AQUATICA

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104 Years of Educating Aquarists

AQUATICA

VOL. 28 JANUARY - FEBRUARY 2015 NO. 3

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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 ~ 2015

Happy New Year 2015

JAN 9 Mark Soberman ~ Keeping & Breeding *Corydoras, Aspidoras* & *Brochis* Catfish ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

FEB 13 Joe Yaiullo - Reef Water Flow - How Much is Too Much? ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

MAR 13 Discus Hans - Raising Discus - Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

APR 10 Todd C. LaJeunesse - The Intriguing Evolution of Palau Corals ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

MAY 8 Giant Spring Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods including a 55 gal. tank & stand.

JUN 12 Lou Ekus (Tropic Marin USA) ~ Basics of Reef Chemistry ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

JULY/AUGUST – NO MEETINGS

SEPT 11 TBA ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

OCT 9 Giant Fall Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a 55 gallon tank & stand.

NOV 13 Bob Fenner ~ Reef Stocking ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

DEC 11 Holiday Party ~ Members, their families and friends, all you can eat sit-down dinner
• Fish Bingo & Prizes • BAS awards presentations.

Anthony P. Kroeger - BAS

MOLLIES LOVE CRACKERS!

Collecting Sailfin Mollies in Florida

Everyone loves vacations. The sunshine state of Florida is an awesome place to vacation, especially for aquarists. So many beautiful and interesting fish live there. Undoubtedly one of the most beautiful is the native green sailfin molly, *Poecillia latipinna*.

A male in full display is incredibly gorgeous with shimmering blues, reds and greens, with the sunlight playing off him. No aquarist would ever forget the beauty of this fish.

Sailfin mollies are a relatively common fish in Florida. They inhabit most creeks, canals, pools, lakes and drainage ditches which are exposed to sunshine. This exposure to sunlight promotes both the growth of plants and algae, both of which mollies need to thrive.

In addition, these environments are warm, heated by the sun. The water temperature here can easily hit 85˚F.

Rarely does one find mollies in shade, cooler environments and never in water devoid of plant life or algae.

So how do you collect mollies in Florida?

It's pretty easy actually and what's a better way to remember your vacation than by looking at a tank of fish you collected while on it!

Basic equipment is all that's needed: dip nets, buckets, bait, 5 gallon buckets and a general bait aerator. You can easily find these items at Wal-Mart, your local fishing supply store and maybe even your pet shop. The cost of these items is minimal. You do need a State of Florida fishing license. All bait shops and sporting goods stores in Florida sell them. The cost is about $25.

My favorite place to go "mollie" fishing is in orange groves. Why orange groves you ask? Well, orange groves are surrounded by drainage ditches. These ditches are easily accessible, tree-free, sandy bottomed and shallow (no gators). Plus they are everywhere. Along roads, they're consid-

ered public domain, so you can collect them with just a license.

These open exposed ditches usually contain extensive growth of plants and algaes, particularily hornwort, *ludwigia*, *sagittaria* and parrots feather.

Note to plant afficionados: DO NOT collect water hyacinth, its possession in Florida is illegal.

So back to our quarry: The sailfin mollies.

Note to plant afficionados – DO NOT collect water hyacinth; its possession in Florida is illegal.

Once you've found a suitable collecting spot, how do you attract them? Bait, of course. I started baiting by throwing Hikari floating pellets and OSI livebearer flakes (my favorite fish food brands) onto the surface of the slowly moving ditches. Mollies love these foods and appear from everywhere, usually with a few hungry golden ear killies and jewel cichlids. What? Cichlids? That's another story, folks!

As I said, sailfin mollies love these foods...only one problem. Wild mollies are FAST!! And they have very good vision and will see you coming. You will catch a few occasionally, but usually they are faster than you are and just steal your bait.

This happened to me time and time and time again. Luckily for me, some migrants taught me how to distract the mollies enough to catch large quantities of them.

Actually, I think they taught me because their sides were aching so bad from laughing at the crazy gringo catching ditch fish that they couldn't take it anymore.

Pedro is from Mexico. He picks Valencia oranges for a living. He loves nature, and Pedro taught me about wild sailfin mollies.

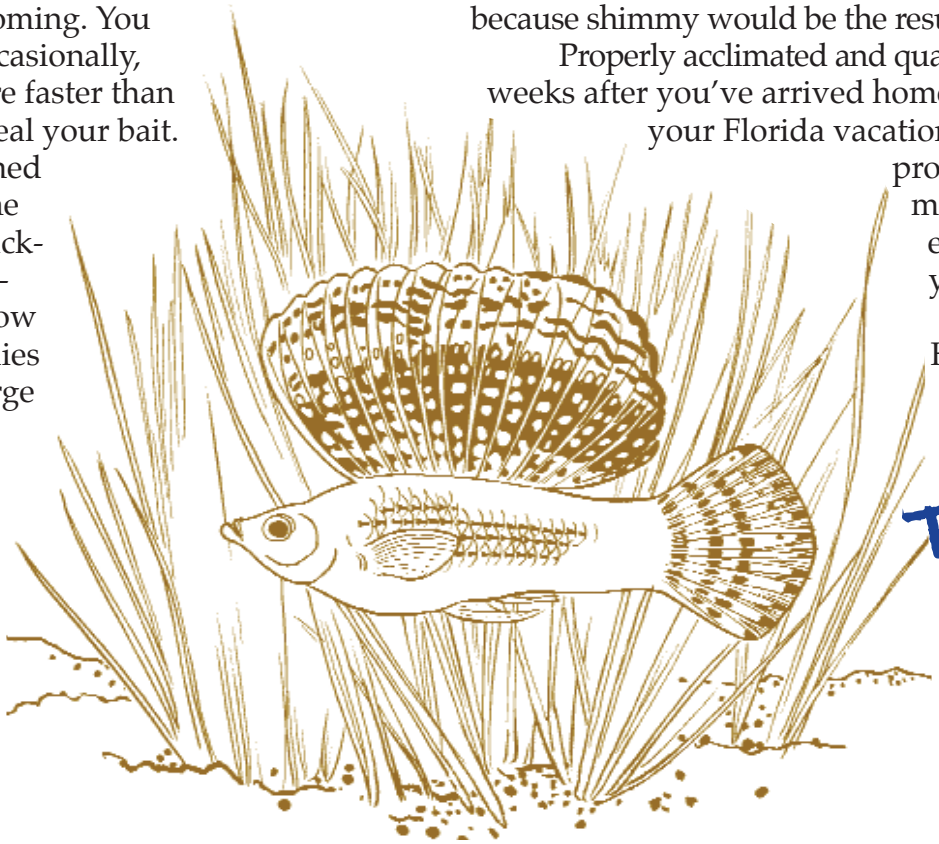
What's the trick, you ask? Saltine crackers! Say what? I kid you not; mollies go crazy over them. They are so busy picking at the salt and crackers, they become distracted enough for you to catch them easily. Just float the saltines salty side down. Crumble up one or two as well and scatter them over the surface of the water. Every fish in the vicinity will come to investigate. Especially the mollies.

For you cichlid fanatics out there, yes, jewel cichlids will eat saltines too, although I'm not sure they're good for them.

Wild mollies are usually quite healthy. Proper care during transit; involves aeration and a stable warm temperature. Avoid chilling mollies because shimmy would be the result.

Properly acclimated and quarantined for 2 weeks after you've arrived home will ensure your Florida vacation mollies will provide you with many hours of enjoyment in your home.

Happy fishing!



Tony

John Todaro – BAS

SPECIES PROFILE

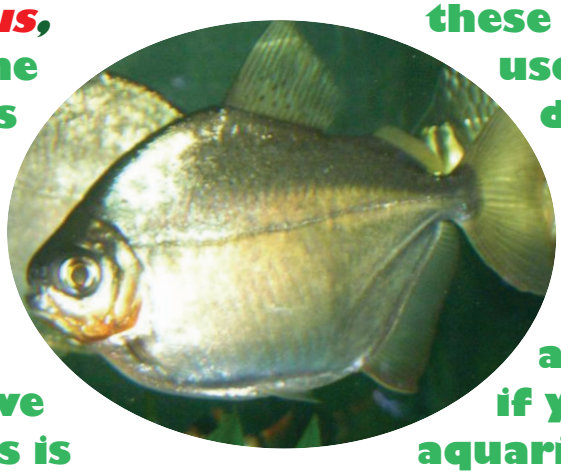
Scientific Name: *Poecilia latipinna.*
Family: *Poeciliidae.*
Common Name: Sailfin Mollie, Yucatan Molly.
Distribution: North Carolina to Texas, the Yucatán Peninsula of Mexico, in marshes, streams, swamps, and estuaries. The sailfin is very common in Florida.
pH Range: 7.0 - 8.0.
Idea pH Range: 7.0 - 7.4.
Temperature Range: 75 - 82˚F.
Water Hardness: High. It's recommended you use 1 tsp of aquarium salt to 2 gallons of water.
Breeding Temperature: Around 82˚F.
Life Span: 2 to 4 years.
Size: Males up to 5 inches. Females up to 5 - 6 inches.
Temperament: Peaceful.
Diet: Sailfin mollies feed primarily upon algae and other plant materials, although they will consume a number of aquatic invertebrates, including the larvae of mosquitoes.Will accept flake food.
Sexing: Easy. Males have larger dorsal fins and are larger than females. Females are noticeably rounder in the body than males.
Breeding: Sailfin mollies produce broods of 10-140 live young, depending upon maturity and size, and females may store sperm long after the demise of their relatively short-lived mates. The gestation period for this species is about three to four weeks, depending upon temperature, and a single female may give birth on multiple occasions throughout the year. A ratio of three females to one male is preferred, as with all live bearers, because the females are harassed by males to the point of exhaustion, and having more females gives the others a rest.
Care of Fry: A livebearer, the sailfin molly will eat its fry, so it is important that floating plants are available in the event you are not present at birth. As soon as you see fry swimming about, place them in a breeder net or remove them from the aquarium and into another aquarium.

Reference:
Wikipedia.org/wiki/Sailfin_molly
www.fishchannel.com

John Todoaro - BAS

TERRORS OF THE PLANTED AQUARIUM

***Metynnis argenteus*, better known as the Silver Dollar fish is often seen in tropical fish, stores with a note on the tank that this fish is not compatible with live plants. I know this is true, since years ago I had a 30 gallon tank in my bedroom with a school of about eight of these spectacular fish. I used these fish to dispose of over-grown plants from my other tanks. These fish sure did a good job. This is a great fish to keep if you have other aquariums that need constant plant pruning or if you're plagued by duckweed.**



If this is a problem you have or if you just want to have a tank full of these herbivores sparkling fish, here is a short background on keeping this beautiful plant-destroying Amazon fish.

The Silver dollar is a common name given to a number of species of fishes, (see page 8) mostly in the genus *Metynnis*, tropical fish belonging to the *Characidae* family which are closely related to *piranha* and *pacu*. Native to South America, these round-shaped silver fish are popular with many hobbyists.

