



AQUATICA

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VOL. 29 SEPTEMBER - OCTOBER 2015 No. 1

Orange-lined Triggerfish *Balistapus undulatus*





104 YEARS OF EDUCATING AQUARISTS
AQUATICA

VOL. 29 SEPTEMBER - OCTOBER 2015 NO. 1

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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:

Brooklyn Aquarium Society, c/o Membership Chairperson, P.O. Box 290610, Brooklyn, NY 11229-0011.

BROOKLYN AQUARIUM SOCIETY

CALENDAR OF EVENTS ~ 2015-2016

Please note:
Make your reservations
NOW!

This year our annual holiday party, Friday Dec. 11, will be held at the **Seaport Buffet Chinese Restaurant, 2027 Emmons Ave., Brooklyn, NY 11235**. The party starts at 8:00 PM. Cost per member and guest will be \$15 and \$10 for children (ages 3-8).

There will be no payment allowed at the door. All who wish to attend must be fully pre-paid by the Nov. 13 event. There is free parking in the back and lots of free street parking after 7:00 PM. Come and enjoy the food, fun and fish friends!



2015

SEPT 11 Rick Borstein ~ 60 Tips in 60 Minutes ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

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

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

DEC 11 Holiday Party ~ Members, their families and friends to be held at a restaurant. Not at Ed Hall ~ Fish Bingo & Prizes • BAS awards presentations. See above!

2016

JAN 8 Jeff Bollback ~ 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 and maintaining Apistogramma Genus and other South American 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 - General Livebearer ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction. BAS elections.

JULY / AUGUST - NO MEETINGS

All BAS meetings begin at 7:30pm.

No members, other than those donating their help setting up or items for the auction, will be allowed in before that time.

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



THE OTHER GLASS CATFISH!

When we think of glass catfish, generally we think of the Thai Glass catfish, *Kryptopterus bicirrhis*. This beautiful, peaceful and interesting catfish is commonly available in the hobby. There are, however, additional glass catfish species in both Africa and Asia. These species are much rarer and only sporadically at best seen in the aquarium trade.

This article will focus on 4 African species. None of these is seen very often in the hobby, yet all are very desirable.



The first species we will discuss is the African Glass catfish, *Parailia congica*. This fish is sometimes sold as the African speckled glass catfish.

Native to the Democratic Republic of the Congo, (formerly Zaire) it is exported from Kinshasa. It occurs in the Stanley Pool of the Congo River near Kinshasa and grows to 3" inches.

This fish is shaped like *K. bicirrhis* and clear but it has black speckles over its body. A thin black stripe extends from the vent to the caudal base just above the anal fin. A second black stripe extends internally along the lateral line. This is the fish's backbone in shadow. Gill covers are

also transparent and red due to the fish's blood flow. The body's organs are enclosed in a silvery sack. Eyes are black with silver irises. Long whiskers. No dorsal or adipose fin.

This is a peaceful, schooling, community tank fish. Always keep it in a school of at least four fish. I keep mine in 6.8 – 7.2 pH, moderate to soft hardness and a temperature range of 74°F – 80°F.

This fish is active all day, swimming up off the bottom constantly. I feed my fish frozen mosquito larvae, daphnia and bloodworms initially. This catfish will accept flake food and floating micro-pellets after acclimation.

It rarely if ever feeds off the bottom. This catfish is an active feeder, rapidly swimming after food of interest as it floats or falls to the substrate.

This catfish can be very difficult to acclimate. Many times, it refuses to feed. If this happens, tempt it with live black worms. It rarely refuses those. You must initiate a feeding response with these fish once you obtain them. Once it is eating live black worms, you can wean it over to frozen



and flake foods.

This catfish is highly seasonal. All specimens offered for sale are wild caught; it has not bred in the aquarium. Congolese exporters between November and February sporadically offer this catfish.

Most of the time, specimens sent to the United States arrive in poor shape. They have had to endure a long trip from the Congo to the USA via Europe.

I know of no direct Congo flights to anywhere in the states. Losses among freshly imported fish are usually high. This, combined with its seasonal availability, difficulty in acclimation and rarity, makes this a moderately expensive fish, if you can ever find them. That said, however, once acclimated, this is a very durable fish. Just keep its conditions stable and clean.

Three particular points of note with this fish.

#1 Do not use a powerhead with it. This fish prefers slow currents. If the current is too strong, it will stop eating. Use airstones to provide a current.

#2 Never use any dye medications on it except Methylene Blue. Acriflavine can kill this fish. If it catches ick, raise the temperature slowly to 88°F. The fish will tolerate that temperature as long as you increase the aeration. Use all copper remedies at 50% recommended dose rate.

#3 Do not do larger partial water changes with this fish. Maintain water quality with frequent small 10% water changes. I change 10% of their water every other day.



The second African Glass Catfish we will look at is the Nile Glass Catfish, *Paralia pellucida*.

This is a large, more active fish. As a result, it needs more room for swimming space. This catfish is an excellent jumper so be sure to cover its aquarium. A layer of floating water sprite or

similar plant will help keep it calm.

Again, this schooling, diurnal catfish should be kept in schools of at least four fish. Food and water quality requirements are the same as the speckled Glass Catfish; so is its sensitivity to dye medications.

The Nile Glass Catfish usually is easier to acclimate as it feeds well.

This fish is highly photosensitive. Turning an aquarium light on in a darkened room will send it into shock, possibly even killing it. Always turn on a room light for 15 minutes before turning an aquarium light on over this fish. It's not that this fish cannot take bright light, but its active nature combined with a too fast transition from dark to light are too much for it to adjust to. Interestingly enough, the reverse is not true. It goes from light to dark with no transition time just fine.

Again this delightful catfish has not been spawned in the aquarium to my knowledge and all specimens are wild caught.

Both *Parailia* species have four pairs of barbells.



The third African Glass Catfish species we will look at is the Swallow-Tail Glass Catfish, *Pareutropius buffei* is an active, beautiful, peaceful schooling catfish. It is native to Nigeria and Cameroon and grows to 3" inches. Always keep this fish in a school of 6 or more.

This diurnal catfish needs a lot of free-swimming space. I suggest a 55-gallon aquarium for a small school.

The fish has a translucent body. A dark broad black stripe extends from the gill cover to and thru the middle of the caudal fin. A second thinner black stripe starting at the gill cover outlines the stomach body cavity, follows the bodyline along and to the end of the anal fin, which is clear.

The lobes of the caudal fin are round and crowned with black dots.

Swallowtails love current so use a power-head to provide such. Heavy filtration promotes high activity. I keep mine in pH 6.6 to 7.2, in soft to medium hardness and a temperature range of 74°F – 80°F. If your water quality is poor, these fish will not be active. They are free swimming constantly. To keep your water quality high, change 1/3rd of the water once or twice a week.

Compared to the previous two species, this one acclimates easily. It is usually hardy and eats any high quality frozen or flake food.

It also is the most commonly available. Usually offered thru most of the fall and winter months by Nigerian exporters. As a result, when available, it is usually reasonably priced. This fish ships well. It shows less photosensitivity than the two preceding species, but still is susceptible to shock if your dark to light transition is too swift, so be forewarned.

It is just as sensitive to medication as the previous two species, however.

This species has spawned in the aquarium. Females appear broader and heavier, especially when filled with roe. Males are slimmer with darker colors. Separate the sexes for 7 to 10 days before spawning and condition on high protein live, frozen and flake foods.

You can breed these fish in a 20-gallon long tank. Use soft water, pH 6.6, a temperature of 80°F. Use a well-established sponge filter for aeration. I use hornwort for plants to receive the eggs.

The trio spawns the morning after being introduced into the breeding tank. The males actively pursue the female, sidling up to her in a parallel line and quivering as they spawn in the tank. The usual spawn is about 100 -150 eggs. Remove adults after spawning. The eggs are white. Do not mistake them to be fungused or infertile. I do not use any dyes with the eggs. I simply remove infertile ones. Keep lighting over the eggs and fry dim initially. The eggs hatch in about 3 days at 80°F. The fry are large and free swimming relatively soon.

The fry can easily eat newly hatched baby brine shrimp when free swimming. Growth is rapid with frequent, small (10% every other day) partial water changes. The fry are easily raised in clean water.



The fourth and final African Glass Catfish we will look at is what most people consider “the” African Glass catfish. *Eutropiellus debauwi*.

This catfish also comes from Western & Central Africa. It grows to 3” inches. Its care and behavior are similar to the preceding Swallowtail. Its spawning is also similar.

The true *E. debauwi* is only rarely available. How do you tell the difference between *E. Debauwi* and a Swallowtail?

Three ways!


#1 In *Eutropiellus debauwi*, there is no second stripe over and around the stomach/body organs and down over the anal fin.

#2 In *Eutropiellus debauwi*, there are no black dots in the caudal fin tips. The tips are pointed in *E. debauwi*.

#3 In *Eutropiellus debauwi* the leading edge of the adipose fin is black.

All of the African Glass Catfish species discussed here are well deserving of a place in any home aquarium or catfish afishcionado’s fish room.

You have to look (sometimes very hard) to find and obtain them. However, all are well worth the effort!

So, the next time you want something unique, try the “other” glass catfish! 

EDITORS NOTE: Keep in mind this article is from a Canadian Aquarium Society and the address noted are in Canada. You can find American suppliers of the same items online.

Fish Food, For Dummies

Fish need food. Otherwise they starve. Simple enough. But like you and me, fish also require that a necessary list of nutrients be in their food or they will slowly grow ill, and then will die.



