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September 2024
volume XXXI
number 7

Greater City Aquarium Society - New York

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Series III Vol. XXXI, No. 7, September, 2024

ON THE COVER

Our cover photo this month is from GCAS member Scott Peters, via our Fishy Friends Facebook Page, and features a *Betta unimaculata*. One writer describes this fish as “a *Betta* that looks like a killifish.” See page 9 for an article on this intriguing fish!

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From the Editor

by Dan Radebaugh

Hello! And welcome to our new meeting venue at the Alley Pond Environmental Center! I trust that none of us got *too* lost while finding our way here for the first time! Note that we've included a map along with the President's Message (see page 4) this month.

In this issue you'll find short articles, longer articles, articles from folks we know, and articles from folks unfamiliar to most of us. Please be sure to check out the newest installment of Marsha R.'s "Who Are We?" (on page 19). This month's installment introduces, for those who don't already know him, Scott Peters! Our cover photo for this issue is by Scott, so if you looked at tonight's **Modern Aquarium** cover, you have seen an example of his work. There are more of Scott's photos inside the issue. Check 'em out!

As I mentioned in this column earlier in the year, I have been revisiting articles from past years by Al Priest and Susan Priest in homage to their contributions to the success of **Modern Aquarium** going back to its inception. Without their contributions this magazine would likely not have become what it became.

Meanwhile, it is up to us now, in this time, to carry the torch left to us by others. Covid struck a terrible blow to our hobby in many ways, and we are still feeling the effects. Nevertheless, there are hopeful signs of recovery here and there. Let's try to be a part of that recovery!

Remember, as always, we need articles! **Modern Aquarium** is produced by and for the members of Greater City Aquarium Society. Our members are our authors, and with ten issues per year, we *always* need more articles. I know several of you are keeping and/or breeding fish that I would like to know more about, and I'm certain other members would be interested as well. Share your experiences with us. Write about it! If you're



a little unsure about the state of your writing technique, don't worry—that's why editors were invented!

If you have an article, photo, or drawing that you'd like to submit for inclusion in **Modern Aquarium**, it's easy to do! You may fax it to me at (877) 299-0522, email it to gcas@earthlink.net, or just hand it to me at a meeting. However you get it to me, I'll be happy to receive it! Enjoy!



Aquarium Care of Cichlids



by Greater City member Claudia Dickinson
(Animal Planet® Pet Care Library)

Hardcover – Also available on Amazon Kindle

<https://www.amazon.com/Aquarium-Cichlids-Animal-Planet-Library/dp/0793837774>



GCAS Programs

2024

March 6	Emperor Tetras
April 3	Inside Filters
May 1	Live Food Culture
June 5	Swordtails
July 3	Aquatic Plants
August 7	Night At The Auction
September 4	Breeding Corydoras
October 9	Fishrooms
November 6	Daphnia
December 4	Holiday Awards Party!

Articles submitted for consideration in *Modern Aquarium* (ISSN 2150-0940) must be received no later than the 10th day of the month prior to the month of publication. Please email submissions to gcas@earthlink.net, or fax to (347) 379-4984. Copyright 2023 by the Greater City Aquarium Society Inc., a not-for-profit New York State corporation. All rights reserved. Not-for-profit aquarium societies are hereby granted permission to reproduce articles and illustrations from this publication, **unless the article indicates that the copyrights have been retained by the author**, and provided reprints indicate source, and that two copies of the publication are sent to the Exchange Editor of this magazine (one copy if sent electronically). For online-only publications, copies may be sent via email to gcas@earthlink.net. Any other reproduction or commercial use of the material in this publication is prohibited without prior express written permission.

The Greater City Aquarium Society meets every month except January and February. Members receive notice of meetings in the mail or by email. For more information, contact: Dan Radebaugh at (718) 458-8437, email to gcas@earthlink.net, or fax to (347) 379-4984. For more information about our club or to see previous issues of *Modern Aquarium*, you can also go to our Internet Home Page at <http://www.greatercity.net>, <http://www.greatercity.org>, or <http://www.greatercity.com>.

