AQUATICA

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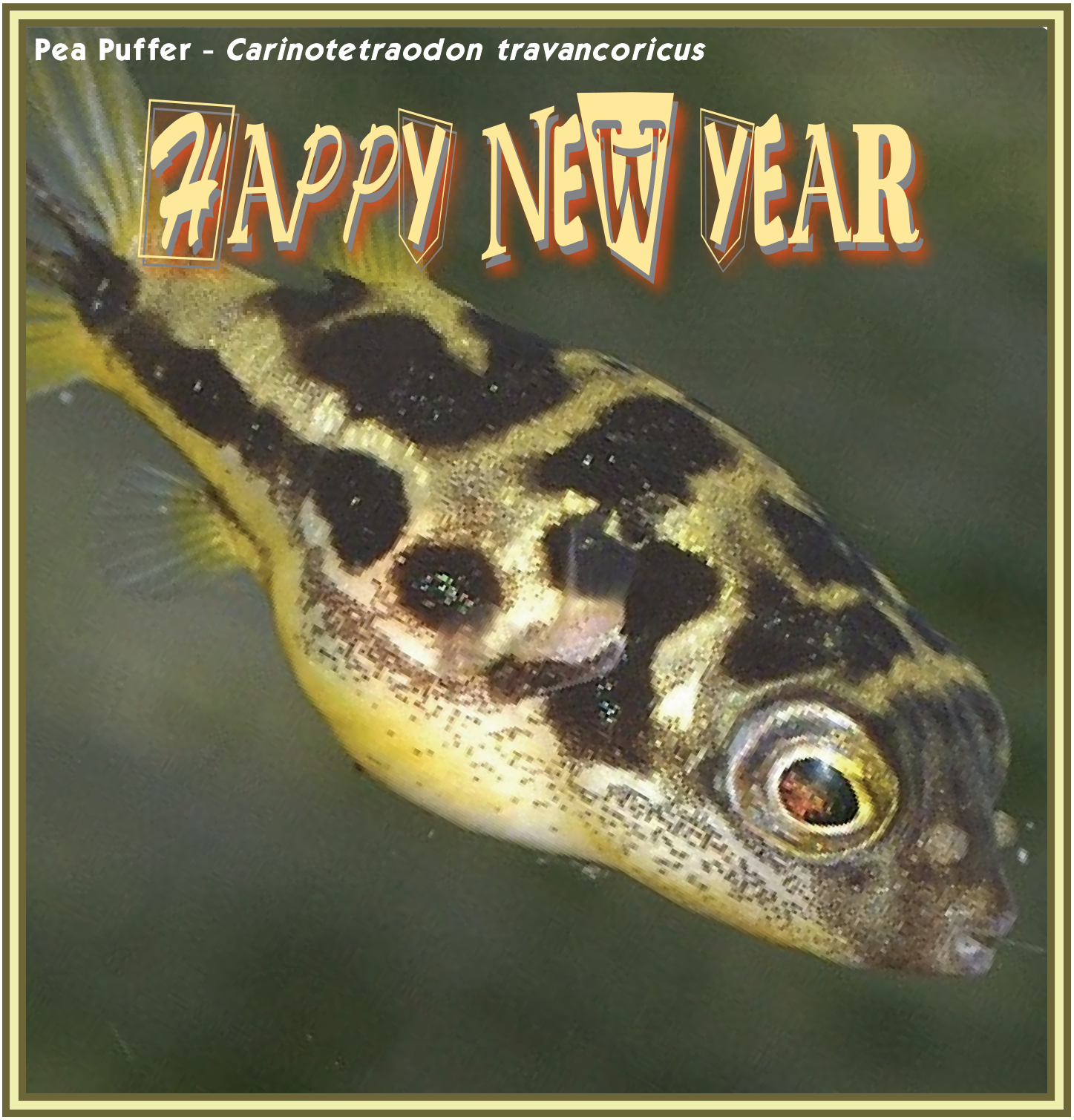

105 Years of Educating Aquarists

AQUATICA

VOL. 30 JANUARY - FEBRUARY 2016 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 ~ 2016

2016

JAN 8 Jeff Bollbach ~ Getting Rich Breeding Fish ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

FEB 12 Joe Caparatte ~ Triton Method ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

MAR 11 Sal Silvestri ~ Breeding & maintaining *Apistogramma* Genus and Other S. America Dwarf Cichlids ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

APR 8 Richard Pierce ~ Seahorses, Pipefish & Sea Dragons ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

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

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

JULY/AUGUST - NO MEETINGS

SEPT 9 Speaker TBA ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

OCT 14 Giant Fall Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a new 5 gallon tank & stand.

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

DEC 9 Holiday Party ~ Members, their families and friends dinner.

• Fish Bingo & Prizes • BAS awards presentations.

Anthony P. Kroeger - BAS

The PUMPKINSEED

Lepomis gibbosus

The U.S. is home to many species of sunfish. One of the prettiest is the pumpkinseed.

The top half is brilliant orange. The entire body is overlaid with neon blue stripes. This fish has an opercular flap with a large black spot on it. This spot is edged in neon blue above and below. A fire engine red spot trails the black spot. Fin rays are black. The caudal is edged in blue and all fins have neon blue dots on them. This is a **very** pretty fish.

Pumpkinseeds are native from southern Canada to South Carolina, including New York. They also occur from the Great Lakes down to the Mississippi River.

In the aquarium, they usually grow to about 8" inches, though sometimes larger. Pumpkinseeds are a very popular aquarium fish in Europe.

Pumpkinseeds live in shallow cool waters and lakes in nature. They usually stay near cover. A 55 gallon aquarium can easily accommodate half a dozen pumpkinseeds.

No heaters are needed; room temperature is fine; pumpkinseeds like cool water and rapidly fall ill to opportunistic bacterial diseases above 75˚F.

Their water must be clean and well filtered. They do not tolerate ammonia or nitrite. I suggest power or canister filters for their tank; a sandy bottom, a few smooth rocks some flower pot caves and driftwood should complete the scene. I use Vallisneria and Hornwort as cover plants for them.

Pumpkinseeds eat any frozen food and will take pellets and flake foods over time. They love to eat snails!

They are peaceful with any fish they cannot swallow and usually do not bother each other except at spawning time.

The breeders must be chilled to 55˚ - 60˚F for one month prior to breeding. I feed the breeders heavily on earthworms and beef heart prior to breeding.

Raise the temperature to 68˚ - 70˚F. The male's belly glows orange. He digs a pit that the pair will spawn in. Remove the female after spawning; the male will guard the eggs which hatch in about 3 days. Then remove the male once the eggs have hatched. The fry take baby brine shrimp once free swimming and are easily raised and grow quickly. I change 25% of both the fry and adults' water twice weekly.

Pumpkinseeds are very pretty and fun to breed. Try this notable native, you'll be glad you did.

Tony

* NOTE: In some states, pumpkinseeds are considered game fish. Check with your local wildlife department before obtaining this fish.

SPECIES PROFILE

Scientific Name: *Lepomis gibbosus*
Common Name: Pumpkinseed, Sunfish, Sunny,
Distribution: New Brunswick to the east coast to South Carolina in lakes and ponds.
Temperature Range: 55˚ to 70˚F.
Life Span: 6 to 12 years.
Size: 6 - 10 inches.
Temperament: Peaceful but they will eat smaller fish. If kept with other fish, they should be robust and larger than the Pumpkinseed, but not overly aggressive.
Sexing: Difficult to sex. Males are more colorful and aggressive; females plumper when in breeding condition with eggs.
Diet: These fish are carnivores and eat invertebrates, fish, and insects. They quickly convert to thawed frozen foods and cichlid pellets are a good staple.
Breeding: Once water temperatures reach 55-63°F in the late spring or early summer, the male pumpkinseeds will begin to build nests. Nesting sites are typically in shallow water on sand or gravel lake bottoms. Females are able to produce 1,500 to 1,700 eggs, depending on their size and age.

Once released, the eggs stick to gravel, sand, or other debris in the nest. Fry hatch in 3 days. The male guards them for about the first 11 days, returning them to the nest in his mouth if they stray from the nesting site. Fry are easy to raise.

Reference:
• wikipedia
• *The Encyclopedia of Freshwater Tropical Fishes,* Expanded Edition, H. Axelrod, TFH Publications, 1996.

REFLECTIONS:

The Biogeography of Cichlids

Biogeography is a fancy word used to describe the location of organisms on the face of the earth. In other words, why are certain cichlids located where they are? Or, equally, we can ask the flip-side of the question: why are they not located elsewhere? The issues of cichlid biogeography raise all sorts of fascinating questions, many unanswered, about these wonderful fishes, such as "how did they get there?", "when did they get there?", "could they live if they got somewhere else?"

For a cichlid to be found someplace, two key things have to happen. First, the fish has to get there. Second, the environment has to be suitable.

Consider California. While we have no native cichlids in California, cichlids can and do live here now. In past installments, I have talked about the Salton Sea tilapia that live in massive numbers in southern California. This population has persisted for at least 50 years. Similarly, there are cichlids, such as convict cichlids, found in the hot springs of Nevada, on Oahu (Hawaii) and even in a few locations in Canada! Of course, these were all introduced by humans. The fact that they are found in hot springs suggests that heat may be a key factor to their survival. In general, cichlids tend to be found in warm water and so the cooler waters of middle to northern California may not be suitable. But that is not entirely true either. If you travel to the southern end of South America, down to Uruguay or Argentina, you will find cichlids quite far south, i.e., in regions that are definitely not tropical. In fact, Buenos Aires, Argentina, has a climate not much different than San Jose or Sacramento. Sometimes it even snows there in the winter and yet cichlids persist. So, clearly, it is more complicated. In fact, we know that the cichlids from Uruguay seem to do quite well in subtropical or even temperate environments. Some cichlid hobbyists have even argued that these cichlids do less well if maintained in constantly warm water, i.e., they need the winter cooling to thrive. I think the jury is still out on that point.

There is also the matter of short-term versus long-term survival. Conditions vary. The Florida fish farmers know this all too well. While much of lower Florida is suitable habitat for cichlids in most years, every now and then, a cold-snap will kill off thousands upon thousands of cichlids in the fish farm ponds. So, while most years Florida is a great place to be for a cichlid, these cold snaps ensure that in much of the state cichlids cannot survive long-term. The same is likely also true on the northwestern side of the Gulf of Mexico, in Texas and Louisiana. Cichlids are found in the hot springs near Austin and San Marcos, Texas and more recently have moved up around the north coast to the New Orleans area where they live in waters not fed by hot springs. They seem to be doing fine, but they might not be able to survive the occasional harsh winter.

