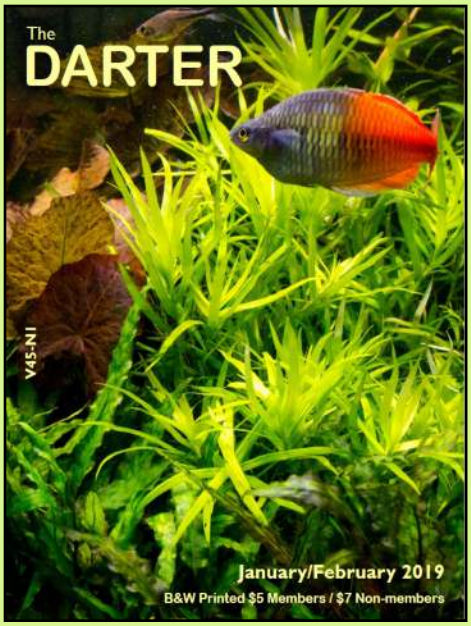
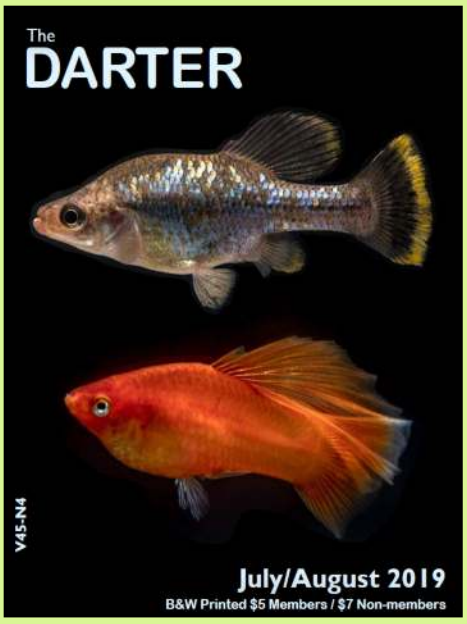
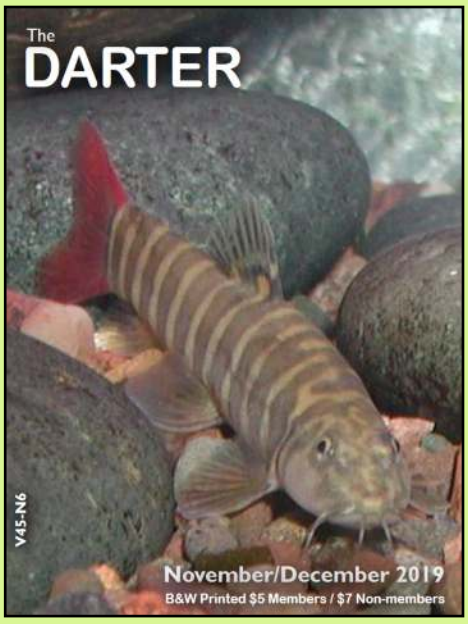


The
DARTER





Missouri Aquarium Society Newsletter articles - 2019 Volume 45, Issues 1 - 6

A Very Special Edition of The DARTER celebrating Missouri Aquarium Society Members' contributions in 2019

This Edition of The DARTER has been compiled as a Thank You for participation in the programs and events of the Missouri Aquarium Society during the 2019 Membership Year.

MASI members appreciate the work and dedication by the authors that went into these articles. Those Editors and Exchange Editors who see newsletters from other Aquarium clubs and Societies also appreciate the efforts that go into these contents. As a result of both first time and established authors, MASI's "The DARTER" annually contains some of the best collections of information about the Aquatic Hobby available.

This Very Special Edition is also meant to serve as inspiration and possible guide for others who would like to contribute information about the hobby. As you find yourself with time or enthusiasm, consider writing about your hobby experiences for the Editors to use spreading information and promoting the hobby. It is an editor's responsibility to guide and help insure your efforts promote yourself and the hobby in general.

I am often asked, "What should I write about?"

My answer is always, "Write about your own interests." No matter what those may be there will be someone who shares those interests or finds them interesting.

In 2019, many aquatic hobbyists choose instant feedback from the Internet for specific species information. Much specific information is there and much, although not all, is accurate enough to help keep aquatic floral or faunal species until one can learn from that actual experience. As you gain additional species information, write about it using some of the guides included at the end of this Special Edition.

In this collection there is a very wide diversity of articles. As writing skills develop or confidence improves, branch out beyond species accounts and write about other experiences within the Aquatic Hobby. Less available from the Internet, such information is readily used in Club publications to help promote the Aquatic Hobby.

If you need an added writing incentive, some clubs, including MASI, offer cash incentives or rewards for writing.

BEGIN WRITING, IT HELPS EVERYONE, including YOU!

THE DARTER
(ISSN 0192-78333) is a newsletter published six times a year by the Missouri Aquarium Society, P.O. Box 1321, Maryland Heights, MO 63043. The Missouri Aquarium Society (MASI) is a non-profit organization. This publication is free electronically to members of the Missouri Aquarium Society and other qualified requesters as determined by the publisher. Subscription requests can be sent to the above address or to editor@missouriaquariumsociety.com. Use these addresses to notify of all address changes and please allow 6-8 weeks for change of address. Include the old address as well as new.

Opinions expressed by the contributors are their own and do not necessarily reflect the opinions of the Missouri Aquarium Society.

The editor reserves the right to edit any article for length, clarity, or content. Photos provided are by each Author unless otherwise indicated.

EXCHANGE POLICY

MASI will exchange THE DARTER with other aquarium societies.

Failure to receive three consecutive issues of a society's publication will be considered as a termination of our exchange, unless advised to the contrary. Send electronic versions to Exchange@missouriaquariumsociety.com and to the Editor@missouriaquariumsociety.com

MEMBERSHIP

Annual membership in the Missouri Aquarium Society, Inc. is $15 and includes an electronic subscription to The Darter. B&W printed Darter's are available at the meetings at cost. Regularly Published six times per year, Special Editions published as necessary.

Join or renew membership at any meeting, most club events, by PayPal from the MASI Website's Membership Page or by contacting the membership chair.

EDITOR Chuck Bremer editor@missouriaquariumsociety.com www.missouriaquariumsociety.com

The DARTER: 2019 - Vol 45 #'s 1 - 6

January/February
Vol 45, #1

March/April
Vol 45, #2

May/June
Vol 45, #3

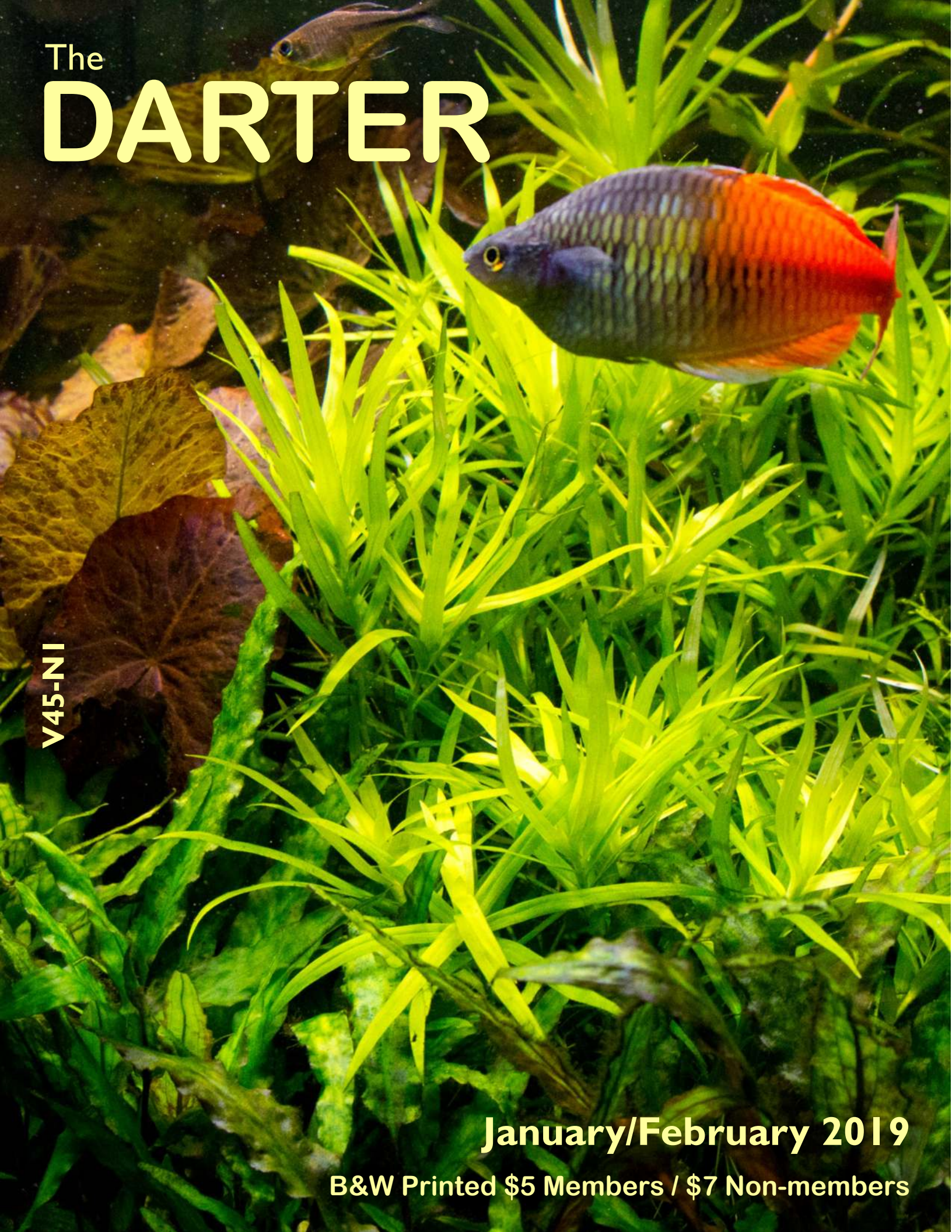
Click Points throughout: Access Video> Return to Contents>

July/August
Vol 45, #4

September/October
Vol 45, #5

November/December
Vol 45, #6

Special Articles & Resources



The DARTER

V45-N1

January/February 2019

B&W Printed $5 Members / $7 Non-members

Meet MASI Fishy Folk:

Holly Paoni & Kevin Wise

1.**Family members?** We have 2 adult children .

2.**Years keeping fish?** For Holly, it will be 35 yrs in march. For Kevin, its since he met Holly 11-12 yrs ago.

3.**What was in your first tank?** Mine was a 10 gal Metaframe® with a baby goldfish. Shortly after I was upgraded to a 30 gallon. Kevin's first was also a ten gallon small community tank.

4.**How many tanks do you have set up right now and what is in them?** 70 tanks running not counting my QT- fasting area which maxes out at 24 more tanks but isn't kept running. We have various fancy & wild livebearers, shrimp, Cories, bristlenose, dwarf new world cichlids, and some various schooling fish.

5. **Favorite fish as a pet?** Mine is a fancy goldfish. Kevin's favorite is Cories.

6. **Your dream fish?** Kevin's would be *Corydoras longipinnis*. My dream fish is a true breeding, pure white HTD guppy.

7. **Your dream tank?** Kevin's a 125 South American community tank. Mine is an indoor swimming pool, planted, with one glass wall, full of fancy goldfish I could go swimming with.

8.**Your realistic dream tank?** Kevin's 125 we can realistically do and my 75 gal is my pet fish tank.

9.**Your latest fish related accomplishment?** Kevin's is totally demolishing and rebuilding a fishroom with running stocked tanks. I'd say mine is running a breeding fishroom with constantly changing water chemistry. But for me that's been a constant the past 11-12 years.

10.**Your latest goal?** My current goal is to see how many different species of fish I can BAP in 2019. Kevin's is to enjoy the hobby and club and be as active as possible.

11.**Other pets?** 2 cats and 1 dog - all are rescues.

A Trip to the Kansas City Sea Life Aquarium

-

By Thomas M. Keevin

MY WIFE AND I made a trip to ansas ity in October to see the Arabia Steamboat Museum, the Sea Life Aquarium and try some ansas ity barbeque.

Other than going on the Internet to see if I could get a coupon for a discounted aquarium ticket to the Sea Life Aquarium, I didn't read any visitor reviews so I made my visit with no preconceived opinions of the facility. The cost included a $6.00 on-line discount off the $20.00 at the door. The aquarium is located in the Crown Center. We arrived just as they opened, so there was nobody in front of us and I took my time, took a bunch of photos, looked at the fish, and read the signs.

Having visited numerous public/privately operated aquaria around the country, I have three questions that I use to judge the aquarium:

- **Does the facility entertain?**
- **Does the facility educate?**
- **Do they have an aquatic conservation program?**

It is a given that the fish should be in good health and the tanks clean or shut down.

One concern was the size of the facility. After roughly 45 minutes, we were at the exit into the gift shop. Ok, I didn't really think I had gotten my $14.00 worth and I didn't know what we were going to do for the rest of the day so I turned around thinking that I would just do it again. Then we noticed how narrow the path really was. Although the facility was nice and the tanks were well kept, they just didn't have that many of them. It was difficult getting past baby strollers and groups of people on the narrow pathway.

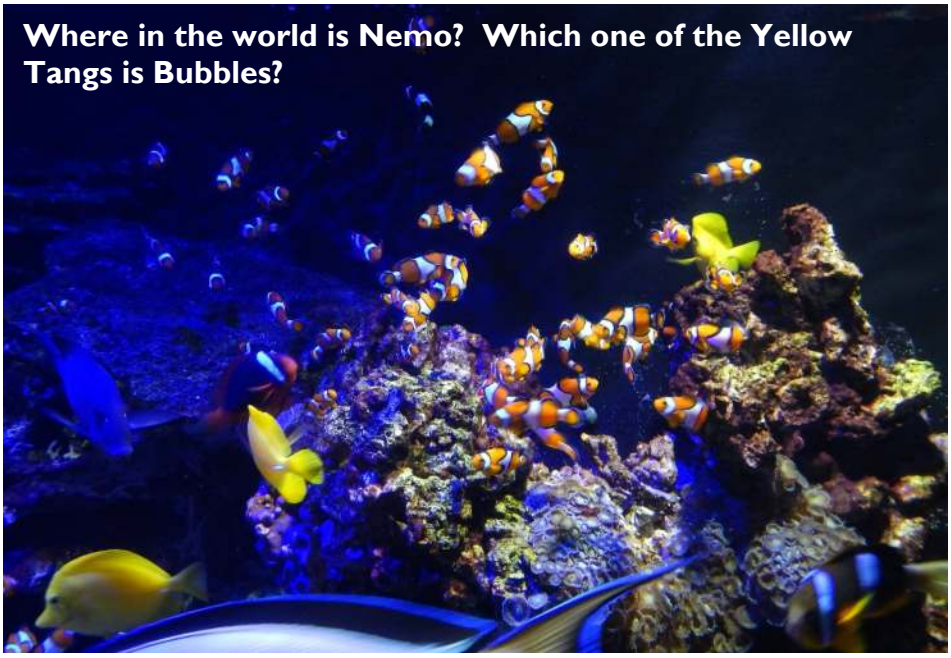
Very short tunnel through a tank allowing viewers to be "One with the Fish".

So, does the facility entertain? This is definitely a facility for small children, not adults that already know about fish. They had the now almost mandatory "touch-tank" at the beginning of the viewing trail. Everybody seems to enjoy petting the animals. If only the animals felt the same way. Many of the tanks are set close to the ground for the kids to see but not so great for adults.

They did have a tank full of clown fishes. What child wouldn't want to see a tank full of Nemos?

Many public aquaria have tunnels that you can walk through and be "one with the fish". They had a tunnel, but it was really short and narrow. The last exhibit was an area where the kids could draw and their efforts became

The almost mandatory "touch-tank" that one now sees at all public/private aquaria around the country.



Where in the world is Nemo? Which one of the Yellow Tangs is Bubbles?

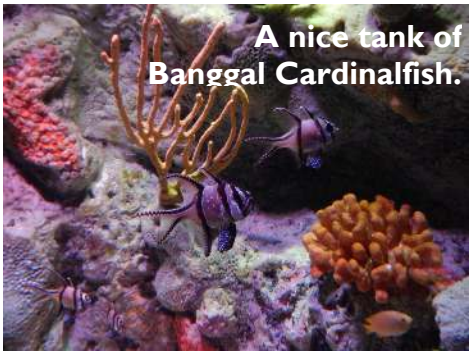
part of an electronic aquarium. So, the kids did seem to enjoy themselves and what parent doesn't enjoy seeing their kids happy.

So, does the facility educate? Well, I guess if young kids get excited by the fish it can lead to a life-long interest in fish and a future commitment to aquatic conservation. Having said that, the facility doesn't do much to inspire adults. They did have electronic touch screens next to tanks with photos of the fish in the tank. You can touch the fish photo and more information about the fish was provided.

I tried the Lionfish touch screen. When you touch the screen a second screen appears with additional information. Note the short red blurb on the second screen. This describes their exotic species classification. The entire second screen could have been a description of the damage they are causing to coral reef faunas.

They had tanks close to the ground that were ideal for small children but not so great for adults.

I touched the Lionfish picture and the next screen had some information about the species and a short blurb on their exotic species status but they certainly missed more of an opportunity to educate. They also had an entire room dedicated to sea turtles and their protected status. They did have signs throughout the aquarium with information about the fish (i.e., seahorse reproduction, etc.) targeting children. For the most part this was not a facility designed with education in mind for the advanced



A nice tank of Banggal Cardinalfish.

aquarist, just look at the fish and move on!

So, do they have a conservation program? If so it wasn't readily apparent! They did have a sign on a cute figure of a sea horse saying that they had released 209 animals since 2016. I have absolutely no idea what

Lionfish touch screen.

this actually meant (What did they release, where did they release them, and why?). They also had a sign concerning Monterey Bay Aquarium's Seafood Watch program (Sustainable Seafood Guide).

The Kansas City Sea Life Aquarium is owned by a British company, Merlin Entertainments. They own a chain of 53 sea life-themed attractions around the world. This seems to be a trend, small commercial aquaria built as entertainment centers (mostly for young children and their parents) to turn a profit. The Kansas City Sea Life Aquarium reminded me of the small commercial aquaria in Austin and San Antonio that I described in a previous article.

When I returned home, I did look at reviews. Although many folks thought the displays were nice and great for kids, here is what tourists on yelp had to say on the negative side.

"The SEA LIFE aquarium is a nice place to visit with young children, but don't expect a world-class aquarium that adults will also enjoy. It's fairly small and expensive for the size."

"It reminded me of an ocean themed kindergarten classroom.

Very cool but the only adult there without a kid should be the teacher."

"If you have some time to kill, a coupon for this place, and some bored kids, I would say go ahead and go. But if you're adults looking for a date spot or what not, I really wouldn't suggest it."

"The place was crowded and the way you have to go through it, its crowded and gets backed up. If there was ever fire you would totally be trapped. Not worth what you pay. Skip it. Total tourist trap!!!!"

So, what do the folks in Kansas City really think about this aquarium? They want an aquarium enough that in October of 2018 a resolution (No. 180659) was introduced to the City Council expressing the City's financial support of $7 million for the construction of a new $75 million aquarium at the Kansas City Zoo. The project would be funded through a variety of sources. The Zoological District will provide up to $40M over the next four years. Private funders have already pledged $22 million to the project if city funding is secured, and the Zoo will raise an additional $5-7 million more private funding. Under the current plan, this aquarium would include 750,000 gallons of saltwater and would open in Spring 2022. Admission to the aquarium would be included with the Zoo admission.

I have to agree with one of the yelp reviewers, if you have some time on your hands, some coupons, and bored kids, then this is a great aquarium to visit. I would suggest that if you were in Kansas City with your young kids or grandchildren, this would be a good place to visit. If you are in Kansas City by yourself or with your wife/husband, as a fish person, save your money and check out a pet shop in Kansas City. If as an aquarist you want to see a really good aquarium then plan a trip to the Tennessee Aquarium, the Georgia Aquarium, or the Shedd Aquarium.

Educational signs throughout the aquarium targeted children.

By the way, the Arabia Steamboat Museum was really neat and worth the trip. The barbeque was so - so - but we only tried one place.

2018 Goodeid Working Group International Workshop

Conservation of Goodieds and Co-Occuring Fishes in Central America

University of Guadalajara, Jalisco, Mexico

-

Patrick A. Tosie, Sr.

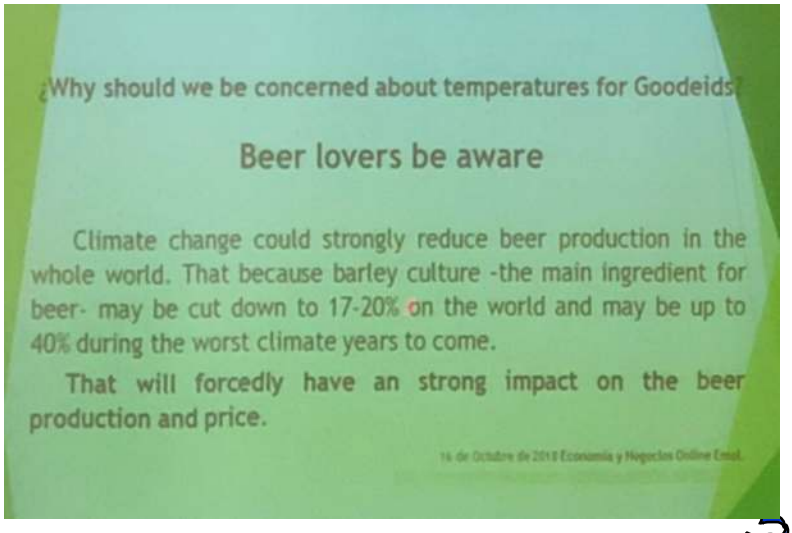

University of Guadalajara's Biblioteca

The Goodeinaes have 18 Genera and 2 Species many of which are nearing extinction and have their own worldwide support organi ations. The 2018 Goodeid Workshop of these organi ations was on Thursday, November 8 so after a collecting trip with Juan Miguel Artigas A as I made it to the hotel around 8 00 pm Wednesday to meet with others also arriving for the workshop for a dinner at a nice restaurant next door.

The 2018 Goodeid workshop was held at the University of Guadalajara's Biblioteca (Library) in a beautiful, very modern building. There was a concurrent King Tut exhibition at the time. Guadalajara University is the second largest college in Mexico with 250,000 students!! It was a giant place!!

The GWG workshop had about 40 participants from seven countries (Mexico, USA, Austria, Germany, Netherlands, France and England). Eight universities, four zoos/aquariums, and two Mexican municipal governments were represented, and eight ALA members participated.

The first day of the workshop was mostly a classroom setting with 12 speakers giving 12 different talks. The speakers included: Michael Koeck, Kyle Piller, Eduaro Santana, Arcadio Valdes, Juan Miguel Artiga



Azas, Pat Hartman, Arely Ramirez, Martina Medina, Norman Mercado, Guenther Scheussner and John Lyons.

I liked most of the talks, although some were too technical to keep my attention. **My favorite talks were the state of Goodeids in the wild, development of a "Red List" for rare Goodeids, conservation of Goodeids and much more. After attending the Workshop I am inspired to keep, breed and distribute some of the endangered and threatened fish even more than now. I currently keep a dozen or so endangered Goodeids and Cichlids of the fish that I am working to breed.**

Fish reported from the Teuchitlán Springs and River prior to the Goodeid Workshop:

Cyprinidae:

- Ameca Chub *Algansea amecae* (extirpated; none seen since 1960s)
- Ameca Shiner *Notropis amecae* (extirpated; re-introduced in 2016)
- Amatlan Chub *Yuriria amatlana* (extirpated; none seen since 1960s)

Catostomidae:

- Mascota Jumprock *Moxostoma mascotae* (extirpated; none seen since 1970s)

Goodeidae:

- Butterfly Goodeid *Ameca splendens*
- Blackfin Goodeid *Goodea atripinnis*
- Golden Skiffia *Skiffia francesae* (extinct in the wild; none seen since 1970s)
- Black Splitfin *Xenotoca melanosoma* (extirpated; none seen since 1970s)
- Tarascan Splitfin *Zoogoneticus purepechus*
- Tequila Splitfin *Zoogoneticus tequila* (extinct in the wild; re-introduced in 2016)

Poeciliidae:

- Guppy *Poecilia reticulata* (non-native; rare)
- Mexican Molly *Poecilia sphenops* (non-native)
- Lerma Livebearer *Poeciliopsis infans* (rare)
- Spottail Killifish *Pseudoxiphophorus (Heterandria) bimaclatus* (non-native)
- Green Swordtail *Xiphophorus helleri* (non-native)
- Northern Platyfish *Xiphophorus maculatus* (non-native; rare)

Cichlidae:

- Blue Tilapia *Oreochromis aureus* (non-native)

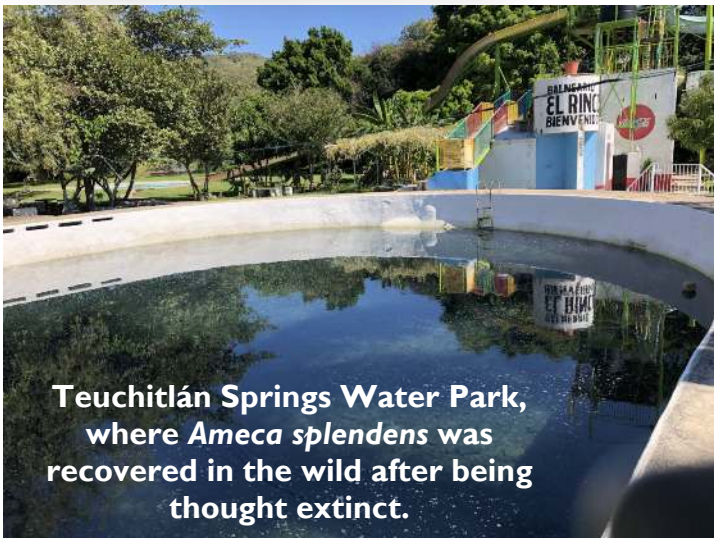
Source: Goodeid Working Group Conference Preliminary Agenda

I learned at the Workshop how important it is to know where your fish come from, not just the country, or state or even river, but the exact location of any collecting sites. There may be a possibility that these fish are either new species or remnants of other species that can eventually be returned to the wild.

When collecting and keeping fish, don't mix fish, even if it is the same species, with ones from different collecting sites. Especially don't mix if it's the same species but from different watersheds. People are now even keeping not only the location, but who caught them and when they caught them. ie: *Skiffia multipunctate*, Lago de Camecuaro, Michoacan Mexico


Teuchitlán Springs Water Park


Ameca splendens at the Waterpark


Teuchitlán Springs Water Park, where *Ameca splendens* was recovered in the wild after being thought extinct.


Ameca splendens

Zoogoneticus tequila. It had a crank to make the tail move as if it was swimming.

At the top of the Guachimontones ruins, you could see for miles with the modern city in the distance and a lake behind it.

Lammert (1990)– **in other words, the more info the better.**

Friday was a trip to the spectacular pre-Columbian (500-1000 AD) ruins at Guachimontones with a presentation on the re-introduction of the extinct-in-the-wild Goodeid *Zoogoneticus tequila* into the Teuchitlán Springs by Omar Domínguez. and other Universidad Michoacana de San Nicolás Hidalgo, Morelia, faculty and students. It was held in the Guachimontones Auditorium, located just outside of the town of Teuchitlán and about 2 kilometers from the springs. There was evidence of MASI's support several times in the slides. After the talk, we had a tour of the building and ruins and a 3 foot replica of


San Sebastian


White Springs of San Sebastian


Xenotoca doadrioi


Carretara El Refugio, San Marcos, Etzatlan

Next we were off to Teuchitlán Springs, where the Universidad Michoacana de San Nícolas Hidalgo in Morelia (Aqualab/FishArk) has re-introduced the formerly extinct-in-the wild Tequila Splitfin (*Zoogoneticus tequila*). Although these fish were shy and hard to see during our visit, their survival has been good, and the re-introduction has been a success so far. Plans are to re-introduce *Z. tequila* into a different but connected spring within the Teuchitlán system. There may also be an attempt to re-introduce the currently extinct-in-the-wild Golden Skiffia (*Skiffia francesae*) into the Teuchitlán Springs. The water here was crystal clear even though locals use it as a recreation area and swim there. Juan Miguel was


Allotoca maculata


Allotoca maculata


…seen on the Return!

Lots of Baby Brine Shrimp!

-

By Rick Renfro


BrewDemon with a new hatch of shrimp.

Hatching Baby Brine Shrimp is an easy way to provide a great food for fry and small fish.

Many hatcheries are available to produce small amounts of BBS at a fairly low cost. A home made hatchery using soda bottles is basically free to make and very effective. If you don't know what these are, YouTube has many videos showing this simple system or one is detailed in the November 2018 Darter.

When more BBS are required, the cost and effort required to produce large batches of BBS can increase dramatically pushing the breeder to consider other options for a source of reliable and affordable food.

The method I use for hatching BBS produces large batches of shrimp daily with a reasonable amount of effort in one square foot of space, and the hatchery is far less expensive than large commercial hatcheries. One of the most important features is the ease of keeping this equipment clean. A dirty hatchery quickly smells up a fish room.

Quality hatcheries of the size I need are expensive, in the $100.00 to $200.00+ range, but still do not seem to offer ease of cleaning nor a small footprint. I was using four of the soda bottle hatcheries and this still did not produce the amount I wanted so adding more was out of the question.