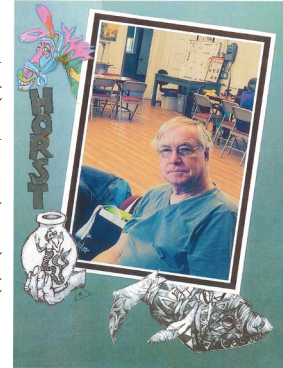
President's Message

A Time for Thanksgiving!

by Horst Gerber

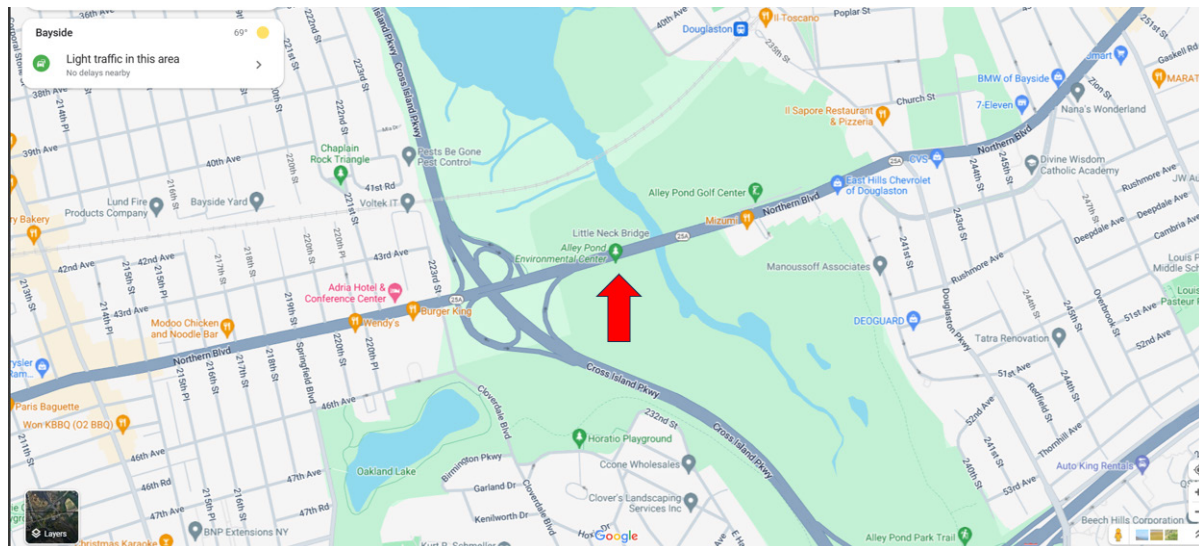
The average aquarium/tropical fish club survives about ten years. We (Greater City) are 102 years old. The Queens Botanical Garden was a great meeting place for 44 years! While we didn't leave with a big party, we did leave with a Big Bang auction with well over one hundred items!

We have many reasons to be grateful as we begin meeting at Alley Pond Environmental Center. The parking accommodations are truly a blessing! The future looks promising, so who knows? Maybe we're at the beginning of another hundred years!



Horst

Map to Alley Pond Environmental Center





GCAS Thanks You!

Our Generous Sponsors and Advertisers

The Greater City Aquarium Society extends our heartfelt thanks to the following manufacturers for their generous donations. Thanks also to our advertisers, whose contributions to our success as a Society are deeply appreciated. Please patronize our supporters.