The Silver dollar is a peaceful, schooling species that spends most of its time in the mid - to upper-level of the water. Its lifespan, if well cared for, can be up to and more than ten years.

Silver dollars natively live in a tropical climate in the sides of weedy rivers. They prefer water with a pH of 5–7, a water hardness of up to 15 dGH, and an ideal temperature range of 75°–82°F. Their diet is almost exclusively vegetarian and in captivity they will often eat all the plants in a tank.

If you have a infestation of duckweed, *M. argenteus* or any of the other *Metynnis* species will end your duckweed nightmares. They will also eat worms and small insects. But plants are their main dietary interest. Siver dollars will eat all sorts of greens once they have demolished all

your aquatic plants, lncluding lettuce, spinach, kale, mustard greens, zucchini, peas and even broccoli.

Silver dollars should be provided with a variety of foods other than just veggies to be completely healthy. They can't get all the nutrition they need out of just eating your aquarium plants and lettuce and spinach, etc., they should be provided live foods, such as brine shrimp, black or bloodworms or chopped earthworms or frozen foods. They will also accept flake or pellet foods and, of course, algae wafers.

That being said, Silver dollars are primarily, though not exclusively, vegetarian. A large part of their diet must include some kind of vegetable matter such as wilted greens, dandelion greens, spinach, or romaine lettuce (fresh, non-wilted greens are harder for them to eat), or cooked vegetables such as peas, green beans, or squash.

Despite being terrors of aquatic plants, they are fairly shy and need tank mates that are also peaceful. Silver dollars do great with medium to large tetras such as serapes, black skirt tetras, Buenos Aires, and phantom tetras.

Given enough space, they also do well with giant danios, and occasionally with smaller types such as zebra danios.

Because silver dollars are mid-dwelling fish, they generally go very well with top-dwelling and bottom-dwelling fish. *Corydoras*, bristlenose *plecostamus*, botia loaches, and other medium-large bottom-dwellers will all get along well in a Silver dollar aquarium. Use caution when combining Silver dollars with the common *plecostamus* often sold in pet stores, as it is a well-known "slime sucker" that loves to eat the slime coat of larger, slower-moving fish.

SILVER DOLLAR SPECIES

Metynnis altidorsalis
Metynnis argenteus
- Silver dollar

Metynnis fasciatus
- Striped silver dollar

Metynnis guaporensis
Metynnis hypsauchen
- Schreitmüller's silver dollar
- Spotted silver dollar

Metynnis lippincottianus
- Striped silver dollar

Metynnis luna
- Red-spot silver dollar

Metynnis maculatus
- Speckled silver dollar

Metynnis mola
Metynnis otuquensis
Myleus schomburgki
- Black-barred silver dollar

Myloplus rubripinnis
- Red hook silver dollar

Mylossoma duriventre
- Silver mylossoma
- Hard-bellied silver dollar*

*Hard Bellies are silvery and somewhat transparent; they are the most commonly encountered species.

As I have always said, you should read about the needs of any type of fish before buying them and adding them to your aquarium.

It's also important to keep in mind what the adult sizes of the fishes will be, when shopping for them. Most Silver dollars are sold very small - generally around 1.5" inches in diameter. Don't be put off by this small size, they'll grow quickly if fed well, so make sure your tank can handle fish that can grow to 6" inches.

As mentioned before, Silver dollars are a peaceful, active schooling fish. So, to keep them happy you should buy six or more fish of equal size, if you can afford it. A 30 gallon tank, or, even better, a 55 gallon tank, would be considered a good size for these fish.

Filtration for a properly stocked tank of silver dollars should be about a 6X turnover per hour. For example, in a 55 gallon tank you'll want a filter rated for 330 gallons per hour.

Silver dollars like a very light current opposed to heavy currents, so make sure you keep the filter discharge water flow aimed towards the side or bottom of the tank.

Live plants should not be put in a silver dollar tank unless you want them to become food for your *Metynnis,* with the possible exception of hardy broad-leafed plants like java fern, but there are no guarantees. Silver dollars are voracious plant eaters and will quickly destroy any live plants in the aquarium.

You can use driftwood and rocks to decorate the aquarium, but leave lots of open space for the fish to school.

Keep the tank tightly covered as Silver dollars are known to be jumpers, but with

sufficient space and clean water, they usually don't do it often. But, to be on the safe side, have a good, tight-fitting lid on your tank.

Partial water changes should be done to keep the nitrate levels in the water under 40ppm; the fish will appreciate a goal of not over 20ppm.

Regular gravel vacuums will keep excess waste and uneaten food out of the system and help control your nitrate levels.

If the water tests with ANY ammonia or nitrite in the water, the tank has either not been cycled properly or was populated too quickly, causing an ammonia spike. This condition is extremely hazardous to the fish and partial water changes will have to be done every couple of days until it is under control.

Breeding these fish is not easy; first, it is tough to tell the sexes from one another. Of course, the fish know the difference. The question is how many fish should you put in a breeding tank? I would try to identify a pair.

Here are some tips that may help sexing Silver dollars:

Check out the anal fins. The female's anal fin is straight; male's anal fin with a reddish hue and a "bump" 3/4 the way down. Some hobbyists say males have a faint black spot shape just behind the gill plate.
Another way is to look at them from the top. The female should have a "fuller" body.

Males may also have more vibrant color in their anal and dorsal fins, but not always.

Some hobbyists feel that you cannot accurately sex these fish until they are at least 6 inches in size; that is fully adult!

Metynnis species often spawn in schools among floating plants such as Java Moss. This is a perfect plant to keep in a Silver dollar tank. The fish will pull it apart as they eat it and thereby spread it around the tank.

When spawning, the released eggs fall to the bottom of the tank or are trapped in the Java Moss. Some sort of netting should be placed toward the bottom of the tank to allow the eggs to fall through but small enough not to allow the parents to get at them.

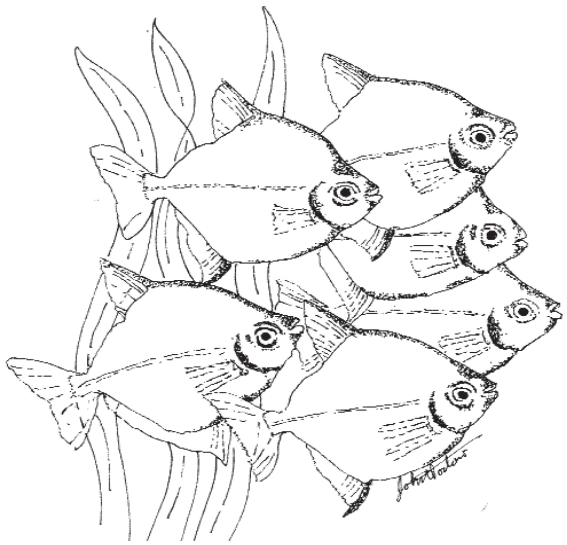
Remember, adults will eat the eggs if they find them. The fry will hatch in approximately three days depending on the temperature. The fry are very tiny and should be feed infusoria at first, then other live foods such as micrworms and, when larger, brine shrimp nauplii.

Silver dollars are one of the hardiest and easiest to care for fish. A good understanding of their basic needs is essential to allowing them to live a full and healthy life.

A tank with a large school of these brilliant flashing fish is a sight to behold.

References:

Wikipedia
Yahoo.com/fish-silver-dollars-4529491.html



John Todaro - BAS

SPECIES PROFILE

Scientific Name: *Metynnis argenteus.*
Family: *Characidae.*
Common Name: Silver Dollar.
Distribution: South America, Guyana.
pH Range: 5.0 - 7.0.
Temperature Range: 75° - 82°F.
Water Hardness: Up to 15 dGH
Breeding Temperature: Around 82°F.
Life Span: 10 + years.
Size: 2 to 6 inches.
Temperament: Peaceful.
Diet: Herbivore: Loves to eat greens, so almost all aquarium plants in the tank with them will be eaten.
Sexing: Very hard to sex. Check out the anal fin. Females anal fin is straight, males anal fin has a "bump" 3/4 the way down.
Breeding: Egglayers. Much like Angelfish, the best way to acquire a breeding pair is to purchase a half dozen juvenile silver dollars and raise them together. Although the parents will not usually consume the eggs or fry, other fish will, so, when spawning them place them in a separate tank.
To facilitate spawning, make sure the water is soft (8 dgH or below) and warm (80 to 82 F), keep the lighting dim, and provide fine leafed plants (which will be eaten if they are live rather than plastic plants).

When they're getting ready to spawn, you will see some of the following changes in the fish - 2 black blotches behind the gills (mainly in the males), black/red fin edges and overall more colorful bodies (Red/Black). The males chase the females, swim next to them and wrap their anal fin under the female. Female releases around 20+ eggs; the male fertilizes them; they shake, then separate quickly, which scatters the eggs. They'll do this for hours at a time until the female has released all her eggs, which may be thousands! The eggs are clear and tiny. You won't see them unless you look very closely.
Care of Fry: When a pair spawns, the female will lay up to 2000 eggs. The eggs will fall to the bottom of the tank, and they will hatch in three days. After approximately a week, the fry will be free swimming and able to eat freshly hatched brine shrimp or fine foods such as commercially prepared fry food, finely crushed spirulina.
I would recommend removing the adults from the tank after spawning.

Reference:

- Wikipedia.org/wiki/Sailfin_molly
- www.fishchannel.com
- freshwateraquarium.about.com/od/silver dollars

David Banks

First published: *In Depth*, newsletter of The Tropical Fish Club of Burlington.
Aquarticles

Sand Loaches

They Breed by Themselves

It has been said very often; it is not the hobbyist which breeds fish, it is the fish that breed. All we can do is try to help, and sometimes we don't even do that. Such was the case when our *Acanthocobitis urophthalmus* spawned. I just went in one day and noticed some strange behaviour going on in our ten gallon planted tank. It just so happened that the only fish in the tank were the sand loaches, as the last of the other fish, Odessa barbs, had just died of old age. The other thing in the tank was a couple of small apple snails.

We bought the sand loaches at a local pet store; they didn't know anything about them and I had never seen them before. But we bought all they had, I think there were about five. They were very inexpensive, only $1.49 from what I remember. I assumed that they were probably not going to get very big. They were just under two inches when we got them and they did grow a little but not much. They definitely fattened up some too as they got older. They were very thin and long and would perch themselves on the bottom of the tank on their pectoral fins. They are cream colored, or sand colored, with faint vertical stripes the entire length of their body. They did seem to chase each other from time to time, but never for very far, and they never did any damage to each other. They seemed somewhat shy, but would come out from the very thickly planted *Anubias* and *Windelov* Java ferns whenever food was in the tank. You would also see them around the tank just hanging out. Overall they seemed like a great little fish to have.

