods. Captive raised seahorses should eat frozen foods, mysis shrimp, and may even go after other foods once trained. They may graze on the live rock in your tank.

Tank Region : They can often be seen slowly cruising around the mid to top parts of the tank and will need places they can hold on to.

Gender : More noticeable during mating, the female's anal fin will be a little larger than the male and the brood pouch should be easily seen on the male.

Author : [Mike FishLore](#)

ACHILLES TANG - ACANTHURUS ACHILLES



The Achilles Tang is an amazing looking tang that gets to about 9 inches as adults but they have a very bad track record in aquariums over the years. They have a similar reputation as the Powder Blue Tang for their short life spans due to not adjusting to aquarium life and the onset of cryptocaryon (marine ich). They can be very difficult to get on foods, especially the common foods like pellets, flakes and thawed fish foods. Many authors recommend giving them nori (algae sheets) a few times a week. For a new introduced Achilles Tang I would offer it to them all day every day to make sure they have they are eating.

The Achilles Tang is often found near seaward reefs where the water flow is highly turbulent. High and turbulent water flow with high levels of dissolved oxygen in the aquarium are recommended. They may not get on well with conspecifics or even other tangs. Keep them in a 120 gallon aquarium or larger and feed often.

They are seldom, if ever available in local reef shops due to their difficulty but you can find them to buy online for \$200 to \$300. An expensive fish that might be quite demanding and difficult to keep. Leave this one be until you get lots of experience in keeping tangs or leave it on the reef.

Achilles Tang Profile Facts and Care Information

Scientific Name : *Acanthurus achilles*

Common Names : *Achilles Tang, Red spot surgeonfish, Redtail surgeonfish*

Care Level : Difficult

Life span : 7 years or longer

Size : 9 inches (24 cm)

Water Parameters : pH 8 - 8.4 | Temperature 78°F - 82°F (26°C - 28°C) | Specific Gravity 1.022 - 1.026

Origin / Habitat : Western Pacific, Hawaiian and Pitcairn islands - found near seaward reefs often alone or in small groups

Temperament / Behavior : If you have a big enough tank you can keep multiple tangs but do not keep conspecifics in the same tank to avoid aggression.

Breeding / Mating / Reproduction : Extremely difficult, open water egg scatterers

Tank Size : 120 gallon minimum - active swimmers

Compatible Tank Mates : One to a tank, may tolerate other tang species like the Zebrasomas in larger setups.

Reef Tank Compatible? : Yes

Disease : Saltwater Fish Disease Freshwater, pH adjusted dips of a minute or two may help. These tangs are known as "ich magnets". Keep a cleaner shrimp like the Skunk Cleaner Shrimp in with them.

Diet / Fish Food : Primarily an herbivore that needs to be fed algae (nori sheets) on a regular basis. You need live rock too for better results because they will pick at it in between meals. They will also accept flake, pellet foods and of course live foods but give them lots of greens for best results.

Tank Region : All over the aquarium

Gender : Unable to determine by external characteristics

Forum : Tang Forum

Photo Credit : Bryan Harry National Park Service

Author : Mike FishLore

References :

"Acanthurus achilles". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

BLACK TANG (ZEBRASOMA ROSTRATUM)

The Black Tang (*Zebrasoma rostratum*) is also known as the Black Longnose Surgeonfish or the Black Sailfin Tang. They are considered a rarity in the hobby and this tang commands extreme prices. As of 2012 when this article was written, the Black Tang is going for anywhere from \$600 to \$1,500 depending on the size! They are so rare in the hobby because they are only collected in a few places and in those places they are not seen by divers very often. Being a tang they need to swim and a recommended tank size of around 120 gallons or preferably much larger would be good to start with. Most adult Black Tangs get up to about 8 inches (21 cm).

Being an herbivore, the Black Tang primarily eats filamentous algae in the ocean. They are found in lagoons and seaward reefs at depths of 26 to 115 feet. Having a good amount of live rock in the tank will help with not only the biological filter but the rock will also provide grazing opportunities in between their main meals provided by you. The rock will also give them a place to shelter in at night when the lights are off. They will do well in highly oxygenated tanks with plenty of water flow (20 to 30x plus gph) and tanks that have very good water quality provided through partial water changes and adequately skimmed with a protein skimmer.

Getting the *Zebrasoma* tangs eating is not usually a challenge and the Black Tang is no exception. They should go after any marine seaweed you place in the tank. I use a veggie clip and feed my tangs daily with it. Try to make seaweed the main staple in their diet. They will also eat meaty marine origin foods like mysis shrimp, brine shrimp, high quality pellet fish foods, etc.

Given the initial price tag of the Black Tang most hobbyists won't be keeping them in an aquarium but if you do get lucky and score one of these tangs let's summarize what you need to do. Have a large enough tank (120 gallons plus), provide highly oxygenated water, over skim with the protein skimmer, have stable water parameters, introduce them to a well-established tank, only stock them with appropriate tank mates (non *Zebrasoma* species) feed them seaweed often and enjoy their beauty for years to come.

Picture



Photo Credit: Tom Ratchett

Black Tang Species Profile Facts and Care Information

Scientific Name : *Zebrasoma rostratum*

Common Names : *Black Tang, Longnose Surgeonfish, Longnose Black Tang, Longnose Sailfin Tang*

Care Level : Moderate, needs a bigger tank with lots of swimming space, the proper tank mates and abundant food.

Size : 8 inches (up to 21 cm)

Black Tang Life span : 7 to 10 years and possibly longer

Water Parameters : pH 8.1 - 8.4 | Temperature 74°F - 82°F (24°C - 28°C) | SG 1.021 - 1.025 | Carbonate Hardness (dKH) 8 - 12°

Origin / Habitat : Found in lagoons and seaward reefs and at depths of 26 to 115 feet (8 to 35 meters) in the Line, Marquesan, Society, and Tuamoto islands

Black Tang Temperament / Behavior : In the aquarium they will fight with other tangs, especially with other *Zebrasoma* species. Sometimes the fighting is for display or establishing territory and it doesn't usually get too bad, but if it does be ready to separate. It's best to keep only one tang per tank unless you have a very large aquarium in the several hundreds of gallons.

Breeding / Mating / Reproduction : Not sure if it's been bred in the aquarium. It's very difficult since they are open water egg scatterers.

Tank Size : 120 gallon (454 liters) minimum and preferably larger to allow for adequate swimming space. This is a very active swimmer.

Reef Tank Safe? : Yes

Compatible Tank Mates : As mentioned previously you want to avoid keeping them with other tangs. It's not recommended to keep them with other Zebrasomas. Use caution when keeping them with non Zebrasoma tangs and be ready to separate them if the fighting turns to more than just dominance displays.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - cryptocaryon (ich).

Diet / Fish Food : An herbivore that will eat throughout the day. Having plenty of live rock in the tank will help with their foraging in between meals and the live rock will provide a place of shelter at night. Give them dried seaweed using a clip or similar daily or at minimum every other day. There are lots of good marine seaweeds available to hobbyists these days. The garlic enhanced seaweed selects from Ocean Nutrition (brown, purple, green marine algae) will be devoured by your tang.

Tank Region : All over

Gender : Don't know of any external characteristics you could use to distinguish male black tang from female.

Forum : Tang Forum

Author : Mike FishLore

References :

"Zebrasoma rostratum". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005.

Lieske, E. and R. Myers 1994 Collins Pocket Guide. Coral reef fishes. Indo-Pacific and Caribbean including the Red Sea. Harper Collins Publishers

BLUE TANG (PARACANTHURUS HEPATUS)

The Blue Tang also known as the Blue Hippo Tang, is one of the best looking tangs you can keep in our humble opinion. Along with increasing the popularity of Clownfish, that movie could also be credited with popularizing the Blue Tang as well. "Hey look, it's Dory from finding Nemo!"

The Pacific Blue Tang is a member of the surgeonfishes and is one of the most active swimmers of the available tangs. They will need at least a 75 gallon tank (284 liters), preferably larger, to allow for adequate swimming space. They can be fairly hardy once acclimated but will not do well in a tank that has not completed the aquarium nitrogen cycle. You will also need highly oxygenated water provided through increased surface agitation (multiple power heads) and/or the heavy use of air stones.

This surgeonfish has many different common names including - Pacific Blue Tang, Blue Surgeonfish, Palette Surgeonfish, Regal Tang, Hippo Tang, Flag-Tail Surgeonfish and some others. Hopefully this makes you want to use the scientific name when researching and asking about this fish. They are remarkably colored with black, yellow and blue markings and are sure to bring lots of activity to the right tank.

Be careful handling this tang with a net because they can get caught easily in the net. If this happens, gently and slowly move the net back and forth in the tank water. Eventually they should relax their fins and come out of the net.

They will probably not do well with other surgeonfish, especially other Blue Tangs, unless the tank is really large, 100 gallons (379 liters) or larger. If you really have a strong desire to keep multiples, you can try to introduce them all at the same time, but have a backup plan ready. This tang is one of the more peaceful of the bunch and may get picked on by other tangs that are already in the tank. A lot of territorial aggression can be determined not only by the size of the tank but also by the order of introduction into the aquarium.

They primarily feeds on marine algae and having lots of live rock in your tank will provide plenty of grazing opportunities in between meals. Try to give your Blue Tang a varied diet and supplement their diet with marine seaweed using a veggie clip to prevent the colors from fading in this fish.

This tang should be relatively disease resistant once acclimated but you still need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank. Keep them in the hospital tank for two weeks or so and watch for obvious saltwater diseases, such as marine ich.

Blue Tang Picture



Blue Tang Profile Facts and Care Information

Scientific Name : *Paracanthurus hepatus*

Common Names : *Blue Tang, Blue Surgeonfish, Palette Surgeonfish, Regal Tang, Hippo Tang, Flag-Tail Surgeonfish*

Care Level : Moderate, should do well if slowly acclimated to your tank.

Size : Up to 12 inches (30 cm)

Life span : 5 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Great Barrier Reef

Blue Tang Temperament / Behavior : They can be aggressive with other tangs (surgeonfish), especially another Pacific Blue. They also are constantly on the move and will need a larger tank for swimming space.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 75 gallon (284 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates for your Blue Tang. Avoid keeping them with other tangs. Might be able to keep multiple blues if you have a tank larger than 100 gallons. May do ok with Clownfish.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment, like most saltwater tang species you'll want to use aquarantine tank with this species as well.

Diet / Fish Food : Primarily an herbivore and feeds on zooplankton in the wild. Try to give them a variety of marine foods but predominantly marine algae. Having plenty of live rock for them to graze on goes a long way. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and females.

Author : Mike FishLore

Forum : Blue Tang Forum

CLOWN TANG - ACANTHURUS LINEATUS

The Clown Tang is one of the more sought after species of tangs but it has needs that most saltwater aquarists cannot meet. The Clown Tang has alternating cyan blue and yellow horizontal stripes with a white belly. Overall Clown Tangs are very active swimmers and can become quite an aggressive fish in the confines of an aquarium.

Being a tang, they need lots of swimming room and highly oxygenated water with lots of flow. Tanks at least 6 feet in length at minimum are recommended since the Clown Tang likes to swim and given their potential adult size of 14 inches (36 cm) plus. Tanks in the range of 240 gallons or more should be the minimum for keeping one of these clown tangs. Yes, you can keep them in smaller tanks as juveniles but for long term health/success you must have an extremely large tank. Some even think this tang shouldn't be collected for the hobby.

Getting a healthy Clown Tang that is eating at the store is crucial. They don't ship all that well, perhaps going through several stops before reaching your dealer causing them to go on a hunger strike. Keep nori either on a clip or under some rock in the tank **at all times** during acclimation. This is very important! If they are going to make it they will eventually nip at it and start eating. Seeing them eat some nori in the dealer's tank is a very good idea before buying them. Have the store hold them for a week or so (good stores will) and do not buy it if it just arrived in the store. Check out the various forum posts around the net to get an idea of their dismal survival rate. Once they start eating the hard part is usually over. Mix up their diet with frozen preparations of mysis and brine, etc. but the bulk of their diet should be greens. Next you just have to watch out for aggression because they can become quite the jerk as they get larger.

Tank mates need to be considered carefully. Similar sized species should be fine, assuming they are not tangs. You can keep them with some of the tang species that differ considerably in appearance. Purple tangs, Yellow tangs, Tomini tangs etc, might be ok but keep an eye out for aggression. If you do plan on picking one of these Clown Tangs up make them one of the last, if not the last fish introduced into the system.

Pictures



Clown Tang Profile Facts and Care Information

Scientific Name : Acanthurus lineatus

Common Names : *Clown Tang, Blue lined surgeonfish, Blue banded surgeonfish, Striped surgeonfish, Oriental surgeonfish*

Clown Tang Care Level : Moderate to Difficult given their dismal survival rates and tank size requirements.

Life span : 10 years, likely longer

Size : 12 - 14 inches plus (36 cm)

pH : 8 - 8.4

Temperature : 75°F - 83°F (24°C - 28°C)

Specific Gravity : 1.020 - 1.025

Origin / Habitat : Indo Pacific, Fiji, Vanuatu, Maldives

Temperament / Behavior : They can be extremely aggressive and get quite large... Do lots of research on the species you're interested in keeping them with beforehand. Do not keep with other similar looking tangs. They may get more territorial, aggressive as they get larger.

Clown Tang Breeding / Mating / Reproduction : Has not been bred in captivity. They form spawning aggregations and pair off to spawn. They are egg scatterers.

Tank Size : 240 gallon minimum, but much bigger for long term health. Long tanks (6 feet plus at least) to allow adequate swimming space.

Compatible Tank Mates : Avoid keeping them in an aquarium with other Clown Tangs. Tangs that are dissimilar in appearance might do ok but watch for aggression and be prepared to remove them.

Reef Tank Compatible? : Given a large enough reef tank, yes they should leave the corals and invertebrates alone.

Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment, a quarantine tank is a must with this species. They often come down with ich from stress during shipment. It's very important to get them eating right away.

Diet / Fish Food : Herbivore, have plenty of live rock and/or be prepared to give them dried seaweed or dried algae using a lettuce clip. Have algae (nori) in the tank at all times during acclimation (first few weeks) to help lower stress and make the more healthy overall. They can be quite finicky when first introduced, ignoring even the most appealing foods like brine and mysis shrimp. Try putting some nori under a piece of rock if they don't go after it on the veggie clip. They will eventually nip at it, realize it's something they like and then eat it regularly. After they've been in the tank for a while they will also accept flake, pellet foods and live foods. Having dried nori in the tank at all times to let them graze, especially in low nutrient tanks where there isn't enough to graze on the rocks.

Tank Region : All over

Gender : Difficult to determine, but the female may be larger than males of the same age.

Forum : Tang Forum

Author : Mike FishLore

References :

"Acanthurus lineatus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

CONVICT TANG - ACANTHURUS TRIOSTEGUS

The Convict Tang is a member of the surgeonfishes and is one of the most peaceful of the available tangs. Convict Tangs will need at least a 75 gallon tank (284 liters), preferably larger, to allow for adequate swimming space. They can be fairly hardy once acclimated but will not do well in a tank that has not completed the aquarium nitrogen cycle. You will also need highly oxygenated water provided through increased surface agitation (multiple power heads) and/or the heavy use of air stones.

Convict Tangs are nicely colored with a white or yellow body and black vertical stripes. They are frequently found schooling in the ocean and provided that you have a large enough tank, you may be able to keep multiple tangs in your saltwater aquarium. However, this Tang will probably not do well with other surgeonfish unless the tank is really large, 100 gallons (379 liters) or larger. This tang is one of the more peaceful of the bunch and may get picked on by other tangs that are already in the tank.

They should primarily eat marine algae and having lots of live rock in your tank will provide plenty of grazing opportunities in between meals. Try to give them a varied diet and supplement their diet with marine seaweed using a veggie clip.

They are somewhat disease resistant but you still need to take proper pre-cautions and use a quarantine tank before introducing them into your main tank. Keep them in the hospital tank for two weeks or so and watch for obvious saltwater diseases, like marine ich and make sure they are eating.

Pictures



Convict Tang Profile Facts and Care Information

Scientific Name : *Acanthurus triostegus*

Common Names : *Convict Tang, Convict Surgeonfish, Manini*

Care Level : Easy to Moderate

Size : Up to 8 inches (20 cm)

Life span : 5 - 7 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Hawaii

Convict Tang Temperament / Behavior : They may be aggressive with other convict tangs in smaller tanks but may do ok in multiples in larger tanks. May get bullied by other surgeonfish. They also are constantly on the move and will need a larger tank for swimming space.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 75 gallon (284 liters) minimum

Convict Tang Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other species of tangs. Might be able to keep multiple tangs if you have a tank larger than 100 gallons. Introduce at the same time to limit territorial aggression.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Convict Tang Diet / [Fish Food](#) : Primarily an herbivore and feeds on marine algae in the wild. Try to give your Convict Tang a variety of marine foods but predominantly marine algae. Having plenty of [live rock](#) for them to graze on goes will definitely help. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and females.

Forum : [Tang Forum](#)

Author : Mike FishLore

MIMIC EIBLI TANG



Mimic Eibli Tang juveniles look like the Eibli Angelfish (*Centropyge eibli*). This is a form of Batesian mimicry which is a survival mechanism. It is thought that the dwarf angelfish is less appetizing to would be predators and the Mimic Eibli Tang has evolved to mimic this look to help avoid predation. It is an amazing occurrence in nature, nonetheless.

The Mimic Eibli Tang gets to about 10 inches when fully grown and needs at least a 120 gallon (454 liters) aquarium with lots of open swimming space. Keep the tank highly oxygenated with lots of turbulent water flows. They are often found in lagoons and near seaward reefs at various depths of 6 to 85 feet (2 to 26 meters). As they mature, they lose the juvenile markings and start to turn a more drab light brown or gray with darker gray fins. Juveniles are definitely more attractive looking and fetch higher price tags than adults.

They need to be fed primarily algae or nori (dried seaweed) along with a high quality pellet food. You can supplement their diet with defrosted foods like Rod's Herbivore Blend or similar. As with all fish purchases, make sure they are eating at the store before bringing them home. Sometimes specimens that are too small (less than 2 inches) are hard to get eating. Make sure they show an aggressive feeding response when food hits the water at the store. This will help ensure that you bring home a healthy fish to place in your quarantine tank for a few weeks before introduction into your display tank.

Avoid keeping them with other tangs, especially conspecifics. If you do plan on keeping them with multiple tang species try to introduce them all at once. They should do well with most other fish species. Some LPS coral keepers have reported seeing them nip at polyps so use

caution if you have a reef tank setup. You can buy them locally or online for anywhere from \$40 to \$60 or so.



Mimic Eibli Tang Profile Facts and Care Information

Scientific Name : *Acanthurus tristis*

Common Names : Mimic Eibli Tang, Blackcheek surgeonfish, Indian Mimic Surgeonfish, Yellowspot Surgeonfish

Care Level : Moderate

Life span : 7 years or longer

Size : 10 inches (25 cm)

Water Parameters : pH 8 - 8.4 | Temperature 78°F - 82°F (26°C - 28°C) | Specific Gravity 1.022 - 1.026

Origin / Habitat : Found in shallow lagoons and seaward reefs in the Indian Ocean, the Maldives and southern Indonesian Islands and near Bali at depths of 2 to 26 meters (6 to 85 feet)

Temperament / Behavior : Avoid keeping them with conspecifics.

Breeding / Mating / Reproduction : Group spawners, open water egg scatterers

Tank Size : 120 gallon (454 liters) minimum

Compatible Tank Mates : Generally peaceful but may bicker with other tangs over territory around feeding time and more so as they get bigger.

Reef Tank Compatible? : This tang is reef tank compatible with caution. There are some reports from hobbyists that they may nip at LPS corals.

Disease : Saltwater Fish Disease Quarantine and a slow drip acclimation are recommended.

Diet / Fish Food : The Mimic Eibli Tang is an herbivore so be sure that you have lots of live rock for them to feed on throughout the day. Offer them dried nori or seaweed daily for best results.

Tank Region : All over the aquarium

Gender : Unable to determine by external characteristics

Forum : Tang Forum

Author : Mike FishLore

References :

"Acanthurus tristis". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

GEM TANG (ZEBRASOMA GEMMATUM)

The Gem Tang (*Zebrasoma Gemmatum*) is also known as the Spotted Tang. Is it called the Gem Tang due to its enormous price tag? The spotted tang is likely the more descriptive common name given its markings. Why is this fish so expensive? The main reason is that it is rarely collected and hardly ever seen in the aquarium trade. If you do happen to see this tang on sale expect to pay around \$3,000 for it! In the ocean they are found near reefs at depths of 30 to 200 feet in the Western Indian Ocean near South Africa, Mozambique and a few other locations.

The Gem Tang is considered just as hardy as the other *Zebrasoma* tangs and adapts well to being in an aquarium. Give them a tank that is at least 120 gallons but preferably much larger since they like to swim. Try not to keep them with other tangs because they may fight. That warning is doubled if you plan on keeping them with other *Zebrasoma* species. Some hobbyists have been fortunate in keeping multiple tangs in the same tank. If you do plan on keeping multiples introduce them at the same time and be sure there are plenty of hiding places. If the fighting gets to be too much be prepared to separate them. Given the price tag of the Gem Tang I don't really think keeping multiples will happen except in the larger tanks or public aquariums though.

The Gem Tang is an herbivore so they need to be given marine seaweed on a regular basis. I feed my tangs nori daily and mix in thawed finely chopped marine origin meaty foods (like Rod's foods or similar), along with a high quality pellet food like New Life Spectrum.

The hard part about keeping the Spotted Tang is actually finding one for sale in the first place and then having the available funds to buy one! They are considered rather easy to moderate to keep just like many of the other commonly available *Zebrasoma* tangs. Acclimate them to your tank (or even better, use a quarantine tank) over a period of an hour or two and keep a skunk cleaner shrimp or red fire shrimp with them to protect your investment.

Gem Tang Picture



Photo Credit: Tom Ratchett

Gem Tang Species Profile Facts and Care Information

Scientific Name : Zebrasoma Gemmatum

Common Names : *Gem Tang, Spotted Tang*

Care Level : Moderate, needs an aquarium with lots of swimming space.

Size : 8.5 inches (up to 22 cm)

Gem Tang Life span : 7 to 10 years and possibly longer

Water Parameters : pH 8.1 - 8.4 | Temperature 74°F - 82°F (24°C - 28°C) | SG 1.021 - 1.025 | Carbonate Hardness (dKH) 8 - 12°

Origin / Habitat : Lives in coral and rocky reefs at depths of 30 to 200 feet (10 to 61 meters) and found in the Western Indian Ocean: Near Mozambique, South Africa, Madagascar, Reunion and Mauritius. They are usually found as lone specimens and are very territorial on the reef.

Gem Tang Temperament / Behavior : They will fight with other tangs especially other Zebrasoma tangs. They should leave other fish species alone and can usually handle themselves against other similarly sized fish.

Breeding / Mating / Reproduction : Has not been bred in the aquarium. They are open water egg scatterers.

Tank Size : 120 gallon (454 liters) minimum. Larger than 120 gallons is better to allow for adequate swimming room.

Reef Tank Safe? : Yes

Compatible Tank Mates : Keep with similar sized fish species, avoid keeping them with other tangs. Use caution if you do stock them with other tangs and introduce them at the same time.

Fish Disease : Saltwater Fish Disease - cryptocaryon (ich) is common.

Diet / Fish Food : They will pick at the live rock in the tank all day long and they need a steady diet of marine origin seaweed (nori). Seaweed selects from Ocean Nutrition (brown, purple, green marine algae) are very good. Mix in some meaty foods such as brine shrimp, mysis shrimp and other finely chopped pieces of meaty marine origin foods.

Tank Region : All over

Gender : Don't know of any external characteristics to determine males from females.

Forum : Tang Forum

Author : Mike FishLore

References :

"Zebrasoma Gemmatum". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005.
Randall, J.E. 2001 Surgeonfishes of Hawaii and the world. Mutual Publishing and Bishop Museum Press, Hawaii.

KOLE TANG

The Kole Tang is most often collected from Hawaii for the aquarium trade and is highly sought after because of the kole tang's constant algae grazing, reef tank friendliness and good demeanor. The Kole tang has a yellow highlight around its eyes with a purplish or brown body composed of horizontal stripes. The head region has many fine dots or "freckles" as I like to call them. The common name is pronounced a couple of different ways including 'coal-eh' or 'coal-ee'. Use the scientific name *Ctenochaetus strigosus*. *Ctenochaetus* is pronounced 'ten-o-kee-tus'. That will sound more impressive around your friends.

The Kole Tang will race around the tank all day long, so a large tank that can provide plenty of swimming room will be needed. Live rock will provide hiding places, a place to sleep in at night and grazing opportunities for algae in between meals. Feed them dried marine seaweed (like ocean nutrition brown algae or sprung's sea veggies) using a clip at least every other day, if not more often. They will eat flakes, pellets and defrosted marine origin foods (like rod's foods - very good stuff). The bulk of their diet should be comprised of greens though.

For reef tank keepers, they are considered reef tank friendly but some hobbyists have reported that they have caught them picking at their LPS corals. Watch them closely at first to be on the safe side.

They are rather good community tank dwellers but as always, use caution when stocking them with other tangs, especially conspecifics. Don't plan on keeping multiple Kole Tangs in the same tank unless it's a very large tank. If you do plan on keeping multiple tang species, introduce them all at the same time to limit aggression.

Standard saltwater parameters are needed (see below) including high flows to keep the water oxygen saturated. Drip acclimate them slowly for an hour or longer depending on the difference in water chemistry from the tank they came from. A cleaner shrimp is always recommended when you have a tank with tangs in it because they are thought of as ich magnets.

Getting a Kole Tang for your reef tank may pose a problem in the future. The state of Hawaii has impending legislation (2012) that will restrict the exportation of many saltwater fish species. This species is supposedly on the list of species that are to have "new bag limits". Many feel that this legislation will pass and that means that the price on this tang and others will go up. This debate is getting pretty heated and it's interesting to watch how it develops.

Pictures



Kole Tang Profile Facts and Care Information

Scientific Name : Ctenochaetus strigosus

Common Names : *Kole Tang, Spotted Surgeonfish, Striped Bristletooth, Goldring Bristletooth, Yellow-eyed surgeonfish*

Care Level : Easy to Moderate

Life span : 5 years or longer

Size : 5 to 6 inches (13 to 15 cm)

pH : 8 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Specific Gravity : 1.022 - 1.026

Origin / Habitat : Regularly found near Hawaii and Johnston Island, western central Pacific: Australia

Temperament / Behavior : Avoid keeping them with conspecifics.

Breeding / Mating / Reproduction : Group spawners, open water egg scatterers

Tank Size : 70 gallon minimum, the bigger the better because they are such active swimmers.

Compatible Tank Mates : Generally peaceful but will fight with other tangs.

Reef Tank Compatible? : This tang is reef tank compatible.

Disease : Saltwater Fish Disease doesn't seem to be as prone to saltwater ich like many of the other tangs, but proper diet, quarantine and a slow drip acclimation are recommended.

Diet / Fish Food : The Kole Tang is an herbivore so be sure that you have lots of live rock for them to munch on. Also supplement their diet with a good quality flake food or pellet food (new life spectrum is good). Feed them dried marine seaweed (nori) using a lettuce clip.

Tank Region : All over the aquarium

Gender : Not able to determine by external characteristics

Forum : Tang Forum

Author : Mike FishLore

References :

"Ctenochaetus strigosus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

LAVENDER TANG - ACANTHURUS NIGROFUSCUS

The Lavender Tang is often passed over by hobbyists since it's not quite as striking at first glance like many of the other readily available tangs. But, once you fatten the Lavender Tang up and get them under the right lighting the colors on these Lavenders can really come to life. Lavender Tangs have light gray bodies with pastel like yellow dorsal fins and purple tail/anal fins. They also have small yellow dots on their mouth and face.

Use caution if you plan on stocking a Lavender Tang with other tangs and only keep them in 100 gallon tanks or larger. It is not advisable to keep them in the same tank with other Acanthurus tangs such as the Powder Blue Tang, Powder Brown Tang, etc. That's not to say it can't be done, but just that you will have to watch them closely for aggression and take the appropriate actions if you notice them not getting along with tank mates. Keeping them with the more common Yellow Tang or the less common (and expensive) Purple Tang may be ok but, again, watch them closely.

As far as feeding the Lavender Tang goes, stick to the usual diet for tangs that is heavy on the greens. Dried brown, red and green algae fed to them using a veggie clip will be required. Having lots of live rock in your tank will allow them to graze in between meals. Herbivore pellets and flakes are also accepted and make for a good main diet.

