AQUATICA

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Bolivian Ram *Mikrogeophagus altispinosus*

106 Years of Educating Aquarists

AQUATICA

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Contents

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Brooklyn Aquarium Society
Calendar of Events ~ 2017 -2018

2017

NOV 10 Joe Yaiullo - Marine ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
DEC 8 Holiday Party ~ Members, their families and friends • Fish Bingo & Prizes • BAS awards presentations.

2018

JAN 12 Joe Uaru - King of DYI ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
FEB 9 John Coppolino - Building my dream system - 1300-gallon SPS display ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
MAR 9 TBA Freshwater ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
APR 13 Sanjay Joshi - Reef Lighting ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
MAY 11 Giant Spring Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a brand new 55-gallon tank & stand.
JUN 8 TBA ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.

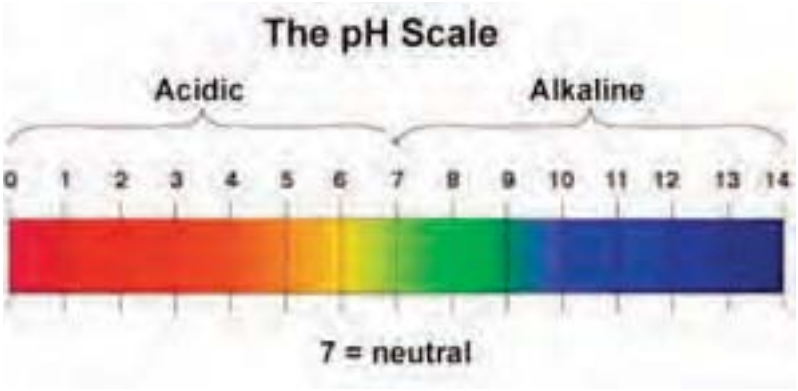
NO MEETING JULY & AUGUST

SEPT 14 TBA ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction
OCT 12 Giant Fall Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a brand new 55-gallon tank & stand.
NOV 9 TBA ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction.
DEC 14 Holiday Party ~ Members, their families and friends • Fish Bingo & Prizes • BAS awards presentations

Ryan Curtis - BAS

From New Shrimp Keepers Must Reads, Water Parameters - January 9, 2017

Understanding Potential Hydrogen (pH)



pH in the aquarium hobby is a key and vital factor on all things from fish and plants to shrimp. Each species has its recommended level of pH to be kept. Keeping your species in this recommended level will allow it to thrive.

pH is a numeric scale used to specify the acidity or alkalinity of an aqueous solution. Solutions with a pH less than 7 are acidic and solutions with a pH greater than 7 are alkaline or basic. Pure water has a pH of 7 and is neutral,being neither acid or alkaline. Contrary to popular belief, the pH value can be less than 0 or greater than 14 for very strong acids and alkalines respectively. However, these extremes are difficult to measure precisely. pH is measured and usually falls between 6.5-8.0 in most home aquariums.

pH in your aquarium will affect how your shrimp breed, feed, and their overall health. The goal to many shrimp keepers is breeding. To be able to do this regularly and effectively you need to have your shrimp in the recommended range for breeding. Shrimp tanks with very low pH can stunt the growth of your shrimp, while shrimp tanks with high pH can be harmful. To determine if it is low or high for your shrimp, you will need to do some research on their breeding parameters. While the pH might be low for some shrimp, it won't be for others, so doing research is key.

In a home aquarium, the best way to control you pH is with substrates that are designed for shrimp keeping and holding pH at certain levels. Your next best option, however not for beginners, is to use CO_2 to control pH in your aquarium. Most likely when using CO_2 to control pH, you will need a CO_2 monitor controller to help maintain it at your desired level.

I personally use API Test Tube Kits to measure pH levels as I find them to be the most accurate on the market. Testing once every two weeks to monitor your aquarium should be good enough.

"Keep on Shrimpin"

Sincerely, "America's Favorite Shrimp Guy"

Ryan

Edward D. Burress - PVAS
Reprinted from *The Underwater News* September 2011
The publication of the Pioneer Valley AS

Breeding *Microgeophagus altispinosa*, the Bolivian Ram

This article is meant to outline the breeding of Bolivians Rams in detail, including courting, spawning, parental care and raising fry. I tried to include as detailed information as possible from my own experience, and I hope that this article will provide a framework for what to expect from spawning Bolivian Rams, and answer any questions you might have.

Introduction

I have spawned Bolivian Rams in a relatively small range of parameters, pH 6.8-7.4, gH 3-4, kH 1-2, and 76-80˚F. That being said, I have come to prefer the measures: pH 7.4, gH 3, kH 2, and 77˚F for the husbandry of the species. These parameters approximate the conditions of the species in the wild, except for being mildly softer. The best spawning trigger I have found is a large water change of 40-50% followed by a minor tank rescape. During water change, I measure the fresh water to 2 degrees below that of the tank to simulate the cooling effects of rain. During smaller water changes, the difference can be greater.

Adult male in breeding coloration

Courting

The courting process can be quite short or drawn out and dramatic, ranging from 2-7 days from onset to spawning. The male undoubtedly initiates the courting with entertaining displays including, throat and gill flaring, body curling, displaying of the flanks, body whipping, and tail lashing. The female may return some of the advances, or may forgo displaying entirely. I do not do any special feeding to induce spawning. However, make sure to feed foods high in protein for egg production, and I always feed twice per day, and take additional care that the female gets an adequate amount. Breeding fishes typically display a strong yellow chest and abdomen, and sometimes strong orange highlights in the dorsal and caudal fins, and display transversal bars on the rear half of the body. Courting escalates when the male begins to prepare potential spawning sites, such as cleaning stones. The male will often engage in head shaking over the intended site, and pick at the substrate with his mouth repeatedly while the female looks on. The male may also construct a large depression in the substrate, and even partially construct several more depressions during courting. The female will also engage in constructing these nests, but not to the degree of the male. When the female begins taking keen interest in cleaning a spawning site, typically spawning is imminent.

During courting, the degree of aggression is quite varied; sometimes the male is content to casually follow the female around and other times, the same male will outright harass the female; however, no damage is ever inflicted. Ample cover for the female is necessary for this reason. An adult pair can spawn every 3 weeks, and most aggression is confined to the intermittent period between spawns, or early in the courting process. After the female has developed eggs and shows interest in the male's advances, any aggression is converted to the dramatic courting displays previously mentioned.

Young adult male guarding potential spawn site

Breeding

The spawning site may or may not prove to be any of the sites prepared by the male during the courting process. I believe the female always has final decision and sometimes chooses a new location altogether. All of my females greatly prefer to lay eggs on flat stones, like slate. One female will only spawn on slate, regardless of the presence of other potential sites. However, it is quite common for Bolivian rams to spawn in depressions in the substrate, on horizontal driftwood, and even on broad leaved plants. My Bolivians always spawn late in the evening, without exception. The pair will diligently clean the chosen surface until the female begins laying eggs, gliding in a circular motion, depositing 6-10 eggs at a time. She will then give way, and the male will fertilize the eggs in a similar fashion. This process of exchange may continue for up to an hour. Clutch sizes seem to vary; young females may lay as few as 60 eggs, while adult females can lay 200. My pairs will always cover the clutch in sand 45-60 minutes after spawning is complete, and remove the sand after 36-48 hours. My theory is they do this to conceal the eggs while they are weak from spawning; after they build back their strength, they remove the sand. I have noticed that when they deviate from this schedule, the spawn is likely to be unsuccessful. For example, if they ever cover the eggs within 18 minutes of spawning, they tend to remove the sand after as little as 24 hours, and almost always eat the eggs before they hatch. I think this is merely an indirect indicator that they are stressed. The pair will take turns fanning the eggs and defending the territory from the other company fishes. I have typically had success with spawns that were in catfish free community tanks. I have had less success when attempting to breed isolated pairs. The two seem to fight a lot before the eggs hatch, causing inadequate fanning shifts, and stirs up debris around the clutch, both leading to increased losses from fungus. In contrast, in a community environment, the pairs prove to cooperate peacefully, and I have spawns that hatched with no observable losses to fungus!

My dominant pair has actually protected a clutch, from spawning to hatching, from a shoal of Corydoras paleatus, without a night light! However, my sub-dominant pair has not been able to achieve such a feat, and such is certainly not typical.

Parental Care

In 24 hours, the eggs will turn an orange-amber color, and unfertilized eggs may begin to turn white, along with those that fungus despite fertilization. Eye spots are clearly visible on the second day. The eggs hatch after 62 to 64.5 hours at 76-78˚F and are immediately transferred by both parents into the pre-constructed nests. During the egg stage, the male will begin constructing these nests for the wigglers; this usually happens late in the egg stage, within 12 hours of hatching. All of my Bolivians prefer to dig down into the root systems of plants, and store the wrigglers there, and relocate them once or twice per day, usually to unique nests. Nests are rarely re-used

for this purpose. They will occasionally dig down underneath driftwood or large stones and store the wigglers there, but a depression is always involved. The pair continues to maintain shifts of fanning the wrigglers, and will constantly mouth and tumble the larvae.