So how do you give your fish adequate nutrition?

Well, thankfully, it is not hard. We have so many very high quality flake foods and freeze-dried foods that fish can be adequately nourished with very little fuss and bother. You may read articles where it is stated categorically that flake foods do not make an adequate diet for any fish, but this assertion has long been disproved by the hordes of aquarists that feed flake foods exclusively, and still maintain colorful, breeding, vibrant fishes. So why not end this article here? Well, it's not that simple. Just because most aquarium fish will thrive on a good flake food, that doesn't mean they all will and it certainly doesn't mean that all flake foods are good. And of course, flake food is boring. Boring for you to feed, and probably boring for the fish to eat. Boring. This is a hobby right? It's supposed to be fun, right? Well, why not get some fun out of meal times then? So I'll talk about live and homemade foods too.

FLAKE FOODS But first of all, the flake foods. **Aquarian®**, **Tetra®**, and **Wardley®** are all recommended brands. There are some other brands that are pretty good, but these three are the most widely available. As a general rule of thumb, if a flake food is for sale in a reputable pet store, it will be pretty good. If you buy it at Walmart®, however, you are taking your chances. Department store flake foods tend to have a small list of inexpensive ingredients and a lot of white wheat flour filler. One particularly bad brand that you should avoid has a red label and a name that starts with H and is a homonym for your primary circularity organ (hopefully that's sufficiently obscure that they won't sue us for defamation).

Wardley is the least expensive of the recommended brands and is also available in bulk, but the Wardley brand name lacks the range of "specialty flakes" that Aquarian and Tetra offer. As far as these specialty flakes go, the only one I have any use for are the "green" flakes that are high in vegetable matter. Most of these vegetable flakes



contain *Spirulina*, which is a *photosynthetic cyanobacterium* (so *Spirulina* is not an alga as is generally assumed). *Spirulina* is quite high in protein and a great source of many amino acids that are otherwise difficult to acquire. Health food stores are full of the stuff. *Spirulina* flakes are just what you need for mollies and a host of other vegetarian fishes. Aquarian and Tetra also offer *Spirulina* enriched wafers that sink, which are very good for algae-eating bottom feeders like plecos.

The various other flake foods, like "carnivore flakes," "color flakes," etc. are, in my humble opinion, more useful as marketing strategies than as dietary supplements. Feel free to purchase a variety of flakes, but all good flake foods are heterogeneous mixtures of ingredients and supply complete nutrition on their own.

FREEZE-DRIED FOODS Aquarium stores also sell freeze-dried foods. These differ from flake foods in that they usually have only a single animal-ingredient each (e.g., mosquito larvae, blood worms, tubifex worms, etc.) and they are usually in the form of chunks or as individual organisms, rather than flakes. These foods are not in themselves complete diets, but they can be part a well-rounded diet consisting of a good basic flake food, a *Spirulina*-enriched flake food, and several types of freeze-dried foods.

Almost all of the organisms that are freeze-dried and sold for aquarium use can be found as either living or frozen foods, as will be discussed below, but in the freeze-dried form they provide a convenience of storing and feeding that frozen or living foods cannot match. Feel free to purchase freeze-dried foods if you are unwilling to devote freezer space to frozen foods or to go through the significant bother of dealing with live foods.

FEEDING The next thing to know about dried foods is how much to feed. Unless you want your fish to spawn or are raising their babies, don't feed much at all. Fish are cold blooded, and therefore do not require food energy to maintain their body temperatures. They also are neutrally buoyant and so they don't require any energy to stand up. As a result, fish can get by on remarkably little food.

The rule of thumb to feed all the fish can eat in five minutes twice a day is a good one, provided that all of the fish are actually getting some of the food. This isn't a problem with schooling fish, but a territorial fish like a cichlid can monopolize a food supply. Most aquarists therefore end up feeding a cichlid aquarium more than the recommended amount, and so they must deal with the high nitrate levels, algae growth, and unwanted breeding that comes with overfed fish. This is just part of the deal when you raise cichlids. But schooling fish can be fed quite sparingly because they will feed as a school rather than competitively. The concentration of their wastes can therefore be kept to a minimum, thus giving you a healthy, easily maintained, and more enjoyable tank.

Then there are the bottom feeders, like loaches and catfishes. What about them? If you feed according to the recommended five-minute rule, your bottom feeders won't get much to eat. Starvation is consequently one major cause of failure with catfishes, and over feeding in attempt to "make sure the catfish gets some" is another. In practice, however, things are not that bad and catfish can generally find enough to eat (remember fish need very little food). If you have a lot of catfish, however, you should take advantage of the fact that most bottom dwellers are nocturnal and supply some sinking wafers when the lights go out. Make sure that this food is gone by morning. By feeding extra at night, you are, however, walking a fine line between adequately feeding your fish and over feeding your fish. So be careful.

HOME MADE FOODS As I mentioned before, you may eventually get bored of feeding your fish just flakes. Or the financial realities of purchasing flake foods (yes, you do pay for their convenience) may make you look for less expensive alternatives.

A less expensive alternative to flake food is homemade food. If you like to cook, this can also be fun, although to be honest I tend to think of making your own fish food as a bit of a smelly chore. Thankfully, it is easy to make and freeze enough to last you a good six months or more so you don't need to put yourself through it very often.

Before you start, get yourself a food



processor. Then you can make any one of the various recipes that are kicking around. Most of these recipes have several things in common; namely they are bound together by unflavored gelatin and contain whole fish, vegetable matter, and beef heart. This is my recipe. I food-process several multivitamin tablets (with vitamin C) to dust, then process about ½ kilo of the red meat portion of a beef heart (cut away from all the fat and connective tissue). Then in goes a good handful of spinach leaves (no stems), one young whole zucchini, and a few raw carrots. Then the bulk of the food is added, which is whole fish. The fish I originally used were those minnows sold as bait. Nowadays I buy a kilo of frozen capelin since they are full of nutritious roe. I also get a frozen ½ kilo bag of something called "shrimp fry." I am not sure exactly what this is (some form of krill I think), but it's a lot cheaper than buying real shrimp, which I would have to do if this wonderful stuff weren't available. I also add ½ kilo of mosquito larvae and *Daphnia* that I had collected myself and froze previously (see below for a discussion on live food collecting). All the ingredients are processed to a thick paste. Then a liter of water is added and the mixture is brought to a low boil to congeal the blood. I then dissolve three large boxes (36 packets) of Knox unflavored gelatin in a liter of cool water. I mix this liquid into the food (after it's cooled a bit) and let the mixture set overnight in the refrigerator. The next day I split the jelly into two or three-day feeding portions and freeze them separately in sandwich-sized freezer bags. I keep one freezer bag defrosted in the refrigerator at all times. My cichlids and turtles love this stuff. It sinks and doesn't cloud the water (too much).

VEGETABLE DIETS Many fish either require vegetable diets or can benefit from them. Most notable for requiring vegetables are the plecos (South American algae eating catfishes), silver dollars (vegetarian relatives of the piranha), and mbuna (rock-dwelling cichlids from Lake Malawi, Africa). These fishes have extraordinarily long guts and will develop lower-digestive problems if they do not get enough roughage in their diets. These problems are usually followed by a lethal

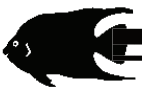
bacterial infection. Almost all other fish will also benefit from some vegetable matter as greens contain folic acid and the carotenes that are needed for the creation of red and yellow pigments. The vegetables in the gelatin food discussed above are adequate for almost all fish, but *plecos* and mbuna should really have some additional plant foods as well. Easiest to provide are slices of par-boiled young zucchini (par-boiling makes it sink). Romaine lettuce is also useful. *Plecos* also eat wood. I'm serious. All plecos should be provided with a nice piece of driftwood for them to slowly rasp away at and hide under.

COMMERCIAL FROZEN FOODS

Nowadays all good aquarium stores have freezers with frozen fish foods. These include various mollusks, fish, crustaceans, and aquatic insects. None of them are inexpensive. Most of them you can make yourself with a food processor and a trip to Shun Fat (see above), but frozen adult brine shrimp (discussed below) and blood worms (midge larvae) are more difficult to come by and could be considered for purchase at the pet store.

Blood worms are named because of their red color (it has nothing to do with blood) and can be collected from local ponds (see below) but never in quantity. They are an excellent food and highly recommended as a dietary supplement for all fishes.

PURCHASED LIVE FOODS The live foods sold by local pet stores include feeder guppies and goldfish (discussed below), live adult brine shrimp (also discussed below), and black worms (*Lumbriculus variegatus*). Black worms are an annelid worm, related to both the earthworm and the tubifex worm (*Tubifex tubifex*). The tubifex worm is another worm that can be considered along with them since they are essentially identical in their aquarium characteristics. Both worms are aquatic but are found in very high nutrient bottoms. They are most often found in open sewers and therefore have a correspondingly bad reputation as disease carriers. Commercially sold black worms are, however, byproducts of the trout hatching industry, and so they are unlikely to give you something nasty like cholera. Black worms



and tubifex worms were mentioned in the June 1998 issue of *The Calquarium*, where **Steve Ward** took a rather dim view on their use. I, however, have a less pessimistic opinion of them. I have in the past fed black worms to my cichlids about once every month or so, and have never seen any bacterial diseases as a result. They are also a very good food for bottom grubbing fish like Corydoras catfish and elephant noses (*Gnathonemus petersi*). In fact, one is hard pressed to keep elephant noses alive at all without a sand bottom and a steady supply of black worms. Cautions are in order, however, as black worms are very high in protein and fat, and so they cause problems if fed too often. The worms must be stored in the refrigerator with daily changes of cold water.