I had seemingly done nothing to help them spawn, but in reality I guess I had. They very much enjoyed the very thickly planted tank, and I had provided them their own tank with no other fish. I apparently had also given them a huge food source. After noticing that they had spawned, I had also noticed that the two apple snails were nothing more than empty shells. I'm not sure if the apple snails had just died or if the sand loaches had killed and eaten them. Loaches in general are known to be very good at eliminating unwanted snails from an aquarium, but these snails were very large by comparison.

The breeding activity was very apparent: there were three loaches left in the tank when the first spawning took place. One was very slender and not quite as big; the other two were more bulky and a little bit larger than the other was. I believe the smaller slender one was the male. I walked into our fishroom and immediately noticed that something was going on in this tank. Two of the fish, what I believe were a female and the one male, were darting around the tank very quickly together. They would stop and the male would very quickly try to wrap himself around the female and then they would be off again. I noticed very small opaque eggs everywhere and as I watched saw eggs go flying several times when the pair were "wrapped" together. The eggs would just go everywhere when they released from each other and started darting all over the tank again. I tend to feed the fish just before going to bed. It was already very late, but we watched this for about twenty minutes. They were apparently at the end of this spawning cycle anyway since I only saw eggs a few times. There were hundreds of eggs all over the tank! I was amazed at how many eggs had been produced from this fairly small fish. Maybe the male had been spawning with both females, but I only saw him with one.

I noticed very small opaque eggs everywhere and as I watched saw eggs go flying several times when the pair were "wrapped" together.

I decided to siphon some eggs out to a separate tank to see if I could try to raise some of them. I left many eggs in the spawning tank hoping they would survive, but by the next morning I couldn't see a single egg. I still hoped that some would make it since the tank was so densely planted, but I never saw any fry in that tank. The ones that I had taken out hatched very quickly, in about 24 hours. They were the smallest fry I had ever seen, just clear little slivers clinging to everything. There were probably sixty or more eggs and I think that almost all had hatched. I waited a few days before trying to feed them. The first food was "filter grunge." I would take a seasoned sponge filter and squeeze it into the tank. They needed very small food and this seemed to work pretty well. I later added APR **[Editor's note; APR is a powedered fry food, artificial plankton & rotifer]** and after a few weeks started with newly hatched brine shrimp. I had quite a few that seemed to be growing, but then I had to go away for a few days. When I returned there were only a handful left, but of these I raised five up to adulthood.

We had lost one of the females shortly after the first spawn, but still had one pair left. We did have a second spawning too, about 1 month later. I was unfortunately not able to get any eggs the second time and lost both fish within a couple of weeks. I am guessing that the spawning had taken too much out of them. It was a very frenzied and an exhausting courtship. I would see them stop at times as if to catch their breath, they were definitely breathing very hard and rapidly. We had these fish for close to two years but they always had tank mates. I am guessing that they may have spawned earlier but I just never saw any eggs as they were probably eaten as soon as they were laid. But then again, maybe these were the only times and we just so happened to see it each time.

Note: I had carefully marked the calendar with the dates on the spawns and the egg hatching and the fry free swimming. But these spawns happened in October or November so the calendar was recycled before I was able to transfer the data to this article. The fry are now almost two years old, so I am considering removing all of their tankmates and trying to spawn these fish again, in the same tank even. I believe I have at least one pair, maybe more than that. I am not sure, as you rarely see them for very long. I might even add a few apple snails again.

John Todaro – BAS

Photo: Martin Thoene

SPECIES PROFILE

Scientific Name: *Acanthocobitis urophthalmus.*
Family: *Nemacheilidae.*
Common Name: Banded mountain loach, Sand loach, Tiger loach.
Distribution: Asia south western lowlands from Kelani River to Nilwala River, Sri Lanka.
pH Range: 6.5 - 7.5.
Temperature Range: 73˚ to 79˚F.
Water Hardness: Soft to medium dh 4 -12.
Life Span: Around 2 to 3 years.
Size: Maximum size 2 inches.
Temperament:. Peaceful.
Diet: Most commercial foods accepted, sinking pellets and bottom-dwelling live-foods. Frozen foods; bloodworm/brine shrimp.
Sexing: Hard to tell. The females normally look plumper than slender males.
Breeding: During courtship, the fish will rapidly dart around the aquarium together. The male constantly tries to wrap himself around the female. Courting is tiring for these fishes. It might be a good idea to separate them after spawning to give them some time to relax before spawning again. A female *Acanthocobitis urophthalmus* can produce hundreds of eggs. Eggs are released multiple times during spawning and are scattered about the tank. Eggs are very small and look opaque.

Raising Fry: Adults will eat their eggs. They can be siphoned out and raised in a separate tank using water from the breeding tank. Eggs will hatch in about 24 hours (depending on temperature). The fry are really small, and will cling to aquarium plants, rocks and driftwood. Feed liquid fry food or strained hard boiled egg yolk; do not feed more than they will eat in ten minutes. Do water changes with water from breeding tank. As they grow bigger, feed them microworms and newly hatched brine shrimp.
Note: Try to replicate their natural conditions. They like fast flowing water, well oxygenated. Provide hiding places, rock formations or driftwood; small flower pots and short lengths of PVC tubes are also good. These fish like to be in groups of 6 to 8 or more to make them feel comfortable. They require clean fast flowing and very high water quality. A species tank is recommended. You might add snails to the tank. The loaches will use them as a food source.

Reference:
www.loaches.com
Wikipedia
Http://www.aqua-fish.net

The Practical Plant

PROPAGATING
Pogostemon stellata

Pogostemon stellata is a stunning plant, but it is quite demanding. It has recently undergone a name change; it used to be known as *Eusteralis stellata.*

This plant is an Asian native. It is a fairly large stem plant which needs a somewhat larger tank than most other stem plants. *P. stellata* will require very high light intensities and because of this you must be careful not to overcrowd it by planting the stems too closely together. When grown in sufficient light, it will be a fabulous red color. If your light is too weak, the plant will be green and start to lose its lower leaves.

I kept my specimen in a 37 gallon aquarium with 130 watt compact fluorescent lighting and that was barely adequate to keep this plant happy. The water was kept at a pH of 6.8, hardness 4-6° GH and a temperature of 78°F. The plant grows a substantial root system by stem plant standards, so substrate fertilization is in order. I am also making use of CO_2 enrichment. A Fluval canister filter (model #303) with the output being directed through a submerged spray bar is doing my filtration. I use the Estimated Index system of fertilizer dosing. This means that once a week I perform a large water change (50-75%). This is usually done on Saturday. Do not be concerned about the large volume of water that is being replaced; your fish will love it. This large water change is necessary to reset the system. Then on Saturday, Monday and Wednesday, I dose the macronutrients. On Sunday, Tuesday and Thursday, I dose the micronutrients. Friday, I take the day off. The lighting is timer controlled and on for 12 hours a day.

The plant is slow to branch and is propagated via stem cuttings. If you can meet the high demands of this plant, I highly recommend it. It's a real attention getter.

Izzy

John Todaro – BAS
From the Brooklyn Aquarium Society's publication
SCRUMPTIOUS MEALS & LIVE FOOD TREATS Compiled, Edited & Written by John Todaro

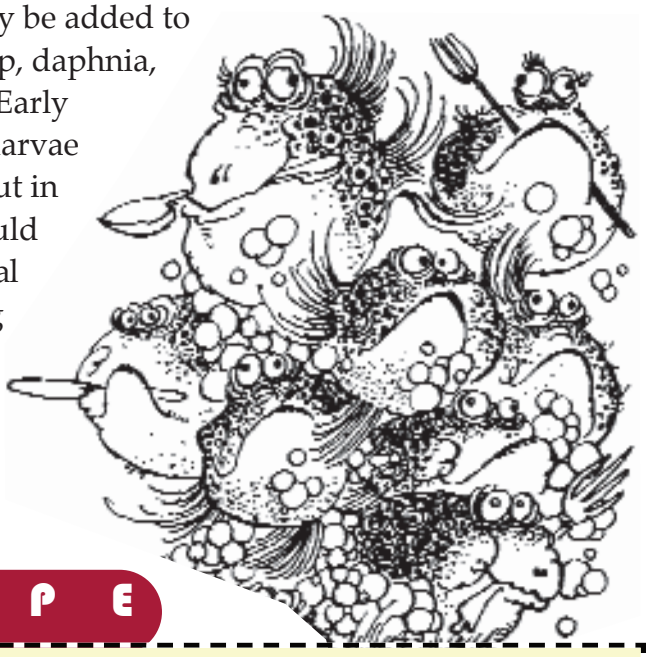
Canadian Beef Heart & Liver Dinner

The following recipe comes from **Hans Roth,** a member of the **Montreal Aquarium Society**, and has been adapted from a 1980 article in *The Bulletin,* the Society's publication.

More ingredients can naturally be added to the mix, Hans suggests, such as fairy shrimp, daphnia, and fresh mosquito larvae when available. Early spring and summer, you can net mosquito larvae and place them in a plastic container and put in the freezer for about half an hour. That should kill them without losing any of their nutritional value. You can then add the larvae, discarding the water.

Paprika is added as color agent to the mixture to help pump up the reds in your fish.

Bon Appétit!



RECIPE

INGREDIENTS:

5 lbs. of fresh beef heart
1/2 lb. of beef liver
1/2 oz. of Tetramin™ or other good staple fish food.
3 oz. fresh spinach (remove stems)
2 pkg of Knox® unflavored gelatin
1/2 tsp. of paprika

PREPARATION:

Trim skin, fat and blood vessels from beef heart.
Place in blender with beef liver and blend. Add Tetramin and blend.
Boil spinach until wilted (about 5 minutes), drain and add to blender and blend.
Dissolve gelatin in 1/2 cup of boiling water. When fully dissolved, add along with paprika to mixture and blend for a minute or two at high speed to liquefy the mixture. If you have to add water, use the water the spinach was cooked in. Use only enough water to make a thick paste.
Cool and place in Zip Lok® bags. Flatten to about 1/4" inch for easier handling.

FEEDING:

Simply break or cut chunks about 1/4" inch in size. You do not have to defrost before feeding fish.
Just drop pieces into tank.

Ian Fuller - BAS
Founder of Planet Catfish

Cool Cats

The topic of what temperature to keep what fish at is something that creates debate wherever fish keepers meet. This seems to be even more evident when the subject is catfish, or, in my particular area, *Corydoras* catfish.

For this particular feature, I would like to deal with some of the species that prefer the cooler end of the so-called tropical scale. We are talking a temperature range of between 60˚ and 70˚ Fahrenheit. There are four species in particular that would be very comfortable living within this temperature range. The first two are very closely related and resemble each other to a degree; these are *Corydoras barbatus* (Quoy & Gaimard, 1834), coming from fast flowing rivers that empty into Guanabara Bay in the Rio de Janeiro State and *Corydoras kronei*, (A. de Miranda Ribeiro, 1907), coming from the Rio Ribeira de Iguape basin, São Paulo State. The third species is *Corydoras macropterus*, (Regan, 1913), which also comes from São Paulo State. The forth species is *Corydoras paleatus*, (Jenyns, 1842) originating from the Rio Paraná, north west of Buenos Aires in Argentina.