Pair fanning sand covered clutch

My Bolivians mainly show interest in keeping conspecifics at bay, and really seem quite unstressed by nearby characin species, and rarely make a great effort to chase them off. The fry are free-swimming after seven days, and are initially kept herded into a shallow depression by both parents, which are most aggressive during this time; however, they are still quite mild mannered and seem content to just keep the other fishes on the other side of the tank, without damaging the other fishes. My pairs typically keep the fry gathered into a shallow depression that is situated between larger plants, such as *Echinodorus*, or in areas with detritus, either for the small food particles there or the protection. They usually do this for the first 48 hours after free-swimming and will then start moving the fry and allow them to roam. However, they do not guide the fry around the tank as much as other dwarf cichlid species, and tend to restrict the fry to the immediate breeding territory. A very interesting behavior also occurs during the free-swimming stage. During danger, the female will drop quickly to the substrate, often with a shake of her head, and immediately the fry will mimic her. I first observed this behavior when I accidently bumped the tank while attempting to take pictures of the mother and her young.

The fry stayed huddled against the substrate until their mother reassumed normal behavior soon after. The fry will live only a few days off of their yolk sac and will then need to be fed. I use a plastic eye dropper while the fry are in the tank with their parents to make sure the food gets to them, and so I can put the correct amount, since excess dirties the tank so much. If you feed baby brine shrimp, the fry should have full orange colored stomachs. If you use a powdered food, such as First Bites, the fry will develop golden-yellow stomachs. If you do not have means to have live BBS and feed powdered foods, it is important to mix it up in a small cup of water for a few seconds so that all the particles break up and soften to where the new fry can eat it easily. Portions can be small and only what the fry will consume in a few minutes. However, they do need to be fed every three hours, if possible.

In my experience with the species, most of the parental deficiencies arise during the free-swimming stage when the parents have difficulty maintaining the cloud of fry, and eventually they would get lost in the tank and snacked on by the other fishes. However, it is worth noting that Bolivians are known to eat their eggs several times before they have a successful spawn. I prefer to leave the fry with the parents for as long as possible, and then as a last resort, remove the last remaining 20-30 fry and raise them, rather than remove a large group of fry prematurely.

Raising Fry

When it is time to remove the fry, I have found the simplest way is to merely siphon the fry out of the tank. If a good number of fry are left with the parents, I like to leave 10-15 behind with the parents. I believe this helps with pair stability and allows for more opportunity to practice their parental skills. For this species, the initial grow out tank does not need to be large - a standard 10-gallon is adequate. I have a routine for this process that has proven to be very successful.

I do small water changes on the main tank

while the fry have been developing, but I do not vacuum the substrate. So I fill the grow out tank entirely with water from the main tank, and take caution to maintain the temperature precisely. This allows for the least shock to the fry, and offers an opportunity to thoroughly clean the adults' tank. I equip my grow out tank with a heater, filter, small air pump driven bubbler, and a small clump of java moss and nothing more. Sponge filters work great, but small power filters are fine too, I merely turn the flow down to minimum, cover the intake with mesh, and take care to maintain the water level to limit the current created by the return. I use bare bottom tanks because of the need for daily cleanings, yes daily.

Fry at 3 weeks

My standard routine is to siphon out two gallons every day and clean the bottom while doing so. Using a small diameter hose will keep the flow slow, and allow ample time to clean the entire tank bottom and make it easier to avoid the fry.

Take care to adjust the temperature of the incoming water. I believe the species is very sensitive to fluctuations in temperature at this young age, I will restate that 77˚F is ideal. During these cleanings, the water volume exchanged is not great, but the debris and uneaten food is kept from accumulating, which allows for the cleanest tank and most stable conditions for the fry. Care should be taken that the NO_3 levels do not exceed 5ppm during the first months of development, or significant losses could result. I add the clump of java moss for shelter, and although the fry will not eat it, they will rasp off of it on occasion. I use a small air pump to drive a bubble maker (only when using a small power filter), and use a suction cup mount to place it a few inches below the water surface (to where it is still submerged during maintenance, but as high as possible to limit any current created). Ideally, the fry should be fed live baby brine shrimp every three hours; however, I must admit that I have had no difficulties raising the fry entirely on powdered foods such as First Bites. A lot of species cannot adequately eat the particles, but I have not found this to be a problem with this species.

The fry will need to be transferred to a larger grow out tank as needed, I have had success using a 36" tank for grow out of small groups (20-30 fishes), and typically move the fry into this sized tank between 12-16 weeks of age. In this secondary grow out tank, I usually add a sand substrate and some vegetation for shelter. I do still lean on simplicity so the tank is still conducive to cleaning. At this age, the fry do not seem bothered by a lack of shelter, and are quite social. At 6 months of age, my fry will eat from my hand. The fry grow painstakingly slow, and after 11 weeks may only be 1/2" in length, and after 6 months measure 1 1/4" or less. After the fry are 12 weeks old, you can start crushing up sinking cichlid pellets (or whatever you feed the adults) and start weaning them onto that. I haven't had any trouble with juvenile Bolivian Rams, they have readily

Male fry at 5 months

Female fry at 5 months

accepted all prepared foods offered, and eat eagerly. However, make sure the particles are an appropriate size, as the fry and adults alike do prefer small, easily consumed morsels. The food will also typically need to sink. Fry will become brave and learn that they can feed from the surface, but it is easier for them if the food sinks readily. I feed the fry small portions: every three hours for the first two months, then three times per day up until the age of 6 months, when I adjust them to two feedings like the adults.

The abdominal spots and facial banding will start to develop around 12 weeks of age, the red lining of the caudal and dorsal fins will develop between 15-20 weeks, and the red in the anal fin shortly thereafter, but will not be fully developed until 6 months. The blue in the pelvic fins also develops around 6 months. At this age, the fry are of a sellable size, or large enough to be combined with adults if the tank space allows. The yellow abdomen may not develop until the fish are mature, after 8-10 months.

Poor quality Bolivian Rams are common in the hobby, and deformity is a problem with the species. The reason for this is inbred fish, poor strains from Asian farms, and a lack of wild fish to mix into the breeding lines. Take care to study your fry before dispersing them into the market. Common deformities include bent spines, clamped tails, short bodies, large lips, and curled pectoral fins. If present, these will be visible in fry after three months, and usually occur in a low percentage.

Overall, the fry are quite easy to raise, care needs to be given to fluctuations in temperature and Nitrate levels, but otherwise they do not present any problems.

Male fry at 6 months

Maturing female at 8 months

CHARLEY GRIMES - YATFS

Reprinted from *The Youngstown Aquarist* Vol. XXXVII Issue III May/June 2011
Youngstown Area Tropical Fish Society

Cichlisoma festae, the Red Terror

If you were to picture in your mind a big, mean, nasty, anti-social Cichlid, surely your first six or eight candidates would be Central American Cichlids

I have been keeping fish pretty seriously, for 50+ years -- and most of those years; I had a lot of fish tanks. Usually a fair number of those tanks were large and I have enjoyed, more or less, keeping a large variety of cichlids over those years.

I have had the big bruisers, like *Tilapia buttikoferi,* a west Africa riverine species, also known as the Zebra Cichlid. At an inch, *T. Buttikoferi* is somewhere between cute and beautiful. And when large (I've seen specimens over 16 inches), they are magnificent! The problem is that they grow more and more territorial as they get larger At four inches, a 55-gallon tank is too small to house two of them. I ended up with six *T. buttikoferi*, nine to twelve inches in six 55-gallon tanks before I finally got tired of the challenge and gave all six to a zoo. Likewise, I've had smallish fish--- the four or five inch 'Brown Auratus' from Lake Malawi and the six inch 'Long-ear Sunfish from right here in Indiana, that inch for inch-- or ounce for ounce are in my opinion the most territorial, anti-social, nasty little drinkers that ever swam in a lake or stream. I've had gigantic bruisers like

Cichlasoma umbiferum and *Parachromis dovii* (pussycats).

However, when I think of the BIG NASTIES, I invariably think of Central American Cichlids. These fish with names like Red Devils and Red Terrors did not get those names because they were good community tank fish.

The Red Terror (*Cichlasoma festae*) gets about a foot long, total length, and is, since appearances are often deceiving, a strikingly beautiful animal.

The male is a yellow/gold color when adult, handsome, but not remarkable. The female gets a very hot orange-red, which to my eye, is Chinese red -- and is one of the most beautiful of any of the fishes, fresh or salt water. However, never forget that the common name, Red Terror, was applied to these fish for a reason!

Now, as to breeding these fish in the home aquarium, unless you have a 300+ gallon aquarium, the younger/ smaller the fish, the better. This concept, as a general rule, is well advised for all of the larger Central and South American cichlids. And, since these fish are so predictably precocious regarding spawning, this method will reduce the odds of wholesale slaughter in a breeding tank. The scheme is to obtain six or eight young (under two inches) cichlids and plop them into a 30-gallon tank with lots of cover -- the water can be hard or soft (Central American Cichlids are not particular), feed them well, and do water changes. Keep an eye on this tank because you will likely have a spawning in two or three months. In my experience, this scheme is pretty reliable.