CULTURED LIVE FOODS Many live foods can be raised at home, and the culture of live foods is a huge topic in its own right. I'll just mention a few foods and try to direct you to more information. A good place to start is in the CAS library, which has a book called the *Encyclopedia of Live Foods*. This book covers almost all the topics discussed below and several more.

Some fish (for example, the *Chaca* catfish) are so highly predatory that they specialize in feeding only upon other fish. For these predatory fishes, you have little choice but to either raise feeder fish yourself or buy them in bulk. Goldfish (*Carassius auratus*) are the traditional feeder fish to buy. However, goldfish, while inexpensive, are a bony fish with tough scales. Only very large fish can handle them. Most people who raise feeder fish raise guppies (*Poecilia reticulata*) or some other livebearer. These are smaller and softer than goldfish and thus more suitable for a wider range of predators. But guppies aren't very prolific, casting off only about 30 babies per month per female, so it's hard to keep enough guppies on hand. Egg scatters like the Danio species would provide many more offspring per female. Or a prolific cichlid like the convict (*Archocentrus nigrofasciatum*) would produce nearly as many babies as danios, but (being larger at hatching) they would be a lot easier to raise to an eatable size. Always feed your feeder fish before their final swim so the predator gets extra nutri-

ents from the food in its prey's stomach.

Compost worms (*Eisenia foetida*) are great for larger fishes and can be chopped up for smaller fishes or processed into a jelly food like that of the recipe given above. They will also get rid of your vegetable table scraps. Raise them in a compost bin.

Learn more about worms on the Internet at: <http://www.cityfarmer.org/wormcomp61.html> or in **Dwayne Tiede's** July 1998 *Calquarium* article. Compost worms are available locally from *The Compost Queen*.

White worms (*Enchytraeus albidus*) can be grown along with your compost worms as well. These are smaller than compost worms and so are good for smaller fish. The classic technique to collect white worms is to place a milk-soaked slice of white bread on top of the compost and leave it overnight. The worms will gather under the bread and can be scraped off in the morning. More information on white worms is on the Internet at:

<http://www.badgerstate.com/JAWS/faqs/white.htm>. White worm starter cultures are often auctioned at club meetings or they can be mail-ordered from: West Kootenay Tropical Fish Hatcheries PO Box 109, 705 Griffin Avenue Slocan, BC, V0G 2C0 Canada (250) 355 2592 jamstutz@netidea.com <http://www.netidea.com/tropical/index.htm>

Wingless fruit flies (*Drosophila sp.*) are another good food source for adult fish. They are especially suitable for top feeders like archerfish (*Toxotes jaculatrix*) and African butterfly fish (*Pantodon buchholzi*).

Starter cultures can be mail-ordered (e.g., from Ward's Natural Science Establishment, Inc., <http://www.wardsci.com/>). Raise fruit flies in mayonnaise jars stopped with a foam rubber plug or covered with a piece of cloth and a rubber band. Dissolve one teaspoon of molasses and a pinch of baker's yeast in five tablespoons of water, then mix in three tablespoons of instant potato flakes. Put the resulting glop into the jar with ten or so adult flies, cover, and you'll get a few hundred flies within a couple of weeks. Learn more about fruit flies at:

<http://www.concentric.net/~worstell/FOOD1.HTM> or in the September 1997 issue of *The*



Calquarium where you will find an article about them by **Doug Forsyth**.

Baby brine shrimp (*Artemia spp.*) are the perfect food for almost all baby fish, and small adult fish such as tetras as well. Very small fry (like those of most egg scatterers) cannot eat brine shrimp immediately, but larger fry (such as livebearers' and most cichlids') can start out on brine shrimp. Brine shrimp are hatched in salt water from commercially available dry eggs. They are usually hatched in some sort of funnel with an airstone at the point of the funnel. An inverted plastic 2-liter pop bottle with the bottom cut off works well. Learn more about brine shrimp at <http://www.rtop.com/features/bs-faq.shtml> or check out *The Calquarium* articles by **Ernie Inglis** and **Dan Grimby** in the April 1993 and April 1994 issues (respectively). Brine shrimp eggs are available at local pet stores.

Microworms (*nematodes*) are another good food for fry, and can be fed to smaller fry than can brine shrimp. Microworms can be raised in plastic containers on a mixture of corn meal, water, and baker's yeast. Learn more at: <http://www.access.avernus.com/~angels/microworms.htm> or in **Paul Price's** *Calquarium* article of March 1993. Microworms can be collected from their culture containers with a Q-tip as they will cling to the sides. Just dip the Q-tip in the aquarium with the baby fish to feed. Microworms can be acquired at club auctions or from the West Kootenay Tropical Fish Hatcheries.

Very small fry, like those of tetras and bettas, often have a hard time with even microworms. To these fry, "infusoria" is often fed (infusoria is an old word for *Protozoa* that aquarists still use). In the past, raising infusoria was a hit or miss affair because the techniques all relied on the organisms finding their own way into the culture. Nowadays, pure *Paramecium* cultures are available by mail order (e.g., from Ward's Natural Science Establishment, Inc.) and these are much preferred ways to get a culture going. Grow the paramecia in boiled and cooled water to which a few boiled wheat seeds and a pinch of brewer's yeast is added. Small, sterilized plastic containers can be used to grow them, and a coffee filter can be used to filter them out of their culture water. A detailed

description of *Paramecium* culture is in *The Calquarium's* June 1996 issue, thanks to **Richard Pon**, and also at http://www.zfish.uoregon.edu/zf_info/zfbook/chapt3/3.3.html

COLLECTED LIVE FOODS It is possible to raise other live foods, but don't bother. Go out and find some. It's more fun. In fact, it can be a lot more fun, for now we are entering the realm of the bug hunter. For the bug hunt, you will need a large fine-mesh fish net. Preferably it has a long handle. Bring along a lidded bucket (to fill with pond water) so you can get your bugs home. A lot of people wear hip or chest waders when hunting, but heck, I just wear a pair of shorts and some old sneakers and get wet. So obviously this is a job for a warm day. And be prepared to pick leeches off of yourself afterward.

You also need a good place to hunt. Any of the ponds around Calgary will do, but you would like one that is accessible without crossing private land or having to scale a fence. If you must go on private land, always ask permission. Tell the landowner you are doing a mosquito larva count for the university or something if you are embarrassed by your own eccentricity.

Local ponds are not supposed to be sprayed with insecticides anymore, but various farm chemicals might still cause problems. Do not choose a pond near a crop field, but instead just stick with cow pastures. And if a pond looks like it should have lots of bugs, but doesn't, assume something is amiss and rather than hunting hard and long for whatever bugs that are there, just go onto another pond. The bugs may not be there because of something in the water that won't do your fish any good either.

You want a pond with plant life in it, but not one that is so heavily overgrown that it is difficult to get to the water. Cattle in the neighborhood are a definite asset, because their droppings fertilize the water and this results in a much more abundant aquatic bug population.

Other subtleties should be considered when choosing a pond. For example, smaller ephemeral ponds or water-filled tire tracks (especially in cow pastures) are going to have lots of mosquito larvae and little else. Not that this is bad though,

since mosquito larvae are one of the very best foods and feeding them to your fish is psychologically very satisfying. Mosquito ponds usually disappear by mid-summer but they can reappear any time if we get a good storm. Give the pond a few days after a storm to repopulate before collecting it. Mosquito larvae are air-breathers and can be easily seen rafting just under the surface with their tail-snorkels sticking out of the water.

Ephemeral ponds are also likely to have fairy shrimp (*Streptocephalus seali*). These look sort of like a larger version of an adult brine shrimp. They make a very good food but are relatively few and difficult to catch in bulk. Fairy shrimp can be reared in captivity but the lack of a commercial supply of eggs makes this much less convenient than rearing brine shrimp. Aquarists are forced to catch the adults and spawn them, which the adults readily do when their homes dry up. To collect eggs, put the shrimp in an aquarium and slowly lower the water, then allow the last centimeter or so to dry up on its own. Learn more about fairy shrimp at:

<http://www.badgerstate.com/JAWS/faqs/fshrimp.htm>

Larger, longer-lived ponds are likely to have *Daphnia pulex* in abundance. *Daphnia* are pinkish in color and look like small spheres a couple of millimeters across. Close inspection shows that they have large black eyes and feathery antennae on their heads. A pond's population of *Daphnia* can change dramatically even over a few days. When a pond is in a *Daphnia* bloom (often following the deposition of a fresh cow pie and a good solid rain), the density of *Daphnia* can be astounding. But after the population explodes, it will inevitably drop again as the predator population increases, the water starts to dry up, and the oxygen levels decrease. *Daphnia* can be reared on a diet of yeast and finely ground spinach, but they are so easily caught that most people don't bother.


Another live food local aquarists can find in abundance is fresh-water shrimp (*Gammarus lacustris*). These are discussed at the web site <http://www.ualberta.ca/~fwilhelm/gammarus.htm>. *Gammarus* inhabit flowing water and larger lakes, and are generally found among the stones of a cobbled bottom. In rapidly flowing streams, they can be collected by kicking and

shuffling among the stones while holding a net downstream of your feet, so the shrimps get swept into the net by the current. They can also be collected by scraping the bottom with the net, but this wears out the equipment quickly. *Gammarus* make good food for larger fish like cichlids, but they are too large and tough-skinned for smaller fishes. They can also swim remarkably quickly. Dropping a few *Gammarus* into a cichlid tank really livens things up.