There are cichlids in other extreme environments. For instance, there are cichlids in desert environments in north Africa and western Asia, such as the cichlids of Iran. Then, there are the "soda cichlids" of Lake Natron in Tanzania, East Africa, living in water with temperatures exceeding 100˚F and a pH of 9.5 to 10!

There are cichlids in other bizarre places. For example, there are cichlids found in the crater lakes of Central America and West Africa. How did they get there? A crater lake is a volcano that has filled with water. In present terms, the volcano is currently "dormant," but there are no guarantees

with volcanos. So, crater cichlids by their very nature, have a limited shelf-life. But how did they get there in the first place, because water seldom runs up a mountain? Biologists use the word "dispersal" to talk about this phenomenon. In other words, how did the cichlids disperse into the crater lakes? Molecular studies tell us that in some of these cases, while there are multiple species in the lake now, the lake was likely colonized a single time and then the colonists evolved into multiple species. So, the colonization event was likely rare, perhaps only a couple of fish which went on to exploit their newfound habitat. The classic explanation is transportation by birds. At first this sounds unlikely, but it is more plausible than you might think at first thought. If you have ever watched fish eating birds for a period of time, you will notice that not all fish go easily to their assumed fate, having being caught by the talons of a bird or in a beak. A fish might wiggle. It might squirm. And sometimes other birds will, in mid-air, attack a bird carrying a fish, during which time the prize falls from the grasp of the bird.

There are cichlids in other bizarre places. For example, there are cichlids found in the crater lakes of Central America and West Africa. How did they get there?

And sometimes, if the fish is lucky, it lands in a body of water, perhaps an uninhabited crater lake. The odds are low. The odds increase if the distance from the existing population is short. So, for instance, Lake Xiloa is a small crater lake with about a half dozen species of cichlids, found a few miles from the much larger Lake Managua in Nicaragua. And in fact, most of the species found in Xiloa, such as convict cichlids, *Archocentrus nigrofasciatus*, Midas cichlids, *Amphilophus* spp., *Hypsophrys nicaraguense*, *Astatheros rostratus*, *Parachromis dovii* and *P. managuense* are all found in Lake Managua. This lake may have been colonized many times in the past, possibly by bird droppings.

There is, of course, another possibility, namely human transport. It is possible that people caught and moved fishes in the past. Why would people do such a thing? For the same reason people do such things now. Perhaps the native fish habitat was a little too far away to go fishing and so people moved the fish, hoping to establish a local, more convenient, population. Although we now know the incredible ecological damage such introductions can have, people continue to do this today, largely for selfish reasons, and there is no reason to expect that past humans were any more ecologically savvy. This is a difficult proposition to test, but perhaps in the future we will have the tools to look at this question in more detail.

Other distributions may have a different explanation. For instance, sometimes we find fish in one location, separated by a substantial "fishless" zone, from another location. Neither location is the top of a mountain, like a crater lake, but there simply does not appear to be any easy way to get from A to B. In my last installment, "The Ever-Changing Stage," I alluded to this when I talked about the changes that are constantly occurring in the natural environment, even setting aside the huge changes humans are imposing. The answer to these "disjunct distributions" as they are called, is most likely that the world we see today is not the world of yesterday, or likely tomorrow. Rivers and lakes rise and fall, sometimes incredible amounts. In fact, the ocean level has risen and dropped dozens or even hundreds of feet over the last thousands and millions of years.

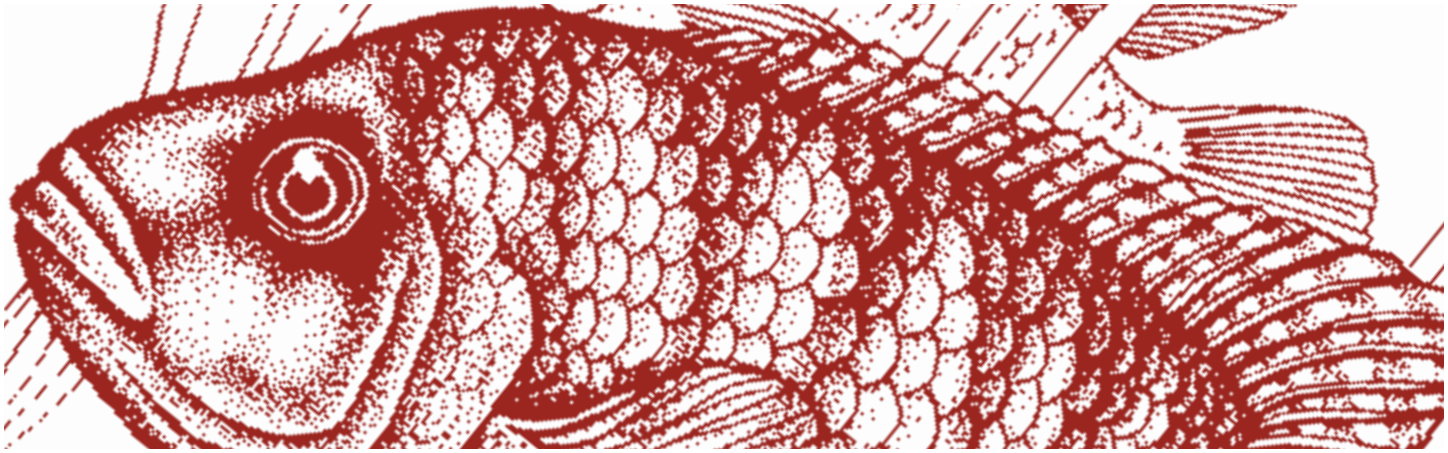
We typically imagine the world as more or less stable, much the same today and yesterday. It is only when we experience such events as the earthquake which rocked the Napa Valley region a few weeks ago that we are jolted with the reality that the earth is much more like a roller coaster ride at Disney or Magic Mountain than sitting in a parking lot. The place is in motion all the time. We plan our lives, and our buildings, even whole cities on the assumption that the water level will be exactly where it is today. Storms such as Hurricane Sandy on the east coast a few years

ago remind us that our precious six or ten feet of seawall is largely meaningless to a rising ocean. And that was just one storm. Imagine the ocean rising or dropping 40 feet, or 100 feet. The world would be very different. In a world with an ocean 50 feet lower, shorelines would push many miles further out to sea, and so rivers would be greatly extended out to the shoreline. Indeed we have heard this in various talks at the PCCA meetings about Lake Malawi: in years when the water level is lower, the shore may move half a mile or more into the lake. What was once a quick hop into the lake, becomes a long walk just to get to the edge of the lake. Oceanic islands, such as those in the Caribbean, though isolated now, might have been joined in a world with a lower ocean and deep passages could easily have been shallow bays.

And indeed, it is now well established that it is no accident that South America and Africa seem to fit together like puzzle pieces; they were once part of the same land mass.

One of "big problems" of cichlid science is understanding the relationship between Old World and New World cichlids. As we develop a deeper understanding of the phylogeny – the evolutionary relationships – of the cichlids, we are getting closer to being able to answer exactly when and how the cichlids got divided onto these two great land masses. If you look at the map today, the east coast of South America and the west coast of Africa are far apart, thousands of miles. But as I said, the world was not always this way. The crust of the earth is made up of many plates (some large, some small) which float around on the hot mantle below. The movements are slow by our standards, but over geological time, huge changes have taken place. And indeed, it is now well established that it is no accident that South America and Africa seem to fit together like puzzle pieces; they were once part of the same land mass. The question as far as cichlid distribution goes concerns timing. Exactly how old are the cichlids (40 millions years? older? younger?), and exactly where were the continents at the time cichlids first evolved? Were they still together or had they already separated somewhat? But then again, where was the water level? If the oceans were lower, then the distances between the continental masses and their respective freshwater habitats (home of most cichlids) may have been less than we might have thought with higher ocean levels. And finally, throw into the mix the fact that cichlids can survive in some rather harsh habitats, including salty water, and bits of the puzzle start to fall into place. The puzzle is not yet complete at this point, but it is the coming together of many branches of science, including geology, hydrology, computer graphics, and many aspects of biology that offers promise that in the near future we may have much clearer answers.

These are exciting times for people interested in cichlids!



Stan Chechak – GPAS
Finformation, April 2015
The newsletter of the Greater Pittsburgh Aquarium Society

MALABAR PUFFERFISH

Carinotetraodon travancoricus

Physiology and Ecology:

Carinotetraodon travancoricus **has many common names in addition to "Pea Puffer". This small member of the** ***Tetraodontidae*** **(Pufferfish) Family is also known as the Pea Pufferfish, Pygmy Pufferfish, Dwarf Pufferfish, Bumblebee Puffer, and Marble Puffer. Since they are native to the freshwater Pamba River in Kerala India,** ***Carinotetraodon travancoricus*** **is also known as the India Malabar Pufferfish or Malabar Puffer. Even though they are related to marine and brackish water species of puffers,** ***Carinotetraodon travancoricus*** **is endemic to freshwater locations in the wild. The Pea Puffer is one of the smallest member of the** ***Tetraodontidae*** **Family with a maximum size of approximately 1 inch (total length). Considering their spherical body shape and small size it is easy to see why they are called "Pea" puffers.**

I had first seen Pea Puffers in local fish stores about five years ago. Even though they are a "cute" fish with an interesting body shape and large "puppy dog" eyes, I never bought any since they only eat "live" food. Other negatives that people associate with the Pea Puffer are their territoriality, fin nipping, and dental issues. Interestingly, the first two negatives seem to be mutually exclusive. Supposedly, if you keep Pea Puffers in a community tank fin nipping becomes evident, but they do not become overly territorial. However, if kept in a species-only tank, there is very little fin nipping, but their territoriality kicks into high gear. One "positive" that is usually mentioned when discussing Pea Puffers is their never ending appetite for snails. Adding Pea Puffers to a tank with troublesome snails is a good way to get rid of the snails, provide live food for the puffers, and also keep their continuously growing teeth in check (i.e., the dental issue).

Early Experiences

While recently visiting my daughter's family in Houston, my son-in-law took me to a meeting of the Greater Houston Aquarium Club (GHAC). One member of the club was very enthusiastic about his love of Pea Puffers. Based on his helpful tips, I decided to give the Pea Puffer a try when I returned to Pittsburgh.

