

# AQUATICA



THE ON-LINE JOURNAL OF THE BROOKLYN AQUARIUM SOCIETY  
VOL. 29 MAY ~ JUNE 2016 No. 5



Photo: John Todaro



105 YEARS OF EDUCATING AQUARISTS  
**AQUATICA**  
VOL. 29 MAY - JUNE 2016 NO. 5  
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The **Brooklyn Aquarium Society Inc.** is a non-profit organization 501(c) (3) for people interested in the aquarium hobby and the study of aquatic life. The Society meets the 2nd Friday of each month except July and August at the Education Hall of the New York Aquarium at Coney Island, Surf Avenue at West 8th St., at 7:30 PM. Meetings are open to visitors. Refreshments are served. Membership is \$25 per year family / \$20 individual / \$15 for students under 14. Send inquiries or membership checks payable to:

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# BROOKLYN AQUARIUM SOCIETY

## CALENDAR OF EVENTS ~ 2016

### 2016

**MAY 13 Giant Spring Auction** ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods including a new 55-gallon tank & stand.

**JUN 10 Rit Forcier ~ Goodeid Livebearers** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction. BAS elections.

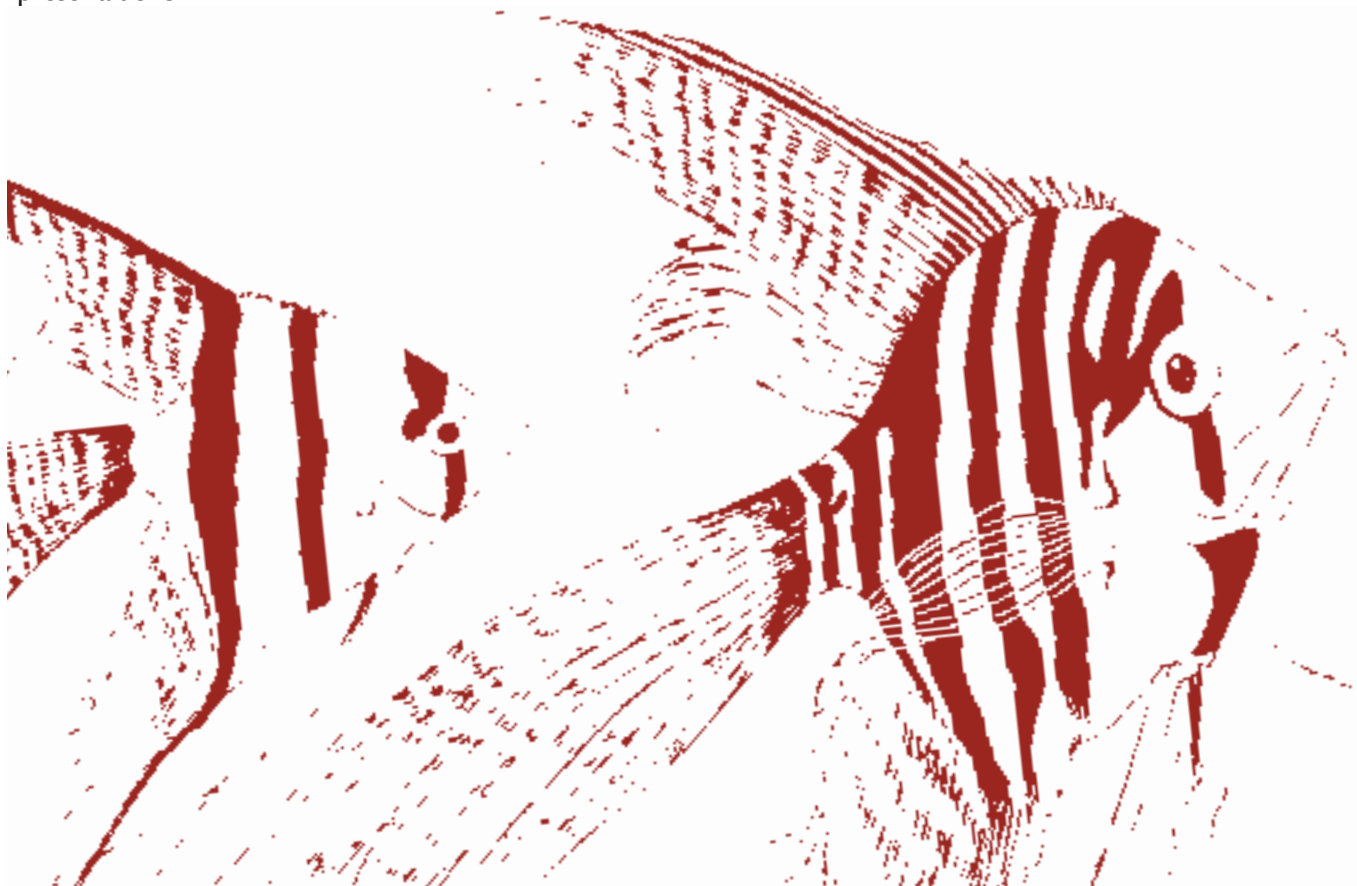
### JULY/AUGUST - NO MEETINGS

**SEPT 9 Joe Graffagnino ~ Joe's New Fish Room** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**OCT 14 Giant Fall Auction** ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a new 55-gallon tank & stand.

**NOV 11 Daniel Kopulos (Fauna) ~ How Collecting Practices Affect the Marine Hobby** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**DEC 9 Holiday Party** ~ Members, their families and friends, dinner • Fish Bingo & Prizes • BAS awards presentations.





# Catfish Dreams



## GUYANA

### BLACK TOP MOUSE CATFISH *Hassar orestis*

(Formerly known as *Hassar notispilus*)



ZZZZZ! Here we go again off to dreamland. This time to Guyana, a lowland, humid jungle country in northern South America.

The Black Top Mouse catfish is native to Guyana and grows to about 3" inches. It is a very elongated fish, its belly and underside is white above; the body is gun metal grey. Eyes are black with a silver iris. Caudal is an opaque white; dorsal has a white base. The top two-thirds of the dorsal is black. hence the fish's name. This catfish has long sensitive whiskers which are finely branched. Their eyes are large!

Black Top Mouse catfish are hard to find; they are not commonly exported. Plus they are sensitive to water quality and, as a result, ship poorly. So if you are lucky to find this fish, expect to pay a moderate price for it if you do find it.

Better aquarium stores may be able to special order them for you. Online vendors have them sometimes too. This is not a beginner's fish. I

keep my Black Top Mouse catfish in a small school in a 29-gallon tank with a power filter. They like a pH of 6.6 to 7.2, low to medium water hardness, and temperatures between 74 - 78°F. Keep them covered; they're nervous, shy fish and are good jumpers. Give each Black Top Mouse catfish a cave or cut PVC tube to call home. They like plants and do not disturb them.



This fish is very sensitive to any amount of ammonia or nitrite. They are also very sensitive to larger volume water changes. I change 10% (no more) of their tank water every other day. I also add dried crushed oak leaves to the power filter to add tannin to their tank water. It makes your water look like tea, but the Black Top Mouse catfish really like it.

Black Top Mouse catfish eat any small food offered: micro-pellets, flake and frozen foods. They especially love live blackworms and daphnia. They are not aggressive feeders, so always be sure



they get their share. I feed mine during the day and again after I turn the lights out, to ensure they get enough to eat.


Black Top Mouse catfish are very shy, peaceful fish, so only keep them with fish that are smaller than they are. Any large fish are viewed as a threat and they will stop eating. Black Tops love each others company and do best in a small group (3 -6). They will even share caves with each other. Initially when introduced in your tank you will not see them. As I have said, they are very shy, but once used to their new home, they will come out for food, but make sure you keep their tank lights dim. Never turn on the aquarium lights without turning the room lights on first; such a drastic light change easily sends them into

shock, from which they seldom recover.

Keep your Black Tops over a sand substrate only. Gravel can damage their sensitive whiskers.

Black Tops are extremely sensitive to disease brought on by chills or poor water quality. They are especially sensitive to ick. Never use any dye based medications on them except methylene blue at half strength. You can use copper at half strength too. No salt. Salt kills them. To treat ick, I raise their temperature to 86°F and add Melafix at half strength. This seems to work well.

A sensitive fish, hard to find and demanding to keep. Keeping this fish alive and well gives you bragging rights of your aquaristic abilities.

Beep! beep! beep! It's the alarm. Time to get up! Until our next catfish dreams. 

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John Todaro - BAS

## SPECIES PROFILE

**Scientific Name:** *Hassar orestis*.

**Common Name:** Black Top Mouse Catfish.

**Distribution:** Guyana, Brazil, Colombia, Ecuador, Peru and Venezuela.

**pH Range:** 6.6 - 7.6.

**Temperature Range:** 71 - 77°F.

**Water Hardness:** Up to 20° dGH.

**Life Span:** ?

**Size:** 7" inches.

**Temperament:** Non aggressive. Social with its own species. Has a fear of larger fish and becomes very shy in their presence.

**Sexing:** Similar to Corydoras. Male has a longer dorsal ray. The female has rounded pelvic fins.

**Diet:** Until acclimatized, feed live foods. Brine shrimp and blackworms. For more

settled fish feed flake or sinking flake-based tablets.

**Tankmates:** Smaller shoaling tetras and corydoras are ideal. Dwarf cichlids and smaller labyrinth fish (gouramis, etc.) are also suitable. Larger fish should be in bigger aquariums.

**Breeding:** Unreported.

**Remarks:** They can be fussy at first, in terms of feeding. Therefore, they should be fed live or frozen foods before moving on to prepared ones. Rarely imported into the aquarium trade.

**Reference:** • PlanetCatfish.com.

• Baensch Aquarium Atlas, Vol. Pg. 4902, Tetra Press 1993.







## Red Squirrelfish - *Holocentrus diadema*

This fish is common in the Indo-Pacific. It grows to 12" inches in nature, but seldom exceeds 8" inches in the aquarium. They are relatively cheap to buy.

Its color is a very pretty red on the body and all of its fins with white tips on the dorsal and white leading spines of the pelvic and anal fins. The body is striped white. Their eyes are big, black, white and red. Red Squirrels tolerate any good quality saltwater. I keep mine at 1.022 salinity, with a pH of 8.0 and a temperature of 74 to 78°F.

They do not tolerate ammonia or nitrite so I change 20% of their water weekly.