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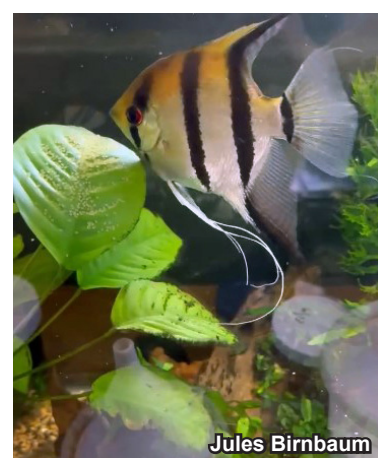
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Fishy Friends' Photos

by Greater City Aquarium Society Fishy Friends

Below are photo submissions to our "Fishy Friends" Facebook group. I've left the subjects unnamed, but not the photographer. If you see a shot you like, and want more info, ask the photographer about it! I'm sure he or she will be delighted to tell you!





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moaph.org

<https://moaph.org/>

August's Caption Winner: Ron Webb

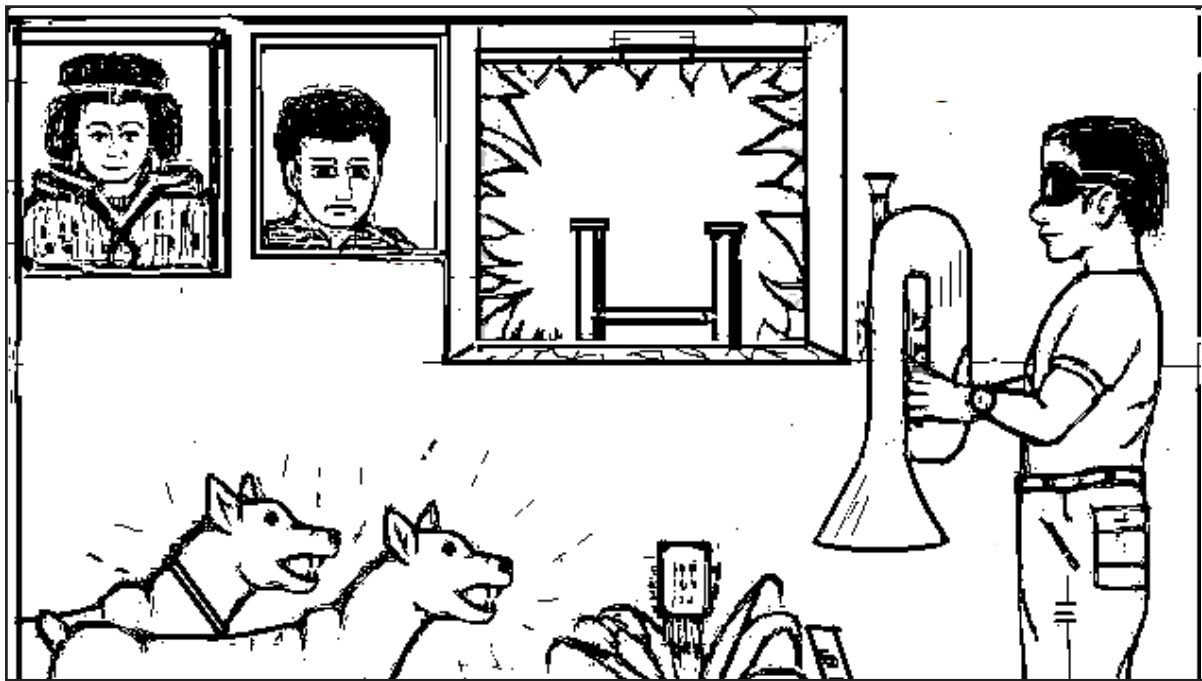


I think that in a moment, life will be imitating
art!