I bought three Pea Puffers which were about 1/2 to 3/4 inches long. I placed them in a 5 gallon aquarium that contained Java Ferns, Java Moss, and SNAILS. I was hopeful the puffers would "take care of" the dozens of unwanted Ramshorn and Pond Snails in the tank. Within a week all that remained of the snails were their shells. Since the three puffers seemed to be getting along in the 5 gallon tank, I decided to leave them in that tank and transfer the unwanted snails from my other tanks, rather than move the puffers to another snail-infested tank.

In addition to the snails, I found the puffers liked live black worms and microworms. However, as the puffers got bigger their interest in the microworms waned. I don't know if the microworms were too small for the full grown puffers to see or if the effort to eat a lot of microworms wasn't worth the time. Maybe the puffers would rather search for bigger prey than spend the time eating the tiny worms.

Two other interesting observations: The three Pea Puffers did get familiar with me and overcame their shyness. They would follow me whenever I walked near their tank and learned that lifting the tank cover probably meant it was meal time. The second observation was they were very messy. Similar to other predatory fish, the Pea Puffers seemed to produce a large amount of waste. Considering their relatively small size, the bottom of their tank really got dirty very quickly. They did not seem to mind, so I did not need to do any additional water changes or extra maintenance for their tank.

New Tankmates

Based on my success with the original three Pea Puffers over the first four months, I decided to bid on two bags of *Carinotetraodon travancoricus* at the Greater Pittsburgh Aquarium Society, Inc. (GPASI) Spring 2014 Auction. The six new puffers (all between 1/2 and 3/4 inches long) were placed in a 10 gallon tank. After a quarantine period of three weeks for the new puffers, I transferred the original three puffers from the 5 gallon tank to the 10 gallon set-up that had the following parameters:

- **Species Tank:** 10 gallon (20" x 10" x 12")
- **Tank Water:**
  Approximately nine gallons of "aged" water (pH = 6.8, Ammonia = 0 ppm, Nitrites = 0 ppm, Nitrates = 5 ppm, General Hardness = 7 dGH, Carbonate Hardness = 4dKH, Temperature = 80oF).
- **Tank Accessories:**
  One Sponge Filter plus Air Pump and Tubing, One 50W Heater (to maintain the water temperature between 76˚F - 80˚F) plus a thermometer, White aquarium sand (~3/4" deep), Plants - Java Ferns (attached to rocks), Java Moss, Duck Weed. Ramshorn and Pond Snails. Full hood reflector with two 15 watt helical fluorescent bulbs.

Even with nine puffers in the 10 gallon tank, there were enough plants (especially Java Moss) to prevent rampant territoriality. Since it is difficult to differentiate the genders, I wondered if the three original puffers were all the same sex. I had never really seen any type of mating behaviors with the original three. By increasing their number, I hoped to have fish of both genders and possibly spawn the puffers.

Spawning the Pea Puffers

About a week after combining all the fish in one tank I noticed a smaller (male?) swimming above and to the side of a larger heavier (female?) fish. The smaller puffer was herding the larger one into a clump of Java Moss. Unfortunately, I never actually got to see the fish release any eggs or fertilize them. Later that afternoon I moved the clump of Java Moss to the 5 gallon tank that originally housed the first three puffers, even though I could not see any eggs in the moss. Since Pea Puffers are notorious egg and fry eaters, I moved the moss in the hope it still contained some fertilized eggs. The 5 gallon tank had the same water parameter as the "spawning tank" and did not have any (egg eating) snails, thanks to the former residents.

Raising the Fry

Four days later I saw a number of tiny fry near the top of the 5 gallon tank. It was not possible to see if they had yolk sacs. A couple days later,I squeezed the sponge filter to release "scrunge" into the water and provide a cloud of bacteria and tiny organisms for the fry to eat.

The growth rate was slow such that the seven 1 month old fry were only about 1/8 inch long. At 1 month, I started to feed them a varied menu of cultured live worms (Banana Worms, Walter Worms and Microworms) twice a day. By the end of the second month, they were about 1/4 inch long and I started also giving the fry cropped live black worms three times a week. I quickly discovered the black worms did not need to be chopped into tiny pieces for their tiny mouths. The fry were not at all shy about chomping on the whole black worms with their large teeth and sucking the pieces in like spaghetti. Numerous tug-of-wars broke out at feeding time. Once the fry were eating the live black worms, they seemed to undergo a growth spurt. By the end of the third month, they were about 1/2 inch long.

Since Pea Puffers are carnivores, it is not surprising there was cannibalism among the fry. I only got three fry out of the first spawn. Those three are now about six months old and approximately 3/4 inch long.

Recipe for Spawning / Raising Fry

After the first successful spawn, I continued to follow the same routine. Whenever I would see two puffers swimming together and/or go into the Java Moss, I would replace the clump later that day. The Java Moss from the "spawning tank" was placed in a 5 gallon tank that had similar water parameters and another clump of moss was transferred to the spawning tank. Within 4-5 days there were usually fry in the 5 gallon hatching tank. The first food for the free-swimming fry was scrunge squeezed from

their sponge filter. At approximately 1 month, I started the Microworms/Banana Worms/Walter Worms* rotation of cultured live foods. When the fry were about 3 months old, I would also add live black worms three times a week to their cultured worm menu. So far I have managed to get three successful spawns (i.e., at least six fry that are at least two months old) using this routine. In order to decrease cannibalism, I have the Java Moss filling up approximately 60% to 70% of the 5 gallon tanks. This seems to provide sufficient hiding places for the fry and provide breaks in the "line of sight." The large clumps of Java Moss also provide additional food sources for the fry, in particular, the ones that are in hiding from their siblings.

Conclusions

Carinotetraodon travancoricus (aka Pea Puffers) are a great fish that unfortunately has gotten an undeserved bad reputation. With the set-up for both my species-only tank and my fry-raising tanks, I've had very good success raising and spawning these delightful oddballs. They are one of the available fish species that are more like pets than just "another fish in your tank." Their big eyes, pouty lips, "curled tails," and personalities make them really adorable. Do some research and give them a try. I guarantee you won't be sorry.

Editors Note:

*Walter Worms are approximately half the size of Micro Worms.

Feed these to the medium sized - Gourami and Barbs sized fry upwards. Use this culture instead of Baby Brine Shrimp (BBS). BBS are such a hassle (getting the water/salt correct, separating the shell from BBS, washing and rinsing BBS because some fry are intolerant of salt, and finally the expense of BBS production in general). Add to this the fact that the fry can take the Walter Worm even if they are too small for BBS.

To culture Walter Worms, you need: oatmeal, water, yeast and a small tightly covered dish like an ice cream container. For quick results, you can use more starter culture but one good teaspoon of starter is all you need, as it will be ready to feed from in 4 days. If you double the amount of starter, you can have them ready to feed in 2 days. To make, mix the oatmeal with water until it makes a medium thick bowl of oatmeal, then add a light sprinkling of yeast.

These Worms like it dark but can stand living in lighted areas, but keep them out of direct light. First thing in the morning, there will be more worms than during the rest of the day but enough to feed 4 times a day. Warmer temperatures can also speed them up when needed.

The room temperature can be up to about 85˚F, and the worms will live up to 35 days, whilst producing 60 or so young each from the 4th day on. There will ALWAYS be enough worms on hand for all the fry you can produce. Literally within days of starting your cultures, you will see the surface of your own cultures shimmering with millions and millions of Walter Worms.

To collect the Worms, just wipe the side of the container with a q-tip or children's art paintbrush. Alternatively you can add them to a jar of dechlorinated water and then use a dropper. The Worms will live for 24 hours in the tank water, and this makes them a great food as they don't foul the water as quickly as other foods.

You will be able to see that just the slightest amount will feed a lot of fry as these guys are tiny. One ice-cream container culture will feed about 300 fry 4 times a day whilst in production, with plenty left over. After about 10 days, the culture will start to smell vinegary. At this point, you should add a little bit more oatmeal to the cultures to keep them going for a couple more weeks. Before you add the new oatmeal, however, you should start up a new culture so that when the old culture dies off, you will have a new one going. By continually doing this, you can always have live foods available for newborn fry. Overall, these are an easy to culture live food for newborn fry.

For those of you who would like to try Walter Worms here is a source for them.

http://www.fishgobble.com.cart

Walter Worms, *Panagrellus Silusioides*, were first isolated and cultured when **Helmut Walter** isolated them in Germany in 2002. They were introduced to California aquarists soon after. They are slightly smaller in comparison to microworms. They are 50 microns in diameter and 1.5 mm in length. Walter Worms are irresistible to fish fry due to their constant restless movement underwater. They will survive submerged in water for approximately 24 hours. Microworm and Banana Worm are closely related species to Microworms in the phylum *Nematoda.* For free swimming nematodes, consider Vinegar eels. Very little effort is required to culture Walter Worms. While accepting of wide range of temperatures, the optimum yield will result at 68 to 80˚F degrees. Female Walter Worms will start producing up to 60 young a day after the fourth day. This will continue for the rest of their lifespan, which is 35 days. Only a container, oatmeal, and yeast is required to culture Walter Worms. First, add 1 1/2 inch of moist oatmeal in the container. Next, sprinkle a pinch of yeast on the surface and add a starter culture. It is important to maintain a moist surface on the culture at all times. The culture will be ready to harvest within a few days or until the worms start to crawl up the sides of the container. The worms can be harvested by either swiping the worms off the sides of the container or by skimming off the top layer of the culture with a dense population of worms. The latter method may result in grabbing the culture media along with the worms. In this case, the worms can be cleaned in a separate container with water and fed to the fish with a pipette. More of the smaller juvenile Walter Worms will be collected in the latter method as well compared to the first method.

Nutritional Value
Protein: 48%
Fat: 21%
Glycogen: 7%
Organic Acids: 1%
Nucleic Acids: 1%

Walter Worms, *Panagrellus Silusioides*,

You can can buy starter cultures of Walter worms on-line. They range in price depending on the size of the culture. Enter **Walter Worms** in your browser to check out the sites that have cultures for sale.

One site that specilizes in them is **FISH GOBBLE AQUACULTURE FEED**. A 1 oz culture cost $3. Find them at: **www.fishgobble.com/product/waterworm**

Another site is **SKEETERBYTES** **www.skeeterbytes.com/wworm.htm**

They sell 14 - 18 oz cultures for $18.50. Shipping is free. The culture is a full 2 - 3 cups of a Walter Worms. You can feed them to your fish as soon as you get them and also start new cultures.