In nature, this fish is nocturnal and hides until twilight, but in the aquarium it quickly adjusts to being active all day.

Red Squirrels are very peaceful fish with other fish their own size. They'll eat small fish and most invertebrates that walk on legs (except starfish). They're fine with corals, clams, gorgonians and urchins. They readily accept flake, pellet and frozen foods.

Their gill plates and fins are very spiny and easily get stuck in a net. So use a plastic container to move them and save yourself a lot of headaches.

Squirrelfish can be kept singly, but in nature

**RED SQUIRRELS  
ARE VERY  
PEACEFUL FISH  
WITH OTHER FISH  
THEIR OWN SIZE.**



they swim in larger schools. They love company so it's best to keep them in a small school of 3 - 6. They're very active and swim everywhere. A school of Squirrelfish is a very pleasing sight indeed.

Red Squirrels are bold and are always the first to chow down. Do not keep them with slow feeding species.

As long as they have some caves to hide in, Red Squirrels will be active and out front and center most of the day.

Keep this fish in at least a 55-gallon aquarium (preferably a 125-gallon or more) in order to give them room to swim and school.

Red Squirrels are very hardy and seldom get ill. They do respond to copper, but freshwater dips are better. Keep them in a freshwater dip for about one minute or until the fish shows distress. Red Squirrels have not been spawned in the aquarium to my knowledge. Perhaps you'll be the first?

For color, movement and hardiness, Red Squirrels are hard to beat. Keep the nuts! Get some Red Squirrels. 

*Tony*



## SPECIES PROFILE

**Scientific Name:** *Holocentrus diadema*.

**Common Name:** Red Squirrelfish.

**Family:** *Holocentridae*.

**Origin:** Indo-Pacific.

**Distribution:** They are found in and among reefs.

**pH Range:** 8.1 - 8.4.

**Temperature Range:** 72° - 78°F.

**Hardness:** 8 -12 dKH.

**Specific Gravity:** 1.020 - 1.025.

**Size:** 8" inches.

**Diet:** Carnivores. Feeds on small fish and will eat invertebrates such as worms, crustaceans, and serpent stars, but will take pellets, flake and frozen foods in the aquarium.

**Sex:** Unknown.

**Temperament:** Very peaceful. Squirrelfishes ideally require a tank capacity of 55 to 75-gallons

so that the Squirrelfishes have enough free space to swim around. Place ample live rocks, caves, and overhangs in the aquarium, for the Squirrelfishes to hide. Keep the lighting dim.

**Breeding:** Not bred in the aquarium.

**Remarks:** A schooling species by nature and should be kept in a small group of at least 3-6. A 70-gallon or larger aquarium with large amounts of live rock, hiding places, and swimming room. It will do well with others of its own species as long as there are adequate hiding locations and adequate space. It is a nocturnal fish and often hides while the lights are on.

**Reference:**

- [www.liveaquaria.com](http://www.liveaquaria.com)
- [www.freshmarine.com](http://www.freshmarine.com)







**Jason Kim**

Jason is the founder of AquaC. Inc.

From his web site [www.proteinskimmer.com](http://www.proteinskimmer.com), Aquarticles

# Planktonic Substitutes in the Aquarium

**I would like to discuss the vital role that planktonic food plays in coral reef ecology. It might be interesting to note that before the popularity of wet/dry trickle filtration, high intensity fluorescent lighting, and protein skimming (among other developments in the reef hobby), aquarists placed more importance on their corals' need for live food. Unfortunately, many of these advanced hobbyists were ignorant to the fact that sunlight, the source of energy for photosynthesis, was just as vital a component in healthy reef ecosystems.**

A few weeks ago, I was doing some research at the Scripps Institute of Oceanography and happened to come across an aquarium "how to" book written during the late 1960s. In the short section dedicated to coral care, the author did hint at the importance of light.

He wrote, "your corals should be placed in a shallow dish once or twice a week and placed outside to be sunned."

I found this advice hilarious, given the fact that tanks illuminated by 400-watt metal halide lamps are hardly a rarity these days. But it really was an insightful bit of thinking back then. The author also stressed the need for live food, and recommended that corals be hand-fed, by pipette or turkey baster, live baby brine shrimp or mosquito larvae. I think that he hit the nail on the head. Even though plenty of aquarists might scoff at

this outdated book today, the author probably possessed more wisdom and insight than some of the most sophisticated "techies" today.

As I mentioned before, the importance of live food has always nagged at the back of my mind... but never really struck me until I watched, while diving, a wild pocillopora colony enthusiastically pull hundreds of organisms from the water like a vacuum cleaner.

## **Now we are posed with two questions:**

1. If we decide to feed our corals planktonic food on a regular basis in order to replicate the nutrient uptake levels they experience in the wild, won't we be adding excessive organics to the system and prompt an algae outbreak?
2. What in the world can we feed the corals anyway?



I certainly don't have access to live plankton! The answers to the two questions are remarkably simple. I stressed the need for a large, efficient protein skimmer in one of my past articles. As long as you have a skimmer that can pull waste and excess organics out of the water, you should be fine. Out-of-control algae growth, often of the "hairy" or "bubble" varieties, is truly the nemesis of the reef aquarist. Large protein skimmers can pull so much waste out of the water that the addition of food to the tank should have a negligible effect on water quality. In fact, adding this extra food to the tank might even benefit the overall health of the tank, especially the vitality of your soft corals. If you are running your tank skimmerless, or with one of the less efficient models available, I would recommend upgrading to a higher quality skimmer and bump up the feeding regime. If this is not an option, add food slowly and monitor your water quality carefully (you should be doing this, regardless) to see how far you can "push" your limits without getting extra algae growth. All tanks are different, regardless of their skimmer or filtration, and you should always be careful when changing your husbandry techniques.

The answer to the second question is simple, but might leave some of you unsatisfied. Since live food is so hard to come by, we must settle for whatever substitutes we can find.

Live baby brine shrimp (some people, usually those who just shelled out \$29.95 at Toy's 'R Us, call them "Sea Monkeys") can be purchased at your local tropical fish store and raised in a small bucket in the garage.


Some reef-oriented stores sell packages of live, frozen, or vacuum packed foods like lobster eggs, mysid shrimp, insect larvae, etc. These are all viable alternatives. I've fed my small polyped stony corals a special mash I make from store-bought seafood. Large polyped stony corals like *Catalaphyllia* (Elegance coral) and sea anemones can be fed small pieces of chopped raw squid, shrimp, clam, or fish. I feed mine once or twice a week. I don't feed them huge amounts of food since they are accustomed to catching small organisms in the wild on a constant basis. Remember, you should not stuff your corals as if they were at an all-you-can-eat buffet.

Jason's Special Reef Mash (a name I just thought of 10 seconds ago)

## Jason's Special Reef Mash

- 1/2 CUP RAW TIGER SHRIMP  
(SHELLS, GUTS, YOU NAME IT)
- 1/2 CUP RAW SQUID
- 1/2 CUP KRILL
- 1/2 CUP UNCOOKED SPINACH  
and here is the interesting part...
- 1 TBS. KALKWASSER
- 1 TBS. MARINE DELUXE\*

Chop up all the ingredients in a blender until you have a uniform slurry (not quite watery - you want little pieces the size of brine shrimp or larvae). I then strain out the watery leftovers and spread the mixture onto a flat sheet, which I then freeze. Every other night or so I break off a marble-size chunk of the special mash and place it in a cup of warm water to thaw. I then use a medical syringe to feed my small polyped stony corals individually, with the powerhead and return pumps off. After about ten minutes I turn the powerheads back on, but leave the main circulation pump off for another hour or so. This allows whatever is left of the mash to circulate through the tank completely, without being skimmed away. My hermits, echinoderms (brittle stars), and other detritivores (creatures that eat detritus, or organic waste) consume whatever remains in the tank.

\*The Marine Deluxe is a product you may or may not be familiar with, but it is essentially a mix of vitamins, essential elements, and some other stuff which the company refuses to divulge to the public. If you can't get your hands on this product, don't worry. I doubt it is anything special, regardless of what they would have you believe. I bet Combisan would work well, or any of those other full spectrum "trace element" solutions you can find. For those daring aquarists, it might be a worthy experiment to try dosing Iodine, Strontium, etc. via food. I have never personally tried this and cannot guarantee that there will be no harmful side effects. I do add the kalkwasser to try and simulate the calcareous nature of some plankton exoskeletons. Give it a try! 



# LESSER KNOWN LIVEBEARERS



## **The Knife Livebearer** ***Alfaro cutratus***

**This unusual livebearer hails from Costa Rica and Panama where it lives in clear deep streams. It grows to 2 1/2" to 3" inches in length.**

Knife livebearers have a quiet reserved beauty. The body is very elongated, the top golden honey in color fading to a white belly. The scales are overlaid in a metallic green/blue hue. It has black eyes surrounded by an iris of electric blue. The fins are colorless. Some specimens have tiny black spots on the scales.

This fish gets its name from a double row of fused scales from the belly to the caudal which

looks like a knife edge.

Knife livebearers are not common. I have only seen it in some of the best retail stores once or twice. It is usually available online and through livebearer specialty groups, but expect to look to find it. As such, expect to pay when you do find it. This fish, if available is never cheap!

Knife livebearers have special needs that must be met. They like space and current. I keep mine in a 55-gallon tank with a power filter and I only plant the back of the tank. Always keep their aquarium covered; they are excellent jumpers.

They like soft, acid water. I keep mine in soft water with a pH between 6.6 and 7.0, the temperature is kept between 75 and 80°F. It is





important to always maintain good water quality with this fish. It is very susceptible to bacterial diseases if the water quality is not top notch. In my experience, this fish is very sensitive to large volume water changes.

Mine seem to do best with frequent, small volume

community tank fish. I disagree. They are very skittish, in my experience, but I have never had any compatability problems with it. I have kept Blue eyes, *Priapella intermedia*, with Merry widows, *Phallichthys amates*, with no problems. The other fish seem to calm the knives down.



**Knife Livebearer**  
*Alfaro cutratus*




**Merry widows,**  
*Phallichthys amates*



**Blue eyes**  
*Priapella intermedia*

Knives breed in typical livebearer fashion: 10 to 30 fry are born about once a month at a temperature of 80°F. The fry are extremely sensitive to water quality and bacterial disease. Initially, I fed the fry live baby brine shrimp, then frozen brine shrimp nauplii and crushed flake food.