Because I know, from many years of experience, that any Central American Cichlid can turn from a devoted and caring parent into a rampaging and deadly killing machine -- overnight, I don't trust the pair or pair bond any longer than I have to. The minute I see the pair has free swimming fry, I remove all of the adults from the tank and raise the fry myself As I related above, this procedure comes from many years of experience----not all positive. Regarding this specific experience with spawning Red Terrors, I obtained a group of eight young fish from **George Coy.** George had the eight in a 20-gallon tank, knowing George, crammed with mops, when he got his spawn. When I got the eight fish from George, I was able to pick out the probable spawning female, but was unsure which of the other two larger males was the most likely breeding male. I plopped all eight into a 30-gallon flat breeder tank with lots of bricks and flower pots for cover. The water was Indy tap water, water temp was 75/80°F, and they were fed pellet food as their main diet.

Then, rather than pay close attention to the tank so I could relate the details of the spawning, I took a fall off our deck -- severely tore my shoulder cuff, had surgery, and have been sort of banned from the fish room until I am released by the surgeon.

However, I sneaked out to the fish room about three weeks post surgery and saw a male (golden yellow) and a female (brilliant orange red) guarding a school of 50, or so, two week old fry.

Fortunately for all concerned, **Mike Downey** was also in the fishroom giving some much needed attention, so he pulled the pair out and put them into another tank and also removed the other sub-adults to yet another tank. If Mike hadn't been there, quite likely, within two days either the parental male or the female would have killed all of the other adult fish, including the mate and possibly the fry

Thanks to Mike Downey, I am able to write this BAP report. I reckon there were more like 200+ fry to start with, but 50 is still plenty as far as I'm concerned. Two week cichlid fry are easy to feed -- they will eat anything -- and they grow fast. I still 'hate' Central American Cichlids!!! But I will have to admit -- again -- that they provide a beautiful, interesting, and rewarding challenge. Right now, with a tank full of Red Terror fry, telling myself, 'Never again'! But, I also know it won't be long and I'll be ready for another adventure with those darn Central American Cichlids.

Coral Conservation Efforts Aided by Computer Simulation

This image shows coral releasing egg/sperm bundles which will be fertilized in the water to form poppy-seed-sized larvae. Source: Jamie Craggs, Project Coral, Horniman Museum and Gardens

Contrary to a prevailing theory, coral larvae could not survive the five-thousand-kilometer trip across the Pacific Ocean to replenish endangered corals in the eastern Pacific, according to new research. Researchers used a supercomputer to simulate billions of coral larvae traveling on ocean currents over a 14.5-year period. The simulations showed that even during extreme environmental events that speed ocean currents, like the 1997-1998 El Niño, coral larvae could not survive long enough to make the trip from coral reefs in the western and central Pacific to help corals in the east recover from environmental damage.

"Our study uses computer simulations to allow us to answer questions about coral biology that we can't answer in the field," said **Iliana Baums**, associate professor of biology at Penn State University and a coauthor of the research paper. "The information we gain can help direct conservation efforts for these vital organisms. Without living corals, beaches would erode at an alarming rate -- there are already areas in the Caribbean that are losing a meter of beach a year due to reef loss. Reefs provide habitats for one of the most diverse ecosystems in the world and they are extremely economically important for fisheries, coastal protection, tourism, the aquarium trade, and as sources for new pharmaceuticals. The reefs in the eastern Pacific that we study are particularly important because they survive in inhospitable conditions, and understanding how they do this could be critical when designing strategies for reef conservation as the climate continues to change."

The research, by an international team of scientists from the University of Bristol in the United Kingdom, Penn State University, the Rosenstiel School of Marine and Atmospheric

Science in Miami, the University of California Riverside, and the National Oceanic and Atmospheric Administration's Pacific Marine Environmental Laboratory, will be published by the journal Nature Communications on August 23, 2016.

The study used a state-of-the-art numerical model run on Bristol University's BlueCrystal supercomputer to track the dispersal of simulated coral larvae from 636 reef locations in the Pacific. The supercomputer enabled the researchers to deal with the very large computational demands required to explicitly test, for the first time, a long-standing theory that El Niño events could promote long-distance dispersal of coral larvae across the Pacific Ocean. The researchers used the simulations to identify reefs that either are important sources of larvae to other reefs, or are very isolated from such sources and therefore potentially more vulnerable to disturbances. One such area is the Eastern Tropical Pacific, a large area stretching from Baja California in the north to the coastline of Ecuador and the Galapagos Islands in the south. Coral reefs in this region have been around for thousands of years despite living in particularly hostile environments for reef formation with limited suitable coastline, cool temperatures, and frequent disturbances. Eastern Tropical Pacific reefs are sparsely distributed and are also very isolated, both within the region itself and from the more diverse reefs of the central and western Pacific.

"We simulated the dispersal of over five billion model larvae from 636 reefs throughout the central and eastern Pacific from 1997 to 2011," said **Sally Wood,** postdoctoral research associate in coral reef ecosystem modeling in the School of Earth Sciences at the University of Bristol and a coauthor of the paper. "This time period crucially covered a range of oceanographic conditions -- ocean currents are highly variable over time -- including the extreme El Niño of 1997-1998. Contrary to the theory that eastward dispersal may happen during El Niño events, we found no such dispersal."

As is happening worldwide at the moment during the current El Niño event, the large El Niño in 1997-1998 wiped out a lot of the corals in the eastern Pacific. Usually corals recover from events like this through a combination of proliferation of survivors and colonization by larvae that are brought in sporadically by the currents from nearby unaffected reefs. However, the new research shows that coral reefs in the far eastern Pacific Ocean, separated from the nearest reefs by over 5,000 km of open ocean, could be on their own when it comes to recovery from mass mortality events such as happened in 1998.

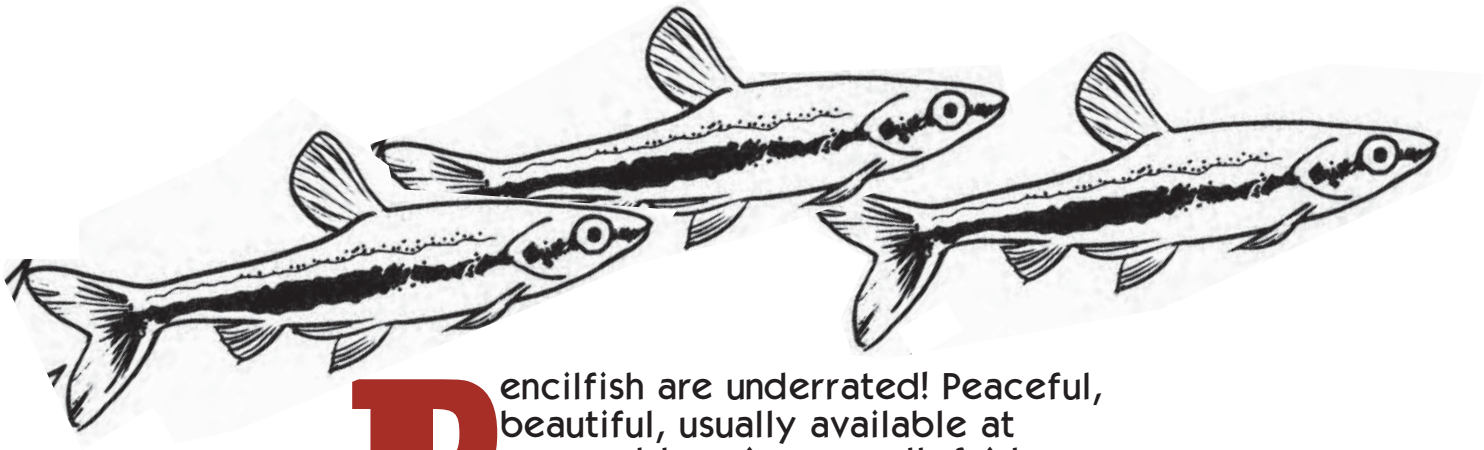
Biologists have been interested in this region since Darwin, who regarded the deep ocean that separates the eastern and western Pacific as an impassable barrier. Several of the same species can be found on both sides of the barrier, suggesting that the barrier has at some point been breached, but it is not clear when or how frequently this has occurred, or in what direction. Genetics is commonly used to detect connections between populations by measuring the level of genetic relatedness, similar to a paternity test. Recent genetic data for corals indicate that eastern and western populations of some species have been isolated for at least the previous few generations -- possibly thousands of years in long-lived corals. "We compared these genetic data to the larvae dispersal data that we simulated," said Baums. "The two data sets lined up pretty well, suggesting that our simulations are doing a good job of capturing what is actually happening in nature."

"Coral larvae are tiny and can survive for a maximum of about 120 days," said Baums. "The larvae travel mainly by ocean currents to establish new colonies, but because of their small size it is currently impossible to track them across the vast distances of the Pacific Ocean to know if healthy populations of corals in the western Pacific could help to rejuvenate decimated populations of corals in the eastern Pacific. For the first time, our computer simulations combined with genetic data allowed us to test whether the larvae could survive this journey."