Check out these two sites and other sellers on-line.

Anthony P. Kroeger – BAS

WHAT'S IN A NAME?

EVERY LIVING THING ON THIS PLANET THAT HAS BEEN DESCRIBED BY SCIENTISTS HAS A LATIN NAME ASSOCIATED WITH IT. THE NAME CONSISTS OF TWO PARTS. THE FIRST IS A GENERAL GROUPING OF THE TYPE OF FISH. THAT IS, WHAT FISH IS IT CLOSELY RELATED TO, WHAT FAMILY IS IT IN. THE SECOND NAME USUALLY DESCRIBES EITHER A UNIQUE CHARACTERISTIC OF THE FISH OR STATES THE NAME OF ITS DISCOVERER OR OTHER FAMOUSLY KNOWN PERSON IN THE FIELD. BUT SOME NAMES ARE REALLY OFF THE WALL AND FUNNY TOO.

So in this article we will look at fish names. Usually, unless you are an importer, wholesaler, store owner or a specialist collector Latin names will not be of primary importance to you.

The above people want to know exactly what they are buying and dealing with, so Latin names are very important to them.

But they are also important to regular aquarists too. Common fish names vary widely from place to place. You should want to know exactly what fish you have.

Take for example the Black Tetra, commonly available everywhere, but in the E.U. and Canada, it is known as the Black Widow Tetra in many places. However, it's Latin name *Cymnocorymbus ternetzi* is always the same. In this case, the first name means "naked nape" due to the small scales in this area. The second name is the name of its discoverer. Mr. **Carl Ternetz.**

As a second example consider Silver dollars. Every store sells these, but many species of Metynnis are sold as Silver dollars. You could go to two different stores and buy two very different species of Silver dollars without knowing you did not have the same fish, as most juvenile Silver dollar species look very similar.

Those examples illustrate why it's always best for you as a home aquarist to know the Latin names of the fish you keep.

So let's take a whimsical look at some of the weird and funny Latin fish names of the fish you may be keeping in your aquarium right now.

Everyone knows Silver Hatchet fish. But do you know their Latin name, *Gasteropelecus levis* means fish with a stomach hatchet smooth. Not very complimentary for sure!

Pity the poor Pearl danio. Its latin name is a mistake! It was described from a poorly preserved specimen. Its name *Brachydanio albolineatus* means "short danio with white line."

When you get into my favorite fish: Catfish, some of the names are real winners! Take for example the glass catfish, *Kryptopterus bicirrhus*. The Latin name means hidden fin (referring to the one ray dorsal fin) with two hairs. The catfish's whiskers!

Or as another example, the talking catfish, *Acanthodoras spinnosissimus,* which means spiny dorsal very spiny. I'm sure some naturalist got stuck pulling it out of his net! He couldn't name it **#@*%^!@&=!.** so he called it very spiny instead!

Killies are generally named pretty well. Blue Gularis were originally named *Aphyosemion coeruleum*, meaning fish with a blue banner.

But there are some exceptions: pearlfish (cynolebias) means dog tooth.

Livebearers are not immune either. *Gambusia* means nothing/worthless. Was the namer trying to say something to us?

Naturalists who named Gouramis either had a great sense of humor or drank way too much rice wine. Look at the Paradise fish, *Macropodus* means large foot! Blue Three-spot Gourami, *Trichogaster trichopterus* are twice insulted. Their name means hairy belly, hair fin! The name Three-spot Gourami at first seems a bit of a mystery. This fish actually only has two spots, the third spot is generally considered to be the eye!

Cichlids as usual steal this show generally too! Egyptian Mouthbrooders were originally called *Haplochromis multicolor*, which means plain, many colored chromide. Hmmm?

Angelfish are no slouchs either. *Pterophyllum scalare* means ladder like winged leaf.

But the real cichlid winner has to be the *Geophagus Jurupari*. Jurupari is an Amazonian demon god! *Geophagus* means earth eater. How much better can you get than being named after an earth eating demon god! That's class that only a cichlid could pull off! I tip my hat to ichthyophile. You win the Latin name game for sure!

Certainly nothing the poor scat, *Scatophagus argus* could ever aspire to. I'll let you figure out that name.

So the next time you look to buy fish, be sure to check out their Latin names too! You never know what it might be trying to tell you.

Happy Fishkeeping!

Tony

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

Veal Heart & Garlic Stew

Here's an interesting twist on the standard beef heart recipe I picked up from **David Webber**, a breeder and importer of wild discus and freshwater sting rays.

Rather than beef heart, he uses veal heart. Veal heart has less fat to trim (not always a pleasant job) and he feels no one expects young veal cattle to grow, so they don't introduce growth hormones in their foods. Also veal hearts are tender, more easily cut up and possibly easier for fish to digest.

Veal hearts cost more and are smaller, but David feels they're a better choice and well worth the price difference.

Check with your butcher or try a kosher butcher. Not every butcher carries veal hearts.

David buys 15 to 20 lbs of veal hearts at a time. It's a messy job, so he makes up 20 to 25 lbs. of stew at a time and freezes it for later use.

David also uses fresh garlic in his recipe. Garlic has been proven to act as an antibacterial in fish. David blends this recipe for discus, but it will work fine for any fish that needs a high protein diet.

RECIPE

INGREDIENTS:

10 lbs. of veal heart.
Trim off all fat and gristle.
20 to 30 fresh garlic cloves peeled and crushed. Use juice, discard skins.
1 lb. of earthworm flake food.
1 lb. of brine shrimp flake food.
Your choice of vitamins with enough water to blend.
Optional; any other ingredients or supplements you wish to add.

PREPARATION:

1. Remove all fat and sinew from the veal hearts.
2. Cut the cleaned veal hearts into 1/2" inch cubes.
3. Blend 1 cup of cubed veal heart with enough water to blend until thick oatmeal consistency.
4. Mix in other ingredients after thinning with water. Use your hands. It's messy, but it gets the job done. You can add any other vitamin supplements at this time.
5. Freeze in Ziploc® freezer bags, removing all air in bags. Lay then out on large cookie sheets to keep them flat, a quarter inch thick or so.

FEEDING:

Feed no more veal heart & garlic stew than your fish can eat in five to ten minutes. Before feeding, allow to melt slightly to facilitate breakup, or you can use a grater to grate the frozen mixture directly into the tank.

Ryan Curtis - BAS

TheShrimpFarm.com is the place to go for freshwater shrimp. The new owner is **Ryan Curtis**, with a new mailing address: **The Shrimp Farm USA, 2401 East Washington St, STE 200 A2, Bloomimgton, Il 61704** 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 Freshwater Aquarium Shrimp.

Blue Velvet Shrimp

Scientific Name: *Neocaridina heteropoda.*
Common Name: Blue Velvet Shrimp.
Origin: India, 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.
Size: 1/2"inch.
Gestation Period: 30 Days.
Diet: Omnivore.

When keeping Dwarf Shrimp in the home aquarium, one of the most exciting aspects is their ability to multiply rapidly. Most Dwarf Shrimp can double their population in three to six months, and this trait is making them more and more popular in the home aquarium trade.

For the purposes of this article, Dwarf Shrimp will be defined as any freshwater species of shrimp found in the *Caridina* and *Neocaridina* genera. These genera include the extremely popular Red Cherry Shrimp (*Neocaridina heteropoda*), the highly refined Crystal Red Shrimp (*Caridina cf. cantonensis*), and one of the first shrimp in the hobby, the Amano Shrimp (*Caridina multidentata*).

For Dwarf Shrimp to breed, there are 3 conditions that must be met. There must be a sexed pair of shrimp in the aquarium, all water parameters must be stable and there has to be a stable source of food. Each individual species of Dwarf Shrimp will have its own individual water parameter requirements and different ways of sexing the shrimp.

Sexing Dwarf Shrimp varies from species to species, but there are a few constants among most Dwarf Shrimp. In general, the female will be larger and often more colorful. The female will also have a larger, broader tail section. In shrimp

species that have a clear to semi-clear exoskeleton a saddle can be seen on mature females. This saddle is the eggs developing in the female's ovaries. Most male Dwarf Shrimp are smaller in size, often less colorful and have a thinner tail section.

Although the water requirements vary from species of Dwarf Shrimp to species, it is most important that all parameters be stable. Dwarf Shrimp should only be kept in a fully cycled and well-established aquarium. Ammonia and Nitrites are very toxic to Dwarf Shrimp and should always be kept at 0 PPM (parts per million). Nitrate can be toxic as well and should be kept below 20 PPM, with less than 10 PPM being ideal.

Many of the *Caridina* species require soft, slightly acidic (pH 6.0 – 6.8) water that is slightly cooler than tropical (65°-72° F). Most *Neocaridina* species are a little less demanding. They often require a neutral pH (6.8-7.5) and are undemanding when it comes to water hardness. *Neocaridina* species prefer more tropical water temperatures 72°- 80° F. Again, stability is the most important factor.

A healthy Dwarf Shrimp will breed more readily and more prolifically, and food is an important factor in Dwarf Shrimp health. To ensure optimal breeding conditions for Dwarf Shrimp, a constant food source must be provided. Whether it be an aquarium with a large amount of naturally occurring algae, or foods specifically intended for Dwarf Shrimp, as long as there is a stable source of food, Dwarf Shrimp will reproduce quickly.

Once the three conditions have been met and the sexed pair of shrimp are mature, the breeding process will begin. First, a female will find a comfortable hiding spot in the aquarium. Once she has become comfortable, she will molt (molting is the shedding of the exoskeleton to enable growth of invertebrates). After molting, the female will release a pheromone into the water indicating to the male shrimp her readiness to breed.

The pheromone in the water will sometimes cause the male shrimp to swim erratically in search of the female. Once the male finds the female, he will mate with her. They will mate belly-to-belly, and the male will deposit sperm. This process does not last very long, and because the female is hiding, most times it is rarely observed.

After the mating process has occurred, the female will pass her eggs through the sperm and deposit them in her pleopods (swimming legs) under her tail. The female shrimp will carry the eggs until they hatch, normally in 20-40 days. The female will often be observed fanning and cleaning the eggs. Once the eggs hatch, there is no longer any parental care of the young shrimp.