I found the BrewDemon Conical Fermenter, designed for the home brewer on Amazon for $45.00. This compares in price to two liter hatcheries made specifically for BBS, but the BrewDemon holds 3 gallons (=11 1/3 L). This higher capacity allows a large batch of shrimp to be hatched and collected daily in about 30 minutes, including cleaning and setting up the next batch.

The process is pretty simple. For set up, fill the hatchery with warm tap water. Focus a light directly at the hatchery and leave it on while the hatch is in progress. The hatchery has a large screw on lid, but also a handy dime sized hole in the top designed for the brewers pressure relief valve which is perfect for for an 18" hard air tube


The last bit is siphoned

Rick received his much delayed

Novice 2017 Hobbyist Society Service Award

at the November 2018 Meeting!

Congratulations Rick! Glad you're back!

The collecting equipment: 2 quart pitcher, specimen container, sieve, 2 cup measuring cup, behind fresh water and turkey baster, ice trays, non- iodized salt and sodium bicarbonate in shaker.

reaching the bottom. Then add one cup of non-iodized salt, a few shakes of sodium bicarbonate, and three scoops of BBS eggs.

For the shrimp eggs, I use the measuring spoon that is supplied by Brine Shrimp Direct that is 1.7 cc. I buy the Grade A eggs. I think that using less eggs actually gives me a better hatch, as almost all of the eggs hatch out. When I tried more eggs in a batch, it seemed like more eggs remained in the bottom, though I have benefited from learning technique and consistent sanitary methods that I am sure have helped as well.

The chlorine in the tap water is beneficial in this case, as it seems to aid in weakening the egg shell.

To harvest the shrimp while avoiding the hatched egg shells and unhatched eggs requires a little finesse, but is pretty easy after a few batches. Pull out the air tube and allow the hatch to settle down for 10 to 15 minutes, the egg shells will float to the top and the unhatched eggs settle at the very bottom.

The BrewDemon has a spigot about four inches from the bottom. Since it is not at the very bottom, some siphoning is required for the last highly productive part of the hatch, but the positive thing here is that you don't get the unhatched eggs mixed in with the BBS when filling the pitcher.

The spigot is used to drain into a 2 quart pitcher and with this hatchery there will be 5 or 6 pitchers full. The next piece of equipment is a fine mesh sieve. There are many options here, I use one made from PVC pipe with a stainless steel screen. The sieve is from Amazon, Mercer of Montana Zooplankton Sieve 120 Micron $15.50 plus shipping.

This sieve also fits into a hang on aquarium specimen container. The pitcher is poured into the sieve, then the sieve is turned over into a 2 cup measuring cup. Use a turkey baster to wash the shrimp out of the sieve with room temperature tap water. This is repeated until the floating egg shells at the surface are almost down to the spigot in the hatchery.

Another hard tube attached to a length of silicone makes up the siphon used to capture the remaining shrimp in the last 4 inches of the hatch. Keep the end of the tube about 1/4 to 1/2 inch above the settled unhatched eggs and a very slight swirl will lift the shrimp that have settled on the eggs. This last part contains close to a quarter of the entire hatch, so it is worth the extra effort to collect. Of course, the siphon is drained into the pitcher and the sieve process is repeated.

The hatch is now in about a half cup of fresh water. Give the BBS a second rinse by pouring the hatch into the sieve again and then wash with two or three fills of the turkey baster back into the cup. Again, there is about a half cup of shrimp in fresh water, and there will still be a few egg shells floating at the surface. I then use a small animal syringe to collect the shrimp from the bottom of the measuring cup and either feed the live BBS to my fish, or deposit them into ice cube trays for freezing. Stop just before the syringe picks up the remaining few unhatched eggs that will be dark in color.

When filling the ice trays, a syringe is used to add a thin layer of BBS into each compartment. The result is 1/8" slices of frozen BBS that can be stored in the freezer. I re-use empty fish food containers for storage. Try to remember to shake these a little about five minutes after they are put in the freezer to keep them from freezing together.

I always gut load the shrimp a few hours before harvesting with pre-mixed spirulina powder in water and yeast in water, about 7 drops each per batch to increase the protein content.


Filling the trays to about 1/8".


Frozen shrimp wafers

BREEDING CORAL RED PENCILFISH

Nannostomus mortenthaleri

-

By Holly Paoni


© Charles König

NANNOSTOMUS MORTENTHALERI, THE oral Red Pencilfish, originates from shallow streams, still rivers and flood plains in Peru.

With new and difficult fish I find it helpful to do some research on new species and attempt to mimic its natural enivronment as much as I can to raise the fry. I found that these areas either have dense aquatic vegetation or fallen branches with a thick layer of leaf litter that both give the fish plenty of cover. These conditions, provide microfauna for fry grazing which helps in their successful survival.

To mimic their natural environment, I placed the breeding group in a well planted tank that had lots of plants from mid-ground to the back and sides. It also had tannin leaching driftwood and I piled up some leaf litter in the front to assist providing tannins and as a secondary food source for fry. When leaf litter breaks down it helps provide infusoria within the tank and other microfauna for grazing.


Río Nanay system, Peru, south of Iquitos. © Howard G. Charing

I fed the tank heavily, did moderate frequent water changes and waited for fry to appear. Pencilfish can be pretty shy, so spotting spawning behavior can be difficult. When fry appeared, I removed the adults to another tank.

I removed the adults instead of moving fry because for me, its easier to check the tank twice a day with lights out and a flashlight to look for new fry. The fry show up quickly, and the adults are easier to catch in this environment as they have settled in for the night.

The fry were raised on microworms then crushed flake foods followed by some frozen and crumbled foods.

Water changes were about 5-10% in the beginning and slowly increased as the fry grew keeping new water the same temperature as the tank.

My water chemistry changes seasonally, so I don't monitor it closely, as its a slow, constant change. In Spring my pH is in the mid 6's, by fall its in the mid 8's, then back to mid 6's again by spring. The dGH and dKH follows the pH. I've found I've been able to spawn and raise most species, regardless of what the water is doing, so I really don't stress on testing for chemistry. When I was monitoring it closely, change was very gradual and the fish don't seem bothered, so I'm just going with it.


Fry. © Graham Ramsay

I rarely use in-tank heaters but do heat the fishroom from late October to sometime in March. This gives a season cool down, then a warm up, followed by another cool down and then warms back up in summer. Typical tank temps range from a low of 66 -72 during cool downs to a high of 74-80 during warm ups depending on the height of the tank in the room. In nature nothing is constant. Temperatures change, water chemistry changes... so I don't fuss over keeping these constant. I focus on clean water and good food sources.

I just let the fish do the rest.

A personal experience with the True Apithanos "Chameleon Whip tailed Catfish"

Pseudohemiodon apithanos

-

By Lee VanHyfte

Lee is a member of the Eastern Iowa Aquarium Association Hiawatha, IA. As a past MASI speaker this is an original publication.

I BEGAN THIS JOURNEY seeking *Pseudohemiodon* sp. " hameleon" after seeing photos of this fish, I was mesmeri ed by its highly unusual color, structure and patterns.

Finding this species in decent health and reasonable prices became an impossible task. I resolved to myself to seek out the more common and larger form, the "true apithanos" from Columbia. Several photos bounced back and forth from distributor to distributor. Finally, my friend Shawn Flynn of Pure Fish Works managed to get a freshly imported group from a Columbian exporter.

The original group came in and I made my journey to the great white north a.k.a Minnesota and Shawn's home. Upon arrival the 75 gallon tank appeared all but empty but once we stirred the sand, out came 30 or so 6-12 inch fish. I attempted to obtain a mix of sexes by choosing a variety of colors and sizes. This eventually proved fruitful, but more on that later. I found greys, grey and black banded, black and silver banded, and a single red form.

I transported the fish in a cooler with heat and aeration as most whiptails are very sensitive to low oxygen- I came prepared. They fared the journey well and along came the challenge of safe acclimation and lots of pictures to share. A 40 Breeder was my quarantine and acclimation

tank that allowed a reasonable volume of water for treatment for parasites and any potential diseases. The tank was well established with 2 large sponge filters and a 900 gph power head that utilized a venturi aerator. A sand bed about 1" deep was provided

for comfort. Examining the fish you could easily tell they appreciated a very high flow of water over their ultra-streamlined structure.

I hit them with my usual cycling regimen using Flubendazole and Levamisole as a treatment for internal and external parasites. All the fish appeared to tolerate the process well. I began feeding them live black worms just to help them regain strength after the long journey to the Northern hemisphere. Once stabilized I began testing different food to make a well-balanced diet. Foods needed to stay on the bottom so heavier weighted foods were chosen. Old standbys of Frozen Brine shrimp, jumbo mysis, and Jumbo blood worms were my choices.

The Jumbo Blood worms proved to be toxic and sadly I lost about 7 out of my original 12. Shawn met the same sad results in using this product. The Normal Blood worms were

well received without issues, however. I could not understand what was killing the fish until several other species in different tanks were also dieing from the Jumbo Bloodworms and noted an odd color in the thaw water.

The remaining 5 fish turned around quite quickly, and I picked up 4 additional adults from my friend Phil Kaiyalethe of Tamed Waters knowing that he had fish of the same origin. I had been in discussion with Charlie Mueller, after meeting him at Cataclysm on where to go from here. He was indeed breeding the sp. Chameleon and they are certainly closely aligned species. I began with a long cool period allowing higher oxygen environment of 72F, planning an eventual raise in temps to 78F which has proven a key ingredient to breeding success.

The diets were altered yet again and I began feeding them Hikari Carnivore, New Life Spectrum Thera A+ with Garlic, and various other NLS pelleted diets. I had also added chopped night crawlers to the mix as they contain ornithine and lysine to stimulate ovarian development and I feel that this proved to be a trigger for spawning.

Next came the warm 78F water. Once temps were elevated I saw more and more activity. Rarely, had they ventured out of the sand during the cool period's day time hours. They are highly nocturnal animals and prefer the confines of a sandy tomb. With the elevated temps they would come out in the daylight to eat and put on quite a show. Frequent water changes of 70% were carried out every other day with cooler water of 70F and lower total dissolved solids, with a ppm reading of 150. I have not found them particularly affected by TDS readings, though I suspect it contributes to difficulty in hatching as indicated later.

One evening I was assessing the condition of the fish and I found one animal only partially buried, much to my excitement I found that he was carrying little Black Orbs under his rear lip. Ironically, this was the smallest fish in the group and after some discussion with Charlie, males indeed seem to be the smaller individuals. I cannot confirm this

theory as I just can't seem to sex them other than which is carrying the eggs.

I have found that behaviors are pretty much routine while lip brooding in that the males will continue to feed and bury themselves, only rising to the surface towards the end of the brooding period. Males are often seen pumping water with their pelvic fins and a frequent chewing action on the eggs. As they do not appear to eat the eggs this may be a method of thinning the egg shells or an attempt to stimulate hatching.

My first attempts to rear eggs and young had proven less than productive. The first batch of eggs were moved to a Marina hang on breeder tank with a screen bottomed incubator of my own design. This seemed to be working well but the bulk of the 25 or so eggs developed a fungus and died. I had about 12 that

Face Banded/Speckeled

survived to hatching, of which 4 are still with me today.

Productivity improved with various attempts. A major hurdle seems to be at approximately 1 month of age. I am uncertain of the cause but assume it is related to an extreme sensitivity to nitrate by binding to hemoglobin and starving the growing tissues of oxygen. Essentially, a supply and demand mismatch with oxygen requirements increasing as they grow larger and nitrate binding to hemoglobin causing the growing organs to fail.

Adult and Months old fry

My greatest successes have been allowing the male to naturally incubate in his own 40 Breeder tank. Oddly the eggs do not seem to hatch in a given time despite being spawned on a given day. The male increases his chewing activity more and more with eggs hatching over a week's time. The fry are miniature replicas of the adults but do resemble mini nurse sharks at hatching. I advise that the fry not be allowed to live with the adults as this has proven to provide a light snack. The brooding male does not seem to harm fry but others are quite happy to eat the entire brood. The eggs and fry are quite large with approximately 3.5 mm eggs and fry upon hatching are 1 cm long. It's also disappointing that they grow very slowly.

Fry are best started on frequent small feedings of microworms. A dry feed powder called "Fry Crack" made by Paul Processi has been initially tried with good response though extra care must be observed due to very high protein content to maintain an adequate water quality. Paul's second step food has also been used with great results for several bottom feeders.

I have observed the juveniles create little notches in the sand at the edge of where the glass has been cleared of sand due to flow of water. There they sit facing into the flow awaiting food particles. I change about 75% of the water in the grow-out tank twice a week to prevent nitrate build up. I use strictly RO water that is reconstituted to 180 ppm TDS and also treat it with low dose Kent Marine Iodide, and Kent Discus essentials to replace lost trace minerals.

Here are some additional interesting observations. The adults will find the highest flow portion of the aquarium and rest there awaiting foods to literally hit them in the head. Most of the fish are buried and only the whip and a set of eyeballs are visible during most of the day. It is often observed that the adults bury themselves in the sand with a quick vibration of their entire body in a side to side motion. This proves quite entertaining to visitors of my fish room.

They are quite placid fish that you can literally pick up out of the sand with minimal annoyance to the fish. This, however, is the only time you will see them swim. They will sit there quite still until they get bored of the activity and then dash away in a bolt of very high speed. The fish mostly "'walk" around on their pelvic fins and, one could almost say, "dance" during their evening feed. Often the adults are noted to dance around in circles, the top ray and whip are often used flaring at each other in an up and down motion. This appears to be a warning to others that are encroaching on their territory- a "HEY you are walking on my back!" of sorts.

Color varies quite a bit with mood but there also seems to be particular phenotypes within the given group including the fry. Brooding males often display a rust red stripe on the face but this can even vary a fair bit. The fry have proven to be highly variable with silver and grey parents producing Black & Silver, Silver & black, Grey with black bands, Partial reds, and full reds. The juvenile phenotype does seem to remain into the late juvenile stages.

This fish has proven a very interesting oddball to keep and breed. I was not aware, nor were the fish, that this is the first successful breeding of the true Columbian Apithanos in the USA. The greatest hurdles to expect are very clean conditions and diligent water changes.

Their overall care and feeding has been quite easy and they reward you with a one of a kind fish!

C.A.R.E.S and I.C.U.N.

-

Patrick A. Tosie, Sr.

AQUARIUM HOBBY GROUP CARES Preservation has officially launched its new website, www.caresforfish.org, which will serve as a central portal for tropical fish clubs and individuals who are interested in participating in or supporting its non profit conservation programs.

CARES (Conservation, Awareness, Recognition, Encouragement, and Support) is a group dedicated to the propagation of conservation priority species within the hobby -especially those which have become critically endangered or even extinct in the wild due to habitat loss.

Some of these species now exist only in the hobby, and the group aims "to create a base stock of conservation priority species by encouraging hobbyists worldwide to devote tank space to one or more species at risk and distribute offspring to fellow qualified hobbyists, while forming an information network where possible between aquarists, scientists, and conservationists."

CARES has four major goals:

1. to bring awareness to the critical situation of fish in nature, while educating the public and stressing the importance of our roles as responsible aquarists;
2. to recognize, encourage, and offer support to hobbyists who maintain species at risk;
3. to share fish as well as data and experiences through notes and manuscripts so that others may learn to maintain those identical and similar species; and
4. to preserve species at risk for future generations.

The I.C.U.N. - International Union for Conservation of Nature (www.iucnredlist.org) has a Red List of Threatened Species. The I.C.U.N., founded in 1964, has evolved to become the world's most comprehensive inventory and information source for the global conservation status of biological species and uses set criteria to evaluate the extinction risk of thousands of species and subspecies of animal, fungi and plants.

The IUCN Red List is a critical indicator of the health of the world's biodiversity. Far more than a list of species and their status, it is a powerful tool to inform and catalyze action for biodiversity conservation and policy change, critical to protecting the natural resources we need to survive. It provides information about range, population size, habitat and ecology, use and/or trade, threats, and conservation actions that will help inform necessary conservation decisions.

With my limited ability to search, I was unable to find the list of freshwater fish on the Red List from the I.C.U.N., however, the Tequila Splitfin - *Zoogoneticus tequila* - is one of the featured species on their homepage.

FISHES AS DISHES

PATRICK A. TOSIE, SR.

We all love our fish! This column is dedicated to using fish for something tasty to enjoy. Try it, you may like it. If you have leftovers, bring them to a monthly meeting for others to enjoy!

Cilantro-Lime Shrimp Wraps

Ingredients:

1 lb. medium shrimp, peeled and deveined
2 tsp. ground cumin
Juice of 1 lime
2 tbsp. freshly chopped cilantro, plus more for garnish
2 cloves garlic, minced
3 tbsp. extra-virgin olive oil, divided
Kosher salt
Freshly ground black pepper
Romaine lettuce, for serving
1 avocado, thinly sliced
1/4 c. Sour cream, for serving

Directions:

In a large bowl, stir together shrimp, cumin, lime juice, cilantro, garlic, and 2 tablespoons oil and season with salt and pepper. Toss until combined, then let marinate in the fridge 10 minutes.

In a large skillet over medium heat, heat remaining tablespoon oil. Add shrimp and marinade cook until pink, 2 minutes per side.

Assemble wraps: Add shrimp and avocado to lettuce, drizzle with sour cream, and garnish with cilantro.

Total Time: 30 minutes Yields 4 servings

The DARTER

V45-N12

March/April 2019

B&W Printed $5 Members / $7 Non-members

Back To Basics:

The Community Display Tank

-

Holly Paoni

THIS MAY BE the display tank in a Nursing ome, ommunity enter, or even one for the busy family with small children that wants one for enjoyment but just don' t have much time to care for it.

It is designed for maximum enjoyment and minimal maintenance and may only need to be checked upon once a week by a caretaker. There are multiple stocking options for this type of aquarium depending on individual interests.

To start, get the biggest tank you have room for, and can afford for the space available. Larger aquariums are much easier to care for long term than smaller aquariums as there is much more water available for dilution if problems arise. This leaves more room for error if the livestock are overfed or life gets to hectic and maintenance or water changes need to be postponed for a few days to a week.

Such a tank should also be under-stocked. A lighter bioload for the bacterial and mechanical filtration also allows more room for error with water quality. The tank still needs routine maintenance- we are just designing it with room for error and maximum stability.

Next, design the hardscape and plants for easy maintenance. Elaborate rockwork, and fast growing plants leads to more maintenance so those we will stay clear of. A simple easy to clean layout is preferable. A couple holey rocks or a few pieces of driftwood with *Anubias*, *Bolbitis* or java ferns that are slow growing and require minimal care. A slow growing hardy stem plant like *Bacoppa monneri* or an Amazon sword would also need minimal maintenance yet lend interest to the aquascape with just over minimal lighting. The occasional root tab provides adequate fertilization. *Cryptocorynes* are also an easy addition.

Filtration should be appropriate for the size of the tank, and easy to service. Hang on back filtration is my first choice. Its simple to clean, easy to get to, and easy to replace. They are also quiet when running well. Circulation is

Gary Lange's current Display Tank, as seen at a recent MASI Council meeting

also an important factor in this type of easy care aquarium.

With a long tank, like a 20 gallon long or a 55 gallon, I recommend using 2 smaller hang on back filters versus one larger one. This will prevent dead spots within the aquarium as well as give extra area for beneficial bacteria in the filters. When doing tank maintenance just service one filter pad insert at a time and alternate.

Remember when choosing livestock that we are lightly stocking this aquarium for a smaller bioload - for this reason I advise staying away from cichlid species that should be overstocked to lessen aggression. A fish that is territorial can be used if given the room for its needed territory. Example: a Gourami will claim an area around a piece of aquascape at the surface of the aquarium. It will chase others away from this area, but will practically ignore bottom dwellers such as Corydoras catfish and middle dwelling fish such as Harlequin Rasboras so this combination would work together in this type of peaceful community aquarium. Each species inhabits one zone of the aquarium, all areas are filled, but there is minimal to no dispute over territories.

Another thing to think about is heating. If the tank will be in an area accessible to children or others could play with the heater settings or accidentally unplug the heater, think about using subtropical livestock that are perfectly content at typical room temperatures. There are dozens of species that like cooler water. White Cloud Mountain Minnows, Rosy Barbs, *Aeneus* or *Paleatus Corydoras* cats, Paradise Fish, Common Platy or Platy Variatus, Endlers, Shrimp, Celestial Pearl Danios, Convict Cichlids, and many other fish will do very well at room temperature needing no heater. I've even bred all these and others with an average temperature of only 68-74 degrees.

We will want these fish to be brightly colored if this tank is for very young children at perhaps a Doctors office or for the elderly at a Nursing Home. Reds, yellows, Oranges are easier to see . In these situations I'd recommend staying away from nano fish as they are much smaller and harder to see from a distance. Medium sized fish in such a community aquarium would be the easiest on the eyes and still allow lightly stocking the aquarium.

Another possibility for a visible tank could be the single wet pet. While these fish even individually have a higher bioload than a group of smaller community fish, if the tank is large enough one large fish can also work. A single Goldfish or a single Firemouth Cichlid are also mid-sized possibilities. Spend some time doing your research, on temperature requirements, care involved, and tank cycling for each species being displayed.

There are thousands of species of livestock available, that can work in a variety of situations, and even in a tank that, by design, needs minimal maintenance.

Mexican Collecting Trip with Juan Miguel Artigas Azas

-

By Patrick A. Tosie, Sr.

West of San Luis Potosi

On my way!!!! My flight was scheduled to leave St. Louis at a leisurely time of 8 50 on Monday morning and set to arrive at in Guadalajara Mexico at 2 15 pm early the afternoon of the same day with a stopover in ouston to change planes.

That was the plan, but that is not what happened. The flight leaving St. Louis did not have a pilot so it was delayed, delayed and delayed a little more. A couple hours later I was finally on my way and I was told I would miss the connecting flight to Guadalajara. The caption did his best for me and all the other travelers with connecting flights. When I got to Houston, the connecting flight had not yet left the gate and was still scheduled to leave on time– but I did not have enough time to go through the boarding process and make it. Luckily they had another flight to Guadalajara 4 HOURS LATER! Oh well, *no problemo*!

I arrived in Guadalajara around 6:30 pm, went through customs (Easy enough because my luggage did not make it on the same flight!) and grabbed an Uber to the Country Plaza Hotel. Sounds like no big deal, but my original plans were to take a bus to San Luis Potosi and meet with Juan Miguel Artigas Azas for a late dinner so we could go collecting the next morning. After I got to the hotel I checked into my room, got directions to the bus station and took an Uber to the bus station. I pictured had Guadalajara as a small town, something you would see in the old western movies but came to find that it is actually the second largest city in Mexico with a population of around seven-million! – there are several bus stations in Guadalajara! The next bus to leave Guadalajara to San Luis Potosi didn't leave until 11:59 pm.

Well, on the Uber ride to the bus station the Uber driver got lost which delayed me even more but I made it with about 10 minutes to spare! With all the delays and not knowing when anything was going to happen, I was getting hungry but didn't have enough time to eat. Luckily, the bus had

1 Guadalajara
2 San Luis Potosi
3 Santa Maria Del Rio
4 Guachimontones & Teuchitlán

Who is Pat's collecting companion and Guide?

Juan Miguel Artigas Azas

An engineer by training, lives in the center of San Luis Potosí, Mexico. He is considered a worldwide expert on Central American fishes, among fish of other locations and is creator and 20+ year editor of the Cichlid Room Companion.

Juan Miguel photographs and tries to understand the natural history and relationships to obtain great knowledge on the biology and geographical distribution of the fishes.

Juan Miguel is an author and worldwide expert on Mexican and Central American freshwater fish and was awarded the Guy Jordan Retrospective Award in 2008 by the American Cichlid Association. The maximum honor this association bestows.

brown bagged sandwiches for us so at least I wouldn't be starving when I got to San Luis Potosi, which would be 4:00 am on Tuesday.

Once at the bus station, I called Juan Miguel and he came right over and picked me up. He lives about 10 minutes from the bus station. We got back to his house, rested up for a few hours, Juan Miguel made breakfast, showed me his fish and then we were off to see a construction site he was managing and headed out to collect some fish.

Mexico is a beautiful place, the rock formations were spectacular and the drive did not seem very long at all as I enjoyed sightseeing. The first place we collected was by a bridge at the highway called Puente Tierra Quemada. We used Juan Miguel's dipnet which is made by a company called Jonahs Aquarium, which worked so well I ordered 2 of them when I got home.

At Puente Tierra Quemada we caught two Goodeid species, *Goodea*

Puente Tierra Quemada

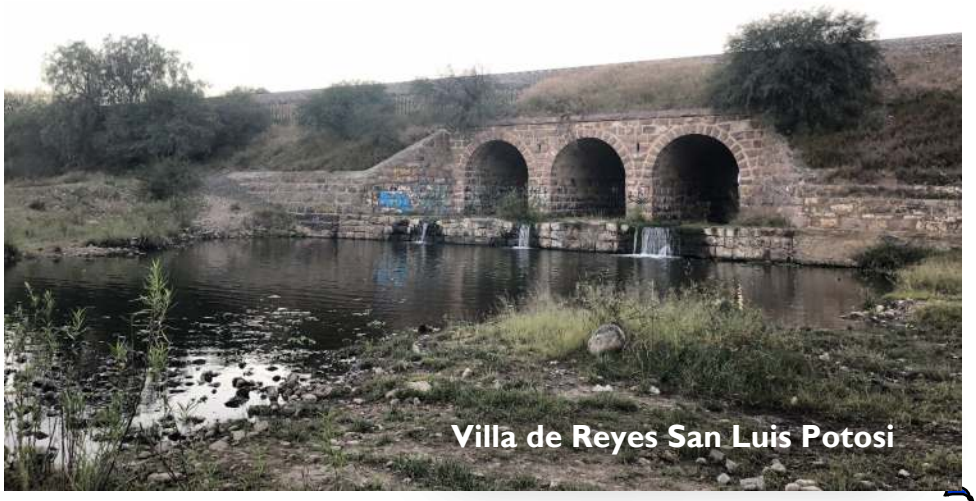
gracilis and *Xenoophorus captivus*, after we caught about a dozen of each we packed up and headed to our next location about 30 minutes away at Santa Maria Del Rio. Here we caught a few *Xenotoca variata*, some *Poecilia Mexicana*, *Lepomis macrochirus* and some *Astyanas mexicanus*.

Our last collection spot was at Villa de Reyes where we caught more *Xenotoca variata* and *Astyanas mexicanus*. We were running out of daylight and headed back to Juan Miguel's house with a quick stop for dinner on the way back.

The next day we packed up and headed to Guadalajara Where the

Goodeid Workshop was to start the next day. It was another beautiful

Santa Maria Del Rio



Villa de Reyes San Luis Potosi

Juan taking fish photos at Teuchitlán Springs Pool

drive. My original drive to San Luis Potosi was from midnight to 4:00 am so I did not get to see much, the drive back was during the day and very enjoyable.

The day after the Workshop Juan Miguel and I returned to Teuchitlán Springs so he could take better pictures when there were fewer people. While he took pictures I was able to snorkel around more freely without disturbance of other people.

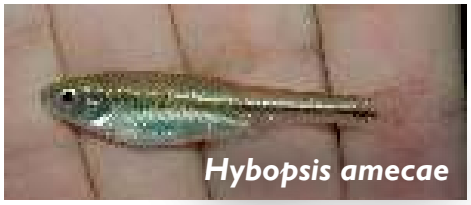
After Juan took his pictures, we headed to the city of Tequila to check out the over 100 Tequila distilleries. The Blue Agave plant is widely grown here and is why there are so many places that make Tequila from it. There was a big party in the town square, along with a parade and a wedding at the church. It was a great time!!

City of Tequila with over 100 Tequila distilleries!!

Xenoophorus captivus

Goodea gracilis ©GWG

Coptodon rendalli



Hybopsis amecae

Lepomis macrochirus

Fish Pat caught:

Characidae

- *Astyanas mexicanus*

Cichlidae

- *Coptodon rendalli*
- *Oreochromis mossambicus*

Cyprinidae

- *Hybopsis amecae*

Centrarchidae

- *Lepomis macrochirus*

Goodidae

- *Allotoca maculata*
- *Ameca splendens*
- *Goodea atripinnis*
- *Goodea gracilis*
- *Xenoophorus captivus*
- *Xenotoca variata*
- *Xenotoca melanosoma*
- *Xenotoca doadrioi*
- *Zoogoneticus purhepechus*
- *Zoogoneticus tequila*

Poecilidae

- *Poecila mexicana*
- *Pseudoxiphophorus bimaculatus*
- *Xiphophorus helleri*
- *Xiphophorus maculatus*

Fish returned to US:

Goodeidae:

- *Allotoca maculata* - Palo Verde, Carretara El Refugio, San Marcos, Etzatlan
- *Ameca splendens* - Teuchitlan Spring
- *Goodied gracilis* - Tierra Quemada
- *Xenoophorus captivus* - Tierra Quemada
- *Xenotoca doadrioi* - San Sebastián
- *Xenotoca variata* - Santa Maria Del Rio

Poecilidae:

- *Poecilia mexicana* - cave molly - Tapijulapa
- *Xiphophorus continens* - El Quince
- *Xiphophorus helleri* - Teuchitlan Spring
- *Xiphophorus maculatus* - San Sebastián
- *Xiphophorus multilineatus* - Tambaque
- *Xiphophorus pygmaeus* - Huichihuayan

Cichlidae:

- *Vieja breidohri* - Rio Salado

The final day was short as my plane was scheduled to leave at 1:15 and I would be back in St. Louis by 4:00. While I waited, it appeared nice of the local people to have a going away parade for me. The parade lasted over an hour and was right in front of the hotel! After the parade, I called an Uber to take me to the airport, and that was a fun ride- *these guys sure know how to drive!*

I thought I might be back in St Louis in time for the end of the MASI Fall auction, but it had already finished. All in all it was a fantastic trip, lots of super people, lots of time collecting and a bunch of fish to bring home. I caught over 20 species of fish!

