# AQUATICA

THE ON-LINE JOURNAL OF THE BROOKLYN AQUARIUM SOCIETY
VOL XXVII NOVEMBER ~ DECEMBER 2012 No. 2

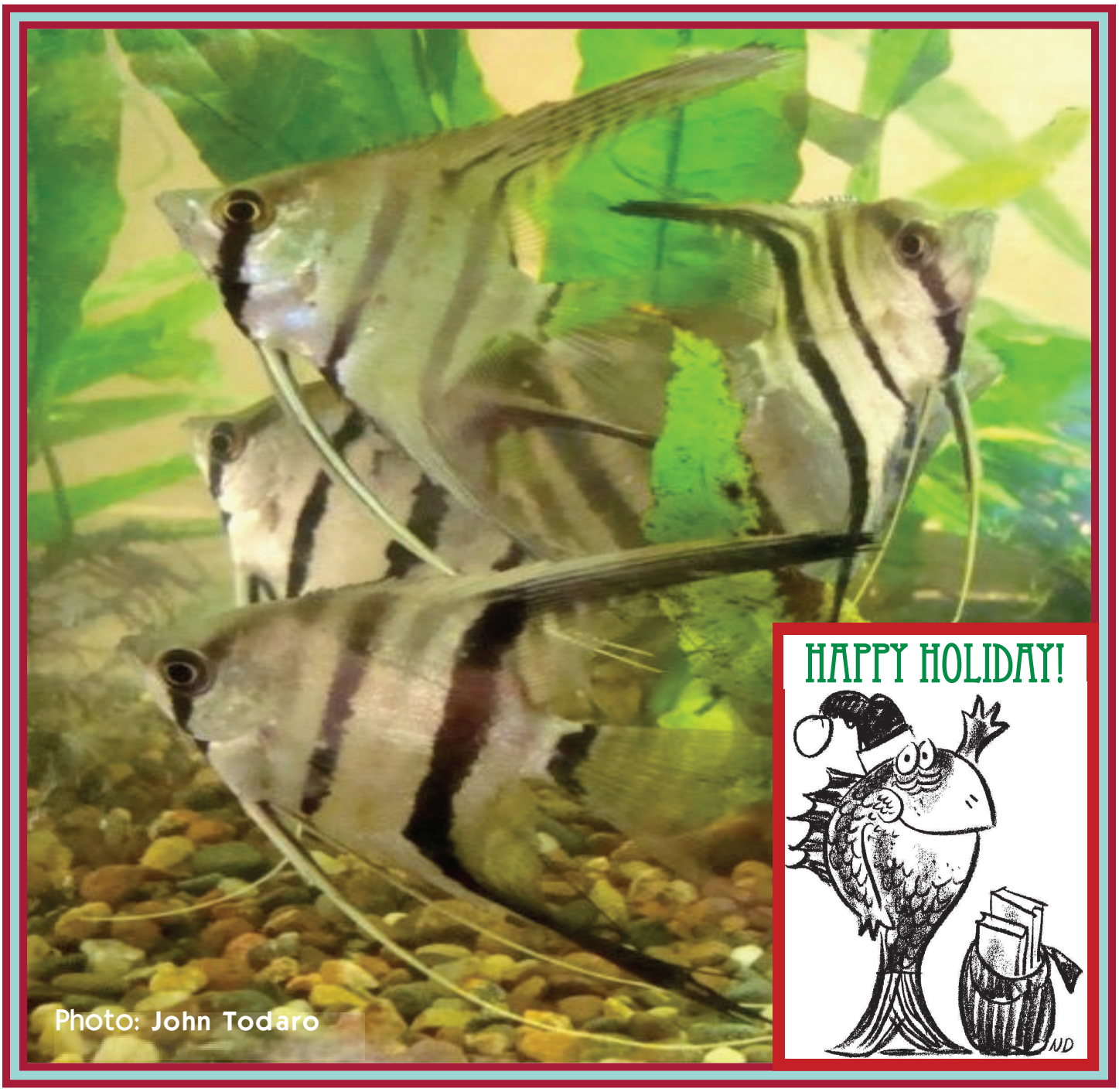


Photo: John Todaro

101 Years of Educating Aquarists

# AQUATICA

VOL. XXVII NOVEMBER - DECEMBER 2012 NO.2

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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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Note: The Editor takes full responsibility for misspellings and punctuation errors.

# BROOKLYN AQUARIUM SOCIETY
# CALENDAR OF EVENTS ~ 2012 - 2013

**NOV 9** **Gene Ritter - Reef Diving in NYC** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**DEC 14** **Holiday Party** ~ Members, their families and friends, all you can eat sit-down dinner • Fish Bingo & Prizes • BAS Awards presentations.

## * 2013 *

**JAN 11** **Joe Yaiullo - Marine/Reef Presentation** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**FEB 8** **Kathy Cardineau - Ponds - The Easy Way** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**MAR 8** **Kevin Kohen - Superstar Fishes for Reef Aquaria** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**APR 12** **Mark Denaro - Where Rare Species are Common** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**MAY 10** **Giant Spring Auction** ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a 55 gal. tank & stand.

**JUN 14** **Laura Birenbaum - Coral & Marine Inverts' Tolerances for Dry Shipping** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

## JULY/AUGUST ~ NO MEETINGS

**SEPT 13** **Joe Graffagnino - Knowledge of Usless Shit I Acquired Over the Years** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**OCT 11** **Giant Fall Auction** ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a 55 gal. tank & stand.

**NOV 8** **John Coppolino - Modern Fish Keeping in Reef Aquaria** ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

**DEC 13** **Holiday Party** ~ Members, their families and friends, all you can eat sit-down dinner • Fish Bingo & Prizes • BAS Awards presentations.

**Robert Fenner**
Reprinted with permission, from Bob's website in San Diego:
www.wetwebmedia.com Aquarticles

# ROCK AND WOOD IN AQUASCAPING

**What would a captive aquatic system be without aquascaping? A water-filled box with at least one transparent viewing panel? Or, consider if decor possibilities were confined to "novelty" ornaments. How many burping clams/ceramic castle/plastic plant themes can you and your livestock take? Thank goodness for the abundance of natural materials available and suitable for aquascaping. These serve many useful and aesthetic purposes, breaking up the environment, providing nooks and crannies for forage, escape and other "natural" (there's that adverb again) behavior.**

Unfortunately, as with other aspects of our hobby, there is a potential downside to what is offered in the trade and collecting your own aquarium embellishments. Much of what you can get is not a good idea, due to toxic interaction with your water and its inhabitants.

## TOXIC AQUARIUM DECOR SYNDROME:

Ideally, what you place in a system should either do nothing deleterious to alter its chemistry and physics, or alternatively, be entirely inert (non-reactive). How many of us want to understand how, what and to what extent a rock, piece of wood, et al., are contributing to hardness, pH shift, specific gravity, ad nauseum? We'd be happy to know that whatever's in "there" is either contributing to the overall health of the system, or at least not outright poisoning the inhabitants.

A counterbalancing point I want to make is that everything changes, including what goes on in captive aquatic systems; there is no null hypothesis. In the wild, some cichlids 'eat' rock material and loricariids (South American sucker-mouth catfishes) ingest large quantities of wood. Reductive processes shift pH, wood decays, rocks melt. Natural systems and aquaria have buffering and counteracting influences in constant interaction, physically, chemically and biologically.

Your job as keeper of these kingdoms is to master my favored oxymoron, "dynamic equilibrium," to keep this ever-changing world balance-shifted in favor of its desired habitants.

## THE OR AT LEAST A TEST FOR SAFETY:

The modern world of physical and chemical assays is amazing. There are contraptions of sophistication that can analyze a substance as to its mixed makeup to parts per trillion and smaller. These are so far the domain of physics, physical chemistry and government-subsidized (i.e., hopelessly money-losing) laboratories, not pet-fish hobbyists.

True, there are general assays mere citizens (the ones getting robbed by the above labs) may pursue. Placing a drop of an acid or base on the subject matter to check if it's reactive in the grossest sense could grant you some relative awareness (compared with other specimens that don't react?), but, really, what's the sense? I mean, do you thereby know whether the material is safe to put in your tanks? Ah, but there is a way to be sure.