The parents will eat their own fry, so remove all the adults! In my experience, they are not a long lived fish.

Knife livebearers definitely require effort to aquire, keep and to breed. But I find them a challenging livebearer and to be well worth the effort... You may feel the same once you try keeping some. 

Until next time.

**Tony**

water changes. I change 10% every other day. Knife livebearers eat frozen, flake and live foods, be sure to vary their diet widely.

Some authorities say this fish is not a good





# 10

## Things That Changed the Aquarium Hobby Forever

**OVER THE LAST FEW DECADES, THE TROPICAL FISH KEEPING BUSINESS HAS MADE AMAZING ADVANCEMENTS WHICH HAVE BLAZED THE WAY FOR MORE HOBBYISTS TO ENTER THE HOBBY. AS A BOY GROWING UP IN THE 70'S, THE PICTURES OF THOSE AMAZING AQUARIUMS IN *TROPICAL FISH HOBBYIST MAGAZINE* SEEMED ALMOST UNOBTAINABLE FOR A KID. IF YOU COULD JUST KEEP YOUR GOLDFISH ALIVE IN THEIR LITTLE BOWL FOR MORE THAN A MONTH, YOU WERE AN ACCOMPLISHED AQUARIUM OWNER.**

**T**here was not a lot of how-to information available on the science of keeping these poor animals alive and some of the tools used back then seem almost barbaric when compared to today's technological breakthroughs. So how did we survive all the pitfalls and perils of this wonderful pastime over the years? The innovations and research over the years have provided vast insights and advancements in both equipment and the methods used for caring for our fine finned friends. In this article, I'd like to point out what I feel are ten of the largest contributions to the hobby.

Now by all means don't hold me to the order of importance assigned to these listed items. This is just listed based on this hobbyist's

observations over the past 30 or so years.

First on the count down list at **NUMBER 10** would be THE POWER FILTER. Many of us jumped into this hobby with nothing more than a tiny goldfish in a bowl (pre-betta era) and a handful of pebbles. Initially, the next step was a ten gallon tank with a box filter or under-gravel set up. Now this kept us going for quite a long time and even as of the printing of this article some diehard hobbyists still swear by these methods alone. While being very scientifically sound, they did not give much room for the new hobbyist to make mistakes or neglect a few water changes. They often ended up with cloudy tanks and dead fish after the first month. The advent of hang on the back filtration and improved circulation



## THE INNOVATIONS AND RESEARCH OVER THE YEARS HAVE PROVIDED VAST INSIGHTS AND ADVANCEMENTS IN BOTH EQUIPMENT AND THE METHODS USED FOR CARING FOR OUR FINE FINNED FRIENDS.

pushed fish keeping to the next level.

As this method of filtration became more and more popular, the era of powerheads jumped onto the scene as **NUMBER 9** on our list of breakthroughs. I remember the magazine photo of one man adding a powerhead to his undergravel filter. It was revolutionary. You now had that flowing plant effect and this gave real motion to the aquarium scenery and animals instead of a bowl of stagnant water. Wow! Those were the days.

Test kits come in as **NUMBER 8** on the list of innovations, becoming a life preserver for those that came home to that upside down fish in crystal clear water. Now that filtration and circulation were such large factors in aquarium husbandry, the advancements in water testing exploded on to the scene. Now we realize there is more to water chemistry than pH and ammonia. I remember the first visit I made to my local shop in Brooklyn, Al's Aquarium, and finding the first ever home saltwater aquarium which had one large group of rocks and a few Damsel fish. I thought this was revolutionary. Al took time to explain the amount of testing and care required. It was mind blowing at the time.

We now keep thousands of species in both saltwater and freshwater aquariums that would have never survived in 1978, thanks to our ability to test water parameters. Everything from phosphate levels to the levels of oxygen can be tested with a simple kit. This has definitely helped us keep fish alive longer.

Let there be light. Illumination comes in at **NUMBER 7**. Lighting comes in all shapes, sizes, wattages, colors and even intensity. Not only can you create a disco effect in your fish tank, but you can set your lights to mimic the Sunrise and Sunset schedule. I am personally astounded by the variety of light options we have at our fingertips,

seeing how I once used a clamp on utility light to illuminate my fine finned friends. This is where my reef hobbyists will jump in and say this is the biggest thing since sliced bread. Once you've burned your arm on a metal halide light fixture or received that \$300 electric bill, you start really appreciating lighting options. Thanks to many improvements, corals grow faster, fish look brighter and plants grow like they never grew before. We now understand things like spectrum and intensity. Oh heck, you haven't lived until you've turned on your aquarium lights from your cell phone. This would have been a big hit in the disco era :-). Now this also brings me to the next item, which is timer technology.

As **NUMBER 6** on the list, I can't mention lighting without bringing timers into the mix. I think we all got accustomed to turning on the tank lights when we got home and turning them off before bed time. Once you ran down to the hardware store and picked up that little Christmas tree timer, you were now running with the big boys. Set it and forget it became a part of almost every beginner starter kit. This creates a sense of consistency and stability in the aquarium. Many of us have even connected powerheads to these timers to create that wave effect which catches home visitors off guard. Lights and motion; now that's a party.

Many will feel this piece of equipment should have placed on the top of the pile, but adding it as **NUMBER 5** does not by any means make it any less important. Heating can be a nightmare in large tanks especially housing sensitive animals such as coral and delicate newborn fry. Anyone that has been keeping fish for 5 or more years has most likely found a broken glass heater or two. We either dropped them, hit them or just discovered a burnt up old heater in the bottom of the aquarium. The advancements





## THE REALITY IS THAT THE AVERAGE NEW HOBBYIST CAN GET AN ALL-IN-ONE-SYSTEM THAT IS WITHIN THEIR ABILITY TO MANAGE.

in heater design allow for much more forgiveness than in the old days. The titanium models are my personal favorite. The risk of getting electrocuted after dipping your hand into a tank housing a broken glass heater is not my idea of a fun day. The most popular have digital displays and auto shutoffs. I once lost a whole tank of guppies to an exploded glass heater. Poor fish!

Aquarium designs which are, of course, the heart of the hobby, is my **NUMBER 4**. We have probably all seen one of the reality aquariums shows like *Tanked* or *Fish Tank Kings* which feature the pros turning a used car or a bunk bed into a luxurious aquarium. The creativity with glass and acrylic has grown by leaps and bounds, allowing endless options regarding the size or placement of aquariums. Not only is shape no longer a limiting factor, but the all in one filtration also makes maintenance much easier than in years past.

All-In-One-Aquariums have burst onto the scene like no one could have imagined. That saltwater set up which once intimidated many of us has become much more obtainable. Like buying a pop up tent, you can buy an All-In-One system and be up and running in the blink of an eye. This is a topic that has created loads of controversy in the industry, especially from advocacy groups who have gone nuts after seeing some of these ice cream or cell phone shaped fish tanks; but the sky is the limit. The reality is that the average new hobbyist can get an All-In-One-System that is within their ability to manage. The easier the maintenance is, the more likely it will be done and the result is an attractive and successful system.

This brings us to the one thing that has definitely had a huge impact on the hobby. The Internet has been responsible for both success and the destruction of many aquariums, which makes it **NUMBER 3**. The Internet is one of the biggest and most widely used aquarium resource on the planet. The ability to share information


with anyone around the world has helped us grow this hobby by leaps and bounds. Exposure to everything from breeding practices in Singapore to coral farming techniques in Fiji has greatly increased our ability to keep animals alive and lessen the burden on the Earth's natural resources. While this is a very good thing, it also allows the sharing of inaccurate information. There is no way to verify whether information is supported by hard science other than researching the source. You should definitely investigate sources before taking blind knowledge to heart. I still feel there is no better resource than your local aquarium club or reputable magazines. While great magazines like *TFH* and others have been the foundation of the hobby, there are many resources around the world that are now translated and shared via the world wide web. We see this in the growing amounts of home breeders and plant cultivators sharing videos via the net. I personally enjoy the millions of YouTube characters that share experiences and techniques in brilliant color. Thanks to the growing popularity of smart phones, you can find hobbyists watching videos 24hrs a day all around the world. Now I know there are other crazy people like me staring at a fish tank at 1 in the morning. The ability to view presentations by great people in the hobby (some of whom may not be around any more) can take you away from the television for hours. Thank goodness for the smart phones and smart TV. I hope to see even more Internet sharing within the hobby in years to come.

**NUMBER 2** on the big list is one of my personal favorites, the aquarium controller. Never before have we had so much control and feedback on what is going on in our aquariums. Companies like **Neptune Apex** and **Reef Keeper** have revolutionized the industry by automating every aspect of aquarium husbandry. Features such as temperature setting, light timing and

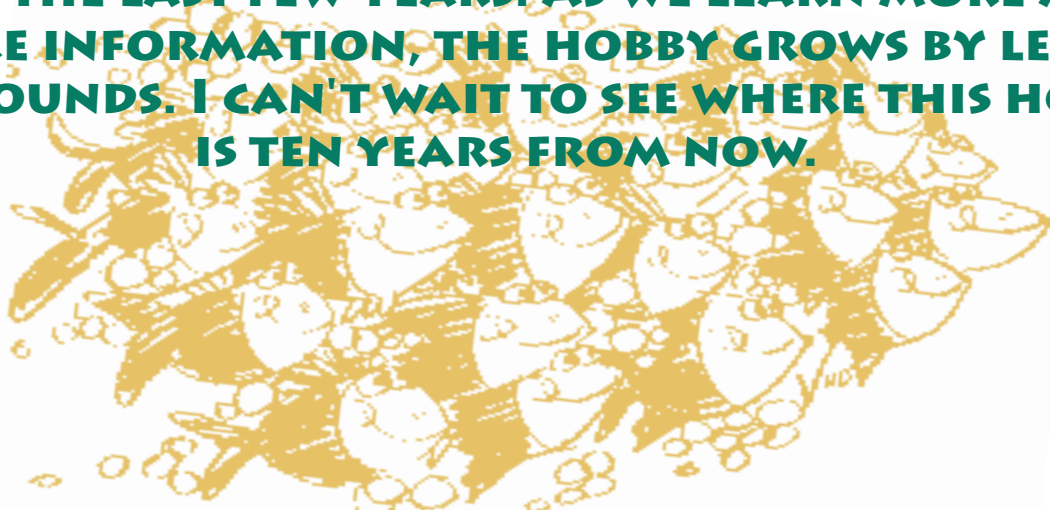


even water changes can be monitored or controlled from anywhere on Earth. Now you can have your aquarium send you an email if the temperature goes up too high in your reef tank, while also turning on a chiller. For the planted aquarium hobbyist, this may seem like overkill, but they save the day if you have had to tell a friend to come over and feed your fish while you're away at Disney World. Set the timer and your little fishy friends get three squares a day. Connecting a webcam even allows you to look in on them from time to time. This has taken quite a bit of the fear out of those wish to set up one of these stunning reefs we see in magazines. Controllers also allow you to email a friend or service company if something goes wrong so they can swoop in to the rescue or give you words of advice while also switching devices on or off from their cell phone or laptop. I have to say my butt has been saved by the email from the controller saying my temperature is 80 degrees. My controller quickly shut off the lights and switched on the fans while I watch from the comfort of my Florida hotel room. There are more and more controller manufacturers on the scene now and while not all of them are created equal, most of the aquarium hardware hitting the market now is geared toward controller compatibility or independent control. This is one investment that will pay for itself in time and has quickly become a must have for many reef keepers and high end aquarists.