The Modern Aquarium Cartoon Caption Contest

by Denver Lettman

*In this contest, you, the members of Greater City, get to choose the caption! Just think of a good caption, then mail, email, or phone the Editor with your caption (phone: 347-866-1107, fax: 877-299-0522, email: gcas@earthlink.net). **Your caption needs to reach the Editor by the third Wednesday of this month.** We'll also hand out copies of this page at the meeting, which you may turn in to Marsha or Dan before leaving. Winning captions will earn ten points in our Author Awards program, qualifying you for participation in our special "Authors Only" raffle at our Holiday Party and Banquet. Put on your thinking caps!*



Your Caption:

Your Name:



<https://www.amazonasmagazine.com/>

On Our Cover

Betta unimaculata:

A Unique Fish You Need to Know About

by Jennifer Doll



B*etta unimaculata* is a very interesting fish in both appearance and character. In fact, this fish hardly looks like a type of betta species and might actually be mistaken for a type of killifish instead! However, the *Betta unimaculata* is a great choice of wild betta to have in your home aquarium if you're looking for something other than your typical *Betta splendens*. Keep reading to find out everything you need to know about wild bettas, *Betta unimaculata*, and how to keep one of these beautiful fish in your own freshwater aquarium!

Interestingly, these tropical fish like to be kept at slightly cooler temperatures than the domesticated *Betta splendens*. The ideal temperature range for *Betta unimaculata* is between 70-78° F (21.1-25.6° C).

In order to keep this species happy and healthy, you will want to give it a protein-rich diet. It is good to supplement feedings with live, frozen, and freeze-dried foods. For the most part, these fish are calm and docile, and will spend most of their time foraging for food on leaves and other surfaces.

They tend to live in sections of forest streams with clear water over sandstone rocks and no algal growth. Though remote and in a limited range, regional variations of *Betta unimaculata* have been reported and are able to hybridize, as they are still the same species.

Betta unimaculata doesn't look like your typical domesticated *Betta splendens*. Instead of most bettas' short, stocky bodies, this wild type has a long, skinny body with a broader head shape, which is almost snake-like! And it has an extended anal fin. In fact, these are one of the largest species of betta, reaching lengths of 4.5 to 5.0 inches (1.8 to 2.0 centimeters). Coloration largely depends on the locality of the fish, though most colors are muted greys and browns with splashes of blues and greens.

Females are very understated in appearance and generally smaller. Typically, these female fish are entirely brown or grey with little to no flashes of color. In addition, females generally have two dark longitudinal stripes. Male *Betta unimaculata* are much larger and colorful. Their heads are even broader, and their fins are even more extended.

Tank Requirements

Betta unimaculata is not a common species in the aquarium hobby, though betta specialists will likely be especially drawn to this species. Unlike the more aggressive *Betta splendens*, *Betta unimaculata* rarely cause problems in the aquarium. However, the two species' care and tank requirements are very similar.

Because *Betta unimaculata* are docile and multiple fish can be put together in the same tank, they will need a larger tank. For one male and female pair, at least a ten gallon tank is recommended. These bettas do not require a substrate. However, a sand substrate covered in leaf litter will create blackwater conditions, keeping pH down and providing fish with extra coverage.

Betta unimaculata will enjoy lots of driftwood and floating plants to keep them covered and hidden, as they can be a little skittish at times; dim lighting with a tight aquarium lid may also help. Some hobbyists actually keep multiple *Betta unimaculata* in larger groups, but this would require a larger tank in excess of forty gallons.

Water Parameters

Like other bettas, these fish enjoy more acidic conditions, and need a pH between 5.0-7.5, which can be adjusted through tannins. Other than that, these fish are very hardy and can withstand most water parameters as long as they're close to the ideal ranges and at constant values. A sponge filter will provide the best filtration to keep water flow minimal while creating a place for beneficial bacteria to spread.

Temperature & Lighting

In the tank, the water should be kept at a consistent, steady temperature of 23 degrees Celsius, or 74 degrees Fahrenheit. Though *Betta unimaculata* is able to adapt to most aquariums due to its high tolerance to high temperatures and pH levels.

You might be surprised to learn that the lighting in the tank for your *Betta unimaculata* should be rather dim. Keeping a lid on the aquarium, a dim lamp, and plenty of plants to block excess light makes for an ideal set-up. This is because the unimaculata organ, called 'Photophores,' is located on the body, dorsal, anal, and tail fins. This organ is used as the betta's main source of light, as they use it to illuminate their surroundings and find their way around, so if the lighting within the aquarium is too bright, it

can render this organ useless.