Other bugs will also end up in your catch, but I never worry about parasites entering the aquarium with the bugs. The only real problem you are likely to introduce with the bugs are Hydra, which are a predator of very small fish fry. My tank does have a few Hydra, but I've never lost any fry to them and so I don't worry about it. But if you have very small fry or a lot of Hydra, a double dose of Aquari-sol given on two consecutive days will rid your tank of them, as was discussed in **Birgit McKinnon's** article in the April 1996 issue of *The Calquarium*. All the other fry predators (dragonfly nymphs, etc.) will be eaten by larger adult fish. When feeding bugs to small fish, however, screen any large bugs out of the food carefully. This is most easily done by passing the catch through a wide-mesh fish net, and feeding the fish whatever passes through it. Pond snails and leeches should be stuck to the sides of your collecting bucket by the time you get home so they aren't likely to end up in your tank. But if you see any, pick them out.

Some of your bugs won't survive the trip home, depending on how many bugs are in the collecting bucket's water. But don't worry about any die-off. When I get home, I dump the bucket's contents through the catch net to filter the bugs out of the pond water. I then quickly rinse the bugs in cold tap water before giving my fish one good feeding of live bugs. Then I freeze what's left. I never bother trying to keep a bug catch alive for more than one feeding.

As far as diseases go, I've never seen or heard of any being introduced in this way so I never worry about them.

So that's about all you need to know about foods. Have fun feeding! 



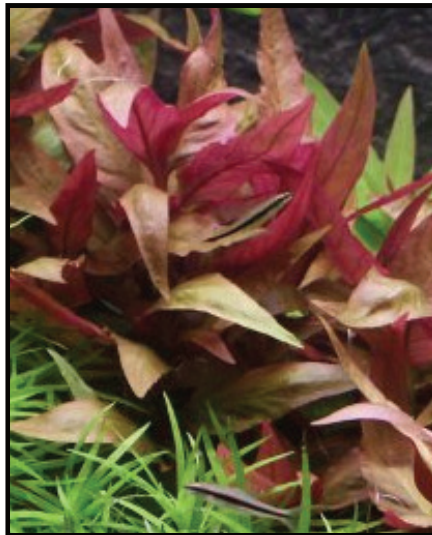
The Practical Plant

PROPAGATING

Telanthera lilacina: Red *Telanthera*

T*elanthera lilacina* is a great plant commonly called "Red *Telanthera*," one of my favorites. It is a stem plant with a fairly thick stem. The leaves are elliptical in shape and, when grown in sufficient light, a deep dark reddish brown in color. If you do not have enough light, the plant will be green. It grows at a fair pace, but is certainly no speed demon. It is important not to plant these stems too close together. Crowding will cause the lower leaves to fall off due to lack of light.

I am keeping *T. lilacina* in a 15 gallon tall aquarium with very intense lighting. This particular aquarium has 96 watt Compact Fluorescent lighting (Coralife "Aqualight" Quad which works out to 6.4 watts per gallon) and CO₂ enrichment. The pH is about 6.8, temperature is kept at 78° and the GH runs 4-60. A Fluval canister filter (model #104) 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. You don't need to worry about the large volume of water that is being changed. 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.

Propagate this plant as you would any other stem plant via cuttings. If you can meet the lighting demands of this plant, you will be rewarded with a truly lovely plant. 🐟

Virginia Cahill - BAS

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Industry.com March/April 2015 the Spotlight

THE TANK CORPS

NOW 104 YEARS OLD, THE BROOKLYN AQUARIUM SOCIETY IS A FASCINATING PHYLUM OF FISH HOBBYISTS, SERIOUS COLLECTORS, AND HOME INSTALLATION GURUS...AND MEMBERSHIP DEFINITELY HAS ITS BENEFITS.

IT ISN'T A REQUIREMENT THAT ONE HAVE A FISH TANK IN ORDER TO ATTEND A MONTHLY MEETING OF THE BROOKLYN AQUARIUM SOCIETY,

but visitors are likely to want one after being in a roomful of breeders, hobbyists, keepers, and other people who earnestly love a family of animals that traces its history back 530 million years. The Brooklyn Aquarium Society (BAS) is the oldest and largest such society in the United States; created on Valentine's Day in 1911 to promote the love of aquatic creatures, it currently has more than 250 members and is the only general aquarium society that has both marine and freshwater hobbyists. Member meetings are the second Friday of each month (except July and August) at the New York Aquarium Education Hall in Coney Island.

The main event is a presentation from an expert the society invites to speak; topics vary

from the basics of starting a reef aquarium to diving in New York harbor to raising African cichlids. There are also tables filled with aquarium equipment for sale - everything from protein skimmers to a bubbling chest of pirate gold.

For many members, the highlight of the evening is an auction of live fish, corals, plants, and equipment, with most of the sale stock raised by members or donated from local pet stores. From clown loach to apistogramma to Siamese fighting fish, the bidding subjects are an adventure in diversity, and prizes like Moscow black mollies, self-replicating crayfish or an Amazon sword plant can be had with a quick enough bid. Auctioneers are professional, rapid-fire and knowledgeable, often stating the latin name of the fish held up for display.


Meetings attendees are also there to absorb both the basics and minutiae of fish habits, habitats, feeding and general tank maintenance. BAS takes particular pride in promoting knowledge and resources and during the last ten years, has set up dozens of aquariums in schools and



community centers.

The outgoing president is **Joe Graffagnino**, who managed the club for the last eight years.

"I was Corresponding Secretary for 12 years before that," he recalled, "and a member since 1975." Known as a tropical fish expert, Graffagnino breeds many different species and lends support to members who want to try something new or improve their tanks. Recently, he built a new fish room in the basement of his Dyker Heights home, with three of its walls devoted to stacks of tanks. Part scientist, part enthusiast, both he and his home facility hum with life. "I've got 33 tanks going right now. The largest is 65-gallons... the smallest, 2-gallons."

The Society's Education Hall, where the meetings are held the second Friday of the month, has an interesting variety of aquatic life (including horseshoe crabs and turtles), macro photographs and sea life reproductions. Doors open at 7:30 PM which allows attendees to view fish donated by members, pet stores and club supporters. Pencils and paper are kept near the auction lots so visitors can keep track of bids they want to make on fish. Expect applause when bidding goes over \$50. 

A SHALLOW HISTORY OF HOME AQUARIUMS

The first documented home-kept fish display was built during the Roman Empire, specifically in the first century BC. The first species to be brought indoors was the sea barbel, which was kept under guest beds in small tanks made of marble. Introduction of glass panes around the year 50 allowed Romans to replace one wall of marble tanks, improving the view. In 1369, the Chinese Emperor, Hóngw established a porcelain manufacturer that produced larger tubs for maintaining goldfish over time; makers there produced tubs that approached the shape of modern fish bowls.

The German naturalist and fish enthusiast, **Leonhard Balder** maintained weather loaches and newts. In 1836, soon after his invention of the Wardian case Dr. **Nathaniel Bagshaw Ward** proposed to use his tanks for tropical animals. In 1841 he did so, though at first only with aquatic plants and toy fish (he soon housed real animals). In 1838, French biologist, **Felix Dujardin** noted owning a saltwater aquarium, though he did not use the term. In 1846, **Anne Thynne** maintained stony corals and seaweed for almost three years and was credited as the creator of the first balanced marine aquarium in London. At about the same time, English agricultural chemist **Robert Warington** experimented with a 13 gallon container that contained goldfish, eelgrass and snails, creating one of the first stable aquaria. He published his findings in 1850 in the Chemical Society's journal.

Adapted from austinaquarium.com/blog

John Todaro - BAS

From the Brooklyn Aquarium Society's publication

SCRUMPTIOUS MEALS & LIVE FOOD TREATS Compiled, Edited & Written by John Todaro


Killifish Pâté Buffet Paste Food 101

One of the simplest paste food recipes we've seen is **Dan Katz's** "Killifish Pâté Buffet Paste Food 101."

Dan is a former president of Long Island Killifish Association (LIKA) and a fervent killifish breeder who feeds this recipe to his fish.

Killifish are carnivorous and this recipe fills the bill and it's so simple to make up; you could even do it!

If you can pull a tab on a can, you have just done the hardest part. Boil a few tablespoons of water, mix the can foods and freeze.

This is a high protein food great for all your meat eaters. If you want to alter the recipe so that it has some vegetables in for the rest of your fish, go ahead. Your fish will never know that you never broke a sweat to cook up this delicious meal. 



R E C I P E

SUPPLIES NEEDED:

6 oz. can Friskies Buffet Salmon
6 oz. can Friskies Buffet Tuna
4 pkgs. Knox® unflavored gelatin

OPTIONAL:

Add zucchini or other vegetables for veggie loving fish.

PREPARATIONS:

Blend with a minimum amount of water, about 2 - 3 tbsp.
Put 4 packages of Knox gelatin into a small saucepan. Add 4 tbsp.

of water and heat. Stir constantly until gelatin dissolves. About 1 to 2 minutes.

Now blend in the cat food and stir until totally mixed. Follow general directions for freezing and storing.

FEEDING:

Serve by cutting off small pieces. No more than they can eat in five minutes or so.



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, Bloomington, 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.

GREEN SHRIMP



Scientific Name: *Caridina cf. babaulti*.
Other Scientific Names: *Caridina cf. babaulti var. Green*.
Common Name: Green Shrimp, *Caridina Babaulti*.
Other Common Names: Caridina Babaulti Green.
Origin: India, Malaysia.
Found in the wild: No.
pH Range: 7.5 - 8.3.
Ideal pH: 7.2.