Tony Kroeger - BAS

A POCKETFUL OF PENCILS

An overview of some popular pencilfish
Nannostomus & Nannobrycon



Pencilfish are underrated! Peaceful, beautiful, usually available at reasonable prices, small, fairly hardy and a good community tank fish...so what's not to like?

In this article, we will look at six commonly available species in the aquarium trade.

But first let's look at some general family information. Pencilfish are divided into 2 species groups *Nannostomus* and *Nannobrycon*. Each group has several species in it, with *Nannostomus* containing the greater number of species.

All pencils come from the Amazon basin in South America. All are small fish, sizes ranging from 1⅓" inches to 2½" inches. 2" inches is an average size.

All pencils are shy, timid and peaceful. Never house them with boisterous fish like tiger barbs or hyperactive fish like zebra danios. In nature, they stay motionless between leaves, grasses, twigs, etc. floating in their water. In nature they eat small insects.

Being small fish; pencils do not need a lot of room. Dwarf species such as *N.marginatus* can be kept in nano tanks, but really I prefer to keep my pencils in groups in 20-gallon long tanks. Their coloration and behavior is much more natural that way.

Being shy, pencils always must have well planted tanks. Use floating plants to enhance their sense of security. I use anubius, crypts and sword plants with water sprite and duckweed floating on top. Use black sand substrate and black background and their color will really shine forth. Not the best jumpers, but cover their tank anyway as species such as *N. espel* and *N. eques* can jump quite well if they want to.

A small power filter or large sponge filter is fine for their needs.

All pencils prefer soft, acidic water with some tannins (from peat moss/extract) added. Keep their pH at 5.5 to 7.0, medium hardness. Temperature should be between 74˚ and 80˚F, They will tolerate harder alkaline water, but will show much less color if kept in such water. What they will not tolerate is ammonia or nitrite, Keep their water quality high; change small portions of their tank water frequently to keep their water sweet and clean. I change 10% to 15% of their water two or three times per week. Never change more than 20% of their tank water at a single time. If you exceed 20%, you run a risk of putting your pencils into shock from which they rarely recover. Shock in pencils is usually fatal!

All pencils have small mouths and need small foods, micropellets, crushed flake foods, baby brine shrimp, tubifex, daphnia and other

small high protein foods should be offered. They love live fruit flies as a treat and frozen daphnia will definitely help bring out their best colors. Pencils shoal together in a loose school. Never keep any pencil alone. 4 to 6 is good, more is better. Pencils are very peaceful fish and mix well with other small quiet fish. They do especially well with neon tetras, black neons, lemon tetras and harlequin rasboras.

Some pencil fish have an adipose fin (between the dorsal and caudal fins) and some do not. All have very different night time (sleep) and daytime colors. The horizontal bands of day disappear at night and are replaced by vertical bands.

All species discussed here have been bred, but it is not an easy task. Most specimens offered for sale are wild caught.

To breed them you need very soft water 2˚GDH, acid 6.0 pH water, a temperature of 78˚ to 80˚F. Condition them on frozen mosquito larvae and live fruit flies. Use a 5-gallon tank per pair. Cover the bottom with marbles or a screen and add Java moss on top of the marbles. Keep the light dim and their water level low (4"inches).

Spawns are small - a few dozen eggs. Adults are voracious eggeaters. Remove adults immediately once spawning is complete. Keep the tank dark and use a flashlight to search for glass silver like fry. Once you see fry (one to three days) gradually increase light and feed with rotifers and infusoria and baby brine shrimp after 10 days. Fry are light and water quality sensitive.

Now onto some popular species:

Nannobrycon eques

The original pencilfish! Up to 2 inches, commonly available at reasonable prices. Standard care. A pretty fish. Golden brown nape, gold stripe snout to tail, dark broad chocolate band underneath snout to tail, anal fin red with blue/white edge, Pelvic fins blue/white tipped on males only. Lower 2/3 rds of caudal fin chocolate/red edged in black. Blue iris with black eye. Sometimes sold as black lined pencils. Healthy fish always swim tail down. Never buy one that swims head down, as it is sick.

Nannostomus beckfordi

Beckford's pencil. Usually available at reasonable prices. Standard care.
Up to 2 ½ " inches. A really pretty pencil! Milk chocolate body, broad nose to tail dark chocolate stripe, males have a broad red stripe above the dark chocolate one. Males nape overlaid in royal purple. Dorsal and caudal bases are bright red. Anal fin solid fire red. Pelvics broadly tipped neon blue. Iris gold, eye black. Swims slighty head down. A stunning fish!

Nannostomus espei

Barred pencil up to 1 ⅓ ". Admittedly the rarest, most expensive and most sensitive of the pencils discussed here. You must look to find this pencil online or in stores. Highly seasonal and expect to pay when you do find it. Standard care, but hyperly sensitive regarding water quality. If your water quality drops, it will die enmass with no warning.

Very sensitive to light and water change shock. **This cannot be emphasized enough!** Do everything very gradually with this fish! Very sensitive to moving. Golden honey brown nape and flanks. White belly. Flanks adorned with 5 broad, irregular backwards leaning blotches. Random green metallic spangled scales overlay along flanks. Iris; silver/orange top. eye black.A rare sensitive fish. Definitely not for beginners.

Nannobrycon unifasciatus

One line pencil up to 2 ½ ". Seasonally available. Standard care. Green/gold nape, broad black line nose through center of caudal fin, black edging on lower caudal surrounding diffuse red and white swath. Small black spot on upper caudal just above black stripe. Spot is surrounded with red on lower side, white on upper. Males have black anal fin tipped in white. Females have red and black anal tipped in white Reasonably priced, but expect to look a bit to find this pencilfish.

Nannostomus marginatus

Dwarf pencil. Beautiful! Smallest pencil; up to 1 ⅓" inches. Commonly available. Reasonable prices. Standard care. Greenish/brown nape and flanks. White belly. Two broad longitudinal black bands nose to tail base along the flanks. Thin black edge around entire body. Neon red dorsal anal and pelvic fins. Dorsal and anal - thin black edge. Partial red stripe mid flank just before dorsal base.

Nannostomus trifasciatus

Three lined pencil - stunning! I saved the best for last. Up to 2" inches. Seasonally available. Expect to hunt a bit to find this pencil. Reasonable prices. Standard care. Honey/gold body. Two broad black horizontal nose to tail stripes separated by broad metallic gold stripe nose to tail. bright red large swaths on all fin bases extending out except for pelvic fins. Ventral and anal fins gold stripe has sporadic neon red incomplete overlay mid stripe area only. Neon red snout. Black eye. Black -lower, gold upper iris, brown topmost iris. This pencil is simply stunning!

One final note on pencils:

All pencils are very susceptible to ich. Do not chill pencils. Ich is usually fatal to barred pencils, *N. espei*. All pencils are susceptible to dye drug treatments. Use all dyes at half strength, except methylene blue, Chelated copper is the best treatment to use for ich on pencils.

Pencilfish have much to recommend them. Try some; you'll be glad you did.

Happy fishkeeping!

Tony

Tony Kroeger – BAS

JUST "BUY" A NOSE!

PETER'S ELEPHANT NOSE

Gnathonemus petersii

I like weird fish! Peter's Elephant Nose surely qualifies in so many ways!

It's put together so weird, it's not even funny. A cigar shaped body has a very thin caudal peduncle stuck on it. Dorsal and anal fins set way back on the body. The tail looks like it belongs to a much smaller fish. Long oversize paddle like pectoral fins and then there's its nose! Long and flexible like an elephant,hence its name, elephant nose or "E nose" for short.

Coloration is simple: black with two irregular vertical white stripes, both way back on the body, one in front of the dorsal extending to the anal fin, the other midpoint of the two fins. Fins are black with a clear edge. No other colors.

Native to West and Central Africa. I import this popular fish regularly from Nigeria. The elephant nose grows to lengths of about 10" inches in size.

Most elephant nose offered for sale are about 4 to 6 inches in length. Smaller ones are rarely seen and are picky feeders. All specimens offered for sale are wild caught. There are scattered captive breeding reports, but no commercial breeding protocols are yet established.

Price is always moderate and most shops occasionally stock or at least can order elephant noses for you.

Elephant nose are living batteries! They are twilight and nocturnal fish and live in slow moving, muddy water in nature. Elephant nose generate their electrical fields around them to help navigate their dark, muddy world. The elephant nose can detect anything that disrupts the electrical field and knows what it is.

Elephant nose have brains, more brains per body weight than humans. However, their brain mass is concentrated in the cerebellum to read electrical fields, rather than the front of the brain to think and reason as in humans.

Just because elephant nose live in muddy water in nature does not mean poor water quality, it simply means the water has a lot of suspended sediment in it.

Elephant nose emit 800 electrical impulses per minute in good quality water. If the water quality decreases, the amount of impulses increases and the fish become nervous. Elephant nose are used in European water treatment plants to test the quality of the water discharged from these plants.