Bioassay is the name given to testing formats involving live organisms exposed to questionable matter under set regimes. This is the realm of science: testable, falsifiable hypotheses. That is, designing and executing experiments under controlled conditions in attempts to disprove a statable, somehow observable event. By such real means, I can assure you that drip-tray methods of delivering water to wet-dry filters are superior to spray-bar technologies, that the vast majority of marine organisms from the Philippines are not cyanided. Other ways of "knowing," such as faith, intuition, anecdotal evidence, are valid, but are not science and of limited value to the serious aquarist.

The science of bioassay you want to engage here is simple and straightforward. By exposing some test species (singular/plural) to the proposed decor, we will be able to make some decision about whether to use it in our display system. A word of caution here; there are two relative terms of degree we need to define, chronic and acute. Just how much, how fast does poisoning have to occur to be considered "acute"? Or, more meaningfully, how little does something have to act as a toxicant before we say it has no chronic poisoning effect?

For our purposes here, let's agree that acute refers to situations that result, directly or not, in losses within 24 hours, and chronic we'll give a month. Notice how arbitrary these values are, and further and more importantly that poisoning or lack thereof is not defined as any successive loss of vitality other than the threshold of death.

Useful examples of the above descriptions might involve the effects of ammoniated cleaners being used around aquaria for acute, and placement of geodes in a soft-water system for chronic poisoning.

A proposed bioassay approach for testing potential decor items is to "lightly" (about a minute) boil a sample of the material in the type of water to be used in the system, allow all to cool, place item(s) and water into a bowl or small tank, and introduce "test" organisms. What sort of "guinea-pigs" should you employ? If your intended use is for a fish, invertebrate, plant system, probably some of all these. Be wary of utilizing the (to some) lowly comet goldfish for all freshwater trials; after putting up with humans for a few hundred generations, this di-hybrid is too tolerant for all but general purposes.

If/when the test organisms have lived apparently none the worse for wear, for two or more weeks, the decor can probably be considered "safe" for use.

## ANOTHER (PHYSICAL) CONCERN:

Separate from considerations of what rock and wood, et cetera, might and will do to your water is the question of mechanical danger. Maybe that coral, shell, colored glass has been sealed up, otherwise found to be rendered chemically inert, but what about cuts and punctures? Though aquatic organisms look supremely dexterous, they and you will get gouged with sharp, piercing edges and projections if such fare is handled or placed carelessly. Keep sharp objects away from dull livestock. Enough said?

## SOURCES:

There are many. Despite the paranoia this article might seem to inspire, rock and wood material abounds that is of use in aquaria. Your local and not-so nearby wholesale and retail pet-trade contacts are apparent, but so are sand and gravel plants, masonry and landscape suppliers. And how about collecting your own?

A note of caution about the last possibility. Be especially careful with materials brought in from the "wild," even ones collected underwater. Though you might clean, bleach, dechlorinate, and dry your heart out, these can still turn out to be more trouble than they are worth. When in doubt, leave them out. For cost and space reasons, many outlets don't carry much of what's available through the trade. There are wonderful woods (pre-cleaned and sinking) that they can order from the U.S., Far East and Africa. Ask your source to check with their suppliers and special order your show pieces. You would gasp to see a whole cargo container load.

## A WEIGHTY MATTER:

What weighs more, a pound of fish or a pound of feathers? They're the same. Now, which is more dense, as in density equals mass over volume? The fish, of course. Perhaps surprisingly, some rock and most wood need to be made more dense to be of use to us as aquarists. This can be accomplished either by fastening or adding to the material to something dense and massive enough to keep it down. Towards this end, there are silicon rubber (Silastic™), epoxies and some ceramics that are suitably inert after curing. Obviously, the finished product(s) of all this improvement should be tested as to the subject decor itself.

## IT'S A BEAUTY, EH?

No discussion of aquascaping would be complete without at least a brief mention of aesthetic elements. You have all this stuff, now how do you put it together so it looks good? As any sensible person who has been on a date, entered or judged at a fish show will assure you, "Beauty is (indeed) in the eye of the beholder." After attending many exhibitions, reviewing the whys and wherefores of the "winners" and, more importantly, diving around the world seeing habitats first hand, the following "guidelines" vis-a-vis aquarium beauty are offered:

## 1) BALANCED IS UNBALANCED:

Symmetry, as in bilateral (mirror image) penta (like starfish) -ramous or otherwise is not natural, or attractive. Take a look around you nature-wise; non-symmetry rules, and it's beautiful. Don't evenly space the elements in your environment like a robot.

## 2) POINTS OF INTEREST:

Most humans "appreciate" a given view from the top left to the lower right. Touching on the above 'balance' idea, you do want to capitalize on the non-equal opportunity you have to control the appearance of the system "frame." For smaller systems this translates into a small odd number (3,5,7) of highlights (vertical, horizontal, fore/background, size/shape, color, texture...) arranged to “guide the eyes.”

## 3) HARMONY, OR BETTER STILL "TELLING A STORY"

Is a worthy quality to pursue. Whether a biotypic slice of real habitat is your goal, or some other-worldly vision, the tank’s arrangement can and should be an attempt at completing this whole; i.e. making a discernible statement.

These are only my three favorite notions of what to shoot for in the way of aquarium beauty. Judging sheets and discussions with other aquarists reveal as many different values and weighting as queries themselves. So goes another footnote on the subjectivity of reality.

## CONCLUSION:

Have you ever wondered just how safe the resins used to make decor are for your fishes? Do the lead weights used with aquarium plants release metal into their surrounding water? What are the effects of lower pH, temperature, softened water, et al., on the solubility and toxicity of whatever finds its way into your systems? How much should you be concerned?

Going to all the trouble and expense to provide initially "clean" water, avoiding excess nutrients through careful chemical use, conscientious feeding, adequate filtration and water change practices, is easily negated by haphazardly placing soluble, toxic rock, wood and other ornaments in your system. A word to the wise: don't count on your sources to ascertain whether what they offer is toxic or not; test it yourself with a simple bioassay.

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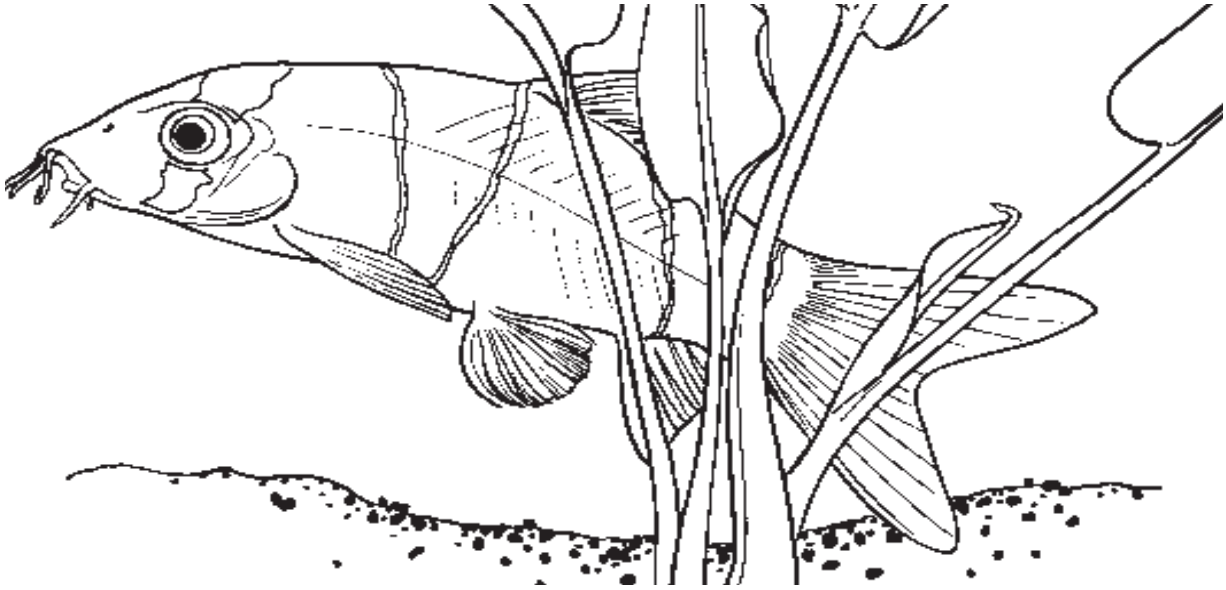
• Wholesale Sources of Rock and Wood for Aquaria
• Aquarium Systems, Inc. 8141 Tyler Blvd. Mentor, OH 44060, 216-255-1997. Original distributor of 'p.c.' naturalistic ornaments.
• Dolphin International 1125 W. Hillcrest Blvd., Inglewood, CA 310- 776-2352. Worlds largest pet livestock distributor; have nice wood seasonally.
• Feller Stone, Inc. 1051 N. 1100 W. St. George UT 84770, 800-776 - 2206. Leaders, originators of modern natural aquarium decor industry.
• Oceanic Systems, Inc. 11839 Shiloh Rd. Dallas, TX 75228, 214-320 - 6050. Have some really neat artificial coral art.
• Tetra Second Nature and Terrafauna, 3001 Commerce St., Blacksburg, VA 24060, 800-564-3711. "Aquarium Correct" decor and so much more.