Temperature Range: 75° - 80°F.
Ideal Temperature: 78°F.
Hardness Range: 8 - 20 dkh.
Ideal Hardness: 12 dkh.
Life Span: 1 - 2 Years.
Size: 1/2 - 1 1/2 inches.
Gestation Period: 30 Days.
Diet: Omnivore.

GREEN SHRIMP HISTORY: The green shrimps were given the name "babaulti" by Mr. Guy Babault who collected a large amount of new species of birds, fish and reptiles throughout his exploration missions worldwide. He collected some of these shrimps in the freshwater rivers of India in the year 1914.

GREEN SHRIMP CARE: The Green Shrimp is an undemanding shrimp in its care requirements. They should be kept in a well established aquarium with no predators. The most important factor for water parameter is stability and as long as none of the water parameters are in the extremes, Green Shrimp should be happy and healthy.

GREEN SHRIMP DIET: The Green Shrimp is an Omnivore. They are decent for aquarium algae control. Being algae eaters, if sufficient algae is not present, foods intended for aquarium fish and invertebrates can be used to supplement their diet. Another great supplement is blanched (boiled until soft) vegetables.

GREEN SHRIMP BREEDING: The green shrimp breeds quite easily and generally have quite a few eggs. The eggs are smaller than other *Caridina*

such as the Red Cherry Shrimp, and therefore the babies are also smaller and harder to raise. Breeding should occur in well run tanks, that have been cycling for some time. Although these shrimp breed in large numbers, they are not the easiest to breed!

GREEN SHRIMP BEHAVIOR: Green Shrimps are very non-aggressive. They spend most of the day grazing on plants, gravel and any other tank decorations for algae and other types of foods. Green Shrimps will get along very well with any other type of dwarf shrimp that is non-aggressive. When the Green Shrimp is kept in an aquarium that has no predators, they are very active and only hide after molting (shedding exoskeleton to enable growth).

It is important to make sure copper does not get into the aquarium. Copper is toxic to all Dwarf Shrimp. Many medications contain elevated levels of copper, so it is recommended not to medicate an aquarium with Dwarf Shrimp in it. 🐟

Ryan

Twyla Lindstrom-Peters - RAS
 From *Fins & Friends* Regina Aquarium Society, Canada
 Aquarticles

Colisa chuna The Honey Gourami



This is the smallest member of the *Colisa* genus with a maximum length of 1 1/2 inches. It comes from the Indian sub-continent. Its body shape is typically "gourami," including the characteristic long threadlike extensions of the ventral fins (which actually house its taste buds). Females remain silver-grey to light yellow and develop a dark longitudinal stripe along their midline when excited (e.g., breeding season). When stressed, males lose their beautiful color and resemble females. Otherwise, a relaxed, mature male develops a beautiful golden color over most of the body with a brighter gold through the dorsal and pitch black along its underside, including its mouth and face.


It is a very shy peaceful little fish ideally suited for a small peaceful community tank with low or no water circulation. It appreciates a well planted, sunny warm (71° - 80°F.) tank with lots of floating plant cover. They relish live food from brine shrimp *nauplii* to grindal worms and HYDRA! They will generally accept small pelleted and flake foods too.

Spawning can be achieved in a small (2.5 gal.), shallow (4 - 6 inches deep), well planted sunny tank. If an air source is supplied, it should be a slow, gentle corner sponge suspended up off

the bottom 1/2 inch and away from the sides. The tank should be kept covered. If a group is used, a female will become heavy with eggs. One male will leave the group and construct a small insignificant bubble nest in a corner incorporating leaves such as water sprite. The male then displays his colors to attract the female under his nest. As she approaches, they "feel" each other with their "feelers." After a few approaches, spawning takes place in the usual anabantoid fashion (i.e., the male wraps around the female and, as they roll over, the eggs are expelled and simultaneously fertilized. The female is released and sinks to the bottom as the male gathers the eggs and puts them up into his nest. Then the activity is repeated until the egg supply is depleted). The male then guards the nest and tends to it, repairing and re-building it as needed. The female leaves the area completely.

At this point, I remove the female and any other fish so the male can concentrate on his nest exclusively. (I haven't seen the male ever attack the female as some anabantoids are notorious for).

The eggs hatch in 24 - 36 hours, at which point I remove the male too. The fry hang from the nest for 24 - 48 hours and then become free swimming. They are very tiny. They do well on infusoria and Liquifry for their first few days after free swimming. By one week of age, they can accept newly hatched brine shrimp and emulsified powder. Snails are a good addition at this point as they help keep leftovers in check. Small daily water changes should be done with a syringe or air stone. Take care to match the temperature and avoid air drafts (especially at 4 - 6 weeks of age) over the water when the cover is removed. Also avoid overfeeding as fouled water happens quickly and is quite lethal to these fry.

Growth is slow but steady. They also remain quite sensitive to sudden changes in their surroundings (i.e., water pH, currents, lighting, new tankmates, etc.) for quite a while longer than other gouramis I've kept. Nonetheless, these are definitely one of my favorites. 



Anthony P. Kroeger - BAS

TOO TOUGH TO KILL

A Column for Beginner Marine Aquarists

#3 TOUGHIE

The Undulated Trigger

Balistapus undulatus

Color! that's why we keep marine aquariums; we want color. Personality! Everyone wants to interact with their fish. *B. undulatus* triggers combine both of these qualities.



The *B. undulatus* trigger is my #3 choice as the hardest beginner fish. However, *B. undulatus* requires some "special" management which I will address later in this column. For now, let's start with the basics.

B. undulatus comes from the Pacific Ocean; usually they are exported from Indonesia.

They can grow to about a foot long, but usually stay much smaller.

B. undulatus are beautiful! The body is lime green with psychedelic glow-in-the-dark orange stripes all over its body. The tail is bright orange or yellow. All the fin rays are usually yellow too.

It has a kind of bulky stocky shape, but don't let that fool you; this fish can move fast. In motion, it undulates its fins and hovers around. This fish is constantly active, exploring its home. It is always front and center showing off. When it moves, its tail fin is usually folded.



Trigger fish are called that because the dorsal fin has a locking spine; in nature, at night triggers lock this spine into a coral crevice to keep them secure in their cave.

B. undulatus triggers easily survive cycling a new tank.

Their preferred water parameters are pH 8.0, salinity 1.020 - 1.023 and temperature range of 72° - 80°F. They need at least a 55 gallon aquarium.

B. undulatus eat any "meaty" foods, chunks of shrimp, pellets, freeze dried krill, etc. Any trigger that refuses to eat is ill.

Not the cheapest fish to buy, but *undulatus* are hardy. All triggers have teeth and they know how to use them! Here is where the "special" management comes in. *B. undulatus* are best kept alone, or with other big tough fish like lions, groupers, tangs and puffers. Never put an *undulatus* with any small fish or

any invertebrates. They will be eaten. *B. undulatus* are very aggressive fish.

B. undulatus love to chew on anything in the aquarium. They can easily shatter glass heater tubes, make swiss cheese of filter intakes, destroy the r-mometers and hydrometers. Keep these items (except for the filter intake) in your sump or external filter.

Expect to replace your filter intakes often.

B. undulatus like to decorate their own home. No matter how you place corals, they will move them to their own liking.

It's amazing how much weight they can lift and drag around. If you upset your *undulatus*, it will not hesitate to bite you. Always watch where an *undulatus* is before putting your hands and fingers in his tank.

That being said, an *undulatus* is a real "pet" fish.

They recognize their owners and see you coming. They bubble at the top of the aquarium to tell you they want to be fed.

I once had an *undulatus* in a 55 gallon tank next to my easy chair and it was bubbling, but I ignored it and it used its tail to throw water out of the open top on me to get my attention. Needless to say, I bought a glass cover for the tank.

I've also had them throw small stones at the glass to get my attention! They swim excitedly around every time they see their owner and are always begging for food!

This is a true "pet" fish. If you can handle *B. undulatus*' "special" management needs, keeping an *undulatus* is tough to beat. It's my #3 choice for toughness and beautiful color.



Tony



Balistapus undulatus



SPECIES PROFILE

Scientific Name: *Balistapus undulatus*.

Common Name: Orange-lined triggerfish, orange-striped triggerfish and undulated triggerfish.

Family: *Balistapus*.

Origin: Widely distributed throughout the tropical and subtropical waters of the Indian Ocean and the western Pacific.

Distribution: Inhabits coral reefs, lagoons and external reef slopes at depths up to 50 meters.

pH Range: 8.1 - 8.4.

Temperature Range: 74° - 79°F.

Hardness: 8 - 12 dKH.

Specific Gravity: 1.020 - 1.025.

Life Span: 5 - 10 years.


Size: Can grow to 12 inches in the wild. Smaller in captivity.

Temperament: Can be aggressive with other fish. It erects its first dorsal spine to intimidate opponents and predators.

Diet: Feeds on a variety of benthos organisms such as algae, echinoderms, fishes, mollusks, tunicates, sponges, and hydrozoans. All kinds of meaty foods including starfish and sea urchins, snails, mussels, calcareous algae, and pieces of passing fish.

Sexing: Females have orange stripes between the eyes and mouth; these are lacking in males and they are larger than females.

Breeding: Has not been bred in captivity.

Remarks: *B. undulate* triggerfish or Orange-lined triggerfish is easy to keep. Triggers are among the hardiest of all marine fish. 