Elephant nose are not fish for beginners. They make specific demands on the aquarist. But any aquarist with some experience should be able to keep them.

Elephant nose like clean soft, acidic water. pH 6.5 to 7.0, medium hardness water. They like to be kept warm; 78 to 82˚F is good. I change 20% of their water weekly.

Since they are nocturnal fish, make sure you plant their tank heavily, use floating plants to cut down on light. Also keep their lighting dim. Use bogwood, roots, PVC tubes and caves for hiding places. A soft sand bottom is mandatory. They dig in the soft substrate using their nose to find food. A cover is not mandatory, but better safe than sorry. Use an appropriate sized power filter to keep their water clean.

Elephant nose are finicky eaters at least initially. You must get them to eat or they will soon die.

Never buy a pinched belly elephant nose; ask to see the fish feed and buy ones that eat well.

Anytime you move one, it will go off its feed. Frozen bloodworms will usually restore it to feeding, but if not, use live blackworms; no elephant nose can resist them.

Feed your elephant nose at night, in the dark, after you have turned off all tank and room lights, otherwise they will not get enough to eat.

Feed elephant nose high protein live and frozen foods: bloodworms, blackworms, tubifex, mosquito larvae, glassworms, whiteworms, flake foods and micro-pellets.

Elephant nose, even large specimens, have a small mouth so be sure the food you offer them is appropriately sized.

Elephant nose need room. A small one needs at least a 29-gallon aquarium, a 55-gallon is better. Elephant nose are problematic to keep with their own kind. First off, they are territorial and harass smaller elephant nose. Never keep 2 or 3 together or soon you will have just one.

One alone by itself is fine, or a group of at least 4 or more. To keep a group, be sure each has at least one cave or hiding place it can call home.

The difficulty with keeping a group is they interrupt each other's electrical navigation field and they're not thrilled with that.

Think of it as if your radio were too close to your old style aquarium heater. The result is static. Elephant nose don't like static any better than you do. So give them room! To keep a small group, I would suggest a 125-gallon aquarium.

Keep all the fish in your group the same size to minimize bullying.

Properly fed and cared for elephant nose, which are slow growing, long lived, hardy fish.

I find elephant nose able to tolerate very adverse conditions and still survive and recover as long as the changes are gradual.

I suggest keeping elephant nose warm, as I indicated before; 78 to 82˚F.

I import this fish year round and I remember that one January my Nigerian shipment arrived in minus 17˚F at Chicago O'Hare. The fish were lost on the tarmac for 3 hours! When they were found and brought into the air cargo terminal I immediately opened their box. Everything looked dead, frozen. The water temperature measured 37˚F. I thought the entire shipment a total loss. Once I signed for the boxes of iced fish, the airline asked me to dispose of them. So not only did they freeze them, I had to dispose of them too! Needless to say I never used this airline again. I loaded the frozen fish into my van and drove back to my warehouse where I unloaded them into the cargo bay and went for a cup of coffee to warm up. When I went to the cargo bay to start dumping the dead fish. I lifted a bag of elephant nose and saw one "twitch."

OMG! Could one be alive!

So I dripped warm water into a bin with the frozen noses. Soon others "twitched." So I warmed the other bags of noses too. And then they too started "twitching". I had the same happen with boxes of synos and lungfish.

Every single elephant nose survived 37˚F! And none ever came down with ich which covered all the synos and lungfish! The kribensis, red eye tetras, killies and monos in the same shipment were all a total loss. Frozen to death. But every elephant nose made it through 37˚F without any ich! Now that's a hardy fish in my book.

Elephant nose even move oddly through the water. They paddle, using their oversize pectorals, they row, pull and paddle their way around, usually tail down or tail up. You certainly will not mistake their quirky movements for those of elegant angelfish. But the best is when they use their nose to probe the soft sand looking for food. That is when elephant nose are at their finest. The name is very appropriate. If you can tell Peter's elephant nose (and all elephant nose species for that matter) are some of my favorite fish.

They're totally unique. No other fish are like them. Their movements and antics are fascinating and just a bit of a challenge to keep. But meet that challenge and you'll have a hardy, long lived, very weird fish in your tank for a long time to come. So pick a winner "buy the nose" an elephant nose that is!

Happy fish keeping.

Tony

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

White Worms
Enchytraeus albidus

White worms, *Enchytraeus albidus*, are an excellent live food and easy to raise. The worms range in size from about 3/4" to 1/2". They are eaten by most fish, but should not be fed except as part of a varied diet, because they're considered to be excessively fatty. The nutritional breakdown is as follows: Fats 14.5% Protein 70%, Ash 5.5% and Carbohydrates 10%.

Starter cultures can often be found at aquarium society auctions, from other hobbyists, or from biological supply companies and live food sellers that you'll find on the Internet. Most starter cultures sell for as little as $5 to $10 and should come with directions.

Plastic shoe boxes make perfect white worm habitats. Make sure you either use a hot nail (held by a pair of pliers) to melt holes, or drill 1/6" holes in the top. White worms need to breathe.

Once the worms are settled in their new home, you can feed them white bread soaked in milk, white cooked rice (cooled), bread crumbs or try Potato Buds® mashed potato flakes sprinkled on the peat moss/soil mixture.

Every few days sprinkle some water on top and some food, if they've consumed all of food they have from the last feeding.

It may take up to six weeks before a culture is ready to harvest. White worm, are fairly hardy and a culture can last for months, so long as it doesn't dry out. The worms also like it dark and cool. So keep them in a cool dark spot in your fish room.

Once the culture is running, you should start a new one by removing half the old soil and worms to a new container and add more soil and food.

Enjoy!

RECIPE

INGREDIENTS:

White worm starter culture Peat moss and/or potting soil. Any of the following; Cooked white rice (cooled) Bits of milk-soaked white bread Mashed potato flakes dry or soaked in milk.

YOU WILL NEED:

Plastic shoe boxes. They're cheap, selling in most department stores for as little as a dollar.

DIRECTIONS:

Fill the shoe box with about 3 inches of peat moss or 50/50 mixture of peat moss and potting soil. Add only enough water to wet the peat moss. It should only be damp, not wet. Add your starter culture and food. The food can be white bread soaked in milk. Cooked white rice is a food the worms like or potato flakes either soaked in milk or sprinkled dry on the surface of the peat moss/soil. Don't use more than the worms can eat or it may become moldy. One trick to retard mold is to bury the food in the top portion of the peat moss/soil mixture. If mold forms, spoon it off and add a little fresh food. Once the culture is up and running, add fresh food as needed by leaving it on the surface. The worms will come to the top and feed and make it easier for you to harvest worms.

FEEDING:

Place a clump of worms and soil in a sieve, swish it in a bowl of water to separate the worms from the soil. Or place a piece of glass in the top of the culture. The worms will gather there and the glass can then be dipped into the fish tank.

Tony Kroeger - BAS

MEET THE STONY CORALS

Part 5

PLATE CORAL/DISK CORAL *FUNGIA* SPECIES

EVERY REEF KEEPER SHOULD TRY PLATE CORALS. THESE ARE SOME OF THE MOST COLORFUL CORALS AVAILABLE. USUALLY SAUCER SHAPED AND DOMED. THEY COME IN BRIGHT RED, GREEN AND PURPLE COLORS USUALLY. ORANGE, YELLOW, BLUE AND PINK COLORS ARE SEEN OCCASIONALLY.

These corals are a single polyp with a single central mouth. Raised blade like septa line up outwards of the mouth.

Native to a wide area of the Indo-Pacific, these corals are common, fairly cheap and always available. In nature they are found over rubble in lagoons on reef flats and edges in areas of low to medium water currents.

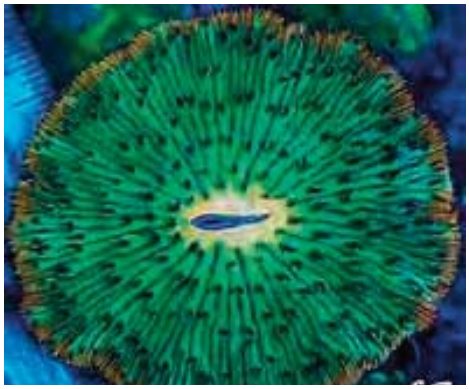
These corals accept all normal reef aquarium conditions and are fairly hardy.

Plate corals do not sting each other so you can put them in close proximity to each other.

However, where you place them and where they decide to stay may be two entirely different things. Plate corals can and do move! They will wander around until they find a place they like.

Don't let plate corals get close to any other corals. They do not seem to sting other corals, rather they excrete and cover them with a thick mucus. This mucus coat when deposited on another coral causes rapid necrosis and demise of the affected coral. So keep an eye on where plate coral wander. Keep in mind plate corals like bright light.

For a stony coral they are fairly hardy. They are not affected by most common coral diseases. Although they host a lot of symbiotic zooxanthellae, plate corals should be fed. I feed mine twice a week after lights



are out.These corals don't fully extend or feed enough for their needs during the day. A simple turkey baster shot of any normal coral diet is sufficient for their needs.