# The Practical Plant
## Chapter 5

**Hello again. Picking up where we left off, we are going to get into lighting. But, to figure out what kind of lighting is right for you, we first need to figure out if you want to be "high tech" or "low tech" in your approach. They employ vastly different hardware setups and maintenance regimes.**

### The low tech approach:

These are systems which rely on simple low cost equipment. To set up one of these systems, all you need is basic fluorescent lighting with a good reflector and something to provide a little water movement.

The lighting fixture you choose should provide 1-2 watts per gallon. Light does not penetrate water very well, so stay away from the really deep tanks. And that's it! You may only need a heater, depending on the fish you keep and your room temperature. These tanks require virtually no maintenance, and no plant fertilizers to fuss with. Now, you might be scratching your head at this point and asking yourself this question: Why doesn't everyone do it this way? Well, there is a down side to the low tech approach. Since your lighting will be of a low intensity, you will need to limit yourself to plants that can tolerate this. There are some good choices in this category: *Anubias*, java fern, *Bolbitis*, and others will do fine. To keep the system in balance, fish stocking levels must be very, very low. If this sounds like the right pace for your aquatic garden, I would strongly suggest reading the *"Ecology of the Planted Aquarium"* by **Diana Walsted.** "Low tech" systems are the focus of this book and it is easily the best I have ever read on the topic. In my opinion, anyone who maintains a planted aquarium ("high tech" or "low tech") would benefit from reading this book.

## The high tech approach:

If you are like me, then nothing short of dense, lush, colorful plants will do. I also like to keep some of the more demanding plants. The only way to do it is by going "high tech." This means higher maintenance and more equipment. The classic recommendation for lighting the "high tech" aquarium would be in the 2-4 watt range. I would consider this a starting point and adjust upwards for deeper tanks. Many people worry about having too much light and "burning" the plants. I personally have never seen or heard of such a case. This includes a technician at **Seachem** I spoke with who has 8.5 watts per gallon on her tank! What might happen is that your plants may reach their saturation point and have more light than they can use. On most of my tanks, I am using compact fluorescent lighting which runs anywhere from 5.2 to 6.5 watts per gallon. The plants look really happy, but I'm sure I didn't hit the saturation point on any of them.

The watt/gallon rule needs to be taken with a grain of salt, because many factors influence lighting intensity. Wattage is not a measurement of light output, but of power consumption. Your hair dryer may be 1800 watts, but you won't be growing any plants with it. Bulb type and ballast efficiencies, the type of reflector, and even the bulb spacing, are all variables in the lighting equation that will affect total output.

To get to the desired levels of lighting intensity, your basic fluorescent strip light won't cut it in a "high tech" system, but today there are many choices. Starting with the king of intensity, you have the Metal Halide fixture. Metal Halides are usually seen on reef systems, but I have heard these will really make the colorful plants look their best. I have yet to test this theory, but it sounds like overkill to me. They do have some serious drawbacks. The first is price. Not just the fixture, but the bulbs themselves are very expensive. This type of lighting also runs very hot.

If you are especially fond of fluorescent bulbs for some reason, there are the HO (high output) and VHO (very high output) systems. They look just like standard fluorescent bulbs, but, as the name implies, produce more light. These systems are a viable choice, but understand that you cannot use these bulbs in a standard fixture. They require different ballasts from standard fluorescent bulbs.

> If you are like me, then nothing short of dense, lush, colorful plants will do. I also like to keep some of the more demanding plants. The only way to do it is by going "high tech."

Fluorescent bulbs and neon bulbs have a lot in common. One of these commonalities is that as bulb diameter decreases, light intensity rises. The diameter of a fluorescent bulb is expressed as a letter "T" followed by a number. Regular fluorescent bulbs made are T5. T5 fixtures are available on the market. They come in the same three types as T12's (standard, HO and VHO). What I really like about these fixtures is the super low profile made possible by these extremely slim bulbs, and they run very cool. I recently got my first one. It is of the standard output variety. I have to say the jury is still out, but the initial impressions are good. The fixture, price-wise, was a little less than the price of Compact Fluorescent (CF), but the bulbs are cheaper and last longer. Although I really like this fixture, I do not feel it is intense enough for a deeper tank. I use mine on a 20 gallon long. If you have a deeper tank, look into the HO and VHO units.

Compact Fluorescent (CF) lighting is extremely popular for high tech systems. I have found them to reliably provide high quality lighting. These are not your regular fluorescent bulbs. They look like a skinny bulb folded back on itself, and all the terminals are on one side. This is the type of lighting on most of my tanks. Works great! I've tried a few from different manufacturers and I really like those made by **Coralife**. They are low profile and appear to be well made. The fans are quiet, and they are competitively priced.

The latest thing in lighting is the LED (light emitting diode) system. That's right, LED! The lowly LED has actually grown up into a high intensity lighting fixture. And because it's digital, it offers more features than any other light system possibly could. The bulb life is phenomenal. This thing is really state of the art. The only problem is I'm afraid to ask how much ($$$).

No matter which type of lighting you choose, all have a usable bulb life. As the bulb ages thru use, it's changing in color and intensity (except the LED systems). So even if the bulb is not burned out, it may be time to replace it. Standard fluorescent bulbs are good for about six months. Metal Halide and Compact Fluorescent are good for about one year. The T5's are supposed to last eighteen months.

The bulbs for all these different lighting types are available in different spectrums (colors). This is usually described as color temperature, measured in degrees Kelvin. This will tell you how red or blue the light will be. Plants seem to do best at color temperatures around 6700˚ Kelvin.

You will get the best lighting with a highly polished reflector. A fixture with an individual reflector for each bulb will give more light than a fixture with a single reflector for multiple bulbs.

Unfortunately, I have never found a fixture with individual reflectors. It seems that this is only available on the retrofit kits which are meant to be installed into a canopy. So, if your setup includes a canopy, and you can use a screw driver, this would probably be your best choice.