Give them stable water parameters, highly oxygenated water, high flow and a proper diet and the Lavender Tang will be in your tank for a long time.

Pictures



Lavender Tang Profile Facts and Care Information

Scientific Name : *Acanthurus nigrofuscus*

Common Names : *Lavender Tang, Brown Tang, Brown Surgeonfish*

Care Level : Moderate

Life span : 7 years or longer

Size : 7 - 8 inches (21 cm)

pH : 8 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Specific Gravity : 1.022 - 1.026

Origin / Habitat : Indo-Pacific, South Pacific Ocean near Hawaii and Great Barrier Reef, New Caledonia.

Lavender Tang Temperament / Behavior : If you have a big enough tank you can keep multiple tangs but do not keep conspecifics in the same tank to avoid aggression.

Breeding / Mating / Reproduction : Group spawners, open water egg scatterers

Tank Size : 90 gallon minimum, 100 gallons plus is way better

Compatible Tank Mates : Generally peaceful but may take exception to new arrivals. Use caution when stocking this tang.

Reef Tank Compatible? : The Lavender Tang is reef tank compatible.

Disease : Saltwater Fish Disease generally hardy but drip acclimate slowly over an hour or so.

Diet / Fish Food : The Lavender Tang is an herbivore, you need live rock and be ready to give them dried seaweed or dried algae using a lettuce clip. The brown, red, green and purple (brown algae being really good) algae will be devoured by these tangs. They will also accept flake, pellet foods and of course live foods but give them lots of greens for optimal results.

Tank Region : All over the aquarium

Gender : Not able to determine by external characteristics

Forum : Tang Forum

Author : Mike FishLore

References :

"Acanthurus nigrofuscus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H.

Publications.

MOORISH IDOL - ZANCLUS CORNUTUS

The infamous Moorish Idol. Here we present one of the most difficult species of fish to keep and raise in captivity. Moorish Idol popularity increased with the release of the kid's movie "Finding Nemo" but as most hobbyists soon found out, the Moorish Idol is very tough to acclimate and keep. Long term survivability of this species in home aquariums is rare.

The Moorish Idol is colored with white, yellow and black vertical body markings. They are frequently found schooling along the reef and provided that you have a large enough tank, you may be able to keep multiples in your saltwater aquarium.

The Moorish Idol is a very finicky eater and to make matters worse, their protruding mouths are sometimes damaged during collection and transport. Another good reason to use the quarantine tank when you first get them is to get them eating without any competition. In the ocean they graze on marine algae and sponges. Having copious amounts of live rock in your tank will provide grazing opportunities in between meals. Try to give them a varied diet of live or frozen marine fish foods.

Moorish Idols can come down with most saltwater fish diseases especially if you're having difficulty getting them to eat. Therefore, use of a quarantine tank with this fish is a must. Keep your Moorish Idol in quarantine for at least a few weeks, but at least as long as it takes for them to start eating.

They are true beauties though and if you consider yourself an expert in marine aquarium keeping you may want to try this elegant and delicate fish. Don't cut any corners with your Moorish Idol and be sure to take your time while acclimating them to your tank. Give them optimal water conditions and please, don't even think about adding them to anything but an established tank after the recommended quarantine period. For most hobbyists, the Moorish Idol is one fish that is best left on the reef for now.

Moorish Idol Photo:



Moorish Idol Profile Facts and Care Information

Scientific Name : *Zanclus cornutus*

Common Names : *Moorish Idol*

Care Level : Very Difficult

Size : Up to 6 inches (15 cm)

Moorish Idol Life span : Unknown, usually short lived in captivity due to acclimation issues and nutritional problems

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Hawaii

Temperament / Behavior : Generally, Moorish Idols are peaceful and can be kept in multiples in large enough systems.

Breeding / Mating / Reproduction : Very difficult to keep, let alone breed in captivity.

Tank Size : 100 gallon (379 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with overly aggressive species. May keep a small school of multiples in larger tanks. May not be a good choice for reef tanks because they may pick at sps corals.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : This is the most difficult aspect of keeping this fish. They are omnivorous and they eat marine algae and sponges in the ocean. Try to give them a variety of live marine foods. Having plenty of live rock for them to graze on may help.

Tank Region : All over

Gender : Difficult to determine the differences between males and females.

Author : Mike FishLore

NASO TANG - NASO LITURATUS

Naso Tang (*Naso lituratus*) - If you have a larger saltwater aquarium that's at least 125 gallons, preferably larger, you might be interested in the Naso Tang. This is one of the larger tangs. Naso Tangs can reach up to 18 inches and they are very active swimmers. A highly oxygenated tank with lots of swimming room is needed.

It can be somewhat difficult to get them eating. In the ocean they eat brown macro algae (*Sargassum* and *Dictyota*). It is recommended to have this algae on hand if you plan on trying your hand at keeping them given their finicky taste buds, at least at first. Once they acclimate you could start introducing other greens into their diet using vegetable clips or placing pieces of dried marine algae under rocks in the tank for them to graze on. Given their high activity rate you will want to provide several small feedings per day.

Be careful when using a net with the Naso Tang (and all tangs). They have spines that they can erect at the base of the caudal peduncle. These spines are used for defense and aggression and they can inflict a nasty wound if you're not careful.

The Naso Tang should play well with other fish species, except for other tangs and surgeonfish. Invertebrates should be left alone, but some hobbyists have reported that they have caught them nipping corals. Exercise caution if introducing to a reef tank and be ready for plan B should they not behave.

According to FishBase this species is separate from it's Indo-Pacific cousin, *Naso elegans*.

Pictures



Naso Tang Profile Facts and Care Information

Scientific Name : *Naso lituratus*

Common Names : *Naso Tang, Clown Tang, Orangespine Unicorn fish, Striped Unicornfish, Lipstick Tang*

Care Level : They can be fairly rugged once they become accustomed to their new home, but take your time introducing them and feed a high quality diet incorporating macro algae.

Life span : 8 years, likely longer

Size : Up to 18 inches (46 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 79°F (24°C - 26°C)

Specific Gravity : 1.023 - 1.025

Origin / Habitat : Near and in reef areas at depths of 1 - 90 meters (1 - 270 feet) near Japan south to the Great Barrier Reef.

Naso Tang Temperament / Behavior : Does not do well with other tangs in the home aquarium but may be ok with larger species as it reaches adult size.

Breeding / Mating / Reproduction : Observed to form pairs, would be extremely difficult in the home aquarium.

Tank Size : 125 gallon minimum

Compatible Tank Mates : Don't mix them in with other Tangs or Surgeonfish but they may/should play nicely with other species.

Reef Tank Compatible? : Could be considered with caution... Some hobbyists have reported that they've witnessed them nipping corals.

Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. Ich (white spot - cryptocaryon) is common in many tangs. Quarantine is always a good idea. Use cleaner shrimps as well.

Diet / Fish Food : The Naso Tang is an herbivore and having lots of live rock goes a long way and be prepared to give them dried seaweed or dried algae using the lettuce clip or place it under

some live rock in the tank. It's highly recommend to feed them brown macro algae as it's in their natural diet and may be one of the key factors in keeping them healthy long term.

Tank Region : All over the tank, this is an active swimmer

Gender : Not sure of any external characteristics to identify males from females.

Forum : [Tang Forum](#)

Author : [Mike FishLore](#)

References :

"Naso lituratus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

Tulloch, J. H. (2001). Natural Reef Aquariums, Simplified Approaches to Keeping Living Saltwater Microcosms. T.F.H. Publications.

ORANGE SHOULDER TANG - ACANTHURUS OLIVACEUS

The Orange Shoulder Tang photos you usually see are of adult specimens. The Orange Shoulder Tang is an interesting fish for the tang lovers out there. As juveniles they are yellow and lack the signature orange shoulder! They develop the orange spot as they mature. Prices range from around \$25 for small (1 - 2 inches) to over \$100 for larger (5 - 8 inches) specimens.

Food wise, the Orange Shoulder Tang needs and eats lots of algae. Make sure to incorporate nori, spirulina and/or dried marine origin algae into their diet. Algae growing on the sand and live rock may not be enough. They will graze the sand surface and rock eating diatoms and detritus.

Like all tangs, the Orange Shoulder Tang is no exception with needing lots of swimming room. Given its adult size of 14 inches (35 cm) we are talking at least a 125 gallon tank or larger! Please don't cramp these tangs into smaller setups.

Is it reef safe? It may be considered reef safe and shouldn't pick at corals, clams or any other invertebrates in the tank. They may get aggressive with other tangs, so it's advisable to thoroughly research this fish as well as any other fish you are planning on putting in your tank before buying! For best results only keep one of these Orange Shoulder Tangs in your tank.

Orange Shoulder Tang Pictures



Orange Shoulder Tang Profile Facts and Care Information

Scientific Name : *Acanthurus olivaceus*

Common Names : *Orange Shoulder Tang, Orange Bar Surgeonfish, Orange Spot Surgeonfish, Olive Tang*

Care Level : Moderate - once they get acclimated and eating they are fairly hardy. Watch for signs of ich upon introduction into quarantine.

Life span : 10 years, likely longer

Size : Up to 14 inches (35 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Origin / Habitat : Christmas Island and the Eastern Indian Ocean to Hawaii and southern Japan. Adults are found near seaward side of reef areas while juveniles are often found in shallower bays and lagoons (FishBase)

Temperament / Behavior : The Orange Shoulder Tang should do fine with other fish species but may get bullied by other tangs, so only one per tank is recommended.

Breeding / Mating / Reproduction : Very difficult in the home aquarium because they are pelagic spawners.

Tank Size : 125 gallon minimum

Compatible Tank Mates : Don't mix them in with other Tangs or Surgeonfish but they should do ok with other species.

Reef Tank Compatible? : They could be considered reef safe and should not bother corals, clams and other inverts.

Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. Ich (white spot - cryptocaryon) is common in tangs. Quarantine is always a good idea. Use of cleaner shrimps is a good idea too. Keep the water highly oxygenated.

Diet / Fish Food : The Orange Shoulder Tang is an herbivore, so having lots of live rock definitely helps as well as ample areas of open sand for them to graze on. They will eat brown algae, diatoms and are even reported to eat detritus. Make sure they're getting enough to eat. Place some dried marine origin algae under the live rock regularly.

Tank Region : All over the tank, this is a very active swimmer

Gender : Not sure of any external characteristics to identify males from females.

Forum : Tang Forum

Author : Mike FishLore

References :

"Acanthurus olivaceus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

PACIFIC SAILFIN TANG (ZEBRASOMA VELIFERUM)

The Pacific Sailfin Tang is another member of the surgeonfishes and grows to be one of the largest of the commonly available tangs. The Pacific Sailfin Tang will need at least a 125 gallon tank (473 liters), preferably larger, to allow for adequate swimming space and to accommodate for their potential adult size of 15 inches (39 cm). They can be fairly hardy once acclimated but will not do well in a tank that has not completed the aquarium nitrogen cycle. Try to add the Sailfin Tang to a tank that has been set up and running for at least 6 months and use your aquarium test kit to test the water parameters before introducing. You will also need highly oxygenated water provided through increased surface agitation (multiple power heads) and/or the heavy use of air stones.

This Sailfin Tang is very similar and often confused with the Red Sea Sailfin Tang. The Red Sea Sailfin has more dots at the base of the body and more pronounced white spots covering the front third of the body. The Pacific Sailfin will not do well with other surgeonfish, especially other Sailfins, unless the tank is extremely large (public aquariums).

Pacific Sailfin Tangs should primarily eat marine algae and having lots of live rock in your tank will provide plenty of grazing opportunities in between meals. Try to give them a varied diet and supplement the diet with marine seaweed using a veggie clip.

Pacific Sailfin Tangs can be susceptible to marine ich (like most saltwater species) and you will definitely need to use a quarantine tank before introducing them into your main tank. Keep them in the hospital tank for two weeks or so and watch for any outbreaks.

Sailfin Tang Picture



Pacific Sailfin Tang Profile Facts and Care Information

Scientific Name : Zebrasoma veliferum

Common Names : *Sailfin Tang*

Sailfin Tang Care Level : Easy to Moderate

Size : Up to 15 inches (39 cm)

Life span : 5 - 7 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Temperament / Behavior : They may be aggressive with other tangs, especially other Sailfin Tangs. May get bullied by other surgeonfish. They also are constantly on the move and will need a larger tank for swimming space.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 125 gallon (473 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other species of tangs.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / [Fish Food](#) : Primarily an herbivore and feeds on marine algae in the wild. Try to give them a variety of marine foods but predominantly marine algae. Having plenty of [live rock](#) for them to graze on goes will definitely help. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and females.

Author : [Mike FishLore](#)

Forum : [Tang Forum](#)

POWDER BLUE TANG (ACANTHURUS LEUCOSTERNON)

The Powder Blue Tang is sought after by most saltwater aquarium keepers due to its remarkable colors. The Powder Blue Tang (PBT) is a true beauty. From the yellow dorsal fin to its dark colored face and powder blue body, this fish is something to behold. Be prepared to spend some serious jack on this fish though. Powder Blue's usually run anywhere from \$60 to over \$100 depending on the size of the fish. As well as being beautiful, they are also quite finicky and can be very difficult to keep for even the advanced saltwater aquarium keepers.

They are notorious for getting ich (cryptocaryon) and velvet usually due to the fact that they don't transport well. Let them sit in the dealer's tank for several weeks and ask to watch them eat before laying down your hard earned cash for one of these tangs. Inspect them closely for any signs of ich or velvet and make sure they are actively swimming.

If all goes well at the fish store, once you bring them home you'll want to slowly drip acclimate them to your quarantine tank's water. It should go without saying that a quarantine is not optional with this fish. Tangs in general and the Powder Blue Tang especially are susceptible to marine ich, which means that it's a good idea to house your new fish in a quarantine tank for several weeks before introducing them into your display tank. It can be a really good idea to get some cleaner shrimps too. The skunk cleaner shrimp does a good job.

They may be finicky when it comes to food and you'll want to provide plenty of algae grazing opportunities and also supplement their diet with dried algae using a veggie clip. Leave the dried seaweed in the tank for prolonged periods when they are first introduced. They **might** accept flakes and pellets and should go after frozen and live foods. We feel that live rock is absolutely needed when keeping this fish because they like to pick at algae on a nearly continuous basis during the daytime hours. It may also be a good idea to let some algae grow on one of the side panels of the tank, just in case.

Like all Tangs, the Powder Blue Tang needs highly oxygenated water. You can achieve this using multiple power heads. Watch the tank temperature though and remove a powerhead if the aquarium water temperature gets too high. They will also appreciate high water flow throughout the aquarium and they need a large tank to allow for large swimming lanes. They are quite fast swimmers.

The Powder Blue Tang can be a very difficult fish to keep and we strongly urge you to research this fish fully before acquiring one. We would recommend this fish only to advanced saltwater hobbyists with a large tank that is well established and stocked with plenty of live rock, high aeration and high water flows.

Pictures



Powder Blue Tang Profile Facts and Care Information

Scientific Name : *Acanthurus leucosternon*

Common Names : *Powder Blue Surgeonfish*

Powder Blue Tang Care Level : Can be very difficult due to the ich and feeding (nutritional) issues. Drip acclimate them to the qt tank.

Life span : 10 years, possibly longer

Size : 7 - 9 inches (18 - 23 cm)

pH : 8 - 8.4

Temperature : 73°F - 82°F (23°C - 28°C)

Specific Gravity : 1.023 - 1.025

Origin / Habitat : Reef flats and seaward reef slopes in the Indian Ocean, Bali, Indonesia

Powder Blue Tang Temperament / Behavior : Does not usually do well with other tangs. Watch for aggressive bully type behavior from this fish on other smaller species.

Breeding / Mating / Reproduction : Egg scatterer that is very difficult to breed in captivity (don't know if it has even happened yet).

Tank Size : 90 gallon minimum

Compatible Tank Mates : Avoid keeping them in an aquarium with other Tangs. Many hobbyists have reported that this tang can become a bully as it grows larger.

Reef Tank Compatible? : Should do ok in a marine reef tank setup, provided there is ample swimming room. They can help perform a small role in grazing some of the algae that may grow in a reef tank.

Powder Blue Tang Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. Ich (white spot - cryptocaryon) and marine velvet is very common with this tang. Quarantine is highly recommended for this fish! Use cleaner shrimps as well.

Diet / Fish Food : Herbivore, having lots of live rock goes a long way and be prepared to give the Powder Blue Tang dried seaweed or dried algae using the lettuce clip. You may have to leave out the dried sea veggies for prolonged periods when first getting your Powder Blue. Let them fatten up a bit and hopefully a good steady diet of high quality foods along with pristine water conditions should help your tang through the transition into your aquarium. They might accept flake and pellet foods and should definitely go after frozen foods and live foods.

Tank Region : All over - very active swimmer

Gender : Males may be much smaller than the females.

Forum : Tang Forum

Author : Mike FishLore

References :

"Acanthurus leucosternon". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.



The Powder Brown Tang comes from the Western Indo Pacific and is a better choice than the Powder Blue Tang because it adapts better to aquarium life. Depending on the lighting they are under, they can appear to have a gray or brown base with a white mark going from the eyes to the mouth which gives rise to the other common name of White Face Tang. It's often confused with the White Cheeked Tang (*A. nigricans*). The fish on this page (*A. japonicus*) has a much better track record in aquariums than *A. nigricans*. This is another one of those saltwater species where the pictures just don't do them justice. You have to see them in person to appreciate how incredible their colors really are.

Some consider the Powder Brown Tang to be one of the more passive of the tangs but having kept them I can say without a doubt, like a lot of species, it comes down to the individual fish. Some are in fact rather passive and others have no problems asserting dominance. It's best to keep only one *A. japonicus* to a tank but they can be kept with other species of tangs with little to no issues. There may be bickering amongst the tangs (other non-conspecifics) at first, but they should settle down. If not be prepared to remove them.

Tangs can be rather sensitive to acclimation issues and the Powder Brown is no exception, so take your time here. I also recommend keeping them in with a cleaner shrimp species just in case. Feed them often. You can even keep a clip of seaweed (nori) out for them to graze on at all times, especially upon first introducing them to your tank. That will help bulk up their immune system and keep them healthy. They will even go after pellets, flake foods and other marine preparations. **VERY IMPORTANT:** Make sure you see the fish eating at the store before

bringing them home! If they are eating at the store they should do fine in your established saltwater aquarium.

They are reef tank safe and generally show no interest in corals, clams or other invertebrates. Keep them under normal reef tank parameters (below) and in tanks that are at least 120 gallons or larger since they are active swimmers.



Powder Brown Tang Profile Facts and Care Information

Scientific Name : *Acanthurus japonicus*

Common Names : *Powder Brown Tang, Powder Brown Surgeonfish, Japan Surgeonfish, White Faced Tang, White Nosed Surgeonfish*

Care Level : Moderate

Life span : 7 years, likely longer

Size : 8.2 inches (21 cm)

Water Parameters : pH 8 - 8.4 | Temperature 75°F - 82°F (24°C - 28°C) | Specific Gravity 1.022 - 1.026

Origin / Habitat : Indo Western Pacific, Indonesia to the Phillipines - found in clear lagoons and near reefs and often in shallow areas in both small and large groups.

Temperament / Behavior : While they may found in groups in the ocean that doesn't mean they will play nicely with conspecifics (other Powder Brown Tangs) in the same tank unless you have a very large aquarium of several hundred gallons. May be fine with other species of similar

temperament and can even be kept with other species of tangs. Watch for aggression if keeping with other tangs though.

Breeding / Mating / Reproduction : Tangs are considered extremely difficult to breed because they are open water egg scatterers.

Tank Size : 120 gallon minimum - active swimmers, needs lots of space

Compatible Tank Mates : One A. japonicus to a tank, may tolerate other tang species like the Zebrasomas in larger setups.

Reef Tank Compatible? : Yes

Disease : Saltwater Fish Disease Freshwater, pH adjusted dips of a minute or two may help. Keep a cleaner shrimp like the Skunk Cleaner Shrimp in with them.

Diet / Fish Food : Does well when kept in tanks with plenty of live rock for them to graze on through out the day in between meals. Providing marine algae (nori) on a clip is a great idea and can form the bulk of their diet along with a quality pellet food like New Life Spectrum or similar.

Tank Region : They will roam the entire tank

Gender : Unable to determine by external characteristics

Forum : Tang Forum

Author : Mike FishLore

PURPLE TANG (ZEBRASOMA XANTHURUS)

The Purple Tang is one of the pricier and certainly one of the prettiest tangs. The body of the Purple Tang is a purplish blue with dark striped patterns and sports a yellow tail. The Purple Tang can usually be had for around \$120 online (as of 2009) but will be even more expensive if purchased locally. Obviously when you shell out this kind of cash you want to be prepared. Let's go over some things that will help you in the care of the Purple Tang (*Zebrasoma xanthurus*).

The first thing you need is a big tank. Tangs in general are very active swimmers and they appreciate a lot of live rock in the tank so they can graze on algae in between the meals that their waiter (you) provides. This tang also grows to around 8 to 10 inches (20-24 cm). Tanks less than 100 gallons (380 liters) might be ok in the very short term when they are small but for long term success you **need** a bigger tank (100 gallons plus) to keep them.

Tank mates for the Purple Tang are another very important consideration. In the ocean they are often seen in pairs and groups but in the confines of our mini-reefs they will fight! They will also fight with other similarly shaped tangs like the very commonly kept yellow tang for example. When stocking multiples in **large** tanks introduce them at the same time. This gives each the opportunity to start on equal footing. Let's reiterate though that it is a good idea to keep just one per tank.

Feeding wise, Purple Tangs primarily are algae eaters. They graze the reef for filamentous algae. In a reef tank they can be considered somewhat utilitarian but the small amounts of algae they would get from most aquariums is not going to be enough to keep them happy. There are plenty of dried marine origin algae on the market now that you can use with a veggie clip or placed under a rock. They will tear this stuff up and it's fun to watch them eat the dried algae. The purple tang will also go after nearly everything you feed the other fish as well, but try to give them plenty of greens.

Acclimation is another important consideration. Don't just do the floating bag thing and then plop them into the tank. Do a slow drip acclimation over an hour or so. Then put them into a quarantine tank. These saltwater fish have to go through a long chain of custody before they reach your tank. Many species are susceptible to disease and you can bet that if you don't qt them they will develop ich or go on hunger strike or similar. Put them into a quarantine tank for 2 weeks to a month, watch for and treat any signs of disease, pamper them by feeding the appropriate foods frequently, get their strength up and then introduce them to your well established main tank. Lots of water movement is needed too. This helps keep the tank saturated with oxygen. Yes, a protein skimmer will help oxygenate the water but powerheads that break up the water surface will help.

Also be careful when using a fish net with tangs. They have a scalpel like appendage on the caudal peduncle that they use for aggressive or defensive purposes that can easily get tangled in a net. Use a bucket or a plastic fish box to move them.

The Purple Tang is a beautiful and expensive saltwater fish. Take your time, research them as much as you can before buying them, give them a big tank and the right tank mates and foods and they should be with you for a long time.

Purple Tang Pictures



Purple Tang Species Profile Facts and Care Information

Scientific Name : *Zebrasoma xanthurus*

Common Names : *Purple Tang, Yellowtail Tang, Yellowtail Surgeonfish*

Care Level : Moderate, needs slow acclimation, appropriate tank mates and proper foods.

Size : 8 to 10 inches (up to 25 cm)

Purple Tang Life span : 10 years or longer

pH : 8.1 - 8.4

Temperature : 74°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : West Indian Ocean, the Red Sea, Persian Gulf, the Maldives and spotted in several other locales

Purple Tang Temperament / Behavior : They may be aggressive with other tangs in smaller tanks, especially other similarly shaped tangs like the yellow tang. Might be ok in multiples in very large tanks.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 100 gallon (380 liters) minimum and would do better in larger tanks. They need lots of swimming space.

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other species of tangs.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - very susceptible to cryptocaryon (ich).

Diet / Fish Food : Mostly an herbivore feeding on filamentous marine algae in the wild. Try to give them a variety of marine foods but predominantly marine origin algae. Aquascape the aquarium with lots of live rock for them to graze on. They should accept vitamin enriched flake foods, frozen and definitely live foods. Small frequent feedings are better than larger infrequent feedings. This is a very active fish and needs appropriate foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and females by external features.

Forum : Tang Forum

Author : Mike FishLore

RED SEA SAILFIN TANG - ZEBRASOMA DESJARDINII

The Red Sea Sailfin Tang is a surgeonfish that grows to be one of the largest of the commonly available tangs. The Red Sea Sailfin Tang will need at least a 125 gallon tank (473 liters), preferably larger, to allow for adequate swimming space and to accommodate for their potential adult size of 15 inches (39 cm). Red Sea Sailfin Tangs can be hardy once properly acclimated but will not do well in a tank that has not completed the aquarium nitrogen cycle. Sailfin Tangs also need highly oxygenated water provided through increased surface agitation (multiple power heads) and/or the heavy use of air stones.

This Red Sea Sailfin Tang is a very interesting looking fish with a peculiar body pattern. They are very similar and often confused with the Pacific Sailfin Tang. To help distinguish between the two, the Red Sea Sailfin has more dots at the base of the body and more pronounced white spots covering the front third of the body. These dots or small spots come with age. The Red Sea Tangs will not do well with other surgeonfish, especially other Sailfins, unless the tank is extremely large. Public aquariums can sometimes get away with putting multiples in extremely large tanks.

This Sailfin Tang needs to eat frequently and should primarily eat marine algae. If you have live rock in your tank you are in good shape because the live rock will provide plenty of grazing opportunities in between meals. Try to give them a varied diet and supplement the diet with marine seaweed using a veggie clip that sticks to the aquarium sides.

They are susceptible to marine ich and you will definitely need to use a quarantine tank before introducing them into your main tank. Monitor your Red Sea Sailfin Tang in quarantine for two weeks or so and watch for any outbreaks.

Red Sea Sailfin Tang Picture



Red Sea Sailfin Tang Profile Facts and Care Information

Scientific Name : Zebrasoma desjardinii

Common Names : *Desjardin Sailfin Tang, Indian Ocean Surgeonfish*

Care Level : Easy to Moderate

Size : Up to 15 inches (39 cm)

Life span : 5 - 7 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Red Sea Sailfin Tang Temperament / Behavior : They may be aggressive with other tangs, especially other Sailfin Tangs. They are one of the largest of the commonly available tangs and will need a larger tank for swimming space.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 125 gallon (473 liters) minimum

Compatible Tank Mates : Use caution when selecting tank mates. Avoid keeping them with other species of tangs.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Primarily an herbivore and feeds on marine algae in the wild. Try to give them a variety of marine foods but predominantly marine algae. Having plenty of live rock for them to graze on goes will definitely help. They should accept vitamin enriched flake foods, frozen and definitely live foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and females.

Forum : Tang Forum

Author : Mike FishLore

TOMINI TANG - CTENOCHAETUS TOMINIENSIS

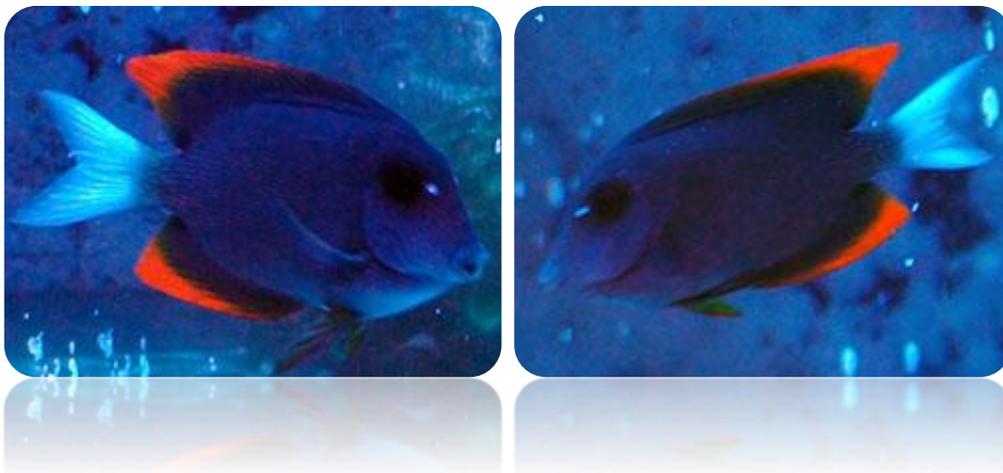
The Tomini Tang is in the genus *Ctenochaetus* (pronounced ten-oh-key-tus) and is one of the more commonly kept tangs due to its staying small as an adult. Tomini Tangs reach up to about 6 inches in size and are fairly hardy too. They have a brown body with brown and yellow dorsal and pelvic fins with a white caudal fin.