There are two types of Dwarf Shrimp, high order and low order. Low order shrimp hatch as larva and oftentimes require saltwater or brackish water to mature into small shrimp. High order shrimp hatch as miniature versions of the adult shrimp and require no special care.

Raising low order shrimp can be quite challenging. Upon hatching, the larva need to be transferred to saltwater. These larvae are very small and require food that they can fit into their mouths. Many of the larvae require single cell algae as a first food and graduate to larger foods as they grow. Once the larvae metamorphosis into miniature versions of the adult shrimp, they need to be transferred back into freshwater and cared for the same way an adult shrimp would be.

Raising young high order Dwarf Shrimp (or post metamorphosis low order) is fairly easy. They have the same care requirements as the adult shrimp and require no special attention. To increase growth rate, smaller high protein foods are recommended (decapsulated brine shrimp eggs are great). And when performing water changes (recommended 15% twice weekly), it is important to make sure not to suck up the young shrimp. Placing a piece of new panty house over the intake of the siphon tube will prevent small shrimp from being sucked up.

If you are interested in breeding Dwarf Shrimp, make sure you have a sexed pair of shrimp, place them in a cycled and well-established aquarium, and feed them well. Nature will take its course and soon you will be caring for young shrimp. Dwarf Shrimp will breed faster and the young will survive at a much higher rate if the aquarium is a species-specific aquarium. So keep these things in mind and beware of the addictive nature of caring for Dwarf Shrimp.

Ryan

Anthony P. Kroeger – BAS

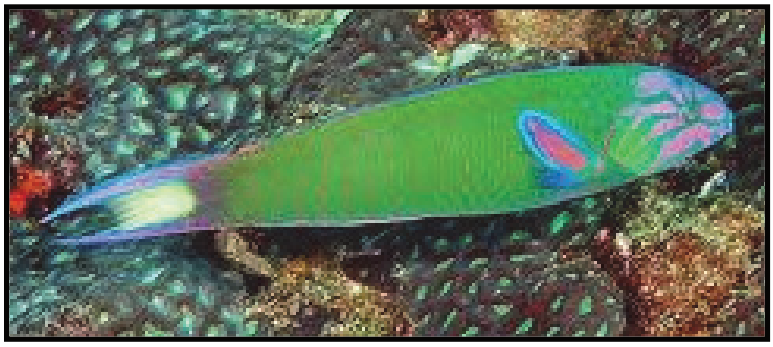
TOO TOUGH TO KILL

A Column for Beginner Marine Aquarists

#5 TOUGHIE

The Moon Wrasse

Thalassoma lunare



Color! everyone wants color in their marine tanks. The Moon Wrasse has color in spades!

The body is basically green with a purple dash reticulated pattern over the green, purple, blue and sometimes pink stripes cover the head. The caudal fin has lyretail-like pink to purple extensions. The center of the tail is moon yellow. The dorsal and anal fins are blue, purple and pink. Even the pectoral fins are pink and blue!

This is one gaudy, colorful fish.

This fish comes from many areas of the Pacific Ocean; most are imported from the Philippines or from Indonesia.

The Red Sea Moon Wrasse, *Thalassoma lunare*, trades its green body color for canary yellow. Significantly rarer and more expensive than the common Moon Wrasse, it is just as hardy.

In nature this fish grows to 12" inches; in the aquarium, it seldom reaches 8" inches.

In my opinion, this wrasse and the Florida Bluehead wrasse are excellent beginner's fish. They are very hardy and tolerant of many beginners mistakes in husbandry and are not really expensive.

Moon Wrasse do well in 1.020 - 1.023 salinity, pH of 8.0, and water temperature of 72˚ to 80˚F water. Obviously, as in any marine fish, they do not like ammonia or nitrite, but they can tolerate brief spikes during new tank cycling. They will express their great displeasure by turning black and resting on the bottom of the aquarium. A Moon Wrasse displaying this color and behavior needs an immediate 20% partial water change and subsequent 20% additional partial water changes for 5 consecutive days thereafter, to improve its

water quality.

Moon Wrasse eat any food offered and seldom fall ill with diseases. Do not keep Moon Wrasse with any crabs or shrimp; the Moon Wrasse will eat them. Corals and anemones are safe with them.

Moon Wrasse are very active. They move with an odd sort of rowing motion. The tail droops down and basically follows the fish as it rows through the water. Even small Moon Wrasse must have at least a 29-gallon aquarium to give them space to move. This fish is always front and center.

Moon Wrasse will burrow under the sand when disturbed or to sleep at night. It is not unusual for them to hide under the sand the first few days in its new home. Don't worry; it will show up. Be sure to cover their aquarium!

Moon Wrasse can be kept together in a small school and they are peaceful with other fish.

For beautiful color and constant activity in a hardy beginners fish, the Moon Wrasse are hard to beat.

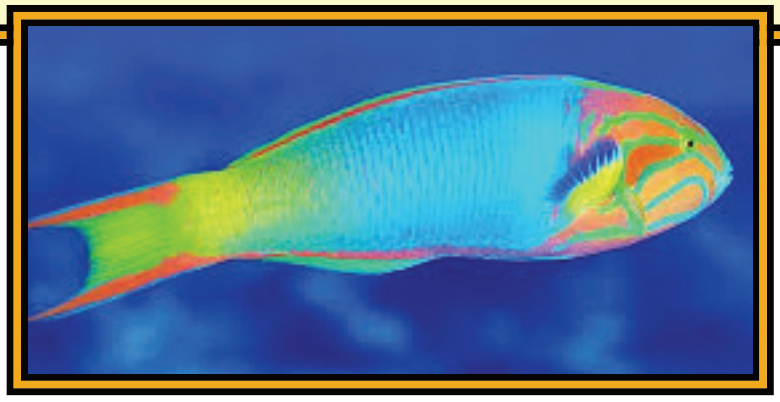
Tony

John Todaro – BAS

SPECIES PROFILE

Scientific Name: *Thalassoma lunare.*
Common Name: Moon Wrasse.
Family: *Labridae.*
Origin: Western Pacific.
Distribution: Inhabits coral reefs.
pH Range: 8.1 - 8.4.
Temperature Range: 72˚ - 78˚F.
Hardness: 8 - 12 dKH.
Specific Gravity: 1.020 - 1.025.
Reef Compatibility: Not compatible.
Life Span: Moon wrasses may live up to a decade in captivity, although this is shorter in the wild.
Size: Can grow to 18 inches in the wild. 10 inches or smaller in captivity.
Temperament: Can be aggressive with other fish.
Diet: Carnivorous. Feeds on fish eggs and small invertebrates. It may eat mantis shrimp and bristleworms. It does not eat corals or live plants..
Sexing: They are protogynous hermaphrodites, all starting off as females and changing to males, a process which, for the moon wrasse, takes only 10 days. Some moon wrasses live in groups consisted of a dominant male, and a "harem" of about a dozen other wrasses, some female and some male.
Breeding: Not bred in captivity.
Remarks: Popular fish in the aquarium trade, due to their hardiness, bright colors, and engaging behavior. They are renowned for their ability to tolerate spikes in nitrite, and eat bristle worms, a fish keeper's pest.
Reference:

- wikipedia.org
- www.liveaquaria.com
- www.freshmarine.com



Anthony P. Kroeger - BAS

PART ONE

TERRIFIC TETRAS

Von Rio Tetra
Hyphessobrycon flammeus

In the next four upcoming columns, I will discuss 4 terrific tetras for the home aquarist which are especially good in community tanks and-best of all-are all readily available. All are easy to feed, colorful and stay a reasonable size. Prices for these tetras are usually low and will not break the bank.

We'll start our discussion with one of the best (in my opinion) tetra there is: The Von Rio Tetra also known as the Flame Tetra. This fish is native to Brazil around Rio De Janeiro. It was introduced to the hobby over one hundred years ago and is still popular and available today. Growing to only 1 1/2 inches, the Von Rio Tetra is a very hardy fish. This beautiful tetra has brilliant red anal, pectoral and caudal fin a reddish lower body, chocolate/brown nape and shoulder areas. Two black vertical bands extend back from the shoulder area. Their belly is a yellowish white. Gold spangles highlight the gill covers. Their eyes are black with a neon blue iris. Anal and pectoral fins are edged with a narrow black stripe. The first ray of the dorsal fin is snow white. A very pretty fish indeed! As long as it is comfortable in its surroundings, it always shows off its colors by flitting around the aquarium with its fins fully extended and erect.

An orange mutation is available where the red color is replaced with a tangerine orange color. Both variations seem to be equally hardy.

Von Rios are shy and retiring and do not show good color unless the conditions are to their liking. What do they like? Well, they are not demanding and very easy to satisfy.

Keep in mind this is a schooling fish, always try to buy at least 6 specimens. Their price is so cheap that 6 will not break your budget. Never keep them in less than a group of 3 or they will not color well or feel comfortable. This tetra loves the company of its own kind.

Once I put 100 Von Rios in a planted 125-gallon aquarium and they colored up and just glowed red!

Sand or any fine substrate is fine. Use lots of plants, especially bushy ones such as water sprite, hornwort and Java moss. I use a small power filter with them, but a sponge or box filter will work just fine too. A 10-gallon tank easily accommodates 6 Von Rios. Any tap water is fine, neutral pH is best; the temperature should be kept between 72˚ and 76˚F. Always cover their tank; they're not great jumpers, but why risk it?

They will eat any appropriately sized food offered; flakes, micropellets, frozen daphnia and baby brine shrimp are especially relished and help to greatly intensify their color.

This small fish is very hardy and long lived. They seldom get ill, recover quickly if they do and will live for years in your aquarium. I do a partial 30% water change weekly.

This tetra breeds in typical small tetra fashion, randomly scattering eggs among bushy plants. It can be challenging to breed and raise however. Conditioning the adults is very important. Separate the male from the female for a week and feed heavily on daphnia and brine shrimp, live or frozen. Set up a 2 to 5 gallon aquarium with tap water, bunch plants and an air stone. Put them in the tank at night. They will usually spawn early the next day.

The very tiny fry usually number between 150 and 200. Use green water and rotifers or a liquid fry food at first. After a week, the fry should be able to take newly hatched baby brine shrimp or baby frozen brine shrimp.

They grow quickly and the ones that survive beyond the first week are seldom any problem to grow to maturity.

Von Rios are great community tank fish very peaceful. They never bother other fish.

They are moderately active and seem to flit and hover in the aquarium. The school will usually move from place to place as one unit.