Be sure to add calcium and other trace elements to their water on a regular basis per the manufacturer's instructions.

Never move these corals when expanded. Always allow them to retract fully before moving them. Their septia can be sharp and cause significant soft tissue tearing if their polyps are not retracted,

Usually any tissue regression means you must feed more to the coral.

Plate corals form daughter colonies or can easily be fragged.

Care for most species of plate corals is essentially the same. These are very adaptable corals.

For beautiful color, hardiness and price, plate corals are hard to beat!

Try some.

Tony

Greg Steeves - CKAS
Reprinted from Chatham-Kent Aquarium Society from
the May, 2017 issue of *SEMPER PISCES*

Oryzias woworae

THE LITTLE RICE FISH WITH A UNIQUE METHOD OF REPRODUCTION

Several years ago, friends Kyle and Monica Osterholt gifted us a small group of fish I had never seen or heard of before, Daisy's ricefish. Initially I had pictured something akin to Gambusia or some other small top feeder. When they arrived, I was taken back by how much color these fish had and wondered why I had never heard or seen these before.

They looked more like threadfin rainbows than the colorless mosquito fish I had imagined. I had a 20-gallon high all set up and ready. It was full of a small leafed *Anubias barteri* (nana petite type) attached to a small piece of driftwood. The tank was already populated with six *Corydoras habrosus* (Venezuelan pygmy cory), *Atyopsis moluccensis*, (bamboo shrimp), and a dozen *Iriatherina werneri* (threadfin rainbows). The aquarium was filtered by a small Aquaclear hang on the back power filter with a sponge placed over the inlet. This turned out to be a very peaceful tank and although the inhabitants were not from the same areas geographically, no interspecies aggression was ever observed. As time wore on, the rainbowfish slowly died off, but all the other tank inhabitants prospered.

Oryzias woworae are from a stream named Mata air Fotuno on the island of Muna in Southeastern Sulawesi. Sulawesi Tenggara is a province in the country of Indonesia. Aquarists might be familiar with the region as a hot spot for many new and beautiful shrimp species being introduced to the hobby. Several waterways in Sulawesi are in ecological danger due to a number of factors all associated with human population and

intervention. An extremely alarming practice of fish farms in the region is to release unwanted or substandard flowerhorns (an artificially created hybrid fish proposed to bring good luck to all who keep it; a marketing ploy) into pristine waters where they quickly become the alpha predator consuming the smaller, mostly endemic species. At present, *0. woworae* has not been access by the ICUN's red list or the CARES priority species listing. We have made no special adaptations to the aquarium decor for our colony of ricefish. The fish come from an area of high aquatic vegetation with organic matter (leaf litter mostly) covering the substrate consisting primarily of fine sand.

Following these natural observations, a planted tank may actually lead to these fish showing their best colors. The natural diet may be containing both micro animal matters along with algae. We have found that *O. woworae* readily accepts any food presented providing it is small enough to ingest easily.

At just over an inch in size; even a small aquarium can house a good number of ricefish. A hatchet shaped body is outlined with brilliant red streaking. The males have a blue sheen to their flanks while females are more of an orange-yellow coloration.

In our thickly planted aquarium, fry have just shown up and we have not witnessed to any breeding activity. Reproduction is rather unique to this species. Reports I have read state that males will spar with each other; however, I have not witnessed this myself. It could be possible that with the larger the number of individuals, any aggression is dispersed or diluted among the group. Females will release between 10-20 eggs every day or two when in prime condition. Eggs are expelled from the female in a single clump. After the male releases milt and fertilization occurs, the female continues to hold the semi adhesive eggs near her anal fin. After several days, the female deposits her eggs among vegetation and begins the process once again. Hatching occurs between one and three weeks (presumably temperature oriented) after which time the free swimming fry are left to their own devices. Spawning reports state that the adult fish will predate on the newborn fry. An area of the aquarium containing a fine leafed plant such as hornwort should give the fry ample cover and also provide the females with an area to deposit their eggs. I have not done this but do plan on providing a thick hornwort area to enhance the number of fry that survive and become part of the colony.

Currently there are 33 recognized species of *Oryzias*. Some are very recent descriptions so I would expect this number to increase. I am not familiar with any other species but have thoroughly enjoyed our experiences with *O. woworae*. If the other species are anything like the Daisy's ricefish, the entire genus is bound to become very popular among aquarists.

Larry Felts-NHAS
New Hampshire Aquarium Society
Reprinted from the *Granite-Fisher* Vol. 26 No.5 May 2017

Coke Bottle Used As Killie Fish Hatchery

A club member asked me
"Why are there NOT LOTS OF FRY in their killifish tank???"
I gave a quick answer. When I got
home I began to think that my answer had been vague and incomplete. I thought I would send a short note explaining what I thought might be the root of the problem and how I had dealt with it in my fish room. When I was done I thought perhaps others might have the same question and perhaps I had the beginning of an article for the *Granite Fisher*...
here it is:

If you have "mom" and "dad" killie swimming around a large tank with one, two, or three fry, it is great to know that yes, "they are fertile, they are breeding," BUT where are the other fry. Why are there NOT LOTS OF FRY? Could someone be eating them?

Here are two photos of empty well used arrangements of commonly found repurposed materials recycled by this Author with the goal of facilitating the hatching and raising of killie fish eggs/fry. In this case, the eggs were laid in/on "spawning mops" that had been placed in the tank that housed the adult breeders. The mops were removed after eggs had been laid, and before they began to hatch. This was done in order to reduce possible adult predation; but, probably more importantly, to monitor the hatching in such a way as to try to prevent the individual fry that hatched first from consuming fry that would hatch at a later date.

In this case, the mop is to be removed from the parents and placed in water removed from the parent tank (goal reduce or eliminate from a water-change) into coke bottles prepared for this purpose. While this isolates them from the parents, it also places them in a small container that is large enough to care for and easily monitor, but also remains small and accessible. The goal is to prevent sibling cannibalization. This is to be accomplished by separating fry a short time after hatching, shortly after or slightly before they have absorbed their egg yolk — BEFORE they begin to eating whatever they can find (their smaller siblings).

Shown in pictures are 2-liter coke bottles (with bottom removed) corked and inverted into, in one case, a repurposed quart sized clear plastic deli-ware container; and, in the second case, a four-inch PVC fitting. In both cases the bottle is capped. The bottle is raised high enough to gain clearance enough for it to stand safely in an up-right position (hanging by the bottle's "shoulders") supported by the object allowing it to stand. The PVC fitting is heavy enough to provide stability and safely support the coke bottle and the fish tank water it is to contain. Experience has shown

that the light weight plastic container benefits greatly from the weight of several small stones inserted into the bottom of that container for that purpose.

The bottomless coke bottles usually are about 9 inches deep; deep enough to completely submerge the spawning mops (mine are 7 ½ inches long) tied to a wine cork and allowed to float without dragging on the bottom. I am told that there is no need to aerate the eggs at this time. I like to punch two holes the size of an airline tubing in the lid of a deli-ware container (seen in black in the pics) and drop in an air-line set to a very slow bubble. I use the 2nd hole to stabilize and grip the end of a water dripper line to add water, in small amounts and very slowly, to effectuate a water change very late in the waiting stage (could be after 30 day or more) while the eggs are developing and preparing to hatch. I use the coke bottle as an initial fry-tank for the slow gradual emergence of the fry. The fry hatch out over a period of days in keeping with the fact that the eggs were probably laid in small number over a period of days.

It is a tricky balancing act to try to introduce some live food for these hatching, emerging fry to consume when their yolk is absorbing and they are first learning to eat. It is important not to pollute the tank. Some say do not introduce food. I like to have something live in there for them to start off with. I do not want them to starve. I do not want them to eat their siblings.

I usually try to "move the fry on" from the coke bottle, not too soon, no too late, after they have eaten a day or two or three. Before they start eating their siblings, I suck them out with a turkey baster or siphon them out with a thin length of airline tubing. I move them with some of the water from the coke bottle (replace that amount of water with your dripper) to some sort of temporary container/wannabetank to hold them until they grow big enough to safely join other siblings (born earlier or later). The goal is to get them all to a good juvenile size where they can safely grow and reproduce. You may need several different temporary containers /wannabe tanks to hold them while they "size-up."

2-liter coke bottles (with bottom removed) corked and inverted into, (left) a repurposed quart sized clear plastic deli-ware container; and, (right), a four-inch PVC fitting.

The Society takes a day trip to Absolutely Fish

A great time was had by all at **Absolutely Fish** and the surprise visit to their marine fish and coral breeding facility.

We had between 25-30 members and family attend this day trip and everyone went home with multiple bags of fish, marine corals, plants, food and equipment/supplies.

Absolutely Fish gave us a 25% discount and opened one hour before normal store hours. We had members there at 8:30 am.

It was a real treat to visit the breeding facility and see the tanks full of baby clown fish and aquacultured corals.

Then we all went off to the Hearth for a well deserved breakfast.

The hearty band of BAS members in front of Absolutely Fish.