Last but not least, there is the **NUMBER 1** giant improvement in the hobby. The Science of

Aquatics has to be number one greatest aspect of hobby improvement of them all. I'm not just talking about high tech gadgets and fancy hardware, but the growing understanding of how animals behave and react in our enclosed home environments. There are people around the world sharing data, techniques and practices which have made maintaining, once thought impossible to keep creatures alive in our home aquariums consistently. The impact of the wild caught species has been greatly reduced and many new varieties of fish have been tank raised and introduced to our local fish shops. The survival rate of these tank raised animals is much better than the wild caught variety which have to undergo days or weeks in transit and almost barbaric catching methods. The hobbyist often ends up with an extremely stressed out fish which doesn't survive long in the home aquarium. The advancement in the understanding of water chemistry, animal breeding and aquatic hardware has jumped by leaps and bounds. There is no better example than the keeping of Jellyfish. Once thought impossible to keep, these "Jellyquariums" have exploded on the scene. The hobbyist of today can go to their LFS and buy an all in one system that you plug in and wait to cycle. The act of choosing a light, filter and stand will take you all of 10 minutes now. I love it. Maybe I wouldn't have ended up with tons of old aquarium equipment in my basement. The growth of trade shows and Aquarium conventions is a testament to just how far the hobby has progressed. 

**IT IS AMAZING HOW FAR WE'VE COME IN KEEPING FISH OVER THE LAST FEW YEARS. AS WE LEARN MORE AND SHARE INFORMATION, THE HOBBY GROWS BY LEAPS AND BOUNDS. I CAN'T WAIT TO SEE WHERE THIS HOBBY IS TEN YEARS FROM NOW.**





# GOLDFISH

## Part 2 Housing & Maintenance



***This month, as promised, I will discuss goldfish housing and maintenance. Should I use a goldfish bowl, aquarium, or pond? What about other containers?***

Goldfish get to a very large adult size and need a lot of oxygen. It is recommended that as large a container as possible be used. It's true that a 10 1/2-gallon aquarium can house two to four small goldfish for a while, but they will not reach their full growth potential or be as healthy as they could be.

To properly house goldfish, they (all types) need 8 square feet of surface area for every inch

of goldfish. That means 31 to 52 gallons of water for every goldfish. Ponds make the perfect homes for goldfish. Remember fancy goldfish are slower moving than the single tail varieties and should not be housed together. These are also cold water fish, so they should not be housed with tropical fish.

I kept six beautiful bubble-eye goldfish in a 3 foot by 8 foot indoor pond. This pond was constructed out of wood (2x4s). The inside sides of the pond were lined with good one-sided plywood. The floor inside this frame was lined with Styrofoam. For draining this pond, a one inch deep well (about 6 inches wide) was left at one end. Then a pond liner was nailed to the top of the wooden frame. The outside and top of the frame was covered in wallboard to match the wall. This is an 211-gallon pond, which allowed just over 34-gallons of water for each bubble-eye goldfish





that I housed in there. A pond pump with a filter box was used. This pump had a bubble fountain attached to it to keep the surface water gently moving. One has to be careful with the fancier goldfish as they cannot take a strong water flow into the filter or any strong current caused by the filter.

I also used soft-sided kiddie pools to house some of my goldfish. These pools were larger than the homemade pond. I kept some ryukins, black moors, and orandas in them. On one of the kiddie pools, a large inside canister filter was used along with a large outside box filter. The other pools didn't have any filtration but had fewer fish, and were stocked with water lilies and other pond plants.

Water changes were done about once a month. Because goldfish are cold water fish, all we had to do was dump some water (outside) and refill with the hose from the outside tap. Of course, caution must be taken to ensure that the water being put into the pond is approximately the same temperature. With these conditions provided, my goldfish grew, matured, and spawned on a regular basis.

I have housed two orandas in a 72-gallon aquarium serviced by an outside canister filter with a sponge on the intake tube so that these clumsy fish didn't get pulled in. This was a bare aquarium, as goldfish have delicate fins and features that can be damaged by ornaments or plastic plants. Even if these items don't appear to have rough edges, they can still damage goldfish.

Other smaller containers can be used for quarantine and temporary housing. The idea here is to not leave them in too cramped quarters for too long a period. Remember that surface area is most important. So a low shallow container with a large surface area is much better than a goldfish bowl with a very small opening in the top. The tall skinny ornamental tanks are simply not suitable

for goldfish. Also remember that some of these fancy goldfish are best viewed from the top

Yes, I have actually used a cat litter pan to quarantine a bubble-eye goldfish for a short while. The litter pan met the requirements of having a large surface area for oxygen exchange, even though it was quite shallow.

I have heard all sorts of people say that they wouldn't keep goldfish because they are dirty fish. First of all, what does that mean? I take that to mean they put five fancy goldfish in a 10-gallon tank, over fed, didn't do any water changes, and ended up with a dirty tank. I would say that could make these fish dirty fish. In my experience, if the above mentioned is avoided there shouldn't be a problem. My pond, pools, aquaria, and substitute containers were always crystal clear.

Ideal water conditions for goldfish are a pH of 6.8 to 7.6. They can live with a pH as high as 8.0. They prefer moderately hard water but can live in very soft to very hard water. Ammonia poisoning is especially harmful to goldfish, the first signs being blood streaks in their fins. I kept my goldfish in a pH of 7.5 in soft water with no problems.

Goldfish will eat almost any kind of food being fed. If flakes are being fed, they should be soaked in water before feeding to the fish. Feeding dry flakes may cause swim bladder problems and fish swimming upside-down. Pellets are a very common diet for goldfish. Any commercial brand is fine. I fed a variety of small pellets including wheat germ pellets for goldfish. Again I did not feed the larger sizes of pellets as they can also cause swim bladder problems. My outdoor fish also got earthworms, assorted bugs, and mosquito larvae. On the very odd occasion they may even have gotten frozen bloodworms.

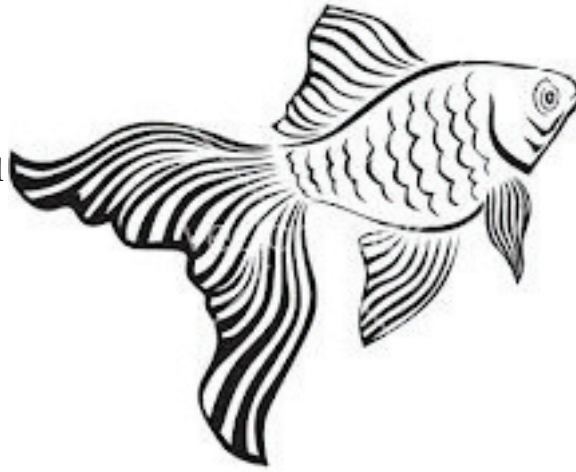
On one occasion (when I was running the fishroom of a pet store) I had a customer come in



and tell me she had a 5 1/2-gallon aquarium with four fancy goldfish in it. She found another one that she wanted that day. She asked for my opinion, of whether I thought she could fit another one into that tank. I thought that I had convinced her that her aquarium was already overcrowded when she left. A short while later she came back, figuring I wouldn't be still working in the fish room. So, since she had to deal with me anyway, she told me that she was sure there was enough room to fit just one more. So I bagged the fish she chose, and she went happily on her way. I wondered if that 5 1/2-gallon aquarium was the one I saw for sale three weeks later? I guess I'll never know.

On the other hand, when visiting a fellow hobbyist's house, I was oooing and ahing over her beautiful koi. Then a very nice red and white fish caught my eye. She began to laugh at me because the approximately 40-centimeter fish was a 10-cent feeder fish that she had bought to seed

her pond with. This was a very nice single-tailed goldfish that had brighter coloring than her koi.



Goldfish can be very beautiful if the proper conditions are provided. Lots of room, lots of water changes (especially if kept in smaller containers), cooler temperatures (no heater needed as long as temperatures don't drop below freezing), and lots of oxygen (air exchange). The hobbyist will find that goldfish are not any dirtier than any other fish. These fish

are just as challenging, if not more so, than tropical fish. One more thing I have to add here, goldfish are truly not a fish for children. I have been told many times in stores that they don't need to carry quality goldfish because they are meant for children to keep in goldfish bowls, and it just really didn't matter. It makes you wonder how one store that specialized in quality goldfish has survived for over 25 years just selling goldfish to the children. I wonder how many four-year-olds buy \$300 goldfish? 🐟





# The Practical Plant

## PROPAGATING *Tonina Sp. belem*

**T***onina belem* is a really pretty stem plant, not often seen for sale. It is a bright green and branches rather prolifically. This branching behavior, combined with proper pruning, results in a nice bushy appearance. The best description I think I can come up with is that it looks like a miniature pineapple top. This bushy appearance makes it a great choice for a mid-ground position.

This plant is very difficult to make happy. It seems to require a great deal of light, nutrients and carbon enrichment. The story begins with a specimen I purchased at a club auction. I cannot say what the parameters it




was grown under, I just know that they were not adequate. I say this because the specimen I obtained was barely recognizable as a *Tonina belem*. The fact is I was not sure it was the plant it was professed to be. The nodes were spread out about ½" apart. Normally these nodes are packed so closely together they seem to be touching. Really dense growth is the norm for this plant. To me this indicates inadequate lighting.