They are considered excellent scavengers that are reef tank friendly. The Tomini Tang will constantly pick at the live rock and glass looking for algae and other tid bits. They even go after and eat fish poo with gusto (gross - I know right). They are the prototypical janitors in your tank.

These Tomini Tangs can be kept with other unrelated tangs provided you have a large enough tank. They are generally peaceful but can be a bully to species that are introduced after them. But the bullying should wear off with time and they should coexist with most other species just fine. Obviously there are always exceptions to this.

For food, they will be constantly picking at the rock work and glass but try to give them a good diet, heavy on the greens. They do eat dried algae although perhaps not as aggressively as some other tang species. Flakes, pellets and frozen foods are good to mix in too.

Tomini Tang Pictures



Tomini Tang Profile Facts and Care Information

Scientific Name : *Ctenochaetus tominiensis*

Common Names : *Tomini Tang, Orangetip Bristletooth, Bristletooth Tomini Tang, Tomini Surgeonfish*

Care Level : Easy to Moderate

Life span : 5 years or longer

Size : 6 inches (18 cm)

pH : 8 - 8.4

Temperature : 75°F - 82°F (24°C - 28°C)

Specific Gravity : 1.022 - 1.026

Origin / Habitat : Indo-Pacific, Western Central Pacific, Northern Great Barrier Reef

Tomini Tang Temperament / Behavior : Can be a bit aggressive with new arrivals but should settle down and tolerate other species except for other conspecifics. Use caution if stocking them with other non-related tangs.

Breeding / Mating / Reproduction : Group spawners, open water egg scatterers

Tank Size : 55 gallon minimum (someone call the tang police!), the bigger the better

Compatible Tank Mates : Generally peaceful but may be quite the jerk to new arrivals. It's not advisable to keep them with other tangs unless you have a much larger tank. We have kept them in tanks (120 gallon plus) with other tangs (non related tang species) and they were fine.

Reef Tank Compatible? : The Tomini Tang is reef tank compatible.

Disease : Saltwater Fish Disease generally hardy but drip acclimate for at least an hour.

Diet / Fish Food : Herbivore, you need live rock and be ready to give them dried seaweed using a veggie clip or similar. They will also accept flake, pellet foods and of course live foods but give them lots of greens for optimal results. The Tomini tang is usually fairly easy to get eating.

Tank Region : All over the aquarium

Gender : Unable to determine by external characteristics

Forum : Tang Forum

Author : Mike FishLore

References :

"Ctenochaetus tominiensis". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

UNICORN TANG - NASO UNICORNIS

The Unicorn Tang is one of the largest of the available surgeonfishes with adult specimens reaching almost 24 inches (61 cm) in size. The Unicorn Tang will need at least a 250 gallon tank (946 liters), preferably larger, to allow for adequate swimming space and water quality. They can be fairly hardy once acclimated and should play nicely with other non-tang species but may get bullied by more aggressive fish such as Triggers. You will also need highly oxygenated water provided through increased surface agitation (multiple power heads) and/or the heavy use of air stones.

The Unicorn Tangs are nicely colored with a white, gray or sometimes light green-blue body and the signature unicorn like horn projecting from the head. To our knowledge, marine biologists have not yet determined the function that the horn plays on these fish.

Unlike most other tangs which have only 1 set of retractable blades at the base of the tail, the Unicorn Tang has two sets of retractable blades for defending territory and protecting themselves. They can easily get caught in netting, so be careful transporting this fish to avoid damaging the fins. It's advisable to use a large container instead of a net when moving this fish.

These tangs should primarily eat marine algae and having lots of live rock in your tank will provide grazing opportunities in between meals. Try to give them a varied diet and supplement their diet with marine seaweed using a veggie clip.

The Unicorn Tang can come down with most saltwater fish diseases. Use a quarantine tank before introducing them into your main tank. Keep them in the hospital tank for two weeks or so and watch for obvious saltwater diseases, like marine ich.

Unicorn Tang Picture



Unicorn Tang Profile Facts and Care Information

Scientific Name : *Naso unicornis*

Common Names : *Bluespine Unicornfish. Unicorn Tang*

Care Level : Easy to Moderate, can be quite hardy once acclimated.

Size : Up to 24 inches (61 cm)

Life span : 10 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Hawaii, Red Sea

Unicorn Tang Temperament / Behavior : They may be aggressive with other unicorns in smaller tanks but may do ok in multiples in extremely large tanks. They also are constantly on the move during the day and will need a larger tank for swimming space.

Breeding / Mating / Reproduction : Very difficult to breed in captivity.

Tank Size : 250 gallon (946 liters) minimum

Compatible Tank Mates : Avoid keeping them with other species of tangs.

Reef Tank Compatible? : This saltwater fish should do fine in a large reef aquarium.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment, always use a quarantine tank for your saltwater fish!

Unicorn Tang Diet / Fish Food : Primarily an herbivore and feeds on marine algae in the wild. Try to give them a variety of marine foods but predominantly marine algae and spirulina. Having plenty of live rock for them to graze on helps. They should accept vitamin enriched flake foods, frozen and live foods.

Tank Region : All over

Gender : Difficult to determine the differences between males and female unicorn tangs but in adult specimens the horn may be more pronounced in males.

Author : Mike FishLore

Forum : Tang Forum

THE YELLOW TANG - ZEBRASOMA FLAVESCENS

The Yellow Tang is one of the most popular of all saltwater fish species. The yellow tang comes from the Hawaiian Islands and is one of the better marine surgeonfishes for a beginner with a fully cycled aquarium. This tang is commonly carried at most saltwater pet shops and is relatively inexpensive. They have a strikingly yellow color with white scalpel like blades at the base of their tail fin. They can be fairly hardy in a saltwater aquarium that has completely cycled. If you plan on keeping Yellow Tangs, they spend much of their time grazing for algae so have plenty of live rock for them to graze on. They will also feed on dried algae or seaweed attached to a lettuce clip. This tang (and tangs in general) requires highly oxygenated water so make sure you have plenty of water surface agitation and/or air stones.

Use caution when netting a Yellow Tang because of the blades at the base of their tail fin. The blades can easily get hooked into the net. If this happens, **gently** move the net back and forth in the aquarium until the tang is released.

Like many marine species, you will have better results if you keep only one tang in your aquarium because they will become territorial otherwise. They use the blade like appendages at the base of their tails to slap at each other.

Tangs are especially susceptible to marine ich, which means that it's a good idea to house any new Tangs in a quarantine tank for a couple of weeks before introducing them into your main aquarium.

As of 2012 there is pending legislation that may make the export of *Zebrasoma flavescens* out of Hawaii illegal. If this legislation becomes law it will impact the number available to stores and drive the price up significantly.



Yellow Tang Profile Facts and Care Information

Scientific Name : *Zebrasoma flavescens*

Common Names : *Yellow Sailfin Tang, Lemon Surgeonfish, Yellow Surgeonfish*

Care Level : Easy to Moderate, good for saltwater beginners with a fully cycled aquarium.

Life span : 5 - 7 years, possibly longer

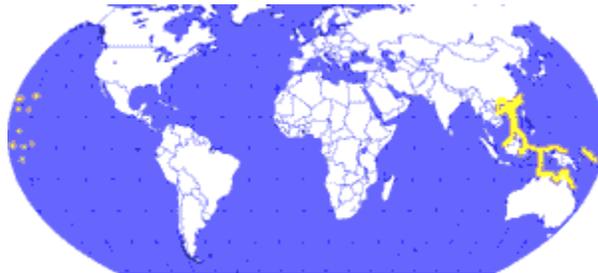
Size : 7 - 8 inches (20 cm)

pH : 8 - 8.4

Temperature : 75°F - 80°F (24°C - 27°C)

Specific Gravity : 1.020 - 1.024

Origin / Habitat : South Pacific Ocean near Hawaii, Marshall and Wake Islands.



Temperament / Behavior : It's best to keep only one tang in your aquarium because they can become territorial with other tangs. They will usually play nicely with others (except tangs) in a community tank setup.

Breeding / Mating / Reproduction : It's not very common for them to breed in captivity

Tank Size : 55 gallon minimum but will do much better in larger tanks - think 90 gallons plus to allow for lots of swimming room.

Compatible Tank Mates : Avoid keeping them in an aquarium with other Tangs, especially conspecifics or other Zebrasomas. May do ok with other tangs if introduced at the same time in large tanks and provided with lots of swimming room.

Reef Tank Compatible? : This tang will do well in a marine reef tank setup. They can help perform a small role in grazing some of the algae that may grow in a reef tank.

Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment, a quarantine tank is a must with this species.

Fish Food : Herbivore, have plenty of live rock and/or be prepared to give them dried seaweed or dried algae using a lettuce clip. They will also accept flake, pellet foods and live foods.

Tank Region : All over

Gender : Difficult to determine, but the female may be larger than males of the same age.

Forum : Yellow Tang Forum

Author : Mike FishLore

References :

"Zebrasoma flavescens". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Fenner, R. M. (2001). The Conscientious Marine Aquarist, Commonsense Handbook for Successful Saltwater Hobbyists. (3rd Printing). T.F.H. Publications.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

Paletta, Michael (2001). The New Marine Aquarium, Step-by-step Setup and Stocking Guide. T.F.H. Publications.

TRIGGERFISH

BLUE THROAT TRIGGERFISH - XANTHICHTHYS AUROMARGINATUS

The Blue Throat Trigger fish goes also by the common names of Blue Chin Triggerfish and Gilded Triggerfish. Blue Throat Triggerfish have gray bodies and the males sport the blue throat and have yellow along the fin borders whereas the females lack the blue throat and yellow bordering on the fins. See the male/female picture below.

The Blue Throat Triggerfish is considered to be one of the least aggressive of the triggers and that is one of the reasons for their popularity in the aquarium trade. Cost wise they go anywhere from \$40 to \$60 with the males usually being slightly more expensive. These triggers can be considered quite hardy and are usually easy to get eating. Standard saltwater aquarium foods like a good pellet food supplemented with frozen foods will do nicely.

In the wild the Blue Throat Triggerfish likes to eat copepods so if you have a refugium that has lots of these pods your triggers will love you for it. They sometimes go after smaller shrimps and hermit crabs. I'm not sure if they are interested in eating them (never witnessed it) or just playing with them. They are very personable, seriously. The triggers remind me of the freshwater oscars with their personalities. I've kept a male/female blue jaw duo for some time now and they always greet me when I come to the front of the tank, begging for food. One interesting thing about them is that they like to lock themselves into a rock to bunk down for the night, usually upside down. They also like to make a grunting or clicking sound (infrequently) at night that is audible outside the tank.

A good tight fitting hood is needed because if they get spooked they might do some carpet surfing.

Blue Throat Trigger Picture



Blue Throat Triggerfish Profile Facts and Care Information

Scientific Name : *Xanthichthys auromarginatus*

Common Names : *Blue Throat Triggerfish, Blue Jaw Triggerfish, Blue Chin Triggerfish*

Care Level : Easy to moderate

Size : Up to 12 inches (30 cm)

Blue Throat Triggerfish Life span : 8 years, likely longer

pH : 8.1 - 8.4

Temperature : 76°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, East Africa to Hawaii

Temperament / Behavior : For triggers, these could be considered one of the more docile but they can still act like most other triggers occasionally.

Blue Throat Triggerfish Breeding / Mating / Reproduction : they are nest builders and males will guard the eggs until they hatch. Not much info on actual breeding attempts in the home aquarium.

Tank Size : 120 gallon minimum

Compatible Tank Mates : These triggers may become more aggressive as they grow. Similar sized species should do fine with the Blue Throat Trigger but watch the smaller shrimps and other crustaceans.

Fish Disease : Saltwater Fish Disease Section. These triggers are fairly hardy , but always Quarantine new fish!

Diet / Fish Food : Primary diet in the wild is copepods. They are voracious eaters though and will go after nearly everything you put in the tank. Get a good pellet (new life spectrum for example) food, supplement with defrosted frozen foods (rod's foods for example) and they will do well. They also will eat dry seaweed if you have tangs in the tank with them and they tend to pull off the veggie clip from the tank wall.

Tank Region : All over, but like to cruise the top of the tank a lot

Gender : This is one of the easier species to identify male from female. Males will have the blue throat (or chin if you prefer) and their fins will be outlined in yellow. Females lack the blue throat and yellow outlined fins

Forum : Triggerfish Forum

Author : Mike FishLore

References :

"Xanthichthys auromarginatus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

CLOWN TRIGGERFISH - BALISTOIDES CONSPICILLUM

The Clown Triggerfish is one of the more popular saltwater fish species but you really need the right aquarium set up to keep them long term. As far as personality goes the Clown Triggerfish is a very enjoyable fish to watch. The common name of this trigger is quite accurate given their general personality. They can usually be bought locally or online anywhere from \$80 to \$200 dollars depending on the size of the trigger.

The Clown Triggerfish can be very territorial and it's gets worse the older and bigger they get. They are pretty much not afraid of anything it seems once they reach around 5 or 6 inches in size. When they are smaller they may be a bit more reclusive and will appreciate having hiding spots and places to lock into at night with their dorsal fins. If do plan on keeping them with moderately aggressive species (like saltwater tangs) introduce the trigger last and get it on the small side (2 inches or so) and let it grow up with the other fish. Give them a big tank at least 120 gallons in size and plan on getting them into something much bigger as they grow up.

The Clown Triggerfish is a really good eater for the most part. They will accept most everything that you put into the tank but you need to give them a varied diet of vitamin enriched, fresh, meaty, marine origin type foods. Clams on the half shell will likely be devoured before they even reach the bottom of tank. Krill, small pieces of silver sides, feeder shrimps, etc. It can be fun to watch them eat but it's not much fun to watch them chow down on your \$5 hermit crabs! Don't keep them with ornamental crabs and shrimp unless you don't mind them becoming lunch for your trigger.

Disease wise they are considered quite hardy but do a slow drip acclimation over an hour or so upon introduction and give them a good diet of the proper foods.

Clown Triggerfish Picture



Photo Credit: Clark Anderson/Aquaimages

Clown Triggerfish Profile Facts and Care Information

Scientific Name : Balistoides conspicillum

Common Names : *Clown Triggerfish, Baliste Clown,*

Care Level : Easy to moderate

Size : Up to 19 inches (50 cm)

Clown Triggerfish Life span : 8 years, likely much longer

pH : 8.1 - 8.4

Temperature : 76°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, East and South Africa. Often found near outer reef edges and steep drop-offs swimming in the open. They are often found cruising around alone and not often found in pairs or schools.

Temperament / Behavior : This is one of the more aggressive of the triggerfish species. The Clown Triggerfish will rearrange aquarium decorations, live rock and knock over prized corals. Keep this in mind when setting up any rock formations in the tank to prevent rock from crashing down into the tank bottom. They are not reef safe since they are known to knock over corals and sample invertebrates like snails and hermit crabs. As they mature they often get more aggressive too.

Clown Triggerfish Breeding / Mating / Reproduction : they are nest builders and males will guard the eggs waiting for them to hatch. A recent issue of CORAL magazine (March/April 2012) had a great article on how the Crosshatch Trigger has been successfully bred in an aquarium. They need some really tiny foods and the author of that breeding article explains the feeding size ratio and how he was able to determine proper food sizes.

Tank Size : 120 gallon minimum - 120 gallon and bigger for larger adult clown triggers.

Compatible Tank Mates : Need to be kept in larger and more aggressive type displays. It's not considered reef tank safe because of it's propensity to rearrange the tank and because they will munch on crustaceans and other inverts.

Fish Disease : Saltwater Fish Disease Triggers in general are fairly hardy , but always Quarantine new fish!

Diet / Fish Food : In the ocean they mostly feed on sea urchins, crabs and other inverts. They will eat most fish foods that are put into the tank. Give them a well balanced diet of marine origin meaty foods like clams on the half shell, mussels, krill, silver sides, etc.

Tank Region : All over

Gender : No known obvious external differences between the male and female

Forum : Triggerfish Forum

Author : By Mike FishLore

References :

"Balistoides conspicillum". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

NIGER TRIGGERFISH - ODONUS NIGER

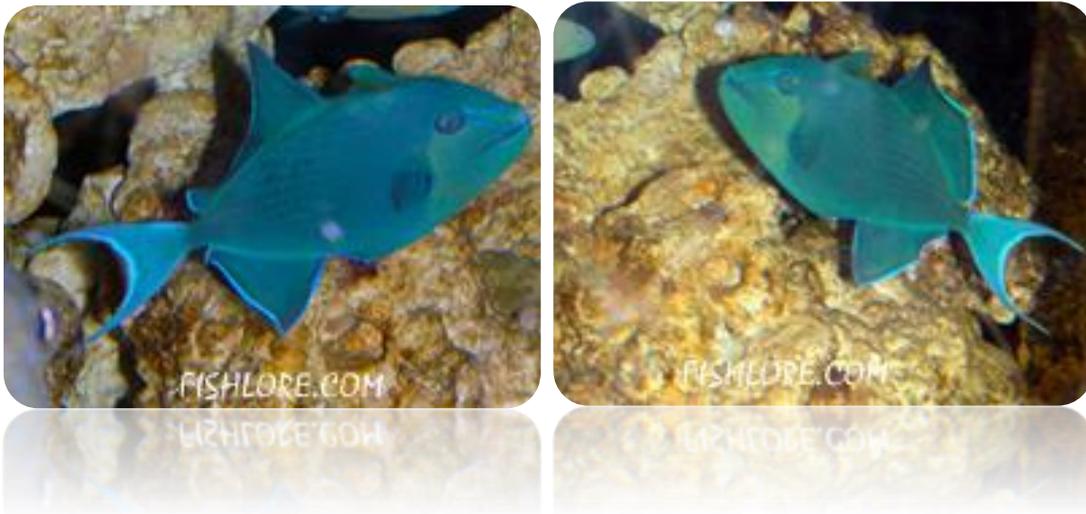
The Niger Triggerfish has a few different common names like the Red Tooth Triggerfish and the Black Triggerfish. The Niger Trigger's colors can look quite different depending on the lights they are under. Sometimes they will look teal green under high output lighting and under subdued lighting they look almost black. In the ocean they form schools to feed on zooplankton and sponges and are found on the seaward side of coral reefs (re.fishbase).

The Niger Triggerfish can get to be over 12 inches (30 cm) with some of the biggest being found in the ocean up to 18 inches (46 cm)! Given their potential adult size not many home aquariums are big enough to keep them in groups. Even keeping just one though you need at least a 180 gallon fish tank.

The Niger Triggerfish has a reputation amongst hobbyists as being one of the less aggressive triggerfish but they are still triggers and each fish can be different. One may be easy going and the next could be quite the terror. As juveniles they will need lots of hiding places to help make them feel secure. As they get bigger, they often get bolder and more aggressive.

This triggerfish will go after and eat nearly all foods offered. Lots of saltwater origin meaty foods, along with a good pellet type food for omnivores would be good. They may even eat seaweed (sea veggies) you put in the tank for other species too.

Niger Trigger Picture



Niger Triggerfish Profile Facts and Care Information

Scientific Name : *Odonus niger*

Common Names : *Niger Triggerfish, Red Tooth Triggerfish, Black Triggerfish*

Fish Care Level : Easy to moderate

Size : Up to 18 inches (46 cm), usually found in the ocean around 12 inches (30 cm)

Niger Triggerfish Life span : 10 years, likely longer

pH : 8.1 - 8.4

Temperature : 76°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, South Africa, Red Sea, Great Barrier Reef Australia, New Caledonia

Temperament / Behavior : In the ocean they can form large schools but given the size of most home aquariums this isn't going to be feasible to recreate. They may fight with other triggers but should do fine with similarly sized fish such as tangs. The bigger they get, the more aggressive they get.

Niger Triggerfish Breeding / Mating / Reproduction : these triggerfish are nest builders and males will guard the eggs waiting for them to hatch. Now that appropriately sized foods have been found to feed the larvae it hopefully will become more common place to see captive raised triggers for sale in the near future.

Tank Size : 180 gallon minimum for one Niger Triggerfish, much larger for keeping multiples.

Compatible Tank Mates : The Niger Trigger is not as aggressive as some of the other triggers but it does get big and the bigger it gets the more aggressive it becomes. I wouldn't keep them in a reef tank, though some hobbyists do. Inverts such as crabs and shrimps may become food for this trigger.

Fish Disease : [Saltwater Fish Disease](#) Section. These triggers are hardy, but [Quarantine](#) and even consider doing a freshwater, pH adjusted dip before introducing them to your display.

Diet / Fish Food : Niger Triggerfish form large schools in the ocean to feed on zooplankton. In the home aquarium you can give them nearly anything and they will go after it. Being omnivores you should try to give them a varied diet of marine origin meaty foods like krill, clams on the half shell, thawed mysis, brine, etc. Rod's marine omnivore foods are good and have a lot of different foods in it.

Tank Region : All over

Gender : Don't know of any external characteristics to be used to identify male from female.

Forum : [Triggerfish Forum](#)

Author : [Mike FishLore](#)

References / Recommended Reading :

"Odonus niger". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

PICASSO TRIGGERFISH - RHINECANTHUS ACULEATUS

In Hawaii the Picasso Triggerfish is the state fish and known as Humuhumunukunuku apua'a. Say that three times fast. Named after the famous Spanish painter, the Picasso Triggerfish has some truly remarkable colors and patterns on its body. This triggerfish is one of the easier going of the trigger fishes but it can still become dangerous in a tank full of smaller aquarium fish and invertebrates. You will want to provide a larger tank (75 gallon minimum) with plenty of hiding places to help reduce the aggressiveness that may well up inside this fish if it feels threatened. They can become very territorial if kept in a tank that is too small. Keep them in a larger tank with some larger tank mates and it should co-exist peacefully.

The Picasso Triggerfish can sometimes be the Bull in the China Shop. As they roam around, they may knock over live rock or other ornaments in the tank.

Feed your Picasso Triggerfish 2 or 3 times a day and provide a varied diet of frozen and live foods. They may go after fish flakes and pellets. It's important to give them small frequent feedings to prevent malnutrition and fading colors.

The Picasso triggers are susceptible to most saltwater fish disease and respond well to most of the standard medicines and treatments. Quarantine any new arrivals for a period of 2 - 3 weeks before introducing them into your main tank.

One last note, be careful when placing your hand in a tank with Triggerfish. They have a mouth full of teeth and may bite if they feel threatened.

Picasso Triggerfish Picture



Picasso Triggerfish Profile Facts and Care Information

Scientific Name : Rhinecanthus aculeatus

Common Names : *Humuhumu Triggerfish, Blackbar Triggerfish, Prickly, Kaputput, White Banded Triggerfish, White Barred Triggerfish*

Care Level : Easy to moderate

Size : Up to 10 inches (25 cm)

Life span : 5 - 10 years

pH : 8.1 - 8.4

Temperature : 76°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, Tahiti

Temperament / Behavior : Can be peaceful if given a large tank and should get along with larger marine specimens. It may eat smaller fish. Provide plenty of hiding spaces (live rock).

Breeding / Mating / Reproduction : One male will serve multiple females. The female will guard the eggs until they hatch. In the wild, once they hatch they are on their own. To our knowledge these have not been tank raised yet.

Tank Size : 75 gallon minimum, the more space it has the less aggressive it should be.

Compatible Tank Mates : Not suitable for a reef tank since they enjoy munching on crustaceans and other small invertebrates. Keep them with larger, more aggressive fish.

Fish Disease : Saltwater Fish Disease Section. Always Quarantine new arrivals!

Diet / Fish Food : Primary diet in the wild is crustaceans and small shrimp. They can be trained to eat frozen foods. Give them a high quality and a varied diet. Frozen meaty foods and frozen foods including marine algae would be good supplements. Feed at least 2 times per day.

Tank Region : All over

Gender : Difficult to determine, but males may be larger than females of the same age.

Forum : [Triggerfish Forum](#)

Author : [Mike FishLore](#)

PINK TAIL TRIGGERFISH - MELICHTHYS VIDUA

The Pink Tail Triggerfish has a green body with mustard yellow like shading or under tones depending on the lights they are under. Sometimes the Pink Tail Triggerfish can look much darker under subdued lighting. They are found all over the Indo-Pacific and get to be about 15 inches (40 cm). Given their potential adult size you are going to need at least a 180 gallon (680 liters) aquarium or larger to keep this triggerfish long term.

The Pink Tail Trigger is just like other triggers when it comes to modifying the rock work to their liking. Keep this in mind if you have any loose fitting rocks to prevent damage to your fish tank, corals and fish. It is not a good idea to keep them with invertebrates such as shrimps, snails and crabs because they tend to view them like we view chips and salsa, especially as they get bigger. Feeding them is usually a breeze since they can be aggressive eaters. Give them a good pellet fish food and throw in some variety a few times a week by offering meaty type foods like thawed meaty marine foods, clams on the half shell, krill, mysis shrimp, chopped up fresh fish, etc. They may also eat seaweed if you're offering it to your tangs.

Like so many other triggerfish, the Pink Tail Trigger has a good personality but you need to keep them in larger setups with appropriately sized tank mates. When they are small they tend to be quite shy so give them plenty of rock work to hide in. They also like to lock themselves into rocks at night to sleep. Give them a high quality diet and they will be with you for a long time.

Pink Tail Triggerfish Picture



Pink Tail Triggerfish Profile Facts and Care Information

Scientific Name : Melichthys vidua

Common Names : *Pink Tail Triggerfish, White Tailed Triggerfish*

Care Level : Easy to moderate

Size : Up to 15 inches (40 cm)

Pink Tail Triggerfish Life span : 10 years or longer

pH : 8.1 - 8.4

Temperature : 76°F - 82°F (24°C - 28°C)

Specific Gravity : 1.021 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific, East Africa to Hawaii, Marquesas and Tuamoto islands

Temperament / Behavior : these triggers are considered moderately aggressive when compared to other triggerfish.

Breeding / Mating / Reproduction : they form pairs and they are nest builders and egg guards. Not sure of any home breeding success stories but that may begin to change now that a suitable sized food has been found to rear larvae.

Tank Size : 180 gallon minimum (680 liters)

Compatible Tank Mates : Similar sized and semi-aggressive species that can hold their own.

Fish Disease : Saltwater Fish Disease Section. Triggers are fairly hardy , but always Quarantine new arrivals!

Diet / Fish Food : They eat small fish, crustaceans, algae and detritus. A fortified and well balanced pellet can serve as their main diet and mix in fresh or thawed marine origin meaty type foods.

Tank Region : All over the tank.

Gender : Not sure how to tell gender from external characteristics.

Forum : Triggerfish Forum

Author : Mike FishLore

References :

"Melichthys vidua". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version.
Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

WRASSES

PENCIL WRASSE (PSEUDOJULOIDES CERACINUS)

The Pencil Wrasse is found in the Indo-Pacific in lagoons and areas of high coral growth. Male Pencil Wrasse are a blue green color and have two horizontal stripes of blue and yellow. Females or primary phase specimens are pink with yellow fins. One male can be kept with multiple females in the same tank but watch for aggression. They may not fair very well with other wrasse species either. It's hit or miss with these pencil wrasses when it comes to keeping them with clams. Some have great success while other hobbyists report that they have caught them nipping at their high dollar clams. Carpet surfer alert! They are excellent jumpers so a good fitting hood or canopy is needed.

Other than being a beautiful fish, these wrasses might (emphasis on might) also be able provide a great service to SPS reef tank keepers. Montipora corals have a very troublesome pest called commonly called the "Monti Eating Nudibranch" that can decimate a tank full of montipora capricornis in no time at all. It can be very difficult to keep these pests under control especially if you have large pieces that are difficult or impossible to remove from your reef tank. Several hobbyists over the years have claimed that these pencil wrasses will eat these monti eating nudibranches. Other hobbyists have tried them with less than stellar results when it comes to eating these nudibranches. It may be worth a try if your tank has these nudis but realize that you will always probably have these pests if you can't get them out to dip since there is not much evidence of any natural predators that eat the eggs of the nudis. If you frag your montis let the people you are sharing frags with know that you've had this problem so they can dip the frag before introducing it to their tank. Always quarantine all new corals and learn from your fellow hobbyists. An ounce of prevention is worth a pound of cure.

However, zoanthid keepers have had better luck with them when it comes to eating the zoanthid nudis which is also quite the annoying pest. Fireworms are also on the pencil wrasse menu.

Feeding the Pencil Wrasse is the challenge, especially new arrivals. They do not ship very well and need a period of adjustment with lots of pampering. Offer them meaty foods such as mysis and brine shrimp 2 or 3 times per day. Aquarists with lots of long established live rock or established refugiums will have better chances of keeping them long term due to the amount of pods that they can pick at throughout the day. They also need a sand bed at least 2 inches deep so they can burrow when they feel threatened. Live rock with lots of hiding places works well too.