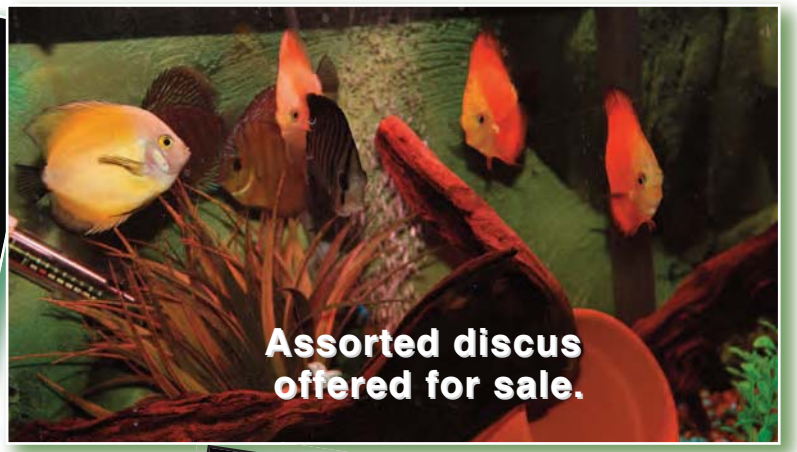
Heather and other members of the staff at Absolutely Fish helping our BAS members with their purchases.

"Show me the fish!"


Flower horn Cichlid.


a stunning saltwater angelfish.


A pair of yellow seahorses.


Assorted discus offered for sale.

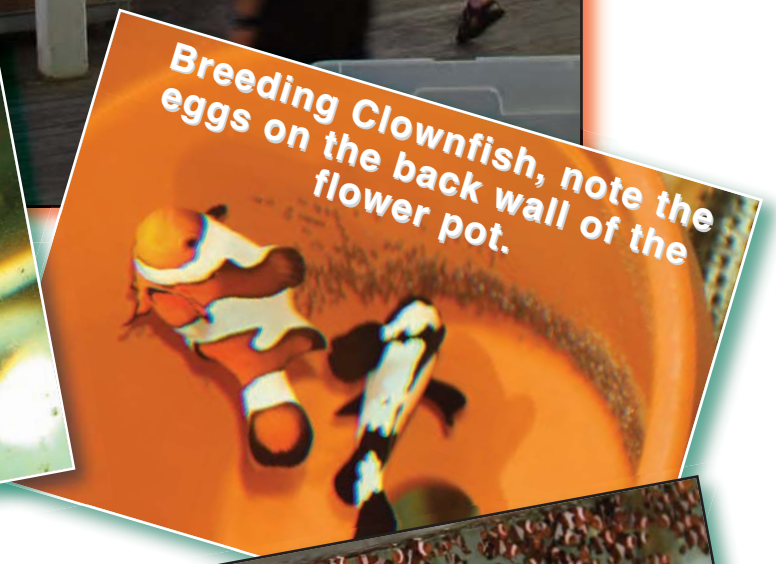

A beautiful orange crayfish checking out our members.


A cleaner shrimp.

"Touring Pat's coral and marine fish breeding facility."

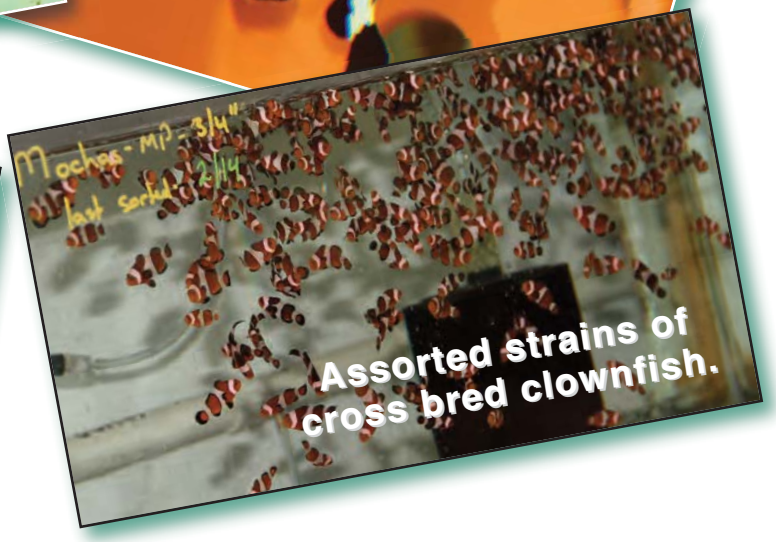
Part of the breeding facility - this section is for coral propagation.

Juvenile Clownfish.



Breeding Clownfish, note the eggs on the back wall of the flower pot.

A pair of breeding purple dottybacks



Assorted strains of cross bred clownfish.

"Coral propagation"

Tanks for coral propagation.

Feeding coral.
Note the turkey baster.

A coral propagation tank.

Assorted strains of
cross bred clownfish.

Dan Simanek - GPAS

Reprinted from *Finformation*, July 2017 the publication of the Greather Pittsburgh Aquarium Society

Corydoras napoensis

Corydoras napoensis (Nijssen and Isbrucker, 1986) is a brightly marked, medium size Cory (50 mm) from northeastern Ecuador where it is found in backwater lakes and lagoons with mud/sand bottoms supporting abundant aquatic vegetation. The type locality is the Rio Aquarico, a tributary of the Rio Napo from which the species takes its name. Collections also have been recorded from the Rio Ata

C. napoensis is similar in size, shape and markings to *C. elegans* and *C. nanus*, all three of which are members of the so-called *"elegans"* group, which is one of the nine lineages identified by Alexandrou's (2011b) study of over 200 Corydoras taxa based on 56 genetic markers. Currently the "*elegans*" group consists of 22-24 such taxa depending on how species with "CW" and "sp" designations are allocated.

The triad of *C. napoenesis, C. elegans* and *C. nanus* share many common markings and decorations. Principally the head, snout and gill cover sport silver to gold spots against a dusky or chocolate background. Over the back and along the dorsal ridge down to the tail, the gold/silver spots of the head begin merging to become a mottled intermediate pattern which eventually gives way to dark spots on a silvery background. All three species have striking deep black and golden lines along the flanks from just under the dorsal fin to the base of the caudal peduncle. These stripes provide the most help as field characters. In *C. napoensis*, the stripes consist of two bold black lateral lines separated by a gold band which is split down the middle by a third black stripe. In *C. elegans*, the third, or middle, black stripe is missing, and the gold band sometimes appears broader than either of the remaining black stripes. In my *C. napoensis* which are kept over black gravel, all dark background colors and spots intensify and spread out so that some of the gold spots of the head are lost and the uppermost lateral black stripe merges with the dark spotting of the dorsal surface.

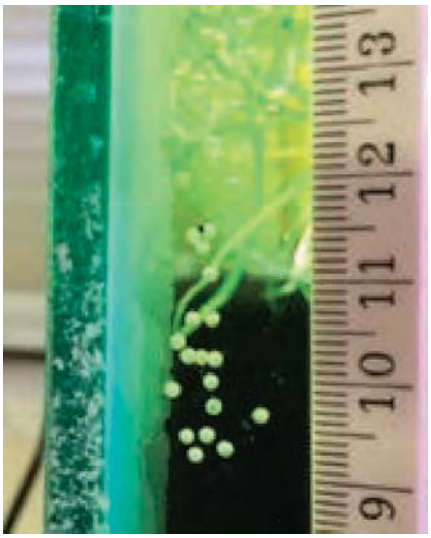
C. nanus has no useful field characters other than it does not possess the third black stripe of *C. napoensis*, but this is of little consequence for field identification because *C. nanus* comes from coastal drainages of Suriname and French Guiana, whereas *C. napoensis* and *C. elegans* share drainages in the same region of Ecuador and Peru. If these two actually are sympatric (living together in the same habitat), such extremely similar species might be considered Mullerian mimics (species convergently evolving the same markings as a badge of harmful toxicity). Certainly the potential for catfish toxicity is well established (Wright, 2009; Greven, 2006), and the brightly striped flanks could be the warning coloration, but in Alexandrou's (2011b) study of 24 Mullerian mimic groups in *Corydoras*, he did not include *C. napoensis/elegans*, which might mean he judges their similarity to be due to descent from common ancestors, not to convergent evolution.


MALE C. *napoensis*


FEMALE *C. napoensis*

In *C. napoensis*, the sexes are distinguishable in the usual way - females are larger and thicker-bodied, while males are smaller and slender, but in addition they are differentiated by a black spot on the dorsal fin (a spot which is not shown by *C. elegans*). In *C. napoensis* males, the spot is large and dense, covering the distal three quarters of the first 4-5 rays of the dorsal fin, ending at the bottom edge in a straight line leaving a distinct clear band at the base of the dorsal. On the contrary, in females, the spot is more diffuse in outline, and is never darker than a dusky smudge. The photos show the dark spots at their maximum development due to the fish being kept over dark gravel. When the fish are over a more typical sand substrate, the female's spot may become so faint that it nearly disappears, but the male's spot will always be visible and pronounced.