When I got it home I placed it into my African shrimp tank. This tank is a 20-gallon long with T-5 lighting. This amounts to 1.8 watts per gallon on a 12" deep tank. The substrate is Caribe Sea's Eco-Complete. Feeding regime

is Seachem's potassium and trace elements dosed three times a week as per manufacturer's directions. All the other nutrients are provided by the fish food added to the system. The system is CO<sub>2</sub> enriched. The pH is about 6.5; temperature is 77°F, and the GH is 5-6. In less than a week, it became obvious the plant was dying. I immediately moved it. In retrospect, I don't know what I was thinking putting it into this tank in the first place, considering my suspicions that it was light deprived to begin with.

The new home is a 15-gallon high. This tank has really intense lighting, a 96 watt compact fluorescent fixture which equals 6.4 watts/gallon on a tank 18"

tall. The substrate is Seachem's Flourite Red. All the other water parameters are the same except for the temperature which is 82°F to keep my Threadfin Rainbows happy. The plant responded immediately with dense explosive growth. It more than doubled in size within a week. Also it now looks like a *Tonina belem*. Once you have made this plant comfortable, it is easily propagated by cuttings. If you can provide this plant with the proper environment, you will be rewarded with a truly beautiful, and rare plant. That is if you can find it. 

Izzy





# THE HALO BARB

*Barbus holotaenia*

**THIS BEAUTIFUL AND SELDOM SEEN BARB IS NATIVE TO THE CONGO RIVER DRAINAGE AND GROWS TO ABOUT 3" INCHES.**

**H**alo barbs have reflective honey brown scales on the upper body, a snow white belly and a wide black horizontal band from the snout thru the eye to the tail, separating the two areas. The eye is black with a silver iris. A small black dot in the dorsal base and the black stripe thru the center of the tail are the only fin markings which are tinged purplish/red.

Under proper lighting the body glows purple/red iridescence. A large scale on the head reflects red hence the name "Halo." Halo barbs, although common and widespread in nature, are seldom seen due to instability in their collection areas. All specimens offered for sale are wild caught. Halo barbs are rarely seen in stores. You are more likely to find them sporadically from online specialty fish dealers. When available, this fish is well worth acquiring even if the price is a bit steep.

Halo barbs are a fairly hardy and relatively undemanding fish. A 55-gallon aquarium can easily house a school of 6 to 8. Always keep this fish in a school. It will not show its colors otherwise. Kept singly, Halo barbs are very jittery and nervous. They are excellent fish for the community tank.


Halo barbs are active fish. Leave room in the tank for them to swim. I plant the sides and back of the aquarium only. Be sure to cover their

tank; they are good jumpers. I use a power filter on their tank. Halo barbs love current and will play in or under a power filter canister return flow.

They are not too picky about water as long as it is clean and well oxygenated. They do not tolerate ammonia well and become very susceptible to bacterial diseases if exposed to it. They love frequent, small volume water changes. I change 15% of their tank water every other day.

They react very poorly to larger water changes and react by clamping their fins and losing all color. I keep mine in soft water, pH 6.6 to 7.2, at temperatures between 74 - 78°F.

The Halo barb is easy to feed and eats all items offered. They do need a varied diet, however. They seem to decline in vigor if fed only flake food. So I make sure to feed mine frozen bloodworms, brine shrimp and pellets. They do not eat plants, but seem to like to nibble on boiled zucchini slices.

Halo barbs make a saintly addition to any aquarium. If you are lucky enough to find them...buy them! 

Until next time.

*Tony*





## SPECIES PROFILE

**Scientific Name:** *Barbus holotaenia*.

**Common Name:** African Long-stripe Barb, Spotscale Barb.

**Family:** *Cyprinidae*.

**Origin:** Central West Africa.

**Distribution:** Lower and Central Congo River basin. It is also widespread throughout the Lower Guinea region.

**pH Range:** 6.0 - 6.5.

**Temperature Range:** 75° - 86°F.

**Hardness:** 36 - 143 ppm.

**Size:** 4 3/4 inches.

**Diet:** Live foods. Strictly insectivorous feeding in the wild, mainly on aquatic insects and terrestrial insects during the rainy season.

Frozen and/or live foods should compose the majority of the diet.

**Sex:** Males should be more intensely colored, slimmer and slightly smaller than females.

**Temperament:** Peaceful, quite shy, schooling fish. They remain timid even in large tanks.

**Breeding:** Breeds during the rainy season, with fecundity ranging between 5 and 18 eggs per gram of body weight. Unreported breeding in the hobby. If you are lucky enough to find it on sale in numbers, it would make an excellent project. Adopt a strategy as for other similarly-sized cyprinids, e.g., larger species of *Puntius* should be a good starting point.

**Remarks:** A schooling species by nature and should be kept in a group of at least 8-10 specimens. Like other African '*Barbus*,' this is a rare species in the hobby and unfortunately little information is available regarding its captive care.

**Reference:**

- [www.fishbase.org.summary.11365](http://www.fishbase.org.summary.11365)
- [www.seriouslyfish.com](http://www.seriouslyfish.com)
- *Baensch Aquarium Atlas* Vol. 1, Pg. 390. Mergus. 1987.





# FUN AND GAMES WITH THE FLIER CICHLID

During the early years of my fishkeeping experiences I was unaware that there was a family of fish referred to as cichlids, even though I had tanks with angels, discus, convicts and kribbs, all with the usual tank mates such as barbs, tetras, and various livebearers.

Then I was lucky enough to be introduced to a couple of cichlid fanatics who opened my eyes to the wider spectrum of the cichlid family.

One of these wonderful fish was the "Flier Cichlid." The common name of "Flier Cichlid" is widely known and used throughout the USA, however, in the UK and the rest of Europe, the fish is known simply by its species name "*Centrarchus*." In its native range of Nicaragua, it is referred to as "*mojarra rayada*." The natural range for *Archocentrus centrarchus* is throughout Nicaragua, especially the Lakes Nicaragua and Managua. It is also found







to the north of the capital city of Managua in the Lake Jiloa. In the south of the country, it is found in Lago Masaya, and along the length of Rio San Juan that flows down towards the border with Costa Rica.

Like other members of the genus *Archocentrus centrarchus* is omnivorous and occasionally hunts down smaller fish. Their diet includes insects, vegetation and detritus. The natural water conditions within their range is moderately hard and tends to alkaline on the pH scale. The preferred regions of the water bodies are the slower almost still areas with plenty of plant growth.

In their natural surroundings, it has been known for a full grown male to reach 10" inches, while the females at best reach 8" total length. However, within the hobby it is rare for a specimen to exceed 6" total length. The reasons for this difference are as yet unknown.

#### MAINTENANCE:

This is a comparatively peaceful unobtrusive species which should be a welcome addition to any community set up housing similarly sized fishes. The tank size should not be less than 36" long, and the longer the better. The water should closely mimic that of its natural environment and be moderately hard, slightly alkaline (pH 7.0 through 7.8), and have a temperature from 78°–82°F. Use of well-oxygenated water helps bring the fish to their best in both condition and color. They are capable of surviving in less than perfect water conditions. Nevertheless, optimum conditions should have minimal levels of metabolic wastes.

The species is by nature a cave-spawner, so it follows that the tank should be decorated with a range of rocky structures or suitably sized clay pots. They are not known to aggressively harm plants (which can sometimes be required as part of the breeding process).

#### FEEDING:

In the confines of the aquarium, this is an omnivorous species eagerly accepting live and frozen foods, as well as the many readily available commercially prepared dried foods. And, as with most fish, the more varied the diet the better the experience of keeping this fantastic fish.

#### COLOR:

There are 2 different known color forms of *Archocentrus centrarchus*. The first has a solid green extending from the dorsal fin through to the belly – the last band being on the caudal peduncle. Two distinctive black blotches are on the gill cover.

There are 4 dark bands running across the snout and forehead; the second of these runs through the golden eye, with the third immediately behind it. These two bars may merge between the eyes giving the appearance of a single band.

The second color form has the same markings as the first, but the background color varies from moss green and golden brown. However, with the inevitable interbreeding of the two forms within the hobby, it is only by comparing the wild forms that the differences

**In their natural surroundings it has been known for a full grown male to reach 10" inches, while the females at best reach 8" inches. However, within the hobby it is rare for a specimen to exceed 6" inches total length.**

can be observed.

The different publications available suggest that females are broader and stouter than the males; however, I have observed that both sexes can be either broad and stout, or slim and slender. Adult males do tend to have extensions to both the dorsal and anal fins, and a steeper head profile. Otherwise, the sexes have little visual difference.

#### BREEDING:


*Centrarchus* will spawn either in a single species tank, or within a busy suitable community setting. In order to encourage breeding, I raised the temperature up to 86°F. Reports of observations



of breeding in the wild state that the species prefers to spawn in caves, although I have often had them choosing to spawn on vertical slates, the internal filter, or the tank glass, even though multiple styles of caves have been available.

The female is the one to instigate the breeding ritual. It begins with her slowly adopting the breeding coloration changing from the normal green into a lilac-silver color. The vertical bars tend to look a rich royal blue rather than their standard black. They gradually merge with the background of the ventral part of the body. The adoption of this color pattern is soon followed by the appearance of the breeding tube. I noticed that after 3 days or so the male starts to go through a similar color change.

The females show off and display to their males until they are interested. The female decides what surface is to be used as the spawning site. This is fervently cleaned mostly by the female but

the male also takes the occasional turn to clean. After a few more bouts of dancing and displays, the female begins laying down a plaque of eggs – often in batches of 10 - 20 – and the male runs over them releasing his milt to fertilise them. Up to 350 eggs can be in the final size of the plaque. The eggs are small and golden colored. After approximately 4 days, the eggs begin to hatch. During the 4 days, each parent takes turns in fanning the eggs and keeping the general area clean. Once all the eggs have hatched, the parents gently move the wrigglers and place them on the underside of the plants' leaves or bog wood – like laundry on a line. Whenever plants were not available, the parents would place the wrigglers into pre-dug pits or hidden away in one of the caves. 