I brought back 18 bags of fish and only one bag of fish did not survive.

If you get a chance to collect in such a beautiful country, I highly recommend it.

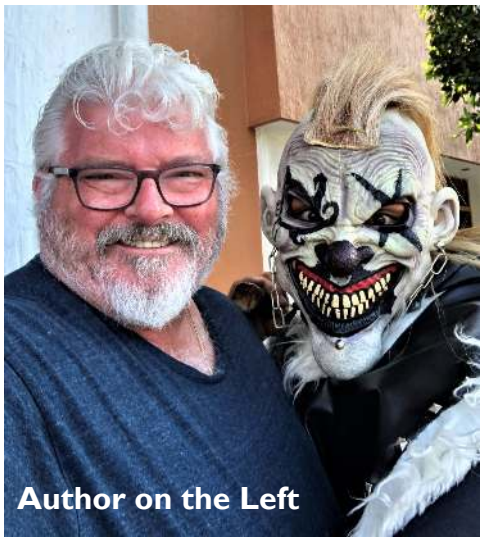

Astyanas mexicanus


Oreochromis mossambicus


Pseudoxiphophorus bimaculatus


Poecila mexicana

While waiting to leave Mexico, it appeared nice of the local people to have a going away parade for me lasting over an hour right in front of my hotel!


Author on the Left

The Perfect Dipnet!

http://jonahsaquarium.com/

This Dipnet is protected inside the aluminum rim so that it never comes in contact with rocks or other debris which would damage it.

The net has a 46" Double Walled Aluminum Handle that can be removed and collapses into two pieces 25" long for packing. The net head is 20" long minus the handle- assembled it is 63". Additional handle segments can be ordered in 21" lengths. Connecting yoke accepts 1-1/8" diameter round handle. Outside diameter of the handle is 1-1/4".

All handles have full double walled construction for strength and durability. Net and handle locks together using stainless steel push buttons.

The net worked perfectly and I ordered 2 of them when I got home and received them a couple weeks later. I can't wait to try them out.

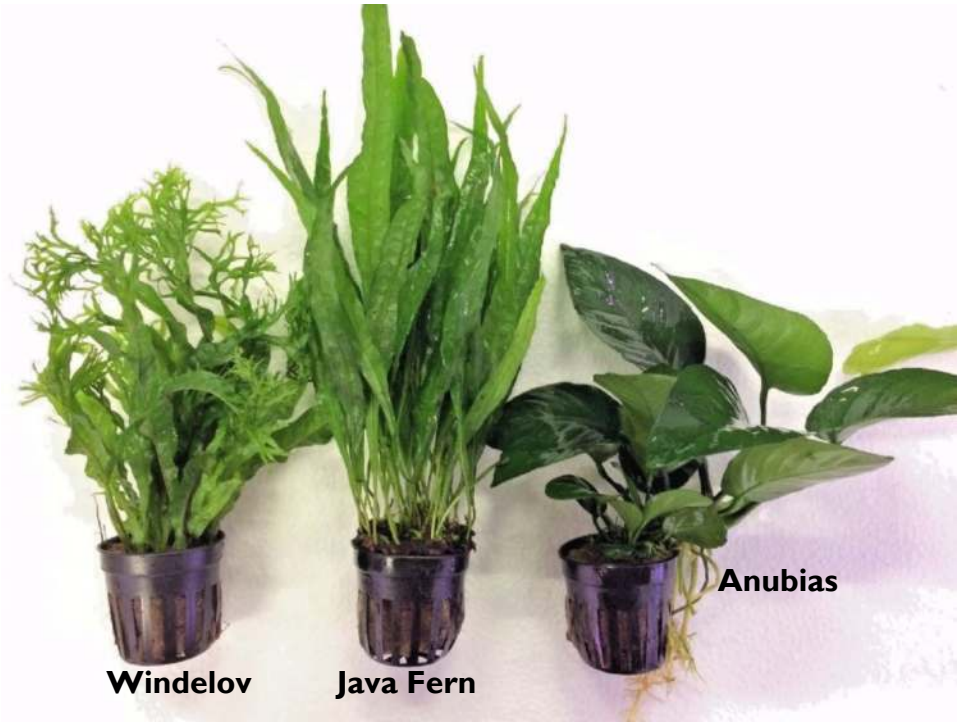
Pat Tosie

Low Tech Plant Basics:

Anubias, Java and Bolbitis Fern Care

-

By Holly Paoni



I AM GROUPING THESE three plants and their variations into one article as these are some of the hardiest and least demanding aquatic plants in the hobby.

These almost anyone can grow, and treat them the same way. Extremely low light to high light, fertilizing or not, they will grow. Most herbivorous fish wont eat them as they are tough. Digging cichlids can't uproot them. These all grow on rhizomes, a thick green horizontal stem, which the others stems and leaves, and roots come off on. the trick to growing these plants is not burying the rhizome. All three of these will root into driftwood, rocks and attach to various decor over time. All are also considered slow growing, which means very minimal maintenance.

Anubias vary from the tiny leaved *A. nana*- Micro, to the huge leaved *A. Gigantea*. Some grow many horizontally, some grow more vertically. There is an *Anubias* variety for every tank, from the 2 gallon picto tanks, to that 500 gallon monster tank. They can even be grown emersed, in a humid terrarium. I've never noticed any real growth rate difference, when tied down to various objects. Resin decor growth seems very similar to driftwood and rock growth. Most have wider leaves, some heart shaped. Veining varies per variety and species. I've grown them in shady tanks with just incandescent room lighting feet away. I've forgot about pieces of a few, and brought them back from only a rhizome. When attached correctly, these are as easy as it gets, just as easy as artificial, and feed off of what's in the water.

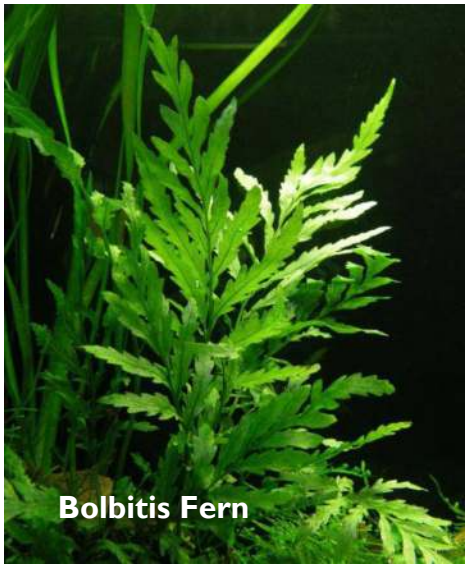
Java ferns can be as delicate as the Narrow Leaf and Windelov (Lace) varieties, or as sturdy and the normal and Trident varieties. In my experience Java Ferns do best in hard alkaline water attached to driftwood. In softer water or tied to rocks it doesn't grow and spread as well. You can still grow them that way, but it may just be slower unless an occasional fertilizer is added.


***Anubias nana* "Petite"**

These will throw baby plants off their mature leaves. At first, it looks like random black dots all over the underside of the leaf. Then you will notice small plantlets and roots forming. I let these grow until there is 4-6 leaves about 3-4 inches long with some good roots before removing and attaching elsewhere. They are easily handled at that size. Occasionally fish will knock smaller ones off and these can be tucked among the leaves of the mother plant, tied down, or pushed into a nook somewhere until they're easier to handle. I've tried a few times to grow these emersed like *Bolbitis*, and *Anubias*, but my luck was short lived with emersed grown plants. I'm sure it is doable, it just needs specific conditions that I was unable to easily replicate.

There are a few varieties \ species of Bolbitis in the hobby. *Bolbitis Asaiatica* sort of resembles regular Java fern. *Bolbitis Heudelotti* is the most commonly seen, it and *Bolbitis heteroclita* both closely resemble common houseplant ferns in their leaf structures.

All of these grow best just like Anubias, tied or attached to driftwood, rocks or decor. A major difference is that *Bolbitis* loves current. Place it near an outflow, or sponge filter and it will be happy and do well. The dwarf variations are great background plants in 10-15 or 20 gallon long tanks. The regular varieties work well in the background of 29-75 gallon tanks. These also can work very well in humid emersed conditions.


Bolbitis Fern

To attach these plants to decor, driftwood, or rockwork, everyone has their preferred method. Ill try to go over some of those, with pros and cos of each method.

The easiest, would be simply tucking or wedging the roots into a nook or cranny. While easy, these plants can easily come un-tucked during water changes, or fish knocking them loose. You also don't always have a nook to tuck them into, or the placement isn't the most visually appeasing. It does occasionally work out, but take care to not break or bury the rhizome. It needs light and water circulation. Many folks fail with these plants when the rhizome gets buried and plant dies off.

Another quick method is to use Super glue gel, or an aquatic plant gel to attach plants where you want them. Care must be taken with method, as you do not want to drown the roots or rhizome with this glue. To much prevents the plant from being able to absorb needed nutrients, or kills the rhizome. The trick is to use very very little and spot it out sparsely over the area where you want to attach the plant.


Emersed Bolbitis

My preferred method is to tie them down using cotton thread. With this method there is no worry about to much glue or burying the rhizome but it can be more time consuming wrapping thread throughout the length of the plant without tearing off leaves and stems. I feel the time is worth it as it's now as stable as I want it, won't be knocked loose, and I won't drown the plant in glue. You want the thread snug, but not super tight or cutting into the rhizome. Cotton will dissolve on its own and simply break apart. Some use quilting thread, which will need cutting off later and others prefer fishing line because it's clear. One drawback to fishing line is that once cut, it remains sharp and fish can scrape themselves on that cut point . If using fishing line, take care to hide your knots and cut edges and place them where fish can't scrape against those accidentally.

You can also bury the roots in the substrate as long as the rhizome stays above the substrate. To do this you need some fairly long roots on the plant. *Anubias* are usually the easiest to do this with as the others typically have only very fine short hair like brown roots. *Anubia* roots can be much longer, are thicker, and typically white to green, making them much easier to plant. The others occasionally are doable but not normally.


Super Glue Gel

If you want to try Live plants, I highly recommend starting with these three types. The only thing you really need to know is how to attach these properly to items in your tank, after that they really are some of the hardiest live plants available.


Cotton Thread used to tie to Decor

Paratilapia "Fianarantsoa green"

-

By Mike Huber

WHEN I BOUGHT the fish they where sold as *Paratilapia Polleni sp.* I bought 6 of them took them home and raised them. They were good si e and they started to beat each other up and killed all but one male and one female.

The first time they spawned all the eggs got fuzzy and white in a day. A few weeks later they spawned again and I was not expecting anything but in a few days the eggs were still viable. The strange thing I noticed with the eggs was that they where not attached to anything and the parents would push them from nest sight to nest sight. thought that was strange so i looked them up on line.

When I saw the images, the fish I had did not look like the ones on the Internet. The *polleni* is black with white spots. The fish I had are greenish black with blue, green, and white spots. The article said it is commonly sold as a *polleni*. The article also said the *bleekeri* is also sold as *polleni* so you have to know the color and spot formation on these fish to know the difference.

The article also stated that the *bleekeri* are extremely rare in the hobby and if you get these consider yourself lucky. Then as I read down the page it stated that this group of fish does not adhere its eggs to anything but they cling to each other and the parents move them often.

This group of fish are from Madagascar or West Africa. The water temp in the tank is 78F and the ph usually varied from 7.0 to 8.0 and the hardness is straight from tap.

Most of the time the female hid in a cave where the male could not get in. Sometimes the pair would swim around the tank together and would eat together. But when he would get aggressive she shoots into the cave. Some people said that the male is so aggressive that they used a milk crate to put the female in and had them spawn through the crate. I guess I got lucky the female had a hiding place to hide in he could not get to.

Reference: Practical Fishkeeping, How to keep Paratilapia, June 13, 2016

Minifins

-

Apistogramma nijsseni

Nijssen's Panda Apisto

–

By Mike Hellweg, CFN
(Certifiable Fish Nut)

***Apistogrammas* (or Apistos** as they are often called are fantastic dwarf ichlids that found all over South America except in the high mountains and in the extreme south of the continent.

While specialists seek them out, I'm really surprised that beyond a handful of species they are relatively rare in the hobby. They are attractive and show all of the amazing behaviors of a full sized Cichlid while reaching just two to three inches. Their breeding territories are relatively small for a Cichlid, and a pair or trio can be kept and bred in a planted 10 to 15 gallon tank.

Río Ucayali Region of Peru

***Apistogramma nijsseni* is easily one of the most colorful of all the known Apistos.** I use the word "known" as there are still dozens more species out there to be found. It seems there is a new species or variety introduced to the trade every couple of months, with no end in sight. There is an "A - number" list, like we have a C - number list for Corys and an L - number list for plecos, but most American hobbyists are unaware of it and rarely use it. More popular and well used is a system assigning nicknames based on location or characteristics like "Rot Punt" (red point) until they get a scientific name. Rot Punt, for example, has been described as *Apistogramma alacrina*. Most of the nicknames are in German as the Germans are doing most of the collecting and most of the naming. Luckily our subject this time has been described and has a common name, though folks may have trouble with the pronunciation until they hear it. I have really heard it butchered a few times! In 1979 *Apistogramma nijsseni* was named in honor of the Dutch ichthyologist Dr. Hans Nijssen. It is pronounced "Nigh - sen - eye" with a long "I". The J is silent.

They make great aquarium residents, and a 10 gallon tank is a perfect home for a pair. I use sand or fine gravel as a substrate - just a half inch or so is fine. Aquascape it with several plants like Anubias and Java fern attached to pieces of driftwood, several caves, and a handful of soaked oak leaves. I add a few broken pieces of clay pots or coconut shells to the bottom, too. These provide extra hiding places for the fry as they grow. In addition, I add a handful of Java moss to the tank as this will provide a home for all kinds of

microscopic life which their hoped-for fry will eat.

Apistos generally like softer, more acidic water, and Nijssen's Panda Apisto is no exception. Most of us in the St. Louis area are lucky- our water is nearly perfect for them without really having to do anything to it. In some outlying areas the water is like liquid rock and may need a bit of modification. Adding peat to a box filter in the tank will help by adding tannins to the water while at the same time, softening it. Change this out about every week to ten days and within a few weeks your water should be just about perfect.

While Nijssen's Panda Apistos have a reputation as being delicate, in my experience nothing is further from the truth. I've found them to be hardy and adaptable. In fact, even when I had a tap water problem and lost several fish in their tank (Coral Pencilfish, Morse Code Tetras and Otos), they not only survived, they spawned!

Here is a good place to mention that fish like pencilfish, small livebearers like guppies or Endler's livebearer, small Rasboras or tetras, and small plecos like Otos all make great tankmates. In fact, these other fish also serve as dithers, helping to strengthen the pair bond and solidify parental care. I would avoid larger plecos like *Ancistrus* as they may decide that a female Apisto's chosen cave is a perfect place and chase her out, or stress her to the point that she won't spawn. Small shrimp are excellent scavengers and excellent tank mates, but it is important to note that the Apistos will consider their young as food, not companions, so don't expect the shrimp to increase in number.

Heat is important, but again, no need to go crazy. A temperature in the upper 70s to low 80s is fine. My pair spawns regularly at 78 degrees Fahrenheit. Clean water from regular water changes will also help to keep them happy. I mostly use Mattenfilters and sponge filters, but they don't seem to mind current so a waterfall type filter should also be fine.

Feeding is pretty straightforward. They will eat flakes,

pellets, frozen foods and an assortment of live foods. I've found that like most dwarf Cichlids they absolutely LOVE blackworms and young cherry shrimp. Frozen foods like bloodworms, brine shrimp, mysis shrimp and daphnia can make up the majority of their diet in breeding season. Not only will these meaty foods condition the adults, but they will also provide some beneficial scraps for the fry. I also feed the fry a mixture of microworms and newly hatched brine shrimp so there is plenty of food for them. As I mentioned above, the Java moss in the tank is also a great place for the fry to find between meal snacks of all kinds of microscopic critters, and Mom will guide them to the Java moss as soon as they are free swimming.

I always add a couple of different caves to the tank, even if there is only one female so she has a choice of potential spawning spots. If all goes well, the adults will spawn fairly regularly. The male's colors brighten up a bit, but the female undergoes an amazing transformation. From the non-descript plain gray brown fish that is sometimes hard to see she becomes this amazing glowing lemon yellow stunner. Black patterns appear on the female as well, unique to each species of Apisto. The black patterns on the female Nijssen's Panda Apisto are the source of their common name, reminding one of the pattern on a Panda bear.

The pair will court, doing an interactive "dance" and displaying their fullest and brightest colors. If both parents are ready, they move off to the cave the female has previously chosen. She lays up to 80 orange-red eggs on the ceiling of the cave. If the male can fit in, he enters and releases his milt. If not, he releases the milt just in the entrance of the cave, moving back and forth to propel the milt into the cave. Once the eggs are fertilized, the female guards them night and day.

To aid the female's work, I leave a small light on near the tank 24 hours a day so she can see any real or perceived threats at night. It may sound silly, but I've found that this technique works well and that Cichlid mothers with a nightlight seem to be more successful than those without.

Once the eggs hatch and the fry are free swimming, Mom will carefully guide the fry around the tank in a search for food. She signals them with twitches of her body, movements of her fins, and changes in color. The fry can disappear in a second if Mom says danger is present, and reappear almost as quickly. Dad usually patrols the territory and has little to do with the actual raising of the fry. In fact, in larger tanks he may take a second or even a third mate and spend time moving between his various families in a sort of harem-like arrangement.

They are usually great parents, but it may take a couple tries for

them to get it right, so don't be discouraged if the first spawn or two disappears overnight. As mentioned earlier, I feed the fry a mix of microworms and newly hatched brine shrimp which I gently squirt right into the midst of the group of fry. It is really cool to watch the fry gobble down the brine shrimp and watch their bellies swell and turn orange with their meal.

After a few weeks you can start adding finely ground flake food soaked in water to the food mix. Depending on the parents, they may raise the fry for a month or more. I usually try to gently siphon out half or more of the fry with a gravel vac when they are about two weeks old. The fry grow quickly and can start to crowd the parent's tank if you don't move them at about this time.

To avoid a potential conflict among the parents if all of the fry suddenly disappear, I always leave at least a few fry with the parents, realizing these will likely disappear when the parents spawn again. Sometimes I'm surprised and a couple months later I'll find a couple of three-quarter inch juveniles hiding among the plants.

Bright colors, fascinating behavior, and a chance of watching Cichlid family life in a small tank. What more could you want?

Additional Apistogramma Info:

General: http://apisto.sites.no/

Distribution List: http://apisto.sites.no/page.aspx?PageID=119

Group ID: http://apisto.sites.no/page.aspx?PageId=116

The "A" List: http://apisto.sites.no/slekt.aspx?gruppeID=1

Species List by Groups: http://apisto.sites.no/page.aspx?PageId=127


Apistogramma borelli - Opal


Apistogramma agassizii Alenquer


Apistogramma macmasteri


Apistogramma cruzi


Apistogramma cacatuoides

Apistogramma eunotus Blue Cheek

Apistogramma Gallery

Assorted Domestic & Wild Types


Apistogramma baenschi Inca


Apistogramma eunotus


Apistogramma elizabethae


Apistogramma Agassizii Double Red


Apistogramma viejita

"Tiny Bubbles..."

Gas Bubble Disease

- a hazard of winter water changes

-

By Gary Lange

WHO CAN FORGET the song from immortal Don o

Original by Don Ho:
https://www.youtube.com/watch?v=t45DKmtzTHo

Tiny bubbles, in the wine,
Make me happy, make me feel fine.
Tiny bubbles, make me warm all over.
With the feeling that I'm gonna
Love you till the end of time.

And, in the fish tank as Paraphrased by Gary Lange:

Tiny bubbles, makes me ill,
Total destruction, in my gills,
Tiny bubbles, makes me sick all over,
With a feeling that I'm leaving
Your little chilly fish tank behind.

Ok, yeah Don's probably turning over in his grave with my lyrics. It was a popular song to begin with but the tiny bubbles we can add to our fish tanks in the winter can be deadly.

A recent discussion on the MASI Facebook discussions page was about some of the problems an aquarist can have when the weather gets cold and our water supply gets down right chilly. You see, cold water can hold more gas than warm water and when the cold water in your pipes hits the warm house is going to lose some of those gases. The water when heated up in your hot water tank will release that gas even quicker and is then going to be under a bit of pressure.

Turn on your hot water, let it get good and hot and then fill a tall clear glass. You'll notice that the water is almost grey from all of the cloudy tiny micro bubbles that are bursting out of the water. If you let this set for a few more minutes you'll see bigger bubbles all over the sides of the glass. It is a problem if you pour that water directly into your warm tank and the dissolved gas does not come out of solution until AFTER it passes through the gills of your fish and into their bloodstream. Yes it's a bit like like the divers bends so it can be, I would imagine, very painful for the fish and the gas once inside the fish can show up between the fin rays, in the eyes or elsewhere.

For years I really didn't worry about "Gas Bubble Disease (GBD)" as I would age my water in barrels usually for several hours with a hang on back

type filter churning and splashing the water into the barrel. This turns out to be a great way, to remove that excess gas and I really didn't give it any thought. But several years ago when I was in Detroit giving a talk in the winter time I was reminded by the Great Jim Langhammer* that you do have to be careful, that "gas bubble disease", or whatever you want to call it, is real. Jim would routinely age his water for a day before using it- remember in Michigan the water comes out of the cold tap almost in icicle form in wintertime.

A recent check of our local cold water supply yielded a temperature of 46 degrees F (8C) and way colder than the average 80 degree aquarium. I switched to using a vigorous pond pump to circulate the water in my barrels and it now takes an hour or two to help remove those bubbles.

If you put water into your aquarium and still see a lot of bubbles forming on the glass you should probably wait a while longer to ensure that it degasses further. An airstone can be added to the barrel to help turn over the water and allow the excess gasses to escape.

The photo shows a good example of this where one container has hot water that was degassed with an airstone for 10 minutes and the other fresh out of the tap. The hot water out of the tap produced lots of bubbles on the sides of the container where there were almost none on the aerated, bubbled hot water.

You really can't solve this problem by just using cold water and pouring that into your aquarium. That cold water has just as much air in it as the hot water but its not visible because the out-gassing bubbles haven't yet formed and coalesced. Hot water can't hold on to it once it's not under pressure and the gas bubbles form more readily. Adding really cold water to your tropical fish tank isn't the smartest thing to do anyway. If you mix in hot water with your cold tap water both sources of water will be spitting out their gasses quite quickly.

There are more than a few people that will claim that they've done this for years when the water was really cold and nothing happened to their fish. Sometimes it's not so extreme to cause immediate deaths but it may still cause a lot of stress in the fish. Several of the linked articles below point out that fish often come down with other diseases because of this stress. Bottom line, in cold weather, put it in a container, aerate it and degas before using. **Do this and you can keep your fish from singing my version of the "tiny bubble song"!**

Additional reading:

Identification and diagnosis from the Toledo Zoo:
https://www.advancedaquarist.com/2014/8/fish
GBD discussion with illustrations:
https://www.adfg.alaska.gov/static/species/disease/pdfs/fishdiseases/gas_bubble_disease.pdf
Causes of gas saturation, etc.:
http://www.aun.edu.eg/developmentvet/fish%20diseases/7_1.htm

***Jim Langhammer is well known** throughout the Aquarium Hobby and respected for his activities with the American Livebearer Association (ALA) and efforts to save and educate about many of the Mexican endangered Goodeid species. The ALA maintains the James K. Langhammer Fund for Conservation in his honor. Join the ALA for the ALA Convention, May 24-26th in Louisville, KY.

**** All blue underlined passages are Hot Linked to their topics!**

Want to continue to get the DARTER with similar articles 6x per year?

Don't Forget to Join or Renew your Missouri Aquarium Society membership!!

A Year's membership is $15 and includes an electronic subscription to The Darter published six times per year. Join or renew membership at any meeting, most club events, by PayPal from the MASI Website's Membership Page or by contacting Ed Millinger, Membership Chair, at 573-883-9943.

Help MASI Support the Aquarium Hobby!

Support Locally by shopping our supporters.

Support Nationally & Internationally by supporting the MASI Challenge.

2019 BREEDER'S AWARD PROGRAM - Steve Edie

BAP Program Update

THERE HAVE BEEN a few tweaks to the AP program.

While at the Catfish Convention this fall, I had occasion to consult with some experts in the field to evaluate the point values for our catfish species. The consensus was that some species were undervalued and some were overvalued, based on their relative difficulty of spawning. An objective look at other species has also been conducted, particularly regarding the Goodeid group. As livebearers, several of these were overvalued.

As a result, **adjustments to several species point values have been made**. For any point values that increased, the higher point value will be retroactively applied to all spawns previously submitted. For any point values that decreased, they will only affect spawns submitted after the first of this year. Prior spawns will maintain the point values in effect when they were turned in.

As background, when our BAP program was established back in the seventies, our version was modeled after the FAAS (Federation of American Aquarium Societies) breeder program and their point values. Fifteen or so years ago, FAAS dissolved, although it has been reconstituted recently but no longer has a breeding component. So our BAP program has proceed to evolve on its own, although we regularly compare notes with other club's programs.

One thing that seems to occur is that **when a new species is spawned for the first time in the club it is assumed to be difficult to spawn**, and a higher point value assigned. In many cases, the species may not really be more difficult to spawn, just more difficult to acquire.

Those that go to conventions, travel to out of town shops, have connections to other breeders, buy online, or have more financial resources have an advantage over other members in getting new species first. At the time we added the first spawn bonus points to the system, we didn't really go back and adjust some of the species that already had a first spawn bias in the original point value. Although there are some exceptions, it's generally true that captive bred fish are relatively easier to spawn than their wild counterparts. So the first spawn bonus is appropriate in many cases.

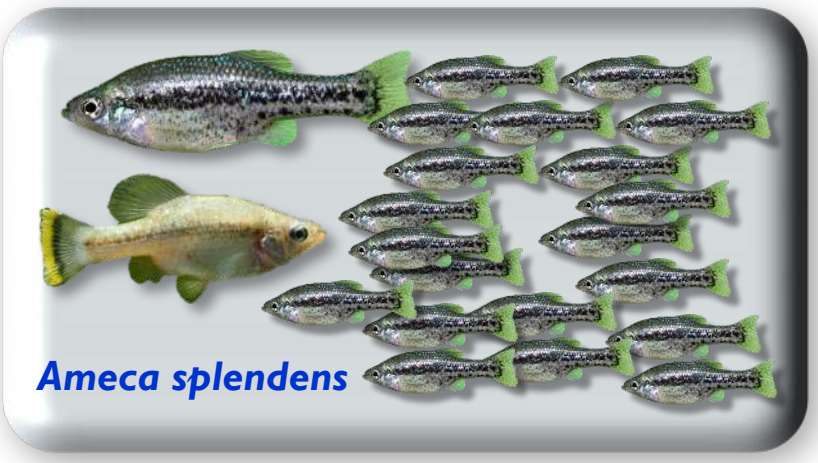
Another area where point values were likely overvalued is **in cases where the species is endangered or threatened in the wild**. With the CARES bonus in place to account for this, some of these base point values have been decreased. As an example, I can clearly state that *Ameca splendens* are easier to breed than roaches. Their point value has been reduced from 15 to 10, although 5 was seriously considered.

The BAP rules have been revised to indicate how point changes will be applied to prior and future spawns. A clarification in the CARES species indicates that if a new species is added to the CARES database, the **CARES bonus will be applied retroactively for five years to previously submitted spawns**. The species likely was in decline prior to receiving CARES status.

A clarification was also made to the option of donating a pair in lieu of fry. A pair may still be donated but fry must be shown to demonstrate that the spawn occurred.

Please know that these changes aren't meant to penalize or upset anyone, just to make the program more equitable for the very diverse species that our members keep.

By the time this Darter comes out, the master member point totals, the revised species point values, and rules updates should be up on the MASI webpage.



VS

FISHES AS DISHES

PATRICK A. TOSIE, SR.

We all love our fish! This column is dedicated to using fish for something tasty to enjoy. Try it, you may like it. If you have leftovers, bring them to a monthly meeting for others to enjoy!

Cilantro-Lime Shrimp Tacos

Ingredients:

FOR THE TACOS

- Juice of 3 limes
- 2 tbsp. freshly chopped cilantro, plus more for garnish
- 2 garlic cloves, minced
- 1/2 tsp. cumin
- 1 tbsp. olive oil
- Zest of 1 lime
- Kosher salt
- 1 lb. shrimp, peeled and deveined
- 8 Tortillas, warmed, for serving

FOR THE CABBAGE SLAW

- 1 c. shredded green cabbage
- 1/4 c. cilantro
- 1/4 red onion, thinly sliced
- 1/2 avocado, thinly sliced
- Juice of 1 lime
- 1 tbsp. olive oil
- Kosher salt

FOR THE GARLIC-LIME MAYO

- 1/3 c. Duke's Mayonnaise
- 2 tbsp. hot sauce
- Zest of 1 lime
- 1/2 tsp. garlic powder
- Kosher salt

Directions:

1. In a large bowl, whisk together lime juice, cilantro, garlic, cumin, olive oil, lime zest and season with salt. Add shrimp and cover with plastic wrap. Let marinate 20 minutes in refrigerator.
2. Make slaw: in a large bowl combine all slaw ingredients. Toss gently to combine and season with salt.
3. Make garlic-lime mayo: in a medium bowl, combine all ingredients. Whisk and season with salt.
4. Preheat grill or grill pan to medium heat. Grill shrimp until pink and opaque, about 3 minutes per side.
5. Build tacos: add a scoop of slaw, a few shrimp, and a drizzle of the garlic-lime mayo to each taco. Garnish with cilantro and serve.