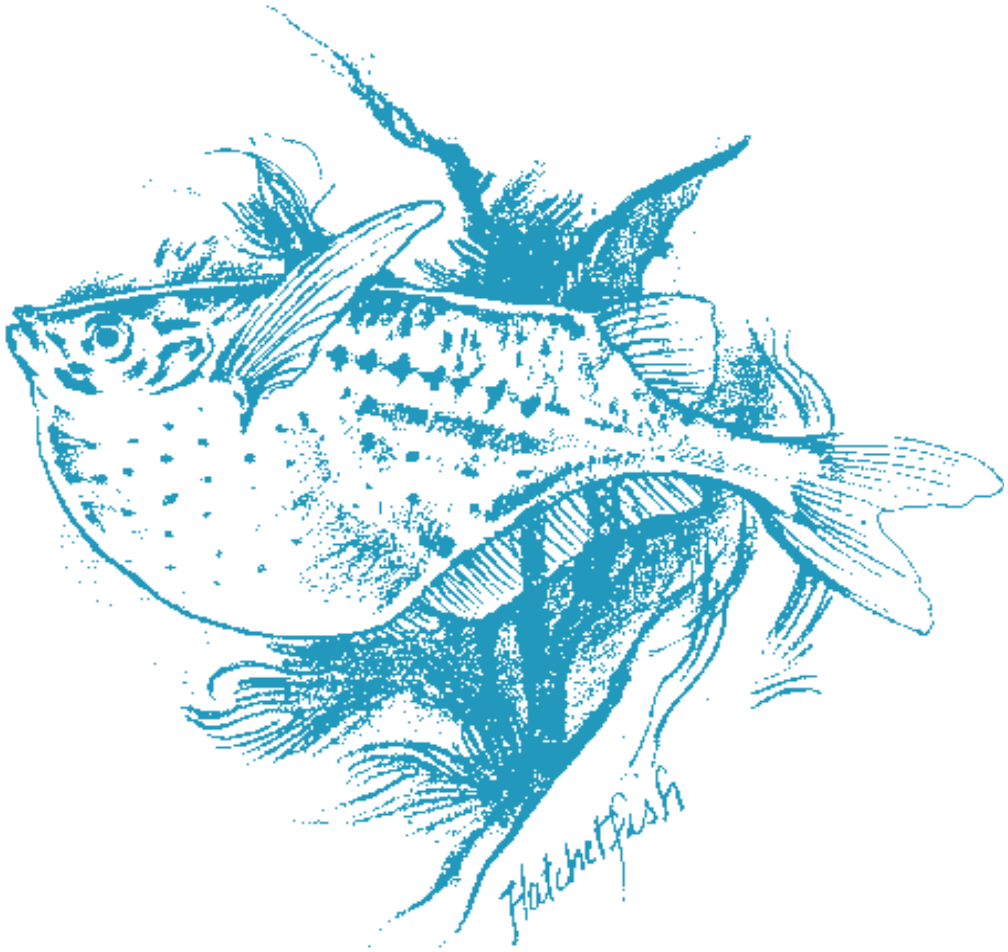
The up side of investing in these kinds of lighting systems is that if you ever get tired of a planted aquarium (I really can't imagine this), then you can change the bulbs to the correct color temperature and switch to a reef tank.

The unfortunate reality is that we have only scratched the surface of what there is to know about lighting, but I do not have the space in this article to cover it all. You should also get familiar with the concepts of Lumens, Lux and PAR. If you would like to know more about lighting, the now defuncted ***Freshwater and Marine Aquarium*** magazine ran a pretty good two-part article on the subject. If you can find the back issues of FAMA these articles are in the November '06 and the December '06 issues.

Well, this about wraps up our hardware discussions. Thanks for reading. In the next article, we will tackle substrates.

Till then, enjoy.

Izzy



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

# Frank's Fish Jell-O

Here's a recipe used by **Frank M. Greco** a former member of the BAS and now the owner of Franksaquarium.com.

Frank says it can be tweaked as needed. Add more veggies or more meat, etc., depending upon the species of fish being fed.

Despite Frank's whimsical name, make sure you use only Knox® unflavored gelatin as the binder.

I'm pretty sure your fish will not care for cherry flavored Jell-O™.

## RECIPE

**INGREDIENTS:**

400 grams of non-oily fish
275 grams clams
600 grams Tetra Marin™
(You can leave this out. Just
increase the greens, fish and/or clams by 600 grams)
150 grams Carrots
150 grams Greens*
200 grams Yeast (I use Salt Creek MicroFeast L-10. If you can't find it, just increase the greens, fish and or clams or add 200 grams of a good quality flake food.
DO NOT use bakers or brewers yeast.)
1-250 mg. capsule of Vitamin E (Open capsule, pour out oil)
1 250 mg. Vitamin C
(tablet crushed)
20 mg. Potassium iodide
(can be omitted if unavailable)
700 mg. Knox® unflavored gelatin.
100 mg. liquid multivitamin
700 ml. Water to mix ingredients
1600 ml. boiling water to mix gelatin

**PREPARATION:**

Place the first 9 ingredients in a blender, and add the 700 ml. of cold water and 100ml. multi-vitamins. Blend on high until well mixed. Boil water, add gelatin, stir until dissolved, then add to blended ingredients and mix on high until well blended. Pour into shallow bakers pan (with sides) and allow to gel. Once set, cut into small squares and freeze.Thaw what you need to feed fish. Will keep about 1 year if kept frozen. Can be grated by using a cheese grater.

*Use kale, collard greens, parsley and similar greens. Do not use spinach or lettuce as both are lacking nutritionally.

**Larry Jinks**
RAS Treasurer and BAP Chairman
Raleigh Aquarium Society Vol. 31, Issue 9 September 2012

# *Hoplosternum thoracatum*: A Bubble-Nesting Catfish

**After finishing the livebearer, old world and new world cichlid specialty groups in the Breeders' Award Program, I decided to concentrate on the catfish and anabantoid specialty groups. This was spurred by the accidental spawning of a group of *Corydoras aneus*. I started buying different species of catfish at various auctions to see if I could complete this specialty. At the July 1998 meeting of the Jersey Shore Aquarium Society I bought at auction a bag of seven fry of *Hoplosternum thoracatum* (spawned by Len Reback).**

**It's a catfish, right?**

With my seven fry safely tucked away in a twenty gallon tank, I attacked the literature and any club members for information. It seems this species is a South American armored catfish that builds a bubble nest to spawn. They can grow six to eight inches and can be very aggressive when spawning.

Well, it seems I only raised two of the seven fry and they certainly didn't act like a pair. At the October JSAS meeting, Len brought in a pair of adult Hoplos and I quickly snapped them up in the auction. I set them up in a twenty gallon long with gravel, some *Anubias* planted and some Java moss. The tank had two box filters and a flower pot and some PVC pipe for hiding places. The water was about 78 degrees F, pH 7.0 and about 85 ppm hardness. I floated a styrofoam cake plate upside down as per Len's instructions.

The male was about five inches with the female slightly smaller. The male could be distinguished by the first pectoral fin spine being enlarged and red to orange in color. They fed hungrily on flake and tablets, frozen brine and blood worms. They would come right to the surface to get the flake food.

After several months of conditioning, I noticed the male had built a bubble nest under the styrofoam plate. Usually it was only the male by the nest and the female hiding. I kept looking for eggs, but I didn't see any in the nest. Ten days later I saw a few dark fry against the white pvc pipe and immediately removed the pair to another tank. I switched the box filter off and put in a seasoned sponge filter and started feeding with baby brine shrimp. With further study, I realized that there were a lot more fry than I originally thought because they were difficult to spot against the dark gravel. After a few weeks I noticed a tremendous differential in the size of the fry. They probably had spawned repeatedly and I had fry from different spawns.

**The male was about five inches with the female slightly smaller. The male could be distinguished by the first pectoral fin spine being enlarged and red to orange in color.**

Meanwhile, three days after they were moved to a thirty gallon tank, the pair spawned again. This time I removed the styrofoam plate and floated it in a one gallon beaker with an airstone providing circulation. While removing the plate I could clearly see about 30-50 eggs attached to the underside. I don't know if this is a normal spawn or if they ate some of the eggs. According to the literature, the males are notorius for eating the eggs, but if this was a normal spawn, then they must have spawned repeatedly in the first tank, judging from the number of fry. After several days they hatched and lay on the bottom with a yolk sac, but after a few more days they were swimming well. The second spawn were very uniform in size, adding more credence to my theory of multiple original spawnings.

Since the male was constantly harassing the female, I moved her to another tank and won't put them together again until I want another spawn. The two younger hoplos have grown and appear to be females. I may try rotating females to spawn with the male to give them a rest. The fry grew rapidly to over an inch in two months, but take about a year and a half to attain sexual maturity.

I can recommend *Hoplosternum thoracatum* as a colorful catfish, active during the day and easy to feed. They will not bother smaller tankmates and are a great community tank fish. I currently have the three females in a 55 gallon tank with four keyhole cichlids, three small *Heros appendiculatus*, and a pretty large *Geophagus* sp. "red bahia."