A single Von Rio isolated from its school is usually sick.

Von Rios are my personal top pick in terrific tetras! Everyone will enjoy watching this fish school in your aquarium.

Happy Fishkeeping!

Tony

Anthony P. Kroeger – BAS

LESSER KNOWN LIVEBEARERS

Perugia's Limia
Limia perugiae

I am partial to Limias. I feel they are very underappreciated and certainly deserve much more attention from aquarists. I have kept many species of Limia and have always been pleased with my results.

The Perugia Limia certainly falls into the category. Native to Haiti and the Dominican Republic, this fish grows to a maximum 2 3/4" inches in size.

I find their color pattern very appealing. The upper body is a honey brown color with a white throat and belly. The shoulder area, particularity in males, shows a golden/orange glow. The scales are edged in a metallic green. Their eyes are black with a silver iris. The caudal fin is a yellow/orange with a broad black trailing edge. The dorsal is very large and broad and is coal black with white stripes along the fin rays. This, as you can see, is a very pretty fish.

Usually it's available online and from specialty groups, and is reasonable in price. Even better, this fish is easy to keep and breed.

A 20-gallon tank is fine for a colony of 6 Limas. I use a sponge filter in their tank with gravel, hornwort and some floating water sprite. That's it! How simple is that? Always cover their tank; they are jumpers.

They like hard, alkaline water. I keep mine in hard water, pH 7.2 - 8.0, at a temperature between 75° - 80°F. They love larger volume water changes. I change 1/3rd of their water weekly. They become very active after water changes and their colors just seem to glow.

These fish eat any food offered. Be sure to give them their vegetables. I give mine boiled zucchini, summer squash, green beans, peas, spirulina and algae. This fish is a heavy feeder and needs to be fed often or they get skinny. I feed mine 4 times a day.

Perugias are very peaceful community fish. I've kept them with guppies and many other fish. They never bother anyone, and they don't

even chase guppy fry.

Perugias breed in typical livebearer fashion. 10 to 100 fry are born every 4 weeks or so. The fry eat frozen baby brine shrimp, crushed flake food and veggies initially. They can be left with the adults and in my experience they're very easy to raise.

Adding just a pinch of salt to their water will be very beneficial to them.

If you can't tell by now, I really like this fish. It has all the good attributes that an aquarium needs. I heartily recommend Perugia's Lima to everyone!

Until next time.

Tony

John Todaro – BAS

SPECIES PROFILE

Scientific Name: *Limia peruiae.*
Common Name: Perugia's Limia.
Family: *Poeciliidae.*
Distribution: Dominican Republic.
pH Range: 6.8 - 7.5.
Temperature Range: 75° - 80°F.
Hardness: 30° dGH.
Temperament: Peaceful with other fish.
Sex: Full grown males have an orange chest. The gonopodium is black.
Diet: Will eat all foods offered. Should have some vegetables in their diet.
Breeding: Easy. Breeds in typical livebearer fashion. After 24 days gestation, female gives birth to 10-100 young. Fry eat baby brine shrimp and crushed flake food.
Remarks: The species is hardy and longlived. They must have excellent water quality to grow to full size and show off their colors. Regular water changes every 2 weeks with the addition of salt will help promote their growth.
Reference:

- www.fishbase.org
- *Baensch Aquarium Atlas*, Hans A Baensch & Dr. Rudiger Riehl, Vol 2., Page 730, Publisher, Hans A. Baensch, 1993

Olga Betts
First published in the newsletter of The Vancouver Aquatic Hobbyist Club
Aquarticles

"So You Want to Grow Aquatic Plants"

Some aquatic plants will grow under some conditions all of the time. In other words, anyone who wants to can grow aquatic plants. ***Here is the secret: Grow aquatic plants that suit the conditions of your aquarium.***

Know your plants. Buy a simple book about aquatic plants such as: *Aquarium Plants Manual* published by Barron's. This is a good and inexpensive book to get you started, available in many aquarium stores.

Aquatic plants are just the same as those that grow in a garden. Some prefer lots of sun; some prefer shade, some like rich soil; others sandy, poor soil. Of course, all aquatic plants like lots of water, but the beauty of that is — you don't have to water them!

Calculate how many watts of light per gallon of water you have. You can grow most aquatic plants with at least 2 watts per gallon. Some will do fine with less; some will do better with more.

The typical aquarium comes with one light in the hood (aquarium cover). If you would like to grow aquatic plants, spend the money to get a fluorescent hood, as fluorescent lighting more closely emulates the sun than does incandescent lighting. A starter tank is generally set up with a gravel substrate with or without an under-gravel filter. You will be able to grow aquatic plants either way. Medium or fine gravel is better than chunky.

Plants to buy for low-light, regular substrate aquarium are:

Java fern (*Microsorium pteropus*) - attach this plant to wood or porous rock *Cryptocoryne wendtii*, **Hornwort** (*Ceratophyllum demersum*), Wisteria (*Hygrophila difformis*), *Hygrophila polysperma*, **Water fern** (*Ceratopteris thalictroides*). These will give a nice variety of leaf shape and green colors. Hornwort and the water fern can be planted or floated. Remember that floating plants block light to those underneath. Java fern and *Cryptocorynes* will live and grow slowly in low light. The *Hygrophilias* will grow quickly towards the light getting leggy and losing leaves on the lower stem. However, if they are pulled up regularly, trimmed and the tops planted back they will grow quickly enough to look good.

All plants need nutrients. These can be added to the water and also come from the fish in the aquarium. Plants use carbon dioxide, ammonia and ammonium as well as nitrates as fertilizer so fish waste is well utilized. The debris that naturally accumulates in the gravel will fertilize the plant roots. A commercial fertilizer can be added at water changes. The best advice here is err on the low side. You can always add once in the tank. Too many nutrients will mean algae that you don't want.

Water quality makes a difference. Do you know how hard your water is? Water in the Vancouver area is generally very soft. Plants like this better than hard water, but they need some minerals such as Calcium and Magnesium that affect the hardness of the water. A commercial fertilizer will add traces of these that may be adequate for your needs. Buy some fertilizer tablets for the substrate and put pieces of these around the plants, especially the *Cryptocorynes.*

As your plants start to grow and do well, you may find that some out-compete the others. You may want to eliminate one species to give more room or light to another. As you become more interested in growing aquatic plants and become more experienced, you can take on the trickier varieties and use more specialized equipment. But the main thing is to have fun! And don't worry. You will be able to grow something.

Steve Matassa – BAS

PLUMBING A SUMP

In this article I will cover the basics of plumbing a sump or wet/dry system. The installation of the plumbing is not as hard as most would think; if you have some plumbing knowledge and are a little handy; this is definitely a DIY project.

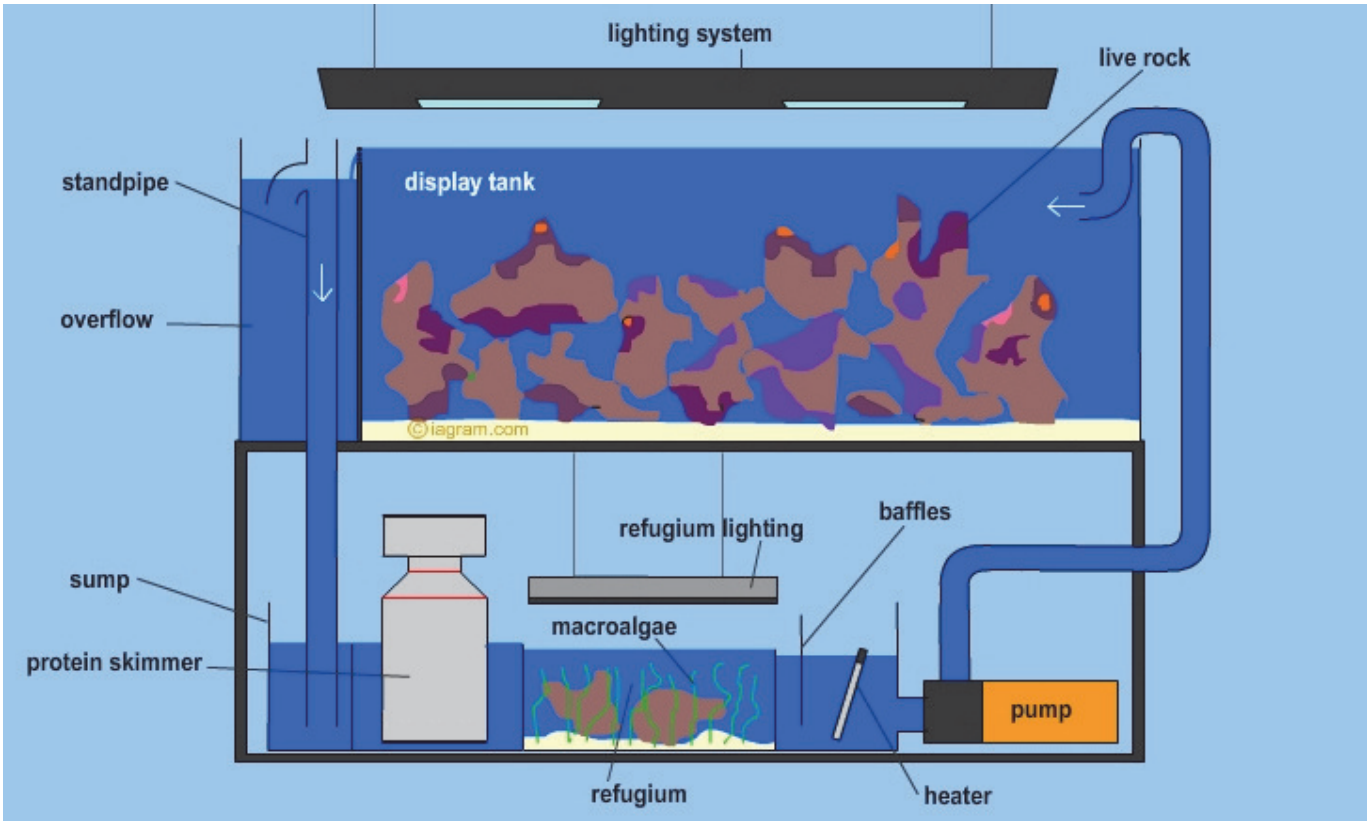
For those of you that are not aware of what wet/dry or sump might be, think it's just a tank under your main display tank used to circulate and filter the water. It is usually set up with several compartments for filter material and media, even your heaters. You can include a protein skimmer if you have a saltwater tank. If done properly, it can be the easiest filter you will ever clean. A sump will also put a great amount of oxygen into the water, which, as we all know, is great for your fish's health.