Total Time: 35 minutes Yields 4 servings

The DARTER

V45-N3

May/June 2019

B&W Printed $5 Members / $7 Non-members

Back To Basics:

Emergency Filtration

-

How to Build a Filter

-

Holly Paoni

IT HAPPENS TO everyone, equipment fails. With good maintenance you can catch most beforehand, but not always. Sometimes equipment just fails. These failures, for me anyway, always happen at times it is not practical to just run to the store to pick up a replacement or parts.

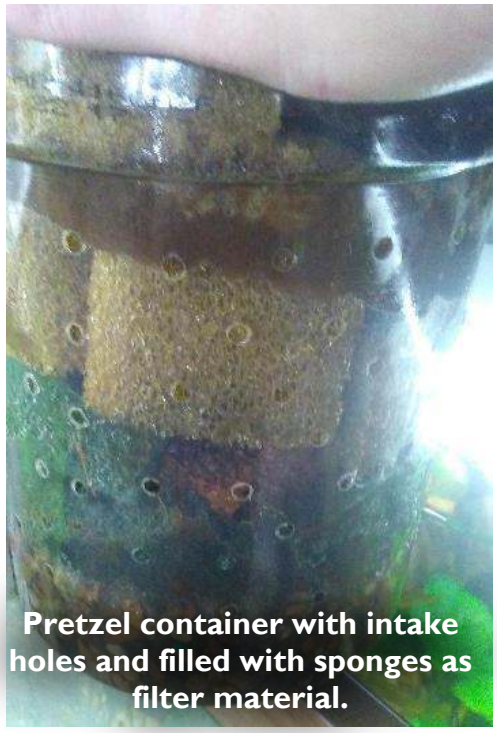
I recently had an ancient hang-on-back filter, that's run reliably for many years, just die. The impeller has been replaced a couple times, the motor was replaced once. Parts for this old filter were no longer available, that's how old it was. Fixing it just wasn't feasible. I didn't exactly want another HOB for this tank, but I needed to replace it immediately. That filter provided most of the circulation, and a good portion of the filtration for my 75 gallon heavily stocked community tank. The plants and other filters were not going to be able to handle the bioload long term . At 11 PM, you can't just go grab a filter- so I made **one.**

Box - type filters work well at providing mechanical and biological filtration, and can be made in a few minutes. They can also provide quite a bit of circulation, depending on how they are set up and powered. I have made several over the years, using items as small as a yogurt cup, or as large as the one I put in my 75, a 2-3 pound pretzel stick container. I've used 1-3 liter bottles, but those just do not hold up long term, but do work in a pinch short term. I've found tupperware type storage containers work the best, are food and fish safe, and don't degrade over time.

I rewashed my clean pretzel container with plain Dawn dish soap. Then rinsed it several times to remove any residue. Then small holes were drilled about an inch apart all over the front half of the container. The bottom and top 2 inches were left intact for practicality making it easier to handle the container while drilling. It also helps improve container durability. After drilling, a new pumice stone was used to smooth the rough edges on the inside of the container and a couple rough spots on the outside. While not needed for a short term filter, this step makes cleaning easier for the long term. Those rough edges on the inside can scratch during routine maintenance and any rough spots on the outside, could scratch your fish so it is best to remove them early on.

I then placed about 1 1/2 inches of substrate from the 75 gallon into the bottom of the new box filter. This provides beneficial bacteria and helps weigh down the filter. On top of this substrate was placed a small pond pump for good circulation. The pump is only rated for about a 20-30 gallon pond, but provides an easy current the full length of the 75 gallon tank. For my slow moving livestock it was perfect. The out-take tube was joined with a section of PVC pipe cut to length for the height of the tank after taking into consideration, the height of the elbow that would be added to the top.

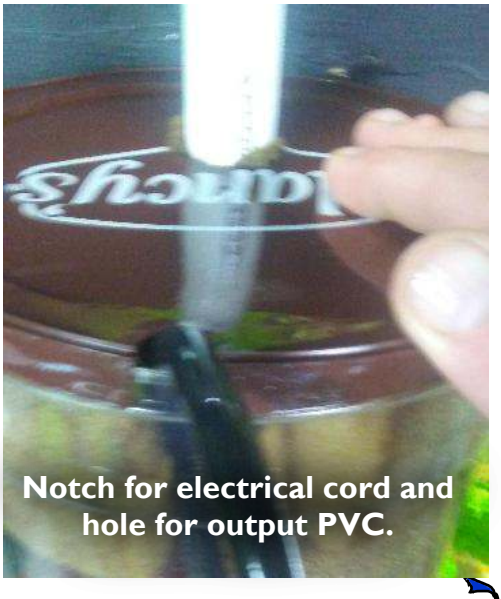
The old filter media from the hang on back, was matten-foam scrap pieces I had cut to fit the compartments. These were given a quick swish into the tank, then cut to



Pretzel container with intake holes and filled with sponges as filter material.

fit the inside of the new box filter. I added a few more pieces of scrap foam to fill in the gaps. Then I cut a place in the lid to fit the cord and PVC pipe. Then I placed the lid. I had one small gap that I cut a sliver foam for, then wedged it in place with my Exacto knife. No rough edges and no gaps. I then placed the elbow on the top of the pipe to direct flow and it was time to test the filter.

I cleared a spot near where I wanted the filter, placed it, and plugged it in and rechecked flow pattern again. The debris I swished off the foam into



Notch for electrical cord and hole for output PVC.

Filled with sponge filters.

the tank, were still in the water column, and by watching them, I could get a great idea of current and flow pattern in the water. After a few small adjustments the filter was working great. The long finned Rosy barbs would play a bit in the current, the goldfish wasn't affected by too strong an outflow and the debris were being pulled into the filter. It was doing exactly what I needed it to do.

I have not yet placed the filter into its long term position. That place is being taken up by some large crypts. Most of those will be going into my 50 gallon tall when I finally reseal it-hopefully soon. The filter will then take that spot behind the driftwood and I'll attach some moss and Anubias to the PVC pipe to hide the filter from view. In the mean time we'll see how often the media needs cleaning before moving it to its final spot. If its only monthly then that spot works just fine. If more frequently then the tank will get a mild re-scape to make access easier.

Author's Note: I wrote the main portion of this article 2 months ago. The filter is still working very well and the media has not yet needed cleaning.

It still hasn't been moved back to the original spot, as I wanted to take some photos of it, and clean it once before moving it. Honestly, this homemade emergency filter, has been working better than the old faithful HOB providing the primary filter and the circulation in this tank.

Oxygen Fill Station as a Shipment Preparation Aid

—

By Chuck Bremer

Ship and Maintain Fish in the Bag for longer with less stress by filling the bag with O2. An O2 fill no le is easy and relatively cheap to make.

Use minimal pressure on the outlet, between 10-15 psi **(A),** and keep the main cylinder valve closed **(B)** when not in use for safety and to prevent loss of gas.

The O2 cylinder was an exchange* of a used CO2 5# cylinder for a O2 refill with 22 cu ft at a local Welding Supply. If needing to purchase a new O2 cylinder this one time cost could approach $100.

The O2 Regulator was purchased at Harbor Freight and the outlet port removed and replaced with a 1/4" NPT nipple from the set below. All fittings in the build are now 1/4" NPT except as noted. (Note**: list price of the regulator was $70, but applying a 20% discount coupon resulted in $56.)

Parts 3-7 were bought as an air kit at Harbor Freight. There were leftover parts in the kit consisting of additional chucks, air gauge and other fittings. It came with Teflon tape which was used on all connections.

The air kit came with a barb fitting but it was replaced with one easier to use from the hardware store. 1/8" NPT to hose barb.

NOTE: I later found it easier to use by substituting a $4 air gun from Harbor Freight for parts 7, 8 & 9. **See Inset.**

#	Part	Cost
1	O2	27*
2	O2 Regulator	$56**
3-7	Air Kit	$14
3	1/4" nipple	
4	F Air Chuck	
5	M Air Chuck	
6	Flex Air Hose	
7	Air fill trigger	
8	Barb Fitting	$3
9	Airline	$0.05
	TOTAL	$100

Rasbora einthovenii - Spawning the Brilliant Rasbora -

By Mike Huber

I **STARTED WITH** 8 fish I bought and put them into a 15 gallon planted tank. I fed the fish micro worms, banana worms, chopped black worms and a variety of flake foods. The temperature was 5 F and the p 6.5.

The water was part tap water, rain water and R.O. water. I also put some peat in a nylon with a rock to hold it down in front of the power head. This, along with some oak leafs in a corner behind some rocks, helped keep the pH down.

I set up a 10 gallon tank next to the 15 so I could use the water from the 15 when doing water changes to put in 10 gallon tank. The tanks have the side and back blacked out and are setting by a window so I can open the drapes and get a natural sunrise instead of an instant on like the tanks in the fish room do.

The Brilliant Rasboras where spawned like my Odessa barbs with a grid in the tank and potted plants on top of the grid for the parents to spawn through. After two days the parents where removed and put back in the 15 gallon tank. I have also spawned some plant spawners similarly in a bare tank with a spawning mop like many do rainbow fish then moved the mop in another tank.

Others have recommended using marbles for egg scatters but they are expensive, so I use round rocks instead. The eggs fall between the rocks and the parents can get to them. I have also used a tank with potted plants with larger round rocks in the pots and left the parents in the tank. After the fry hatch they follow the plant stems up to a lot of floating plants where I can remove them and put them into another tank, as I did with the *Danio rerio*.

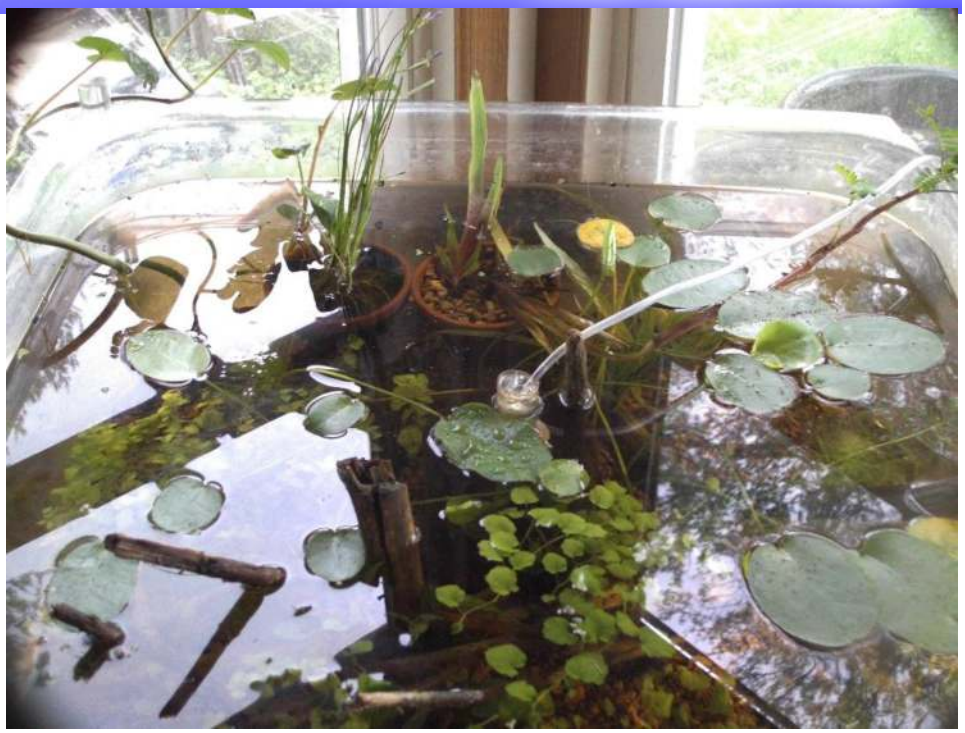
After the fish got bigger I fed them black worms, frozen blood worms and chopped earth worms. I also learned from chatting with Greg Sage and watching his YouTube how to culture infusoria in the tank and how to time it to the spawn. Now I grow infusoria in a gallon jar so I can feed it to other baby fish also.

Low Tech Plant Basics:

Building an Indoor Pond

-

By Holly Paoni



THERE IS NOTHING simpler or easier than growing plants outdoors, using the sun as your light source It's how they grow in the wild, on fish farms, and plant nurseries from where we get many of our plants. The set up can be as simple or complex as you wish, the container can be as small or large as you want, or have space for. The options are limitless

I've got a few small containers, sitting in windows and outdoors. I've set up a few tubs indoors and out, and have started an indoor pond in my sunroom. All are pretty simple low to no tech set ups that are growing plants very well! The simplest is a gold fish bowl, with moss and waste fish water sitting on my kitchen counter where it gets morning light. That's IT.

The indoor pond, is the basis of this article. I wanted a year round pond indoors- with a sunroom. Why not, right? I can grow pond and aquarium plants year round without needing additional light! My sunroom stays about 10 degrees cooler than the rest of the house, so the fish occupants must have a wide temperature range- I choose White Cloud Mountain Minnows. They are hardy and active, yet peaceful schooling fish. They will also eat any mosquito larvae that could potential happen. I don't want those blasted 'skeeters in the house! White Clouds also compliment plants very well which is the entire point of this pond!

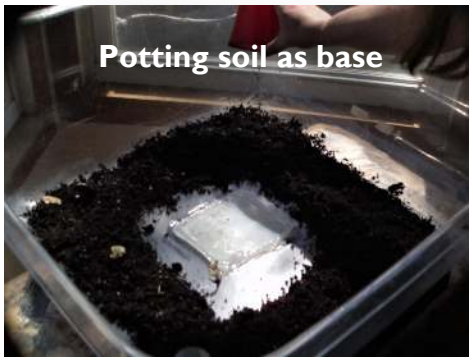
I wanted a pond for the Plants!

We took almost step by step photos of setting up this pond. It is a repurposed coffee table aquarium that holds somewhere between 35-50 gallons. With the sloping sides, I wasn't too worried about figuring out the exact gallons as it has tons and tons of surface area for its size. Its all about surface area anyway when stocking.

Gallons matters for dilution, but the nitrogen cycle and oxygenation levels are all about how much area is available for the bacteria to colonize and the surface area is for oxygen exchange.

In a pond surface area also gives a lot of extra room for plants to grow up, across and potentially even trail down the sides. The later is a goal I hope to accomplish.

After patching a hole in the aquarium where it was plumbed for a sump I put in about an inch of potting soil. The front soil was covered with washed play sand, and the rest was capped with regular ol' home improvement store pea gravel.



When I brought in the garden hose I grabbed a pie plate. Water from the hose was directed into the pie plate to keep from disturbing the capped soil. When working with soil, and water, its easy to end up with a muddy mess. Use layers of newspaper or a shallow dish, like a pie plate

to prevent a muddy mess of disturbed soil.

After it was filled I let it sit for 2 days, to warm up to room temperature. When the plants I'd ordered to put in arrived 2 days later- the water temp was about 64 degrees, and the sunroom was about 66 degrees.

My hands got a bit chilled planting but the plants settled in very well without any going into shock. Most were shipped in or were trimmings from the warmer fishroom.

I had played around with various pieces of driftwood prior to set up and picked the pieces wanted for this transparent pond. Once the aquarium was filled I had a pretty good idea of which ones would work but wasn't quite yet sure.

I almost always have a plan, but plans don't always work once all the pieces are put together. I go with the flow, more than follow the original plan anyway. I finally picked out 3 of my pre-picked, pre-soaked pieces and added a few pieces of Asian Bolbitis Fern to two of them.

The driftwood pieces were placed just behind the sandy "beach" area in a tangle to look natural. Another piece started mid back, and came forward at an angle. This will be used to support and divide some other plants. A sponge filter went in the center, behind the driftwood tangle. Since this will be year round with fish and wouldn't get the wind as such an outdoor pond would I wanted some water movement but I didn't want to see this sponge either.

I then planted 3 yellow water poppies around the sponge filter. These will give me the look of a water lily at a much more manageable size indoors. The leaves are 1-3 inch pads, versus the huge pads of an actual pond lily.

These don't like to be planted very deep, and can float. I planted mine into the soil, as my pond is pretty shallow. If it was deeper, I would've used Plant pots. In 6 weeks, the number of pads has tripled and that's not counting a couple that came in damaged from shipping.

In the nooks and crannies around the driftwood I planted *Cardamine lyrata*. I adore this plant for many reasons- its got minimal requirements to be happy. Low light, high light, cool or warm, it doesn't really care. It is like a dainty thin stemmed pennywort, It can be planted

upright or kept pushed down and kept trimmed to make a carpet. Im using it for both, a carpet in front of the driftwood, and upright behind. I'm hoping it's very nice cover gives cover for fish and shrimp fry!

At the very back of the pond I

added a clear acrylic shelf. This lets me raise some plant pots closer to the water level and lets fish swim under those pots. In the back pots I planted Blue-Eye Grass and Yellow Eyed Grass. These don't like to be very deep but do need the soil wet.

In one back corner, I planted a start of Lizard's Tail. This does well for me in the fishroom at the same depth and I'm hoping to get it to bloom in the pond. It has one down side in the fishroom that it getts too tall. In the pond it can grow as tall as it wants to!

The opposite back corner has a Large Leaf Sensitive plant and some Hygro Willow. These plants in the back DID take a bit a damage early on. My cat, Lady Bug, got a bit curious and knocked things over tossed them on the floor. The Yellow - Eyed Grass was almost lost but I found it mostly dried up on the floor and it is coming back. The Blue Eyed Grass hasn't missed a beat and is blooming!

Yes, with all the storms, rain, cloudy days, and being indoors in a corner of the sunroom that only get direct morning light I've already got blooms!

I am not adding CO2 and haven't added any fertilizes- just plain ol' potting soil, direct morning and indirect afternoon sunshine.

The gaps in the planting have been filled in with trimmings from the fish room. *Bacopa, Rotalla colorata*, Myrio Green, *Ludwigia Ovalis* and some moss tucked here and there. All of these were short little cuttings originally but I have since pinched back and replanted them all at least once. They have grown up and started floating across the surface. Some have already been pinched back and planted twice. All holes have now filled.

Next is to let those that will grow out of the water do so. The *Ludwigia, Bacopas,* and Hygro willow I hope will grow out then trail and maybe even bloom!

In 6 weeks time I've had a lot of growth with an extremely simple indoor set up using just natural sunlight.

Try something similar- maybe even just a small container with one plant. It doesn't have to be on a large scale. Its all about trying NEW things, to gain experience in this hobby!

Till next time- keep your hands wet !

Minifins

-

Tatia intermedia

The False Galaxy Woodcat

–

By Mike Hellweg, CFN
(Certifiable Fish Nut)


False Galaxy Woodcat, *Tatia intermedia*, Male

There are over 430 families of fishes, but we aquarists regularly keep members of only a couple do en of those families in our aquaria, with nearly 50 of them being from just one family ichlidae That leaves literally thousands of species of fishes that are rarely, if ever, encountered in the aquarium hobby.

Even if you weed out the marine and estuarine fishes, there are still several thousand species in dozens of families that we don't know! One of those families that is gaining in popularity is the woodcat family, *Auchenipteridae*, which consists of about 90 species of catfish that live in South America. All of them are fairly non-descript.

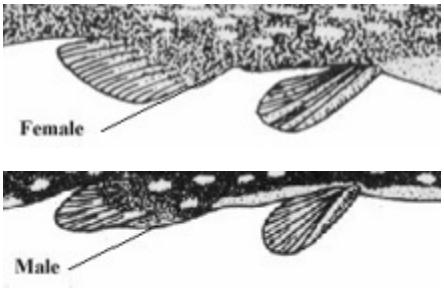

Collection Points

Of the dozen or so species in the genus Tatia, there are two species that really stand out in pattern - *Tatia galaxia* (the Galaxy Woodcat) and *T. intermedia* (the False Galaxy Woodcat). They both have a dark brown to almost black basic coloration with a pattern of creamy to whitish spots or splotches covering their bodies. For the subject of this article, *Tatia intermedia*, the blotches are elongated ovals.


Galaxy Woodcat, *Tatia galaxia*

Tatia intermedia grows to about 5 inches in the wild, though most specimens that I have seen or kept have been a bit smaller. Females generally grow larger than males, and are thicker bodied.

Males have the first two rays of their anal fin modified into a grasping organ that they use similar to the way



half beaks and Goodeids use their andropodia (the modified first rays of the anal fin), to grasp the female's anal fin and line up their genital pores so they can fertilize the female internally. It is still unclear exactly how the woodcats accomplish this so more study is needed. The fertilized female then goes off and lays the fertilized eggs several hours to a few days later. Several hobbyists have reported purchasing heavy (apparently gravid) females and having them lay fertile eggs without having a male present.

They are primarily nocturnal fish but, as with most animals, they can be motivated to change their nocturnal habits with the introduction of food to their tank. Within seconds of the food hitting the water, an apparently empty tank explodes with life as the catfish charge out and chaotically hunt down every morsel of food.

As soon as the food is gone, they disappear again to their hiding

spots. Don't think you can get away with forcing them to be out in the open by not giving them plenty of hiding spots. All they will do then is sulk in the corners, not eat, and eventually waste away. Be aware of their hiding habits from the start and be amazed at the explosion of life when food is added. Be content with that and you will come to really appreciate these wonders of nature.

In the wild they spend much of their time trying to hide in crevices or under bark in fallen trees in the water, hence their name "woodcats". Native fishermen have come to recognize where local species are found, and carefully return pieces of wood to the water after inspecting known hiding places in the various pieces. Oddly, they can regularly harvest individuals from prime hiding spots, so as one individual fish is removed another moves in to take over the suddenly vacant real estate!

In aquaria care is simple and fairly straightforward. In order to really see them at their best give them a single species tank. If you want to have companions in the tank so that it doesn't always look empty add medium sized tetras, rasboras or similar fishes. Avoid species that are hyperactive as they might intimidate the woodcats into hiding more.

It is best to start off with a group of a half dozen or so juveniles if you can, or young adults if juveniles aren't available. A 20 gallon long or larger tank is perfect for a small group of them. Provide them with plenty of piles of wood, ceramic caves, and similar habitat.

Plants and lighting are unnecessary. A sponge filter or small power filter works well to help maintain water quality, but regular water changes are most important. They do not seem to tolerate the buildup of nitrogenous waste, so I give my specimens a 50 percent water change at least twice a week.

Water temperature should be kept in the mid to upper 70s Fahrenheit. They prefer water with parameters on the soft and acidic side of neutral, but aren't super demanding. They seem to be happy in our local water without any modifications, making water changes easy.

They are micropredators so feeding is really easy. They will eat anything meaty that will fit in their mouths with a strong preference for frozen brine shrimp and bloodworms. They love live blackworms, *Gammarus*, and small cherry shrimp. They will also readily consume sinking pellet foods and even flake foods.

Once sexually mature, they will spawn pretty regularly for several months, then stop for several months, then start up again. I have no idea what triggers them to start this cycle. They usually spawn within hours of a large water change, and often I find

balls of eggs the day after a water change.

The females lay a golf ball to tennis ball sized clump of eggs that look similar to the spawn of a frog. The individual eggs are covered and connected by a mass of clear jelly. Apparently it tastes bad as the first time they surprised me with a spawn, the other fishes in the tank were staying far away from the eggs!

Some breeders report that the female guards the eggs for a few hours, but I have not seen that in my fish. Perhaps I missed it. By the time I find the eggs, the adults are all in hiding again. I remove the eggs into a 2-gallon tank set up with water from

the adult's tank and a small Hydrosponge filter.

It takes about a week, maybe a bit more, for the eggs to hatch. It is interesting to watch the little whitish tadpole like larvae develop and wiggle around in the eggs, and eventually work their way out of the jelly like mass.

The first time I had eggs, as the fry hatched, they disappeared. In a bare tank! I couldn't figure out what was going on. Eventually, the eggs had all hatched and the tank was empty. Disappointed, I started to dismantle the tank. When I removed the Hydrosponge filter I found where the fry had disappeared to! They were all hiding INSIDE the filter!

I had over 300 young fish all crowded together inside a Hydrosponge II filter. When I added microworms to the tank, just like the adults, within seconds they began piling out of the sponge and the tank became a swirl of activity. About 20 minutes later, they had all eaten their fill and returned to their hiding spot.

They young fish eat microworms, newly hatched brine shrimp, finely ground powdered fry food, and after a few days will even attack larger pellet foods. It's amazing to see a pile of fry devouring a large pellet!

I do large, daily water changes on the fry tank with water from the adult's tank, and after a couple weeks, I move them to a 10-gallon tank for grow out. I add a pile of coconut fry hides and PVC pipe pieces to the tank, too, to give them plenty of places to hide. Growth is fairly rapid, and within a month they are about three quarters of an inch long.

Several breeders that I have talked to report losing a large number of fry in the first few weeks, but I did not have that experience with them. Maybe they need to have a lot of space to hide, and without that they are stressed? I'm not sure. I just know that from each spawn I had several hundred juveniles to find homes for a couple months later!

Fortunately they are easy to sell, make great trade-bait, and finding homes isn't too hard.

So if you come across a group of juveniles or young adults at a club auction, it might be a fun project to **bring them home and see the explosion of life for yourself!**

Photos: ©ScotCat.com & PlanetCatfish.com

FISHES AS DISHES

PATRICK A. TOSIE, SR.

We all love our fish! This column is dedicated to using fish for something tasty to enjoy. Try it, you may like it. If you have leftovers, bring them to a monthly meeting for others to enjoy!

Cajun Butter Baked Salmon

Ingredients:

2 lemons, sliced into rounds
1 large salmon fillet (about 3 lbs.)
Kosher salt
Freshly ground black pepper
4 tbsp. melted butter
3 cloves garlic, minced
2 tbsp. whole grain mustard
2 tsp. cajun seasoning
1 tsp. fresh thyme leaves
Pinch crushed red pepper flakes
Thinly sliced green onions, for serving.

Directions:

1. Preheat oven to 350° and line a large baking sheet with foil. Lay lemon rounds in an even layer in center of pan. Place salmon on top and season with salt and pepper.
2. In a small bowl, combine melted butter, garlic, mustard, cajun seasoning, thyme, and red pepper flakes. Brush all over salmon.
3. Bake until salmon is cooked through, about 25 minutes. Switch oven to broil, and broil for 2 minutes, or until butter mixture has thickened.

Garnish with green onions before serving.

Total Time: 55 minutes total (15 minutes prep time) Yields 8 servings

The DARTER

V45-N4

July/August 2019

B&W Printed $5 Members / $7 Non-members

June 2019 Missouri Collecting Trip

-

By Tom Keevin, Jack Heller, and other Participants


Every collecting trip has to have a plan!

THIS YEAR'S COLLECTING trips were fraught with weather problems but fun and productive nevertheless.

Friday, June 21, 2019 by Jack Heller

FRIDAY'S TRIP WAS a bit further afield in search of some of the species with more limited distribution. We had a great time and caught a lot of neat fish. I only wish that more people had shown up.

Dave and his son had a fantastic weekend and the Friday trip to find *Fundulus zebrinnis* was a great bonus. Friday provided quite a nasty storm and I still cannot believe we actually caught our targets with the torrents of rain coming down and the swollen condition of the stream.


Plan in Action!!

Fearless Leader

Even though there weren't a lot of members who braved the rains for the collecting trip, Dave gave a great talk and we had an outstanding weekend. Tom Keevin was a great help in identifying the various fish on Saturday before their release. The darters and red belly dace were beautiful and we even caught a few *Fundulus olivacious*, which made my day. I am afraid that noone kept a list of all the species we caught. With the rain and all of the activities getting home in the rain, I lost track of time and that little detail.

no rain followed by drizzle and downpour, and on and on.

Things were starting to look up when I got to Steelville- it wasn't raining and the stream wasn't high. Only three folks initially showed up to collect - Dave Hemmerlein (our speaker on Thursday night), his son D.J., and Jack Heller (Dave's guide).

Saturday, June 22, 2019 by Tom Keevin

I WOKE EARLY ON Saturday morning looking forward to a day of fish collecting.

Because we were going to meet in Steelville, MO, at 9:00 am I had to leave the house around 7:15 am. The morning TV weather report was really iffy and the trip down to Steelville confirmed the weather report - no rain - then drizzle - then downpour, then

A reminder to potential fishermen that Missouri's water laws as they relate to trespass are different than many might expect because Missouri's water and trespass laws can be interpreted as a "western doctrine," and differs from many states east of the Mississippi River. In Missouri, the landowner owns the bottom of stream (and the banks), therefore, anytime someone sets foot on the bottom of a stream, even in "floatable" waters, they are technically trespassing. Missouri also has a "right of portage" law, which states if a floatable stream is blocked (say by a log jam), the floater is allowed "reasonable portage" around the obstruction and, therefore, is not deemed as "trespassing."