At the recent CCA Big Fish Deal I bought five fish (3 males, 2 females) thinking they were juveniles needing time to grow out, but when I found eggs on the front glass of their aquarium after only three weeks at home I realized that one inch standard length was sufficient for a medium size Cory species to start breeding. Their tank was a standard 15-gallon fitted out with a Poret filter (whose current they seemed to enjoy), fluorescent lighting for 12 hours, black gravel, dense plantings of Java fern and *Bolbitis* (African fern), pH 7.6, KH 4, GH 7, 78 degrees. They were fed on frozen blood worms, earthworm flakes, Ken's Fish 300-500 mm Golden Pearls, Ken's Fish Tropical Green sinking granules and baby brine shrimp. Water changes of 25% were made every 5-7 days using municipal tapwater filtered through an AquaticLife sediment/charcoal 2-canister setup. For tankmates there were only a few small killies growing out.Eggs are laid in small clusters of 1-4 around the tank, but primarily on the underside of the broadest leaves available. A few eggs wind up on the glass, and a favorite site will be revisited until until a dozen or more eggs accumulate. Nevertheless, regardless of location all eggs wind up where the water current is strong. The eggs looked small to me, so I thought I would have to be ready for the new experience of feeding fry who are too small for baby brine shrimp as a first food. As you can see in the accompanying pictures, *C. aeneus* eggs on the right are almost .5 mm larger than the *C. napoensis eggs*.



Left egg photo: *C. napoensis* eggs to left of ruler
Right egg photo: *C. aeneus* eggs above the ruler .

I did not disturb the eggs immediately, and the next day there were more eggs found.

Meanwhile, the fish kept busy fussing about and producing more. I used a razor blade to scrape the eggs from the glass, and for those eggs on leaves, I just cut off the leaf. I placed all the eggs (about three dozen) in a 28 oz plastic container, added two drops of methylene blue, an airstone and two ramshorn snails. I've had good luck using these snails to eat fungus which attacks the eggs, but the snails don't seem to prosper if the methylene blue dosage is too high. The plastic container was floated in a different aquarium of nearly the same temperature. For the next four days until hatching began I did not change water or add additional methylene blue. By the time hatching began on the fourth day the tint from methylene blue was nearly gone. I removed the snails and added a spoon size plug of java moss, and dusted a pinch of Sera Micron growth food onto the water surface. The intent here is to inoculate the container with the microorganisms growing on the Java moss, and encourage their growth with the Sera very fine dry food.

Indeed the fry turned out to be smaller than what I had experienced with other Cory's. Over the next few days while hatching and yolk sack absorption completed I added another pinch of Sera to the fry's container daily after a 60-80% water change. When changing the water I was careful not to disturb the clumps or films of mulm accumulating from the Sera feedings. Periodically I used a hand lens to verify these clumps were supplying adequate fare to the fry. No change in feeding regimen was needed when the fry became free-swimming because they were essentially living in their food culture dish. In a week the fry were nearly the size of guppy fry, and I switched from Sera Micron to First Bites which has a larger granule size. At this point I intended to be feeding the fry as well as the microbe culture. At the same time I started feeding 24-hr old baby brine shrimp, hoping to get the smallest size shrimp when their nutrient value is highest. By three weeks old the fry were on baby brine shrimp fed twice a day with matching water changes, and living quarters were now a quart size container. At five weeks they were in a one gallon show aquarium, and by six weeks they were in a 10-gallon grow out tank on a mixed diet of baby brine shrimp and 100-200 mm Golden Pearls. At eight weeks I added finely ground flake food into the mix. At each container size change I focused on providing a deeper water level in order to ease the ultimate transition to an aquarium. I don't claim this practice is required, but it has worked well for me. Overall I thought *C. napoensis* showed a very brisk growth rate, and they seemed to be happy with all the foods presented.

Meanwhile, the adults produced two more batches of eggs at three week intervals; then they stopped altogether for about two months until I found a lone cluster of eggs on the glass again. *C. napoensis* has been an attractive and cooperative species with which to work, and although the fry are somewhat small, they are not impossible to raise. I imagine hobbyists who keep live food cultures on hand would have an easy time with them.

RESOURCES:

• (All except Nijssen (1986) can be downloaded as .pdf's for private use only. If you have trouble getting a .pdf to "Save," email it to yourself from the site then drag the document to the desktop.)

• Alexandrou, M. A. & Taylor, M. I., 2011a, (http://www.academia.edu/5890874/Evolution_ecology_and_taxonomy_of_the_Corydoradinae_revisited)

• Alexandrou, M. A., et. al., 2011b, Competition and phylogeny determine community structure in Mullerian co-mimics, Nature Volume 469 Issue 7328 Pages 84-88 (https://www.researchgate.net/publication/49732083). Supplemental charts and graphs for Alexandrou (2011b) can be downloaded as separate .pdf's from www.nature.com. Alexandrou's taxonomic chart of the nine Corydoras lineages is in the Supplemental data.

• Greven, H., 2006, Axillary glands in the armored catfish Corydoras aeneus (Callichthyidae, Siluriformes), https://www.researchgate.net/publication/256441979

• Nijssen, H. & Isbrücker, I.J.H.1986. Cinq espèces nouvelles de poissons-chats cuirassés du genre Corydoras Lacepède, 1803, du Pérou et de l'Equateur (Pisces, Siluriformes, Callichthyidae). Revue française d'Aquariologie Herpétologie (Série 2) v. 12 (no. 3) (1985): 65–76.

• Wright, J. J., 2009, Diversity, phylogenetic distribution, and origins of venomous catfishes, BMC Evolutionary Biology, 9:282

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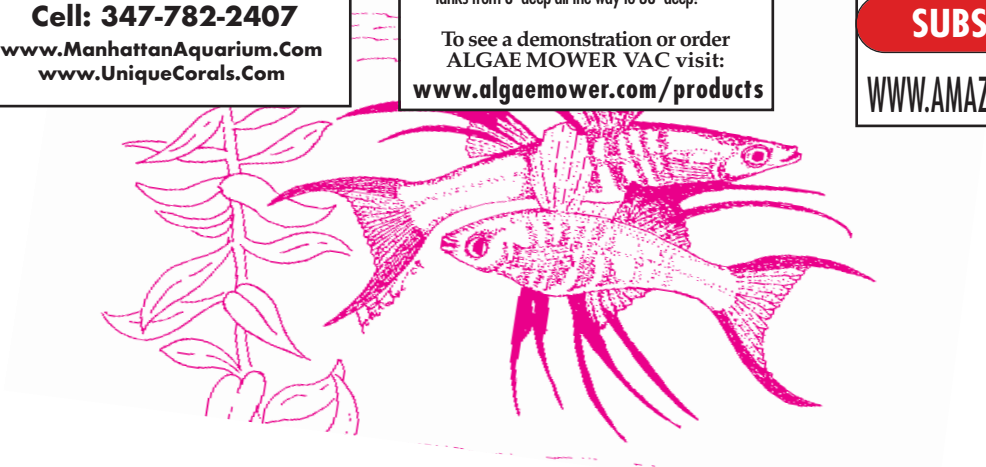

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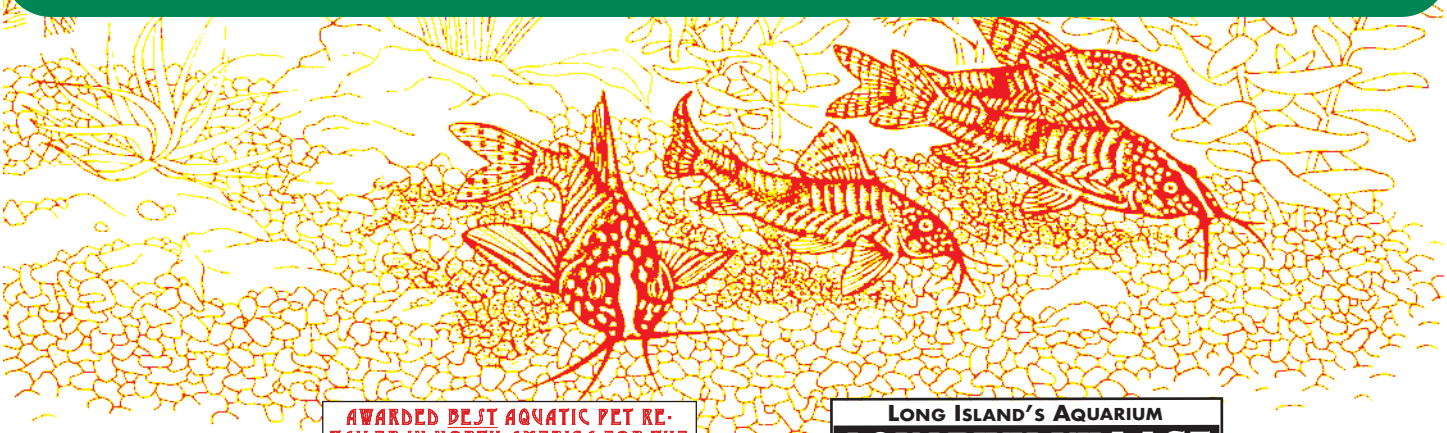

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