All four species are found at least 22˚ South of the equator, in the case of *Corydoras paleatus* 33˚ South. The water temperatures in these areas fluctuate far more that we would imagine, with temperatures of below 60º F being recorded.

My recommended set up for any of these four species would be a tank of at least 24 inches in length, with a thin layer of smooth grained sand (10 – 12mm), a few lumps of sandstone rock to create a few hiding places and the impression of a river bank and maybe a couple of clumps of Java fern to give a bit of color. For filtration, I would use an outside canister type power filter, which will give a good movement of water and optimum filtration. I would only install a heater to combat extreme

winter temperatures. If you live in an area that is free from winter frosts, then I would not use a heater at all. The natural day night temperature fluctuation would actually be beneficial to all four species. I have successfully spawned the species *Corydoras barbatus*, *Corydoras kronei* and *Corydoras paleatus* at 60˚F.

In smaller tanks, 24-inch minimum, *Corydoras barbatus* and *Corydoras kronei* are best kept in pairs. If there are two males per female, which is the preferred ratio with most *Corydoras* species, there will certainly be squabbling, if not out and out fighting. Both species tend to be territorial, especially during the breeding season. I have found *Corydoras paleatus* are best kept in multiples of three, two males per female.

Corydoras macropterus, although a species that also enjoy the cooler temperatures, are not a fish for the inexperienced *Corydoras* keeper.

They are a fish that inhabit Blackwater biotypes and require a little more water preparation. Soft and acidic is a term we have heard and read about for many fishes, but it is a requirement for this particular species. They will survive without too many problems in neutral water (7 pH, 8˚-10˚ GH), but are definitely at their best when the water is around 5-6 pH. 2˚-3˚ GH. To help put some of the natural elements into the water, I use a piece of soft bogwood, which is allowed to leach its tannins into the water giving it the look of weak tea. A regular check must be kept on the pH level to make sure that it does not suddenly drop too low, which can happen very quickly in a small environment like a aquarium. The best way I have found to avoid such problems is by twice weekly 25% water changes. Rainwater filtered through moss peat is a good way of creating the right water conditions, providing, of course, that, there are no industrial contaminants in it. Failing that, then it can become somewhat more expensive, with the need for a water-purifying device.

Corydoras macropterus males are defiantly territorial and are very aggressive towards each other, even when there is an abundance of females. The best method I have found to stop any serious damage from being caused is to slightly overcrowd them. I have 6 males and 5 females in a 18 x 12 x 12 tank and so far there has not been any harm done from their little squabbles. This is the only one of the four species that I have not yet bred, but I am working on it.

Jason Kim
Jason is the founder of AquaC. Inc. From his web site www.proteinskimmer.com
Aquarticles

THE AQUATIC ENVIRONMENT

PART 1

A lot of people who become interested in reef keeping have little or no background knowledge about the marine environment. Oftentimes, beginning hobbyists are those individuals who feel ready to make the transition from freshwater to saltwater aquariums. Although some of the basic principles which apply to a freshwater system remain, reef microcosms are often more complex due to the fact that they are really miniature replicas of the actual ocean environment.

So what is a reef, anyway? Biologists define a traditional coral reef as a large, stable framework which is biogenic in origin, limited to the photic zone, and resistant to wave and storm action. Did you know that the Great Barrier Reef in Australia is the single largest organic construction on the planet? These tiny animals are really quite amazing. Because coral polyps are so small and slow-growing, it takes thousands, if not millions of years to build a large reef. Over time, the calcareous remains of coral skeletons, molluscs, bryazoans, and other marine critters are slowly cemented together by coralline algae and geological processes. Coral reefs are limited to the photic zone (the warm, sunlit bathed belt around the Earth's equator) since hermatypic invertebrates rely on U.V. light to synthesize food. One of the hallmarks of a pristine reef is the crystal-clear, nutrient-poor water which surrounds it. Just like the expensive condominiums in Hawaii, real estate in tropical oceans is hard to come by and extremely valuable. The only way slow growing corals can compete with the faster colonizing species of algae and sponge is by living in an environment which is inhospitable to nutrient-loving organisms. Most algae require lots of nutrients like nitrates and phosphates in order to thrive, and these delicacies are often in short supply off the shores of a tropical island. Corals, on the other hand, subsist quite well on the simple sugars their symbiotic zooxanthellae provide via photosynthesis. Not only are tropical waters nutrient-poor,

but they also tend to be clear of sediment, terrestrial run-off, and phytoplankton blooms. Sunlight already has a tough enough time penetrating water - in fact, as much as 75% of useful U.V. light is absorbed in the first few feet of the ocean's surface. Unclear water only makes it harder for corals to harness the sunlight they so desperately need.

Through proper techniques and husbandry, an oligotrophic (nutrient-poor) environment can be maintained.

Those are topics for future articles, however... Look forward to next week's issue, which will be part two of this three part series on the aquatic environment.

In last week's article, I stressed the need for superb water quality. Some of you may have wondered why many tropical areas are oligotrophic (nutrient-poor) by nature, since temperate parts of the world seem to be heavily inundated with an abundance of nutrients. One of the main reasons is due to the fact that nutrient-rich water, after a long journey through the deep sea, is constantly imported by offshore currents along the coasts of many temperate areas. Most of the world's temperate coastlines are directly affected by upwelling currents, and this is one of the reasons that kelp/macroalgae habitats are common in these areas. Tropical coral reefs export rather than import nutrients through strong wave action and currents. Furthermore, the biological interactions which exist on coral reefs are so tightly interwoven

Since water serves as a very good filter for most of the visible light in the spectrum, corals have, over time, evolved and adapted to specific "colors" of light.

that most nutrients freed through biological processes are simply sucked right back up into the system and recycled. Just like the real estate on a calcareous reef, nutrients are hard to come by and are plucked up as if they were hotcakes. Besides having crystal-clear water, tropical reefs are also remarkably "sunny" places. Unlike Northern England or Seattle, Washington, the tropics receive near constant bombardment by the sun's intense U.V. rays. The tropics experience fewer cloudy or overcast days per year than do other latitudes, and they also receive a greater amount of sunlight. The angle of incidence effects light's ability to penetrate the atmosphere and ocean surface. If you hold a flashlight at an angle and stare into the bulb, your eyes would probably be just fine. But if you look straight into a flashlight head on, you might be temporarily blinded. This is a good example of light's angle of incidence and how it affects intensity.

Since corals depend so heavily on light in order to survive, and we know that light rays are amazingly strong at the equator, it makes sense that we must strive to create a very bright environment in the aquarium. The term brightness, however, means very little to the experienced reef aquarist. Light, just like sound, varies in wavelength, as well as intensity. Certainly, there is a huge difference between one of Beethoven's symphonies and the sharp sting of an air horn. Imagine that corals, in the same way that people can tolerate certain frequencies of sound, enjoy certain wavelengths of light and dislike others. Since water serves as a very good filter for most of the visible light in the spectrum, corals have, over time, evolved and adapted to specific "colors" of light. These wavelengths happen to be those which penetrate water the most effectively. When you are underwater, everything seems to look blue, green and grey. Notice how reds and yellows become drab the deeper you go. Since blues and greens, or wavelengths near 400-450 nanometers penetrate the ocean so well, corals absolutely depend on this band of energy to survive. This is of great importance to the reef aquarist, since many of the bulbs offered for sale at pet stores produce high intensity red and yellow

light, and little blue light. The reason manufacturers produce these bulbs is simple. Corals, fish, and decorations look their best under red/yellow light since this wavelength seems to bring out their vibrant colors best. When purchasing lights for a reef tank, however, it is wise to pick bulbs which most closely match the wavelengths which are found in the natural environment. Do not buy bulbs which only make your critters look vibrant. Sure, you may get a few oohs and ahhs, but they will be temporary gasps of amazement since your tank's inhabitants will soon be dead. Luckily, the recent boom in the reef keeping hobby has brought about an awareness of this issue, and it's quite easy to find the perfect lighting system.

I would like to mention one other matter before I end this article. Now that we have covered the basics of light and water quality, some people might wonder what other aspects of the aquatic environment remain to be discussed. One issue that frequently gets left out of many popular texts is the bioload factor. For those familiar with fish-only aquariums, there is an old rule of thumb which states "one inch of fish per gallon of water." How does this rule apply to reef tanks?

First of all, there are very, very few "rules" in the reef keeping hobby at all, and anyone who tells you otherwise should be looked at with great skepticism.

Even in regards to fish-only tanks, this rule of thumb is silly. Why? Different species of fish produce varying amounts of biological waste. For example, a six inch triggerfish which feeds on raw meat and goldfish will certainly present a greater stress on a filtration system than would a six-inch pipefish. Some people recommend calculating actual body mass as a way to decide how many fish an aquarium can handle. This, in my opinion, is just as silly. A large angel fish with the same body mass as a triggerfish just doesn't produce the same amount of waste. Triggers are messy fish, whereas angels tend to be delicate, nit-picky eaters. Furthermore, a tank with a wet/dry filter, protein skimmer, mechanical canister filter, U.V. sterilizer, and ozonizer will certainly be able to process a heavier bioload that one which only benefits from a single wet/dry filter. Once again, the old trustee "rule of thumb" falls apart.

Many species of corals have evolved specialized defense mechanisms to ward off would-be intruders. These include stinging, nematocyst-lined sweeper tentacles and various methods of chemical warfare.

Corals, like fish, come in all sorts of shapes and sizes, and also vary in their capacity to produce waste. If you've ever seen a picture of a coral reef, or had the privilege of diving one, you undoubtedly noticed that most sections of living reefs do not look like the pictures of beautiful aquariums you see in magazines and books. For the most part, corals simply cannot coexist in such tight orderly fashion with one another.

Remember, it's a dog eat dog competition for space and resources out there. This is not to say that a tank jam-packed with corals is an unhealthy tank... it is merely a word of caution. I once read an article which stated that the average two-inch damsel fish, in nature, has the equivalent of 2,000 gallons of water in which to live. It would be mighty depressing if we were forced to purchase huge, ten foot long tanks in order to keep a lone damsel. The point is that many ocean creatures are accustomed to a large amount of space to move about in and live. Corals, though sedentary, need space too. Many species of corals have evolved specialized defense mechanisms to ward off would-be intruders. These include stinging, nematocyst-lined sweeper tentacles and various methods of chemical warfare. Since we should attempt to duplicate nature in the home aquarium, it is appropriate to keep these factors in mind. Beware of placing corals too

close together. Some specimens, such as certain species of soft corals that produce harmful biotoxins, should also be watched closely. As long are your aquarium's inhabitants live peacefully and appear healthy, then there really is no limit to the number of animals you may stock in your tank. Do not, however, purchase a thoughtless assortment of animals, place them in your tank haphazardly, and hope for the best. This would be cruel and pointless, since your animals would undoubtedly harm themselves, and might even die.