First off, you will have to figure a way for the water to drain to the sump and return back to the tank. You can drain the water one of two ways. The first is buying a tank that is already drilled with an overflow box. These tanks are called reef ready, but don't be fooled by the name. It can be used for fresh or saltwater tanks. The second way is to drill a tank, using glass drill bits. If you are uncomfortable trying to drill your tank, most fish stores will do it for a small fee. The one item to always check first is if the tank has any tempered glass panels. Tempered glass cannot be drilled; they will shatter if you try to drill them. Manufacturers should disclose if any panels are tempered.

Another method is an outside overflow box, of which I am not a fan. This is just two boxes that hang (one on the outside and one on the inside) with a "U" tube between them. These are known to fail and cause floods or, at the least, stop flowing. Whatever holes you have in the tank and sump, you will need bulkheads to connect the pipes or fittings. Bulkheads are made of either PVC or ABS. If you use ABS, which are the more common black ones, you will need cement called "all-purpose cement." This cement will bond PVC to ABS. The primers and cements can be bought at any plumbing store or home center.

The sump can be bought at most local pet

This set-up is a refugium (salt).



stores, or can be custom made. They can also be made out of a standard tank. You can get it to fit your stand or cabinet and configure it for what you need to put inside it. I will not get into the sumps too much now.

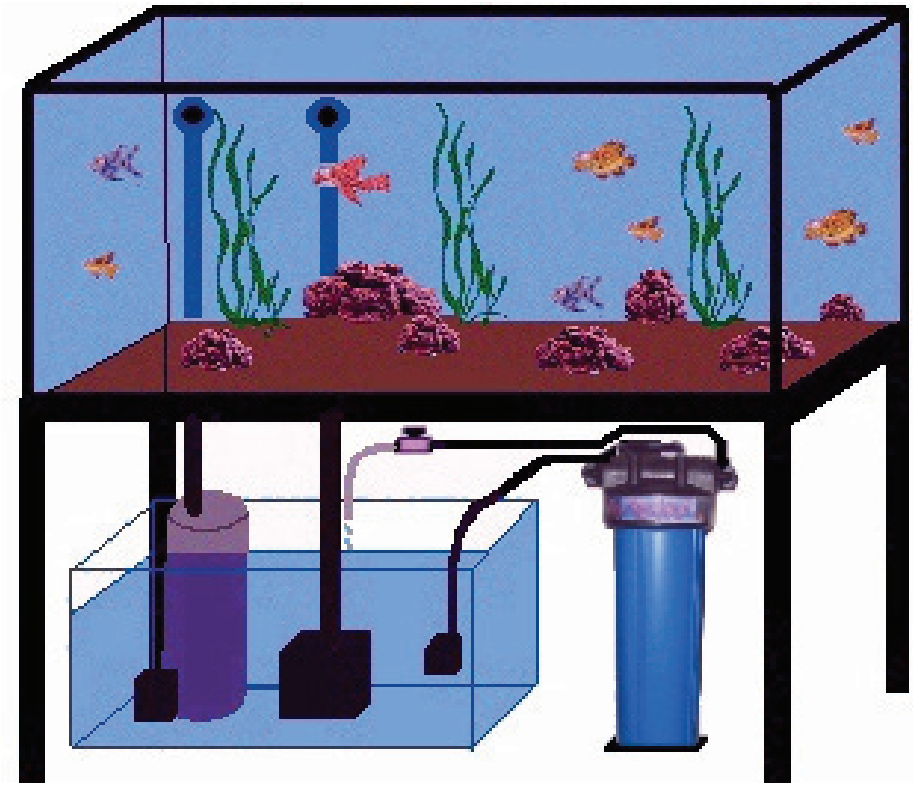
The second thing to consider is what you will use for the drain and supply -- whether PVC (ridged or flexible) or vinyl tubing, or a combination of the two. There are advantages and disadvantages of both systems.

PVC is easy to work with if you are fairly handy; the one drawback is the smell when bonding the pipes and fittings. The smell does go away in a short time; just be sure to leave windows open and glue as much as possible outside the house. Also, it helps to wear a dust mask and latex gloves. You will need a few basic tools such as a PVC cutter or a hacksaw; either one will work fine. If you have an electric miter saw, that is even better to cut the pipes. You will need PVC primer and PVC cement. The cement is not actually glue; it does not glue the parts together but bonds them to almost become one. Once cemented together, within a minute or so, they cannot be removed, so position them carefully. Even the primer will bond them, so do not put them together until you are ready to bond them. If done properly, PVC should last a lifetime.

To assemble PVC pipes and fittings, you first dry fit, and use a marker to mark the pipe and the fitting as to where they go together. Place a mark on the pipe and a mark on the fitting so when you bond them together, you align the marks to assure the correct position. Remember to try to make as little bend and turn as possible. The straightest path has the least resistance to and from the tank.

Next, use the primer on both the pipes and the fittings, and do the same with the cement. Now you assemble the parts; push them together and give a little turn back and forth to assure an even bond. Hold them together for about 10 seconds and that's it. Wait 24 hours for the cement to fully cure, before adding water. Keep in mind the pipe will go in a little further when you use the cement more so than a dry fit, so to get the correct size,

This is a basic sump set-up (fresh or salt) with a media reactor. and an external pump.



measure inside the fitting to figure your total lengths. For example, if you need 12 inches between the fitting and the inside of the fittings, the stop is 1 inch in each; thus you would cut the pipe 14 inches total. You will see a stop inside most fittings; this where the pipe will go up to when cemented.

PVC is not the only way to go. You can use soft tubing -- PVC also comes in flexible lengths to simplify things a little more. You can even use a combination of both, with the help of some barbed adapters. I do prefer PVC because once it is done, it is finished, but it is a little noisier. Tubing does have to be replaced every so often. It also can leak from cuts or just dry rot. If you are going to use tubing, don't buy cheap material. Buy a good quality product that is fish safe, and check it periodically. They usually sell tubing that is nylon reinforced in most home centers.

Keep in mind the drain pipe should always be at least one size larger than the return line. The size you will use depends on the amount of water flow. You should install valves and union on each line. The valves are to adjust the flow and the unions to remove pipes for future cleaning.

A few tips on plumbing: First, the drain pipe in the sump should be underwater because it will be quieter that way, but do not install the pipe under the water more than one inch or it can cause back pressure and gurgle. The use of a durso valve in the overflow box will help quiet the drain down quite a bit. You can search durso online for more details. This is something that you will have to play with to get it right.

One last thing to consider is the return pump. You can use an external pump or an internal one. The internal pump is easier to install and remove for cleaning, and usually cheaper. (I know the cheaper part caught your attention). While the external pump will put out less heat transfer into your tank, and is usually stronger with a higher head height. In case you are not aware, head height is how high up a pump can push water. If you do use an external pump, be sure to put unions on both sides and at least a valve on the discharge side, if not on both sides. If you have to control your pump's flow, only throttle down the valve on the discharge side or you can damage the pump. The other valve is just to shut it down when removing the pump. If you are concerned about the noise of an external pump, then add a 6 inch or more piece of tubing between the pump and the PVC return line to reduce the noise transfer. You can also put a rubber pad or vibration damper under the pump; this will also reduce the noise.

I hope I shed some light on the concept of a sump installation. If done correctly, it can give you years of easy and efficient filtration.

Steven

Izzy Zwerin ~ BAS

The Practical Plant

PROPAGATING

HYGROPHILIA POLYSPERMA

Sunset Hygro

This is a great plant, period. Alright, I'll elaborate. I have a specimen of this plant currently in my guppy tank. Although at one time or another in has probably visited most of my tanks, or at least some cuttings from it. My specimen is a cultivar known as "Sunset Hygro." This plant used to be readily available at your local pet shop.

Unfortunately, some fool (either intentionally or accidentally) released some into the wild where it became a problem. To make a long story short, the plant is now on the Federal Noxious Weed list and can no longer be shipped across state lines.

What was once a popular plant is now completely unavailable. The only way you will ever find this plant is if some club member brings cuttings in to auction.

My Guppy set up is in a 25-gallon tank. I keep all the males in this aquarium. The pH is about 6.8, temperature is kept at 78° and the GH runs about 60. This aquarium has 130 watt Compact Fluorescent lighting (Coralife "Aqualight" double strip) and CO_2 enrichment. A Fluval canister filter (model #204) 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. Don't worry about the large volume of water 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, and 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.

It is a shame that this plant has become so difficult to find. This plant has a lot going for it. It is easily cultivated, hardy and attractive. It's a stem plant that is tolerant of a wide range of aquarium conditions. It can get rather large, but can handle the aggressive pruning needed to keep this plant under control. The plant has leaves that are lanceolate shaped and about 3" long. Two leaves, opposed to each other, emerge at each node. The leaves of the following node are rotated 90° around the stem axis. The "Sunset Hygro," when grown in proper lighting, is a bright light green color. Each leaf is etched in deep veins which are almost white in color. As the plant grows taller (and even closer to the light), the leaves start to take on a pinkish coloring. At the top of the plant, the vegetative tip can become almost magenta. It has grown well for me under a variety of lighting and water conditions. Because of its branching and spreading nature, it takes on a rather bushy and wild appearance. This is one of those plants that will help maintain good water quality because it is such a fast grower and an aggressive feeder. This fast growth and heavy feeding habits make it a great plant for combating algae. One of the really interesting things about this plant is the coloring. It is my understanding that the coloring of this plant is due to the activity of a virus which it harbors.

You heard all the good. Now we have to cover the bad and the ugly. This plant, as discussed, is very fast growing and highly aggressive. When I say fast growing. I mean that at the end of the day you can see that the plant has grown since you turned the lights on in the morning. Sunset Hygro will branch profusely, virtually every node it has will branch unprovoked. Any branching stem which comes in contact with the substrate will take root and sprout more plants. It will also send out side shoots to root new plants, and of course taking cuttings will work as well. To propagate this plant, all you really need to do is turn it loose in your aquarium. This plant behaves like it is on a mission to take over the planet! That is the big problem with this plant, and how it landed on the Federal Noxious Weed List. It will need frequent, and at times, quite aggressive pruning.