Under Missouri law, surface water belongs to the state, thus anyone can float a stream of any size and so long as they do not step onto ground they are not trespassing. No one can run you off "their stream" if you are floating, but as soon as you tie up to (like with a rope or anchor) or touch ground, then you are trespassing unless you have received permission to be on private property by the landowner.

Dave wanted to find Southern Redbelly Dace. Of course, the Southern Redbelly Dace is really common in the headwaters of the small creeks in west St. Louis County (Fox, Antire, Wildhorse, and others), no real need to go to Steelville.

The creek was crystal clear, shallow, wider and with more flow than I expected, and the water was really cold. It was obvious that there was a large spring somewhere up stream. The fish fauna was what you would expect from an Ozark headwater stream. We collected the Southern Redbelly Dace, Central Stoneroller, Mottled Sculpin, Fantail Darter, Missouri Saddled Darter, Bluegill, and probably a Blackspotted Topminnow - it was very small and was bleached out from sitting in a white cooler.

The Missouri Saddle Darter was unusual, usually being found in larger Ozark streams. After collecting for roughly ½ hour, the skies finally really opened up and unleashed a torrential rainstorm. Collecting was finished for the day.

The rain took care of the photos I was going to take of the fish species we caught. I'm sure we would have collected more species of fish, but the short sampling time and small sampling crew created their own limitations.

Photos by Tom Keevin

Calculations with Dechlor

OR

It can be easy to Get Too Much of a Good Thing!

-

By Gary Lange

A while back I went over to a good friend's house to take some pictures of one of his newest fishes for a publication.

When you are shooting for a magazine or trying to provide an image for publication you try and make it as clear a picture as possible. To do so, you use sparkling clear fresh water and make sure you have the front aquarium glass well cleaned. There is nothing worse than a photo taken in dirty yellow water in an aquarium with a lot of scratches, algae patches or water marks. So there we were with our 2.5 gallon perfect "photo tank" setting it up with freshly prepared 24 hour aged water.

The only problem was that the aged water contained thousands of tiny white pieces of "something". Those tiny white pieces caused huge reflections from the flash on the camera and it almost looked like it was snowing in the aquarium when you looked at the image. Several minutes of swishing a brine shrimp net around the tank corralled most of the pieces but many tiny pieces still remained as you can see in the photo.

After a little brainstorming and inspecting his water barrels we realized that it was flakes of the dechlorinator that he uses. Rather than make up a stock solution, He used 3/4th of a teaspoon (3.87 grams) of the crystals straight into the 55 gallon barrel used to age his water.

Most of you are familiar with this particular product even if you don't remember the name: Sodium Thiosulfate. Its sold at the back of the room at every MASI meeting in a 500 gram bag. The suggestion is to make a stock solution from one 500 gram bag by dissolving it into one gallon of water (1 gallon is also 3,785 milliliters) which makes enough to treat 19,000 gallons. It is suggested that you treat with 4 drops per gallon of new water.

A packet of sodium thiosulfate containing 500 grams treats 19,000 gallons. Therefore the correct amount in grams to treat 55 gallons is:

Amount needed = (55 gallons X 500 grams)/19000 gallons or 1.45 grams are needed to treat a 55 gallon drum.

Gallons to be treated with: NORMAL STOCK SOLUTION						
Treat	1	5	10	50	100	Gallon
Amount to Use:						
Oz	0.01	0.03	0.07	0.34	0.67	Oz
Tsp	0.04	0.21	0.42	2.1	4.2	Tsp
cc/ml	0.2	1	2	10	20	cc/ml
Drops	4	20	40	200	400	Drops

After working up this math I realized that he was using over three times the amount safely needed and this was causing the snowfall in our photo tank.

When dealing with very small amounts in difficult to measure quantities, such as this, sometimes it is much easier to convert/dilute to a liquid and use a relatively larger and more easily measured amount. It is also difficult to dissolve in cold water, as would come from the tap to fill the barrel.

Using Drops are relatively easy for small amounts. So quick, it's 11 pm, you're tired and you're doing a 50% water change on a 15 gallon aquarium. How many drops do you add? Answer: changing 7.5 Gal * 4 drops per gallon is 30 drops

However, I don't know about you but I start losing count when I have to count to 220 drops for a 55 gallon barrel! So if you have a diluted solution already and you are really tired of counting, how many teaspoons of his dechlor do you need for a 55 gallon barrel?

Let's do that math as well. We'll make the following assumptions:

A drop of water is very very close to 0.05 milliliters so there are about 20 drops per milliliter.

A teaspoon is 5 ml so 100 drops is also very very close to a teaspoon.

That 220 drops for a 55 gallon barrel of water now becomes about 2 and 1/4th teaspoons; or one could measure it as 11 ml/cc .

In my opinion, that's way better than counting to 220 every time you fill that barrel. Its also more accurate than trying to measure out enough dry material and over dosing just to be safe.

A smaller amount would be a quick and dirty estimate of 40 drops per 10 gal X 0.05 ml/drop = 2 ml or just under one half teaspoon for every 10 gallons to be safened.

Note: If your teaspoon/tablespoon has either "cc's" or "ml" they are different names for the same measurement.

Even if you are using the correct amount, is it Dissolved?

Another reason not to use crystal sodium thiosulfate in your barrel (or aquarium) is you can't always be sure the crystals have completely dissolved. I know of an aquarist who didn't completely dissolve the crystals before adding it to the aquariums and he lost a lot of fish. It is kind of hard to see the bottom of a black barrel to make sure it's all dissolved but this damage could have simply been avoided by ensuring the stock solution was completely dissolved!

In future articles I'll point out some problems I've had when using sodium thiosulfate and tell you how to make an even more concentrated solution (Super Dechlor) of water safener.

Editor's note: If you want to do all your measuring in ML or CC, large syringes are available at low cost in the veterinary supply of farm stores that let you read the gauge directly.

Add a piece of flexible airline tubing and a piece of rigid air tubing to complete the tool.

From My Fishroom - Spring Events & ALA Convention -

By Rick Tinklenberg

For me, this spring was a busy time of the year, with many fishy events. The Quad Cities Swap Meet was held in mid-April, which was just as well attended as last year. The trip up there was quite an adventure, with 4" + of slushy, slippery snow. Chuck was driving, we fishtailed at least once, but he handled it like a journeyman. On the way back, the roads were clear! That's the Midwest for you.

Two weeks later was the MASI Swap and Auction weekend. Also well attended and as a Swap vendor, I nearly sold out. The Auction was excellent as usual, and I find the new auction rules are really working out for me. It was another great weekend.

2019 American Livebearers Association Convention in Louisville, KY

The premier event this spring was the American Livebearer Association (ALA) Convention held in Louisville, Kentucky.

I had not attended an ALA Convention in many years and was really looking forward to this one. Conventions are made up of many parts: the tours, rare fish auctions, meetings, show fish, hospitality room, room sales vendors and most importantly, "The Talks".

To start things off with a splash was the welcome BBQ & Wessel fish house tour with a rare fish auction (and I do mean, rare!) I have wanted to see Rusty Wessel's fish house for many years, so this was very interesting for me. The Wessel compound consists of the fish house, two very large and extremely fantastic koi ponds, a natural pond, a patio area with lots of seating, some houses and a garage.

The fish house is excellent, filled with rare and common fish from Rusty's many collecting trips into Mexico and Central America and I was not disappointed!


Inside Rusty's Fish House

We were served two items at the BBQ that I had not eaten before, BBQed Bologna and BBQed turkey ribs. The Bologna was good, but the turkey ribs were great. You would think the fish house, koi ponds and BBQ would be enough, but the rare fish auction was the real excitement for the night!

Rusty had pulled together a group of livebearers and a few cichlids from his fish house and a donation from the Xiphophorus Study Group, many of which I had never seen for sale. The star of the night was the *Alloophorus robustus* for which the bidding went extremely high! This is the largest of the goodeids and is rarely available and two bidders did not want to give in. By the end of the auction, a great deal of money was collected for donation to worthy fish related activities.


Convention Hotel

On Friday, my wife and I skipped a tour and went antique shopping. We had a great time and even got a treat at Stone Cold Creamery.

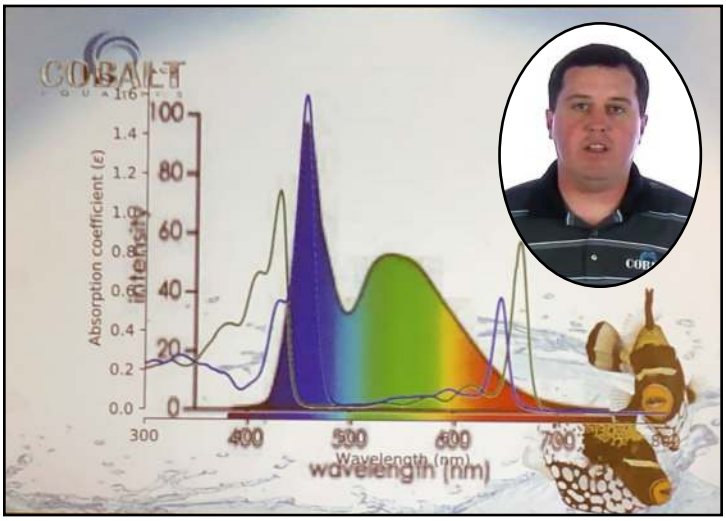
We were back at the convention hotel by 5 pm for the Goodeid Working Group (GWG) meeting and rare fish auction. Dr. John Lyons moderated the meeting, which was a summary of the activities of the GWG for the past year and a look forward to the coming year. Many of the projects are funded

by the rare fish auctions and by fish clubs like MASI. This rare fish auction was also extremely lively, and prices were high. Also, on Friday, show fish started to appear in show tanks and at 8 pm, the hospitality room opened with a dry good goods auction.

Saturday was an extremely full day, with a Board of Directors meeting, fish judging and "The Talks". I would like to point out that nearly all the talks were given by PhDs, which gives a high level of professionalism to the convention.

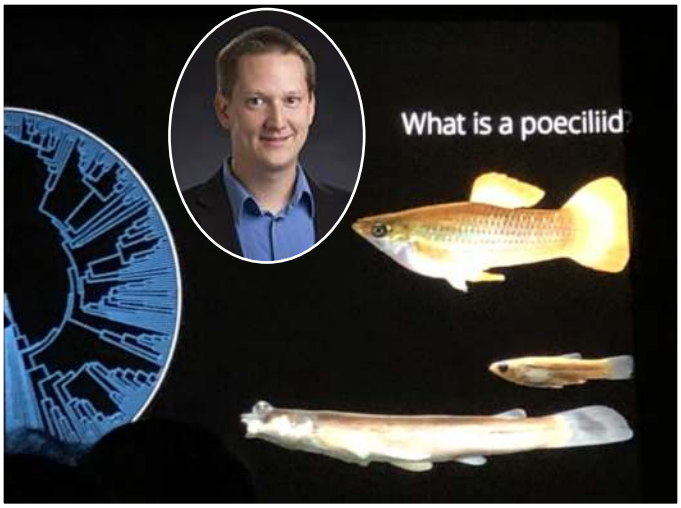
Dr. Horacio Dominguez started the day with his talk about raising guppies on a commercial scale in Mexico. He spoke of the day to day operations as well as challenges they had faced and improvements that were made. One comment he made was, "If I had more room". So, if you are a hobbyist fish keeper or a commercial operation, the lament is "if I had more room". I guess only nature has "enough room"!

Lee Wilson, with our sponsor, Cobalt, spoke on LED lighting. I found him very interesting- to the point that I even took notes.



Dr Michi Tobler spoke on *Poecilia*. His dynamic and energetic delivery kept all of us focused on his subject. When his story about looking for a "Lost stream" and finding it concluded, I wanted to clap.

For me, the most important talk was given by Dr. Omar Dominguez. He spoke about the reintroduction of *Zoogoneticus tequila* back into its natural environment, a



Goodeid that was extinct in nature but survived in hobbyists aquariums.

Dr. Domingues lead a group who overcame all the obstacles, including raising enough fish to make the reintroduction possible. It is one year into the reintroduction and the fish are doing well and even increasing in population. The reintroduction will be

ALA 2019 Convention Schedule

Thursday, May 23rd

6 - 9 PM Welcome BBQ & Wessel Fish House Tour with Rare Fish Auction

Friday, May 24th

8 AM - 4 PM Kentucky Derby Museum & Buffalo Trace Distillery Tour

5 PM Goodeid Working Group Meeting & Rare Fish Auction

8 - 11 PM Hospitality Room Open Including Dry Goods Auction Promptly at 8PM

Saturday, May 25th

8 AM Board of Director's Meeting

9 - 10:15 AM Horatio Dominguez, PhD - Commercial Guppy Production

10:30 - Noon Les Wilson - LED Review and Updates

Noon Kid's Tank Decorating Event

1 - 2:15 PM Michi Tobler, PhD - *Poecilids* of the World

2:30 - 3:45 PM Omar Dominguez, PhD - Reintroduction of *Zoogoneticus tequila* into the wild

4 - 5 PM John Lyons, PhD - Easy Vacation Collecting in Mexico

5 PM Wine Tasting

6 PM Banquet & Awards - Sandy Moore - Legislation Surrounding the Aquarium Hobby

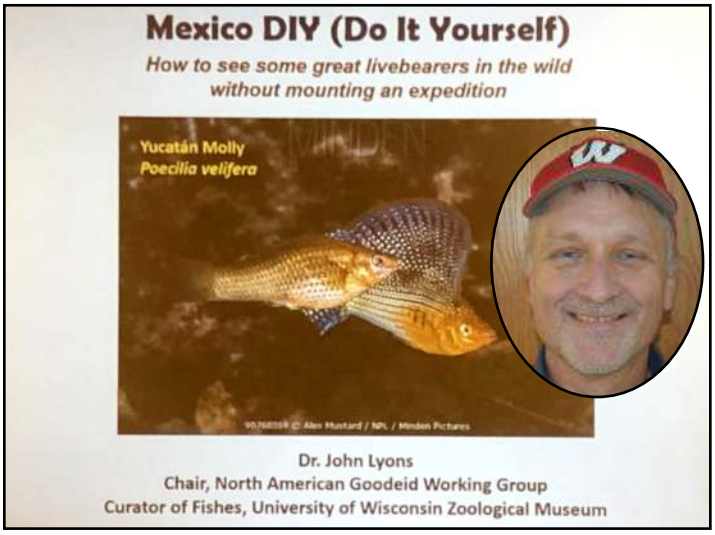
8 PM Board of Director's Meeting

8 - 11 PM Hospitality Room Open/Room Sales

Sunday, May 26th

10 AM Auction Begins/Show Room Cleared

officially recognized after the fish have been established for 5 years. Here is proof that fish keeping is not a frivolous hobby but provides value to the natural world. MASI has made significant donations of funds and members of the club provided fish to this effort ! Wow!



Dr. John Lyons gave the last talk about catching fish while on vacation. If you are staying in safe areas of Mexico, bring nets, catch cups, etc. along. When you are near water, you can sample the local fish to see what lives in that area, making sure to obey all local laws. It's a great way to expand your trip and learn more about fish.

Saturday evening started with Wine Tasting, then the banquet with speaker Sandy Moore, President of Segrest Farms followed by the awards. **The Cover of this DARTER issue are some of the Fish Award winners from the ALA Convention Show.**

Then later more fellowship in the hospitality room and viewing of show fish.

During the whole convention, the vendor room called to me, "Swiss Tropicals" with food, filters and more, my favorite, "The Fish Factory" with books, books and more books. Cobalt, who was giving away fish food, Segrest Farms' donated fish and many others. –Don't forget the goodie bags, which I thought were exceptional.

I think there are many reasons to go to the ALA conventions and by getting involved in the activities, it was a great time. Please consider attending in Florida next year. I hear collecting fish down there is a great fun!!

A humble Thank You to the Louisville Tropical Fish Fanciers club, who showed me a great time in Kentucky!

Minifins

-

Barbodes semifasciolatus

The Gold Barb

–

By Mike Hellweg, CFN
(Certifiable Fish Nut)

THE LEGEND OF the origin of the gold barb is an aquarium hobby mystery story that goes back to the early days of the hobby's great expansion after the Second World War, most likely it developed in the late 1940's.

The first reference to this fish in hobby literature I have found is dated 1951, which means it was well established by then. By the mid-1950's, it can be found in trade catalogs and was noted in books of the day. It is reported to have first appeared as a xanthic sport of *Barbodes semifasciolatus* from a spawn of wild type fish from southern China. This is reported to have happened in the tanks of the well-known New Jersey breeder Thomas Schubert. With careful tending and line breeding, Mr. Schubert was able to establish a true breeding strain. By the early 1960's the hobby literature was calling this golden strain *Puntius "schuberti"* in his honor but this was never a valid name.

The golden form became so popular that by the late-1950's it had replaced the wild type fish almost completely in the trade. To add to the confusion, somewhere along the line the common name of gold barb also became attached to *Puntius sachsi*.

Like most popular barbs, Gold Barbs are not picky about water parameters and are greedy feeders.

Recently it was moved to the genus *Barbodes* and now you can find the gold barb online and in literature as *Barbodes semifasciolatus, Puntius semifasciolatus, P. semifasciolatus shuberti, P. schuberti*, or *P. sachsi*! In addition, many European authors don't recognize the genus *Puntius* and put all barbs in the catch-all genus of *Barbus*! So this one little fish, a domestically developed strain, can be found by searching for as many as 9 different "scientific" names! Whew!

While their history is a bit cloudy, no one can argue that the gold barb is a striking aquarium resident that is a perfect fish for the community tank. Their bold yellow coloration highlighted with moss green on their flanks and bright orange to red fins, their friendly demeanor, and their bold nature that keeps them out in the open all day long, help to win them many fans. Many long time and advanced hobbyists, including me, keep them in at least one tank even to this day.

Like their distant cousin the goldfish, the gold barb is fun to watch and a great reminder that this is one of the main reasons for our hobby - the pure, relaxing joy of sitting in front of a tank of fish, just watching them. Gold barbs also do very well in tub gardens and ponds outdoors for much of the year, though they cannot overwinter in St. Louis, so they have to come in late in September. They can usually be

among the first fish to move out in the spring, as soon as the water temperature hits the mid-60s.

Since gold barbs are domestically produced fish, all fish are farm or hatchery raised. While they don't bring a lot of money, they breed easily and are always in demand so many local breeders produce them. This means that you can often buy locally raised fish from your local aquarium store. They can also be found at local aquarium club auctions and even from online sellers.

Like most popular barbs, they are not picky about water parameters and are greedy feeders. They will eat any type of aquarium fare. To enhance their colors, you should feed them with special foods designed to bring out colors by the addition of natural pigment enhancing foods like astyxanthin, spirulina, and carotene. I feed my gold barbs a staple diet of spirulina based flakes along with fresh vegetables a couple of times a week.

Spawning

To bring them into spawning condition, separate the females from the main tank. I enhance their diet with frozen meaty foods like brine shrimp, mysis, and bloodworms along with live foods like white or black worms, small earthworms, and daphnia for a week to ten days prior to spawning.

A simple spawning setup will produce all of the gold barbs you could ever want. Give them a 5 to 10-gallon tank with a bare bottom in a room that gets some natural light early in the morning. Add a half dozen or so yarn spawning mops, some floating and some sinking, at one end of the tank. Make sure the tank is covered, too, as the spawning frenzy can become hectic and fish have been known to wind up on the floor otherwise.

Add the female to the tank and give her time to settle in. Add the male in the evening before the lights in the room are turned off for the night. Some breeders like to add two males, but I've found that the extra fish often winds up eating eggs!

They will spawn at first light the next morning. If the male doesn't begin courting, the female will often begin courtship, nudging the male. After a hectic chase, the pair will move into the spawning mops and quiver together side by side, the female releasing a dozen or so eggs and the male fertilizing them. This will be repeated several times over the next couple of hours until from a couple hundred to as many as 400 eggs are laid in the spawning mops.

At this point, remove the parents as they will now be tired and hungry and are not above eating their own progeny.

Raising the Fry

The eggs take two to three days to hatch, depending on temperature. The fry remain on the bottom for a day or two after that, then are found hanging on the glass and mops for another day or two. Then they begin the first attempts at swimming in short hops. By the next day, all will be up and swimming, looking for their first meal. They will take commercial fry foods for egg layers, microworms, and by the third or fourth day, newly hatched brine shrimp. When all are eating brine shrimp, you can discontinue the commercial fry food.

From this point on, growth is rapid and by the age of two months the fry will be large enough for you to have to find homes for them. Fortunately they are always in demand and you can usually trade them in at local shops in exchange for food and other supplies- if you have built up a good relationship with the owner and they know you as a good customer.

SHOP HOPPING - St Louis Area, 2020

These Local Fish Shops (LFS) help introduce hundreds of people to the Aquatic Hobby every day.

They also help the Missouri Aquarium Society reach those hobbyists and keep them engaged by promoting our programs. **Support their programs too!**

Happy Fish Shopping!

The Missouri Aquarium Society

Local Fish Shop	Location	Phone
AquaWorld, Gravois	St Louis, MO	(314) 772-0100
AquaWorld, Manchester	Ellisville, MO	(636) 391-0100
Corals-n-More	St Charles, MO	(636) 757-3684
Lualyn Aquatic Gems	Maryville, IL	(618) 514-9571
Malawi Aquatics	Florissant, MO	(314) 830-6460
Midwest Tropical Fish	Jerseyville, IL	(618) 946-7408
Pet Connection	St Louis, MO	(314) 773-7387
Petco, N Lindburgh	Florissant, MO	(314) 839-5136
Sailfin Pet Shop	Champaign, IL	(217) 352-1121
Saltwater Paradise	Fairview Heights, IL	(618) 514-9571
Seascape Studios	St Louis, MO	(314) 843-3636
Tropical World Pets	Webster Groves, MO	(314) 849-4020

Texas Cichlid

Herichthys cynoguttatus

-

by Beth Hall

Reprinted from:

Atlanta Area Aquarium Association (AAAA) Fish Talk Newsletter June 2019

The Texas Cichlid was originally part of the genus Cichlasoma until this group was restricted to South American cichlid species.

The fish is now a part of Herichthys, which is defined as cichlids that "share a color pattern of short vertical bars and black spots posteriorly from the middle of the side, and a unique breeding color pattern in which the dorsal half of the entire head and anterior flank region turns a pale grayish color in contrast to black or dark gray adjacent areas, or the entire body turns pale. Other common names: Pearlscale Cichlid and Rio Grande cichlid.

This is the only cichlid species that is native to the United States, and originates from the lower Rio Grande drainage in Texas near Brownsville and Northeastern Mexico. The Texas Cichlid has an omnivorous diet that consists of vegetable matter or detritus, often feasting on plants, insects, and smaller fish as well as fish eggs.

They can grow to 8-12." A tank of at least 100 gallons is recommended for keeping adults. My 9-month-old Texas Cichlids surprised me by pairing off in my 80-gallon community tank, which had other Texas Cichlids, ancistrus, clown loaches, tri-color sharks, and green corries. The tank was set up with gravel, rocks, drift wood and live plants to model the needs of South American Cichlids.

I did nothing special to the tank except regular water changes. The tank had a hang on the back filter and compact fluorescent lighting. The PH in the tank is what occurs naturally from my water source about 6.2-6.5. The temperature was about 80 degrees. The parents were fed a good quality flake food and shrimp pellets.

After the fry became free swimming, I let the fry forage on the naturally occurring food in the hornwort, moss, ferns, and other plants. My pair consisted of a larger male and a smaller female.

I knew they were spawning because they turned black along the face and lower body and began to aggressively guard the “cave.” The pair spawned in an area that was easily defended. The "cave" was made from several stacked rocks on top of a fine to medium gravel base.

This was the second time they spawned. The first time the fry were eaten by others in the tank. On the second spawn, the parents were successful in raising the fry to the free-swimming stage where I separated the fry to a grow up tank.

The pair cleaned the spawning area by nipping the surface of the rocks and gravel. The female released between 1-5 eggs at a time. The male then excreted a seminal fluid onto the eggs to fertilize them. They repeated the process multiple times.

I read that they can lay up to 2000 eggs each time they spawn. During the egg stage, both parents alternate in the parental tasks, though males spend more time patrolling territory and females spend more time actively attending to the offspring by fanning the eggs. At certain intervals, the female cichlid stops fanning the eggs and begins nipping at them.

The eggs then hatch into wrigglers with yolk sacks which are absorbed after one week and the wrigglers become free-swimming fry. The parents herded the fry around the tank and defended the fry against the other fish in the tank.

Corydoras CW124

Collecting, Keeping & Breeding an undescribed catfish species from Peru

by Don Kinyon

Reprinted from:

Aquarium Club of Lancaster Co. (ACLC) Tank Tales Newsletter

April 2018

First caught CW124— Photo by David Snell

IF EVER YOU have the chance to venture to South America (or anywhere else) to collect your own fish, don't think about it: just do it.

In October of 2017 I was fortunate enough to be included on a collecting trip to the Madre de Dios area of Peru and I wouldn't trade the experience for anything. We were able to collect a variety of fishes, with our sights set on *Corydoras* species. One of the species that we found was a yet undescribed *Corydoras*: the CW124.

CW124 is an average size species for a *Corydoras* with the males reaching around two inches and the females just a little larger, perhaps two and one-quarter inches. This is a long-nosed species. The body color is a charcoal pattern over a white background, with the pattern being darker and more distinct on the males. The pattern coloration is darker near the center of the body and fades out toward the outer edges and the tail. The fins are clear for the most part, but on some individuals the first ray of the dorsal and pectorals fins is dark. Under light, the head will reflect a metallic green; again, more prevalent in the males. The females body is a little more stout than the male, but the dimorphism is not as great as it is with others of the genus.

We collected these fish on pastureland in the Madre de Dios area. It was fair walk to the site from the road, but well worth it. The collecting area consisted of a small pool and outflowing stream. Water came into the pool from a very shallow, swampy area of the forest. The pool itself was perhaps 15 feet across, 30 or 40 feet in length and 2 feet deep. The stream flowing away from the pool was very small and shallow: in many spots you could walk across with one step and barely get your ankle wet in the middle. Most of the pool was exposed to the sun, so the temperature was much warmer than most keepers' idea of Corydoras temps: 81°F. The farther downstream the water flowed

CW124 habitat - Photo by David Snell

into the forest, the cooler it became. The pH was between 6.5 and 7.0, TDS at 16ppm.

We collected a variety of fish in the small pool and stream; Corydoras, Ancistrus, and Characins. Most of the adult CW124 were found in the pool, while many of the younger of the species in the outflow stream. For conservations' sake, we only took adults and limited ourselves to 12: three pair for me and three pair for another member of our group.

Our guided collecting tour provider, Go Wild Peru, has an aquarium room on site with plenty of soft water at the perfect temperature for water changes, so keeping the fish healthy for the week was made relatively easy. One of us (usually me) did water changes daily at a rate of 30 to 50 percent. All the CW124 were in very good shape when we left at the end of the week, and several weeks later when they were shipped to the US, they were still very healthy.

Once the fish came home, their new digs consisted of a 55-gallon aquarium; not because I thought the six fish needed that much room, but it was the only thing available at the time. I tried to duplicate the conditions of their natural home, filling the tank with almost 100% rain water and using two outside filters along with a small wavemaker for current. The bottom of the tank had a thin layer of brown sand. A few broad-leaved Anubias and some sunken wood gave cover for the wild fish. One yarn mop was hung near the wavemaker, looking like a bunch of water plants caught in the flow of the stream. pH was 6.0, TDS at 55 ppm, and temperature was 70°F; much cooler than their natural home.

We collected a variety of fish in the small pool and stream; Corydoras, Ancistrus, and Characins.

The first thing that was noticed about this species is that they're very active fish, and on the aggressive side (for Corydoras). The males almost constantly chased each other and sometimes the females would join in as well. There was a lot of bumping and sparring, but nothing that looked like it was a danger to the fish's health. With all the activity going on, it's probably a good thing the larger tank was the only one I had available for these fish at the time.

A few days after they arrived, one of the males was found dead; wedged behind the uplift tube on one of the HOB filters. I'm not sure what happened, whether it was the aggression of the other males or perhaps a wound or disease from the shipping process. None of the other fish showed any signs of distress.

CW124 Eggs—Photo by Author

After the new catfish had been in their new home for a few weeks, they became even more active and spent a good deal of their time swimming into the current produced by the filters and wavemaker. One morning while feeding them, I noticed that two of the females were swimming right into the mop which was still flowing in the current from the wavemaker. Removing the mop and making a quick inspection revealed many very small, dark amber colored eggs: about 1mm in diameter. That mop was taken to a hatching tank of around 6 gallons, filled with water from the breeding tank. I replaced it with a clean mop and set watch on the hatching tank. Besides the mops, the hatching tank held a sponge filter, a thin layer of sand, and some java moss.

It took two days for the first free swimming CW124 to emerge, and they were difficult to see in the brown sand. At that time, I checked the mop in the breeding tank. It was loaded up with eggs, just like the first, so it was added to the hatching tank as well. Two days later, the process was repeated, with more eggs in another mop added to the hatching tank. Now it was time to stop: no more empty tanks to put mops into and when the hatching tank was flashlighted after the room lights were out, so many fry were present that it appeared the sand itself was moving.