### *Archocentrarchus centrarchus*





# **DISASTER IN YOUR REEF AQUARIUM!**

## **Coral Diseases** **An Identification Guide**

All living plants and animals are susceptible to diseases of one sort or another. It is nature's way of maintaining balance. Corals, being living animals, are no exception to this law of nature.

As a marine life importer/wholesaler, coral disease exposure is a fact of life. An ill or dying specimen can turn up in any shipment at any time, thus triggering intensive isolation and quarantine protocols. A sick specimen can easily wipe out an entire shipment or conversely your entire reef tank! Thus any sign of any coral disease must be watched for very closely at all times.

But what do we really know about coral diseases and their treatment? How do we identify the various coral diseases? The information to answer these questions is sparse and scattered at best.

My goal in this series of articles is to give you, the home reef keeper, a sort of primer or guide if you will, that will help you identify the various diseases of corals. Later in this series, we will explore "potential" treatments. Treatments of coral diseases are in their "infancy" and mainly experimental. Hobbyist input and observations are vital to building successful treatments. I encourage all reef keepers to document their observations and experiences.

This primer is not an exhaustive coral disease guide. New coral diseases are still being discovered. Rather, it is a guide of the most common coral diseases you are likely to run into based upon my experiences as an importer.

Likewise, all treatments suggested are "experimental," again based upon treatments I have tried. Some of which were successful; some of which were inconsistently successful, and some of which were utter failures.

Before we get to identifying diseases, I must stress one thing first –





# ALWAYS QUARANTINE ALL CORALS FOR 15 TO 30 DAYS!

“AN OUNCE OF PREVENTION  
IS WORTH A POUND OF CURE.”

## NOW ONTO THE DISEASES

**#1. WHITE PLAGUE DISEASE** - This is a virulent and fast moving disease. Infections result in massive very fast tissue loss on the affected corals. Board swaths are rapidly denuded of tissue down to the white skeleton. Areas affected are usually irregularly shaped. Star corals, *Dichocoenia* & *Montastraea* species, are the most commonly infected species. It may be contagious. There appeared to be two variations on this disease.

The first expands its coverage by about 1/4" inch per day in all directions.

The second is much more rapid and can expand up to 3/4" of an inch in all directions per day. There is an area of demarcation between healthy and dead corals, no half dead polyps in between.

I've seen other coral species occasionally with the disease, but usually it's a Star coral disease.

**#2. RED BAND DISEASE** - I've seen this disease in *Gorgonians*, although I am told it can affect stony corals, but I have never seen it in them. It definitely seems to be contagious in *Gorgonians*.

This disease usually seems to start in a damaged area and spreads from there. A narrow encircling red band of *Cyanobacteria* destroys the living tissue.

This is a fairly slow moving disease which seems to spread in relation to the amount of light it gets. It spreads only during the day and seems to spread faster in higher light. There may be a photosynthesis quotient to this disease. I will explain my experimentation with such in the treatment section in the next issue. Although this disease shows up only once in a while, it seems

to be more common in the summer when water temperatures are warmer.

**#3. BLACK BAND DISEASE** - This is not a common disease, but it's very destructive when it occurs. A slow moving deadly dark band of cyanobacteria and other bacteria literally feast on live coral tissue leaving a bleached white skeleton behind as it moves and opportunistic algae quickly colonizes the bare skeleton behind the bacteria, making matters worse. Warm water temperatures and high nutrient loads definitely accelerate the progression of this disease.

This disease is highly contagious. Any coral touched by black band disease will be infected. There also is definitely a water transfer component to this disease, but other than random current dispersion, I'm unfamiliar with the exact method of transmission. In a tank with a coral that has black band disease, it can suddenly show up in a different species of coral elsewhere in the tank skipping multiple corals in between.

Plate/disk corals (*fungia* species) seem to be very resistant or completely immune to this disease. Even if they are infected (which is rare), they seem to recover on their own. Any species of coral which produces extensive or heavy mucus coatings seems to be very resistant or immune to black band disease.

**#4. WHITE BAND DISEASE** - This disease is a real mystery. It is usually seen in various *Acropora* species. It usually starts at the base of a coral or a dark overhang and works its way up. To my knowledge no organism has yet been determined to cause this disease.

Again, as in white plague disease, there



seems to be a fast and a slow moving variety.

Living tissue literally falls off the skeleton in little balls, in corals affected with this disease.

In the slower moving variety, a very distinct white line separates living tissue from the dead white skeleton.

The faster moving form seems to leap forward over itself and irregular shaped spots of living tissue will discolor and bleach ahead of completely dead areas. There also is not a distinct white line with the faster moving variety, rather it is a general lightening of the tissue color over a broad area, again followed by separation of little balls of live, or formerly live tissue.

The disease seems to be minimally contagious outside of *Acropora* species in my experience.

**#5 BROWN JELLY DISEASE** - This disease is commonly seen especially in large polyp corals like *Xenia*, *Galaxea* and *Euphyllia* species.

Opportunistic organisms feeding on damaged tissue cause this disease, the result of which looks like a brown goo or jelly enveloping the coral. Brown jelly infections can and do spread very rapidly and often kill entire colonies. All the nearby corals are in danger with this highly contagious and rapidly progressing disease. It can easily spread from colony to colony and rapidly destroy an entire reef tank.

High temperatures and a heavy nutrient load in the aquarium facilitate not only the occurrence of this disease but its rapid spread.

Be especially watchful for brown jelly disease, if you have a power outage for any length of time in the summer.

I believe the causative organisms are naturally present in your aquarium water and need only an injured or otherwise stressed (environmentally induced) coral to take advantage of.

A power outage in warm weather simultaneously raises the temperature, lowers the oxygen content and increases nutrient loads which offers just the right opportunity brown jelly disease needs to feed on stressed corals.

**#6 WHITE POX** - This is the last disease I want to discuss. *Acropora* commonly gets it. This disease looks like a white peeling rash. Tissue is lost, exposing the white skeleton in irregular patches. It appears as though the living tissue has been burned or torn clean off of the skeleton.

Elkhorn coral seems especially susceptible to this disease. It does seem to be contagious to all *Acropora* species. I have not seen it on other types of coral, however, that is not to say it could not infect other species.

As I stated previously, there are other coral diseases, but I feel, based on my importing experiences, these six are the most likely ones that a reef aquarist will unfortunately encounter sooner or later.

I have not discussed coral events such as "bleaching," "shut down," and "rapid tissue necrosis," (sloughing) in this article. They will be visited in a future article.

The second part of this series will deal with my "experimental" treatments, both successful and not, of these diseases.

**For now, remember always quarantine!** 





Lyle Marshall,  
SouthWestern Michigan Aquarium Society. From SWAM, May/June 1984 Issue  
Aquarticles

# Landscaping and Gardening in the Wet

**Humanity's use of ponds and pools for beauty and utility can be traced back as far as ancient Egypt and China. Apparently, as soon as mankind developed enough civilization to produce individuals with leisure time, they began to appreciate the esthetic and emotional benefits of water gardens.**

**T**he history of pisciculture probably went hand-in-hand with the history of garden pools in general, but it can be traced with certainty only in China and the monastic gardens of Europe and the Middle East. The appeal of water gardens seems to be universal, and the notion to include fish for practical purposes such as mosquito control and a convenient food supply is only common sense. However, only in the Orient did the idea of ornamental fishes develop to any extent. In Europe, even after the carp in various garden pools had ceased to be regarded as an adjunct to the kitchen, they were kept as a matter of habit and tradition rather than ornaments. It was not until after a rather extensive system of trade with the Far East had been developed that the idea of raising fish for strictly decorative purposes occurred to Europeans. To this day, the really

advanced and extensive development of ornamental fishes for outdoor ponds is an oriental forte.

One of the best reasons for putting in a pond is often overlooked by people who are not into fish. If you wish to landscape your property to increase the beauty of your surroundings, to impress the neighbors, or for whatever reason, there comes the problem of growing grass, shrubs, trees, or flowers. Now, in many places, our yards simply are not suitable. There may be too much direct sun, or maybe the soil is all hard clay or nothing but fill sand thrown in by the contractor who built the place. In many places one can't even grow grass without shipping in yard after yard of expensive topsoil. Then, when you've spent a bundle getting the lawn in, you get to spend the rest of your life mowing, fertilizing, trimming, and general maintenance.





Now, if you have some nasty sun-baked area where grass would hardly make it, you've got the perfect area for a pool. You make a decision as to how elaborate you want to get and how much you want to put into the original installation, do it, perform a little maintenance in Spring and Fall, and enjoy. By the way, for a pool 18 to 24 inches at maximum depth, you'll use less water to fill it than you would normally use to water a similar area of good grass in a summer's time.

There are so many advantages to putting in a pool, whether or not one is really concerned about fish, that there seems to be no good reason why we don't see more garden pools. There are two that I can think of. One is that until recent years, it was quite difficult and expensive to put in any sort of pool. About the only choice one had for any kind of worthwhile installation was to put in concrete, which is expensive and requires considerable skill and a constant danger of frost ruining the whole thing. Another problem is that any small body of water is almost irresistible to small children. They head for it like iron filings to a magnet. This attraction is not too serious for school-age kids, but for toddlers the pool, even a very shallow one, is an active danger. You must provide the same sort of protection for a pool of any size that you provide for a ground level swimming pool.

There are many, many ways to put in a pool these days. Garden pools can range anywhere from Sutter's monster (beats mowing that 1/4 acre) to a tub sunk in the ground with a miniature water lily. They can be constructed from anything from concrete, to various kinds of plastic and fiber glass. It all depends on your imagination and resources. My own preference is for black builders' polyethylene film because of cost, simplicity, and versatility.

When you decide to put in a pool, the first

step is, of course, to look over your property, and decide where it should be put and what shape.

**There are so many advantages to putting in a pool, whether or not one is really concerned about fish, that there seems to be no good reason why we don't see more garden pools.**

You want an area that provides the maximum of full sun for as much of the day as possible. Ornamental plants such as water lilies like all the sun they can get. Trees should also be avoided when possible, because it can get to be a real pain digging through tough roots, and too many leaves in the water can cause unnecessary problems.

Don't forget to allow enough room on all sides for some sort of edging and space enough that you can work from any point around the circumference. If you plant something with thorns right up against any point, that's right where you'll have to get to for some sort of necessary maintenance.