Reference:

Wikipedia

animal-world.com

fishchannel.com

fishindex.blogspot.com



Tom Wojtech - MAS
 From "Splash," Milwaukee Aquarium Society
 Aquarticle

GETTING THE LEAD OUT OF YOUR PENCILS



I have a reputation to uphold of liking dull fish so don't come over and look at the subject of this article, *Nannostomus beckfordi*. Most hobbyists are familiar with pencilfish from seeing them in a dealer's tank and they do look pretty much the same; small, thin fish with a dark stripe or two some of whom float in the water in a head down position. The head down angle was the first thing that attracted me to this group of tetras years ago, but after keeping six species, it's not even a factor anymore.

Pencilfish are native to South America and come from Brazil, Columbia, Guyana, Surinam and even Venezuela. They can range in size from one inch to nearly three inches. They would all prefer soft acid water but the most common species; *N. eques*, *N. beckfordi*, *N. trifasciatus* and *N. marginatus* will accept Milwaukee tap water. This is the way I

have kept Pencilfish for years just to enjoy their beauty without a thought of trying to propagate any species. Even in tap water, I have observed spawning behavior and have seen eggs a few times and even had a fry or two show up but it has always been a surprise.

I like to include pencilfish in tanks of dwarf cichlids as a dither fish for which they are

perfectly suited. This is the reason for my current success. I had a tank set up for spawning Rams with a planting of Water Sprite and a couple coconut shell caves and a piece of driftwood. I filled the tank with an 80/20% mix of RO water to tap water which gave me a hardness of 70 ppm and a pH of 6.0. This was perfect for many dwarf cichlids. After the Rams spawned, I tried another dwarf. Since I have always been a breed and dump sort of guy, the fate of the next dwarf was the same. I had an empty tank.

I ran across some *Corydoras ehrhardti*, which were dumped in the empty tank. I also had one Firemouth I missed when I emptied their tank and tossed him in the 20 for lack of a better place. I even bought a few Killies at the last WAKO show and introduced them to the same 20. I figured the Firemouth would not be happy in this soft acid water, but it thrived. I then saw some new Beckford's Pencilfish for sale and couldn't pass them by. I did have some of the same species in another tank but these were different. I have never seen Beckfords with so much color. The males had the typical dark brown stripe but above and below the stripe was an intense red. Males usually just have a little red in the anal fin, but these were spectacular. I added them to the 20.

After a couple days feeding of live baby brine shrimp, the reds intensified. The males would grab a territory and keep all comers away except the females. It is a joy to watch a 2" pencilfish chase away a 2.5" Firemouth. The males would

spar by stretching their fins to the fullest and

**WITHIN A WEEK,
I SAW REAL SPAWNING
RUNS WHERE THE MALE
WOULD DART BACK AND
FORTH IN FRONT OF
A FEMALE TRYING TO GET
HER TO FOLLOW HIM INTO
THE WEEDS. IF SHE WASN'T
READY, SHE WOULD DART
THE OTHER WAY. I STOOD
AND WATCHED THESE RUNS
ON A SATURDAY MORNING
UNTIL I SAW AN EGG LAID.
THIS TOOK A WHILE
SINCE THE FEMALES WERE
VERY PARTICULAR ABOUT
THE BEST DISPLAY AND
WHICH MALE WOULD WIN
HER AFFECTIONS. I HAVE
SEEN ALL THIS BEFORE, BUT
IT IS ALWAYS A THRILL TO
WATCH.**

(I REALLY NEED TO GET A LIFE.)

swimming side by side in what appears to be a spawning run, until one male gives up and runs off to hide. I have to tell you that by this time the Water Sprite had grown to the top and spread across the surface making the bottom of the tank very dark. I kept the front couple inches of the surface clear for feeding, but the back was solid Sprite. The *Beckfordi* would also chase the pair of killies into the Sprite whenever they came out to feed. This was fine with the *Rivulus* who will sit on top of the Sprite with their backs out of the water for hours by choice.

Within a week, I saw real spawning runs where the male would dart back and forth in front of a female trying to get her to follow him into the weeds. If she wasn't ready, she would dart the other way. I stood and watched these runs on a Saturday morning until I saw an egg laid. This took a while since the females were very particular about the best display and which male would win her affections. I have seen all this before but it is always a thrill to watch. (I really need to get a life.)

I had no hope that I would see fry with the Firemouth patrolling the open areas and the *Rivulus* snaking through the Sprite, but I enjoyed the action. I continued feeding baby brine daily along with Total Tropical Flake food and frozen brine. The *Rivulus* had been in the tank for a couple months and in spite of the other fish had produced



a few fry, which were approaching an inch. The first fry were badly deformed with accordion spines from what I figured was the too soft water.


One night while feeding, I noticed a flash of a fry in the dark reaches of the tank. I thought it must be another *Rivulus* but it was not at the surface. The next day I was doing their weekly 50% water change when a fry spooked out and zipped across the front of the tank. It was a *Rivulus* fry. That night at feeding time I scanned the surface to see if there were more fry. I peered along the surface from every angle looking between the mass of Sprite and spotted a couple more *Rivulus* fry about the size of a baby guppy. In the dark reaches of the tank I saw another fry which I thought must be another *Rivulus*. It stayed in one place too long and didn't swim right. I took the flashlight to get a better look. It was about 3/8" long and looked like a piece of blackworm with an eye. I found a baby *Beckfordi*! I searched for more and spotted a second fry in the back near a plastic Cabomba. An adult *Beckfordi* came by and the fry didn't move. I figured it would be lunch. The adult lunged at the fry and stopped short. The fry dashed off into the weeds. Were they training the fry to look out for predators? I don't know but I

**I FOUND A BABY
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THE FRY AND STOPPED
SHORT. THE FRY DASHED
OFF INTO THE WEEDS.**

have seen this behavior for weeks with all the small fry.

As soon as I noticed the fry, the Firemouth had to come out. He was unceremoniously dumped into a 40 with soft water and larger fish. Every night at feeding time I watched the tank for fry. I could see fry showing up in various sizes as time went by. I wanted to be very careful when changing water to create as little disturbance as possible so I wouldn't chase out a fry into the mouths of the tankmates. The smallest fry I have seen was less than 1/4" and was just showing a dull

stripe. As anal as I am, every night I see how many fry I can count at one time. So far the record is 11 and I figure there must be at least 15. I almost hate to bring them in for BAP but maybe I will be able to get a real count when I catch the *Beckfordi* and the *Rivulus*.

It would be nice to set the adults in their own tank for breeding but then I may get bored with them when I have too many to keep and end up dumping the Pencils. I like them too much to let that happen and I will be satisfied to get a few fry as long as I don't need the tank for the next dwarf cichlid. I will continue to enjoy the fish without babies. 

SPECIES PROFILE

Scientific Name: *Nannostomus beckfordi*

Common Name: Golden Pencilfish,
Beckford's Pencilfish.

Family: *Lebiasinidae*.

Origin: Native in the rivers of Guyana,
French Guyana, Suriname; lower and middle
Amazon basin and lower Rio Negro, Brazil.

pH Range: 6.0 to 7.0.

Temperature Range: 75° - 79°F.

Ideal Hardness: Soft to moderately hard
12 dGH.

Life Span: 5 years.

Size: Up to 2.5" inches, but usually around
2 inches.

Temperament: Generally peaceful, but males
regularly chase other fish away from their
area. Should not be combined with sedate fish
like angelfish, discus, gourami.

Diet: Accepts flake foods; bloodworms,
daphnia, brine shrimps, tubifex worms and
mosquito larva.

Sexing: Males are more intensely-colored,
especially when in spawning condition.
Females are noticeably rounder-bodied. The
anal-fin of the male has a curved posterior
edge the female's is straight.

Breeding: An egg-scatter, no parental care.

An adult group can be conditioned together
in a smaller aquarium filled with mature
water. The tank should be dimly lit and the
base covered with a mesh of a large enough
grade so the eggs can fall through but small
enough so the adults cannot reach them.
When well-conditioned, a pair or group of
one or two males and several females can
be introduced to the breeding tank. Note:
the more fish involved, the greater the risk
of egg predation, plus males may distract
each other from females if there's more than
one in the tank. Adults can be removed
after 2-3 days. The first fry should be visible
around 3 days. Initial food should be
Paramecium or a proprietary dry food of
sufficiently small (5-50 micron) grade,
introducing *Artemia nauplii*, microworm,
etc., once the fry are large enough to accept
them.

Remarks: There are 19 currently recognized
species in this genus.

Reference:
tropicalfishkeeping.com
seriouslyfish.com
wikipedia.org





CATFISH CONNECTIONS

THE PANDA CORY *Corydoras panda*



**Hi everyone, Sy here.
Every family has a favorite member.
Well my family has one too! The Panda Cory.
Everyone loves Pandas!**

Native to the Ucayali River in Peru, Pandas are small corys, growing to about 1 3/4" inches.

Face it. Pandas are cute! A whitish/pink body, black eye mask, black dorsal and larger black caudal peduncle spot, make their color pattern pleasing and endearing to the eye. I'm certainly glad I'm handsome.

Pandas will do well in most normal tap water at a temperature of between 68° - 78°F. They prefer softer, neutral to slightly acidic water for breeding, pH of 6.8 - 7.0 and 16 - 18 gDH.

Pandas are great community tank fish. They get along with all their neighbors.

Easy to feed, Pandas love flakes, pellets and frozen foods.