Next week will be part three of this series on the aquatic environment.

PART 3

Ahh... we have finally reached the last article of this series. Hopefully, those of you who are taking the time to read these articles are actually learning new information and gaining new insight into the biological processes which help make coral reefs some of the most fascinating places on Earth. So far, I've talked about water quality, the importance of light, and factors concerning bioload. The last topic I want to discuss is the state of the world's reefs. While this topic does not directly deal with aquarium techniques, I think it is important for all prospective reefkeepers to have an idea of what's going on below the ocean's surface.

There are hundreds of different types of habitats here on Earth. People tend to be most familiar with terrestrial ecosystems, since these areas often benefit from the most popular spokesmen. I am not talking about Jack Hannah or some environmentalist from Greenpeace... I am referring to those cute, furry animals that inspire compassion for nature. Tigers, koala bears, and their assorted cuddly friends contribute a great service to ecologists who fight to save their habitats. Unfortunately, ecosystems like salt marshes, deserts, and the open ocean do not have many spokesmen to speak of (no pun intended). Everyone knows that the world's rainforests are being slashed and burned at a mind-boggling rate, but did you know that coral reefs are taking just as bad a beating?

What can we do to help save the world's reefs? Unfortunately, not a whole lot. Even with increased legislation and awareness of key environmental issues, the state of the oceans hangs perilously from the sloped shoulders of mankind.

Agricultural runoff, blasting, cyanide use, and over-fishing are just a few of the problems which threaten reefs today.

I doubt that the International Coral Reef Conservation Association would attract much public support by putting a longhorn cowfish on its brochure. What a shame! Corals (or their close relatives) have, for the most part, inhabited the earth's tropical ocean's for over a billion years. That is a very long time, even geologically speaking. Coral reefs have witnessed the birth and extinction of dinosaurs, and will likely persist to witness the last days of *Homo sapiens*. One of the reasons they have been so successful is the fact that reefs, as an ecosystem, are remarkably adaptable. Unfortunately, human beings have used this fact as a way to justify their grossly exploitative actions. The progressive, blitzkrieg-style impact on reefs due to anthropogenic influences, combined with natural phenomena like storms, temperature variations, and disease are really taking their toll throughout the world's tropical oceans.

Quite a few experts in the field agree that the pristine reef environment is a thing of the past. A habitat gone extinct.

What can we do to help save the world's reefs?

Unfortunately, not a whole lot. Even with increased legislation and awareness of key

environmental issues, the state of the oceans hangs perilously from the sloped shoulders of mankind. As the world's population continues to explode, the oceans will be forced to accept greater and greater stresses. There are many ill-informed conservationists who would have the public believe that the aquarium industry is one of the greatest threats to coral reefs. This saddens me, since I feel that their energy could be better spent trying to tackle more serious issues at hand. Until recently, caring for live tropical invertebrates was something straight out of a science fiction novel. We simply did not understand the biology or possess the technology to keep such delicate creatures alive in the home. As a result, corals have the reputation as a wasted resource in the aquarium. Conservationists can easily target aquarists since they are not backed by the enormous funds which oil companies, foreign fishing conglomerates, or organizations representing farmer's agricultural rights use to fight their economic and political battles.

The fact is, the harmful effects of harvesting for the aquarium trade is low on the list of environmental threats.

Unlike other pressures, the industry does increase awareness and promote education which might ultimately lead to increased conservation efforts. I believe that one of the most promising ways to preserve natural coral reefs is through education. As the reefkeeping hobby continues to gain popularity, the general public will learn what amazing creatures these are and hopefully want to help save them. The manatees in Florida or the California condor would have gone extinct long ago had their plights not been made so visual to the entire world. Large public aquariums are sprouting up like weeds in many parts of the country, which goes to show that increased awareness and education is now within our reach. As responsible reefkeepers, and in order to help fight to save the world's reefs, we should avoid purchasing specimens which are obviously unfit for life in an aquarium. There are plenty of species of coral, fish and invertebrate which can live comfortably in a captive tank

Let's not add fuel to the fire by attempting to maintain those certain "delicate" species which have little chance to survive.

If we act responsibly, there just might be the slightest glimmer of hope for the future of our Earth's most prestigious aquatic environment. Take pride in the fact that, as you acquire knowledge and gain the experience necessary to become a successful reefkeeper, you are also a full-fledged conservationist, playing an ethical role in the grand scheme of things.

Anthony P. Kroeger – BAS

Notable Natives

An American Beauty

Illustration:
Ted Walke

The Rainbow Darter
Etheostoma caeruleum

When people think of gorgeous aquarium fish Cardinal tetras, Discus and others come to mind. Most people, when they hear "North American fish" think minnows. But North America has stunning aquarium fish. Most are seldom seen and almost never available commercially.

Arguably the most colorful, gaudiest, beautiful aquarium fish from North America is the Rainbow darter, *Etheostoma caeruieum.*

Male Rainbow darters are gorgeous! The body is tan above diffusing to orange below. Fins are fire engine red edged in wide neon blue bands. 6 to 12 broad neon blue bands run vertically across its flanks. Some populations have red speckles on the sides and a neon blue anal fin with electric blue bodies.

The female is tan with a lighter belly and brown and black mottled markings.

Rainbow darters are widespread; their natural range is from Tennessee and north Georgia, north thru the Great Lakes and westward into Minnesota.

Males grow to 3 inches, females to 2 inches. Although hard to find commercially here, Rainbow darters, though rare, are extremely popular in Europe and the Far East.

In the wild, Rainbow darters frequent shallow (3'or less) clear, cool, well oxygenated streams over rocky or shallow stream beds with rough water and rubble type of bottoms.

Rainbow darters require well filtered,

clean, high quality water. I suggest power filters so as to provide sufficient water turnover and current.

Editor's Note: *A water circulation pump can also be used to create a current.*

I change 20% of my tank water twice weekly on all my darters; darters do not tolerate nitrite.

Rainbow darters can easily be kept in a 20 gallon long tank with a gravel bottom, power filter and Hornwort, *Ceratophyllum demersum*. No heater is needed. Room temperature is fine. In summer heat, keep your darters cool by using a chiller or floating ice cubes in the aquarium. Never let Rainbow darters get warmer than 77˚F. Ice in their water does not bother them. Their natural habitat freezes over every year.

Darters readily eat all live foods and frozen foods; they will accept high quality pellets and flake food after they become acclimated to your aquarium. They move about in Goby style.

Darters in general (though there are some exceptions) need hard alkaline water. All darters are peaceful.

There are many species of darters. Thus they spawn in many different ways: plant spawners, gravel spawners, cave spawners.

Rainbow darters are gravel spawners.

To spawn, set up a bare bottom 20 gallon tank with 1 male and 2 females. Separate the sexes and condition them heavily.

The fish must be "chilled" before spawning. They spawn in the spring when their creeks warm up.

I chill mine by putting the tank on an unheated cold basement floor. Chill the fish for about 30 days prior to spawning. The "chilled tank" must be filtered and lit. The fish are fed lightly during this time. I use ice cubes to keep the water temperature between 50˚ and 55˚F for the 30 days.

After 30 days, I warm the water to 70˚F and start feeding heavily for 2 weeks. Then I put the fish in the breeding tank at night, in the dark.

The breeding tank is a 20 gallon long, bare bottomed with a glass pyrex tray of gravel on the bottom. I use 12 X 4 tray with 1" to 2" inches of gravel. (So it is possible to remove the tray and eggs to a fry hatching tank). An air stone provides aeration. The water must be hard and alkaline or the eggs will fungus. The temperature is kept at 70˚F after the fish are introduced to the tank. The fish will usually spawn the next morning and continue for 4 to 10 days. A normal spawn is about 500 eggs; if fed lightly, the breeders seldom eat the eggs.

They spawn side by side similar to Florida Flagfish, usually producing 25 eggs per day. The male's colors are especially intense at this time. His colors literally glow.

The eggs hatch in 11 days at 68˚ - 70˚F. The eggs are not especially adhesive. I have tried stirring the gravel and collecting eggs daily.

This allows you to hatch them separately, but I have not noticed any difference in the hatch rate of collected and uncollected eggs. Do not use Methylene Blue when the eggs are left with the parents. The dye seems to cause the fish to stop spawning. I don't know why. I need to research this more. You can use a fungicide on collected eggs, but it's not really needed. The eggs are tough, like killie eggs.

The eggs are yellow, shaped like miniature chicken eggs and have an oil/fluid droplet at the small end. When hatched, feed the fry newly hatched brine shrimp *nauplii.* They will soon learn to take micro-pellets and crushed flake food.

Two final bits of information:

1] I have had rainbows spawn at 65˚F, but the largest and best spawns have been at 68˚-70˚F.

2] I have tried experimenting using a small powerhead in addition to an air stone for more current. The fish seem to like it, but I'm unsure if it improves spawn size or not. I need to do more research on this.

3] Last but not least - native fish are governed by state laws in many states. Always check with your local wildlife authority prior to obtaining native fish to be sure their possession is allowed in your area. Most states do allow possession.

The Rainbow darter is gorgeous, unique, interesting and a challenge to breed. What more can an aquarist ask for? Try some. You'll be glad you did. They are well worth looking for.

Until next time.

Tony

Photo: **Konrad Schmid**

SPECIES PROFILE

Scientific Name: *Etheostoma caeruieum.*
Common Name: Rainbow darter.
Distribution: Great Lakes, Mississippi River basins, southern Ontario, western New York, Minnesota, south to northern Alabama and Arkansas.
pH Range: 7.0 to 8.0 or higher.
Temperature Range: 65˚ to 77˚F.
Water Hardness: 250 ppm or more.
Life Span: In captivity around 3 years.
Size: Males 3" inches. Females 2" inches.
Temperament:. Peaceful. Darters are very nervous fish and should have a full aquarium cover to prevent jumping.
Diet: Frozen bloodworms, small worms and crustaceans. Will take live and flake foods in captivity.
Sexing: Males have blue stripes separated by orange coloring. Females have brown stripes.
Breeding: Rainbow darters breed between 62˚F - 70˚F. Males are brightly colored during breeding. The female buries the ventral half of her body into the gravel substrate and the male fish promptly mounts her. The two fish vibrate and the male deposits his sperm; the female deposits 3-7 eggs in the gravel. The fish separate and repeat the process over again for several days until the female lays about 800 eggs.
Raising Fry: Eggs will hatch between 10 - 12 days. When free swimming, feed fry newly hatched brine shrimp *nauplii.* They will soon learn to take micro-pellets and crushed flake food.
Note: Although many darter species are endangered or threatened, the Rainbow darter is one of the most abundant of all the darter species. They do well in an aquarium if provided with a modest current, but you must have a special permit to collect and keep them.