The tools needed are simple enough. A shovel, or as many shovels as you can draft hands for, a good level, and a board or 2x4 long enough to span the longest dimension of your pool. Start by laying out the outline of the pool with a garden hose, chalk, or whatever you choose, and cut out the sod within the outline. Dispose of the sod and start digging. If your soil is firm enough to hold its shape, it's a good idea to leave a ledge about eight to ten inches under the water line and ten to twelve inches wide. This is to hold potted plants such as marsh marigold and papyrus etc. The depth of the pool should be at least 18 inches to provide thermal stability. Neither plants nor fish appreciate temperatures that change too fast, and for some reason, shallow water seems to encourage some fish to jump out. There is no real need to go much deeper than this, unless you are planning to leave your fish out during the winter. If you are, it may be necessary to go as deep as four feet to leave the fish enough room to live below the ice. Michigan is not known for its mild winters.

One reason for not going too deep is that it



takes a lot of water. Remember, sooner or later, you are going to want to drain the pool for any of a number of reasons. If you don't have a ditch or sewer close at hand, and you have more water than you can spread out across the lawn, it can get to be a problem.

When you reach the depth you have chosen, make sure that the earth is clear of all stones, roots, tools, and what have you. If the soil condition is such that you can't be sure there's nothing there that could punch through the plastic film, you can get a little insurance by lining the hole with a few layers of newspaper. The thing to remember at this point is that if it is possible for the plastic to get punctured, it will. You will be walking on it, and water is heavy stuff. You must be very sure there are no sharp points anyplace.

The next step is to prepare the outside rim of the pool. It is a good idea to construct a small rim of earth around the pool-about two-inches higher than the surrounding lawn. This is to prevent ground water from running into the pool, carrying with it any fertilizer, insecticides, and all such good stuff that you and the neighbors have been using in order to grow a crop of grass.

Next, take the long board and the level, and make sure that the rim of the pool is reasonably level all around the circumference. It is amazing how many humps and hollows there actually are in an apparently level stretch of ground, and every one will show up very clearly as soon as there is water in the pool.

The next step is to install the liner. Spread the plastic film across the hole, smoothing it across the bottom and shaping it to the sides

rather loosely, with a generous overlap around the upper rim. As the pool is filling, smooth out such wrinkles and creases as may be possible

without tearing the film. It will not be possible to eliminate them all, but they won't show much, so don't get too concerned at this point. As the water level reaches the top, you will probably spot some spots that are not properly leveled. Simply raise the flap of plastic film and add or remove enough earth to smooth it out. At this point, stop to consider the fact that it is going to rain, and there will be times when the pool will overflow. Bog gardens can be nice, but not in the middle of the lawn. Simply decide where you want excess water to go, and make a low

spot in the rim, and some sort of channel to lead the water away.

To finish off the edge of the pool, you can use patio tiles, flagstones, or whatever appeals to you. Just place the edging, and tuck any protruding plastic out of sight. Let it set for a couple of days so the temperature stabilizes, and you are ready to start adding plants and fish.

Goldfish and Koi are the obvious choices, and certainly the most ornamental, but there are some other possibilities. Silver and Golden Orfe are often used in Europe, but they are not usually available here. You might consider such things as Paradise Fish, Blue Gouramis, and White Clouds, among others. Many of our aquarium specimens enjoy a summer out, and what pool life does for their color is an astonishing thing. You'll find that almost anything you put in the pool will breed,

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and a well planted pool will provide enough protection, so that some of the fry will survive.

Plants in the pool are not just for the looks. You will find that the ornamental plants also serve to prevent the pond from becoming a mess of green soup, provide security for eggs and fry, and protection from predators. A visit from a coon or a heron can be a real disaster!

The hardy water lilies are usually the first choice. Most of the available varieties are large, fast growing plants that provide magnificent blooms in a number of colors and shades. Their large, flat leaves cover a great area of the water, providing shade and cover for the fish. In my experience, the only maintenance they require is to be split up, fertilized, and repotted in the Spring. I plant them in tubs with the top of the tub two or three inches under the surface. I would let them stay there throughout the winter, and by Spring the tub would be completely clogged with roots. I would use a machete or hatchet to chop the clump in half, replant the best half, and that was that for the rest of the year. Some authorities recommend stuffing a bag of dehydrated manure down in the tub the last of July or so to encourage more blossoming, but I never found it necessary.

Tropical water lilies provide a greater range of colors and interesting habits, such as night blooming and viviparous leaves, but they take a little more care and are not, of course, winter hardy. Most varieties are quite difficult to keep alive over the winter, and it's usually considered wisest to just restock each Spring.

There are a number of other plants that add to the interest and attraction of your pool. There are a number of Arrowheads, Cardinal Flower, Calamas, Taro, Papyrus, Water Lettuce, and many more. Water Lettuce and Water Hyacinth are floating plants that provide huge masses of hanging roots to protect small fishes and fry. Most of the rest are plants that should be potted at one depth or another, and you are limited only by what you want to put into the project. About the only pest you are likely to have trouble with is


black aphids on the water lily leaves. They don't seem to do much harm, but if they bother you, you can easily weight down the infested leaves for a day or two and simply drown them off.

It is not usually a good idea to stock your pool with plants, snails, or other critters from the local waters. You can be almost certain that you will also introduce a number of pests and parasites. Stock acquired from a reputable nursery may not seem as adventurous, but it will be clean and save a lot of trouble. Ask **Bob Sutter** how much fun he's had with fish louse and anchor worms. Remember, the smaller the pool, the more intense the infestation is likely to be.

If you want a fountain or waterfall, they are easy to accomplish with a small pump, a length of tubing, and a little imagination. A fountain using fresh water is not a good idea for several reasons, among them being the fact that such an arrangement keeps the water too cool for the lilies. One other thing to remember is to place the pump off the bottom of the pool. If the pump sits flat on the bottom it will clog up with every bit of leaf and sediment that manages to find its way into the pool.

Black is the color to use for your liner for several reasons. For one thing, black lasts much longer in either polyethylene or PVC. For another, most colors really don't look good when the pool is set up. Believe it or not, the wimpy blue that most fiber glass shells come in really looks nasty.

During the first couple of weeks the pool is set up, the water will probably turn green and will not be too attractive. As the water ages and the plants take hold, the water should start to look "black" and transparent, which works very well to show off goldfish, koi, and plants. If possible, avoid using any medications or algacide, as they will not be all that effective, and will inhibit the development of the desirable plants to some extent.

Usually, the best tactic is to develop patience and practice a policy of benign neglect. This is a low to no maintenance project. In almost every case, nature will do the job for you if you give her a chance. 





**PART TWO****TERRIFIC  
TETRAS**

**Neon Tetra**  
*Paracheirodon Innesi*

**WOW!**

That's what every aquarist thinks the first time they see a school of neons! I think this fish has convinced more people than any other to keep an aquarium. I cannot think of any aquarist who has never kept neons.

Stunning! Best describes its colors. A chocolate brown nape, neon blue stripe from nose to just before the adipose fin, fire engine red lower body one half the length of the fish, a glowing white belly and black rayed fins. What more do you want!

Originally this fish was imported from Peru and was very expensive! Now it's mainly bred in Hong Kong and Singapore. Prices are always cheap. Neons have to be in the top five of the most popular aquarium fish. Every pet store has them.

This gorgeous, peaceful tetra gets to about 1 1/2" inches. Neons are recommended for every community tank where its neighbors will not make snacks of them!

Speaking of snacks, neons are very easy to feed. They eat all suitable sized foods offered. Remember this is a small fish so it has a small stomach, but brine shrimp, freeze dried tubifex



are all greedily accepted. It's amazing watching tiny neons tear chunks of frozen tubifex out of a cube stuck to the glass in their aquarium. They maul the cube and will stuff themselves until they look like they will burst.

A 10-gallon aquarium with a cover (neons will and can jump) will easily accommodate a school of six. But with neons more is always better. The bigger the tank, the bigger your school can be. I once put 500 neons in a 220-gallon aquarium. OMG! Incredible as they swam among the Amazon sword plants!

Always keep neons in a school of no less than six. They're so cheap buy as many as you have the room for. You'll never be disappointed!

Originally neons were finicky about their water. But having been aquarium bred for many years, they adapt to most water - given the time to do so! Never change neons water quality quickly. Such changes can kill them I change 20% of their water twice a week. In my experience, neons do not like any larger volume water changes at a single time. Always give your neons time to acclimate to any new water or new / changed aquarium. Keep all the lights off when acclimating neons.

Neons can be light sensitive, especially young neons. In nature, neons are a deep forest, blackwater fish, where the light is low. Too bright of a light without them acuminating to it can lead to shock - a condition where they just seem to thrash around randomly, "lockup" and sink to

the bottom. If this happens, kill all the lights immediately and cover the aquarium with a blanket. You'll have a 50/50 chance of your neons recovering. Never float a bag of neons under a bright light while acclimating them for temperature. You're just asking for trouble!

The use of peat moss or dried Oak leaves in their filter will leach tannins into their water making it look like tea. Neons love this and glow brightly in it, but be sure not to add too much and crash your pH. I use just a bit in a small box filter so if there is a problem I can easily remove it if need be.

Neons need plants to feel secure. The more plants the better. Floating ones too! Live or artificial is fine. Use a black substrate and a black background to show them off at their absolute best.

A power filter sized for their tank works just fine. Neons are usually very hardy and long lived (5 to 10 years) if well cared for. Ich is the most common disease in neons.

Neons are sensitive to all dye medications. Use only one half of the manufacturer's suggested dosage when treating neons for any illness.

Neons are not easy to breed. Water conditions, light conditioning are all very particular. It can be done, but takes work. Unless you want BAP points it's easier just to buy your neons. Without a doubt, neons made this hobby. Get a school today. 🐟

TONY





Ed Young

National Geographic – Not exactly Rocket Science

<http://phenomena.nationalgeographic.com>

This article is a follow up on about the research being done by  
**Todd LaJeunesse**, our guest speaker back in April 2015.

# THE MICROBE THAT INVADDED CARIBBEAN CORAL REEFS

Think of giant pythons from southeast Asia, ending up in the Florida everglades and suffocating any small mammal they could find. Think of cane toads from South America, relentlessly marching over Australia, swallowing bird eggs and native frogs.

Think of rats from pretty much any mainland country, stowing away onto pristine islands and eating their way through the helpless local birds. These are all classic examples of invasive species.