It was hard to estimate the number of young catfish, but I'd guess somewhere between 100 and 150 had hatched out in the small tank. This created a real problem with crowding. Call it a blessing in disguise or not, but I was kept out of work for several months recovering from rotator cuff surgery due to a misadventure with a log splitter. This was very good for my fish room maintenance, but not for all other aspects of life. With nothing but time on my hands, one-armed water changes once or twice a day became the routine. The changes were small at first; maybe 15 or 20 percent for the first few weeks, giving the young fish's air bladders to develop, then larger changes of around 50% were the norm. Even in such a small tank, all the fresh water kept the fish healthy and the tank clean. Eventually, I started using tap water for the changes; pH of 7.2 and TDS of 140 ppm. There was no heater in the hatching/rearing tank and the temperature remained in the low to mid-seventies.

I noticed that two of the females were swimming right into the mop which was still flowing in the current from the wavemaker.

Feeding the young isn't difficult. They always seem to be hungry and accept anything that they can fit into their small mouths. Microworms, decapsulated brine shrimp eggs, Golden Pearls and other micro foods were fed in rotation twice a day. Even with all the good food and fresh water, these Corydoras grow slowly. At three weeks they were just over one quarter inch in length and at five weeks, barely three eighths. They are very active both day and night, much like the parents and a very interesting fish to watch.

At this writing the young catfish are six weeks old and looking very healthy. Though not common in the hobby and quite possibly not imported to this point, I believe this Corydoras will be a popular fish in the future among both Catfish enthusiasts and general hobbyists. With the ease of care and prolificity of this fish, I don't believe it will be uncommon in the hobby for very long.


Young Fry

Breeding *Microgeophagus ramirezi*

by John Stoller

Reprinted from:

Circle City Aquarium Club, Indianapolis (CCAC) Fancy Fins Newsletter October 2018

Parents tending fry

I'VE ALWAYS BEEN a fan of South American dwarf cichlids, particularly the German Blue Ram (*Microgeophagus ramirezi*).

After a long sabbatical from the hobby, I acquired a few tanks and began looking for a few interesting dwarf cichlids. When I didn't find anything at my local fish stores, I turned to Aquabid online. I was awestruck with a new color variety of my beloved rams, the Electric Blue Ram. I purchased a group from a seller with the handle of Coral Bandit and set about enjoying my new acquisitions. I placed my original group in a planted 20L. Within weeks I had two fish pair off, lay eggs and eventually produce a shoal of 40 or so fry. Although I was not able to bring that group of fry to adulthood, I was able to learn a few lessons and successfully rear their offspring.

Obtaining a Pair

To obtain a pair, I start with a group in a species only tank. A 20L will suffice, but a larger tank will work as well. It is my personal preference, but I like some black sand and a black background on the tank as I feel this brings out the colors best. From a group of six and the right conditions, you will almost certainly have some fish pair off.

Rams prefer very clean and soft water and a much higher temperature than most commonly kept fish. For filtration, I use sponge filters. I use a mix of mostly R.O. and some tap water. I keep the temperature between 82° and 84° F. I don't pay much attention to pH. I do 20-50% water changes at least weekly.

I keep a few "low-tech" plants in my tanks such as java moss, java fern, and water sprite. Rams prefer to span on smooth rocks on the bottom of the tank so I provide a number of rocks and clay pots scattered across the bottom of the tank. I add driftwood to the group tank, but only for aesthetics.

I feed my rams a variety of foods but with strong preference for live black worms. I also feed frozen daphnia, frozen brine shrimp, and Ken's Blackworm flakes.

Conditioning and Spawning

Once I have a pair, I setup a 10-gallon tank, in a similar manner to the group tank. I make sure that there are several spawning sites. Optionally, I will add one or two dither fish such as glow-lite tetras or Endler guppies.

To condition the pair, I alternate feeding live blackworms one day and frozen brine shrimp the next. I also pay close attention to the upcoming weather. When I know a cold front or storm system will be passing through, I will do daily 30% water changes for several days. The change in barometric pressure, the live food, the clean water all work together to trigger the spawning.

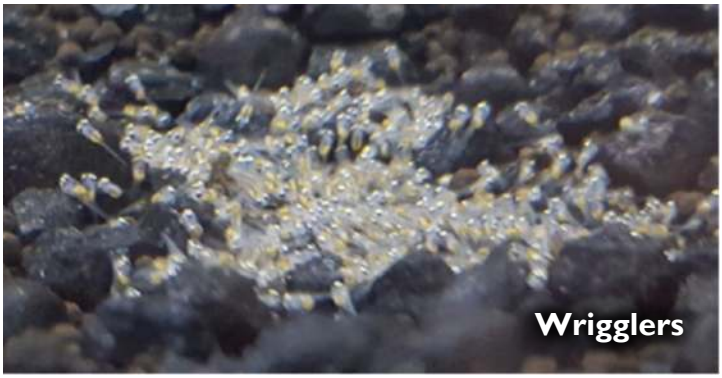
Prior to spawning, the female's ovipositor tube will be protruded. It may be extended for even a few days before the spawn. When a spawning does occur, it seems to be in the after noon or early evening. The process of laying eggs may take several hours.

Hatching and Raising

Once a spawn has occurred, it is my preference to leave the eggs with the parents. It is my experience that they will diligently work to keep any infertile eggs from spreading fungus to the others. The eggs will hatch in about three days.

As the eggs hatch, the parents will move them to a nearby pit in the sand. The wrigglers will look like a small grey mass. When all the eggs have hatch, form me it is decision time. I have to choose whether I am going to raise the fry with the parents, or on a separate tank. I enjoy watching


Guarding eggs


Wrigglers

the fry being herded by the parents. If I take this route, then I need to plan on moving the parents to a new tank in about two weeks.

If I'm going to raise the fry separately, I set up a Marina Hatchery box on the spawning tank. I move the fry to the Marina box. The Marina hatchery has two advantages:

1) The fry are in a small space and will have a better chance of finding food.

2) Because it pulls in water from the larger tank, it has better water quality and continuous water changes.

Using this approach, I have a 2 ½ gallon, bare bottom tank already set up and transfer the fry there after about two weeks.

About the sixth day after spawning, some wrigglers may be ready to take foods. I feed a mix of micro worms and vinegar eels. I like that the eels live a little longer in the water, but they tend to migrate to the surface. The micro worms tend to drift to the bottom.

Six to seven days begin looking for the "fry cloud". That is, the fry become free swimming. At this point, begin to consider feeding the fry in earnest. Once the fry cloud appears, the fry can eat newly hatch baby brine shrimp. I feed three times per day if its is possible.

I generally don't start water changes back up until the fry are at least a week past free swimming. At that point, I will do 10% daily changes, using fresh RO water heated to 84° F. As the fry get older and stronger, I increase the amount of each change, but tend to back off doing them daily. After one month, I don't use heated water, just my normal room temperature.

FISHES AS DISHES

PATRICK A. TOSIE, SR.

We all love our fish! This column is dedicated to using fish for something tasty to enjoy. Try it, you may like it. If you have leftovers, bring them to a monthly meeting for others to enjoy!

Blackened Tilapia

Ingredients:

FOR TILAPIA

2 tbsp. packed brown sugar
4 tsp. ground cumin
2 tsp. kosher salt
2 tsp. paprika
2 tsp. dried oregano
1 tsp. freshly ground black pepper
1 tsp. garlic powder
4 (6-oz.) tilapia filets
2 tbsp. extra-virgin olive oil

FOR AVOCADO SALSA

2 avocados, diced
2 tomatoes, diced
1 jalapeño, minced
2 tbsp. chopped cilantro
2 tbsp. extra-virgin olive oil
Juice of 1 lime
Kosher salt
Freshly ground black pepper

Directions:

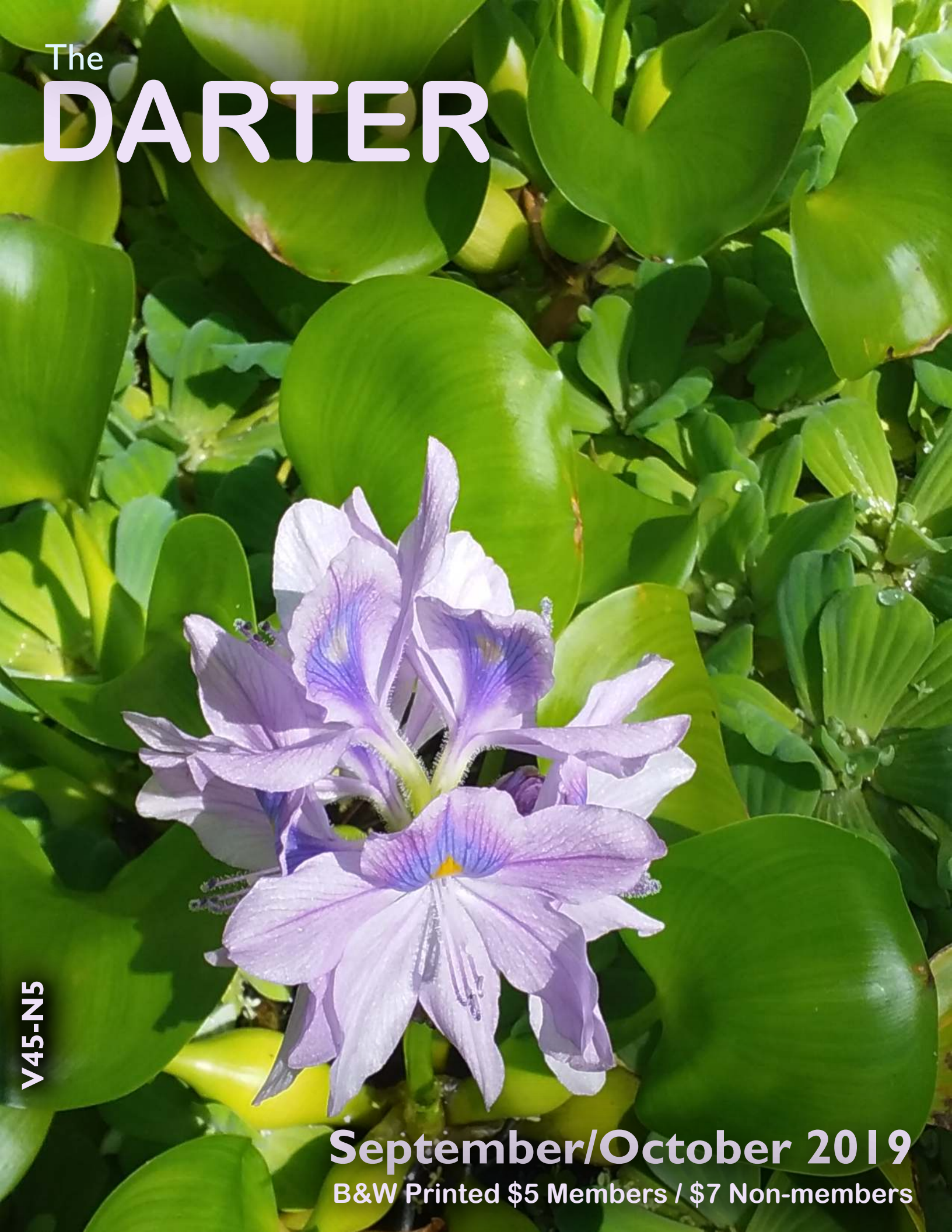
In a small bowl, combine brown sugar and spices. Rub spice mix all over tilapia. In a large cast-iron skillet over medium heat, heat oil. Add tilapia and cook until crust is deeply golden and fish flakes easily with a fork, 2 to 3 minutes per side.

In a medium bowl, toss avocado, tomato, jalapeño, and cilantro. Add oil and lime juice and season with salt and pepper.

Serve tilapia topped with avocado salsa.

Total Time: 15 Minutes prep, 25 minutes to make. Makes 4 servings

The DARTER



V45-N5

September/October 2019

B&W Printed $5 Members / $7 Non-members

Meet MASI Fishy Folk:

Mike Slater

- **Family members?** Spouse, Kathy, a Macoupin County Master Gardener and the force behind our daylily farm.
- **Years keeping fish?** Fifty Seven, starting in 5th grade and taking home some guppies from the class aquarium at the end of the year. Had at least one tank going except for the 6 months in Army training.
- **What was in your first tank?** Guppies
- **How many tanks do you have set up right now?** Defined as glass cubic rectangles, I have 40 set up.
- **Favorite fish as a pet?** Is that defined as having a given pet Name? then none.
- **Your dream tank?** A large tank of Tanganyika cichlds in a biotope setting with only fish from a certain place on the lake.
- **Your realistic dream tank?** Maybe a smaller tank of same
- **Your latest fish related accomplishment?** Finally spawning and raising Discus after many years.
- **Your latest goal?** Repeating that success.
- **Other pets?** Over the years Kathy and I have owned, bred and shown Doberman pinschers and Whippets. We also owned, showed and finished Championships on 2 half-brother Miniature Wire-haired Dachshunds. Presently we have stopped the breeding and are simply racing our whippets around the country in racing events –not literally racing them, they're way faster than us!

Jars from Betta breeding

Fish Room Entry…

…and Exit.

after the Army I bred Brichardi. Before I joined I bred Serpae tetras, Pearl Gouramis, and some Cories. I had my own list going but I seem to have misplaced it. I was also a member of SLAKA and bred several killies including winning Best Nothobranchius in Show at the Annual AKA Show they hosted with my pair of N. Guentheri.

I recently did a bucket list trip to Peru with Michael Barber and cruised the Amazon collecting various fish. The highlight was a night-time side trip up the Nanay River collecting wild Discus.

Editor note: *Mike's Fishroom is accompanied by an innovative rainwater collection and management system that allows him to utilize nearly 100% rainwater for water changes.*

Anything else?

Over my lifetime, I have been intrigued first with Betta splendens, even giving a talk on their genetics in a Freshman Science class in high school. –What a nerd! Twice in my life I bred Bettas, the second time recently and showed them in IBC shows, I was quite successful at a recent Annual Show and decided that it was not for me.

Since I started with guppies in 1962, I was always intrigued with Fancy Guppies and was introduced to Gateway Guppy Associates back in the early 1990s by Leroy McCreary and started showing in IFGA shows with some success. I stopped when we got heavy into breeding and showing our whippets in 1998. I'm back in it now and am waiting for some to become show-worthy.

Meanwhile I have always been into breeding other species, many before I was ever in MASI. In junior college and living at home, I bred zebra danios. In the 1970s I bred Convicts and Kribensis. Back in college at Illinois

Fish Pond Rescue

A Day in the Life of MASI Fish Rescue

-

By Mike Huber

MASI's FISH RESCUE, AKA John Van Asch, got a message from someone who had a pond overstocked with fish. So a rescue date was set for June 22 to help him out.

I was supposed to go native collecting already on that date with another group but I told John that first I would help him. We did not know how many people where going to be there, so I also called a friend of mine who has a lake and 2 ponds and wanted a few Koi and goldfish to put in his ponds and we contacted yet another MASI member who also has a pond and wanted some Koi and goldfish for his pond.

The three of us only lived a few miles from the rescue place so it was easy to get to. When the 1st friend and I arrived John was already their talking to the pond owner. So the three of us- the pond owner, my friend and I jumped in and started to seine the pond.

The owner had drained it to about four feet on the deep end. We made a couple of seine passes before the other MASI member showed up and jumped in to help.

The sides of the pond were uneven and difficulty keeping the seine against them created problems with the fish slipping past the seine along the sides of the pond. As we seined the pond and dipped fish out with a dip net, we handed them to John and he would put them into tubs and buckets.

After about two hours of effort we had about 70 fish removed from the pond, although the owner assured us their were many more there. But after a few seines without catching any fish we decided we would come back at a later date and try again if he wanted more fish removed.

As a rescue, we divided the fish up between the four of us and took them to the new homes in several ponds and a lake.

THANK you so much to the pond owner for letting us keep these fish!

My wife and I like sitting on our back porch and watching them in our water garden. We love to feed them and watch them eat and they give us so many hours of watching

Avoiding possible egg hatch issues with Sodium Thiosulfate

-

By Gary Lange

Pseudomugil ivantsoffi **(Blue-eye)- I couldn't solve the mystery of getting these eggs to hatch until I realized it was sodium thiosulfate that seemed to be the problem.**

Sodium Thiosulfate and Problems with hatching some types of eggs

Besides avoiding "snow" in your aquariums by adding too much dechlor there is another reason to be cautious with sodium thiosulfate or any other dechlorination solution.

If you are a breeder you might avoid using too much sodium thiosulfate or maybe even any dechlor at all for some fish. I first started thinking about this problem about a year ago when I was having trouble hatching two species of very interesting *Pseudomugils*. *Pseudomugil ivantsoffi* and *Ps. reticulatus* both tiny fish that have fairly large eggs. For me the eggs required at least a 2-3 week incubation period.

My problem was that I could see the fry developing quite nicely but it seemed like they could never make it out of the egg. They would just die instead of hatching and I was only getting perhaps ten percent of my viable eggs to hatch. To some extent this was also happening with some smaller *Pseudomugil* eggs like *Ps. gertrudae* "Aru II's" and *Ps. Luminatus*. I took my problem to the world's expert on breeding and raising P*seudomugils*, Wim Heemskerk, a Dutchman. He feels that sodium thiosulfate was causing a hardening of the egg membrane.

Since we have chloramines in our water in St. Louis and really most of Missouri I needed to remove the amine instead of degassing like you can commonly do when there is only chlorine in the water. Using a filter with activated carbon did the trick after a few hours AND my hatch rate for both of these species went way up.

I still have to perform a few more controls but for me I'm leaning toward sodium thiosulfate as the culprit. I was a killifish nut before being a "bowhead" so I am quite familiar with some of the ways both use to resolve hatching problems and none of them really worked for these *Pseudumugil* species.

Now that I am seeing this problem resolved with *Pseudomugils* I can only wonder if it might also be a problem for killifish in some cases, ESPECIALLY if one is drastically overdosing their water with dechlor. Killifish folks might consider if some hatching problems are perhaps related to a hardened egg membrane caused by sodium thiosulfate in hatching water.

Testing for Chlorine

Why is it sometimes important to know if any chlorine remains? Occasionally the water companies vastly increase the amount of chloramines or chlorine that they add to the water. If after a large water change and addition of dechlor you are seeing problems with your fish a quick check for chlorine is really helpful to make sure that they haven't doubled or tripled their dosage. For me trying to remove the chloramines with a carbon filter instead of dechlor this test kit was a life saver.

A chlorine test kit uses 1 drop of test solution to 5 ml of water and quickly indicates if you've eliminated

Pseudomugil reticulatus **- Another beautiful *Pseudomugil* with difficulty hatching of their eggs.**

all of the chlorine. Sera and LaMotte both sell chlorine test kits but MASI's own Charles Harrison also sells one on his website, http://inkmkr.com/Fish/ItemsForSale.html Give Charles a holler before the next meeting and I'm sure he'll be glad to sell you a chlorine test kit, very cheap insurance to always have on hand.

To Left: Chlorine and chloramine test kit from Charles Harrison Clear solution on left is chlorine free, solution on right contains chloraine/chloramine and needs to be treated with more dechlor.

Minifins

-

Acanthopsis species

The Horseface Loach

–

By Mike Hellweg, CFN
(Certifiable Fish Nut)

LOACHES ARE POPULAR aquarium residents that most aquarists keep at one point or another.

Some are gregarious and spend a lot of time out in the open, others are aggressive or solitary, and yet others spend their time simply hiding until the lights go out. Then there are some true oddballs that actually spend their time buried in the substrate with only their eyes showing. They have long snouts with the eyes placed high up on the back of the head just in front of the gills, giving their head the overall appearance of a horse's head, hence their common name, allegedly first applied by the Pan Am pilot who first introduced them to the hobby.

In their native lands of Southeast Asia they are known by many names such as "sand fish", or *pla sai*, in Thai. There they are considered a food fish and eaten deep fried, seasoned with turmeric and garlic.

Here in the USA, I've seen them sold in happier situations as aquatic pets in fish stores by names such as banana loaches, horseface loaches, horse head loaches, long nose loaches, sand loaches, and moose face loaches.

There is a bit of confusion in the trade as to which species are actually being imported. There are currently 7 species recognized in the genus *Acanthopsis*, with likely a few more to be described. While hobby literature usually references only one species, *A. Choirorhynchus* -with several different species pictured in different literature all given the same name- it is obvious that different species have been available from time to time as sometimes they have a long thin body with a long, narrow snout, and at other times they have a shorter snout and shorter, thicker body.

Husbandry is the same for all, so for this article we'll just consider all as "Horseface Loaches" and go from there. All species are reported to reach about 5 - 9 inches in the wild, and usually top out about 4 -6 inches or less in our aquaria, although I have seen a couple of 8 inch specimens in fish shows around the country.

The horseface loach's unique head is not just for show. It has a practical purpose. When startled they are actually able to burrow through the substrate so quickly that it appears they are "swimming" through it! Their narrow, tapering snout and narrow cylindrical body makes this easy. In addition, their eyes are covered with a retractable thin membrane that protects them while the fish is sand swimming.

When they rest, they often position themselves just under the surface of the substrate with only their eyes protruding. The gill openings are right behind the eyes, so they can breathe easily when resting in this manner without exposing themselves to predators. Most of the scientific literature reports that they only engage in this behavior when "startled by a predator" (or, I guess, a scientist with a net), but after years of keeping dozens of specimens of likely three or four species, I can say that at least with my specimens it is a common behavior even when "predators" are not present.

Their bodies are a sandy tan to silvery color with brownish or black blotches, dots, or partial bars often forming a thin dark line along the lateral line, depending on the species. The bellies are usually whitish and the fins are usually clear. This coloring

helps camouflage them against the sand substrate.

Smith reports eight distinct patterns based on their collection location in Thailand alone, but notes that even more are recorded in the literature. These could be distinct species, or just locality variants of a single species. The scientific literature is mostly silent on this. The combination of sand swimming, body structure and cryptic coloration all allows them to hunt for food while avoiding predators that otherwise might be able to see them easily in the clear streams they prefer.

Their mouths are right at the front, surrounded with three pairs of barbels. They have one tiny pair above the upper lip, one pair on underside at the side of the mouth, and one pair on the "chin" below the mouth. These barbels are covered in taste buds and in addition their lips are covered by sensory organs called papillae that serve to help locate food. These structures help them to find food without actually having to see it.

If they have a fine substrate like sand, they will pump the sand through their mouths and out their gills almost looking like little puffs of sandy smoke. As the sand passes through they swallow the tiniest particles of detritus that they can use as food. With larger gravel, this behavior is not often observed in aquaria.

Their preferred foods are detritus, worms, insect larvae, and small crustaceans. In the aquarium they will take flakes, all types of sinking foods like pellets and frozen foods (brine shrimp, mysis, and bloodworms are favorites), but they should be offered a treat of live white worms, black worms, or tubifex worms on a regular basis. They will also scour the substrate for every bit of missed food, so even tiny crumbs won't escape them.

They are reported from the Irrawaddy River drainage in Burma in the north throughout Thailand, Laos, Cambodia and Vietnam to the Malaysian islands of Sumatra and Borneo in the south. In the wild they are most often found in clear flowing streams and rivers that have a sandy substrate, though they are reported from the muddy Mekong as well. This wide distribution means they are able to adapt to many differing water parameters so pH and hardness are not as important as clean, flowing water. They prefer temperatures in the mid to upper 70's Fahrenheit.

A river tank would be an ideal habitat for them. A long, low tank would be perfect. Consider something like a 33 gallon extra long (48 x 12 x 12) as the perfect tank. Instead of setting up the filter on the back as one would normally do, add the filter to one end with the current directed across the length of the tank.

Some people even make a special filter for stream fish with a power head at one end and a sponge filter at the other connected with a length of PVC pipe under the gravel that works incredibly well in a tank like this, creating a directional current and filtering the water at the same time.

Cover the bottom with an inch or so of sand or fine round gravel. You can add a few plants, but the horse face loach's unique sand swimming behavior will likely root up these plants fairly quickly unless they are well established before the fish are added. It might be best to stick to plants like Java moss, Java fern, and Anubias that can be attached to driftwood or rocks.

Make sure there is plenty of room for the fish to burrow. Choose peaceful tankmates that will stay up in the

water column. Giant danios, zebra danios, and similar riverine fish would be ideal as they stay up near the surface and love the water movement in a tank like this.

Like most loaches, Horsefaced Loaches are social fish and prefer to be in large groups. Instead of purchasing a single specimen or two or three fish as most fish keepers do, consider purchasing a group of six to twelve fish, especially if you are using a larger tank. Males can be a bit scrappy, but though they might do some serious damage if there are only a couple fish, little harm is done if there is a big enough group.

I can find no accounts in any literature of either captive or wild spawning. I would be willing to bet that the main reason for this is that not enough aquarists keep a group of these interesting fish for a long enough time in a tank without competition.

They are easy to sex when mature. Males have enlarged pectoral fins that have thicker first rays than those of females. Gravid females are unmistakable, as when full of eggs they are bulging. All of the literature reports that they reach sexual maturity at just over 2 inches, but this is based on a single specimen of a ripe female collected from central Thailand in 1927. She was only about 6 cm long. So whether that is applicable to one species or the entire group is open to debate.

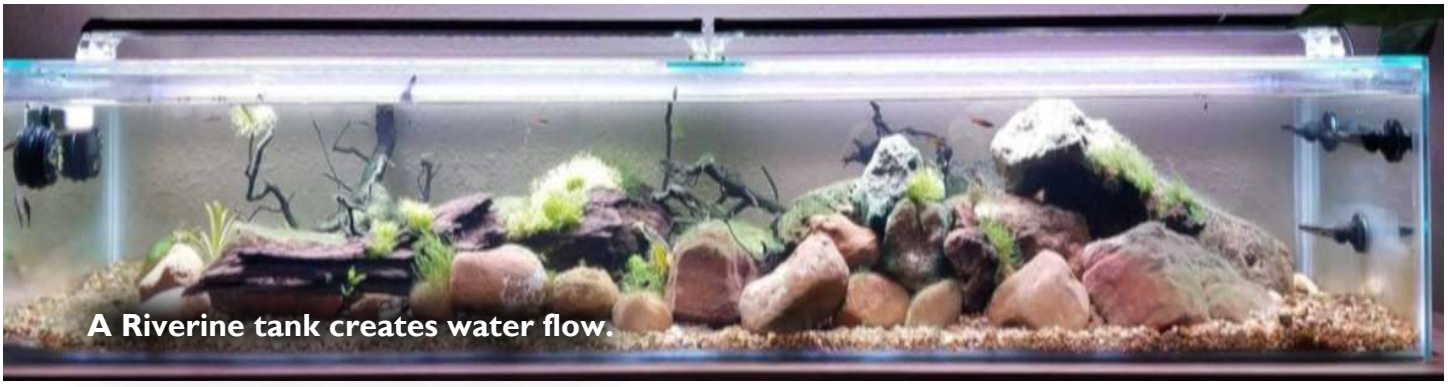
If they are like other Cobitids, it is likely that they are egg scatterers, with pairs swimming side by side, possibly with the males using their enlarged pectoral fins to grasp the females' pectoral, holding the pair together in the current and ensuring fertilization of the maximum number of eggs. They likely lay a large number of eggs over a rocky bottom and count on the current to disperse them far and wide in hopes that at least a few young will survive to maturity. Some Cobitids lay eggs that float for a while before sinking, while most lay eggs that sink immediately but I find no references to which type the horseface loaches might produce.

The horseface loach has something to offer all aquarists from beginner through intermediate to advanced. It makes an interesting addition to a community tank, where it will often be observed just peeking from the gravel and is also an interesting challenge to the advanced aquarist looking for something truly unusual.

...and for the breeder looking for the ultimate challenge? Well, how about a fish whose spawning has never been recorded either in nature or the aquarium? How can you beat that?

References:

- Smith, Hugh M.; The Freshwater fishes of Siam, or Thailand; Smithsonian Institution, TFH Publications, Jersey City, NJ; 1965 reprint
- Rainboth, Walter J.; Fishes of the Cambodian Mekong; Food and Agriculture Organization of the United Nations, Rome, Italy 1996
- Breder, Dr. Charles M. and Rosen, Dr. Donn Eric; Modes of Reproduction in Fishes; TFH Publications, Jersey City, NJ; 1966



A Riverine tank creates water flow.

Brevibora dorsiocellata

Known as the Eye-Spot, Ocellated or Emerald Eye Rasbora

-

By Mike Huber

THESE FISH HAVE a beautiful color around the eyes and like all the schooling fish they love to swim around the tank together.

I bought 10 small fish and raised and conditioned them in a 20 long, planted tank with some other fish of similar type. After several months I noticed some of the females that where very full in the body and were holding eggs. I fed them more live food and did a water change on their tank then checked the two tanks I had set up for them too spawn in and made sure those tanks had the proper setup.

The spawning tanks are 20 longs with round rocks, a little bigger than marbles and less expensive, in them so the parents can't get to the eggs and have a few potted plants, so the fish feel comfortable. The water temp is 78 F at 6.5 ph. The spawning tanks are in a window which is about 8 feet long so they get a natural sunrise which helps some fish to spawn.

In the evening I picked out two pair and moved them to the first spawning tank and after two days I moved them to the second tank. When I went to move them back to the original tank I could already fry bouncing around the rocks.