# A letter from Bob Goemans a living legend of the marine aquarium world

Hi Joe,

As you know, I've been in the aquarium hobby for over sixty years and have written for numerous magazines and published/written many books; with the last being the TFH/Microcosm published ***The Marine Fish Health & Feeding Handbook***. I've also been a speaker at your club several times in the past.

Just recently (about 60 days ago), a magazine, ***Marine Habitat*** in England said the following, which I think your marine members would be highly interested in hearing about:"Aquarium Industry FIRST!

*"**Marine Habitat** is pleased to be the first publication in the world to inform its readership that one of its contributors, **Bob Goemans**, has uploaded to his website **saltcorner.com** a massive/complete book he has written over the past several years that covers the marine hobby from A - Z! It's comprised of about 300,000 words and contains over 1100 photos that actually depict what is discussed, and it's there for all to read for free! **Yes – FREE**! Furthermore, it can be read in many languages other than English! The book is titled **The LIVING Marine Aquarium Manual** because it will periodically be updated to remain in focus with today's hobby!*

*Visit his website and also explore there, its Aquarium Library with over 4000 marine fish, invertebrates, algae and other interesting species each with their own photo and specific species information, its hundreds of articles and book reviews from various icons in the trade, its Gallery where many hobbyists have photos and information about their aquariums (yours also if you wish!), and much more including this newly installed highly informative book!"*

**Bob Goemans**

**Congratulations Bob, an immense gift to all hobbyists! Thanks for this information. I will certainly pass it along for inclusion on our web site and also in our publication *Aquatica* so all of our members and visitors can obtain this free educational information. Thank you again for thinking of us.**

*Joe*

**Thanks, and you guys have the 'BEST' aquarium society that I know of!!!**

*Bob*

# Proposed Synonymy of Midas and Red Devil Cichlids

As I wish to allay the rancor of some individuals who objected to my species synonymy of these two fish in the Cichlid Room Companion Forum, I reiterate here that just because *citrinellus* and *labiatus* have been placed in the same species, I do not believe they are the same. Ernst Mayr has given credibility for the designation of "races" amongst animals. He did also mention that these are usually synonymous with subspecies, but not always. Given the unique situation of these two Heroine Amphilophine cichlids which have a majority of their populations in the two great Creater lakes of Central America, Lake Nicaragua and Lake Managua, and interbreed, the definition of subspecies does not apply (they are not allopathic breeding only where their ranges overlap). I therefore decided the race best suits two organisms who are slighter more closely related than subspecies, but not entirely the same. If the reader would rather use the term varieties, I would not be opposed, but there is simply not enough differentiation, morphologically, sexually or genetically to support specific recognition of Midas Cichlids and Red Devil Cichlids as separated species at this time.

Also, to the supporters of De Queiroz (2007), I agree that in Systematics the definition of species as "separately evolving metapopulation lineages" makes sense. However, in an era where the definition of species in muddled at best, in Taxonomy, the classification of the here and now, species need to be defined as of a date on which we can attribute the traditionally employed suite of character traits so we can say what a Midas Cichlid or Red Devil is.

We recognize that they may not be the same 10,000 years hence.

Red Devils, *Amphilophus labiatus*

Midas Cichlids, *Amphilophus citrinellus*

In this article, I propose to use modern theorizers of taxonomy and systematic which were not available to **Gunter** (1864) to give credible evidence that the Midas/Red Devil Complex in Lake Nicaragua and Managua is indeed nothing more than two extreme races of the same species, which may be in the process of undergoing sympatric speciation. I use the word race deliberately, as it is not commonly used in Systematics and Taxonomy except for human beings, and I believe that makes my proposal easier to understand. No doubt some people will agree with me and others will argue the point, but I ask that everyone Google "Images of *Amphilophus citrinellus*, " and Images of *Amphilophus labiatus*" and note any significant difference other than lip thickness.

Red Devils, *Amphilophus labiatus* and Midas Cichlids, *Amphilophus citrinellus* were both described by Gunther in 1864. Gunter was hampered by having few specimens, a lack of knowledge of their complete geographic range, and because he was in the pre-DNA era, not familiar with the theory that speciation can happen in two distinct ways. Today we recognize genetic and geographic isolation resulting in speciation, and as **Ad Konings** and I believe, evolution happening in another way with regard to speciation, by genetic drift and small changes in the DNA within a species flock. These species were fairly extensively studied by **Barluenga** and **Meyer** (2010), who elucidated several new species in the other minor nearby crater lakes, yet after having stated that the DNA markers they chose to examine usually proved very poorly differentiated between *citrinellus* and *labiatus* and that their DNA were more similar in Lake Nicaragua than to allopatric *citrinellus* in the smaller crater lakes, did not emphasize that the two freely interbreed in said lake. **Seth Meek** in 1907, stated that despite all his efforts, he could not recognize them as two distinct species of the complex in Lake Nicaragua.

When encountered, geographic isolation and the inability to interbreed are easy to tell. Genetic drift within similar organisms that shared their geographic range requires a more philosophical approach.

In the online article "Midas Cichlid," *Amphilophus citrinellus*, Animal-World speculates that Red Devils and Midas are the same species... because the majority of both are sympatric in Lake Nicaragua and look very similar and act much alike. Midas cichlids are found in Lake Managua and Costa Rica, and a few of the small crater lakes as well, where Berluegna et al.

correctly note they have apparently given rise to very new species. Both of them are avid diggers, but their ecological status in the lakes have not been well studied. In 40 years, I have never seen conclusive evidence that one lives enough higher up in the water column than the other to make any difference. Barluenga et al. (2006) admit that "few credible examples of sympatric speciation exist," and Barluenga et al. (2010), referring to *citrinellus* and *labiatus*, conclude "they remain genetically surprisingly indistinguishable." Since it is not known what the 15 genetic loci they studied code for as far as characteristics, is a great beginning that as yet has not proven much difference between Midas and Red Devil cichlids.

Let me wax philosophic and compare the *citrinellus* and *labiatus* to people, with whom we are all familiar. If I live on Bear Mountain and my mother lives in the Bronx, does that indicate we are allopathic or less closely related? Of course not. That argument is poppycock. The argument about Red Devils' thicker lips is very tenuous. You can find fish in the same place with no lips, medium thick lips and thicker lips. They both eat the same things in captivity. The speculation that Red Devils thicker lips help them extract food from rock crevices is of no more significance than within the human species which has several races with different lip thickness. No one has attributed much taxonomic significance to that either. Midas Cichlids are said to be less elongated than Red Devils. By comparison, several central African tribes of humans average a foot taller than people in some Oriental countries. Again, a good argument for a race or subspecies, but not for a full species, especially as the lip thickness varies in specimens from different localities. Another specious argument is the size of the hump. Let's not play "mine is bigger than yours," that is for children. Many species of *Amphilophine* cichlids have humps, and you can establish a cline within a species ranging from smallest to biggest. Both species are polychromatic and come in lots of shades of several colors. So do people, and no one I know is trying to say there are different human species.

**Red Devils, *Amphilophus labiatus* and Midas Cichlids, *Amphilophus citrinellus* were both described by Gunther in 1864.**

In short, there are as many differences in the various races of *Homo sapiens* as there are between *A. citrinellus* and *A. labiatus*. And of course we need a clincher- just as all people can interbreed, so can Red Devils and Midas Cichlids in Lake Nicaragua and Managua, and they apparently do very often - often enough so that only a tiny difference in their genetics has been yet discovered. Barluenga and her associates have stated that Nicaraguan Crater lake cichlids of the Midas Cichlid complex are a great model for incipient speciation and definition of a Species Flock. I have no problems acknowledging that zaliosus and the other minor crater lake species they have helped describe as distinct, but as long as Lake Nicaragua survives, *citrinellus* and *labiatus* are in the same position as different human races who are mobile within the ranges of others and interbreed. It is indeed curious that Barluenga and Myer (2010), after an elegant DNA analysis of all the Nicaraguan crater laker varieties, have to fall back on small morphological differences to justify them not calling *citrinellus* and *labiatus* the same species.