Overall, it is a highly decorative plant that can be a real eye catcher in the aquarium. I highly recommend it, especially to those of you who enjoy lots of pruning.

Izzy

Anthony P. Kroeger – BAS

The Red Stripe Barb
Barbus bimaculatus

There are many formerly popular species of barbs which are seldom seen now.
This column hopes to reintroduce them to you.
We'll start with one of my favorites.
The Red Stripe Barb, *Barbus bimaculatus.*

This very pretty fish is native to Ceylon and India. It grows to about 2 1/2 inches.

The Red Stripe barb has a honey brown back. Males have a broad red stripe along the lateral line from behind the eye to the caudal peduncle, females have a pale red shading instead of a stripe. Belly is white. They have a black spot in the middle of the caudal peduncle; eyes are black with the iris orange - top half, silver lower half. All fins are clear except for the dorsal which in some (but not all) specimens has fine black markings.

Most better pet stores sell this fish occasionally. It can also be found online if you search thoroughly.

This very peaceful barb is an excellent community tank fish. It does not eat plants either. Keep them in a school of at least 4 to 6 fish. Red Stripes require a 20-gallon long tank or a bit larger, equipped with a power filter to keep their water clear.

Plant the tank as you wish, but leave an open swimming area for the fish. Make sure you cover their tank; they will jump.

They like medium hard, neutral pH 7.0 water with temperature between 74˚ to 78˚F. This fish loves large partial water changes, 50% of their water once a week.

Feeding is easy. They eat everything offered: frozen foods, flakes and pellets. They love frozen bloodworms and slurp them up like spaghetti. Daphnia is good for them too. Both intensify their colors.

Compared to Tiger barbs, Red Stripes are a sedate fish.They school loosely and are never in a rush like Tiger barbs.

Red Stripes breed in typical barb fashion. The sexes are easy to distinguish: males have the bright red stripe and are noticeably thinner.

Separate the sexes and feed heavily for 10 days on high protein frozen foods.

Put the pair together in a 5-gallon tank with a spawning mop. When they are through spawning, remove the adults; they are avid egg eaters. This is a very prolific fish. Most spawns run 500 to 1,000 eggs.

Use medium hardness, slightly acid 6.8, temperature 78˚ to 80˚F water to spawn. Eggs hatch in 24 hours. Feed the fry baby brine shrimp and crushed flakes. Keep their water clean; they are very sensitive to poor water quality. This old favorite has much to recommend it.

Try some!

Tony

SPECIES PROFILE

Scientific Name: *Barbus bimaculatus.*
Common Name: Red Striped Barb.
Family: *Cyprinnidae.*
Origin: Indo-South East Asia.
Distribution: Inhabits standing and flowing waters.
pH Range: 6.5.
Temperature Range: 75˚ - 79˚F.
Hardness: 15˚ dGH.
Size: 2 1/2 inches.
Diet: Flakes, frozen and live foods.
Sex: The male is more slender with a dark red stripe from the base of the tail to the eye. The female may be with or without a faintly visible band.

Temperament: Peaceful, quite shy, schooling fish, They remain timid even in large tanks.
Breeding: Can be bred in a 5-gallon tank with a mop or Java moss. Water should be softer to 10˚dGH and slighty acid. Remove parents as soon as they have finished spawning - they will eat the eggs.
Remarks: Always keep this fish in a school of at least 6 fish or more. This is a very good community fish.
Reference:
• *Baensch Aquarium Atlas* Vol. 2 Hans A. Baensch & Dr. Rudiger Riehl, Tetra Press, 1993.
• www.saltytank.com

Bill "Pegasus NZ"
of New Zealand Aquarticles

MY FISH JUST DIED!

SO YOUR FISH JUST DIED, OR THEY ARE DROPPING LIKE FLIES. WHAT DO WE DO?

If your fish has no visible signs of injury then usually we tend to just accept it as "one of those things that happen", but in many cases, and with little effort, a few things can be learned from the deceased fish. Unless your fish died from old age, which few fish do, then we need to establish if possible what caused its demise, but how do we approach this? Of course our first objective is to test our water, but if this shows no obvious causes, then what do we do?

External examination of the fish can reveal many things, and apart from obvious wounds which might have been inflicted, there are other things we can look at.

Parasites are one of the main causes of fish deaths, and we get internal and external types that can sometimes lay dormant for months, then suddenly wreak havoc on our tanks. Bacteria buildups in our water can cause many problems, from inflamed gills to stress and breathing disorders. Fungi of various types will affect fish with open wounds, or fish in an unhealthy condition that have lost their immunity to resist the spores that linger in wait for the slightest chance to attack. Body slime, clouded eyes, fin and tail rot, shimmies, are all visible external signs, as are spots, blisters or cysts of any type or color, which can include white spot and a yellow looking spot that could be Velvet disease, or an ugly parasite that has burrowed under the skin of the fish.

Then we have such things as Pop Eye caused by gas behind the eye, Dropsy, which shows protruding scales, and Swim Bladder problems, all which show visible external signs. Many of the above can be treated with various medications, but then we get the scenario where a fish refuses to eat, or lurks in a corner for days on end, or is just found dead in the tank one morning, or perhaps it was dashing madly around the tank before it died. Death by stress is

hard to determine, as usually there are no visible signs.

Observing, not looking, at your fish each time you have a chance will tell you many things, and by doing this you begin to understand each fish and their general habits. It makes little difference if you keep goldfish or exotic species of marines that cost thousands, the same rules apply. They can't tell you they are ill, but they can show you in most cases, and anything that does not look normal should be treated with suspicion. Usually anything differing from these habits can be spotted soon and action taken. Flicking on objects in the tank is a sure sign of trouble, not feeding, trailing feces, cloudy eyes, patchy colors, slimy skin, cloudy skin, bloated body, erratic swimming, restless and lethargic behaviour are all signs you should be looking for, as all mean that trouble is just around the corner.

Dinner time should be a mass of activity for all fish in most cases, and now is a good time to do a number count if that is possible

All external parasites can be identified such as Anchor Worm, White Spot, Flukes, Fungi, and so on. With a good quality scope we can also see various bacteria, but knowing the good ones from the bad is still beyond me. Just finding some simple answers can be so rewarding, even though you did lose a fish in the process.

These are the mysteries, the unknown causes that lead to the deaths of our fish, which can in many cases be looked into in a different manner in the hope of finding at least some answers to these mysteries.

Someone recently asked me about fish deaths, and I made the statement that "If a fish of mine dies, and it is not through any fault of my own, then I want to know the reason why." In my early years, fish deaths caused me a great deal of concern, and more so when they became my means of earning a living. I learned in my early years how to dissect fish and examine the various parts with both a strong hand glass and a microscope. For quite some time it was still all just a mixed up mess of internal organs that I was not too sure if they were healthy or not, so I took some lessons and advice from a professor friend of mine at university and came away a little wiser, but still a little confused. It was not until I compared a previously healthy dead specimen to an infected one that I became aware of the various differences in the two dead fish. Guppies, Platies, Mollies and Swordtails were my test cases, and from these I learned a number of things.

THE MICROSCOPE

This is such a handy piece of equipment if you want to delve into the inner workings of fish, for with it you can not only recognize some of the major parasites, but you can examine algae, your water, plant structure, along with just about everything that can attack your fish internally or externally. Algae alone holds a world of information, with unbelievable shapes and patterns that have to be seen to be believed, and your water, both drinking and in your tanks, hold more than you could possibly imagine.

To me the microscope became in a sense much like being a diver. The non-diver can only look at the ocean from above, and sees a huge body of water holding untold mysteries, but seeing that same ocean from beneath the surface is a completely different world, one that never fails to fascinate me, and is different at every dive, even in the same area. My many years of diving are gone, but the memories remain, and hopefully always will.

The microscope is very much like this, for you are taken into a different world, one of which has been in existence since the beginning of time.

By just taking smears from infected parts of fish you can begin to recognize the microscopic life that infects our fish. With observation you can spot a healthy organ from an infected one, and examine all parts from the mouth to the anal region, which will tell you many things as to why your fish died. The intestines, the alimentary

canal and the stomach will tell you exactly if the fish was eating, and what it ate for its last meal, and will also tell you if that meal was recent, or some time ago. The intestine is short in flesh eating fish, and long in vegetable matter eating fish Discoloured organs will give you clues also, and inspection of the swim bladder will in most cases enlighten you about swimming disorders. In Catfish, the swim bladder differs from the normal fish. The world of wonders grows with each slide you make.

You don't have to be a scientist to look at these things, nor do you need a microscope costing mega bucks to observe some of the above, as a simple microscope from a children's toy store will reveal many things.

You don't have to be a scientist to look at these things, nor do you need a microscope costing mega bucks to observe some of the above, as a simple microscope from a children's toy store will reveal many things. I have had several over the years, and now I am looking at buying another as my last one mysteriously disappeared. One of my early ones was made entirely of brass, was very old indeed, and had a single lens, but the workmanship was outstanding and it gave me a lot of pleasure. Ones with built in lights are better than the reflector type, and three optics are always better than one. The quicker you can examine the fish after death, the better your chances are of seeing the parasite or infection in its active state. Once you isolate the culprit, take a slide and a slip and make up a sample that you can keep for future reference.

I am no expert in this field, but I don't like to accept something happening that I know nothing about, so to this end I tried to learn all I could about the life and deaths of my fish. Make it your goal to learn something new about your fish every day, should it be from reading a book, or surfing the net and forums, but do it. The knowledge you gain will never be wasted, not if you keep fish.

It is a well documented fact that a huge percentage of fish deaths are caused by their owners, either through neglect, or even over indulgence of kindness where we tend to overfeed, or add this and that to our water "just in case," or neglect to consider the "soup" that our fish are swimming in. Perhaps if you had done that water change instead of just topping up with water, your fish might be still alive, or perhaps you changed too much water, or it was too cold and caused great stress to your fish. These are things that only experience and time will tell us where we went wrong, but watching others and learning all you can from any means possible is the best advice you can get. We have all lost fish, and made many mistakes, but with the technology of today and these excellent forums, perhaps our chances of success have just been increased by a huge amount.

Reaching that perfect balance where both your fish and yourself are without stress can sometimes be hard to achieve, but invariably if your fish are happy, so are you.

Take Care Always, Regards

Happy Days,

Bill (Pegasus NZ).

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Tell them you saw their ad in the *Aquatica*.

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. No meeting July & August. 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

2016

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