Overall, they are not really for the less experienced hobbyists. It goes without saying, but make sure your tank is fully cycled and that you have top notch water and a suitable tank (tank mates, inverts, etc) before you buy a pencil wrasse.

Wrasse Pictures



Pencil Wrasse Profile Facts and Care Information

Scientific Name : *Pseudojuloides ceracinus*

Common Names : *Pencil Wrasse, Smalltail Wrasse*

Care Level : Difficult - can be difficult to feed or get a feeding response from newly acquired specimens

Life span : 7 years, likely longer

Size : Up to 5 inches (12 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 79°F (24°C - 26°C)

Specific Gravity : 1.023 - 1.025

Origin / Habitat : Hawaii, Indo-Pacific - Found at depths of 2 to 60 meters (6 to 200 feet) in lagoons and areas of high coral concentrations.

Temperament / Behavior : May attack shrimps, possibly snails and males may fight with other males of the same species. One male can be kept with multiple females.

Breeding / Mating / Reproduction : As of this time (2011) and to our knowledge this species has not been bred in aquariums.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Should do well with other species but may fight with other wrasses. Use caution when keeping them with invertebrates such as shrimps, hermit crabs and clams. It's not widely documented that they will attack clams but, as always, be prepared to remove them if they are caught nipping your prized clams.

Reef Tank Compatible? : Could be considered with caution.

Pencil Wrasse Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. These wrasses are not very good shippers. Ich (white spot - cryptocaryon) is common. High quality saltwater via Quarantine is needed upon introduction.

Diet / Fish Food : This is the hard part about keeping them. They can be very difficult to start eating anything you give them. Offer foods multiple times per day (2 to 3 small feedings at least) upon introduction. If they are eating after acclimation then 1 to 2 feedings per day of brine and mysis shrimp and/or the frozen meaty preparations for saltwater fish. I've tried pellets and flakes (and will continue to do so) but they just laugh at me.

Tank Region : Hides a lot and swims near the bottom or near cover.

Gender : Males are green with a blue tint and have two horizontal stripes with the top stripe blue and the bottom stripe yellow. Females or primary phase pencil wrasses are a pinkish orange with yellow fins.

Similar Species : Wrasse Species

Harlequin Tuskfish

Six Line Wrasse

White Belly Wrasse

Author : Mike FishLore

References :

"Pseudojuloides ceracinus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

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SIX LINE WRASSE - PSEUDOCHEILINUS HEXATAENIA

The Six Line Wrasse (*Pseudocheilinus hexataenia*) is one of the wrasses that can be considered reef safe. The Six Line Wrasse should leave your corals, clams, and most other invertebrates alone. They may get a little rowdy with new fish introduced to the tank, but more on that later. They have really nice coloring and markings. They have a purple/blue body with six horizontal yellow/orange lines. The caudal fin is often a shade of green with hints of yellow. The coloration on males may become even more vibrant when they are ready to spawn.

The Six Line Wrasse can be quite hardy if shipped and acclimated properly but they are known as "poor shippers" and online merchants may not reimburse you if this fish dies in transport. As always, it's a good idea to take your time and slowly acclimate your sixlined wrasse into your quarantine tank and keep them there for several weeks so you can get them eating and so you can monitor them for signs of disease. Getting them out of a tank full of live rock is not fun. Use this time while they are in quarantine to give them highly nutritious fish foods to help them overcome the stresses of shipping. If after several weeks in QT and you see no signs of disease you can slowly acclimate them into your display tank.

Behaviorally they may be kept in multiples in larger tanks but may get aggressive with other six line wrasses in smaller tanks. Keeping them with other wrasse species is not recommended in smaller tanks (like less than 100 gallons). They should do fine with other marine fish species though but each fish can be different and you'll need to watch closely when first introducing them to your tank. It is recommended that they are one of the last species introduced to your tank to help limit aggression.

Feeding wise, the Six Line Wrasse is not all that picky and they should eat standard marine fish foods. They also will pick at the live rock in between meals. Six lines can also be used to help control the pyramidellid snails that are known to prey on your prized saltwater clams.

Six Line Wrasse Pictures



Six Line Wrasse Profile Facts and Care Information

Scientific Name : Pseudocheilinus hexataenia

Common Names : *Six Line Wrasse, Six Stripe Wrasse, Sixline Wrasse*

Care Level : Easy

Life span : 5 or more years

Size : 3 inches (8 cm)

Water Parameters : ph: 8.1 - 8.4, Temperature: 70°F - 80°F (21°C - 27°C), Specific Gravity: 1.020 - 1.025, dKH: 8 - 12°

Origin / Habitat : Red Sea, Indo-Pacific

Six Line Wrasse Temperament / Behavior : They can be peaceful if you introduce them last to your aquarium. They are considered semi-aggressive since they may scrap with other wrasses and similar looking tank mates.

Six Line Wrasse Breeding / Mating / Reproduction : Although spawnings have been reported, we don't believe they've been successfully raised in captivity.

Tank Size : 20 gallon minimum

Six Line Wrasse Compatible Tank Mates : Avoid mixing them in with other wrasses but if you do, watch closely for signs of aggression between the wrasses. Although they are considered one of

the more peaceful species of wrasses, they may also harass other tank mates such as grammas, gobies, pseudochromis, etc. If you wait to introduce them last into your tank you may have a better experience with keeping them.

Reef Tank Compatible? : Considered reef safe in that they should leave your corals and other beneficial invertebrates alone. They may even act as cleaners (albeit rarely) on larger fish species in the tank. They may even help control pyramidellid snail populations if you're having problems with these snails and your clams.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Carnivorous, they will pick at the live rock in between feedings looking for tiny crustaceans and should take standard aquarium foods. Cyclop-eeze, frozen marine preparations, flakes, smaller pellet foods, etc.

Tank Region : Usually hanging around their turf on the live rock.

Gender : Males may become more colorful when ready to breed.

Author : [Mike FishLore](#)

References / Further Reading

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WHITE BELLY WRASSE - HALICHOERES LEUCOXANTHUS

The White Belly Wrasse is also known as the Lemon Meringue Wrasse and is often sold as the yellow coris wrasse. The White Belly Wrasse has a white belly and a yellow top with spots on the dorsal fin. This wrasse is often picked up in the hopes of ridding a tank of unwanted pests such as montipora eating nudibranchs, acropora flatworms, bristle worms and pyramidellid snails that are parasites on tridacnid clams. Reports are hit and miss regarding their true effectiveness of controlling these unwanted pests. Some hobbyists swear by the White Belly Wrasse and others get annoyed with their exceptional carpet surfing abilities. A tank with a good fitting hood or canopy will go a long way in keeping them in your tank. If yours should end up missing, check the floor, the overflow and sump for the little jumper.

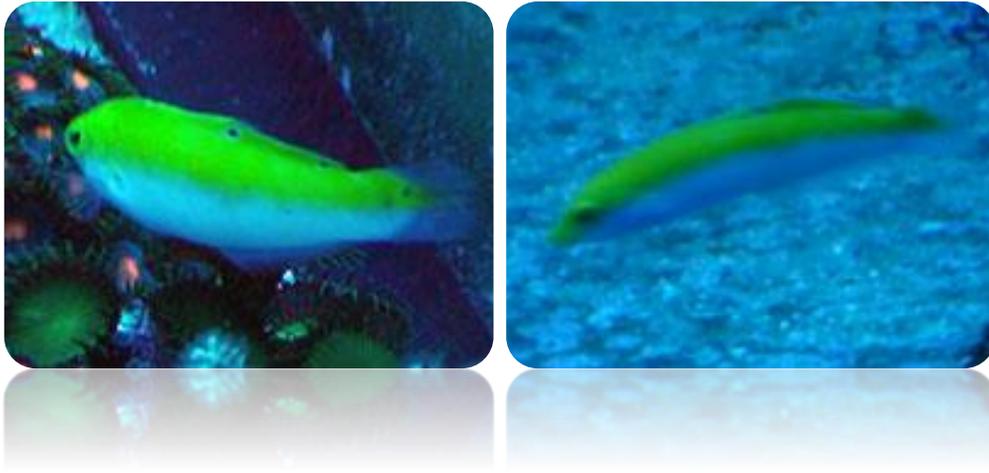
Upon introduction to your tank they may be somewhat skittish but they should soon settle down and be out and about picking at the live rock in your tank. Use caution if you plan on keeping the White Belly Wrasse in a reef tank because they may (or may not) pick at snails, crabs and clams. A sand bed of at least a couple of inches is needed because they dive into it at night to sleep.

Try to feed the White Belly Wrasse a couple of times per day frozen meaty foods. You can try the pellets and flakes but it may take awhile to get them eating the pellets/flakes. Keep trying though. They will also pick up nourishment from any pods found on and within the sandbed and live rock. You may have picked one of these wrasses up with the hopes of them helping rid your tank of one of the pests mentioned above. In my personal experience they have not done much in the way of controlling montis eating nudis, having kept one in a frag tank with afflicted montis. However, others claim that they did notice them eating the nudibranchs.

Whether you picked a White Belly Wrasse up to be a part of a utility crew or just because it was a pretty little wrasse, it will make a great addition to the right set up. They stay on the small side and get along well with others (except others of the same species) and they are not that hard to get eating.

Also, a sand bed a few inches deep is needed for them to sleep in at night. If you have a bare bottomed tank a Tupperware bowl full of sand hidden behind the live rock will work fine. Make it deep enough so they can dive into it.

White Belly Wrasse Pictures



White Belly Wrasse Profile Facts and Care Information

Scientific Name : *Halichoeres leucoxanthus*

Common Names : *White Belly Wrasse, Lemon Meringue Wrasse, White and Purple Wrasse (seldom called this), sometimes sold as the yellow coris wrasse but this species has a white belly*

Care Level : Easy - usually adapts quite well to aquarium life

Life span : 5+ years

Size : Up to 5 inches (12 cm)

pH : 8.1 - 8.4

Temperature : 75°F - 79°F (24°C - 26°C)

Specific Gravity : 1.023 - 1.025

Origin / Habitat : Indonesia, Sri Lanka, Indian Ocean

White Belly Wrasse Temperament / Behavior : Mostly peaceful

Breeding / Mating / Reproduction : To our knowledge and as of 2011, this species has not been bred in the home aquarium.

Tank Size : 30 gallon minimum

Compatible Tank Mates : Use caution when putting them in with other wrasses but otherwise should do fine with other similar sized fish species.

Reef Tank Compatible? : Could be considered with caution. They may nip at hermit crabs and tridacnid clams.

White Belly Wrasse Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment.

White Belly Wrasse Diet / Fish Food : Goes after meaty frozen marine foods readily but ignores flakes and pellets. Picks at the live rock all day long.

Tank Region : Some are quite bold and will swim all over the tank whereas others seldom venture far from cover.

Gender : Unknown

Forum : [Saltwater Angelfish Forum](#)

Author : [Mike FishLore](#)

References :

"Halichoeres leucoxanthus". FishBase. Ed. Ranier Froese and Daniel Pauly. November 2005 version. N.p.: FishBase, 2005.

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HARLEQUIN TUSKFISH - CHOERODON FASCIATUS

The Harlequin Tuskfish (*Choerodon fasciatus*) is an interesting wrasse that is usually shipped out of the Philippines or Australia. If you can (and if they know) ask your pet store where they get their Harlequin Tuskfish from. If they say the Philippines you may want to take a pass on it. If they say Australia you may be good to go but make sure you watch them eat something first. The harlequins coming from the Philippines are caught using questionable practices whereas in Australia the fish have a better shipping and survival record. If all that checks out, assuming you can afford the price tag and you have a big enough saltwater aquarium with the appropriate tank mates you may find yourself owning a Harlequin Tuskfish. Their blue tusks (teeth), beautiful colors and markings can be hard to resist. You will pay a premium price for those coming out of Australia but it's most likely worth it because they will live longer than a couple of weeks and they are supposed to be more colorful.

Although they can be shy when small and first acclimated to a tank, they usually come around and will be out and about. You may have problems introducing them into a tank with larger angelfish or triggers if they were in the tank first. The larger species may bully a smaller tuskfish. Make sure they are getting enough to eat and they should come around.

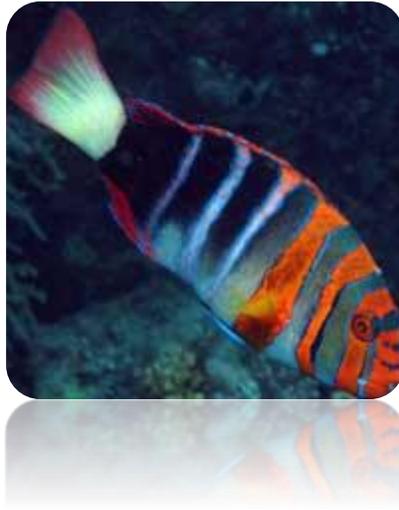
Speaking of food, the Harlequin Tuskfish is mostly carnivorous but does go after most foods presented to them. Try to give them a healthy, fresh and balanced diet. Fresh fish, shrimp and clams from the market cut up into appropriately sized pieces works well. Try to mix in some sea veggies too to get some roughage into their diet.

Reef tank keepers may not be interested in this species due to the fact that they will go after smaller invertebrates such as shrimp and crabs. They may have a harder time getting at the snails. Corals and clam mantles are usually not bothered.

Even though the Harlequin Tuskfish coming from Australia are reported by hobbyists to be quite disease resistant (avoid the Philippines Tuskfish) it would still be wise to do a freshwater dip and/or quarantine for several weeks before putting them into an established aquarium.

This is a really cool fish that could be the show piece in a larger saltwater tank setup with the right tank mates. Provide them a large tank with caves using the live rock, good water quality, fresh foods and they should be happy campers.

Harlequin Tuskfish Picture



Tuskfish Photo Credit: Leonard Low (Australia)

Harlequin Tuskfish Profile Facts and Care Information

Scientific Name : Choerodon fasciatus

Common Names : *Harlequin Tuskfish*

Care Level : Easy

Life span : 8 or more years in captivity

Size : 10 inches (25 cm)

Water Parameters : ph: 8.1 - 8.4, Temperature: 77°F - 82°F (25°C - 28°C), Specific Gravity: 1.020 - 1.025, dKH: 8 - 12°

Origin / Habitat : Reefs of the Western Pacific, Indonesia, the Philippines and near Queensland, Australia

Harlequin Tuskfish Temperament / Behavior : Does well with similar sized species but can be territorial with other tuskfish. May eat smaller fish and invertebrates as it gets larger. They are frequently quite shy when first acclimated to a tank. Give them some time to adjust and make sure they are eating and they should eventually be out and about.

Breeding / Mating / Reproduction : Not sure if this species has been propagated in captivity. They are open water egg scatterers.

Tank Size : 75 gallon minimum, preferably larger

Harlequin Tuskfish Compatible Tank Mates : Don't mix them with other Harlequin Tuskfish. Keep only one to a tank and you should be ok. Snails might be ok, but shrimps and hermit crabs will probably be on the menu for these wrasses.

Reef Tank Compatible? : If you're not keeping shrimps or crabs they have a pretty good reputation for leaving corals and clams alone. You need a big reef tank though.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : Mostly carnivorous, the Harlequin Tuskfish will do well with a varied diet in captivity. Occasional fresh meaty seafood fare from the market such as clams and small pieces of shrimp can be offered. Mix in some sea veggies to round out their diet along with a good quality and fresh flake food or pellet food. Most of the time these wrasses are easy to feed relative to other saltwater fish species.

Tank Region : Out and about much of the time but they do like a cave to hunker down in at night.

Gender : Don't know of any external differences between the male and female harlequins.

Author : [Mike FishLore](#)

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Michael, S. W. (2001). *Marine Fishes, 500+ Essential to Know Aquarium Species*. T.F.H. Publications.

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SNAPPERS

EMPEROR SNAPPER - (LUTJANUS SEBAE)

The Red Emperor Snapper is one of those fish that in my opinion shouldn't really be as easily available to hobbyists as it is. The problem is that the Emperor Snapper gets way too big for 99 percent of home aquariums. They can get up to 45 inches (116 cm) and need lots of swimming space. Some of the stores (both online and locally) recommend a tank in the 200 gallon range which to me is way too small for a fish that can grow to over 3 feet in size. As juveniles they have black and white stripes but as they mature they take on more of a red color with the stripes fading.

The Emperor Snapper needs to be fed bigger and bigger food items as they grow. As juveniles they will eat frozen or fresh chopped pieces of fish, clam, scallops, shrimp, etc. When they start getting large, feeder fish and large carnivore pellets should be on the menu.

As juveniles they can be kept in groups but as they mature they may begin fighting with each other and it's recommended to keep only one Emperor Snapper per aquarium.

For the most part, they acclimate to aquarium conditions well and they are somewhat easy to feed. The main problem is the size they can reach and the fact that most hobbyists simply can't afford the aquarium accommodations this snapper needs. If you see this snapper in the store, check it out. Admire it in the store's tank and then keep on walking.

Emperor Snapper Picture



Emperor Snapper Profile Facts and Care Information

Scientific Name : *Lutjanus sebae*

Common Names : *Emperor Snapper, Emperor Red Snapper, Government Bream, Red Emperor*

Care Level : Difficult, this snapper needs an enormous tank that would have to be custom built to keep one of them adequately.

Size : Up to 45 inches (116 cm)

Life span : 15 - 20 years, possibly longer

Water Parameters : pH 8.1 - 8.4 | Temperature 72°F - 76°F (22°C - 24°C) | SG 1.020 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo West Pacific, Red Sea, East Africa, Northern Australia north to southern Japan. Found at depths of 16 to 600 feet (5 to 180 meters)

Temperament / Behavior : This snapper is a voracious eater and will eat smaller fish and invertebrates. They need to be kept in an extremely large aquarium with other large fish species.

Breeding / Mating / Reproduction : Don't know if it's been bred in an aquarium setting yet. These snappers are open water substratum egg scatterers and do not guard the eggs.

Tank Size : 1000 plus gallons (3700 plus liters) or much bigger

Compatible Tank Mates : Other large fish species that can fend for themselves.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment.

Emperor Snapper Diet / Fish Food : Primarily a carnivore, smaller fish, crustaceans, meaty foods.

Tank Region : As juveniles they are somewhat reclusive and shy so they need plenty of available hiding places. They get less reclusive/shy as they get bigger and will be all over the tank.

Gender : Don't know of any external characteristics to use to differentiate the male emperor snapper from the female emperor.

Author : [Mike FishLore](#)

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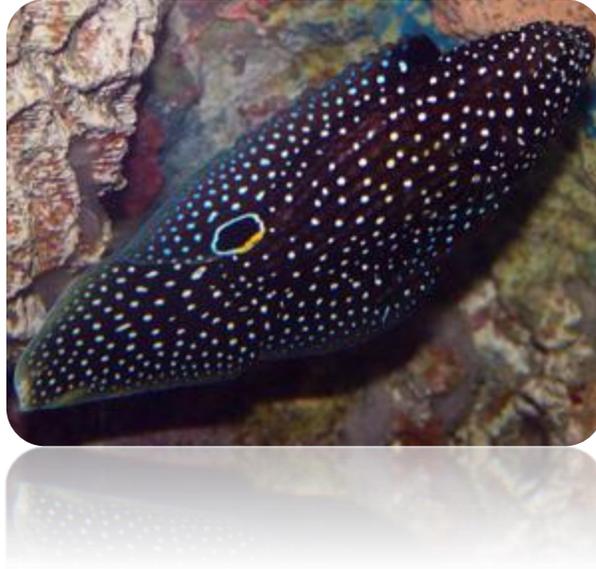
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COMETS

MARINE BETTA (CALLOPLESIOPS ALTIVELIS)



The Marine Betta (*Calloplesiops altivelis*) is also commonly known as the Comet. It is another amazing looking saltwater species that gets to around 8 inches in size and needs at least a 55 gallon aquarium or larger. They can be very shy when first introduced and that can pose problems if they are kept with more aggressive tank mates. Make sure they are getting something to eat. Once eating though they are considered very hardy. They may fight with other Comets but should be ok with similar sized fish. Smaller fish and shrimp may become snacks.

If you want to buy a Marine Betta plan on spending anywhere from \$70 to \$100.

Marine Betta Species Profile Facts and Care Information

Scientific Name : *Calloplesiops altivelis*

Common Names : Marine Betta, Comet

Care Level : Easy - considered quite hardy once it starts eating

Size : 8 inches (20 cm)

Life span : 10 plus years or longer

Water Parameters : pH : 8.1 - 8.4 | Temperature : 72°F - 80°F (22°C - 27°C) | Specific Gravity : 1.020 - 1.025 | Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific: Red Sea and East Africa to Tonga at depths of 3 to 45 meters found near reefs and caves near drop-offs

Temperament / Behavior : They will eat smaller fish and shrimp

Breeding / Mating / Reproduction : These are egg-guarders/nesters. The male will guard the eggs with the eggs hatching in 5 to 6 days

Tank Size : 55 gallon (210 liters) minimum

Compatible Tank Mates : Needs to be kept with similar sized species. It may fight with other comets.

Reef Tank Compatible? : No - will eat smaller fish and ornamental shrimp.

Fish Disease : Saltwater Fish Disease

Diet / Fish Food : Needs to be fed meaty type marine origin foods such as clams on the half shell, pieces of fresh fish, mysis shrimp, larger pellets (as it grows in size). They may eat smaller fish in the tank too.

Tank Region : Swims all over when lights are dim, but middle regions mostly.

Gender : No external characteristics that we know of to tell males from females. They may be able to change sex from female to male.

Photo Credit: Lonnie Huffman

Author : Mike FishLore

References

Michael, S. W. (2001). Marine Fishes, 500+ Essential to Know Aquarium Species. T.F.H. Publications.

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MARINE INVERTEBRATE SPECIES

BRITTLE STAR - TIGER STRIPED SERPENT SEASTAR

The Brittle Star is one of those reef invertebrates that is often hidden away during the day. The brittle stars come out at night and scavenge all over the bottom of the tank and on the live rock looking for bits and pieces of things to eat. The brittle stars for the most part are rather good tank mates with fish, corals and other inverts. Some are quite cool looking, including the Tiger Striped Brittle Star varieties. Colors vary quite a bit with some being light brown with darker stripes and some are dark brown with even darker stripes. They are called "brittle stars" because their arms are easily broken off as some sort of defensive mechanism.

Sea stars in general should be acclimated slowly to your well established tank. They won't tolerate extreme differences in salinity and pH. Don't add them to new tanks since they can be intolerant of changing or fluctuating water parameters. Do a slow drip acclimation over an hour or longer so they can adjust to your tank's water conditions. Once they've adjusted you should find them to be relatively hardy provided that you keep your water parameters at optimal levels. They don't ship all that well though with many perishing in shipment.

You can try to feed your Brittle Star very small pieces of fresh raw seafood using a feeding stick. If money is tight and you don't want to shell out the \$15 buck or so, you can always use the good ole chop sticks taped together trick to make your own feeding stick. If you can see one of their arms poking out of a cave or wherever they're hiding, place the food as close as possible to them. They should react to it.

Brittle Stars can be considered reef tank safe since they will leave corals, fish and other reef invertebrates alone.

Brittle Star Profile Facts and Care Information

Scientific Name : *Ophiolepis superba*

Common Names : *Tiger Striped Serpent Seastar, Brittle Star*

Brittle Star Care Level : Moderately difficult to care for in the home aquarium.

Life span : If well cared for they can live for several years in a saltwater aquarium.

Size : 12 inches and sometimes a little larger (30 cm) when measuring from arm tip to arm tip.

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Found on many reefs from Southern Japan to Australia's Great Barrier Reef

Temperament / Behavior : These brittle stars are scavengers that should feed on detritus, dead organisms, etc. They should leave corals and fish alone.

Breeding / Mating / Reproduction : Unknown if breeding has been achieved in the home aquarium.

Tank Size : 20 gallon minimum

Brittle Star Compatible Tank Mates : Many given their behavior and feeding habits. Watch out for any stars labeled "green brittle stars" though. These are known fish eaters.

Reef Tank Compatible? : Yes, they should be fine in a reef tank setup.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment. These brittle sea stars are usually relatively hardy once established. Broken off arms should regenerate. Don't use any copper based meds, keep nitrate levels low too.

Diet / Fish Food : They should scavenge the tank floor and rock surfaces at night. You can try supplemental feedings by placing small pieces of fresh uncooked seafood near them. They may come out when they sense that fish food hits the water.

Tank Region : All over the substrate and live rock.

Gender : It's very difficult, if possible, to determine external differences between male and female brittle stars.

Author : Mike FishLore

CHOCOLATE CHIP STARFISH - PROTOREASTOR NODOSUS

The Chocolate Chip sea star is a somewhat hardy echinoderm. Acclimating them to your tank can take a while longer than most other saltwater organisms because Chocolate Chip Starfish are very intolerant of sudden shifts in water parameters such as pH, temperature and salinity levels.

Even though these Chocolate Chip Starfish will scavenge around the tank you still need to supplement their diet. Feeding them can be challenging because they are slow moving and the fish in your tank will eat the food before your sea star has a chance to get at the fish food. Use some Tank Tongs to place the food right next to the starfish. It should hover over the food and begin eating. It is important to note that they will eat smaller invertebrates and soft corals. This starfish is **not** recommended for a reef tank setup.

Chocolate Chip Starfish Pictures



Chocolate Chip Starfish Profile Facts and Care Information

Scientific Name : Protoreastor nodosus

Common Names : *Chocolate Chip Starfish, Sea Star*

Care Level : Easy to moderate

Life span : 5 - 7 years, possibly longer

Size : 6 inches or larger (15 cm)

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Red Sea

Chocolate Chip Starfish Temperament / Behavior : They are generally peaceful.

Breeding / Mating / Reproduction : Not very common in the home aquarium.

Tank Size : 30 gallon minimum

Chocolate Chip Starfish Compatible Tank Mates : This is not considered a "reef safe" echinoderm. They will eat corals and slow moving invertebrates.

Reef Tank Compatible? : Nope. They will eat any stationary and slow moving animals in your reef tank setup.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Chocolate Chip Starfish Diet / Fish Food : Algae, Shrimp, shell fish, etc. Place the food near the sea star so that it may eat.

Tank Region : All over. They like to attach to the sides of the glass and on live rock or the substrate.

Gender : Hard to determine differences between male and female.

Author : Mike FishLore

CORAL BANDED SHRIMP - STENOPUS HISPIDUS

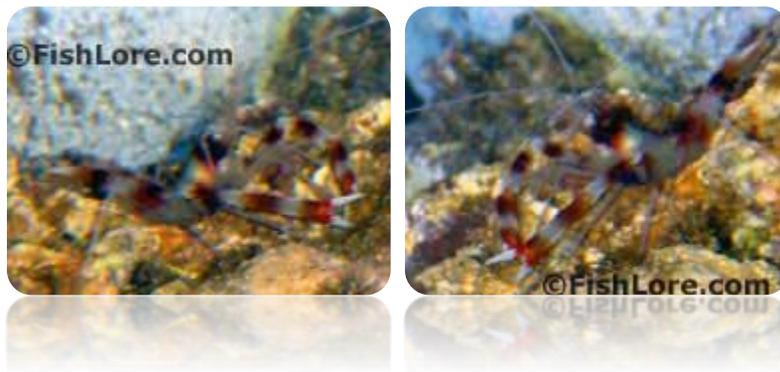
The Coral Banded Shrimp is a very popular invertebrate that is kept in many marine aquariums. Coral Banded Shrimp are usually found in small crevices or hanging from live rock in the aquarium. Most of their time is spent in hiding and you won't see them walking around very often. It is important to make sure they are getting their share of food around feeding time. This may mean that you have to use a feeding stick and place the food directly in front of them so they can grab it. It's probably not a good choice for reef aquariums because they have a tendency to pinch at corals and anemones looking for food.

If your Coral Banded Shrimp loses one of its arms or claws, don't worry. They will regenerate it the next time they molt. Iodine supplements may need to be added to your tank water.

The Coral Banded Shrimp is usually lumped in with the other cleaner shrimps but this behavior is not often seen in the home aquarium. Many hobbyists have noted that they have never seen this shrimp clean fishes.

These Coral Banded Shrimp are usually very hardy if they have been acclimated slowly. It's recommended to acclimate them to your aquarium water over a period of an hour or more to avoid pH shock. Also, carefully read any medications before using them in a tank with invertebrates. Many fish medicines will kill your invertebrates.

Coral Banded Shrimp Pictures





Coral Banded Shrimp Profile Facts and Care Information

Scientific Name : *Stenopus hispidus*

Common Names : *Banded Cleaner Shrimp, Banded Boxer Shrimp, Barber Pole Shrimp*

Care Level : Easy, good invertebrate for saltwater beginners, use a slow drip acclimation to introduce to your tank.