While live plants are often highly recommended for bettas, when it comes to *Betta unimaculata*, an abundance of live plants is necessary in order to block light, prevent insects such as mosquitoes from getting in, and provide plenty of hiding places for your fish. Little caves and decorations can provide great dark hiding spots too!

The lighting in the tank also contributes to temperature control. As with any betta, the water temperature and parameters should be maintained in order to prevent bacteria growth, which can cause illnesses in your fish.

Substrate

The substrate used in your *Betta unimaculata* tank is very important. Sand will give this betta more space to burrow and hide, and wood shavings are sometimes used as they're easy to clean.

The amount of live plants and algae building up in this tank can be necessary to keep ammonia levels from getting too high. Options for a good substrate include sand, wood shavings, river sand, and potting soil! Sand or sand-like mixture is recommended, however, preferably one with high fiber content. Again, this is because peat substrates can lead to the growth of bacteria and fungus, which can cause ammonia build-up and, ultimately, make your fish sick, in many cases, leading to the death of your beautiful and beloved pet. Some good choices might be small minnows or loaches found in the Kajan and Howong water drainages and similar water conditions.

Remember that there are different variations of *Betta Unimaculata* based on locality, and that they are able to hybridize! Choose your pet fish wisely, especially when interested in a compatible pair.

Betta unimaculata is a very interesting species of betta fish, as they are mouthbrooders. This is when one of the parents carries the eggs and/or the fry in its mouth for protection.

Breeding

In order to breed *Betta Unimaculata*, you will need an established pair. This can be difficult, as not all females will accept the male you introduce. Unless you have a larger tank that can hold several *Betta Unimaculata* and wait for them to pair, purchasing an already compatible male and female couple is usually recommended.

Once this pairing is established, the fish will intertwine and mate. Once the eggs have

been fertilized, the female will help move the eggs into the male's mouth. During this time, it's very important that the male stays calm and undisturbed. If he becomes stressed, there is a good chance he will swallow the eggs, and the brood will be lost.

For the most part, female *Betta Unimaculata* will leave the male undisturbed, and can stay in the tank with the male. However, if you have an especially annoying female, she should be removed from the tank for the brooding duration.

After about 2 weeks, the fry will hatch; removing the fry from the tank is recommended for a greater yield. Fry can be fed larger foods immediately, though they should not be fed too much, as this can easily cause intestinal issues. Water changes should also be continued to keep water quality pristine.

Conclusion

We all know the many shapes and sizes that *Betta splendens* comes in, but what about all the other *Betta* species that can go in the home aquarium?

Betta unimaculata is a unique betta that has a long, snake-like appearance and keeps young in its mouth! These fish are much less aggressive than other bettas, and can be kept in larger groups.

Source: This article previously appeared on BettaSource.com



Fishing Online

Story and Photos by Stephen Sica

With the decline of small “pet shops,” many hobbyists have either considered, or have purchased live fish and related animals online. Many individuals have been purchasing pet supplies online for many years. This is not a new concept. It is convenient to sit at home on one’s computer, make a purchase, and have it delivered to your doorstep—sometimes the very next day. I began purchasing aquarium plants online during the pandemic. This avoided contact with another person who might accidentally kill me! Of course, it wasn’t as simple as that. What is? But it introduced me to another facet of this hobby.

Aside from purchasing plants and occasionally fish at GCAS auctions, I sometimes purchase plants on eBay. These vendors sought my business with offers such as, buy one plant and get a second one for half price, or buy two and get a third plant free. I am currently expecting an eBay order of “three for two” plants to arrive at my home shortly.

AquaBid.com is an online auction website where you can buy and sell both fish and equipment. Many aquarists are familiar with this internet site. In addition, there are probably dozens, if not hundreds,

of businesses that sell fish either in their stores, online, or both.