The hardest part of these fish is not to get them to spawn but- like most of these fish and other dwarf fish, including *Elassoma*- is feeding the fry. I raised infusoria as a first food after which I fed them baby brine shrimp, micro worms, and banana

Keeping the Pirate Perch

Aphredoderus sayanus

-

By James E. Wetzel

The Pirate Perch

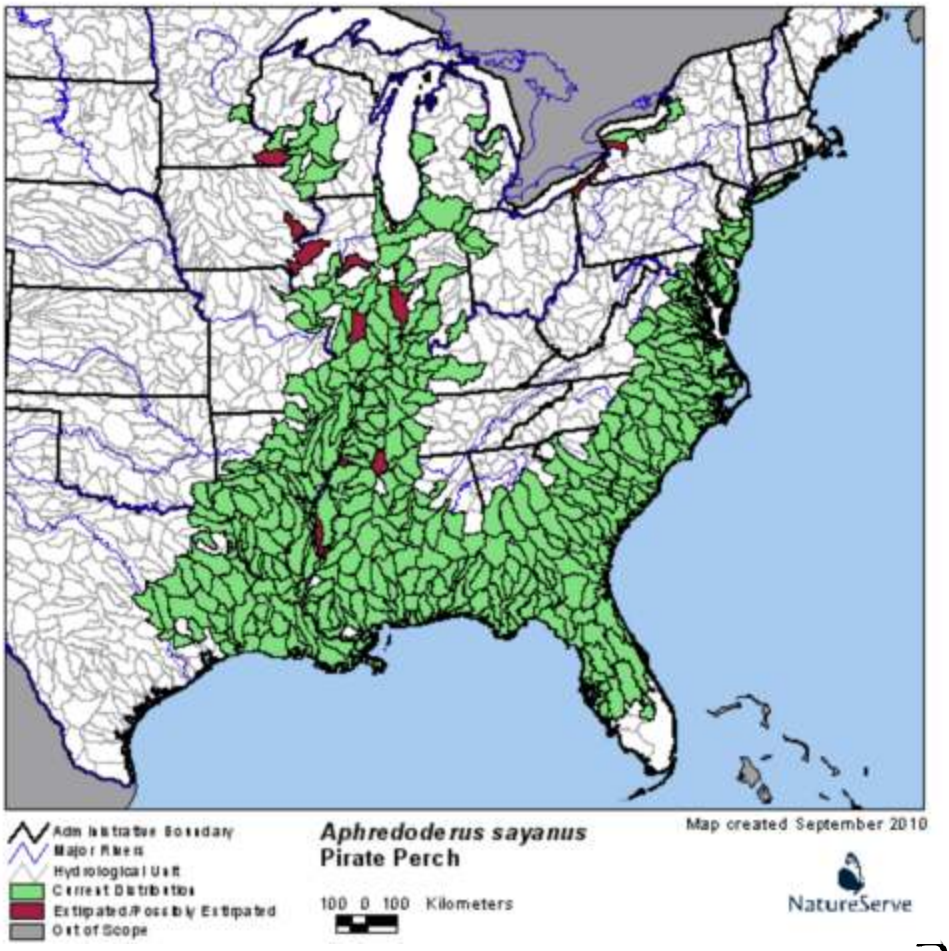
Aphredoderus sayanus is the sole member of the family Aphredoderidae within the small minnow-like order Percopsiformes which includes trout-perch family Percopsidae and the cavefish family Amblyopsidae that are all endemic to North America.

There are two apparent subspecies with *Aphredoderus sayanus sayanus* along the east coast and *Aphredoderus sayanus gibbosus* centered on the Mississippi River drainage with an integration zone through Georgia and Mississippi.

The Pirate Perch is the most generalized and wide spread and shares many characteristics with those in the family Amblyopsidae. Like the epigean Amblyopsids (i.e. Swamp Fish *Chologaster cornuta*, and Spring Cavefish *Forbesichthys agassizii*) the Pirate Perch has a base brown coloration and obvious eyes. An additional five Amblyopsids (Hoosier Cavefish *Amblyopsis hoosieri*, Northern Cavefish *Amblyopsis spelaea*, Southern Cavefish *Typhlichthys subterraneus*, Ozark Cavefish *Amblyopsis rosae*) are obligate cave dwellers lacking pigmentation and eyes. Cavefishes stimulated my early interest in the order Percopsiformes because of the mystery surrounding their reproductive biology.

The Pirate Perch and Amblyopsids share the highly developed lateral line system position and a gular position of the anus and urogenital openings. The lateral line system enables this group to detect and locate water movement which aids with navigation and capture of prey. The urogenital opening positioned near the gular region is related to the fish spawning transbranchiorally where the gametes are sucked into the branchial chamber via the opercula and then ejected through the mouth into protected locations where the embryos can develop.

Pirate Perch are typically associated with low gradient streams shaded by trees. During the day the fish are concentrated in piles of detritus



Forward placement of the urogenital pore.

From Wikipedia Commons

and root wads. At night the fish move about usually in close proximity to the stream bottom where they progress slowly about with rhythmic paired-movements of the pectoral fins being the most obvious sign of propulsion. The majority of prey consumed are insects and crustaceans small enough to fit easily in the fishes mouth and easy for the human observer to see. The prey must move, otherwise the Pirate Perch cannot detect it. When prey is detected the fish will orient its body so the mouth is close to where the prey is located- then the mouth opens explosively sucking the prey item inside. Vision does not appear to play a role in how a Pirate Perch feeds. By the following morning the Pirate Perch effectively return to roost for the day.

When a Pirate Perch is disturbed, the most frequent response is a rapid straight line move that ends when the fish collides with something. The direction taken is simply away from the threat. The fish are less inclined to eat immediately after being disturbed and require some time before resumption of feeding activity.

Pirate Perch are seasonal breeders with reproduction occurring during the early spring. Signs of breeding (embryos / prolarvae) are most evident in with root wads like those found under bank cuts. When breeding is underway groups of males and occasional females are found associated with those same locations.

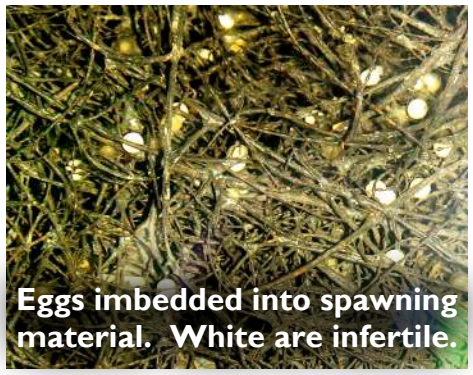
In many ways the social interactions around the breeding sites is similar to toads breeding around a pond. The males patrol and nip each other as they protect their respective

spawning sites. When a female approaches the males engage in little trembling dances with fins outstretched. If a female begins to push her head into the spawning site then the male(s) put their heads in next to hers. The trembling of both sexes seems to help the fish synchronize gamete release. The release and expulsion of gametes is through transbranchioral spawning as described in Poly and Wetzel 2003, referenced below.

Only males seem to spend any amount of time around developing embryos and it may simply ensure presence in the event additional ripe females approach. Adults are cannibalistic. Shortly after hatching prolarvae begin moving away from spawning area to rest on the bottom- often in the crevices provided by an irregular bottom. As the prolarvae develop thay darken becoming a dark gray color by the time they are ready to feed. Feeding behavior is similar to the adults and vision does not appear to be

Adult nuzzling into spawning media

important. The larval through fry stages target zooplankton and other small invertebrates that are close to or in contact with the substrate the fish is swimming near.



Eggs imbedded into spawning material. White are infertile.

Pirate Perch can do well in an aquarium setting assuming there is sufficient cover. Overturned flower

Successfully hatched larvae

pots, hanging plant roots, pieces of pipe, and piles of course rocks can provide good daytime roosting cover. The Pirate Perch do not share the cover patches well and are much more active there when the number of individuals is higher. The pattern of nocturnal activity can be overcome for observation purposes using two lights. The first light a daylight bulb on a timer and the second a red light that operates when the other light is off. No heating is needed.

Feeding is easiest using live foods. Larger species of water fleas work very well as planktonic forage and baby brine shrimp are readily consumed by first feeding larvae until the fish approach 1.5" total length. Scuds and the various cultured worms also make for good forage. Earthworms, especially when cut into chunks, are also consumed but consumption of those over long term are not good for keeping fish in good weight. Small fish are also consumed, although mostly when lights are off, as the Pirate Perch are not good at pursing evasive prey.

Generally, Pirate Perch are poorly suited for community tanks. They can be housed with Pygmy Sunfish *Elassoma* spp. and Dwarf Crayfish *Cambarellus* spp that are too large to ingest whole. Top-minnows can also make good tank mates.

Poly, W.A. & J.E. Wetzel (2003). "Transbranchioral spawning: novel reproductive strategy observed for the pirate perch Aphredoderus sayanus (Aphredoderidae)". Ichthyol. Explor. Freshwaters. 14 (2): 151-158.

Unmarked photos by the author.

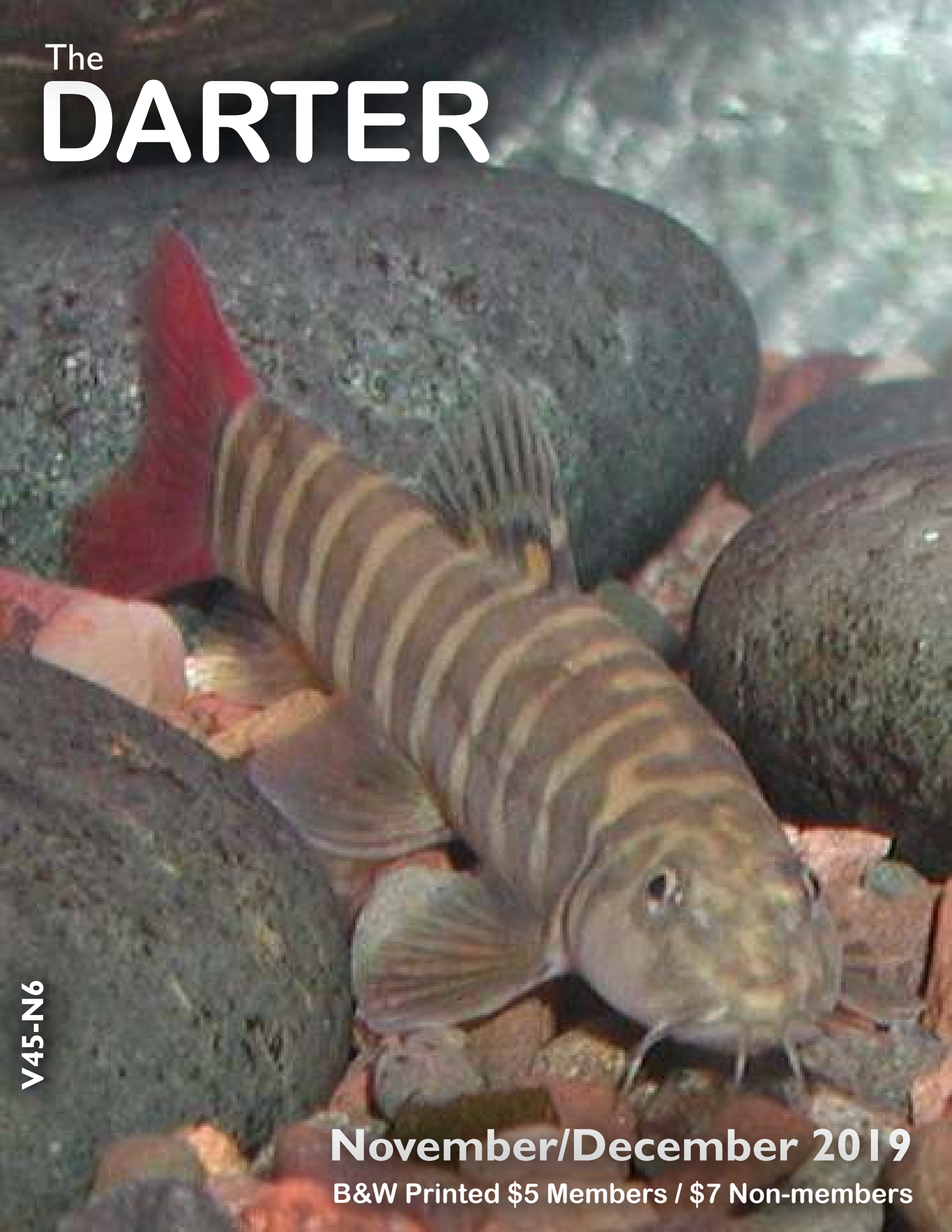
The author, James Wetzel, has been an Missouri Aquarium Society member for several years. His Day job is as a Lincoln University Associate Professor of Animal Science in aquaculture for the Department of Agriculture and Environmental Science for in Jefferson City, MO.

Jim received his Ph.D. At the Southern Illinois University of Carbondale and his M.S. and B.S. from Purdue University. Previous work was on the Orconectes of Southern Illinois and his current research focus is on the Breeding and Genetics of Sunfishes, Fish Nutrition and Intensive Culture of Larval Fishes.

He teaches aquaculture-related animal science courses, primarily Fundamentals of Aquaculture, Aquatic Biology, Breeding and Genetics of Aquatic Organisms, as well as Monogastric Nutrition and, for the Graduate Environmental Sciences Program, Limnology. His research primarily focuses on development of sunfishes for food production. He has been the PD or Co-PD of projects funded by the USDA and Missouri Department of Conservation and published over 25 research articles. Wetzel provides guidance to high schools with aquaculture related projects and has been working to develop 4-H programs for Missouri in the area of aquaculture.

For a list of his current publications see his profile at Lincoln University. Some of his previous publications may be found here.

The DARTER



V45-N6

November/December 2019

B&W Printed $5 Members / $7 Non-members

Meet MASI Fishy Folk: Larry Allbright

- **My Family members are my Wife of 49 years, 3 kids, 11 grandchildren and 8 great-grandchildren!**
- **I've kept fish for 63 years starting with a tank of Live Bearers and right now I have 24 various tanks. Almost all are stocked with varieties of plants, angels, barbs, cardinal tetras, rainbows, bristle nose and Cory cats.**
- **My Favorite pet fish is an Angelfish but I dream of breeding High Fin Lyretail Swords and I would love to have a 1000 Gallon saltwater aquarium and someone to take care of it. More realistically I'd probably settle for a 350 freshwater tank.**
- **Recently I've gotten Blue-eyed Bristlenose' to spawn and am trying to get black angels to spawn for me again.**
- **Other pets we have around the household are two dogs and two cats.**

A "*Hobbyist's*" Guide to Selling Fish

PART 1: *Intro to a Series of Articles on the business of Selling Fish*

-

By Kevin Plazak

The way to make a million dollars in the fish business is to start with three million".

–

Anonymous

THERE ARE A lot of reasons a hobbyist like you would be interested in selling fish for a living or, maybe just as a fun side-hustle or, heck, just to get rid of all the extra fry that are piling up in every tank you own. You might see it as glamorous, a lot of fun, or a sirens' song that calls to your soul at every moment of every day.

...You know, sirens call men to crash into rocks and die, right?

Selling fish can be a lot of things depending on how you approach it. If it is a casual endeavor that allows you to free up space in your fish room, you might be a hobbyist that gets a few bucks at the club auction while building up a little credit at the local stores.

This is where it started for me and I really loved it. On club meeting nights I could sell around $100 to a local wholesaler, trade fish to local fish stores and sell fish through the club auction. Yeah, I might have spent most of what I earned in the auction - but it was a lot of fun! If your business goes no further than this, count yourself a Rockefeller because that was the easiest money I've ever made at fish selling. It was also really satisfying.

You can take a job at a local store and sell fish that you may get to order and stock. You may also sell the fish that someone else stocks. In either event, you are selling your time and skill while you sell someone else's fish. This will make you more money than working in your own fish room (statistically, not absolutely), but you will have to sell fish that you might not have any interest in selling. I did this for most of my college life and it served its purpose, but I would not care to go back into selling fish retail unless I owned the store.

There are a lot of online businesses that work really well. I can't speak from a lot of experience in this venue. I have sold fish through Aquabid and found that you sell about 10% of everything you list if you list your fish for a fair price and you have a critical mass of fish listed. If you list high dollar items or rare items, it may be different. I intend to explore this further in the future, but can't really speak to this with as much expertise as an author should have.

You can work at a wholesale business. This is a lot like working at a retail company without all the customers and a lot more catching fish. And when you aren't catching fish, you are cleaning a tank or medicating sick fish or feeding fish or discovering a new problem. The upside of this work is that the dress code generally includes covering all bathing suit areas without a lot of other specifics. You will likely be left alone if you catch fish quickly and the counts are right. The downside is the pay is often bad. I've been paid badly now for 15 years at my own company and I still love it every day. But I'm getting ahead of myself...

There are other facets of the live fish business: A jobber is one who gets fish from farms or importers and sells them to stores in smaller quantities. Jobbers often pay more than stores, but less than retail. There are trans-shippers who bring fish in from other countries and send them to their customers without ever taking the fish out of their bags.

There are fish farmers who produce fish for wholesalers, retailers, and hobbyists - sometime simultaneously. There are blends of every facet and there are specialists who only sell fish from one lake or one country or only sell cichlids or only plecos... the possibilities are endless.

But as the lines blur between farm and end user (the person who keeps the fish for most of its life), the business starts to get tricky. The first thing that will happen when more farms sell to the public (and a lot of farms do now sell to the public) is a streamlining of interesting fish

in local stores. We're already seeing this everywhere. And as fewer fish are available, smart (or talented or fanatical - call 'em what you will) fish keepers are seeing the gaps and they are trying to fill them.

The problem with this is that once you have filled the appetite of the buying public, you will not make as much money on rare bichirs, or rare plecos, or rare corals... there is a finite amount of demand for high dollar critters, so you will need to rely on volume. Volume solves many ills in a business and focusing on keeping fish flowing is the key to diverse sales. Diversity in the tanks, and a rotating diversity, is what make a store a draw for people.

The market is not flooded, there are gaps in the supply chain everywhere and fish stores have an incredibly narrow variety of fish that they can get each week. Most stores are more than happy to buy healthy fish that are priced fairly and they will pay for those fish each week. Getting in front of the retail buyer is just a function of being online and selling through an existing fish site - Aquabid, Amazon, Ebay or just through one of the Facebook replacement sites.

If you have two hours a week, I would stay a hobbyist and enjoy those two hours at a nearby club meeting selling your fish through the club or trading at a local store. If you have a spare 60 hours a week, wholesale or retail may be for you. If you like money, marry a doctor that finds your fish hobby adorable.

Ideas for Making Money by Selling Fish:

- As a Hobbyist at a Club Auction
- Job at a local store
- Own a Local Store
- Sell Online
- Work at a wholesale business
- Be a Jobber
- Be a Trans-shipper
- Start a Fish Farm
- Other?…

While there are exceptions to this summary, the norm is far closer to my summation than it is a rags to riches tale. Exceptional people can do exceptional things and they can make money in the hobby. They can make money doing anything they set their mind to, it's a character flaw of the exceptional - they choose to succeed at stuff.

Head-strong people do pretty well in the fish business too as long as their strict set of rules include hiring good people to make good choices on their behalf. This ensures their head-strong ways don't reject the newest trends in the hobby. Best of all, when they should pack it in and give up on this very difficult business, they just keep plugging along. This is my tribe, the hopelessly in love with the fish business.

This series of articles are not written to dissuade you from starting a fish business. I would encourage you to believe that the aquarium fish business can be a money pit. And without a lot of very savvy people guiding you through the pitfalls of the business, you will likely spend three times what you make.

Not losing money can be as simple as tracking your money expenses and sales... **SERIOUSLY,** many people have no idea what they spend or take in. More on this too, later...

Next installment: "The Ethical Fish-Business".

Editor's Note: Although he has been associated with MASI peripherally, Kevin is a recent long distance member of MASI, of which we are beginning to have several.

Since he has never been to a MASI meeting and brings a different perspective to this newsletter, he deserves some introduction:

Like many of us, he has spent most of his life and all of his adult life keeping fish. His first fish tank was at 8, his first volunteer job in a pet store was at 13. He paid for college working at pet stores and raising African cichlids.

After receiving a degree in Environmental Biology, he went on to work for PetCo for a number of years working in the fish area and then managing stores. When his hobby started making about as much as a job would pay, he took his first shot as a wholesaler – and *within a couple of months he went back to work a desk job* – but not before he learned a couple of very valuable lessons. He eventually moved to Portland, Oregon to ultimately begin his current business: **20/20 Tropicals**, mainly a business of selling fish to stores.

He claims to have failed in a myriad of ways and has earned the knowledge to know how to prevent catastrophic failure as well as how best to leverage every penny.

This is an introduction article to a series of articles. His plan is to provide a complete, step by step guide on how to sell fish; starting with a hard look in the mirror for each would-be entrepreneur, and then create simple guidelines to actually make a go of selling fish. Your feedback will determine how the steps are covered.

When the reader has finished the series, they should be able to assess if they might want to try a full blown business or keep it a hobby. Kevin's goal is to make the hobby more profitable for most folks rather than having them lose a pile of money starting a business. He says he "will cover 'exit strategies' down the road. Almost for sure... Probably."

I have met Kevin. He was previously Editor of the PCCA's newsletter and not bashful nor shy, so get ready for an interesting ride…

Neocaridina Shrimp Keeping Basics

OR

Keeping Shrimp Simple!

-

By Holly Paoni

THERE HAVE BEEN a lot of questions lately about keeping shrimp. Some answers try to make something simple and easy too complicated. It's not complicated at all. A simple low tech set up is all that is really needed.

My best advice is to begin with a cycled and well established tank. Shrimp do not handle spikes in ammonia, nitrites or nitrates well at all. They are not fond of jumps in PH, GH or KH either. Even though they have a very very low bio- load on the tank, it needs to be very stable. To get a very stable tank, nothing beats the length of time it's run to establish plenty of beneficial bacteria, and make it past the fluctuations a newer set up goes through. Once over those, go ahead and add some colorful shrimp!

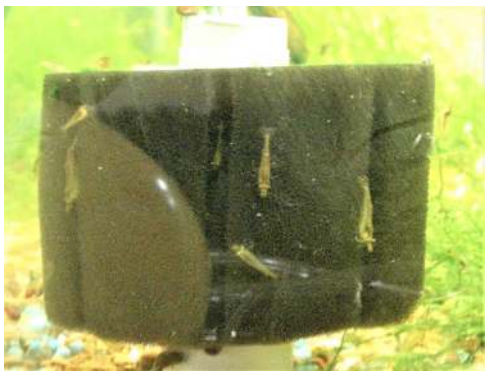
I'm focusing on shrimp of the genus *Neocaridina*, as they thrive in our area's tap water. Needs of the genus *Caridina* vary species to species. A few *Caridina* can handle or even like harder water, but the majority have very specific needs requiring specialized substrates, and RO/DI water formulated within their preferred range.

Not all dwarf shrimp are the same, so I'm sticking with what will work with our tap water and do well. You can branch out with your own research after getting some experience with the *Neos*.

As a well established tank, I mean it is beyond just being cycled. There is biofilm or some trace algae growing somewhere in the aquarium, and water parameters have been testing nice and steady for a couple of months after cycling with some small fish residing there; there aren't any mini ammonia spikes; GH and KH are holding steady; and nitrates are staying low with normal water changes- It's a nice stable tank.

For shrimp tanks I prefer to use plain old sponge filters because there is no place for the shrimp or li'l shrimpettes to get stuck or trapped.

Box filters- some have holes small enough for the wee ones to get into. I've had shrimp climb into the chamber on the back of hang-on-back filters to



presumably feed on the goodies on the media and I've had them climb right over matten filters and stay in the back.... finding dozens living in that small pocket in the back. Shrimp can get into the tiniest nooks and crannies. Sponge filters keep them from being lost or trapped and shrimp can also feed off of a seasoned sponge filter.

Substrate can be anything inert. Pick whatever color of inert substrate that contrasts with your shrimp. Light substrate for your deeper reds, blacks, deep blue shrimp or darker substrate for your light colored shrimp such as lower grade cherries, all yellows, rillis, snowballs and blue pearls will make them show up best. When the substrate contrasts with the shrimp, the shrimp POP.

Decoration for the shrimp tank includes something with lots of nooks and crannies. When shrimp molt, which they do routinely, they are vulnerable until the new exoskeleton hardens. During this time they prefer to go hide in a safe place. Driftwood with small crevices, cholla wood with some decent sized holes and specialized shrimp caves all work well as do thickets or mats of Java ferns, Bolbitis ferns, Anubias or Bucephalandra. In those well established mats of live plants there are dozens of places under the leaves to hide out for a few days. Mosses

also work well. I have a moss wall in one of my shrimp tanks formed by adding moss to a few small sticks and letting it grow together and thicken.

I leave shed exoskeletons that make their way into the open areas of the tank. If the shrimp are needing calcium they will eat them and they are an easy visual indicator of what the colony may need. If the shrimp are not eating the shed exoskeletons, no need to do anything- all is well. If you see them grazing on them, your tank is lacking minerals and calcium.

I add dead coral to the tank to supply calcium. I have a few nano sized pieces andput a piece over by the filter where it will slowly release calcium and trace minerals. The shrimp will pick at it as needed- similar to a salt lick for livestock. Another way is adding a natural cuttlebone piece, like is used for pet birds which works the same way. Some folks use a homemade food recipe usually referred to as snail jello. It gets extra calcium into their diet. All these work well, without needing to mess around with water chemistry by re-mineralizing water.

Water that is too hard is said to cause molting issues. The shrimp can't molt and dies trapped inside its older but too small exoskeleton. I have not had this issue, and my water can get extremely hard during dry hot months of summer. For me this is a Ph of 9.4 and TDS of 924 for a couple months. My water gets that high every few years during long dry summers. My shrimp so far haven't ever missed a beat. However, that increase came slowly over many months then slowly came back down to our typical St Louis water chemistry. It wasn't an overnight change, it was slow & gradual. Shrimp can't handle rapid change. They can go outside their typical parameters, but changes with shrimp must be slow and gradual.

Open space is needed in a shrimp only tank because you'll want to regularly sort through and grade or cull your shrimp to keep their colors up. With the colored shrimp, there are several grades of color intensity. Reds are the most popular, so Ill use those as an e**xample.**

It goes from Low grade to High grade: Cherry, Super Cherry, Sakura, Fire Red, and Bloody Mary. Some break this down into even more grades of just red. Differences between grades can get as complicated as to how intense the color is even on their leg joints.

…I'm trying to keep it simple…

Even though the grades breed mainly true, you will still find higher or lower grade shrimp in your colony. Use the open area to view and sort your shrimp to keep the color you've got or to improve it. If you have lower grades popping up and don't remove them, over time they will interbreed and the colony color will degrade.

Shrimp are grazers, picking constantly at whatever they can find. They are omnivores that lean towards plant based foods. A specialized diet is not needed. Whether algae wafer bits, algae pellets, mini-sticks and pellets, a variety of flake foods, soft green algae off the glass tops, canned french cut green beans without salt, steamed spinach, zucchini, or microworms - they will eat it. They aren't picky.

Since shrimp are constantly grazing, it's a good idea to keep something in the tank for them to graze on. Usually the seasoned sponge filter is enough, but as the population grows, it needs to be supplemented.

I supplement with hardwood leaves, fresh cholla, or new driftwood. These get a slimy coating on them shortly after being introduced to a tank. The shrimp Love to eat that stuff. Its can look pretty gross if it really blooms, as its white and slimy. Gross looking or not, the shrimp love it. It doesn't affect water quality, as it's a living micro fauna or fungus. Since shrimp are sensitive to water quality issues, its about the perfect food to keep in a shrimp tank. They can graze on it constantly and you are just feeding other foods as a supplement in small amounts to balance their nutrition. I feed the fish a varied diet, 2-3 times a day and my shrimp get a tiny bit of whatever the fish are getting once a day.

Tank maintenance on a shrimp tank is about the same as any other breeding tank. You don't want the tank spotless. Its okay and actually preferred to let a bit of algae grow. I

don't clean the back or side glass on my breeding tanks. Micro fauna live there and algae is something to be grazed upon and nibbled at. As for the sponge filters, I do check them routinely, but don't clean them often. When I do clean them, I only clean them partially as I want to save the goodies growing there. The shrimp graze on them and need the majority of that nitrifying bacteria.

Make water changes often enough to keep the pH, GH, KH from fluctuating wildly with each

water change. You also want to keep nitrates at 20 ppm or lower. Each tank is different. My fish tanks get 50-75% water changes, usually weekly, if they need it or not. My shrimp get treated the same but they would be fine getting a 25% - 35% water change once a month.

I change water in my shrimp tanks like I change my fish tanks, for one reason. My tap water is slowly but steadily always changing and if I wait it will be even more different the next time. The change is non readable to minuscule with liquid test kits but over a couple months the change adds up to to much for them to handle. By giving my shrimp tanks constant water changes like the rest of the fishroom it's not an issue.

Shrimp do very well at room temp, and even down into the low 60's without showing any change in activity level. They can go up to the high 70's to low 80's, but will cook at slightly higher temps very quickly. In a fish room, a heater isn't needed, as the

water in the room maintains temp very well. For an household or office tank, a heater set in the low 70's to maintain the temperature will keep drafts or HVAC vents from making the tank temperature rise and fall repeatedly throughout the day.

Newer aquarium LED lighting puts off next to no heat, but lights and hoods from just a few years ago do. In small tanks, this is an issue, as the heat from some of these lights can raise tank temp as much as 4-8 degrees on a nano-tank when on, then drop again when off. If this is the case, I recommend upgrading your lighting to something that puts off very little to no heat.

Tank mates for shrimp are limited. Most fish want to eat them. Even some nano species will gang up on and eat shrimp if given a chance.

Even if they don't eat the adult shrimp, the new shrimplets are still tiny enough for a 1" adult fish to eat. There are some species that can work, however, if you're just looking for shrimp numbers to maintain or slowly climb.