They're constantly rooting around in the substrate looking for snacks. Change 25% of their water weekly. Pandas are active all day.

Like my other Corydoras relatives, Pandas will dash up to the surface every once in awhile for a bubble of air. This ability helps them survive in seasonal pools after the rainy season floods are over.

Most Pandas are now captive bred, but they are so popular they are wild caught too!

A trick to help acclimate Pandas (and any cory for that matter) is to acclimate them in a shallow aquarium first.

In nature, Pandas occur in shallow creeks and pools. Putting them into a very deep aquarium (Ex: 110-gallon cube tanks) is


stressful on them. Acclimate them to your water first in a 10-gallon quarantine tank for two weeks. Yes! Always quarantine first! Then, after quarantine, put them in a deep tank if you want to.

They will adjust to the increased water pressure okay. This is especially necessary if your Pandas are wild imports.

Pandas are usually quite hardy and seldom fall ill. They breed in typical *Corydoras* fashion laying adhesive eggs all over. The fish are easily sexed, looking down from above, females are wider and are heavier. Males are noticeably smaller and slimmer. They can be bred in a 5 - 10 gallon aquarium with an airstone or sponge filter and a small flowerpot for cover.

To stimulate breeding, change 20% of the breeding tank water and replace it with cooler water. I spawn my Corys at 76°F. I change 25% of their water and replace it with water at 72°F. I then bring the temperature back to 76°F.

Condition the breeders (which you have separated by sex) well on heavy feedings of frozen foods. They breed the morning after the water change. Remove the adults after spawning.

Eggs hatch in about 4 days at 76°F. Fry eat brine shrimp nauplii and are easily raised. Everyone loves Pandas! Now you know why. Try some. Until next time. 

John Todaro - BAS

SPECIES PROFILE

Scientific Name: *Corydoras panda*.

Common Name: Panda Cory.

Family: *Callichthyidae*.

Origin: Native to Peru, the Ucayali river system.

pH Range: 6.0 to 7.4.

Temperature Range: 72° - 79°F.

Hardness: Soft 2 - 12 dGH.

Life Span: 10 + years.

Size: Up to 1 3/4" inches.

Temperament: Peaceful and suitable for many community tanks.

Diet: The Panda cory is omnivorous and will require a well balanced diet including dried, flake, frozen, and live foods.

Sexing: Best sexed from above; female will have more rounded belly and is likely to be larger. Males slimmer and smaller.

Breeding: Set up the breeding tank (18 x 12 x 12 or similar size), with either a bare bottom, sand or fine gravel. Use air-powered sponge or box-type filtration so fry won't be

sucked into these. Provide vegetation such as Java moss. A temperature of around 75°F and a pH of 6.5. Filtering the water through peat is useful. It's better to have a higher ratio of males to females when breeding. Two males per female is recommended.

Remarks: The attractive patterning of dark and light markings gives rise to the common name. It is among the best choices for the newcomer to catfish, being peaceful, hardy and easily bred.

Virtually all fish entering the hobby are produced commercially on farms. These fish are generally more hardy and adaptable than their wild counterparts, having been raised in aquarium conditions.

Reference:
liveaquaria.com
seriouslyfish.com
freshaquarium.about.com

Corydoras panda



Alexander A. Priest - GCAS

Text & Photo: Alexander A. Priest

Modern Aquarium April 2014 Vol. XXI No. 2, Greater City AS



THE REDDISH DWARF FIGHTER

Betta rutilans

First described in 1991¹, *Betta rutilans* is endemic to the Island of Borneo in Indonesia. It has been placed in the “Coccina Complex.”² All members of this complex are considered endangered and are on the “Conservation Priority Species at “Risk List” of the C.A.R.E.S. Preservation Program³. A “species complex” is a grouping of species primarily based on similar physical and/or behavioral characteristics. The “Coccina Complex” consists of betta species endemic to blackwater environments, all having small, slim, red or dark colored bodies (*rutilans* is latin for “reddish”).

Members of the Coccina Complex are all fairly small. *Betta rutilans* usually grow no larger than 1.4” inches total length (that is, from tip of the nose to farthest end of the tail). Males tend to be darker red with more pointed dorsal and longer pelvic fins. Females are generally rounder and mature adult females can often be seen to have an egg spot (small white dot on the abdomen marking the opening of their egg tube).

This species has been collected from localities connected

with the river Mempawah and Kepayang close to the town of Anjungan in Kalimantan Barat (West Kalimantan) province, Borneo, Indonesia.⁴ The water in this region typically is stained dark (i.e., “blackwater”) and fairly acidic from humic acids and other chemicals released by decaying organic material.

Horst Link found it in “a marshy, low conductivity (39mS), acidic (pH 4.5) stream with clear, dark brown water, where it feed on bloodworms (*chironomid* fly larvae), mites and *ostracods*.”⁵

All betta species have an

accessory breathing organ in their head consisting of a labyrinth-like network of membranes that enable the fish to absorb oxygen directly from the air above the water’s surface. instead of through their gills.

Because of this accessory organ, anabantoids (i.e., all species in the sub-order *Anabantidae*) are often called “labyrinth fish.” This accessory ‘labyrinth organ’ allows *anabantoids* to “breathe” oxygen directly from the air around them. Because of that, as long as their bodies do not dry out, they can survive out of water for extended

periods of time. Possibly because of this, these species all seem to be hard-wired to jump out of the water when they feel threatened.

Keep a tight lid on every *anabantoid* tank, including placing blocking material around even the smallest opening (such as for air lines or electrical parts). Filter floss or plastic wrap works well for this purpose.

Before I get into the care and breeding of *Betta rutilans* in the home aquarium, I want to insert a personal caveat. Of all the Coccina Complex species I have kept (and I've kept most of them), I have found *Betta rutilans* the most challenging. I have never seen a mention that these fish were any more difficult than other Coccina Complex members (none of which I would recommend to the absolute beginner). It could have just been an idiosyncrasy of the group I had, but I feel obligated to mention this. Mine are very picky eaters and seem extremely sensitive to even slight changes in water conditions.

I've mentioned this before in other articles I've written on blackwater species requiring acidic water, but it is something that anyone not familiar with this environment should be reminded of. In a tank with water having a pH as low *Betta rutilans* require, fish waste, and decaying food and plants do not break down by the usual bacterial action. Ammonia (NH₃) is the principal nitrogenous waste released by fish and it is toxic to them. Normally, naturally occurring nitrifying bacteria break down ammonia in stages to less harmful

The spawning behavior of *Betta rutilans* is typical of the genera, with the male wrapping himself around the female and expelling her eggs.

Typically, the male places the eggs into a nest of bubbles he has prepared in advance and which he will guard until the fry are free swimming.

compounds. However, below a pH of 6.8, the nitrifying bacteria are inhibited and so cannot convert toxic nitrogen compounds into harmless compounds

What happens in those very low pH tanks is that the fish, detritus, uneaten food and decaying plants will still produce toxic ammonia, but in the absence of beneficial nitrifying bacteria, a chemical process occurs converting ammonia (NH₃) to the non-toxic compound ammonium (NH₄). However this also means that water added during water changes must match the pH of the original water. If newly

added waer has a much higher pH (i.e., is less acid), then neither this chemical process nor nitrifying bacteria are readily available to handle a suddenly increased bio-load, resulting in a deadly ammonia "spike," wiping out an entire tank in just minutes!

The spawning behavior of *Betta rutilans* is typical of the genera, with the male wrapping himself around the female and expelling her eggs.

Typically, the male places the eggs into a nest of bubbles he has prepared in advance and which he will guard until the fry are free swimming.

It is usually not necessary to remove the female after the spawning, unless she appears to be a threat to the eggs. The male will guard and tend the nest. Depending on the temperature, the eggs hatch in one to three days (hatching faster when it's warmer). The newly hatched fry will still have their yolk-sacs attached so they should not be fed until the yolk sac is completely absorbed (in another three to four days). Once the fry begin to swim freely, the male will stop guarding the nest and generally ignore the fry. The fry can then be fed microworms and newly hatched brine shrimp, as well as finely crushed dry food.

This fish is a submerged bubble-nester. This means the male builds a "nest" of bubbles in a cave or under driftwood (as compared with the common *Betta splendens*, which is a surface bubble-nester, building a nest at the surface of the water).

Several members of the



Photo: E. Gasser

Coccina Complex, including *Betta rutilans*, have been reported to be “switch hitter” and may either build a bubble nest, or parenterally mouthbrooder. The mechanism that determines the mode of reproduction to be used is, as of now, unknown.

It is probably safe to say that *Betta rutilans* is primarily a submerged bubble nester since most reports of its spawning have been of the male guarding a cave containing a bubble nest. Because of this, tank filtration should not result in rapid water movement.


To reduce the pH and provide the dark “blackwater”

color to the water that mimics the fishes’ natural environment, I use crushed Indian almond leaves in a box filter and driftwood. Initially and until the almond leaves and driftwood have had enough time to leach tannins into the water, I use a wild almond leaf extract: “Atison’s Netta Spa” by Ocean Nutrition™.

To further mimic their natural environment, the tank should have subdued lighting and contain multiple caves and hiding places. Caves are a necessity for a “submerged” bubble nesting male in which to build his nest of bubbles (and if

for some reason he decides to be a mouthbrooder, then the cave will be where he stays for the duration).

Few plants can survive in a dimly lit, very acid and very low mineral tank. I have found that Java fern (*Microsorium pteropus*) and most *Anubias* species (especially *A. hastifolia*, *A. coffeefolia* and *A. barteri*) are about my only choices.