Albert Gunter, the greatest ichthyologist of his age, described both fish in 1964, based on preserved specimens in the British Museum. So we can't fault Gunter for describing two separate organisms with a dearth of specimens. Still relevant however, is which name takes precedence as they were described in the same year. Fortunately, we know that Gunter designated the type of *labiatus*, in 1863, so *citrinellus* becomes a junior synonym of *labiatus*, and in conclusion we now designated the species *Amphilopus labiatus* as monotypic and composed of two races of varieties, *labiatus* and *citrinellus.*

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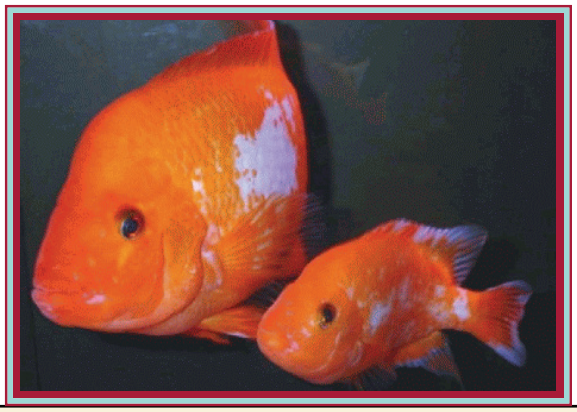
Midas Cichlids, *Amphilophus citrinellus*

# SPECIES PROFILE

**Family:** *Cichlidae*.
**Common Name:** Midas Cichlid
**Species:** *Amphilophus citrinellus.*
**Origin:** Central America
**Habits:** They can be kept in highly varied water conditions. The tank should be a minimum of 75 gallons and have rocks and hiding areas, but should also have open areas for swimming. They like a sandy bottom to dig in, as Midas Cichlids are aggressive diggers. Needless to say, plants do not fare well unless they are plastic.
**Size:** Up to 13 inches.
**Water Conditions:** pH of about 6.8 to 7.2.
**Temperature:** 73˚ to 91˚ F.
**Diet:** Accepts all kinds of foods.
**Breeding:** *Amphilophus citrinellus* are egg layers and very aggressive within its own species and a large aquarium with a lot of hiding places are necessary for a succesful breeding. An alternative can be the use of a transparent divider which protects the female from the larger male. It's best to let the male take care of the fry alone.
**Sex:** Males are distinguished by a large bump on their forehead, known as a nuchal hump and this is more predominant during breeding. Males are usually larger and have longer fins. Females have a much smaller nuchal hump.
**Remarks:** Aggressive. Should only be kept with other larger aggressive fishes in big aquariums.



**Family:** *Cichlidae*.
**Common Name:** Red Devil Cichlid.
**Species:** *Amphilophus labiatus*
**Range:** Central America, found only in Nicaragua.
**Habits:** Territorial and aggressive to conspecifics (same species) as well as heterospecifics (other species) and are often kept by themselves.
**Size:** 14 inches.
**Water Conditions:** a pH of about 6.5 to 7.5.
**Temperature:** 75˚ to 79˚ F.
**Diet:** Carnivorous, feed cichlid pellets, freeze dried bloodworms and brine shrimp. Some fish will accept flakes if fed when young.
**Breeding:** Open spawners. They prefer to spawn on inclined substrates. The spawn is usually around 600-700 transparent, amber-yellow color eggs. The female takes care of the initial brood.
**Sex:** Males are larger and have a larger hump. Males also have more pointed anal and dorsal fins.
**Remarks:** Red Devils have a great deal of variability in structure and color. Some are bright red, others white or yellow. Some have black-tipped fins and tail with black lips, while others have thick rubbery lips. They can be kept in aquariums of 50 gallons, bigger aquariums can reduce aggressiveness. They will usually not tolerate other fish in the same aquarium. Very similar to *Cichlasoma citrinellum*, or Midas Cichlid. They are found in different places though, while the Red Devil is only found in the Nicaraguan lakes, Midas can ranges from Costa Rica to Nicaragua.

## Editors Note:

Our friend Dan Hagan has sold TheShrimp Farm.com! But The Shrimp Farm still lives on and is still the place to go for dwarf freshwater shrimp. The new owner, **Brad Kemp**, has a new address: The Shrimp Farm USA, 11936 West 119th St., #197, Overland Park, KS 66213, United States and has set up an Aquarium Shrimp Forum http://theshrimpfarm.com/forum/index.php. You can go to this forum and ask question, talk to other shrimp nuts and discuss anything and everything related to Aquarium Shrimp. I would like to thank Dan for his service as the Shrimp Editor of *Aquatica* and we extend that thanks to Brad for continuing to let us use the Shrimp Farm information in *Aquatica* and being now becoming our Shrimp Editor.

# BLUE VELVET SHRIMP

**Scientific Name:**
*Neocaridina heteropoda*
**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:** -8 dkh
**Ideal Hardness:** 6dkh
**Life Span:** 1 - 2 years
**Size:**1/2 inch
**Gestation Period:** 30 days
**Diet:** Omnivore


**Regarding the Blue Velvet:** It's turning out to be one of our most popular shrimp we sell. The coloring of the shrimp is what I believe is so attractive for most. We also sell the Blue Pearl, but its color is almost ...ice blue. The velvet shrimp is a deeper/darker blue. On top of that, water parameter needs are much like the easy-to-care for, Red Cherry. We keep ours in pH 7.0...temp 75 degrees. They are super easy to care for and they also breed really easily. People love that!!

**Lastly...We are striving to keep as many shrimp in stock as possible and I have even lowered many of the prices since I took over.**

We also utilize what I personally consider one of the most prime ways of shipping live shrimp. We are using a specially designed Styrofoam container that has a self-sealing lid. Once sealed, this box is superior at keeping temps stable inside the container. **Our DOA rate is next to "0."**

**We also now have a Facebook page:**
- https://www.facebook.com/pages/The-Shrimp-Farm/196582057021072

**A brand new Shrimp Forum:**
- http://theshrimpfarm.com/forum/index.php

**And a Pinterest Page:**
- http://pinterest.com/theshrimpfarm/
- The Shrimp Farm.com
- Shrimp Farm Facebook
- Shrimp Farm Forum

*Brad*

**Brad Kemp**
Shrimp Farm article printed with permission

# BREEDING DWARF SHRIMP

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 that 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 their 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 bellow 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 import 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 throughthe 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 often times 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.

**There are two types of Dwarf Shrimp, high order and low order. Low order shrimp hatch as larva and often times 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 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 hose 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.

**Dominique Isla** BAS

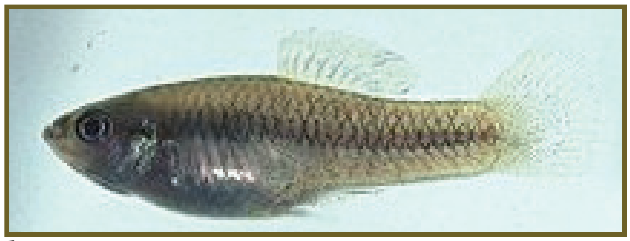
**Editor's note: Dominique Isla** was a member of BAS back in the 1990's; unfortunately for the hobby, he passed away in 2008. He was an avid livebearer aquarist and kept and bred dozens of different *Goodeids, Gambusia* and *Xiphosurous*.

As a member, he wrote a series of short articles on these fish. The following was published in the February 1990 issue of the *Aquatica*. He moved to Florida around 1997 to work at a fish farm in Homestead which was wiped out by a hurricane. He relocated to New Orleans for a couple years and then moved to Denver to establish a large fish breeding facility in the Denargo Park section of the city. I'll be reprinting more of Dom's writings in future issues of the On-Line *Aquatica*.

# Dom's Livebearer Corner

## My First BAS Meeting

(Or how I got to breed an endangered species)



Being an avid hobbyist with a good 15 years under my belt, I had decided to start getting more involved in the hobby. What better way than by joining the BAS? When I arrived at my first meeting, the BAS was having its semi-annual auction. It was like a dream come true, not only a room full of interesting fish nuts, but also tables filled with bags and bags of tropical fish. Oh what a joy!