Life span : 2 - 3 years, maybe longer

Size : Up to 2 inches (5 cm)

pH : 8.0 - 8.4

Temperature : 72°F - 80°F (24°C - 27°C)

Specific Gravity : 1.022 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Coral Banded Shrimp Temperament / Behavior : Peaceful if not mixed with other shrimps, especially other banded coral shrimps. The exception to this rule is a mated pair of Banded Coral Shrimps.

Coral Banded Shrimp Breeding / Mating / Reproduction : Difficult to breed them in the home aquarium because the larvae either gets eaten or sucked into the filtration system. Also

see: [How to Raise and Train Peppermint Shrimp](#) for a complete how-to on breeding saltwater shrimp.

Tank Size : 30 gallon minimum

Coral Banded Shrimp Compatible Tank Mates : Avoid keeping them in an aquarium with [Lionfish](#), Snappers, Groupers, Triggers, Eels or any other predatory fish large enough to eat them. We would not recommend mixing them with other shrimps. You will probably see much better results keeping only one CBS in your tank.

Reef Tank Compatible? : If you have other shrimps in the tank, you might see some aggression from the banded coral shrimp. Others report that they have no problems with keeping this shrimp in a reef aquarium with other shrimps. They may steal food from anemones and corals.

Diet / Fish Food : Omnivore - try to give them a variety of foods. They will take vitamin enriched flake foods, frozen and definitely live foods. You may have to use a feeding stick to place the food directly in front of them so they don't have to compete with the faster fish.

Tank Region : Bottom, often hides

Gender : The male is slightly smaller and the female has bluish colored ovaries that can usually be easily seen.

Author : [Mike FishLore](#)

References

Shimek, R. L. (2004). [Marine Invertebrates - 500 Essential to Know Aquarium Species](#). T.F.H. Publications.

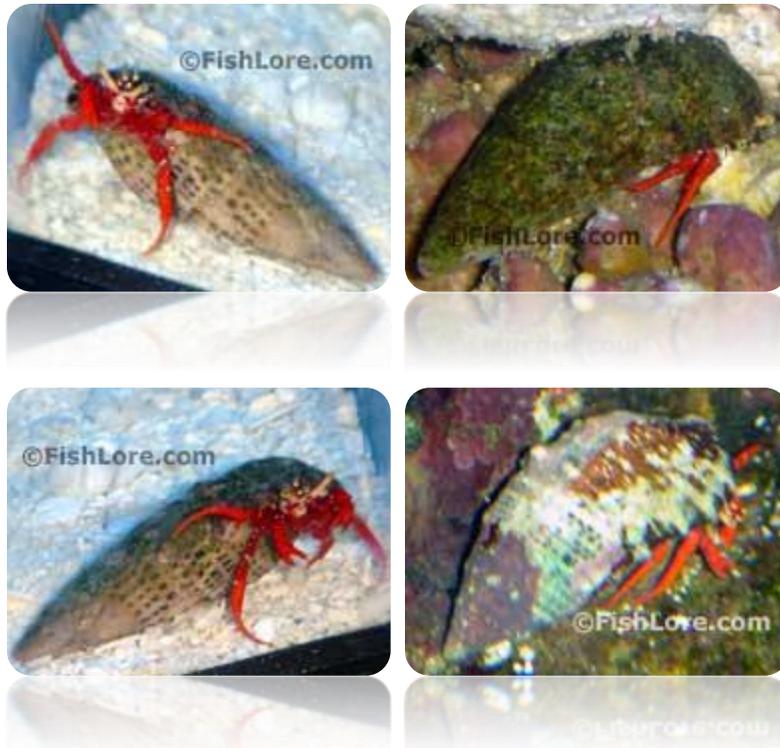
Calfo, A. (2003). [Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility](#). Readin Trees Publications

HERMIT CRAB - CLIBANARIUS SPP.

Hermit Crab Information - There are a lot of different types of Hermit Crabs available but some are better than others in a marine aquarium. If you are looking for something to add to your cleanup crew, check out the blue-legged and red-legged hermit crab varieties. They will scavenge all over your live rock and sand substrate looking for algae and detritus. It has been reported that the red leg hermit will eat cyanobacteria, which is red slime algae. If you have a relatively new tank you may want to supplement their diet with dried seaweed to prevent them from starving. You will also want to get some extra hermit crab shells of different sizes for them to move in to as they grow.

Take a little more time when acclimating the Hermit Crab to your tank water to prevent pH shock. As with other invertebrates, use extreme caution when using medicine in a tank with hermit crabs. You risk wiping them out if you do use medicines.

Hermit Crab Pictures



Hermit Crab Profile Facts and Care Information

Scientific Name : Clibanarius spp.

Common Names : *Dwarf Red Tip Hermit Crab*

Care Level : Easy, good for saltwater beginners but take an hour or more and use a slow drip acclimation to get them used to your tank's water parameters.

Hermit Crab Life span : 2 - 4 years, maybe longer

Size : Up to 1 inch (3 cm)

pH : 8.1 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.022 - 1.025

Origin / Habitat : Mexico, the Caribbean

Hermit Crab Temperament / Behavior : Very peaceful

Hermit Crab Breeding / Mating / Reproduction : Difficult to breed them

Tank Size : 10 gallon minimum

Hermit Crab Compatible Tank Mates : Even though they do have a protective shell, caution is advised if you plan on keeping them with some of the more aggressive marine invertebrates.

Diet / Fish Food : They will usually scavenge all over live rock and the sand substrate looking for algae and cyanobacteria (red slime algae). If you don't have enough algae in your tank give them dried seaweed.

Tank Region : Mostly found on, in or around your live rock.

Gender : There are no definite ways to distinguish males from females.

Author : Mike FishLore

EMERALD CRAB - MITHRAX SCULPTUS

The Emerald Crab (*Mithrax sculptus*) is a saltwater invertebrate that is often used as part of a cleanup crew in marine fish tanks. Emerald Crabs are popular because they help keep the tank clean and have been reported to eat bubble algae (*Velonia* sp.). Bubble algae can grow under even optimal water conditions and this crab is supposed to help keep the bubble algae population to a minimum. They are a pretty emerald color and stay on the small side, only reaching about 2 inches (5 cm) when fully grown.

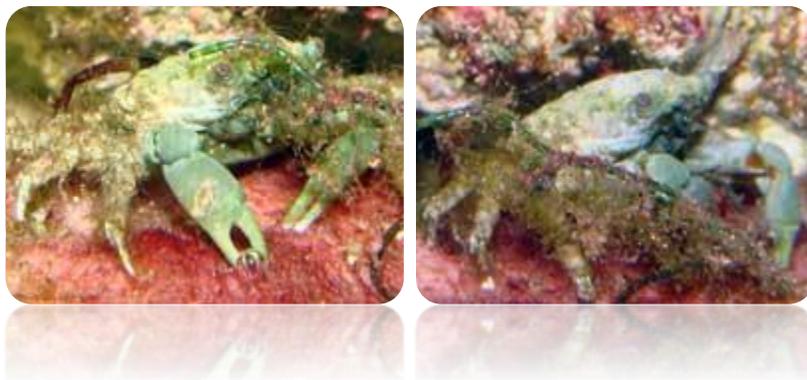
Stocking wise, it is recommended to keep only 1 emerald crab per 20 or 25 gallons. Some have reported that keeping them in higher concentrations could lead to aggression amongst themselves. They may also attack smaller snails so if you like your snails, you'll need to keep an eye on your crabs. They may do just fine with snails, but you never know.

Another part of their diet may consist of coralline algae. Yes, the pretty purple and red algae that encrusts the tank glass and live rock. If your tank has several emeralds you may have some issues with this habit.

While they are quite hardy, you will still want to take your time and acclimate your Emerald Crab slowly into your aquarium. Take an hour and do a slow drip acclimation to help get them adjusted to your water parameters. Once inside the tank they may hide out for much of the time, but you may start to see them out and about as time goes on.

Overall, the Emerald Crab can be a good scavenger for your tank. Use caution if you have a reef tank with snails and corals. They may eat or nip at coral polyps. Fish only setups should have no problems with keeping these emerald crabs.

Emerald Crab Pictures





Emerald Crab Profile Facts and Care Information

Scientific Name : Mithrax sculptus

Common Names : *Emerald Crab, Mithrax Crab*

Care Level : Easy

Life span : 2 - 4 years

Size : 1.5 - 2 inches or larger (5 cm)

pH : 8.1 - 8.4

Temperature : 70°F - 80°F (21°C - 27°C)

Specific Gravity : 1.020 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Caribbean, Atlantic

Emerald Crab Temperament / Behavior : They can be peaceful but are considered semi-aggressive since they may scarp with other crabs and shrimp.

Breeding / Mating / Reproduction : Not sure of a successful rearing of baby emerald crabs in the home aquarium. They can and do release larvae.

Tank Size : 10 gallon minimum

Compatible Tank Mates : The Emerald Crab could be considered reef tank safe, although when it reaches it's adult size of 1.5 to 2 inches it may get more aggressive, especially with other inverts such as snails.

Reef Tank Compatible? : Yes, but watch them closely. They may go after your saltwater snails.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : A scavenger, their claim to fame is their propensity to eat bubble algae. They have also been reported to eat coralline algae (Doh!) as well as scavenge on the live rock and sand bed. They do a decent job as part of a clean up crew.

Tank Region : Usually on, in or around the live rock or sand substrate.

Gender : Hard to determine differences between male and female.

Author : [Mike FishLore](#)

References

Calfo, Anthony & Fenner, Robert (2003). Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility.

Kurtz, Jeffrey (2005), TFH Publications. The Simple Guide to Mini-Reef Aquariums - Modern Reefkeeping Practices, Coral Compatability.



The pencil urchin is often picked up by hobbyists that want to add them to their cleanup crew. This urchin will graze on algae, sponges, tunicates and does a decent job. However, they may also eat calcareous coralline algae and macro algae as well. The pencil urchin will eat meaty foods too and some hobbyists have reported that they have caught them munching on ornamental shrimps and crabs. You can usually find them online for \$10 to \$20 a piece and they are often on the small side but they can get up to around 6 inches (15 cm) when fully grown.

They may knock over loose frags so keep that in mind if you put one in your reef tank. They will also eat the items mentioned above so you may want to take a pass on this invert if you have a reef tank. A fish-only type tank setup of 30 gallons or more with lots of live rock for them to graze on is decent to start with. They are mostly nocturnal so you may not see them out and about when the lights are on.

Pencil Urchin Profile Facts and Care Information

Scientific Name : Eucidaris tribuloides

Common Names : *Pencil Urchin, Mine Urchin*

Pencil Urchin Care Level : Easy

Life span : several years

Size : 6 inches (15 cm)

pH : 8 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.026

Origin / Habitat : Caribbean

Reef Safe? : Not considered reef tank safe

Temperament / Behavior : Peaceful algae grazer

Breeding / Mating / Reproduction : Sorry, don't have info on breeding them at this time.

Tank Size : 30 gallon plus recommended

Compatible Tank Mates : They should be able to take care of themselves and most fish species will leave them alone, except for triggerfish. Triggers have been known to be able to flip them over to get at their softer undersides.

Pencil Urchin Diet / Fish Food : They will graze on algae (including calcareous algae), macro algae. May eat sponges and tunicates as well. Clams and mussels on the half-shell and other meaty marine origin foods will be accepted as well.

Tank Region : All over the live rock

Gender : There are no definite ways to distinguish males from females.

Similar Species : Marine Invertebrates

Author : Mike FishLore

References:

Reef Invertebrates Guide by Calfo and Fenner

Marine Invertebrates by Shimek

NASSARIUS SNAIL (NASSARIUS SP.)

The Nassarius Snail is a saltwater snail that is used as part of a cleanup crew that sifts through the substrate (live sand) looking for bits of detritus. Detritus can be thought of as uneaten foods, fish waste, and any dead or dying organisms. These Nassarius snails do a decent job even though you may not see them very often since they stay submerged in the sand bed most of the time.

There are two different varieties of the nassarius snail that you may come across. There is the smaller variety, simply called Nassarius Snails, which are usually quite small, around 1/2 to 3/4 of an inch (approximately 1.5 - 2 cm). Then there is the larger, Super Tongan Nassarius Snails which can get to be about 1 inch (2 cm). The larger variety usually fetches about \$1 more per snail.

You shouldn't have to feed them in an **established tank**, since they will be scavenging detritus most of the time. The recommended stocking levels for the smaller Nassarius is 1 or 2 snails per gallon, while the larger Tongan Snail can be kept 1 snail per 2 or 3 gallons.

These Nassarius Snails are considered reef safe and should not harm corals or other invertebrates. Caution is advised if you plan on keeping them with saltwater hermit crabs.

Like most invertebrates, you will want to use a slow drip acclimation and keep those nitrate levels on the low side (20 ppm or less). Use caution when performing water changes and vacuuming the sand bed, especially for the smaller snails.

Nassarius Snail Pictures





Nassarius Snail Profile Facts and Care Information

Scientific Name : Nassarius sp., Nassarius distortus (Super Tongan Nassarius Snail)

Common Names : *Nassarius Snail*, *Super Tongan Nassarius Snail*

Nassarius Snail Care Level : Easy, good for saltwater beginners but be sure to use a slow drip acclimation.

Life span : 2 years, possibly longer

Size : Up to 3/4 inch (2 cm)

pH : 8.3 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.023 - 1.025

Origin / Habitat : Caribbean

Temperament / Behavior : Very peaceful

Nassarius Snail Breeding / Mating / Reproduction : Difficult to breed. They may deposit eggs, but the chances of these eggs maturing past the egg stage are slim.

Tank Size : 1 per 2 gallons is the recommended stocking ratio

Compatible Tank Mates : They should do well with most fish with the exception of Triggers and other snail eaters. Avoid mixing snails and crabs (saltwater hermit crabs) in the same tank. The crabs may decimate your snail population.

Diet / Fish Food : The nassarius snail will eat detritus from the substrate. They will also (usually) come out of hiding once meaty foods hit the water.

Tank Region : Mostly buried in the sand, burrowing through the live sand scavenging for detritus.

Gender : Difficult to distinguish males from females.

Author : Mike FishLore

PEPPERMINT SHRIMP (LYSMATA WURDEMANNI)

The Peppermint Shrimp (*Lysmata wurdemanni*) is a smaller saltwater invertebrate, reaching about 2 inches (5 cm) in size as adults. Peppermint Shrimp have transparent bodies with red stripes all over. This shrimp is fairly common and can be bought for anywhere from \$5 to \$10 dollars. It is sometimes called the Candy Cane shrimp or the Caribbean Cleaner Shrimp but the name Peppermint Shrimp seems to be the most common.

The peppermint shrimp is supposed to eat aiptasia (glass anemone). Aiptasia is considered to be a pest in the saltwater aquarium because it will reproduce rather quickly in tanks with high nutrient loads and because it can sting corals and fish. There are a few different ways to control this anemone and using the Peppermint Shrimp is a popular choice for many aquarists. The problem though, as some have stated, is that they may only go after the smaller aiptasia anemones and leave any larger aiptasia alone. Some hobbyists have also complained that their peppermints will not touch the aiptasia at all. Perhaps its because they don't have the *Lysmata wurdemanni*? There is another shrimp similarly named with the scientific name *Lysmata rathbunae* and it may not eat aiptasia. *L. wurdemanni* and *L. rathbunae* can be very difficult to tell apart. We never witnessed Peppermint Shrimp actually eating the aiptasia in our tanks but these pest anemones quickly vanished, one by one, over a several day time period. There were two aiptasias that had to be at least 1 inch in diameter but these are now with the big anemone in the sky thanks to these shrimps.

They are also considered a cleaner shrimp but may not "clean" as often or prolifically as the skunk cleaner shrimp.

The Peppermint Shrimp is a fairly easy going shrimp that should play well with others of its own species but it may fight with other shrimp species in the aquarium. Reef keepers have reported mixed results when keeping them in their reef tanks. Some say that they nip at soft corals and others claim that they've never witnessed this behavior. They can be extremely shy at times, seldom venturing out from behind the rock scaping for days at a time.

Like other shrimps, the Peppermint Shrimp one needs an iodine supplement periodically added to the tank water to help them shed their exoskeleton in a process known as molting. They can be very vulnerable during a molt and will usually stay hidden in the live rock until this process is complete. Only dose iodine if you have an iodine test kit! You can easily overdose and you may get bad side effects such as excessive brown algae growth.

Feeding this shrimp should not be a problem since they should scavenge the tank for any uneaten foods and detritus. You may want to give them a sinking shrimp pellet or a small piece

of fresh fish from time to time. Some folks claim that they will eat hair algae, though we've never witnessed it.

Peppermint Shrimp Picture



Peppermint Shrimp Profile Facts and Care Information

Scientific Name : *Lysmata wurdemanni*

Common Names : *Peppermint Shrimp, Candy Cane Shrimp, Caribbean Cleaner Shrimp, Veined Shrimp*

Care Level : Easy

Size : Up to 2 inches (5 cm)

Life span : 2 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Caribbean, East Atlantic, Florida

Temperament / Behavior : This is a fairly peaceful shrimp that might make a nice addition to a peaceful tank. They may not be acceptable in a reef tank because they sometimes pick at and steal food from your corals.

Breeding / Mating / Reproduction : This shrimp species is successfully being aquacultured and raised commercially. Also see: [How to Raise and Train Peppermint Shrimp](#) for a complete how-to on breeding saltwater shrimp.

Tank Size : 10 gallon (38 liters) minimum

Compatible Tank Mates : Peppermint Shrimp may scrap with other invertebrates in the same tank but they may do fine with other Peppermint Shrimps. Obviously, you don't want to keep them with much larger fish species that could eat them. Not considered as efficient as the [skunk cleaner shrimp](#) when it comes to cleaning fish.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Diet / Fish Food : This shrimp is an [aiptasia](#) eater and will also scavenge around the tank looking for bits and pieces. Make sure they are getting enough to eat. Give them a sinking shrimp pellet or sinking tiny pieces of fresh fish.

Tank Region : Tends to hang out on the [live rock](#) in the tank and seldom ventures far from it's chosen territory in the aquarium. You may be able to get them out of hiding once food hits the water.

Gender : Hermaphrodites

Similar Species : [Marine Invertebrates](#) | [Skunk Cleaner Shrimp](#) | [Coral Banded Shrimp](#) | [Red Fire Shrimp](#)

Author : [Mike FishLore](#)

References

Shimek, R. L. (2004). [Marine Invertebrates - 500 Essential to Know Aquarium Species](#). T.F.H. Publications.

Calfo, A. (2003). [Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility](#). Readin Trees Publications

The Red Fire Shrimp (*Lyasmata debelius*) is also known as the scarlet cleaner shrimp and the blood red fire shrimp. This shrimp is a deep blood red with antennae that are used to signal fish with their cleaning services. You can buy a fire shrimp for around \$20 to \$30 locally and online. The fire shrimp will hang out on a rock overhang and wave their antennae about waiting for fish to come up to them at which point they will clean the body, fins and gills of the fish. It is really quite the sight to see the red fire shrimp doing this. I like to keep a cleaner shrimp species in all of my tanks (reef or fish only) even though there are some things to keep in mind regarding keeping them with corals.

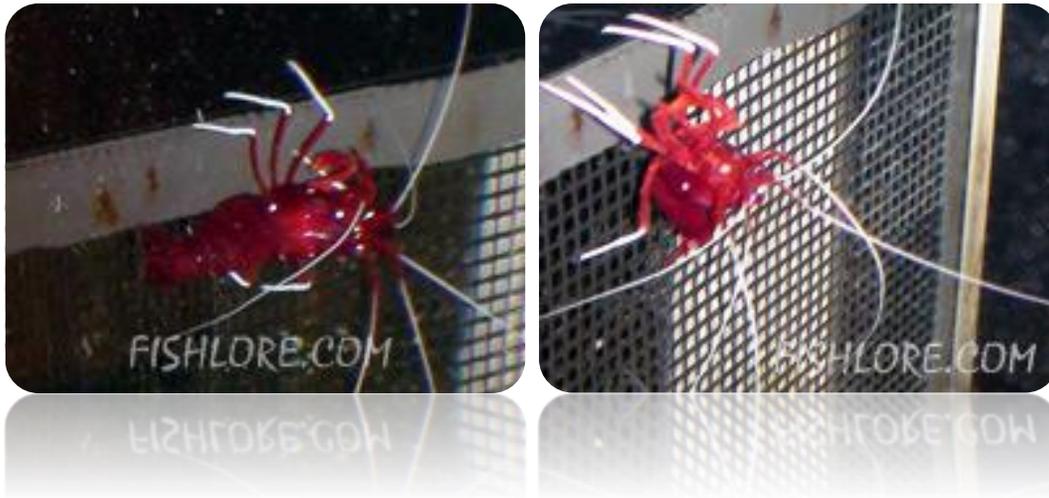
The fire shrimp has been reported to prey on both large polyp stony (LPS) and small polyp stony (SPS) coral polyps. They are rather reclusive when the tank lights are on but come night time (while you're sleeping) they may be out and about crawling all over the tank nibbling on your prized corals. So, just keep this in mind if you have a reef tank setup full of expensive corals, they may be doing some damage to the corals. The fire shrimp doesn't seem to be as active in the cleaning fish department as the skunk cleaner shrimp but they do in fact clean fish. I need to get a video up of mine cleaning the fish but until then check out youtube for videos on this cleaning behavior.

I personally don't target feed my scarlet cleaner shrimp since they will grab any foods that get past the fish. They will scavenge at night too. You won't see them out and about very often in highlighted tanks, but in aquariums with subdued lighting you should see them more often.

Keeping the fire shrimp with other fire shrimps can pose problems unless they are a mated pair or the tank is big enough to keep multiples. They may also bicker with other shrimp species.

Also, the fire shrimp will molt periodically, shedding their exoskeleton to form a new one. The old skeleton will be seen floating around the tank and may cause some to panic thinking their shrimp has passed on to shrimp heaven. Don't worry, they have just molted. Remove the old skeleton from the tank and discard. Some authors have reported that iodine supplements are needed for them to grow new skeleton. My advice would be not to dose iodine unless you have a test kit. If you are getting low iodine readings on your test kit, then dose. Otherwise, let it be.

Red Fire Shrimp Picture



Red Fire Shrimp Profile Facts and Care Information

Scientific Name : *Lysmata debelius*

Common Names : *Fire Shrimp, Red Fire Shrimp, Blood Red Shrimp, Cherry Red Shrimp, Scarlet Cleaner Shrimp*

Care Level : Easy, take an hour or longer to acclimate and use a slow drip acclimation.

Size : 1.5 to 2 inches (3 cm)

Life span : 2 years and longer

Water Parameters : pH 8.1 - 8.4 | Temperature 75°F - 82°F (25°C - 28°C) | SG 1.023 - 1.025 | dKH 8 - 12°

Origin / Habitat : Indo-Pacific

Red Fire Shrimp Temperament / Behavior : They may fight with other red fire shrimp and possibly other cleaner shrimps. Since this is a cleaner shrimp the fish should leave it be, but you never know with some of the larger triggerfish and lionfish.

Breeding / Mating / Reproduction : The fire shrimp has been bred in the home aquarium. Also see: [How to Raise and Train Peppermint Shrimp](#) for a complete how-to on breeding saltwater shrimp.

Tank Size : 10 gallon (114 liters) minimum but preferably much larger to provide more stable water conditions. One shrimp per 30 gallons would be a good starting point.

Red Fire Shrimp Compatible Tank Mates : Don't keep them with larger fish that may eat them. Being cleaners, most fish somehow know not to eat them, but if a larger fish is hungry you don't know what they'll do.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment - this is an ok cleaner shrimp. I personally prefer the skunk cleaner shrimp over this species since the skunk cleaner shrimp seems to clean fish more often.

Diet / Fish Food : They will eat most meaty type foods that get past the fish. They will come out and be more active when the lights are off looking for bits and pieces of food.

Tank Region : Stays near its cave or ledge in the live rock.

Gender : Hermaphrodites - has both male and female reproductive organs.

Author : Mike FishLore

References

Shimek, R. L. (2004). Marine Invertebrates - 500 Essential to Know Aquarium Species. T.F.H. Publications.

Calfo, A. (2003). Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility. Reading Trees Publications

SKUNK CLEANER SHRIMP - LYSMATA AMBOINENSIS

The Skunk Cleaner Shrimp is probably the most sought after of the common cleaner shrimps simply because it really does clean fish. These Skunk Cleaner Shrimps will setup a cleaning station on top of a section of the live rock and will wave their antennae until a larger fish stops by and they commence their cleaning tasks. What exactly are they cleaning you may be wondering? Well, they are looking for small parasites (i.e. marine ich) and dead tissues. They will probe all over the fish, along the gills and sometimes even inside the mouth of the fish removing the parasites and dead tissues.

The Skunk Cleaner Shrimp should do fine if you want to keep them in multiples but they should not be kept with more aggressive fish species such as Hawkfish, Lionfish and Triggers who may go after them.

Feeding them is relatively easy because they will eat nearly any meaty type of fish food that you put in the tank. You just need to ensure that they are getting their fair share. They may even take flake foods once they realize they can eat flakes.

The Skunk Cleaner shrimp is usually very hardy if they have been acclimated slowly. It's recommended to acclimate them to your aquarium water over a period of an hour or more to avoid pH shock. Don't be alarmed if you look in your tank one day and see what appears to be a dead shrimp. Look around the tank and if you see that the shrimp is indeed still alive, then what you're looking at is the exo-skeleton that they shed every once in a while. You will need to periodically add an iodine supplement to the water because they use iodine in building their new exo-skeleton.

Skunk Cleaner Shrimp Picture



A cleaner shrimp that actually does a decent job of keeping tank mates clean.



Click photos for larger image

Skunk Cleaner Shrimp Profile Facts and Care Information

Scientific Name : *Lysmata amboinensis*

Common Names : *Skunk Cleaner Shrimp*

Care Level : Easy, needs to be slowly acclimated to the tank. Take an hour or longer and use a slow drip acclimation.

Size : Up to 2 inches (5 cm)

Life span : 3 years or longer

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Origin / Habitat : Indo-Pacific

Skunk Cleaner Shrimp Temperament / Behavior : This is a very peaceful little shrimp that should make a great addition to nearly any peaceful tank. Watch them closely in reef tanks because they may sometimes pick at corals and may even take food from your corals. They may also chase away other shrimps that invade its territory.

Skunk Cleaner Shrimp Breeding / Mating / Reproduction : This invertebrate has been bred in the home aquarium. Also see: How to Raise and Train Peppermint Shrimp for a complete how-to on breeding saltwater shrimp.

Tank Size : 30 gallon (114 liters) minimum

Skunk Cleaner Shrimp Compatible Tank Mates : Use caution when selecting tank mates. Don't keep them with more aggressive fish species such as Triggers, Hawkfish and Lionfish that may munch on them. You should be able to keep multiple skunk cleaner shrimps in the same tank. They seem to tolerate each other well.

Fish Disease : Saltwater Fish Disease - Diagnose, Symptoms and Treatment

Diet / Fish Food : Omnivorous, try to give them a variety of marine foods. They should accept most meaty types of frozen and live foods.

Tank Region : Usually stays close to its chosen territory in the live rock or any other tank decor that can provide shelter. They should come out when food hits the water.

Gender : Hermaphrodites - has both male and female reproductive organs.

Author : Mike FishLore

References

Shimek, R. L. (2004). Marine Invertebrates - 500 Essential to Know Aquarium Species. T.F.H. Publications.

Calfo, A. (2003). Reef Invertebrates - An Essential Guide to Selection, Care and Compatibility. Readin Trees Publications

TURBO SNAIL - TURBO FLUCTUOSA

The Turbo Snail is one of the better algae grazers available for saltwater aquariums. Are you looking for something to help control the algae growing on your glass and on the live rock in your marine tank? Look no further. The saltwater turbo snail will continuously graze on algae and make short work of it.

Even though they are excellent as part of a cleanup crew, there are a few things to keep in mind if you plan on keeping the turbo snail in your aquarium. The Turbo Snail requires calcium for their shells, so you will need sufficient calcium levels in your water. Sometimes hobbyists put too many in the tank thereby starving their snails. Allow for 20 to 30 gallons of water per snail. If you do have too many Turbo Snails in your tank, you can supplement the Turbo Snails diet with dried seaweed. Also, if you have fish that graze on algae such as some of the Tangs, you may want to limit the amount of snails you put in your tank.

These snails get to be about 2 inches or so in size and are usually more active at night. They do sometimes come out during the day too and roam about the tank walls and live rock searching for food. They are fairly hardy and make a nice addition to a cleanup crew. One word of caution though: they can and will knock over corals that are not glued down or that haven't attached yet.