**H**ere is another, and it's very different. It's a microscopic algae called *Symbiodinium trenchii*. Unlike the python or the cane toad or the rat, this tiny brown bauble seems fairly benign—even beneficial. It lives in the cells of corals and provides them with food, by harnessing the sun's energy to make sugars. It typically does this in its native waters in the Indo-Pacific Ocean. But somehow, it recently found its way to the Caribbean, on the other side of the world. And there, it displays all the characteristics of an invasive species.

**Tye Pettay** from Pennsylvania State University has shown that *S. trenchii* has spread through a large number of Caribbean corals. It provides its hosts with nutrients but is less generous than the

native coral-associated algae that it has displaced. It is especially common in populations that have been ravaged by heat or pollution or disease. It looks for all the world like an opportunistic infection, of the kind that takes hold in people whose immune systems have been weakened. "It's all over the Caribbean and it's not going away," says **Todd LaJeunesse**, who led the study.

Brain coral, *Pseudodiploria strigosa* with *Symbiodinium* algae, partnerships with many species of *Symbiodinium* algae. These allies—these symbionts—provide them with the energy they need to construct their impressive reefs. But if oceans get too hot, the corals evict their symbionts, losing a source of both energy and colour. That's why they are said to be "bleached." If they stay





too long in this condition, they die. Solitude is no life for a coral.

But there's a way out. Some *Symbiodinium* species make their coral hosts more tolerant to heat and other stressful conditions. If a coral can swap its algal partner for a hardier one, it could survive.

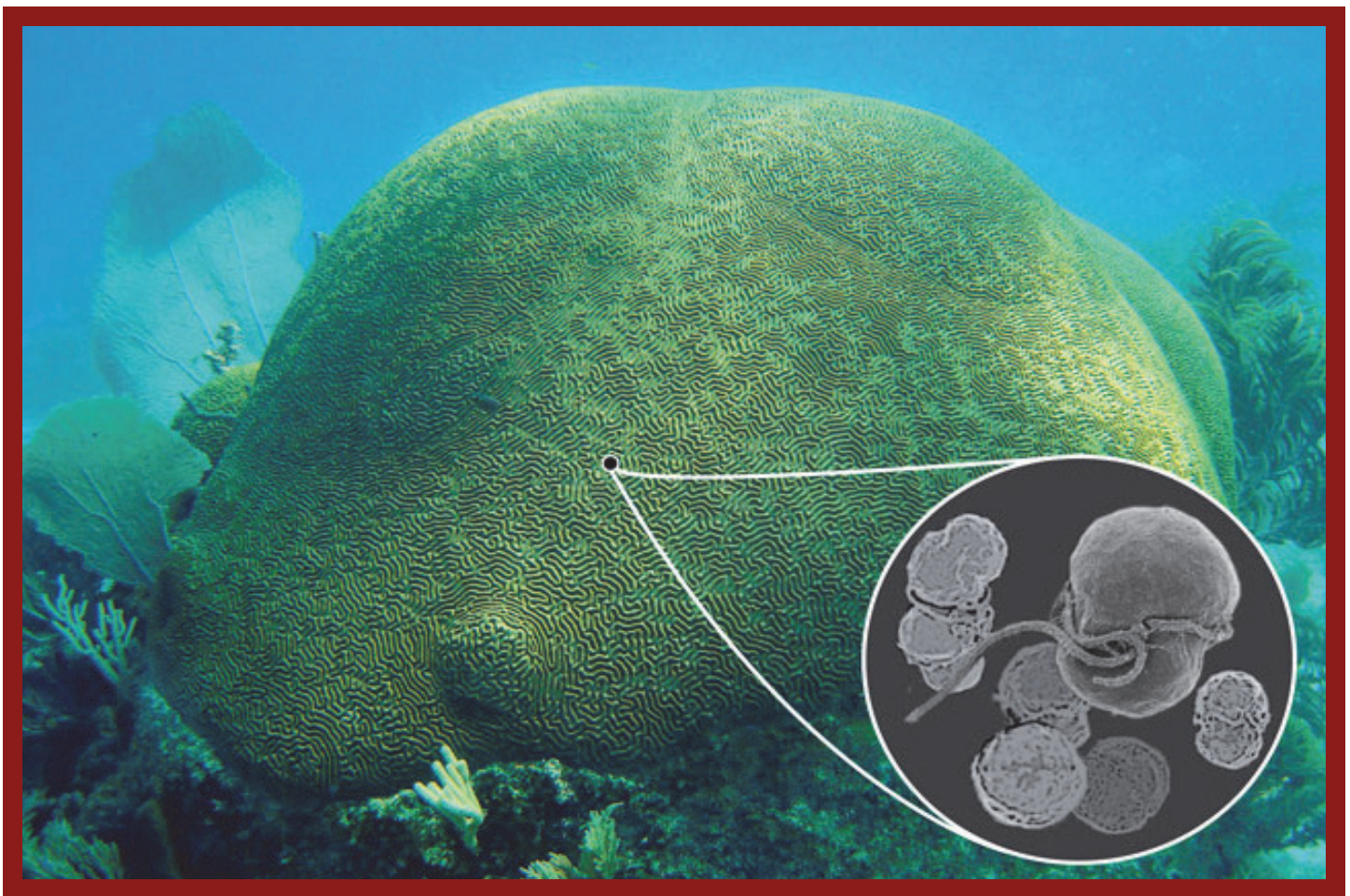
This is what happened in 2005. That year, the Caribbean experienced exceptionally high temperatures; as a result, more than 80 percent of its corals bleached. It was a catastrophe, but for *S.trenchii*, it was an opportunity. In the months before the bleaching event, LaJeunesse found this species in less than 1 percent of the corals. During the event, he saw it in 20 percent of them. "We found it in the most severely stressed animals," he says. "We have never seen it behave like this elsewhere."

Through almost a decade of work, LaJeunesse's

team has confirmed that *S.trenchii* does indeed behave very differently in separate parts of the world. In the Indo-Pacific, it exists as a genetically diverse population, which has probably been around hundreds of thousands of years—if not millions. It is not alone, either. *S.trenchii* is part of a lineage of *Symbiodinium* called "Clade D," which arose in the Indo-Pacific Ocean and diversified into many species, each of which associates with certain types of coral.

In the Caribbean, things are very different. *S.trenchii* is the only member of Clade D around, and it lives inside a wide variety of coral hosts. This population has absurdly little genetic diversity. Even across hundreds of kilometres of oceans, individual cells of *S.trenchii* are almost identical. It's like looking at a sea of clones.

*S.trenchii* must have hitched a ride to the Caribbean on some kind of ship, perhaps as



Brain coral, *Pseudodiploria strigosa* (Credit: Robin T. Smith, Science Under Sail) with *Symbiodinium* algae (inset; credit: Sung Yeon Lee and Hae Jin Jeong, Seoul National University).




recently as a few decades ago. It then spread across the entire region, perhaps taking advantage of the rough times that the local corals were experiencing. "The poor Caribbean has been trashed with sea surface temperature anomalies and pollution and a huge human population," says LaJeunesse. "It's severely degraded. If it were pristine, if we went back 100 years, I'm not sure *S.trenchii* would be so successful."

But we can't go back, and it is successful. "It is what it is," says LaJeunesse. "There's nothing we can do about it." And indeed, we might not want to do anything about it. There's a tendency to view all invasive species as villains, but they're not all like cane toads or Burmese pythons. There's some evidence that these invaders can have positive effects on their new homes. Take *S.trenchii*. You could argue that its invasion benefited the corals, by allowing them to weather the warm spell of 2005.

This silver lining comes with a cloud. Pettay's experiments showed that *S.trenchii* is a more selfish partner than the native algae of the Caribbean. It produces just as much sugar as its peers, but it hands over much less to its coral partners. As a result, the corals can only build their rocky reefs at half their usual rate. It might be better for them to have a stingier partner than no partner at all, but in the long-term, incompatibilities with *S.trenchii* might ultimately harm them and the reefs that they build. For now, no one knows where the balance of benefits and risks lies.

LaJeunesse wants to find out. He wants to know how *S.trenchii* affects the growth rates of its coral hosts. Also, what makes it such a good invader? And why is it hardier than other related species? "It's the only member of Clade D whose genome has been duplicated," he says. "It's speculative, but maybe that's something to do with it."

He also wants other coral biologists to pay more attention to the microbial side of the coral-algal symbiosis. Many of them talk about corals "choosing" or "shuffling" their symbionts, as if the symbionts were passive halves of their own partnership. "It drives me crazy," he says LaJeunesse. "I think people work on corals because they like corals, so they take the host's point of view."

But the symbionts are incredibly complex, too. They aren't just bacteria; they are very complex organisms. They have as much DNA in their cells as you do in yours, and even more genes. Humans and corals have just over 20,000 genes in their genome; *Symbiodinium* has between 40,000 and 50,000, and we have no idea what around half of those do. "Who is the master of this house?" asks LaJeunesse. 

#### Reference:

Pettay, Wham, Smith, Iglesias-Prieto & LaJeunesse. 2015. Microbial invasion of the Caribbean by an Indo-Pacific coral "*zooxanthella*." PNAS





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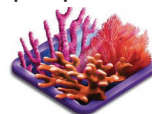
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Meetings are held at the NY Aquarium Education Hall on the 2nd Friday of the month at 7:30pm. Knowledgeable speakers on fish care and culture, door prizes, raffles, and fish auctions. All meetings are free to members. Visit us on line: [WWW.BROOKLYNAQUARIUMSOCIETY.ORG](http://WWW.BROOKLYNAQUARIUMSOCIETY.ORG)

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TYPE & LENGTH of MEMBERSHIP: (CHECK ONE)

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FAMILY

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\$36

3yr.  
\$51

4yr.  
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1yr.  
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(UNDER 18 YEARS)

\*If family membership, please list all family members. Only first two listed will have voting rights.

1 \_\_\_\_\_ 2 \_\_\_\_\_ 3 \_\_\_\_\_

4 \_\_\_\_\_ 5 \_\_\_\_\_ 6 \_\_\_\_\_

Number of tanks [ ] marine [ ] freshwater [ ] Do you breed fish?  
 [yes] [no]

If yes, what types do you breed: \_\_\_\_\_

Special interest (if any) \_\_\_\_\_

How did you hear about BAS [friend] [dealer] [flyer] [Aquatica] [mag ad] [online]  
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