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Larry Jinks ~ RAS – BAS – NJAS

Tips, techniques, and commentary from master breeder, Larry Jinks. Larry invites you to contact him at **bapman13@hotmail.com** for any questions you may have about the hobby.

HOBBY HAPPENINGS

My June trip to the Pittsburgh club and the July trek to the ACA in Louisville were great, but this month I want to get back to talking about fish. Fish are always spawning somewhere in the fishroom, but I'd like to touch on two events in particular. The first is the southern purple spotted gudgeon, native to Australia, and the second is *Krobia* sp. "Xingu orange spots" from the Xingu River in Brazil.

The gudgeon story begins several years ago. Since I first joined the Raleigh Aquarium Society in 2010, we've had a rotating cast of characters (in every sense of the word!). Two notable members at the time were **Dr. Eric Hanneman** and **Dr. Peter Unmack**. I had known Eric previously from ACA conventions. He was working as curator of aquariums at the NC Museum of Natural History in Raleigh (and provided me with a neat "behind the scenes" tour!). I met Peter at a Raleigh AS meeting. He was doing post-doctoral research at UNC. Both men graciously provided Raleigh AS with outstanding talks and had visited my new fishroom.

One day I got a call from Peter. He had just had a spawn of a gudgeon and he had to go away for several weeks. He wondered if I could raise the fry for him, since I had a new fishroom with plenty of tank space and regularly hatched baby brine shrimp. He brought the fry over in a bucket and we transferred them to a 2 ½ gallon plastic tank (which are everywhere in my fishroom). The fry were absolutely tiny and I told Peter I would do my best. I started feeding them with the sub 50 micron Golden Pearls powder and mixed in newly hatched baby brine shrimp when the fry gained some size.

I had previously gotten *Mogurnda cingulatua* from Peter and they turned out to be five inch territorially nasty fish which systematically ate voraciously and killed each other off for fun. Peter assured me that *Mogurnda adspersa* was not nearly as large or aggressive. He was truthful and I wound up with about two dozen one inch fish in a ten gallon tank. Peter then announced that he was moving back to Australia for a job opportunity. I asked him when he wanted his fish back, since I had not only the gudgeons, but several species of rainbows which he had loaned me to spawn and spread around the hobby. He said: "Keep them." I said: "Thank you!"

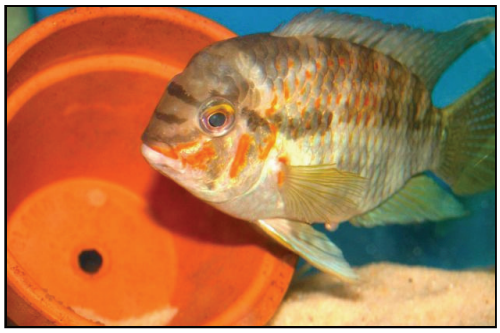
I moved the gudgeons to a 20-gallon long tank with a sand substrate and some rocks and they proceeded to eat well and not show any spawning behavior, but at least they didn't kill each other! I had about a dozen two inch fish in the tank. They were shy, but came out to feed greedily on anything I put in. They got flake food, live baby brine, live blackworms and frozen bloodworms.

Joanne and I were going to a wedding in Pennsylvania the first weekend in August and I was getting the fishroom ready for my friend **Rich Poole**, who stops on the way home from work and feeds my fish when we're away. He probably takes better care of my fish than I do (maybe I should go away more often!). As I was walking by the gudgeon tank, I noticed one of them camped

out halfway up the glass on the short end of the tank. I grabbed the flashlight and looked to see a patch about an inch in diameter being guarded by the fish. The patch consisted of small ovals that were difficult to see (maybe the algae had something to do with that). I figured they wouldn't be there when I returned after several days away, so I got a brine shrimp net and a razor blade and scraped the eggs into the net to transfer them to a gallon plastic shoebox. Upon a more careful examination in the shoebox, the discovery was made that the ovals weren't eggs, but were yolk sacs with tiny fry attached. Scraped algae from several tanks was put it in the shoebox, along with Java moss and hornwort, and several sponge filters from other tanks were squeezed into the shoebox as well. I figured between the algae and "sponge grunge" they would find some microorganisms to feed on if they became free swimming.

Krobia sp. "*Xingu* orange spots." Female laying eggs as the male stands guard.

Eggs fertlized by the male.



Eggs guarded by the male.

We returned from the trip late Tuesday night and I didn't get into the fishroom until Wednesday morning. A pleasant surprise awaited me as I counted ten to twenty silver slivers swimming in the shoebox. Powdered food was added and, after a week, baby brine shrimp. I still have tiny fry swimming almost a month later. I'll keep you posted on the progress.

Last May I stayed with very good fish friend **Frank Nell** while speaking at the Jersey Shore and North Jersey clubs. Frank and I always trade fish whenever I make a journey north. While admiring a pair of *Krobia* sp. "*Xingu* orange spots" sitting on a clutch of eggs in a forty gallon tank, Frank said that he had turned them in for points already and I could take the pair if I wanted them, as he could use the tank space. The pair made the trip to NC in a five gallon plastic tote and Frank gave me a bag of half inch fry as backup in case the parents didn't make it.

Upon the return to NC the pair was housed in their own 40-gallon tank with a sand substrate and several flower pots. They were initially very shy, but fed on flake, live blackworms and frozen bloodworms. One morning while doing water changes I noticed the pair hovering around one of the pots and they both had spawning tubes extended. I carefully cleaned the outside of the glass and they ignored me doing it. Grabbing my camera I proceeded to take pictures. They ignored me as I watched the female deposit the eggs and the male fertilize them. Two days later the pair moved the wrigglers to a pit they had dug in the sand. A day later I didn't see any fry in the pit. I searched around the tank, as the parents often move the fry, and discovered a fat, happy *Corydoras metae* that I had missed while clearing the tank! Oh well. I netted out the cory and, hopefully, will be getting another spawn soon.

I often say to BAP members that getting the fish to spawn isn't always hard, but raising the fry to turn them in for points can be tricky. I'm looking forward to the Raleigh AS auction on September 14th and the Atlanta auction on September 21st and then to the Catfish Convention in October, where I can obtain some new fish after clearing tank space for the auctions.

Larry

Sy Angelicus - BAS

CATFISH CONNECTIONS

A KNIFEFISH WITH WHISKERS? AUSTRALIA'S YELLOW FIN TANDANUS

We're traveling again. This time we're visiting my Aussie relative. Sorry, no shrimp on the barbie. We both prefer our shrimp raw, frozen or freeze dried.

My niece, the yellow fin tandanus, is only very rarely available in the U.S.A. She is very athletic, spending her time swimming with her friends. Always keep her in groups or 3 or more. She seldom rests and is always swimming in a knifefish fashion.

She is very much shaped like a knifefish with whiskers; her color is a yellow tan body, with a white belly and a pretty yellow anal/caudal fin.

My niece loves freshwater, preferably hard and alkaline at 72˚ - 80˚F. She grows to 8" inches and eats all foods offered. She is very peaceful with fish her own size or larger. She makes a very good dither fish for Malawi Peacocks. Do **not** put her with fish smaller than she is. Those she will consider as snacks. Like all my relatives, she appreciates water changes, 25% twice a week is fine.

When maintained in a school, she is active and swims all day. She likes to show off her stuff. She even feeds at the surface.

I think she thinks she is a rainbow fish sometimes. Keep her tank covered; she jumps.

My niece has not spawned in the aquarium yet.

She is from very hardy stock, being from the Northeastern jungle of Australia. But if for any reason she does get ill, never use Malachite or copper for her meds. She is deathy allergic to both and will die if you use them on her. Use Methylene blue or Acriflavine and you will get good results. Formalin works too!

Because she is so active and likes to be with her friends, give her some room. She and 4 or 5 of her best friends are fine in a 55 gallon aquarium.

She never digs up or bothers plants so you can decorate with them and with rocks, but be sure to leave lots of free swimming space up front so you can enjoy her athletics.

She is very long lived in the aquarium. Some of her sisters and brothers have lived for more than 10 years.

My niece is a really good fish to have. Next time you see her, let her and her friends vacation in your tank. Just remember "shrimp NO barbie." G'day!

Sy

Editors note: This catfish is currently a protected species within Victorian waters.

Brad Kemp - BAS

TheShrimpFarm.com is the place to go for freshwater shrimp. The owner, **Brad Kemp**, has a new address: The Shrimp Farm USA, 11936 West 119th St., #197, Overland Park, KS 66213, U S A and has set up an Aquarium Shrimp Forum **http://theshrimpfarm.com/forum/index.php**. You can go to this forum and ask questions, talk to other shrimp nuts and discuss anything and everything related to Aquarium Shrimp.

Blue Velvet Shrimp

Scientific Name: *Neocaridina heteropoda.*
Other Scientific Names: *N/A.*
Common Name: Blue Velvet Shrimp.
Origin: Taiwan.
Found in the wild: No.
pH Range: 6.2 - 8.0.
Ideal pH: 7.2.
Temperature Range: 65° - 85°F.
Ideal Temperature: 75°F.
Hardness Range: 3 - 15 dkh.
Ideal Hardness: 8 dkh.
Life Span: 1 - 2 Years.
Gestation Period: 30 Days.
Size: 1/2" inch.
Diet: Omnivore.

Fresh Water Invertebrate Health Considerations

Most types of invertebrates are quite low maintenance as far as healthcare goes, so long as the quality and chemistry of your water are kept in optimum condition. With the exception of the pond snail, most types of invertebrates are vulnerable to poor quality water, or water containing high levels of nitrates. While some fresh water invertebrates are able to breathe air, for example, apple snails and crabs, most cannot do so, and could quickly succumb in tanks that have poor water conditions.

One of the most important issues to be aware of if you want to keep fresh water invertebrates is that of copper-based medication. These types of medicines should be avoided at all costs, because most types of invertebrates are extremely intolerant of these compounds. Most aquarium medications use copper, and so you will need to check carefully before you go treating your tank.

Another important consideration is that many fresh water invertebrates like to molt. Molting is a complex process, and depends on the animals receiving the right kind of diet and living in the right conditions. Under the wrong conditions, many invertebrates will not be able to molt, and will therefore die.

Anthony P. Kroeger - BAS

PRISON BREAK!
CONVICT WORM GOBIES

BEAUTIFUL MARINE FISH ABOUND, ANGELS, TANGS, BUTTERFIES AND MANY MORE. MY FIRST MARINE FISH WAS NONE OF THE ABOVE. IT WAS A CONVICT GOBIE.

Convict worm gobies do not have stunning colors. Juveniles are black with a white/silver stripe running down the lateral line. Adults are black with yellow bumblebee style stripes. The juvenile coloration disappears.

But what convict worm gobies lack in color they more than make up for in interesting behaviors and hardness.