Turbo Snail Pictures



Turbo Snail Profile Facts and Care Information

Scientific Name : Turbo fluctuosa

Common Names : *Top Shell, Turban Snail*

Turbo Snail Care Level : Easy, good for the saltwater aquarium beginner

Life span : 1 - 2 years, sometimes slightly longer lived

Size : Up to 2 inches (5 cm)

pH : 8 - 8.4

Temperature : 72°F - 80°F (22°C - 27°C)

Specific Gravity : 1.020 - 1.024

Origin / Habitat : Mexico

Turbo Snail Temperament / Behavior : Very peaceful

Breeding / Mating / Reproduction : Difficult to breed

Tank Size : 30 gallon minimum

Turbo Snail Compatible Tank Mates : Avoid keeping them with some of the more aggressive marine invertebrates.

Turbo Snail Diet / Fish Food : Herbivore, mainly algae. You can try to supplement their diet with dried seaweed. Having live rock is beneficial because it can constantly graze on it for food. Limit the amount of snails if you're also keeping algae grazers such as some of the Tang species.

Tank Region : All over the glass and live rock

Gender : There are no definite ways to distinguish males from females.

Author : Mike FishLore

CROCEA CLAM - TRIDACNA CROCEA CLAM

The Crocea Clam is an absolutely amazing looking saltwater clam. The Crocea Clam usually costs anywhere from \$30 to \$100 dollars depending on your location. In general, there are several different species of Tridacna clams available. There is the T. maxima which gets to be about 12 inches. The T. derasa which gets even bigger than the maxima. Then comes the Tridacna crocea which stays smaller, usually only growing to about 6 inches (15 cm). All of these clam species are quite colorful and eye catching. There are blue, blue-green, brown and other color varieties. These clams are very easy to care for, provided that you have high intensity lighting over your tank.

For standard sized and shallow tanks you may be able to keep these Crocea Clams with power compacts with multiple bulbs. For deeper tanks (those greater than 24 inches deep) you'll need HO, VHO or even better, Metal Halides. They get most of their needed nutrients from photosynthesis and the aquarium light you put over your clam tank is crucial for their wellbeing.

Crocea Clams are also filter feeders and will feed on dissolved nutrients in the water column. They take up ammonia and nitrates and should do ok in aquariums with normal nitrate levels (less than 20ppm).

Placing your Crocea Clam is important and you don't want to be moving it around all the time. This can stress them and even lead to their demise. Find a spot and stay with it. If you have moderate lighting levels you will want to place them in a crevice in the live rock in the mid to upper regions of the tank. Tanks with higher lighting levels may be able to place them in the sand.

Crocea Clam Picture



Crocea Clam Profile Facts and Care Information

Scientific Name : Tridacna crocea

Common Names : *Crocea Clam, Boring Crocea Clam*

Crocea Clam Care Level : Moderate to Difficult

Size : Up to 6 inches (15 cm)

Life span : very, very long lifespans

pH : 8.1 - 8.4

Temperature : 75°F - 82°F (25°C - 28°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 12°

Saltwater Supplements : Needs high calcium levels (400 - 450 meq/L) and seems to need iodine supplementation.

Origin / Habitat : Indo-Pacific, most of the available clams are aqua-cultured

Temperament / Behavior : Very peaceful, and will stay in the same place you put it. Avoid keeping crabs with your clams since they may pick at the clam's mantle.

Crocea Clam Breeding / Mating / Reproduction : Most clams are aqua-cultured nowadays. They release gametes into the water where they meet up with others and fuse. They then settle to the ocean bottom and start to grow.

Tank Size : 30 gallon (114 liters) minimum

Compatible Tank Mates : Avoid crabs and any other predatory fish species that may nip at the clam mantle.

Fish Disease : [Saltwater Fish Disease](#) - Diagnose, Symptoms and Treatment

Crocea Clam Diet / Fish Food : They get most of their nutrients from photosynthesis (needs high output [aquarium light](#)) and they are filter feeders and will feed on ammonia and nitrate.

Tank Region : Crocea clams can be placed in the bottom in the sand or in a crevice of your live rock. If you place it in the live rock, make sure that it is in a secure location and won't be toppled by the currents or fast moving, larger fish.

Similar Species : [Marine Invertebrates](#) | [Maxima Clam](#)

Author : [Mike FishLore](#)

Recommended Reading: [Giant Clams in the Sea and the Aquarium](#)

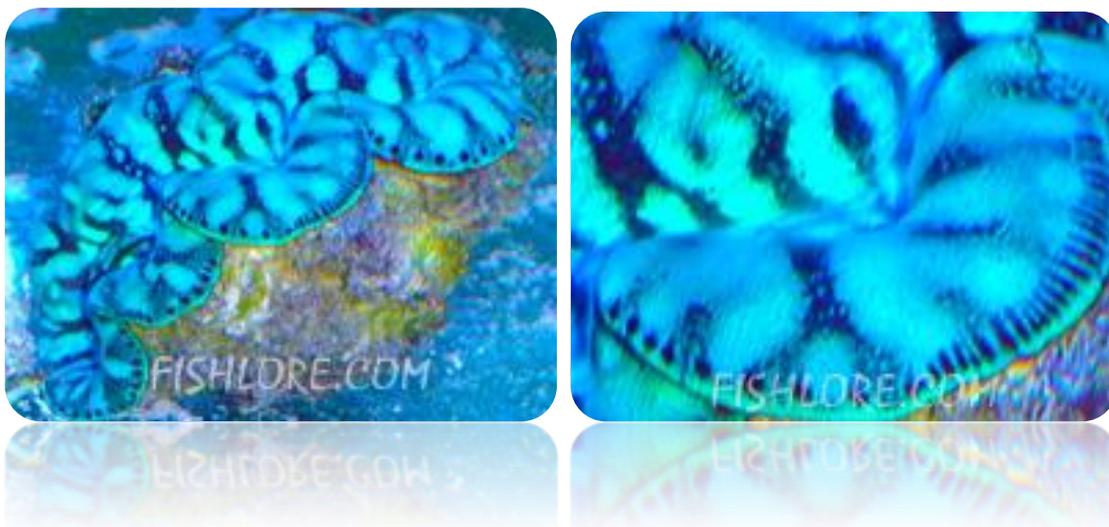
TRIDACNA MAXIMA CLAM

The Tridacna Maxima Clam also goes by the common name of the giant clam but it's really the small giant clam since the true giant clam is Tridacna gigas. The colors on the Maxima Clam can be simply outrageous and extremely vibrant. Common mantle colors are blue, green, gold and turquoise with various mantle patterns. They are found all over the Indo-Pacific often in large congregations where there is high light penetration.

The Maxima Clam gets most of their energy needs from the zooxanthellae living within the mantle and need high intensity lighting over the tank. Metal halide and T5's are recommended to keep these clams. Smaller species less than a couple of inches are supposed to be more sensitive to intense lighting and should be adjusted slowly over a period of weeks to higher lighting levels. They will do well when placed on a hard substrate or rock so they can attach.

A often debated topic is whether or not to feed the Maxima clam. Some swear that they need to be fed phytoplankton at least a couple times per week. Others think they do not need to be fed and get most of what they need from their zooxanthellae and filter feeding on ammonia and nitrates from the water column. My take is that it wouldn't hurt to feed them unless you end up polluting your tank. If you see increased growth rates and better coloration when feeding them, why not try?

The Maxima Clam is long lived and needs stable saltwater or reef tank like conditions to thrive. Keep the temperature, salinity, calcium, magnesium and alkalinity levels at natural saltwater levels or slightly higher (see below). Don't keep them with tank mates that will pick at their mantles like hermit crabs and certain fish species that might pick at them such as dwarf saltwater angelfish and large saltwater angelfish.



Maxima Clam Profile Facts and Care Information

Scientific Name : Tridacna maxima

Common Names : *Maxima Clam, Giant Clam*

Maxima Clam Care Level : Moderate to difficult

Size : Up to 12 inches (30 cm)

Life span : Tridacna clams can have very long lifespans

pH : 8.1 - 8.4

Temperature : 75°F - 80°F (25°C - 27°C)

Specific Gravity : 1.023 - 1.025

Carbonate Hardness (dKH) : 8 - 11°

Saltwater Supplements : Needs steady calcium levels (400 - 450 meq/L), Magnesium (Mg) levels need to be kept at natural saltwater levels (1250-1380 ppm) and Alkalinity levels (8-10 dKH)

Origin / Habitat : Indo-Pacific, most of the maxima clams these days are aqua-cultured.

Temperament / Behavior : Peaceful and needs to be kept with tank mates that will not bother it.

Tank Size : 55 gallon (208 liters) minimum, preferably much bigger water volumes for water parameter stability.

Compatible Tank Mates : Stay away from hermit crabs and any other predatory fish species that may nip at the clam mantle.

Maxima Clam Diet / Fish Food : They derive most of their energy requirements from photosynthesis (high output aquarium light such as Metal Halide or T5's) and they are filter feeders and will filter ammonia and nitrate. You can try to feed them phytoplankton or something like Phycopure Reef Blend which has a range of particle sizes. There are several products available for feeding clams. Turn off water flow and using a turkey baster or similar feeding device carefully squeeze the food out a few inches away from the mantle and let the food drift down to them. Sometimes this causes them to clench up. If you have trouble doing it

that way, cut the bottom out of a clean 2 liter soda bottle (or milk jug depending on the size of the clam), place the bottle over the clam and while holding the bottle in place with one hand, administer the food to the clam with the other hand. Hold the bottle in place for a minute or two.

Tank Region : Depends on the light intensity in your reef tank. Smaller maxima clams need to be adjusted slowly to higher output lighting because their mantles are more sensitive than larger clams. I've kept them in the bottom to mid-levels of tanks for years under 8x54 watt T5's with excellent results.

Author : Mike FishLore

Recommended Reading: Giant Clams in the Sea and the Aquarium

SMALL SALTWATER FISH TANK (NANO) SPECIES

Finding small saltwater fish tank species for a small marine aquarium (nano tanks) is not difficult and they are often easily found in local saltwater reef stores and online. If you have a small saltwater aquarium it is vital to keep it lightly stocked and your water parameters stable. Make sure you research any fish you decide to get before you go to the store. Do not make that impulse buy or you may regret it later.

Any fish tank from 10 to 30 gallons could be considered a small saltwater fish tank for the purposes of this article. Really, any saltwater tank under 30 gallons is going to be a chore to maintain (my opinion of course, to each his own). Nano tanks are often considered even smaller. It should also be noted that the smaller the fish tank the harder it is to keep in my opinion. Larger tanks provide so many more options for both equipment and fish species and I strongly urge any new hobbyists to get the largest tanks they can accommodate. Leave the smaller specialty saltwater tank setups for when you become more experienced later on.

The saltwater fish you're looking to keep in your small saltwater aquarium need to have a few characteristics to make the list below. You also need to keep in mind how they will get along with other species along with conspecifics. For better long term success, look for fish that:

- Stay small even as adults. Research the average adult size before you buy them.
- Don't require much swimming space. Some fish are very active swimmers, others not so much.
- Accept the more common marine fish food preparations, such as flakes, pellets, frozen, etc.



Banggai Cardinalfish - these fish stay on the small side and are not very active. Feeding wild caught specimens can be somewhat challenging at first so look for captive born specimens. They are mouth brooders too!



Pajama Cardinalfish - same as above, but most are still wild caught but they stay small and should eat most foods.



Blue Devil Damsel - these guys are on the small side but the downside to keeping them is they can be very territorial. Keeping multiples may prove to be a problem but they are generally very hardy.



Blue Chromis - the chromis are one of my favorite species. They are awesome looking, stay small, eat most everything you can give them provided that it is small enough and they do well in groups.



Green Chromis - a great little fish that will sometimes get overlooked but they look amazing under bright aquarium lighting. Very hardy and does great in groups. They may bicker to establish a pecking order but in general they are good for smaller tanks and look fantastic in schools inside larger tanks.



Clownfish - some species of clownfish get bigger than others. They are not active swimmers, nor do they patrol a large territory. Though many folks keep them in smaller aquarium set ups, I don't think I would keep any of the clownfish species in a tank under 30 gallons as adults other than maybe the Amphiprion or Ocellaris.



Neon Goby - These are a cleaner species that stays on the small side. Many hobbyists feel they should be left on the reef but they are being captive raised nowadays...



Orchid Dottyback - these dottybacks are quite striking in coloration and could be kept in smaller tanks. They can be somewhat territorial and reclusive though and need hiding spaces.



White Belly Wrasse - sometimes picked up by reef tank keepers to help rid their tanks of unwanted coral pests. This is a good species that is generally hardy and will go after most foods put into the tank. They are fairly active, so nothing smaller than 30 gallons is recommended.

Lots of live rock for them to pick on is good and you also need a good fitting hood because (like most wrasses) they are really good jumpers.



Purple Firefish - I debated putting this one on the list but I'm going to anyway. I've found them to be somewhat challenging to feed at first. Once you get them eating though they are good to go. Good jumpers too so have a hood.



Yellowtail Blue Damsel - these damsels stay small but they can be very territorial. They are hardy and will eat most foods presented.



Catalina Goby - this is a cooler water species and could do well in a tank set up to meet their cooler water requirements.

There are also invertebrates such as many of the cleaner shrimps, snails and hermit crabs that can be easily kept in smaller saltwater tanks.

Obviously, the list above is just my opinion from years of being around them and don't take these recommendations as gospel. Research the species on your own and form your own

opinion **before** you buy them. Look into the gobies, basslets, along with some of the wrasses and blennies for more ideas on small saltwater fish species.

FORUM ETIQUETTE – REMEMBER THIS WHEN POSTING ON FORUMS

One Definition of Etiquette:

"The rules governing socially acceptable behavior."

Forum Guidelines

Anytime a group of people come together and interact there must be rules set in place to make that interaction go as smoothly and comfortably as possible. Rules are there to be enforced and followed, but there are also suggestions that can go along with the rules. Some of the reasons for having etiquette above and beyond the enforced rules are to enable people of various lifestyles, backgrounds, and nationalities to gain equal enjoyment potential from the material.

Online forums are a unique situation for the etiquette guidelines. When speaking to a person face to face one can see their facial expressions, body language, and hear the tone of their voice. When using only text to communicate with other people it becomes much harder to detect things such as sarcasm, jokes, and even seriousness. The etiquette guidelines, if followed, help ensure that everyone enjoys their time spent on the forums rather than getting offended.

Some of the Etiquette guidelines are enforced as rules, such as: no cursing, avoiding flame wars and personal disputes, giving respect, avoiding plagiarism, slander, and keeping civil. Others are left as suggested tools of communication, enforced only if situations become problematic. Some of the suggested tools would include: staying on topic, not cluttering the forum, use of proper grammar, and providing enough information.

As for cursing, unless the forum's 'Terms of Service' agreement explicitly endorses the use of profanity, it is a bad idea to use such language. Foul language is hardly ever acceptable in mature public conversations, such as most forums are intended to be. If you are prone to the use of foul language in your life off the forum (as many of us are) it is probably best to proof read your posts until you get in the habit of not using such language.

Flame wars are probably the worst situation to encounter on a forum. They basically consist of extremely hostile verbal jabs back and forth, which often result in nothing but hurt feelings and juvenile behavior. Flaming another poster for any reason shows an extraordinarily childish level of thinking. Of course these behaviors all lead back to respect.

Personal disputes would include flame wars, but as a whole personal disputes should be kept to private messages between the parties involved and possibly a mediator if needed. It is extremely immature to allow the people on the forum to know of private disputes. Even better would be to let things go and not have personal disputes in the first place, it saves a lot of hassle.

Often times the number one rule is to respect your fellow posters. "Respect must be earned", we hear that from the time when we are small children, but sometimes it is easier to earn respect by giving it freely. If you exude respect in your posts it will "rub off" onto others and everyone will be happier to visit the forum and more and more people will join, which would make the forum a more fun place to be. After all, aren't those things the goal of a forum, to be a fun, happy, people-rich environments to visit?

Some of the more serious problems would include Plagiarism and Slander. Plagiarism is, of course, the use of someone else's material without their express permission, when not citing the source. If you were to quote a website's information on a subject there are two ways for that to not be Plagiarism:

- A) Cite the source by saying, "I got this from ____ .com"
- B) Show the website link, "____ .com"

Plagiarism is a misdemeanor criminal offense in which the innocent party may sue the guilty party in a court of law, for damages. Slander is the other problem that could get actual legal action. Slander is the act of spreading harmful, untrue information. (Ex. Man, everything _____ sells is crap. Whereas it would've been better to have said, "Everything I've bought from ____ is crap.")

Civility is one of the most encountered violations for forum-goers. Sometimes it can be very difficult to remain civil to folks that annoy, infuriate, embarrass, or appear stupid to you. Situations are always easier if the discussions remain civil.

Forum Suggestions

The aforementioned etiquette guidelines are all some of the things that are required of members to most online forums. We are about to discuss some of the polite rules to follow on forums, but these polite rules are often not enforced. While most of the yet to be mentioned ideas are not enforced, they are strongly encouraged.

The first is probably the most important. Stay on topic. It sounds simple, but often people read a post and whatever comes to mind they feel they must share with everyone. That is fine to feel

and fine to do, but usually is only alright if the person starts their own thread for their thought. It often seems okay to mention the thought in response within the thread, but if sharing the thought changes the subject of the thread it becomes hijacking. Hijacking occurs when someone changes the subject of someone else's thread and is considered very rude.

Avoiding forum clutter is a very good idea also. If you have a question and post it in one area, that should suffice. There is no benefit to posting the question in multiple areas of the forum. (Most forums have a space to show most recent posts, and as far as Fishlore goes just about everyone checks the entire forum, not just a few areas.) Another form of cluttering the forum is done quite often. When people respond to a post and make multiple separate responses back to back to each other, even if responding to different points of the thread. There is a button for multiple quoting for a reason, it is suggested to use the button rather than jacking one's post count in a rather cluttering manner.

Another thought to keep in mind is that the forum is usually owned by one person or a small group of people. The owners have ultimate decision as to what occurs as far as rules and disciplining rule-breakers. Moderators are the second line of leadership. The moderator team is usually appointed by the administrator (which is often the owner(s)). Moderators are entrusted to handle problems as soon as possible and to be advisors to the administrator. With all of that said, often times people forget that the forum is usually made to please the majority of the people involved in the decision making process. Sometimes those that forget that try to get the forum to meld into what they would be most comfortable with, and are often very self-centered people. That is obviously a very rude behavior.

Grammatical skills are **extremely important** when it comes to online forums. If your message is not easy to understand it will inevitably either be misunderstood or not read at all. If your primary language is not that of the forum you are a member of just do your best and let it be known that the language is not your primary language. If it is the same language as your primary then follow the rules of the language and do not treat the forum as a text message on a cell phone, it is rude and immature.

Providing enough information is one of the hardest things to get people to do. If you are going to ask a question try to include any possible information no matter how minor it may seem, but do so in an organized manner. For example, on our fish forum include the following:

Q: My fish are sick, what do I do?

Response 1:

- What kind of fish?

- What other kinds of fish are in the same tank?
- How many of each kind of fish are in the tank?
- In what size tank are your fish housed?
- What symptoms are present?
- How has your fish's behavior changed since sickness was noticed?
- How has your fish's eating habits changed?
- How much do you feed the fish?
- What chemicals, if any, do you put in the tank?
- What are your water parameters?
- When was your last water change, what percentage do you do, and how often do you do them?
- What kind of equipment do you use on the tank? (heater, filter, decorations, substrate, etc)
- Have you had problems with other livestock purchased from the same supplier?
- Were there any noticeably sick fish in the supplier's tanks?
- Have any supporting photos that could help?

There are many other questions that could be asked, but you probably get the point, huh?

Now let's talk about a problem that is rampant on forums. Jacking post counts. It is kind of immature to post with the express intent of raising one's post count. We all know each post we make raises our post count, but when posting a large number of insignificant posts just to surpass other's post counts it is considered very much a juvenile behavior. (Saying it is a juvenile behavior doesn't make it alright for juveniles to do!

Some of the self-explanatory actions would include: bumping/reviving dead threads (if it has not been posted on in over a month, start a new thread rather than reviving), taking things personally, and use of proper font. It is considered rude to post messages in all CAPITAL LETTERS. Another good idea is to use an easily read font. If the background is white or gray, use a black font. The default forum font is usually sufficient and there is no need to change it. For example, don't use a light green or pink font on a white background! If you are one of those that need your own special font, realize that you are virtually assuring that no one will read your post.

One of the last situations to be mentioned is, when posting follow-up posts it is considered appropriate only to quote the part of the message that is needed for context of your post. Quoting the entire message when only part of it is needed is a form of clutter for the forum. You can use the forum tools to get the quoted text into your reply, but go into the quoted part and remove everything except for what you need to quote. Tech forums are notorious for this and make it miserable for readers to sift through to find an answer.

A finishing thought for everyone: Etiquette and manners go hand in hand, and if used properly you will appear mature beyond your years. (Unless you're really old, then you'll appear as mature as you look!) Go out there, follow the rules, use as much etiquette as possible, and most of all HAVE FUN!

References

Thanks go to the following websites for the ideas I gathered from their forum etiquette page:

www.google.com

www.mozilla.org

<http://forum.tweakxp.com/forum/Topic130928-29-1.aspx>

About the Author

Chief WaterChanger (Ross)

Aerobic :

when organisms need oxygen to survive they are called aerobic.

AC :

see Activated Carbon

Acan or Acantastrea Coral :

see Acan Coral

Acropora :

see Acropora Coral

Acclimate :

Acclimation is the process of introducing fish or other animals into new conditions (tank water). This process should be slow with aquarium water testing beforehand to help determine the length of time needed for the acclimation process. More information on Fish Acclimation.

Acidic :

relates to the pH scale where a measurement of the fish tank water under 7 is considered "acidic" and over 7 as "basic or alkaline" and 7 is considered "neutral".

Acrylic :

this is a plastic material used to construct fish tanks, filters and other devices used in aquaria. There are many benefits to using acrylic over other materials. It is light weight, durable, inexpensive, and it can be made to be very clear to look through making it ideal for aquarium use. It is also prone to scratching easily and great care must be taken when scraping algae off the tank walls to prevent the acrylic from scratching. You can buff out scratches but this can be a very difficult project.

Actinic Light :

actinic lighting is aquarium lighting composed of lighting in the blue wave length and it should be able to penetrate deeper into the water than other wave lengths. Often times,

you'll hear about saltwater aquarium keepers using a combination of full-spectrum and actinic lighting. Actinic lighting can help set off colors in corals and it can be used to help coralline algae growth.

Activated Carbon :

sometimes abbreviated as "AC", this is a form of carbon that is used in aquariums to remove dissolved nutrients and yellowing compounds to help clean or polish the aquarium water. It is often used to remove smells in the aquarium as well. It is frequently used on water faucets to filter drinking water too. Activated carbon has a limited lifetime and must be replaced periodically. How often you need to replace your carbon depends on the tank circumstances, such as stocking levels and maintenance regimen. There are various grades of activated carbon with some being better than others when it comes to leeching compounds. Some brands may release phosphates into the water. If you have a reef tank or are experiencing algae problems while using activated carbon, try testing your brand using a phosphate test kit. You may be surprised. Also see the article on [Activated Carbon](#).

Use caution when replacing large quantities of activated carbon in your aquarium. It's a better idea to replace half at a time to prevent light shock to corals.

Adipose fin :

The usually very small fin between the dorsal fin (top fin) and the caudal fin (tail fin). For example, you can easily see the adipose fin on [Silver Dollar Fish](#) and other [characin fish](#).

Air Pump :

An aquarium air pump is a device used to force air into aquarium tubing. The tubing is placed into the aquarium (used in conjunction with an air stone) to increase water agitation and for decorative purposes. Who among us didn't have that diver with the air bubbler at one point?

Air Stone :

An air stone is used in conjunction with an air pump and tubing, the air stone is placed at the end of the tubing in the tank. These "stones" are made out of sand and sometimes lime wood and have various air diffusing capabilities.

Aeration :

Aeration is usually referred to in the context of "you need to increase the aeration in your tank". This means that you need to increase the surface agitation by using a device to agitate the surface of the tank water. You can do this by using air stones, power heads pointed at the water surface, and via return filters or other aquarium pumps.

Ahermatypic :

Corals that do not host symbiotic zooxanthellae are called ahermatypic corals. They are also sometimes referred to as the "non reef building" corals. Since they can't derive the benefits from zooxanthellae they usually have more advanced prey capture mechanisms to meet their energy needs.

Algae :

Algae can be both simple and complex in form with varieties growing on nearly any surface within an aquarium. There are brown diatoms, blue-green algae, green algae and red algae. Sometimes algae is desirable (coralline algae in saltwater aquariums) but most often if it grows uncontrolled can become a nuisance. Algae needs nutrients such as carbon dioxide, phosphates, nitrates and iron. Limiting these nutrients is key to controlling the rapid takeover of your aquarium. Some methods to control algae growth include limiting the amount of fish food entering the water, use live plants, keep less fish in the tank, increase the frequency of your water change routine, invest in a Reverse Osmosis water filter unit to filter out impurities from your tap water, and use aphosphate removing medium.

Algaecide :

A chemical that will kill algae but it may also kill other desirable life forms. Care must be taken if you use an algaecide. This is simply treating the symptoms of a larger problem. Find out why you have an algae problem in the first place.

Algae Turf Scrubber :

Abbreviated as "ATS", is also referred to as a turf scrubber or algal scrubber. It is a filtration method usually employed in reef tanks where the aquarium water is sent into a separate tank (a sump, for example) and there the water passes over algae mats, cleaning

the water in the process. These scrubbers have to be cropped periodically for nutrient export.

Alkaline :

alkaline relates to the pH scale where a measurement of the fish tank water is over 7 and is considered "basic or alkaline".

Alkalinity :

Alkalinity you'll usually hear reef keepers discussing. Alkalinity is basically a measurement of how well the water in your aquarium can buffer against a drop in pH. An alkalinity test kit will measure the levels of elements such as carbonates, bicarbonates and some other elements. It is usually measured in units of meq/L or ppm which are essentially the same.

Ammonia :

abbreviated as NH₃ (one part nitrogen and 3 parts hydrogen), ammonia is released into the aquarium from uneaten fish foods, fish wastes and other biological processes. It is easily measured using an aquarium test kit and is the first reading you'll get at the beginning of the aquarium nitrogen cycle. Ammonia is always being released into the aquarium and adequate biological filtration is needed to prevent the life forms from suffering because it is very toxic to fish. Ammonia is thought to be the number one killer of fish in aquariums, most likely due to aquariums going through the nitrogen cycle.

Amphipod :

a tiny crustacean that are a food source for many aquarium fish and invertebrates. They can range in size from 2 - 50 mm. Saltwater aquarium keepers sometimes utilize a refugium to culture amphipods.

Amquel :

this is a chemical used to detoxify tap water of chlorine, chloramine and other harmful metals. You use amquel with new tank water to prevent harming the aquarium inhabitants from these elements.

Amyloodinium :

the saltwater version of the parasitic single cell organism in velvet disease.

Anal fin :

the anal fin is on the lower part of the fish, in between the anal opening and the caudal fin (tail fin).

Anaerobic :

means that there is no oxygen is present or an organism does not require oxygen. Some of the bacteria living on the inside of Live Rock that convert nitrates to harmless nitrogen gas are though to be anaerobic. Sometimes anaerobic conditions can form in the aquarium substrate and if these areas are disturbed, harmful compounds such as hydrogen sulfide can get released into the tank.

Aquariology :

is the study of fish health and the management of fish health in aquariums.

Angelfish :

refers to either the Freshwater Angelfish or the Dwarf Saltwater Angelfish or Large Saltwater Angelfish.

Anoxic :

refers to low oxygen levels in the tank water, such as in the deeper levels of the aquarium substrate where anoxic conditions may be present.

API :

Aquarium Pharmaceuticals Inc - Most often used to describe the API Master Test kit.

Aragonite :

a form of calcium carbonate, this term refers to a substrate used in the aquarium to raise or maintain high pH and alkalinity levels. Freshwater fish keepers might use this substrate to **raise** the pH in African Cichlid tanks and saltwater aquarium keepers use it to help **maintain** the pH and alkalinity levels.

Aquarium :

A container usually made out of glass or plastic (see acrylic) that is used to hold and view fish, plants and corals.

Aquascaping :

is the process of decorating or arranging your aquarium. This is an artistic term for situating the tank to the needs of both the aquarium inhabitants and the fish keeper and is quite fun. Also see [Rock Scaping](#) and the [Aquarium Aquascaping Ideas](#) article.

Artemia :

see [brine shrimp](#).