I would recommend *Betta rutilans* to experienced aquarists wishing to maintain an endangered C.A.R.E.S. Preservation Program listed fish. 

References:

1. Kottelat, M. 1991. *Notes on the taxonomy and distribution of some western Indonesian freshwater fishes, with diagnoses of a new genus and six new species (Pisces: Cyprinidae, Belontiidae and Chaudhuriidae)*. Ichthyol. Explor. Freshwaters 273-2f.
2. <http://www.ibcbettas.org/smp/Pages/complex.html>
3. http://www.caresperservation.com/priority_list.html
4. <http://www.seriousfish.com/species/betta-rutilans/>
5. Goldstein, Robert J, 2004. *The Betta Handbook*. Barron’s Educational Series, Hauppauge, NY p. 39



SPECIES PROFILE

Scientific Name: *Betta rutilans*.

Common Name: Reddish Dwarf Fighter.

Family: *Belontiidae*.

Origin: Borneo.

pH Range: 4.0 to 6.0.

Temperature Range: 72° - 80°F.

Hardness: Very Soft.

Life Span: ?

Size: Up to 2" inches, both sexes.

Temperament: Peaceful, timid.

Special consideration: *Anabantoid* (air breather).

Diet: Primarily a carnivore, live or frozen, blood worms, daphnia, brine shrimp, etc.

Reproduction: Submerged bubble-nester.

Sexing: Females have an egg tube. Females ovaries might be visible via spotlighting and are rounder. Males are more intensely colored. Males will also have a more

pointed dorsal fin and longer pelvic fins.

Breeding: *B. rutilans* primarily a bubble-nest builder; however, under certain circumstances, *B. rutilans* has been known to mouthbrood. The exact trigger is unknown..

Remarks: They can be housed in community tanks with proper hiding spots in place and tank adequately sized for the amount of fish and species. They are from blackwater environments and should be housed in warm water with filtering. They build their nests in flower pots or under driftwood or broad leaf plants.

Not often available in shops.

Reference:

<http://smp.ibcbettas.org/species/rutilans.html>

[Whhttp://en.wikipedia.org/wiki/Betta_rutilans](http://en.wikipedia.org/wiki/Betta_rutilans)



Sal Silvestri - NAS
Norwalk Aquarium Society, Aquarticles.com

BREEDING

Dicrossus maculatus



Photo: Robert Van Mossevelde

While this species isn't real flashy or colorful, they have a ton of personality. A group of them kept in a larger tank would be a lot of fun to watch, but my pair gave me some quality fish watching time.

Background:

I have kept and bred *Dicrossus filamentosus*, but I never saw (except in pictures) *Dicrossus maculatus* until 3 years ago. You can imagine my excitement when I saw it available on a wholesaler's list. I immediately ordered 12 fish. After almost 30 years, a legend became a reality.

Introduction:

This species was found at Lago Maximo and Jose Assu as well as branches of the Amazon River near Tonantins, the Rio Javari and Rio Tajapuru. Little is known about the distribution range of this species. Reliable records stem from the vicinity of the city of Santarem.

Description:

Dicrossus maculatus resembles the widely known *D. filamentosus* and only larger males exhibit features which distinguish them apart.

While the male *D. filamentosus* develop a clearly lyretail (forked) caudal fin, the males of *Dicrossus maculatus* grow an oval to slightly lanced (spaded) tail-fin, bluish with a dense pattern of vertical bands. The female's is round and transparent without design. In addition, *Dicrossus maculatus* have much longer ventral fins. The males of the latter species are larger and may reach up to 4 inches TL (Total Length). In contrast, the females may only reach 2 1/2 inches TL.

Care:

When my 12 fish arrived, they were set up in a 20-gallon high tank. The fish were juveniles and at that size they weren't sexable. They were housed with 6 juvenile *Apistogramma meciliensis* and one small albino *Ancistrus* bushy nose pleco. The tank had two *Anubias* sp. - Nana plants, whose leaves would hopefully be used as the spawning media and a very LARGE clump of Java Fern, which covered half of the tank! Since



they love to masticate the substrate in search for food, a fine medium as substrate (sand) and especially small foods - i.e., *Artemia nauplii* (baby brine shrimp) are recommended. The water was regular tap water. The pH fluctuated between 6.8 and 7.2, with a GH of 6 degrees. Temperature was set at a steady 80° degrees and water changes of 25-30% were done weekly. This is very important since they are very sensitive to water conditions.

Food:

As with any other fish that I am attempting to breed, I provided them with a varied diet high in protein. They were fed twice daily with a rotating menu of live baby and adult brine shrimp (I never use frozen brine), frozen bloodworms, live blackworms (which I use sparingly...2 - 3 times a week), frozen daphnia, and a good paste food (my home made recipe). **Note:** Since *Dicrossus maculatus* has a small mouth, the bloodworms and blackworms were chopped to small pieces to make it easier for them to eat it. Given this and the frequent water changes, it wasn't long before they started showing sexual dimorphism, I ended up with 4 males and 6 females (2 died). At this point the Apistos were also showing sexual dimorphism, but that is another story!

Breeding behavior:

At this point I contemplated whether to move the entire colony to their own tank or just remove 2 pairs and see what would happen. Since all the fish were doing well, I removed all but 2 males and 3 females of *Dicrossus maculatus* and 2 pairs of the *Apistogramma macilinesis*. Reading that these fish demanded soft and acid water, I mixed 50% RO (Reverse Osmosis) water with my tap water. This gave me a 6.5 pH and a GH of 2.

As time passed, the males got larger and they started to show some red coloration on their

dorsal and caudal fins. To be honest, at first, all the fish hid in the large mass of Java moss, only to come out to eat. But I soon saw one female hanging around one of the anubias plants. She started to pluck on one of the leaves and chased any fish that came within the immediate vicinity. It wasn't long before I saw her coloration change. She lost her two rows of black spots and they were replaced by a large black lateral band.

About three days after I noticed this change of behavior, I noticed that she was hovering around one particular leaf and she had developed light yellow pectoral fins and a red anal fin. She was protecting the area more intensely. Upon closer observation, I noticed a patch of light beige colored eggs on the leaf she had cleaned. At this

point even the male is chased away and the female cares for the eggs alone. Once spawning is finalized, there's no trace of bonding anymore.

At this stage, the female positions herself on top of the eggs and fans fresh water over the eggs without interruption. The eggs hatched after three days and immediately

the larvae were relocated to a pit/depression in the sand. The site is changed at least once a day. She preferred depressions near roots of plants. My *anubias* plant still had the plastic pot on it and she loved to deposit the brood inside the pot, I guess because they were perfectly camouflaged against the beige gravel. After 6 - 7 days, the fry were free swimming and the "proud mother" began to herd the brood around the tank. The mother would always stand on top of the feeding school. Any fry that stray away from the school were caught with the mother's mouth and re-deposited in the school. At this point she became a "Terror"! She attacked any moving objects (including my finger)! Everyone knew that she ruled the tank!



Raising the fry:

As they became free swimming, I started feeding baby brine shrimp, which I sprayed with a turkey baster over the clump of java moss. This was done because most of the time the brood were foraging inside the java moss. I estimated that there were approximately 50 fry. At this stage, the water changes were done very carefully. The water was siphoned into a bucket, which was carefully checked for any fry that might have been siphoned out! Since this was the first spawn, I didn't want the fry to be picked-off by the other residents in the tank! So in order to guarantee that I would have some surviving fry, I decided to remove half of the clutch. I placed them in a 15-gallon tank, which was filled with 70% of the water from the tank where they hatched and 30% straight tap water. The tank was bare except for java moss. My filtration was a sponge filter and a corner box filter. A 30-40% water change was done weekly. I also put a juvenile bushy nose catfish (*Ancistrus*), with the fry, to eat any uneaten food. Even with this regimen, the fry grew slowly.

A special observation that I made was that


there were not any noticeable differences in size between the fry left with the parents and those raised separately.

My experience has always been that fry left with the parents always grew faster. At about 4 months old, they were approximately 3/4". At this age and size, I included finely chopped blackworms and bloodworms in their diet. At about 5 months old, they were a good 1" and the sexual dimorphism started to be noticeable.

In this spawn, I ended up with about 10% males. This was mainly due to the low pH, which seemingly favors the development of females offspring. The subsequent spawn was done with straight tap water...In that spawn, almost 40% were males.

Conclusion:

Despite what I read about this fish, I found them to be quite hardy and easy to work with. I enjoyed working with them immensely and the males are very impressive when fully grown.

If you are looking for a bit of a different dwarf, give the *maculatus* a try. You will not be disappointed. 



Dicrossus maculatus

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NAME _____ OCCUPATION _____

ADDRESS _____ CITY _____ STATE _____ ZIP _____

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

E-mail Address _____

TYPE & LENGTH of MEMBERSHIP: (CHECK ONE)

INDIVIDUAL				FAMILY				<input type="checkbox"/> \$15 STUDENT 1YEAR
1yr. \$20	2yr. \$36	3yr. \$51	4yr. \$68	1yr. \$25	2yr. \$45	3yr. \$63	4yr. \$85	(UNDER 18 YEARS)

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

1 _____ 2 _____ 3 _____

4 _____ 5 _____ 6 _____

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

If yes, what types do you breed: _____

Special interest (if any) _____

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

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

On occasion, the Brooklyn Aquarium Society uses its mailing list to send notices of interest to our members.

If you **DO NOT** wish to receive these mailings please check here

Official use

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