Convict worm gobies grow to about 6 to 12 inches. They're peaceful community fish in my experience.They eat any flake, frozen or pellet food offered. Convicts tolerate any normal salinity. Temperature: 72˚ - 76˚F. Above 80˚F is too hot for them. Low nitrite and ammonia is a given, but they can easily tolerate breaking in a new tank and tolerate new tank syndrome well. This is one tough fish. It tolerates a lot of abuse and beginners mistakes.

Why keep this fish, you ask? The answer is its behavior. This is a neat fish to observe. It swims eel-like. Juveniles school,

Pholidichthys leucotaenia
Juvenile

but adults are solitary. Convicts dig! Usually under a coral head, they form a "cave." The fish build a substrate pile all around its "cave." Convicts peer out over their "cave wall" all day and dart out for food or the occasional reconnoissance of its tank.

Convicts are not shy fish; they readily compete with tankmates at lunchtime. Convicts will feed from the surface, mid-tank and bottom.

Pholidichthys leucotaenia
Adult

They can easily swim backwards ala freshwater knife fish. Not surprising, seeing as their body shape is similar.

Keeping several of these gobies in the same tank is very interesting. Once sub-adults start to dig caves, each stakes out a territory. These territories frequently are very close and overlap. This close proximity gives the convicts ample chance to steal stones from each other's "cave wall." When the walls collapse, a new digging binge ensues. Their behaviors are entertaining and a delight. Try your own prison break. Try a convict worm goby or better yet, several.

Happy fishkeeping.

Tony

SPECIES PROFILE

Family: *Pholidichthys leucotaenia.*
Scientific Name: *Pholidichthys leucotaenia.*
Common Name: Convict goby, engineer goby.
Origin: Indo-Pacific.
Distribution: It lives in shallow lagoons and on coastal reefs from the Philippines to the Solomon Islands.
pH Range: 6.0 - 7.5.
Temperature Range: 72˚ - 78˚F.
Hardness: 8 - 12 dkh.
pH: 8.1 - 8.4.
Life Span: Up to 10 years.
Size: .6 to 12 inches.
Diet: Carnivore. Its diet should consist of a variety of fresh or frozen seafood, brine shrimp, and mysis shrimp. It should be fed at least twice per day.
Sexing: Unknown.
Breeding: The convict goby has been spawned in aquariums. Spawning occurs in the nest once a year after the fish is over one year old. The eggs are a white adhesive mass, less than a 1/8" in diameter. Hatching occurs 7 – 10 days after fertilization. The larvae are colorless except for the eye and are around 1/4 " in length, having a small yolk sac. Around 26 days, the larvae will morph into a young convict gobie.
Remarks: It is neither a blenny nor a goby, but in fact one of two species in the family *Pholidichthyidae*. Its markings change throughout its life. Buy them in a small group (they're social animals), 3 or 5 fish, if your tank has sufficient size. As juveniles, the markings are horizontal, running the length of the body. With age, they become vertical bands.

Reference:

•www.liveaquaria.com.
•http://www.freeinfosociety.com/site.php?postnum=2303.
•http://www.redorbit.com/education/reference_library/animal_kingdom/fish/1112757218/convict-blenny-pholidichthys-leucotaenia/.

Frank M. Greco
AnimalForum.com staff - From Frank's Aquarium.com

How to Quarantine Fresh & Salt Water Fish & Invertebrates

While at first thought quarantining your newly purchased fish or invertebrate may seem to be a royal pain, this simple procedure can, in the long run, save you from a number of problems that could endanger the well-being of the animals already present in your system.

One should assume that all fish, either captive bred or (especially) wild are carriers of one form of nasty pathogen or another. From bacteria to protozoas to viruses... any or all may be waiting to cause you grief. Why take the chance of introducing something like that into an already established system when a simple quarantine can take care of this potential problem? I know... I know... you don't have room to set up another tank. Well, in most cases all you need is about 240 square inches of floor space... which just happens to be the size of a 10 gallon tank. Nor need the tank be left up and running all the time. It can be set up at a moment's notice to hold that one of a kind animal you have had your eye on. And you don't need all the fancy bells and whistles you would expect to find on a permanent set up.

In fact, all you'll need is listed here:

- 10 gal. tank (or larger if need be).
- Cover, preferably with light
- 2 or 3 pieces of 6" long 2" PVC for hiding places.
- Air pump.
- Heater and thermometer
- Biologically active sponge filter.
- Net.
- Crushed oyster shell or calcareous gravel.
- Ammonia test kit (fresh and salt water).
- AmQuel or similar product.
- Nitrite test kit (freshwater).
- Antibacterial medicated food
- Anti-parasitic medicated food
- Citrated copper (for marine fish)
- Copper test kit (for marine fish)
- Malachite green (for freshwater fish).

As you can see, not much is needed to get started, In fact the most costly item on the list is the canopy and light. This need not be an expensive fluorescent light. An incandescent fixture will do here.

Starting Out

How do you start? Quite simple. You will be setting up your tank the same way you'd set up any tank, with the exception of painting the OUTSIDE bottom of the tank black or in some way blocking the bottom of the tank (note that NO substrate is used in the quarantine tank, hence the need to black out the bottom). This will give the fish the illusion of a solid bottom, and place them more at ease (with fish, as with humans, psychological well-being goes a long way to aiding with physiological well-being).

Next, place the tank on a nice sturdy, level surface (a stand made for this purpose, preferably), and fill it with 10 gallons of water from your already established aquarium. Add the heater, PVC pipe pieces, a small amount (a handful is usually good) of crushed oyster shell or calcareous gravel in a mesh bag (to provide some buffering) and the biologically active sponge filter, and... VOILA!...a quarantine tank is born!

"Hey!", you might say, "Where do I get a biologically active sponge filter?" There are several options here. Perhaps your local dealer can sell you an active sponge filter. (A note to dealers here: since it is a good idea to have auxiliary aeration in your systems, in any event, why not utilize sponge filters? This way, when your customer needs an active sponge filter, you have plenty on hand to sell). Failing this, perhaps a fellow hobbyist can help you out. However, the easiest thing to do, in my opinion, is to always have a sponge filter on hand. This is easily accomplished by placing a working sponge filter (or two) in your sump or directly in your tank (hidden behind some decorations so that it is not visible when viewing the tank). After 4 to 6 weeks you will have an active sponge filter! After the quarantine period is over, all you need do is remove the sponge filter from the quarantine tank, rinse it under hot water, and place it back into your tank/sump for bacterial re-colonization. Really, what could be simpler?

O.K., now the tank is up and running. All environmental parameters check out (so far). What next? You'll want to add the fish, of course. Follow whatever acclimation procedures you normally follow (which, in my case, consists of netting the fish from the bag to the tank while yelling "ACCLIMATE!").

NEVER dump bag water into your quarantine or main tank. Always net the fish from the bag. Allow the fish 24 hours to settle in before starting treatment.

FRESHWATER QUARANTINE PROCEDURE

For those of you quarantining freshwater fish, please read on. For those dealing with marine species, please skip down three paragraphs.

For freshwater fishes, the quarantine procedure is quite simple:

First, you will want to feed your fish an antibacterial medicated food twice a day for 14 days. Feed as much as the fish will eat in 2 minutes or so at each feeding. Bacterial disorders are the most common cause of death in fishes, and it pays to give a preventative treatment here. If you are dealing with wild-caught fishes, you will also want to supplement this with an antiprotozoal medicated food (antibacterial diet at one feeding and antiprotozoal at the other) to rid these fish of whatever intestinal parasites they may be carrying. There are antiparasitic diets that contain both an antiprotozoal and an antibacterial, and this type of food can be substituted in place of the two separate diets.

Next, you will want to treat the fish with malachite green. I know some of you must be shaking your heads, saying that malachite green will kill some freshwater species. NONSENSE! When dosed correctly, malachite green is safe for even the most so-called sensitive species.

The dose I use, and have been successful with, is 0.05 PPM malachite green for three treatments, one every other day. At this level, your fish should not experience malachite sensitivity. Of course, dosing at 0.05 PPM means doing more than adding one drop per gallon. To figure out the correct amount of liquid to add, you take the concentration of malachite green listed on the bottle (in percent), and convert it to milligrams per milliliters (10 percent = 1000 milligrams per 100 milliliters of water). Divide the milligrams per milliliters by the final concentration. This will give you the results in milliliters/liters. To convert to gallons, divide the number of liters by 3.8. For example, we have a 10 gallon tank, want a final concentration of 0.05 PPM (or 0.05 mg/l. It's interchangeable for our purposes), and we are using a 0.75% malachite green solution. So...0.75% = 7.5 mg/milliliter. 7.5 mg/ml divided by 0.05 PPM (or mg/l) = 1 ml per 40 gallons. Since 1 milliliter is about 16 drops, we will need 1/4 of that, or 4 drops per 10 gallons of a 0.75% malachite green solution.

Now for the kicker: most malachite green based medications

advise ONE DROP PER GALLON of a 0.75% solution. This works out to 2.5 times the amount actually needed. No wonder some hobbyists lose fish when using malachite green: they have severely overdosed!

Anyway..to continue...

You want to dose at least three times, once every other day for three treatments, all the while feeding the medicated food(s). While the malachite treatment will last only six days, you really want to continue the quarantine for another eight days. If after this time period no obvious signs of disease are present, you may safely add the fish to your established tank.

If obvious signs of another illness show themselves (for example, a lesion caused by an external bacterial infection), you will need to treat that as well, in conjunction with the malachite treatment. Nitrofurazone, or any of the furan-type antibiotics will usually effect a cure.

Please note that malachite green, being an organic dye, will stain clothing, skin, the silicon sealant in your tank...almost anything! If fabrics or silicon have become stained, you will need to live with it since this stain is not removable. Malachite green inadvertently gotten on skin should be rinsed off as soon as possible. The stain left behind will wear off within a few days.

During this 14 day period, you will want to monitor both the ammonia and nitrite levels in the tank, and take appropriate actions if you notice an increase. If the ammonia level is slight, the addition of AmQuel or similar product will take care of it. Just be aware that AmQuel will lower the pH of the system, and constant use can bring about pH readings of 4 or lower!

Hence the use of crushed oyster shell or calcareous gravel in the tank: it will help in maintaining an acceptable pH range. If the ammonia level continues to rise, a water change (up to 50%) is in order. Remember to re-dose the appropriate amount of medication after the water change. If the nitrite level begins to climb, the addition of aquarium salt at one teaspoon per gallon will negate its toxic effects.

MARINE FISH QUARANTINE

If you have a marine system, the process is a bit more complex.

First, the acclimation of the new fish is the same, but you want to give the new arrival at least 24 hours to recuperate from bring moved before you begin medicating. If the animal does not begin to eat within 24 hours, hold off treatment until it does begin to take food.