I examined the bags carefully, and to my surprise found a bag with a trio of very, very rare fish, *Xiphophorus couchianus,* Monterey Platyfish. I remembered reading in TFH (Tropical Fish Hobbyist) that this fish is in danger of becoming extinct.

What an opportunity! On the spot I decided to bid for the trio. The next thing I know I'm on my way home with the trio, two females and one male. Both females pregnant like good little livebearers. I thought, these fish are like guppies. Soon I will be up to my elbows in *Xiphophorus counchians.*

Wrong, and wrong again. These are completely different. To start, I did some quick research on the area in nature that the species comes from. I had a heavily planted 10 gallon tank at home (hygro, Java Moss, Madagascan Lace and some small Swords). I adjusted the pH by adding sea gel to my outside filter. What I didn't know at the time was the condition in which the fish had been reared (back to that subject later).

I let the trio loose and left them basically alone, except for weekly water change, 10%, and twice-daily feeding. Already I noticed something strange. The fish preferred flake to live food!

After a month the most pregnant of the females was dead. There was one fry in the tank. At this point, I became nervous. Not wanting to lose the fish, I placed the remaining female in a breeding trap and isolated the male. I do not like using this method, since I prefer breeding fish as naturally as I can. Well anyway, in about two to two and one half weeks I was rewarded with about one dozen offspring from the gravid female. I am happy to say that all of the offspring are doing well. In November of '88, I attended a hobbyist meeting at another society. The speaker was **Dr. Klaus Kalman** from the Osborne Lab (*the Osborne Lab at the New York Aquarium is now a Coral Breeding facility and Dr. Kalman is retired*) where the fish came from. I was able to get more information on the species' native habitat, but still didn't think of asking him (Dr. Kalman) about the conditions the fish are kept in at the lab.

I found out that my adults are the 43rd generation in captivity, since I believe, 1939. So now I have the 44th generation and I hope one day, the 45th, etc., etc. I have been lucky enough to contact **Bob McKean**, who is a livebearer authority who keeps over 100 species of livebearers in his home.

He has filled me in on the conditions at the lab, and that has shed some light on why the fish don't readily take live food (which they do now). I am planning to pass a trio onto Bob soon, when I visit him, Oh, and the female is out of the breeding trap and in her own 10 gallon spawning setup.

**Michelle Stuart**
Ontario, CanadaFrom Fishtanksandponds.net
Aquarticles

# Colt Coral Propagation

Propagating a Colt Coral is a very easy and rewarding process. For those of you who are reluctant to propagate your corals for fear of hurting the animal, you will be happy to know that corals do not feel pain. They do not have a nervous system therefore they do not feel pain the way we do. So the parent and cutting will not be hurt during propagation, even though it will seem that way when you see them curl up in a small ball, so don't let it deter you from propagation.

A second area of concern that may hinder a decision to propagate a Colt Coral is lighting. Minimal lighting is required for these corals because they are naturally found deep in the ocean where they do not get very strong light. I am only using two fluorescent lights, one actinic blue and one super daylight bulb, and my coral is thriving.

However, during propagation the corals are more susceptible to infection and other ailments while they are recovering, so it is very important to have a healthy tank before, during, and after you make the cutting.

## Equipment Required:

- 1 Toothpick
  (I find the round ones are easier to work with)
- 2 Elastic
- 1 Razor blade or very sharp scissors
- 1 Rock to fasten the cutting on
- A container of clean saltwater to put the cutting in

## Before you make the cutting:

Before you make the cutting, you need to have a very healthy tank. Make sure that all of your readings are (preferably) lower than the safe range. You don't want to stress the parent and cutting any more than you have to. I generally do

a water change 4 or 5 days before I propagate my Colt. This way I know that I won't have to worry about stressing the new cutting by having to make a water change while it is just starting off. The water change will also help replenish the required trace elements in the water which the colt corals will need to recover and grow.
Next, you want to make sure the Colt Coral is healthy as well. Make sure that the polyps open up all the way and that the coral is fully extended. If it isn't for any reason, wait a couple of days before you make the cutting.

## During the cutting process:

The time has finally come to make the cutting! Make sure you have everything you need to make the cutting close at hand. Choose a branch that you want to cut, make sure the branch is at least 2 or 3 inches long. This will give you around a 1½ inch cutting. When you make the cutting, don't cut the branch right at the base, leave around a ½ inch from the base. The parent coral will eventually grow another branch from the stub.

The Colt Coral has a very tough skin, so when you make the cutting, you will need to use some force. I generally use a razor blade to make my cutting and lean the branch against a rock for support while I cut. Make the cutting in one clean cut. This will help the coral recover quicker and the cutting will grow onto the rock easier. When you make the cut, the corals will excrete a clear liquid, this is normal and it will stop soon after.

Once you have the cutting, take it out of the tank and put it in the container of clean saltwater you have prepared. Get the piece of rock you want the new coral to grow on and lightly dry off a spot to place the cutting on. Wrap two elastics around the rock, one on each side. You will use these to secure the cutting in place until it has had time to grow on to the rock.

Next take the cutting and push a toothpick through the centre, near the base. Place the base of the cutting on the rock and put the toothpick under the elastics. The cutting should be held firmly against the rock.

Now you are ready to put the cutting back in the tank.

Place it in a location with good lighting and a light current. Make sure that it is in an area where other creatures in the tank will not disturb the new coral (i.e., knock it over or bury it).

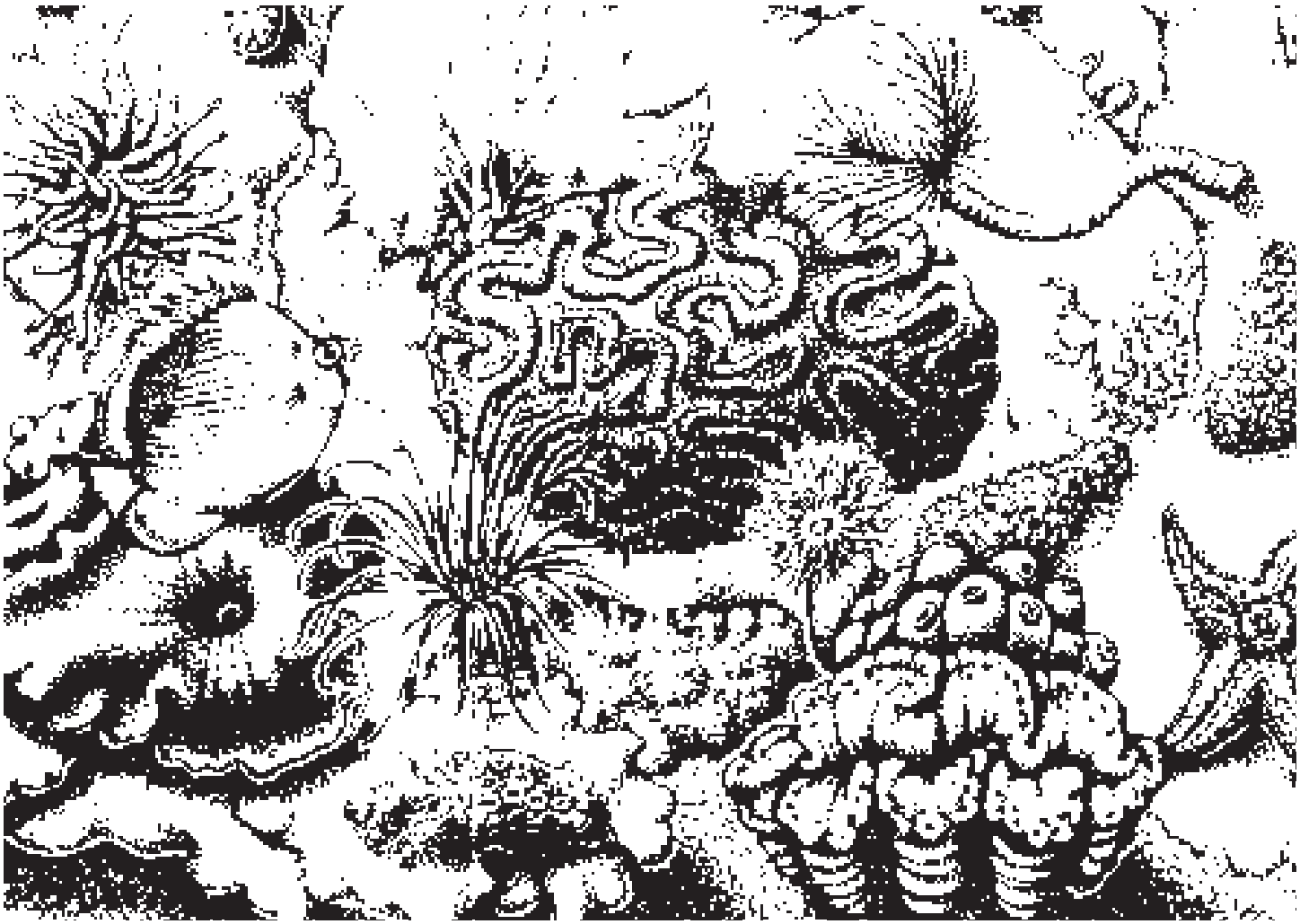
## After care of the new coral:

Now that the hardest part is finally done, you have to have patience and wait for parent and cutting to open up. I have found that the parent will open up first within a few hours. As for the cuttings, I can't tell you any normal length of time. I have had one open in a few hours and another open in a day. So have patience! (Something I am trying to learn myself!)

If the cutting doesn't open in a couple of days, check to make sure that the cutting is firm to the touch and isn't losing its colour. If it is soft to the touch or dull looking, then chances are it isn't going to live. I suggest that you remove it from the tank before it pollutes the water. If you have a quarantine tank you could try putting it in there to give it more time.

Over the next couple of weeks, the new cutting will start to grow and secure itself to the rock. It should be attached after about a week but I suggest that you give it a little more time. After two weeks, it's time to take the toothpick out of the young coral. Remove it slowly and gently so you don't pull the cutting away from the rock. I find that it helps if you turn the toothpick to detach any part of the coral that has grown on to it. Remove the elastics from the rock at this time also. Replace the young coral in the tank and you are done!

Congratulations! You now have a new Colt Coral! Easy wasn't it! (After you got over the jitters of harming the coral and see that everyone is going to live! LOL).



# SUPPORT OUR SPONSORS. THEY SUPPORT US. WE MUST SUPPORT THEM!

**Reefs2Go.Com** has joined the BAS family of quality sponsors. They're located in sunny Florida. Visit their web site to view the full line of saltwater fish, inverts, corals, live foods for marine fish and corals plus a complete line of saltwater dry goods and equipment. Get all the details on FREE SHIPPING and their 14 day Guaranteed Living or Credit policy. If saltwater is your passion and you're looking for deals, check their Daily Deals and Over Stocked Items page. For more great buys, check Buy 1 get 1 Free Offers. Check out the site. Read the testimonials and if you still have questions, call them Monday to Thursday from 10am to 5pm EST at **727-623-0914.**

**Absolutely Fish's** staff is knowledgeable and can help you solve your aquatic problems. **They offer a 15% discount on select fish, marine life & supplies with current BAS membership card.** A really great aquatic shop. Well worth the trip.
**Absolutely Fish** 1080 Route 46 W. Clifton, NJ 07013
Ph: **1 (973) 365-0200**
Open 7 days a week: Mon-Fri 12-9 Sat 12-8 Sun 12-5

**Aquatic Wildlife,** features 11,000 gal. of freshwater fish, plants & marine life. **Discount with current membership card.**
**Aquatic Wildlife,** 179D Demming St., Manchester, CT 06040
(In Panera Plaza) Ph: **1 (860) 648-1166**
www.aquaticwildlifecompany.com

**Brooklyn Zoo & Aquarium Inc.** A classic pet shop with a full line of aquarium supplies, freshwater, marine fish and corals. **BAS members get a 10% discount with a current membership card.** Some restrictions apply.
**Brooklyn Zoo & Aquarium Inc.**
2377 Ralph Ave., Bklyn, NY • Ph: **1 (718) 251-7389** Hrs:
Sat - Sun 10am - 6pm & Mon - Fri 10am - 8pm

**"C" The Jungle Pet Store** In the heart of Brooklyn carries a full line of pet supplies, tropical fish, birds, and small animals. They offer a **10% discount to BAS members with a current membership card.**
**"C" The Jungle Pet Store**
247 New Lots Ave., Bklyn NY 11207 Ph: **1 (718) 649-2536** Hrs:
Tue-Sat 10am-8pm • Sun 10am-6pm

**Fauna** is Manhattan's largest exotic pet boutique and a new sponsor of the BAS. **Dan offers a 10% discount to members.** They keep over 2,300 gallons stocked with freshwater, marine fish and corals. They also carry small animals, birds and reptiles. Make a point to visit and tell them you saw their ad in the *BAS Bulletin* and *Aquatica*. This store will blow you away!
**FAUNA 265 West 87th St.**
**between Bway & West End Ave., NY, NY**
Ph: **212-877-2473**
Hrs: M-W-T-F 11am- 7pm • Closed Tues.
Sat 11am-7pm • Sun 11am-6pm

**Petland Discounts,** the complete pet store, carries a full line of pet supplies for fish, dogs, cats, birds, reptiles and small animals. Also a variety of fish, birds, small animals and reptiles. Open 7 days a week. Locations in New York, New Jersey & Connecticut. Over 15 stores in Brooklyn. Shop on line at: See the white pages, for a store near you.
**www.petlanddiscounts.com.**

**Mark's Discus:** over 4,000 gallons of hormone free Brooklyn bred discus & angelfish. Mark stands behind his quality fish with a live delivery guarantee. Feel free to contact him with your questions. **10% discount for BAS members with current membership card.**
**MARKSDISCUS.COM**
You're welcome to visit their hatchery by appointment only. Call for directions.
Ph: **917-202-7699**
Open 7 days and all Holidays • 9am -11pm

**Manhattan Aquarium** has one of the largest Selections of Marine Fish & Corals on the East Coast. Located conveniently at 522 West 37th St. in Manhattan. You should check them out for all your Marine Fish & Coral needs.
**Manhattan Aquarium**
**522 West 37th Street, NYC, NY 10018**
**Ph: 212 594-2271 • Fax: 212 594-2271**
**www.ManhattanAquarium.Com • www.UniqueCorals.Com**

**Pet Shanty.** Family owned & operated; 3 rooms of freshwater fish & 1 of marine fish & corals. They stock a vast list of fish, posted on line at http://pet-shanty.com. They also carry other pets and pet supplies. Check them out; they probably have what you want. **Members get a 10% discount.**
**Pet Shanty**
2507 U.S. Hway 22, Scotch Plains, NJ 07076
Ph: **1 (908) 889-8262** • Fax: **1 (908) 889-0803**
Mon-Fri: 10am-9pm • Sat: 10am-7pm • Sun 10am-5pm

**Pacific Aquarium & Pet Inc.,** in Manhattan's Chinatown, carries ornamental goldfish, koi, freshwater fish, & aquatic plants. **BAS members get 10% discount with current card** (Discounts not to be combined with other specials). They have a full line of aquarium supplies. You can order custom size tanks.
**Pacific Aquarium & Pet Inc.**
46 Delancy St., NY, NY 10002 • Ph: **1 (212) 995-5895**
Open 7 days a week and all holidays 10am to 7:30pm

**Royal Aqua World Inc.** Over 100 tanks of marine fish, hard & soft corals, freshwater fish, goldfish & koi imported from Japan, plus plants and pond supplies. **BAS members get a 10% discount on all purchases with a current membership card.** Open 7 days a week.
**Royal Aqua World Inc.,** 815 65th St., Bklyn, NY 11220
Ph: **1 (718) 238-0918** Hrs: 7 days a week 10:30am-8pm

## Membership & Renewal Application Brooklyn Aquarium Society

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

Please check your address label to see when your membership expires

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: 1yr. $20 | 2yr. $36 | 3yr. $51 | 4yr. $68

FAMILY: 1yr. $25 | 2yr. $45 | 3yr. $63 | 4yr. $85

[ ] $15 STUDENT 1YEAR (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_____