If you want to save most of the shrimp & their young you'll need basically a species only tank. The only totally shrimp safe species in my experience are common *Otocinclus* and Siamese Algae Eaters (SAE)- although SAE get way to large to have 1 in a shrimp tank, let alone a good shoal of them. Otos and most snails do work well, as they are shrimp sized but they do fill the same niche in the eco system as shrimp- clean up duty.

Mostly shrimp safe fish species are those that won't wipe out the entire population and will let the shrimp colony grow slowly or maintain. You will loose some, but not a big chunk of the shrimp population. This works best in a very well planted tank with a lot of thick cover. Examples of these species include the laid back to shy nano-fish such as Chili Rasboras, *Microdevario kubotai* or other nanos with a similar temperament.

Smaller bristle nose, *Cory habrosus*, guppies and endlers that do not ever predate on their own young may also work. Temperaments among fish vary considerably within the same species, so what works for one person may not work for all. It is trial and error for most.

Species that will thank you for providing a shrimpy treat as a meal include most large livebearers, all cichlids including angelfish, most anabantoids, most active schooling fish and medium sized to large catfish of all types. A vast majority of killies and rainbow fish will also eventually hunt down the majority of shrimp tank mates. The majority of our aquarium species do not do well with shrimp.

My rule of thumb is: if the fish even thinks the shrimp or shrimp baby will fit in its mouth, good chance the shrimp will be a fish snack. If the shrimp doesn't fit in the fishes mouth, but the species is outgoing or rambunctious, or would gang up and hunt it together, good chance the shrimp will be lunch if the fish get

hungry or bored. Calmer, laid back to shy species that stay small are the best bet, but please have another place to move them to in the event they don't work out.

Shrimp do climb, and will even go on what I like to call a walkabout, from time to time. To prevent this, keep the hole for your airline blocked, as shrimp can climb through that space. I watched one climb up the airline tubing, take a walk on the glass top and over to the next glass top on another tank still looking for a way into the neighboring tank. A scrap of filter pad or foam, wrapped around the airline, going into the tank prevents the walkabout. I also do not keep different colors of shrimp next to each other just to prevent contaminating color varieties and muddying their color.

That's my *Neocaridina* basics. If you want to branch into the *Caridinias* then *Caridinia* cf. *babaulti*, and the Various Caridinia Tiger varieties also do very well in the same conditions as *Neocardinias*. Some others types may survive but not thrive.

Shrimp keeping is fun and enjoyable. There are a multitude of colors and patterns available and it's not complicated. Every fish species has a list of special needs and shrimp aren't any different. Use a simple low tech set up that's matured with places to hide, tank mates that won't eat them, a constant food source for grazing, and good water quality, and they will breed like bunnies!

A 5-10 gal is all that's needed for a medium to large colony (50-300 shrimp). Larger tanks do give more buffering for water quality issues and look nice too, so go ahead and use that 20 long for your shrimp tank.

Photos by the author.

Sunken Gardens

A Book Review

-

By Mike Hellweg

I HAVE TO START off this review by stating that I have been friends with the author, Karen Randall, for more than twenty years, but that shouldn't color my review of this excellent book.

There are over 40 books on aquarium plants available, from the old Pet Library book (which actually isn't all that bad) to Christel Kasselman's Aquarium Plants and her Planted Aquariums, which are both excellent and should be in the library of any serious planted tank enthusiast. There are several books put out by the master Takashi Amano as well.

Why would I recommend a book when "everything" is available on your phone at the touch of a button? Because books are concise and information is all available in one place, and it has been reviewed by experts, unlike websites which might be put out by anyone, whether or not they know what they are talking about! This book differs from websites in that Karen presents facts as facts, not opinions. She explains the why of each suggestion, without saying you "have to" do this or that, but rather explaining why this or that is needed, and what the options are.

Many of the older books don't cover modern equipment and techniques, and some of the others give many an inspiration, this is the first book I've read that is actually a step-by-step guide to setting up and running an underwater indoor garden. In addition, this 250 page book has it all in one place, unlike many of the websites available on the subject. Everything is categorized, easy to find, clearly explained, and illustrated with excellent color photos.

First the author introduces aquatic plants and gives a basic overview of aquatic plants and how they are different from terrestrial plants. Then she introduces basic water chemistry as it applies to the planted aquarium without getting too technical. She even advises the reader that if they want, they can skip the chemistry chapter and return to it later after they have read the rest of the book, when they might have a better understanding of why they might need to know a bit about water chemistry.

Her lesson here is painless, yet covers the subject in enough detail that the beginning aquatic gardener can get what they need without being overwhelmed by more advanced details from more advanced hobbyists who think that you should understand what they are talking about. The chapter is very simply and very well written.

Then she spends three chapters discussing the basics of essential equipment, substrates and fertilizers. Again, without overwhelming the reader with terminology or insisting that the reader has to go out and spend hundreds of dollars on specific equipment to start out, but guiding the reader toward making wise purchases as one starts out.

If you feel overwhelmed simply by lighting choices, Karen introduces the reader to lighting terminology and types, again without getting too

"Sunken Gardens" author, Karen Randall, will be speaking to MASI in April, 2020 on "Sarawak, Beautiful Land of Disappearing Species"

technical. It will help the reader understand what they need to know about planted tank lighting without all of the opinions mascaraing as fact on the internet. The same goes for CO2 fertilization, substrate, heating, and even fertilizers.

Once a reader sets up a tank, maintenance is important. Karen covers how to maintain an aquatic garden, trim the plants, and gives a simple schedule to follow as you move through the months with your new aquatic garden. In addition, she has a section on what to do while you're away on vacation which is something I have rarely seen in books.

The next section of the book covers the plants themselves, and divides up the many choices available into low light, moderate light and high light. Each species is described with a short paragraph about care and is illustrated with a photograph. This chapter covers about 50 pages. This is followed by a chapter on care for the plants, every thing from how to plant the different types to how to trim them as they grow, illustrated with several excellent photos.

Of course, every aquarium should have fish and other critters in it! The next chapter covers fish to avoid, and then gives a nice selection of some of the more popular fishes that can be successfully kept in an aquatic garden tank. She also covers shrimp and snails. Yes, I know some planted tank folk hate any kind of snail, but there are actually several that do very well in an aquatic garden.

There is an introduction into the different schools of thought on Aquascaping. Though an in-depth look at the various techniques is beyond the scope of the book, Karen's introduction to each type is well done and each is well illustrated. This chapter is followed by one on actually how to lay out a planted tank and get some of the effects that a reader can see, but otherwise might have no idea of how to pull them off. She covers everything from setting up one of the popular nano tanks all the way up to setting up a large tank.

Karen wraps up with troubleshooting and dealing with problems that all of us run into, especially algae. This chapter alone is worth the price of the book! Prevention is the key, but algae are nefarious little &*^%@ (survivors) and are found even in the best maintained tanks. The whole Idea is to keep them from becoming the dominant plant life in the tank.

The final pages are dedicated to a listing of resources, starting with the Aquatic Gardener's Association, of which every planted tank enthusiast should be a member. There are several trusted websites listed as well, which might help the beginner weed out (pun intended) some of the less informative sites out there.

This book is available on Amazon.com for $25 or less (depending on sales running - as I write this it is on sale for $17!). It is a nice, solid paperback with full color illustrations and done in an easy to read font.

I highly recommend this book to all of our members. As a bonus, Karen will be here as a speaker at a meeting next spring, so you can even pick her brain if you have any questions, although I think covers, most of the questions that may come up in this book. I highly recommend it, and think it should be in the library of anyone even remotely interested in a planted tank!

Oh, and I wanted to mention that our own Gary Lange has several photos featured in the book!

Making Super Dechlor

OR

Good things in even smaller packages!

-

By Gary Lange

Gallons to be treated: SUPER DECHLOR SPECIAL DILUTION!!

	1	5	10	50	100	
Amount to Use:						
Oz	0.002	0.01	0.02	0.1	0.19	Oz
Tsp	0.01	0.06	0.12	0.6	1.2	Tsp
cc/ml	0.06	0.28	0.57	2.8	5.7	cc/ml
Drops	1	6	11	57	113	Drops

Ok so I promised you the "Super Dechlor" recipe.

NOTE: Super Dechlor is a NON-STANDARD dilution and does NOT use the same dosage chart as the usual Dechlor recipe!! Which can be found in Darter Vol 45, No 4: July, 2019, !!

Many years ago, pre-internet I looked up in the chemistry reference books in my lab the solubility of sodium thiosulfate in water to make the most concentrated solution practical. Slight dilutions were made from there because if there was any evaporation in the container or the container got too cold I wanted the sodium thiosulfate to stay in solution. What I ended up making a 200 ml total volume containing 93 grams (46.5 grams/100 ml).

I've been making this recipe for over 25 years and it has worked quite well and not fallen out of solution. This 200 ml solution can be used to treat 4,000 gallons of water so quite a bit of water changing to be had for such a small volume.

Find a suitable jar, the best type will be one with a fairly narrow diameter, 2 or 3 inches maximum. Find a jar, plastic or glass, that has a good tight lid. You are going to shake the jar to COMPLETELY dissolve the crystals so you will need a jar that has a tight seal to prevent splashing sodium thiosulfate and water all over the room.

Prepare the jar by carefully measuring out 200 milliliter (ml) of tap water. Most modern kitchen measurement devices have both cup and milliliter markings on the side and it's just a little over ¾ of a cup but you want to be accurate here. Pour that water into your jar and place it on a level counter. Once it stops moving use a magic marker or other permanent marker to mark EXACTLY where the 200 ml of water meniscus is on your jar for future reference. A jar with a smaller diameter will help measure the 200 ml line more accurately. Once you have done that re-empty the jar completely, leaving as little water as possible.

Next, measure out six tablespoons or 93 grams by weight, of Sodium Thiosulfate crystals. If you prefer to work in grams and don't have a scale, they are available at Harbor Freight fairly reasonably. The tablespoon measurements also work out if you are using the coarse crystal Sodium Thiosulfate, just measure carefully. Add the sodium thiosulfate crystals to the jar.

Take a little more than a cup of DISTILLED or RO water and heat it in your microwave. It's rather important to use distilled or RO water as you don't want any other salt ions in your water. Get it fairly hot but it doesn't need to be boiling. When water is added to sodium thiosulfate the reaction will be endothermic, meaning the solution will get cooler. If you start with a room temperature solution of distilled water it will soon be quite cold and all of the crystals won't dissolve. If all of the crystals don't dissolve then later the rest of the sodium thiosulfate will also start falling out of solution until you have a huge crystal blob in the bottom of the container.

We don't want no blobs here so use hot water! SO, it is very important to initially dissolve all of the crystals.

Using extremely hard water, which some people in the St. Louis area have, may cause the almost saturated solution of sodium thiosulfate to start precipitating sometime later, which is very bad. There is only so much room between those water molecules so if you start with distilled water or RO water you will have a much better chance of keeping it all in solution.

Think of it this way, you have a closet that is half full of ugly Christmas sweaters that you hate to wear. Those are our unwanted, "hard water molecules". Now you really want to stuff your closet with cool looking jeans and shirts (our sodium and thiosulfate ions) but you don't have enough room because of all of those darn sweaters. Start with an empty closet (RO or distilled water) and there is a whole lot more room for the jeans and shirts! Got it? -so get rid of those sweaters, er... I mean hard water molecules... and go RO!

Carefully add SOME of that hot water until it reaches the line marked on the side of the jar. Put the lid on the jar and seal it tightly. Then shake until the crystals have dissolved completely.

Double check when everything has dissolved that you indeed have a volume level of 200 ml. You will have to add a bit more water because the sodium thiosulfate is now dissolved into the water and you won't have a perfect 200 ml volume anymore and if it's less than a 200 ml final volume your sodium thiosulfate may fall out of solution later.

I keep most of the dechlor in the jar I use to make it for storage but put my day to day working solution in a bottle with the dropper built in like you get with a pH test kit bottle or you can try Michael's or Harbor Freight to find one. Just clean it out really well before using and you should have a nice clean drop delivery system.

What you have now made is an almost super saturated solution of sodium thiosulfate. For our water in St. Louis and St. Louis county one drop per gallon contains enough sodium thiosulfate to effectively remove any chlorine or chloramines. I have found by measuring and checking with the chlorine test kit that this is usually 1.5-2x more than needed for St. Louis County water, depending on the time of year so just sticking to 1 drop per gallon and in St. Louis County all year round and you should be fine. Elsewhere do the test, like you should actually be doing for any dechlor solution.

Remember that when the chloramine bond is broken it releases ammonia and sodium thiosulfate does not neutralize ammonia like some of the other dechlor (ammonia locking) solutions on the market. If you already have an active biological filter in your tank then it will quickly pull out the minor amount of ammonia that is released in this reaction.

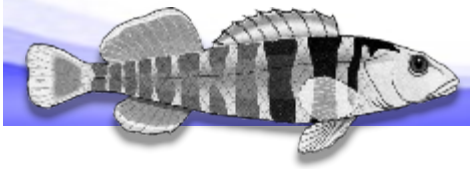
If you don't have a good biological filter going, especially true if the aquarium is freshly set up, use Prime or Amquel as a dechlor (and ammonia locking) reagent for the first few months. They will neutralize the chloramine and also tie up the ammonia released in the process.

Use Super dechlor at - 1 drop per gallon, or 1 ml per 20 gallons or 1/4th teaspoon/25 gallons, 2.75 ml(just slightly more than ½ teaspoon)/55 gallon barrel.

So, to treat a 55 gallon barrel I add 55 drops or 2.75 ml. Just to finish off the math puzzle that's 1.28 grams of sodium thiosulfate used to safely neutralize 55 gallons of water. That's three times less than the snowfall amount that we got when 3/4th of a teaspoon of crystals (3.87 grams) were added to that original 55 gallon barrel. So "I'm not cheap I'm frugal", was the old MASI member Ralph Wilhelm quote. As you can see here if you use the right amount of dechlor it can go three times further.

If you REALLY change a lot of water then maybe you want to take that 500 gram bag of Sodium Thiosulfate and make it up as Super-DeChlor all at once. That way you don't have to measure or weigh out the crystals. For that the final total volume needs to be 1,075 ml or a little bit over one liter. Use a big enough container to hold 1,075 ml and again mark it so that you get as close to the correct volume as possible when you finish dissolving all of those crystals. One can usually grab the kitchen measuring cups as they also have milliliter markings on the side.

That 1,075 ml will be enough Super dechlor to neutralize 19,000 to 21,500 gallons of water.



Minifins

-

The Least Killifish

Heterandria formosa

–

By Mike Hellweg, CFN
(Certifiable Fish Nut)

The Least Killifish (*Heterandria formosa*) is a fish with a weird name. Its common name includes the word "killifish", even though it is not a killie, but rather a livebearer of the family Poeciliidae. Well, maybe it's not so weird, there are other Poecilids that ARE actually Killies and are egg layers to boot.

The Least Killifish is one of the smallest of all fishes, and indeed, all vertebrates. For decades the male held the title of smallest known vertebrate, but in the past few decades that title passed on first to a marine goby, then to a freshwater Cyprinid related to the danios, and most recently, to a diminutive frog that is barely larger than a newborn *H. formosa*!

Male Least Killifish usually barely top a half inch. A really big one might reach five eighths of an inch. Females are substantially larger, relatively speaking. A big female might reach an inch and a quarter, but most are closer to an inch in size. Since they are so small, the ideal tank for them would be a species tank, considering just about every other species would be larger than they are, potentially creating a stressful situation for these diminutive fish.

While most of the fishes we hobbyists like to keep are found on the other side of the world, the Least Killifish is found in the good ole USA, from the Carolinas down the East Coast through Florida and along the Gulf Coast to Louisiana. It is found in everything from weed choked blackwater swamps to roadside ditches, hardwater springs, small streams, ponds, lakes and just about anywhere that is wet all year around. Populations are remarkably similar, though there are a few in southern Florida that are colored blonde and others around the Miami area in which males sport a bright orange spot in their dorsal fin.

US Distribution of *Heterandria formosa*

Over the years I have been fortunate to be able to collect them at the far north eastern edge of their range in North Carolina, the southern edge of their range in the Everglades and areas just outside of the Everglades, and in Coastal Louisiana near Lake Ponchartrain. It's amazing how varied these habitats are, from swampy and low pH to high pH spring fed water to slightly brackish.

In all of these habitats the Least Killies are so numerous that at least a half dozen came up in EVERY swipe of the net! In the Everglades along "Alligator Alley" they were so numerous that each swipe of the net in a roadside ditch brought up literally hundreds that would have to be removed by the handful before we were able to see what other fish we caught.

For a tiny fish they are amazingly adaptable, hardy, and not really that shy. In some places I found them in water that was so deep I couldn't see the bottom, and in others the water was barely an inch deep. This really helps when thinking about what kind of home to give them in the Fishroom.

While it would seem that they are the perfect candidate for a nano tank or small tub garden, they are

just as perfect for a larger tank as well. With such a wide range in the wild, they are also tolerant of temperature and don't really seem to need or even want a heater. If you're comfortable in the room, they will be, too.

They can remain out in the tub garden until early October, so move everything else in first, and leave these guys till last. They won't mind as long as the change is gradual. I've even had them in a tub outdoors until early November, but I did add a small heater- just in case. I'm not sure if it was really needed but it made me feel better. The only fish I've ever left out longer was a pair of Paradisefish that stayed out until Thanksgiving weekend one year before I was able to bring them inside. They, too, had a small heater and rewarded me with one last outdoor spawn for that year!

Least Killifish are omnivores in the wild, taking small insects, crustaceans, worms, algae, and aufwuchs, making them undemanding and easy to feed. They will literally eat anything that fits in their mouths. I feed them primarily newly hatched brine shrimp, micro pellets, finely ground flakes and Grindal worms. They will also take microworms with gusto, and greedily gobble down the springtails that love to live on the tops of my Mattenfilters. In outdoor tubs they will thrive on mosquito larvae and similar invertebrates.

Mention of Mattenfilters brings me to filtration- the least killifish is one of the few fish that I can say with certainty that filtration is optional. They don't seem to need the water movement, though it doesn't bother them in tanks where water movement is also fairly heavy. Even a fairly decent sized colony does not have a heavy bioload, and as long as their water is changed regularly and the tank is planted, use a filter or not as you choose.

If you keep them in a group without other species in the tank, a colony will quickly form and soon you'll be looking for new homes for them. Their reproductive strategy is a bit different than many other livebearers, including the guppy. Both species are Poecilids and so produce living young, but since the Least Killis are so small, in order to produce fry large enough to survive on their own from the start, they utilize a strategy called superfetation. The female is able to carry as many as a dozen or more broods of one or two fry at a time. When the embryos are first fertilized, they form a connection to the mother and she provides them with nutrients as they develop for a short time.

As fertilized eggs move down the reproductive track this supply shuts down and they then live off their yolk sacs as they grow allowing others behind them to get a good nutritional start from the mother as they did. Before they reach the end of their development the nutritional supply starts again and they finish the last few days of their development getting more nutrition from their mother. When each group are ready to be born, the female will drop the small brood of one to three fry in the early hours of the day daily until all dozen or so broods have been dropped. She then rests for a week or two and starts the cycle over again. This is an extremely simplified explanation, but will suffice for this article. If you would like to learn more

there are articles and even books on the subject.

Newborn fry are about the size of a newborn guppy, surprising since the female least killi is less than half the size of a female guppy! Unlike many other livebearers, the fry don't head to the surface, but instead look for cover near the bottom. They begin to feed immediately, and will take everything from finely ground food, to powders, to newly hatched brine shrimp. Between feedings they will feed on aufwuchs and the microfauna that covers most surfaces of the tank, especially live plants. In fact, with a good growth of live plants you can get away with only feeding them once a day. The rest of the day they'll be picking on every surface in the tank.

Growth is rapid, and in less than two months they will be getting ready to spawn themselves. They are not long-lived fish, but expect 2 - 3 years out of well cared for adults. With a colony, it seems that there are always plenty of fish reproducing.

This is one cool little fish, and if you give them a try, I'll bet you'll be like me and still have some swimming in your tanks 30 or more years from now!

Why Hobbyists Should Write for their Club Journal.

-

Wayne S. Leibel

First appeared in The Shoreline Jersey Shore AS, March 2002

As Reprinted from the BAS Aquatica Jan 2017

WE STAND ON the shoulders of others who come before us. This is no less true of the aquarium hobby than it is for most other aspects of life.

We learn by hearing of or reading about other people's experiences. In the case of the beginning aquarium hobbyist, this is usually through books or slick magazines. But once having joined an aquarium society where hobbyists of all experiences and abilities meet and exchange ideas (and fish)!), our learning increases exponentially. This can happen via speakers invited to share their knowledge specifically because of their expertise in particular areas of the hobby or, better, through informal chat with members of the club over coffee or the auction table, or, yes, through club publications like Jersey Shoreline/DARTER.

Although my major lifelong hobby interest has been cichlids, I find nuggets of useful information in virtually every talk I have attended, be it about guppies, bettas, or even marine fishes, or in conversation with other members about some weird fish they've spawned, or fielding a question or problem they might bring me (and more often than not I don't have a clue, but learn something from discussing!), or reading an article in the club journal, be it a short BAP report about some fish I have never kept, or a longer feature article.

There is always something to be learned, and it is what keeps us vital in the hobby. A club's publication is its lifeline to the membership and its lifeblood for information exchange. In my talks to various and sundry groups I always try to give hobbyists a pep talk on how what we do as hobbyists is important. I think, as a group, tropical fish hobbyists have a collective inferiority complex; we think that our experiences in captive rearing and spawning of fishes is unimportant - simply a "hobby" (with all the lack of seriousness that implies), particularly,

relative to science. But nothing could be further from the truth!

We have much to contribute, even to that serious activity we call "science." Let me tell you why. These days, the number of professional ichthyologists and other scientists actively engaged in research on fish has dwindled in favor of more molecularly oriented research. That's where the action and money is these days! Fact is, too, most professional ichthyologists are great with the dead and pickled fish they study and name, and not so good with the living critters! (Though there are some exceptions, thankfully.) Also, with so few ichthyologists and so many fish, a lot of interesting observations just never get made: So many fish, so little time, so few professionals to do it!

Here's where we hobbyists come in. Our stock in trade as aquarium hobbyists is creating conditions that encourage our fish to spawn in captivity, where we can watch what they do at close range and learn from them. We do this for a variety of reasons: to accumulate Breeder Award points, to have young fish to sell at auction or to stores to help defray the cost of our hobby, or simply for the challenge and bragging rights of being the first to spawn some difficult or little-known,seldom-kept, or new fish. But along with these activities comes the opportunity also to observe - really observe - what our fishes do, record what they do by taking notes on the conditions we spawned them under and the behaviors we witnessed, and to share that information with other aquarists either through brief BAP reports or better, through articles published in the club bulletin (or even national slick hobby magazines!).

The information is important not just to other hobbyists who would like to learn how to spawn a particular fish, but also to science!

Really!

Here's one (of several) examples of how hobbyists have contributed to ichthyology in a direct and important way. About 15 years ago, in the mid-1980s, some of us playing with South American cichlids of the genus *Geophagus* (eartheaters) noticed that one of the "species" appearing in the hobby and sold as "*surinamensis*" differed from batch to batch. Although all "forms" had blue and red longitudinal striping along their sides, and the same basic body shape, and all sifted sand for food, they differed in the coloration of their tail fins; some had flag stripes (alternating blue and red), some had spotted tails, and some of the spot-tails had black throats and others did not. We also knew they came from different river systems in South America, since, among others, Ben Rosler, (Metropolitan Pets), a

knowledgeable local wholesaler, kept track of where they were collected and exported from: Colombia, Venezuela, Peru, Guyana, Brazil, etc.).

At the time, ichthyologists (J. P. Gosse, 1974) who had studied the dead, pickled bodies of these "*surinamensis*" eartheaters, concluded that it was one very widely distributed species. A (then) newcomer to South American cichlid ichthyology, Sven Kullander, thought otherwise, and suggested that these were discrete, different species, not just various flavors of *Geophagus surinamensis*, in need of different species names. He thought the colorational and other differences (body shape, scale numbers, etc.) were different enough to justify splitting them as different species.

It was hobbyists who bred these fish that provided the final clue and proof: some of the popular forms were "immediate" mouthbrooders, and picked them up in their mouths immediately to incubate them to hatching, while other forms were "delayed" mouthbrooders, which pasted their eggs down on a rock, guarded them for a few days, then took them in their mouths for final incubation, and some were simply non-mouthbrooding "substrate brooders" who did the typical cichlid thing and pasted and guarded their eggs!

Clearly, there was more than one species involved! And it was hobbyists who provided the crucial information. How did Kullander learn about this? There was no ichthyologist sufficiently skilled in getting live fish to breed in the aquarium, leastwise not Dr. Kullander. He didn't breed these himself, rather hobbyists did and wrote about their experiences in hobby magazines that Kullander had the good sense to be reading, and went "aha!"

In fact, Kullander and other ichthyologists have increasingly looked to the aquarium hobby community to provide observations of fish behavior they would never see in the wild. Have you heard about mouthbrooding severums! Or contact feeding pike cichlids? Of killifish who inject their eggs into cracks in rocks in fast moving streams? Or splashing tetras that jump out of the water to spawn on overhanging plants? Or bubblenest brooding catfish? or etc., etc., etc. The list goes on and on, and science would be ignorant of all if it were not for tropical fish hobbyists and the articles they have written about observations they have made in their home aquaria!

We should give ourselves a huge pat on our collective back!

Ok, well maybe your experiences breeding this or that may not prove important or crucial to science (though you never know!), but **I am certain someone, somewhere, would love to learn about them even if it is just to repeat them and rack up BAP points.** Our hobby is, among other things, about generating and sharing information.

I can think of no better chatter vehicle for doing this than a fish club, and no better way for sharing the information within and between fish clubs than through club publications, particularly in this age of the internet and websites, where club journals and your writings are posted on the web for all to access and learn from.

So, please, really observe your fish, take good notes and SHARE them with the rest of the tropical fish community by WRITING FOR YOUR CLUB PUBLICATION.

A SUPER-SIMPLE METHOD FOR WRITING ARTICLES ON BREEDING FISH

The following article is a reprint from The DARTER - Sept., 1976. At that time taken from a 1974 Sarnia Aquarium Society paper, the original source is unknown.

I'LL BET ONE of the most often heard comments cried when people are asked to compose an article for the bulletin is "How do I begin?" Maybe I can help eliminate the stalls and false starts by providing an outline that could be used as a guide or even turned in with the blank spaces filled to be turned into a full article by the editors of the newsletter/bulletin. Give it a try and see how it works for you!

A. Name of Fish
1. Common name (if it has one)
2. Latin name (if you possibly can)

B. Description of Fish
1. Color and General Shape
2. Sex differences
3. Size at maturity
4. Temperment

C. Fish's Natural State
1. Geographical Location
2. Climate of area
3. Water chemistry, if possible

D. Spawning Tank
1. Size & description of tank
2. Water temperature and chemistry
3. If chemistry altered, how?
4. What substrate, plants, etc.?
5. Type of filtration
6. Situation - light sources, distance tank from floor, traffic by the tank, etc.

E. Set-up
1. Pairs or multiples
2. How introduced to tank
3. Any special time of day
4. When to expect the spawning
5. How long to leave set up?
6. Feed during set up

F. Conditioning
1. Were sexes separated? How long?
2. Food, what and how much?
3. Raise temperature?

G. Description of Spawning
1. What is spawning site?
2. Courtship and spawning actions
3. Spawning colors and patterns
4. Number and description of eggs
5. Parental care

H. Raising the Fry
1. How long until eggs hatch?
2. Special care of eggs
3. Size and % of hatch
4. When do fry begin to eat?
5. What did you start them on and when and what did you switch their food to?

Happy Writing!!

MASI SUPPORTERS AND FRIENDS

Ad Konings

California Blackworms @ Eastern Aquatics
9 out of 10 Fish Approve

THE EXOTIC AMPHIBIAN & REPTILE CENTER

Imperial TROPICALS
SINCE 1979

Segrest Farms

UNITED PET GROUP, INC

Seachem Just add water. We'll do the rest.

Tetra

SWISS TROPICALS

EST. 1968 SAN FRANCISCO BAY BRAND 50 YEARS

MIDWEST TROPICAL FISH
JERSEYVILLE IL

MARINELAND

LUALYN AQUATIC GEMS

Dupla

Original Plecostomus Plush GREENPLECO

LRB L.R. Bretz Aquatics

AQUARIUM HOBBYIST MAGAZINE

EXOTIC AQUATICS
www.minifins.com

Sailfin PET SHOP

PlecoCaves.com

PETSWAY

MARK OF EXCELLENCE Mark Huffman Aquatic Plants and Select Fish

Hikari "Making Species Specific Diets For Decades!"

sera

Jonah's Aquarium

Tropical World Pets

OMEGA ONE Aquatic

AMAZONAS The world's leading freshwater aquarium magazine!

AQUEON

SAVE YOUR FISH ZOO MED

HAGEN
YOUR TRUSTED SOURCE FOR THE BEST IN PET PRODUCTS SINCE 1955

Brine Shrimp DIRECT
PRODUCTS TO MAKE YOUR TANK THRIVE!
Discount code 05114 for 5 % off an order

CENTRAL Garden & Pet

TROPICAL FISH HOBBYIST MAGAZINE

CORALIFE

Florida AQUATIC NURSERIES

COBALT AQUATICS

MARS fishcare