ATS :

see [Algae Turf Scrubber](#).

Aufwuchs :

A German term for the tiny crustaceans, insect larvae and other organisms found living in algae and other surfaces.

Background :

is the backside of the aquarium. There are several options available to the aquarist when it comes to aquarium backgrounds. Underwater scene prints and 3D backgrounds are affixed to the outside of the back wall of the fish tank, providing a background when viewed from the front of the tank. You can even paint the outside back wall. Popular color choices are various shades of blue, black, dark green, etc.

Bacteria :

small, microscopic organisms that are present everywhere in the aquarium. Some can be harmful, but most are beneficial and are necessary for the [aquarium nitrogen cycle](#). Use caution when using anti-bacterial medicines in the fish tank since they may be indiscriminate in the bacterias they kill.

Ballast :

is an electrical device used to start fluorescent lamps and for regulating the power flow through fluorescent lights.

Barb :

is a type of freshwater fish. Also see [Barbs - Cyprinids](#).

Bare Bottom :

a term used when referring to an aquarium lacking a substrate, often used when referring to saltwater tanks. People have bare bottoms with the hopes of limiting nutrients (that could accumulate in sand beds) for growing corals. Others simply like the clean look of a bare bottom tank.

Benthic :

means the bottom of a body of water. Benthic dwelling organisms can live on or in the aquarium substrate.

Betta :

is a type of freshwater fish. Also see the [Betta](#) fish profile.

Bio-balls :

as the name implies, these are small plastic, porous balls that are usually placed in wet/dry trickle filters that help promote the growth of bacteria that aid in the nitrogen cycle.

Bio-load :

the sum total of the biological burden placed on the biological filter in an aquarium. An overstocked tank will place a heavy bio-load on the filtration system.

Bio-wheel :

this is a part in a bio-wheel filter that provides biological filtration. It is a wheel shaped device that spins using water motion provided by the filter. As the wheel spins it comes in contact with aquarium water and then mixes with air, providing a large surface area for beneficial bacteria to colonize.

Biological Filtration :

is the part of the aquarium filter system that promotes or allows the growth of beneficial bacteria that helps filter the aquarium water by breaking down wastes into nitrogen compounds (ammonia, nitrite, nitrate, nitrogen gas). There are many filtration devices primarily designed for biological filtration such as bio-balls, filter floss, sponge filters, etc. Beneficial bacteria colonies can form on nearly every surface in the tank including the

filter, the tank walls, and the substrate. For saltwater aquarium keepers, live sand and live rock can be fantastic biological filters.

Birdsnest Coral :

see [Birdsnest Coral](#)

Black Water Extract :

is a water conditioner that contains peat and it helps provide soft, acidic water conditions for aquariums. Hobbyists keeping fish from the Amazon river locations may be interested in using black water extract to more closely resemble these Amazon river water conditions.

Bloodworm :

a fish food, these are midge larvae that are naturally occurring in the bottom of streams and rivers that make a part of the diet in some fishes. They can be high in protein and can be given as a treat to your fish or to help condition them for spawning. They commonly come in frozen and freeze-dried form.

Blackworm :

a fish food, also see [Tubifex Worm](#).

Blastomussa Coral :

see [Blastomussa Coral](#).

Bottom Feeder :

is a fish that spends most of its time scavenging the substrate for food. Many catfish species, such as [corydoras](#) are bottom feeders.

Brackish Tank :

In between a freshwater tank and saltwater tank is the brackish fish tank. These tanks have water with smaller amounts of dissolved salts and they may try and replicate locations where freshwater rivers meet oceans. See [Brackish Fish](#) species profiles for more information.

Breeding Tank :

this is a specialized aquarium set up for the breeding of fish. They are often scaled down tanks and breeders run them without substrates and sometimes sponge filters to minimize damage to fry. Having no substrate makes it easier to keep the water conditions optimal and the tanks easier to clean during the frequent water changes that rearing tanks require.

Brine Shrimp :

a fish food, brine shrimp is another good treat for your fish that is easy to cultivate and nutritious. Baby brine shrimp is often fed to fish to condition them for spawning or breeding. For ideas on how to raise your own brine shrimp, please read the [brine shrimp hatchery](#) article.

Brood Stock :

a fish or a fish pair that is used for breeding. Some fish species pairs ([Discus fish](#)) can fetch high prices.

Bubble Nest :

is a nest of air bubbles constructed by the [anabantoid fish species](#) for protecting the eggs. Males usually build the bubble nest and guard the eggs.

Buffer :

is a powder or chemical used to change the alkalinity of aquarium water so that it can resist changes in the aquarium pH. Saltwater aquariums often need buffer agents added because they are skimmed off or used up. These buffering agents usually consist of carbonate and bicarbonate. Baking soda can also be used as a buffering agent.

Bysus Gland :

an organ in clams that secretes bysus threads which allows them to attach themselves to the substrate or other surface.

CAE :

abbreviation for [Chinese Algae Eater](#).

Calcium :

Ca, is an element needed by corals, clams and certain algae to grow. Natural Saltwater has a range of approximately 380 - 450 mg/L and it can be difficult to keep this level up in an aquarium with calcium consuming corals, clams and algae. There are various ways to keep the calcium levels up. Some popular ways include the use of Kalkreactors that dose kalkwasser and Calcium reactors to dose calcium. You can also purchase diluted calcium chloride (easier but kind of expensive) and dose that way. The problem with dosing liquid calcium is that you have to also use a buffer (carbonate or bicarbonate) when you dose calcium or you risk lower the alkalinity levels. There are two part calcium/alkalinity solutions and you should look into these products if dosing this way interests you.

Calcium Carbonate :

CaCO₃, a main component of many rocks, seashells and crushed corals. Saltwater reef tank keepers have to dose or supplement this compound in order for corals to grow. Corals need calcium carbonate to grow.

Calcium Reactor :

a somewhat complicated piece of aquarium equipment that is used to supplement calcium in saltwater aquariums. A media such as aragonite is mixed with carbon dioxide (CO₂) in a tube like device which causes the aragonite to slowly dissolve thereby releasing calcium and other important trace elements which is then dosed into the tank. Aragonite dissolves at a lower pH and the carbon dioxide is used to lower the pH. A calc reactor is sometimes used in tandem with a pH controller.

Candy Cane Coral :

see Candy Cane Coral

Canister Filter :

is an external aquarium filter that pulls water from the aquarium, forces it through various types of filtering media and then pushes the clean water back into the aquarium. Canister filters allow you to use multiple media types inline. For example, these filters often have multiple media trays. In tray one you could use filter floss to remove debris, in tray two you could use activated carbon and in tray three you could use another media type such as zeolite to remove ammonia. These filters are often more expensive than other filter types. A decent, less expensive canister filter: Cascade Canister Filter.

Captive Propagation :

is the process of breeding, growing and raising plants, animals and fish in captive conditions (fish in aquariums) for the purpose of increasing the population of the particular plant, animal or fish.

CFL :

abbreviation for Compact Fluorescent Light or Compact Fluorescent Lamp. See [Power Compact Light](#).

Catfish :

is a type of fish that is scaleless, has barbels and is often times a bottom dweller. Some stay on the small side such as [scorydoras](#) whereas others grow to be quite large like the [Iridescent Shark](#). There are both freshwater and saltwater catfish species. Also see: [Aquarium Catfish Species](#).

Carnivore :

an animal, plant or fish that primarily eats meat or meaty items.

Caudal Fin :

is the tail fin on a fish. It is for propulsion. Also see: [Fish Anatomy](#).

Caudal Peduncle :

is the area directly before the caudal fin (tail fin). Also see: [Fish Anatomy](#).

Chaetomorpha :

is a algae that grows in saltwater and is used by saltwater hobbyists in a [refugium](#). Chaetomorpha is one of the better types of algae for hobbyists to use for nutrient export. Chaeto is often used in an attached refugium where it grows quickly as it consumes and competes for nutrients with less desirable forms of algae. After it reaches a certain density or size it can be cropped and removed from the system, providing nutrient export.

Characin :

one of the fish families that consists of tetras. Also see: [Characin Species - Tetras](#).

Chemical Filter :

is an aquarium filter type that removes dissolve nutrients from the water. The most common form of chemical filtration in the aquarium is using activated carbon. Also see: Aquarium Filters.

Chloramine :

NH₂CL, chloramine is used as a disinfectant in tap water. Most municipalities use either Chlorine and/or chloramine to treat drinking water. These chemicals are harmful to fish and must be neutralized in our aquariums before adding fish.

Chiller :

is a device that works like a refrigerator and is used to cool the aquarium water. These are external devices and can be quite costly to purchase and operate. For more info, see the Aquarium Chiller article.

Chlorine :

element Cl, chlorine is used as a disinfectant in drinking water. It is very toxic to fish and must be eliminated from the aquarium water before use. Chlorine may dissipate if you let the water sit for a day or two, but chloramine may stay in solution. Use a water conditioner that removes both chlorine and chloramine to be on the safe side.

Cichlid :

is a fish from the Cichlidae fish family. They originate from many different locales including Central America, South America and Africa. There are many species and they can sometimes have very different water parameter requirements. Most are great parents to their young and they can become quite aggressive with tank mates while breeding. For more info, see Cichlids profile pages.

Circulation :

refers to the amount of water movement within the aquarium. Water movement is accomplished by using internal pumps (powerheads) and/or external pumps. Water circulation is very important and is often too slow in most tanks. High water movement within the tank can help increase the dissolved oxygen levels by increasing surface

agitation and it can keep detritus suspended in the water column for the mechanical filter to pick up.

Cleanup Crew :

a term for saltwater aquariums, refers to the algae and detritus eating organisms such as snails, crabs, starfish and sea cucumbers. The need for all these animals in the same aquarium is sometimes debated. Sand sifting starfish can make short work of a sand beds, sea cucumbers can release toxic compounds that are harmful to fish and crabs can kill snails for their shells and pick at sessile invertebrates. Some reef keepers like to keep only snails for these reasons.

CO2 :

carbon dioxide, this is a byproduct of fish respiration and it also sometimes bubbled into freshwater planted aquariums to increase the growth rates of plants in brightly lit aquariums.

CO2 System :

a carbon dioxide dosing system that bubbles water into freshwater aquariums with plants. In brightly lit aquariums there is sometimes not enough CO2 present in the water from fish respiration and it needs to be added (bubbled) into the tank in order to get better growth rates from aquarium plants.

Conspecific :

belonging to the same species.

Coldwater Fish :

are fish species that need to be kept in water temperatures that are cooler than what tropical fish species need. Coldwater fish usually need to be kept in tank water under 70°F (21°C). Goldfish and Koi are good examples of coldwater fish species.

Cnidarian :

is the term for an invertebrate that has stinging cells called nematocysts. Examples of cnidarians are corals and sea anemones.

Commensalism :

a form of symbiosis in which one organism benefits from the association but the other organism is unaffected.

Coral :

aside from being a pretty color, a coral is an animal in the class Anthozoa that has colonial polyps and produces a calcium carbonate shell.

Coralline Algae :

is a plant form, or algae that needs light and calcium to grow. Encrusting coralline algae can form beautiful shades of purple or pink and will spread over the surfaces of live rock and on tank walls and aquarium equipment.

Corallivores :

Fishes that primarily eat corals, the Parrotfishes for example.

Corner Filter :

is an aquarium filter that is placed inside the tank, in a corner, imagine that. A corner filter can provide very basic filtration for an aquarium. Often these are one of the first filters young hobbyists (used to) gain experience with. Also see: Aquarium Filters.

Crustacean :

is an invertebrate with a hard exoskeleton. Examples of crustaceans include lobsters, crabs and shrimps.

Cryptocaryon :

this is more commonly known as marine ich or saltwater ick. It is a parasitic infection with very small salt like spots that show up on the body of the fish. It can be deadly to the fish and once you can see these white spots, the infection is in the advanced stages. Prompt action may need to be taken and there are many fish medicines on the market to treat this infection. Also see: Saltwater Fish Disease.

Cyanobacteria :

considered a nuisance in saltwater aquariums, this is a bacteria that is more commonly called "Red Slime Algae". It is primarily caused by low water flows, high amounts of

dissolved nutrients and maybe an incorrect spectrum of lighting. Increase water flows, use a protein skimmer, increase the frequency of water changes, limit nutrients, replace old lights and use Reverse Osmosis or Deionized water for top-offs and water changes.

Cyprinid :

is a type of freshwater fish. Also see Barbs - Cyprinids.

Daphnia :

also known as water fleas, this is a nutritious fish food that is found in lakes and streams.

Dechlorinator :

a water additive used to eliminate chlorine and sometimes chloramine from tap water. This product is used when adding new water to the aquarium since chlorine and chloramine can harm fish.

Deionization :

is the process of removing ions from a solution (water) using an ion exchange resin. Sometimes used in conjunction with a Reverse Osmosis water filter to remove impurities from tap water before using it in the aquarium.

Denitrification :

is a process where nitrates are converted to harmless nitrogen gas that escapes at the tank water surface. In order for this process to take place there needs to be anoxic or anaerobic conditions in the aquarium. These anoxic or anaerobic places are usually found in the lower layers of Deep Sand Beds and deep within Live Rock.

Detritus :

is decomposing organic materials, but you can also think of it as fish waste or uneaten fish food that settles into or on the substrate.

Detrivore :

organisms (fish and invertebrates) that eat detritus.

Diatomaceous Earth :

a very soft rock made out of fossilized diatom algae that is crumbled into a powder for use in diatom filters.

DFS :

abbreviation for Drs. Foster and Smith which is an online aquarium and pet supplies website.

DG :

short for Dwarf Gourami.

DI :

abbreviation for Delonization. Also see: Reverse Osmosis and Deionization.

Diapause :

usually used in reference to insects, but in our case the killifish. The embryos of killifish can go through a stage of suspended growth or development called diapause.

Diatom Filter :

a mechanical filter that pushes or pulls the tank water through packed diatomaceous earth material which cleans the water, or polishes the water. They can become clogged quickly and are usually only used occasionally to polish aquarium water.

Discus :

is a type of freshwater fish. Also see the Discus profile page.

Dinoflagellate :

is also known as saltwater plankton. Some are photosynthetic and these are called zooxanthellae.

Dissolved Oxygen :

is the amount of oxygen dissolved in the aquarium water for use by the tank inhabitants. It is measured as a saturation level or in ppm. Fish need oxygen in the water for respiration.

Distilled Water :

the distilling of water is the process where water is heated to a boil, the water vapors (steam) are collected in tubes where they cool and drip into another clean container. Distilled water could be considered pure water in that it removes many dissolved solids, salts and organics. Distillers can sometimes be a pain to clean and it's usually easier to generate pure water using reverse osmosis and deionization. Saltwater aquarium or reef tank keepers may be interested in reverse osmosis units.

Dither Fish :

these are fish that stay out in the open all the time and in the process will calm and reassure more reclusive fish species that it's safe for them to venture out from their hiding spot.

Diurnal :

is a plant, animal or fish that is active during the daytime.

DIY :

abbreviation for **Do It Yourself**. There are many pieces of equipment that hobbyists like to make on their own. For instance, here is a DIY Homemade Algae Scraper.

dKH :

abbreviation for Degrees of Carbonate Hardness and is a measurement of total alkalinity.

DOC :

abbreviation for Dissolved Organic Carbon or Dissolved Organic Compounds. DOC is the dissolved carbon compounds in the aquarium water that form as a result of various biological processes that take place in the aquarium. It's difficult to measure DOC in aquariums, so Nitrate was one of the things hobbyists started to use as a guide to know when the DOC's were getting too high. When the nitrates started edging up so too were the dissolved organics. To remove DOC from your aquarium you will need to dowater changes, use chemical filtration and protein skimming in saltwater aquariums.

Dolomite :

is a carbonate rock composed of calcium magnesium carbonate. Saltwater hobbyists sometimes use this material as a substrate but it takes a lower pH than aragonite to dissolve and may therefore not be as suitable for a marine substrate as aragonite.

Dorsal Fin :

the fin located on top of the fish. Some fish even have two dorsal fins. Also see: Fish Anatomy.

Dosing Pump :

is a pump used to regulate and administer a slow dose or drip to the aquarium on a continuous or occasional basis. Kalkwasser is sometimes dosed using a slow drip dosing pump.

Driftwood :

are old tree branches that are used in aquariums for decoration. It is important to sterilize or "cure" the driftwood before using it in your tank. You can boil it (for a couple of hours) or simply let it soak in an aquarium use only bucket for several weeks. Boiling is quicker and you can usually get it ready after a few hours of boiling. Driftwood will release tannins that can soften the water and also cause a drop in pH.

Dropsy :

is an accumulation of fluids in the tissues of fish, making the fish appear bloated or the scales to stick out. This is thought to be caused by a bacterial infection brought about by poor aquarium husbandry (dirty water) and improper diets. Also see: Fish Disease.

DSB :

an abbreviation for Deep Sand Bed. Deep Sand Beds are used in saltwater aquariums for the purpose of denitrification.

Ecosystem :

can be thought of as an environment or location and all the organisms and animals that make up this environment along with their relationships with each other and their relationship with the environment.

Egg Burier :

is a reproductive method where the fish will dig a pit and the female will release her eggs into the pit and then the male fertilizes them. One of the parents will usually guard the eggs while the other guards the immediate vicinity, keeping any egg eaters away.

Egg Layer :

or Egg Depositor, this is a method of fish reproduction where the female places the eggs in a particular location (vertical surface, plant leaf, inside driftwood, etc.) and the male comes behind releasing sperm to fertilize the eggs.

Egg Scatterer :

is a reproductive strategy where the female fish drops the eggs as she swims and the males releases sperm into the water at the same time. It's not the most efficient strategy since many of the eggs fall into the substrate or get eaten by the other fish. Bare bottoms tanks are highly recommended in order to increase your chances of success when breeding egg scatterers.

Endangered Species :

is an organism, animal or fish that is at risk of becoming extinct. It could mean that the natural population of the animal is dwindling or the habitat of the animal is under serious threat.

Endemic :

means that a fish or animal is native to the particular place or geographical location.

Endosymbiosis :

when an organism lives within the cells of another organism. Also see: [symbiosis](#)

Estuary :

is a body of water connected to the ocean with freshwater rivers flowing into it.

Euthanize :

to terminate a fish in a painless manner in order to stop its suffering resulting from disease or injury.

Extinct :

when a species is no longer living.

Filter :

is a piece of aquarium equipment used to clean the aquarium water through mechanical, biological or chemical methods. Also see: [Aquarium Filters](#).

Fin Rot :

is a fish disease that causes the fish fins to rot away. This is a bacterial infection that is usually brought about by poor nutrition and poor water quality within the aquarium. It may also be caused by fin nipping coupled with poor water quality. Given good conditions (water, foods and no fin nippers) the fish fins may grow back.

Fingerling :

is a baby, young, or very small fish.

Fish Only - FO :

is a term that is often used to describe a saltwater tank that consists of fish only. There are no [live rock](#), corals or other [marine invertebrates](#) present. These are very basic setups and can actually be a little harder to run than tanks employing live rock.

Fish Only With Live Rock - FOWLR :

is a term used to describe a saltwater tank using live rock. Fish are included in this [saltwater aquarium setup](#), but there are no corals or invertebrates.

Flashing :

used to describe the quick darting or fish flashing against objects in the aquarium. This can be signs of the onset of a disease known as [ich](#) in your fish. Watch them closely and hopefully, if they are new fish, they are in a quarantine tank where you'll be able to treat them effectively. If not, it may be a good idea to start getting a [quarantine tank](#) ready.

Flourescent Light :

is an aquarium light that uses electricity, mercury vapor and neon gas to produce ultraviolet light. These lights require a [ballast](#) to regulate the electrical flow to the lamps.

Fluidized Bed Filter :

an aquarium filtration device that forces water through a sand medium. As the aquarium water flows continuously through the sand, beneficial bacteria colonies attach themselves to the sand and it should increase the biological filtration capacity of the aquarium. There can be some potential problems with running these filters. They can become packed and turn into nitrate factories. Mechanical filtration of debris before the water enters the fluidized bed filter should help prevent this from happening though frequent monitoring and maintenance may be required.

Foam Fractionation :

a method of removing dissolved organics from the aquarium water. Also see: Protein Skimmer.

Frag :

short for coral fragment, refers to a small piece of coral. Corals can be very expensive and hobbyists will often frag their corals for trading with other hobbyists.

Frogspawn Coral :

see Frogspawn Coral

Fry :

can be thought of as free swimming baby fish.

Full Spectrum Light :

is a light that displays the entire spectrum of visible light, from violet to red. For example, sunlight is considered Full Spectrum.

FW :

abbreviation for the term "Freshwater".

GAC :

abbreviation for Granular Activated Carbon.

Gammarus :

a freshwater amphipod that is used to feed fish.

Gang valve :

a valve that is used with multiple air lines to direct and regulate air flow to each of the tubes.

GBR :

stands for German Blue Ram or the Great Barrier Reef in Australia.

GH :

abbreviation for General Hardness. This is a measurement for the total amount of dissolve minerals in your tank.

Genital Papilla :

is the tube through which the sperm and eggs pass on fish and can only usually be seen during breeding. Angelfish has a genital papilla.

Genus :

is a taxonomic group of similar organisms that has one or more species. For example, for the freshwater angelfish, *Pterophyllum scalare*, *Pterophyllum* is the genus and *scalare* is the species.

GFCI :

abbreviation for Ground Fault Circuit Interrupter. A GFCI outlet is a safety device that will prevent you from getting shocked or electrocuted. When the circuit detects a difference in electrical flow through the outlet it will trip the circuit, preventing serious damage to the aquarist from happening. These are a must have around aquariums. It's also a good idea to always turn off the electricity to the tank before working in it.

Goldfish :

is a type of freshwater fish. Also see the Goldfish profile page.

GPD :

abbreviation for Gallons Per Day. This term is often used when referring to how many gallons of water a reverse osmosis filter or RO/DI filter can produce in a day.

GPH :

abbreviation for Gallons Per Hour. This term is used when referring to filter turnover or water turn over within an aquarium.

Gills :

are used by fish to extract gases (oxygen) from the water. Also see: [Respiration](#).

Gonopodium :

is a modified anal fin for reproductive purposes. Also see: [Livebearer Fish](#).

Gorgonian :

is an octocoral species that can take on various forms such as branchlike, encrusting or whiplike. Some species contain [zooxanthellae](#), while other gorgonian species do not.

Gourami :

is a type of freshwater fish. Also see the [Gourami](#) fish species profiles page.

Gravid Spot :

is a term usually encountered when dealing with the freshwater livebearing fish. Gravid simply means carrying and developing eggs. The gravid spot is usually a dark spot located near the anal vent and is often easily seen in fishes such as the [guppy](#) and [swordtails](#). In [Mollies](#) and [platies](#) it may be more difficult to see, especially in darker colored fish.

Green Water :

the result of an algae bloom, green water can be unattractive to look at but shouldn't harm the fish. The amount of dissolved nutrients in the tank are the primary cause of green water. For ideas on how to correct green cloudy water, please read [cloudy aquarium water](#).

Grindal Worm :

sometimes called dwarf white worms, these are white worms that reach about 1/2 an inch in size and they are used to feed smaller fish species and fry.

GSP :

reference to [Green Star Polyps](#) or [Green Spotted Puffer](#)

Habitat :

is the location where an animal, plant or fish naturally lives. It can be important to understand the natural habitats of the animals we keep in order to try and replicate them in the aquarium.

Hard Water :

is water that contains many minerals, such as calcium and magnesium. When you have hard water (use a test kit) it can be more difficult to regulate the aquarium pH. Reverse Osmosis filters can soften hard water. Some fish species (like many tetras) do better in softer water.

Heater :

is aquarium equipment that is used to increase or maintain the temperature of the aquarium water. There are many types and varieties of aquarium heaters on the market and it can be a good idea to invest in two lower wattage heaters instead of one higher wattage heater in case of heater malfunctions.

Herbivore :

is a fish that mainly eats plants, algae, or plant matter.

Hermatypic :

usually used in reference to corals, it means that the coral has the symbiotic algae zooxanthellae present in their tissue. Hermatypic corals depend on photosynthesis for the majority of their nutrients and appropriate lighting is vital for the proper care of these animals.

HID :

abbreviation for High Intensity Discharge and refers to high intensity lights such as metal halide lights.

Hermaphrodite :

is a fish or other animal that has both male and female organs for producing eggs and sperm.

HITH :

abbreviation for Hole In The Head, which is a fish disease. Read more on this fish disease here: [Fish Disease](#).

HO Light :

refers to High Output fluorescent aquarium light. HO lighting is gaining in popularity as an economical method for placing high intensity lighting over reef tanks while not adding much heat to the tank water. HO lamps are usually in the 20-60 watt range, sometimes higher. T5 lights are considered HO lights. HO lights may not be as intense as [VHO](#) bulbs or [Metal Halide](#) bulbs.

HOB :

abbreviation for "Hang on Back" and refers to aquarium equipment that can hang on the back of the tank. Most aquarium products will list in the product description whether or not they are HOB. HOB equipment eliminates the need for running your own plumbing lines outside the aquarium but the downside is that you can easily see the equipment hanging on the back of the tank.

Hospital Tank : very similar to and sometimes synonymous with a [quarantine tank](#). A hospital tank is a bare bones setup that is used for treating sick or diseased fish. They usually have a filtration system, no substrate, a heater, some place for the fish to hide (pvc tube maybe), lights and thats about it. The sick fish are held in the hospital tank while they are treated for the infection or disease and once they recover they are released back into the main tank.

HQI :

an abbreviation for High Quartz Iodide and is used when referring to [metal halid bulbs](#). HQI can be in either the single ended or double ended metal halide varieties. The HQI bulbs supposedly burn brighter, with more intensity than standard metal halide bulbs.

Hybrid Fish :

is a fish that is a cross between two different fish species. There is much controversy and many ethical issues around the inter-breeding of different fish species.

Hydrometer :

is a device used to measure the specific gravity of the aquarium water. Brackish tank and saltwater tank keepers need this device to monitor specific gravity levels.

Ichthyologist :

Ichthyology is the study of fishes. An Ichthyologist is the person that does the studying. An Ichthyologist could work for a large aquarium, a museum or a university identifying fish species and documenting fish behavior and habitats.

ID :

usually short for Iridescent Shark but also for the word "identification".

Inch Per Gallon :

refers to a rather silly guideline you'll come across that some hobbyists use to stock their aquarium. This "guideline" recommends stocking 1 inch of fish per 1 gallon of water. This is an extremely short sighted rule and only works on very small or juvenile fish. Larger fish species require much larger living quarters. A 1 inch pacu will not last long in a 1 gallon aquarium. Various factors come into play when stocking an aquarium such as fish temperament, how large the water surface is for gas exchange, the type of filter system used, water change regimens, etc. Please don't follow or believe this rule!

Infusoria :

are tiny organisms (protozoa) and algae that are cultured (grown) and fed to fish fry.

Ich :

also known as ick or white spot disease, Ich is a very common fish disease. The freshwater ich version is Ichthyophthirius multifiliis and the saltwater ich version is called Cryptocaryon. It appears as small white dots all over the fish's skin. It's actually a parasite that is just below the skin. Ich has a life cycle that consists of a free-living stage and a parasite stage when it attaches to the fish. After it has been attached to the fish for a while, it will break free and settle into the substrate where it will become a cyst, reproduce and multiply many times over. When these cysts mature they can swim and start looking for a fish host. This is a common disease and should be taken seriously if you want to save your fish. It has the capacity to wipe out entire tanks if not treated. There

are many products on the market to treat this parasite. Please use a quarantine tank for any new arrivals to prevent an ich outbreak. Also see: Fish Disease.

Internal Aquarium Filter :

any filter that needs to be operated inside the tank. Examples of internal aquarium filters are the undergravel filter, sponge filter and corner filter.

Invertebrate :

animals that do not have a backbone. In aquariums, invertebrates are snails, shrimps, crabs, corals, anemones, etc.

Iodine :

a saltwater aquarium supplement, iodine is used up quickly by the tank inhabitants (corals and invertebrates) and skimmed from the tank via the protein skimmer. It is crucial to use an iodine test kit before dosing iodine in your aquarium. In natural sea water, the iodine concentration is 0.03 - 0.06 mg/L (ppm).

Jaubert System :

is a biological filtration method first developed by Dr. Jean Jaubert for the Monaco Museum. This system requires the use of a deep sand bed, under which there is a plenum that consists of aquarium water with low levels of oxygen. This system promotes the growth of denitrifying bacteria in the lower levels of the deep sand bed. These denitrifying bacteria convert nitrate to nitrogen gas which escapes via the water surface.

JD :

Jack Dempsey - A type of cichlid.