Next, you will want to add enough citrated copper to bring the level up to 0.15 PPM (you can really go as high as 0.20 PPM, but no higher, please). I know many of you use heavily chelated (or bonded) coppers, but I advise against their use. First off, in order for copper to be truly effective, it must be in its ionic state. Heavily chelated coppers, by definition, are not in that state, and so are less than useful. The fact that, in my experience, crabs and shrimp can live in systems treated with heavily chelated copper attests to its ineffectiveness in most cases. (Try that in a system treated with an ionic copper. The inverts do not live very long). Secondly, the level produced by some chelated coppers may be far higher than is actually needed to control the disease organism (which should also tell you something. At as high a dose as some of these chelated coppers produce, the fish should be dead). This higher-than-needed dose is actually detrimental to the fish in the long run in several other ways: gill degeneration, liver shutdown, anemia, compromised immune system...the list goes on. There is absolutely NO need to subject the fish to levels far above what is needed to treat the condition.

How do you know how much citrated copper is in your system? You'll need to get a good test kit in order to measure the level. Personally I advise the powdered reagent kits over tablet or dipstick based kits, as they are far more accurate. (I have checked many a test kit against atomic absorption readings, and many are consistently off, especially when testing marine water).

In the beginning, you may find it difficult to maintain a 0.15 PPM level due to the calcareous material in the system. This is to be expected as the carbonate reacts with the copper, forming copper carbonate. At first, you will need to check the level twice a day, and add copper as needed to maintain the 0.15 PPM level. Once you get two consecutive readings of 0.15 PPM, you can consider that day one, and you can begin

monitoring the level once a day, adding copper as needed.

You will want to continue this regimen for 14 days. During this treatment period, you will also want to feed the fish an antibacterial medicated food.

Doing so does help the fish fight off systemic bacterial problems since the copper treatment does tend to compromise the immune system to a degree. After 14 days, do a 50% water change (to bring the copper level down), and wait 24 hours after that before adding the fish to your established tank.

As with freshwater fishes, if obvious signs of any other diseases show up, treat with the correct proprietary medication for the appropriate period of time. For copper sensitive species, you can use malachite green at 0.10 PPM (which ends up being 8 drops of a 0.75% solution per 10 gallons). Treat every other day for three treatments, wait two days, and repeat. As always, monitor water quality and take appropriate action if it degrades. Please note that this treatment is NOT as effective as copper, and will not result in the same kill rate of parasites. There are other non-copper based medications that can be used (such as chloroquine phosphate, pyrimethamine, quinacrine and other proprietary medications). In my experiences with them, most are FAR less effective than is copper, and should be used only as a last resort. Also note that I have not mentioned the use of formalin as a viable treatment. There are MANY chemotherapeutic mixtures that contain formalin. However, IMO and IME, formalin should NEVER be used as part of a mixture. If one is to use it (and there is no reason why one should), it should be dosed separately, and at its correct therapeutic dose. The fact that, if dosed incorrectly, you can kill your fish quickly and that it can be injurious if gotten into ones eyes is reason enough to stay away from formalin.

QUARANTINING INVERTEBRATES

As for invertebrates, there really is no set procedure for quarantine. Luckily, few inverts can be considered carriers of pathogens. A simple 14 day quarantine without any chemotherapeutics is your best bet. It is important though, to fully quarantine all new corals, both stony and soft, before introducing them into an established tank. With all the new epizootics occurring on the reef, there is a great chance of introducing these pathogens into your tank, thereby wiping out your coral collection.

NOW WHAT?

O.K., your fish are through quarantine, and there are no new fish on the horizon. Now what? Simply break down the tank. Rinse everything (except the sponge filter) out with warm (NOT HOT OR BOILING) water into which a little bit of bleach has been added. (Please wear eye protection and gloves when using bleach in this manner. Also realize that bleach will eat some fabrics, and cause color loss in fabrics not intended for bleaching). The sponge filter should be rinsed in HOT water, with no exposure to bleach (some sponge material used in sponge filters reacts poorly to bleaching). Allow everything to dry, and put it away until it is needed again.

So you see, setting up and using a quarantine tank is not difficult or complicated. Remember, it is better to control a disease in a smaller tank, treating beforehand, than it is to treat in a large system. A little preventative medicine is your best bet.

AUTHOR'S NOTE

The information and procedures contained within are based upon techniques (with minor modifications) that have been used for many years at the public aquarium at which I work. I am not saying that this article contains the final word on the subject. Far from it.

However, it does contain what I consider a practical quarantine procedure which any hobbyist can utilize to the benefit of their hobby. All opinions expressed herein are my own, and are based upon my experiences with particular products and/or techniques.

Comments regarding this article are appreciated, and should be sent to
franksaquarium@hotmail.com

Stu Hershkowitz, BAS

Exchange Editor's Report

The Exchange Editor's job is reading publications from different clubs and suggesting items of interest to our members.

Our esteemed President, **Joe Graffagnino**, was the honored speaker at the Central New York Aquarium Society in the Syracuse area for their September meeting. I understand that he survived and they survived and no one was hurt.

Did anyone go to the ACA (**American Cichlid Association**) annual convention this year? It was held in Louisville, Kentucky, July 10-13, and had quite an array of speakers like **Juan Miguel Artigas Azas, Ad Konings, Dr. Paul Loiselle, Joe Fredenzi** and **Willelm Heijns**, to name a few. If you attended, the members would like to hear from you. Perhaps you can share your experiences at our general membership meeting. This would inspire others to attend as well.

• **New Hampshire Aquarium Society,** ***The Granite-Fisher***, Volume 23, Number 6 June 2014. **Bill Janetos**, the editor, publishes the NHAS list of their library books and videos that are available for their members to look at if interested and the selections will be brought in to the next meeting. Pretty neat, eh?

• **Greater City Aquarium Society** - New York, ***Modern Aquarium***, Volume XXI, Number 4, June 2014, has several articles that are worth reading, one of which is ***"The LFS (Local Fish Store) Report"*** by **Dan Puleo**. He does a 'spotlight' on the **Franklin Pet Center** located in Franklin Square, N.Y. He spent some quality time with the current owner, **Manny**, who like the rest of us began his involvement in the trade as a hobbyist. It is a nice piece, very well done and worth reading.

Alexander A. Priest also provides a list of the 2013 FAAS Awards. The list covers 11 clubs and numerous categories and even more winners. You can view the current and past lists by going to the FAAS website at **www.FAAS.info** and click on 'Publication Awards' and see the listings for the past 8 years or so.

Jules Birnbaum writes an article ***"Water and the Fishkeeper"*** which of course goes into how important the chemistry of water and its filtration related to fish as well. Did I mention water changes?

"The Pea" is a well done story and photos by Stephen Sica chronicling his and his wife's visit to the Caribbean two years ago and some really nice pictures of a trunkfish, Latin name *Lactophrys triqueter.* Once again, very well done.

That's it for now. See you all next issue. Happy fish reading.

STU

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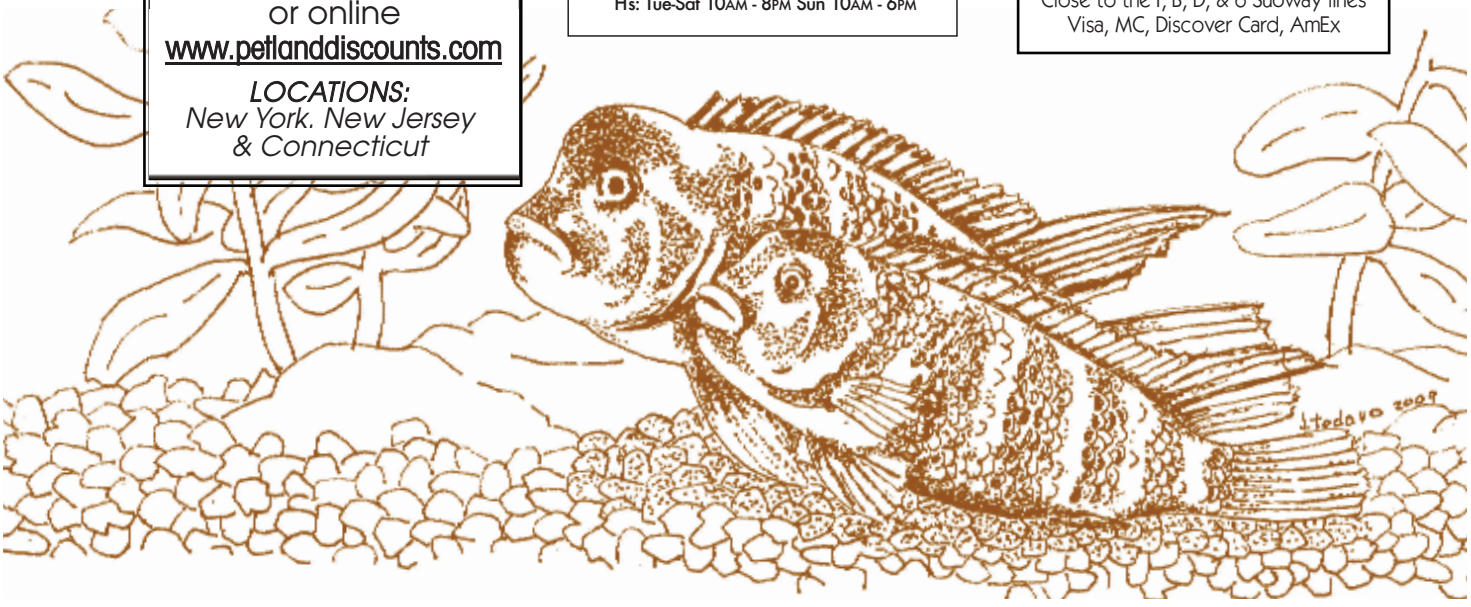

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Membership & Renewal Application Brooklyn Aquarium Society

Mail This Form And Your Check Payable to Brooklyn Aquarium Society to
BROOKLYN AQUARIUM SOCIETY, ATT: MEMBERSHIP CHAIRPERSON
P.O. BOX 290610, BROOKLYN, NEW YORK 11229-0011

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

NAME_____OCCUPATION_____

ADDRESS_____CITY_____STATE____ZIP_____

PHONE (DAY) _____(EVE)_____(FAX)_____

E-mail Address_____

TYPE & LENGTH of MEMBERSHIP: (CHECK ONE)

INDIVIDUAL				FAMILY				[ ] $15 STUDENT 1YEAR
1yr. $20	2yr. $36	3yr. $51	4yr. $68	1yr. $25	2yr. $45	3yr. $63	4yr. $85	(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] **other**_____

To volunteer check [yes] [no] A board member will contact you if you check yes.

On occasion, the Brooklyn Aquarium Society uses its mailing list to send notices of interest to our members.
If you **DO NOT** wish to receive these mailings please check here [ ]

Official use

Member number:_____ Type of membership [F] [I] [S] Date paid:_____ Board approved date _____
Amount paid:_____ Renewal/member since_____