K - Kelvin :

For fishkeepers, the Kelvin scale is a thermodynamic temperature scale used when referring to the color of fluorescent lighting. A candle flame is about 1800°, daylight is about 6500° and a cloudless day could be 10,000° plus. Fluorescent lighting wise 10,000°K bulbs are a crisp white and 20,000°K are more blue in color.

Kalkwasser :

a German word that translated means "lime water". Kalkwasser is calcium hydroxide that is usually administered using a dosing system. The dosing system can be automated

whereby the dose is controlled by the pH levels in the aquarium or it can be a manual process of dosing kalkwasser during water-top offs or slow-dripped into the aquarium. The good thing about kalkwasser is that it will supplement both calcium and help keep the alkalinity level and the pH stable.

Kalk Reactor :

a piece of aquarium equipment that is used to mix freshwater with calcium hydroxide (kalkwasser) using an automated stirring mechanism in tandem with a slow dosing system.

Kelvin :

refers to the Kelvin Scale that is used to measure the color temperature of light. Common color temperatures (measured in Kelvin - °K) are 6,000°K, 6,700°K, 10,000°K and 20,000°K. Saltwater Reef tank keepers sometimes experiment with lights of various lighting temperatures to get maximum growth out of their corals.

Krill :

is a small crustacean that is used to increase the colors in fish. Krill should only be used occasionally as a supplement.

Labyrinth Organ :

is a specialized organ in the anabantid species that allows them to take in oxygen at the water surface directly from the air.

Larvae :

after fertilization, the first stages of life for fish and invertebrates. The larvae looks different from the adult form of the organism.

Lateral Line :

along with being able use their vision to detect fish, food and other objects, Fish can use their lateral line to detect vibrations and other objects in the water. The lateral line runs the length of the fish, from the head to the tail. It is located in the upper part of the body, starting at the head of the fish.

Laterite :

is a planting soil that is rich in nutrients and minerals that is used for freshwater aquarium plants.

Lepidophagy :

a feeding behavior in some fish species where the fish will eat the scales off of other fish.

Lettuce Clip :

a clip with a suction cup used to attach to the inside walls of the aquarium used to feed fish. You can attach seaweeds such as snori for your herbivorous fishes.

LFS :

abbreviation for Local Fish Store.

LED :

abbreviation for Light Emitting Diode. Is LED aquarium lighting the future of aquarium light systems? They are still rather expensive at this time (2007) but prices are expected to come down. These LED lights run cooler (no need for chillers?), use less energy and can provide many different lighting configurations. These LED's present some exciting possibilities but prices need to come way down before more hobbyists start using them.

LPH :

abbreviation for Liters Per Hour and usually refers to the flow rate of aquarium filters or powerheads.

LPS :

abbreviation for Large Polyped Stony Corals or Local Pet Store.

Light Meter :

a device that measures light intensity. Also see lux meter.

Limewood Diffuser :

used like an air stone, a limewood diffuser produces fine bubbles and is sometimes used in protein skimmers, air bubblers, or in the lift tubes of an undergravel filter.

Livebearer :

refers to fish that have free swimming fry. Also see: Livebearer Fish Species, Guppy, Mollies, Platies and Swordtails.

Live Rock :

is rubble that has broken off the coral reef structure and is inhabited by many forms of life that can be beneficial in the saltwater aquarium. Good quality live rock is extremely porous and provides a great location for colonizing bacteria that aid in the aquarium nitrogen cycle. Also see the article on live rock.

Live Sand :

is sand that is used in saltwater aquariums that is populated with beneficial bacteria, invertebrates and other microscopic life forms that aid in the breakdown and conversion of elements within the aquarium. Live sand can be expensive to purchase (per pound) and a saltwater tank does **not** need to be stocked with live sand from the start. There is much skepticism within the trade regarding live sand manufacturers claims about this product. How can these organisms possibly stay alive in sub-optimal temperatures and little to no oxygen during transport? Regular sand (for saltwater aquariums) is much cheaper (per pound) and will quickly become populated with these beneficial organisms when using live rock over a period of time.

LR :

abbreviation for Live Rock.

LS :

abbreviation for Live Sand.

Lumens :

is the total output of a light source.

Lux :

is a measurement of the intensity of the light. Sunlight on a clear day is approximately 32,000 lux. $1 \text{ lux} = 1 \text{ lumens/meter}^2$

Lux Meter :

is a device used to measure lux, or light intensity in the aquarium. Coral keepers may use them to determine ideal locations for coral placement within the tank. It's also good to

use a lux meter to determine if your aquarium light can provide enough lux for the corals you want to keep.

Magnesium :

element Mg, atomic number 12, is the third most abundant element in natural sea water in concentrations of 1200 - 1300 ppm. For our purposes, it is used up by coralline algae and other algae during photosynthesis within a saltwater aquarium. Get a magnesium test kit before dosing magnesium in your tank. Mg is closely tied to the calcium and alkalinity levels in sea water as well. Not having enough magnesium could pose problems when trying to maintain calcium and alkalinity levels.

Mantle :

refers to the top, colorful, fleshy part of the tridacnid clam species, such as the Crocea Clam. The clam mantle contains symbioticzooxanthellae that helps provide nutrition to the clam.

Mariculture :

is the aquaculturing, farming or raising of fish or invertebrate species using water from the ocean. For example, tridacnid clams are often cultured in canals or raceways that are connected to the ocean to provide a continuous influx of clean saltwater.

Marine Biologist :

Marine Biology is the study of marine (saltwater) organisms. This includes all the animals, fish, plants, invertebrates, corals, etc. that live in the water. A marine biologist is the one who studies these organisms. Considered a dream job for many saltwater hobbyists.

Mbuna :

is a common name for African cichlids from Lake Malawi that can be aggressive and territorial. They are a rock-dwelling species of cichlids.

Mechanical Filter :

an aquarium filter that performs the function of removing the larger, suspended particles from the tank water. If the mechanical filter is not maintained regularly they can become a source for nitrate buildup.

Metal Halide :

a very high intensity aquarium light (HID) that is used for growing coral in saltwater reef tanks and they are also sometimes used in freshwater planted aquariums. They are about the brightest and most intense light that is currently practical for aquarium use. Metal Halide lamps need special fixtures and ballasts and put out significant heat. Fans and possibly an aquarium chiller may be needed for keeping the tank temperature within acceptable levels. They come in various wattages, anywhere from 125 watts through 1000 watts.

mg/L :

abbreviation for milligrams per liter and a unit of measurement that is approximately equivalent to PPM.

Molybdenum :

a trace element in natural saltwater that is used by the symbiotic algae (zooxanthellae) in corals. Also see the Saltwater Aquarium Supplements article.

Montipora Capricornis :

see Montipora Capricornis.

Montipora Digitata :

see Montipora Digitata.

Montipora Spongodes :

see Montipora Spongodes.

Mouth Brooder :

fish that hold eggs and fry in their mouths. Many cichlids and the Banggai Cardinal fish (saltwater fish) are mouth brooders.

MTS :

abbreviation for Multiple Tank Syndrome. This syndrome usually afflicts those aquarists that have achieved success with keeping fish. They soon want "just one more tank" in order to keep a different or bigger species. They may not know it at the time, but they

will soon get a third tank. The cycle continues until you run out of space or money. This syndrome spreads quickly and takes tremendous willpower to keep in check. There is no known cure at this time.

MTS could also be in reference to Malaysian Trumpet Snail. You've just got to use context to tell which one a member is referring to.

Mutualism :

a form of symbiosis in which both organisms derive some benefit from the association with each other.

Mysis Shrimp :

a small shrimp like crustacean that is used as a fish food, especially for finicky eaters such as the Seahorse.

nm :

abbreviation for Nanometer.

Nanometer :

abbreviated nm, is one billionth of a meter. It refers to the wavelength of light in aquarium lighting. Different light wavelengths produce different colors. Humans can only view light in the range of 380 nm (violet) to 780 nm (red).

Nauplii :

used in reference to newly hatched brine shrimp, Nauplii are newly hatched free swimming crustaceans.

Nematocyst :

the stinging cell, sometimes poisonous, that cnidarians (corals, sea anemones, jelly fishes) release to capture prey or as a defensive mechanism.

NH3 :

see ammonia.

Nitrate :

NO₃, occurs toward the end of the aquarium nitrogen cycle and can harm fish in high enough concentrations. In tanks without any form of denitrification, water changes are needed to remove nitrates.

Nitrite :

NO₂, is the middle step in the aquarium nitrogen cycle where Ammonia is converted to Nitrites and Nitrites get converted into Nitrates. Nitrites are not as harmful to fish as ammonia, but can still be deadly if the fish are exposed for prolonged periods.

Nitrogen Cycle :

sometimes called new tank syndrome, the aquarium nitrogen cycle refers to the conversion of Ammonia to Nitrite and then Nitrites to Nitrates by beneficial bacteria that form inside the aquarium and in the filtration system. Also see: Aquarium Nitrogen Cycle

NO :

abbreviation for Normal Output fluorescent lighting.

NO₂ :

see Nitrite.

NO₃ :

see Nitrate.

Nocturnal :

refers to an animal or fish that rests during the day and becomes more active at night or in darkness. The opposite of diurnal.

Nori :

a fish food (humans eat it too!) that is used to feed fish that are primarily herbivores. Often sold in dried sheets, it is supposed to be nutritionally superior to many other vegetable type foods that are often fed to fish. You can use a vegetable clip to feed the fish or put it under the live rock in the tank and let the fish nibble at it. Many saltwater tangs like to eat nori too.

nsw :

abbreviation for Natural Salt Water.

NTS :

New Tank Syndrome - More of an old school term from when less was known about the aquarium nitrogen cycle.

Nuchal Hump :

is the large hump on the backside of the head in some cichlid species. The purpose of this hump has not been scientifically determined, but is thought to be used for attracting mates.

Odontode :

external "teeth like" growths near body openings found on some fish species like the catfishes.

Omnivore :

is an animal or fish that eats both meaty and plant like foods.

Oodinium :

is the freshwater version of the parasite that causes velvet disease.

Osmoregulation :

is the process fish use of regulating the concentrations of salts (ions) and water across a semi-permeable membrane (the gills) through osmosis and diffusion. As a very over generalized example, there is a much greater amount of salts in the ocean than in the saltwater fish's body and saltwater fish would dehydrate quickly if not for their specialized gills that can remove salts from the water.

Overflow Box :

a piece of equipment that hangs on the back of the tank that is used to drain water from the tank into a sump type setup. Hobbyists that don't have a pre-drilled tank for running a closed loop circulation system or sump utilize an overflow box to get the water from the tank and into the closed loop or sump.

Oxygen :

Just like humans fish need oxygen for respiration. Fish take oxygen out of the water using their gills. Oxygen is dissolved in the aquarium water at the water surface. If oxygen levels drop too low, fish may suffer and even die. To increase the oxygen level in your aquarium, use a powerhead directed toward the water surface to cause agitation. Air stones (attached to an air pump) can also cause water surface agitation, thereby increasing the dissolved oxygen levels. Also know that cooler water can carry more oxygen than warmer water and avoid overcrowded conditions (stock lightly).

Ozone :

O₃, is a very unstable gas that is sometimes used to increase the dissolved oxygen content in aquarium water and in conjunction with saltwater protein skimmers in order to increase skimmer output.

Parasitism :

a form of symbiosis in which one organism benefits from the association and the other organism is harmed.

PC :

abbreviation for Power Compact and refers to Power Compact Fluorescent lights.

Pelagic :

for our purposes, this term is usually used when referring to the breeding styles of many marine species. These species essentially release the fertilized eggs into the open ocean to be carried by the currents. This breeding style can be quite difficult for breeders to successfully raise larvae.

pH :

this is a water measurement on a logarithmic scale that will tell you if your water is considered acidic, neutral or alkaline. A pH of 7 is considered "neutral", under 7 is considered "acidic" and over 7 is considered "alkaline".

Phosphate :

PO₄, consists of Phosphorous and Oxygen, is a primary ingredient for algae. Aquarists should try to limit phosphates in the aquarium water to prevent noxious algae blooms.

Piscinoodinium :

the freshwater version of the parasitic single cell organism in velvet disease.

Pleco :

is a type of freshwater fish. Also known as the Plecostomus. See the Pleco profile page for more information on this species.

Plenum :

mostly used only in saltwater aquariums, this is an open space under a deep sand bed that is used to promote biological filtration in the sand bed.

Power Compact Light :

is a U shaped fluorescent light that is able to generate more light than standard fluorescent tubes. Power compacts are reported to be more energy efficient while producing more light intensity. They can be a viable alternative for smaller and shallow saltwater reef tanks. They do put off some heat and a fan may be needed. They range anywhere from 9 watts through 96 watts.

Power Filter :

an HOB aquarium filter that performs mechanical filtration, biological filtration and chemical filtration. It performs mechanical filtration by pulling in tank water and forcing it through filter floss. Chemical filtration is accomplished by using activated carbon inside the filter floss. The better power filters also have a coarse media that the water flows through as it exits the power filter. This coarse media is a colonizing area for the beneficial bacteria that perform biological filtration. These aquarium filters are very popular because they are inexpensive, easy to maintain and do a decent job. It is important to replace the filter floss (not the bio-filter) when needed to prevent nitrates from accumulating in the filter.

Powerhead :

is aquarium equipment that is used to perform water movement inside the aquarium. Powerheads can be great if you don't want to run plumbing lines to an external water pump. Powerheads are also sometimes used with a UGF to create a reverse flow undergravel filter. There are some drawbacks to using powerheads inside your

aquarium. They can add heat and using several can be a problem if tank temperature is staying too high. The water intake strainer needs to be cleaned on a regular basis to perform at peak efficiency and having several in a tank can be a bit distracting and take away from the beauty of a tank (personal opinion of course).

PPM :

Parts Per Million, is a unit of measurement used in many test kits and is equivalent to mg/L.

Protein Skimmer :

a saltwater aquarium filtration device used to remove dissolved organics from the water using a process called foam fractionation. The protein skimmer pulls in water from the fish tank and then agitates it thereby forming tiny microbubbles. These tiny microbubbles attract the dissolved organics on the bubble surface. As these bubbles accumulate they are slowly forced upwards into a skimmer collection cup. Frequent maintenance is vital for the proper operation of a protein skimmer. The collection cup, the riser tube the bubbles travel up through and the water intake into the skimmer should be cleaned frequently to keep the skimmer operating at peak capacity. Protein skimmers help by removing these dissolved organics before they have a chance to turn into nitrates. If these dissolved organics are not removed from the water column they can cause problems such as nuisance algae growth, yellowing of the water, and an overtaxed biological filter.

Protogynous Hermaphrodite :

when a species begins life as a female and changes to a male. Often only a one way change, (i.e they can't change back to female) that can be triggered by the death of the lead male in the harem, the dominant female will turn into a male. The change process can take weeks to months to complete.

Pulsing Xenia :

see Pulsing Xenia for detailed information - a coral with polyps that pulse.

PWC :

abbreviation for Partial Water Change. More info on aquarium maintenance.

PVC :

Poly Vinyl Chloride, is a hard plastic type material used in plumbing aquariums and for routing water throughout multiple systems.

Quarantine Tank :

is a bare bones aquarium that is set up for housing new fish, invertebrates or corals for several weeks so we can monitor them for pests, parasites or disease. Using a quarantine tank is highly recommended and can save countless headaches and money. Trying to catch a diseased fish in a tank full of live rock is not our idea of fun. Quarantine tanks allow you to not only monitor new arrivals for disease but it also allows the fish to more slowly acclimate to captivity (saltwater species) and we have a chance to bulk them up a little bit with some good foods before we introduce them to the main tank. More information on [Quarantine Tank](#).

QT :

abbreviation for Quarantine Tank.

Reef Tank :

is a type of saltwater aquarium that is used to keep saltwater corals and other invertebrates. The reef tank often requires much higher lighting and more pristine water conditions than a [fish-only](#) or [fowlr](#) aquarium. [Live rock](#) and [live sand](#) is used as a food source for many of the invertebrates in these systems and as the primary biological filter. Temperature, Salinity (specific gravity), pH, [Calcium](#) and [alkalinity](#) are some of the constantly monitored parameters in reef tanks since the organisms can be more difficult to keep than fish. Since reef tanks use much more intense lighting than standard fish only or fowlr tanks, nitrates and phosphates need to be kept at extremely low levels to prevent algae from growing all over the aquarium. Reef tanks are the ultimate setup for many hobbyists, but they can be very expensive and challenging to setup and maintain. RESEARCH is your best friend if you're interested in [how to set up a reef tank](#).

Refractometer :

there are several different types of refractometers, but for our purposes it is a device or piece of aquarium equipment used to measure the salinity of water. You place a drop or two of aquarium water on a prism and then while pointed at a light source, you view

through the eye piece on the other end of the refractometer (opposite the prism) a reading of the salinity level. As the light passes through the water and prism it is bent or refracted. These refractometers are considered more accurate than the less expensive hydrometer because they can be recalibrated easily using pure water such as Reverse Osmosis or Distilled water.

Refugium :

is usually a separate tank that is inline or connected to the main aquarium, but it doesn't have to be connected. A refugium is used to grow and harvest organisms (plants and animals) for feeding the animals in the display tank. The refugium is separated from the main tank because these organisms would not be able to grow their populations because of predation in the main aquarium. These animals are protected in a place of "refuge", hence the term refugia or refugium. By being inline or connected to the main tank, the refugium can be a place where you can grow beneficial macro algae that can aid in nutrient export from the system. You could also use the refugium as a place to grow macro algae and periodically cultivate it for feeding to your Tangs or Surgeonfish. Essentially, refugiums can be anything that you want them to be.

Respiration :

is the process fish use to extract oxygen from the water in order to live.

Reverse Osmosis :

is a water filtration process where water is pushed through a semi-permeable membrane. This membrane only allows certain types of atoms to pass through the membrane and stops the "bad" atoms from passing through. Reverse osmosis water can sometimes be 90% more pure than regular tap water. Sometimes an RO unit is used in conjunction with a Deionization filter.

Ricordea Florida :

see Ricordea Florida

RO :

abbreviation for Reverse Osmosis. See: Reverse Osmosis and Deionization for more information.

Rock Scaping :

is the process of decorating or arranging the Live Rock in a saltwater aquarium. Also see Aquascaping

RTS :

abbreviation for Red Tail Shark. See the profile and care information for the Red Tail Black Shark.

RTBS :

abbreviation for Red Tail Black Shark. See the profile and care information for the Red Tail Black Shark.

SAE :

short for Siamese Algae Eater.

Salinity :

is a measurement of the total amount of dissolved salts in saltwater.

School :

refers to the grouping behavior that certain fish species practice in order to avoid predation.

Sessile :

refers to organisms (invertebrates) that do not freely move around the tank (immobile) and they are attached to the substrate, live rock or other surface.

SG :

abbreviation for Specific Gravity.

Spawn :

can be considered the period of time while fish are reproducing (breeding). It can also refer to the fertilized eggs or the release of eggs into the water column for fertilization.

Specific Gravity :

is a weight ratio of one liter of some substance compared to one liter of water and is temperature dependant. Specific gravity can be measured with a hydrometer. Saltwater aquariums need to be in the 1.021 - 1.025 range.

Spirulina :

used as fish food, is a type of blue-green algae that is good for feeding to herbivorous fish.

Sponge Filter :

is an internal aquarium filter that is very popular with fish breeders for their easy maintenance and durability. It basically performs mechanical filtration and biological filtration. These filters consist of a sponge material that is attached to a powerhead like device that pulls aquarium water through the sponge. Larger particles are trapped in the sponge and beneficial bacteria can grow on and within the sponge. To clean a sponge filter all you have to do is ring it out in discarded tank water and it should be ready to go again.

SPS :

abbreviation for Small Polyped Stony Corals.

Strontium :

a trace element in natural saltwater that aids in calcereous algae growth. Also see the Saltwater Aquarium Supplements article.

Substrate :

is the bottom of the aquarium and usually consists of gravel, sand or mud (saltwater aquariums).

Sump :

is an aquarium that is connected to the main tank, often hidden below or behind the main display aquarium, that is used to increase the total amount of volume in the system and used to hide equipment such as protein skimmers, heaters, aquarium filters, chillers, etc.

Surgeonfish :

The Tang or Surgeonfish is common name for a saltwater fish species. They are nicknamed surgeonfish because of the scalpel like growths (blade like) at the base of the caudal peduncle which they use for aggression and defense.

SW :

abbreviation for Salt Water.

Symbiosis :

is when two different types of organisms live in close association (i.e. together). There are several different classes of symbiosis: mutualism, commensalism, parasitism, amensalism, neutralism and competition.

T5 HO :

a newer type of High Output fluorescent light that is 5/8 inch in diameter and is more efficient than standard T12 fluorescent lights. These lights require a special ballast and are slimmer in size, allowing you to put more light over the tank. Typical life spans for a T5 bulb is reported to be in the 18 - 24 month range. HO T5 lights are gaining in popularity with Saltwater reef tank and freshwater planted tank hobbyists because they can grow some of the more light demanding species without adding too much heat. T5 hoods have fans that pull heat out the sides of the hood.

TDS :

is an abbreviation for Total Dissolved Solids. You can measure the amount of total dissolved solids using a TDS meter. Reef tank keepers use a TDS meter to track how well their reverse osmosis or RO/DI filter is running and the measured level of total dissolved solids using a TDS meter can indicate when it is time to replace these RO or RO/DI filters.

Tang :

The Tang or Surgeonfish is common name for a saltwater fish species. They are also known as surgeonfish because of the scalpel like growths at the base of the caudal peduncle which they use for aggression and defense.

Target Feeding :

is a feeding process for filter feeders (corals) where you use a turkey baster (or something similar) to deliver the food directly to the animal. Slowly push the bulb on the baster to allow the food to cloud over the filter feeder.

Taxonomy :

is the scientific practice of classifying of naming animals by species. The most famous taxonomist was Carl Linneaus.

Temperature :

for fish tank purposes, temperature refers to how hot or cold the tank water is. We measure temperature in degrees Fahrenheit (°F) or degrees Celsius (°C). While keeping fish and invertebrates it's important to have slow temperature variances. Temperature swings in either direction that are too drastic can be quite stressful for fish. An aquarium heater and aquarium chiller are used to keep the tank water within a certain range.

Timer :

refers to an electrical device that incorporates an internal clock to turn the devices on that are plugged into it. We highly recommend a timer for your aquarium lights. You can achieve some cool effects with a multi-timer device. For instance, if you have a light hood with full spectrum bulbs and actinic bulbs you could have the actinics come on at 10 am and stay on until 10 pm to achieve a sunrise and sunset effect. The full spectrum bulbs could come on at 12 pm and stay on until 8 pm.

Trace Elements :

is used in reference to saltwater for our purposes. Trace elements in natural saltwater are those elements that are present in less quantities than the major elements that make up saltwater. These elements may be less in quantity or (PPM) but can be just as important. Examples of trace elements in NSW (natural salt water) that are supplemented in saltwater aquariums include Iodine,Molybdenum and sometimes Iron.

Triggerfish :

a type of saltwater fish. See Triggerfish page for a list of fish profiles.

Trickle Filter :

an aquarium filter that incorporates a type of wet-dry filtration. Aquarium water is dripped (trickled) over plastic bio-balls (various types of media available) that are partially exposed to air. This type of filtration enhances the biological filtration in the filter.

Tubercles :

refers to the small white dots or pimple like growths around the gill covers of male goldfish. Can be used as an indicator in determining the gender differences in Goldfish and Koi.

Tubifex Worm :

a fish food, tubifex is a worm that is fed as an occasional treat to fish that is high in protein and other nutrients. Breeders will sometime use this in conjunction with other high quality foods to prepare their fish pairs for breeding. Live tubifex worms will quickly spoil if not kept in clean conditions and if that happens dispose of them, don't put spoiled worms in your tank. They also come in freeze-dried form, although they may not be as nutritious as the live version, they are much easier to keep and administer in freeze-dried form.

Turn Over :

refers to the amount of water flow through a filter or the total amount of water movement within the tank. For example, if your filter is rated at 300 GPH and you have a 55 gallon aquarium, your turn over rate is 5.5. This simply means that you "turn over" the tank water 5.5 times per hour.

UGF :

abbreviation for Under Gravel Filter.

Ultraviolet Sterilizer :

is aquarium equipment used to kill harmful parasites or other organisms in aquarium or pond water to prevent disease and algae problems. The UV Sterilizer works by slowing passing aquarium water over an ultraviolet light. The ultraviolet light reportedly destroys the cell structure of the organism, thereby killing it. Also see the UV Sterilizer article.

Under Gravel Filter :

is an internal aquarium filter that consists of plates that are placed under the substrate with rising corner tubes. Inside these corner tubes are air lines with attached air stones at the bottom. The air lines are attached to an air pump. The rising air bubbles create current that pulls water down through the gravel and up through the corner tubes attached to the undergravel plates. These filters were the popular choice back in the day, but have fallen out of favor with some of the easier to maintain aquarium filters of today (power filter). A UGF filter can perform mechanical filtration, biological filtration and chemical filtration. You can also set these UGFs up to do a reverse flow using a powerhead.

Venturi Valve :

used in protein skimmers, a venturi valve draws in air and mixes it with aquarium water to create tiny micro-bubbles.

Vegetable Clip :

a small clip with a suction cup that attaches to the aquarium glass that allows you to conveniently feed fish foods such as nori as well as other fish foods.

VHO :

stands for Very High Output and refers to fluorescent aquarium lighting. They typically range from 75-160 watts. These usually produce more heat than HO fluorescent bulbs and a fan (or an aquarium chiller) is needed to keep the tank temperature within an acceptable range.

Velvet Disease :

also known as Coral Fish Disease, velvet disease is caused by single cell organisms (Amyloodinium in saltwater fish and Piscinoodinium or Oodinium in freshwater fish). This disease can look very similar to ich or white spot disease, but velvet looks more yellow or gray and "dust like" instead of salt like. Velvet can be difficult to eradicate and a separate quarantine tank may be needed. There are many fish medicines on the market to treat velvet. Also see Fish Disease.

Water Change :

refers to the process of removing a percentage of the aquarium water in order to improve water conditions for your fish. Unlike a fish's natural environment, aquariums are enclosed systems that quickly become polluted with biological substance buildup and dissolved organics. A water change is a good way of reducing the number of pollutants in aquarium water. Frequent and small water changes are considered better than infrequent large water changes. Also see: [Aquarium Maintenance](#).

Water Parameters :

refers to the measurement of various levels in the aquarium. For example, aquariums that have been recently set up need to have their ammonia and nitrite parameters measured frequently in order to monitor the nitrogen cycle. Some other important water parameters that are frequently measured include temperature, pH, nitrate, phosphate, calcium, magnesium, alkalinity, etc. Measuring water parameters such as these will give the aquarist a general idea of the water quality in the aquarium.

Water Pump :

is aquarium equipment that is designed to move water in an aquarium. External water pumps are used to pull water from the aquarium and send it to sumps or refugiums. After the water passes through the sump or refugium it is pushed back into the tank. Water pumps are also used in closed loop circulation systems that are designed to increase the water movement within the aquarium.

Wave Maker :

is an aquarium device that is designed to simulate waves in the aquarium. Most often used in saltwater aquariums, there are stand alone products that pull in water and once the water reaches a certain level in the wavemaker, it is quickly released back into the tank, creating a surge or wave. Multiple [powerheads](#) connected to a switching device that turns the various powerheads on and off in intervals can achieve a similar effect but the constant tripping of power to powerheads can cause accelerated wear and tear on the powerheads.

WPG :

abbreviation for Watts Per Gallon and used in reference to [aquarium lighting](#). Light intensity and aquarium depth are more important factors than Watts Per Gallon. WPG is

a crude rule for estimating the amount of light needed for various organisms such as freshwater aquarium plants, corals and other invertebrates.

Wet-Dry Filter :

is an aquarium filter that incorporates a dry portion (air) in the filtration process. The exposure to the air increases the biological filtration capabilities of the filter. Trickle filters and bio-wheel filters incorporate a wet-dry filter portion.

White Spot Disease :

see Ich.

Yellow Water :

forms as a result of large amounts of DOC, which are Dissolved Organic Carbons. To remove DOC you will need to do more frequent water changes, use or replace the chemical filter (activated carbon) and perhaps lower the bio-load in the aquarium.

Zeolite :

is a mineral that is used in the chemical filtration component of aquarium filters. Zeolite is used in aquariums to remove ammonia from the tank water.

Zoanthid :

see Zoanthids, also known as zoas or button polyps.

Zooplankton :

are tiny organisms that are a food source for many animals in the ocean.

Zooxanthellae :

is a dinoflagellate that lives within the cells of various corals. They provide corals with carbon compounds (energy) which the zooxanthellae derive from photosynthesis.