I have recently been googling online fish dealers in earnest to purchase live fish. In the past, I was dissuaded by the shipping costs. Also, I felt uncomfortable purchasing a live animal through the mail, but nowadays it is common procedure for dealers to ship or mail bulk quantities of aquatic animals. During my online research of tropical fish dealers, I discovered a mail order retailer that charges a \$12.99 packing and shipping fee for two day delivery by USPS. This retailer, Aqua Huna, is in

Renton, Washington, eleven miles from Seattle. Interestingly, this dealer does not ship to customers in its own state because it is also a wholesaler for local businesses, and does not want to compete with the pet and aquarium stores that it sells to.

On a Thursday afternoon, I made an online purchase from this company for fourteen fish and four snails. Their policy is to ship from Monday through Wednesday to avoid the possibility of live

animals spending the weekend at a postal warehouse. My order was prepared and mailed on Monday afternoon, Pacific Daylight Time. I received the package of fish just after 4 PM on Wednesday, local



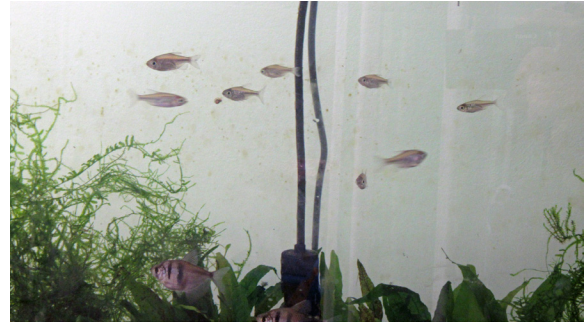
time. I took the box down to the basement and carefully opened it. There were three bags of fish; each was double bagged and all three were enclosed in a larger bag.

Separately, the snails were wrapped in a damp paper towel and sealed in a single small bag. The fish and snails were snugly nestled in a small box lined with white insulation material with a removable top, so the whole box was insulated. During this stretch of weather the outdoor temperatures have been in the fifties, so the fish were warm enough during the two day delivery from the Pacific Northwest.

Aqua Huna currently has in stock the Penguin Tetra and Glass Catfish, two of my favorites, so I have the urge to order from this company again. Unfortunately, I have no tank(s) for these fish. As of this writing, all fourteen fish that I purchased have been alive for almost two weeks since I received them.

Most of this company's fish are sold in lots. I purchased one allotment of *Corydoras aeneus*, or the green corydoras. This lot consisted of six fish. This is the first *Corydoras* catfish species that I ever purchased. It was over thirty years ago that I bought a single fish. I have always been attracted to this fish. It's not fancy—just a nice little fish.

But the primary reason that I made an online fish purchase was to secure a



fish that I had never kept before. Online videos of it swimming in a nicely planted aquarium always caught my attention. Aqua Huna sells this fish, the Congo tetra, in lots of four fish, so I purchased two lots, or eight fish. The eight tetras and six corys were put in my uninhabited thirty gallon aquarium that I recently cleaned out and refurbished while recovering from a torn rotator cuff and fractured shoulder. This small project would provide both therapy and exercise, and keep my mind from pain during the healing process.

I want the Congo tetras to be the showcase fish in this aquarium—just like the videos that I admired. I believe Aqua Huna's prices to be fair. I suspect it's because the fish are small, but they are not fry, or even large fry. The tetras are about 1 and a quarter to 1 and a half inches at most, and the *Corydoras* catfish slightly larger. It's a mixture of somewhat larger and smaller sizes. This is my personal estimate. Same for the catfish.

I am not recommending that you purchase fish online or from this specific retailer. I am describing my experience, which has been positive so far. The big question is, should you spend your money 3,000 miles away or a few miles from home in your local "mom and pop" pet shop? There are numerous reasons for either choice. You decide!





BOWL SHOW RULES

There is a Bowl Show at every GCAS meeting, except our Night at the Auction/ fleamarket meeting and our Holiday Party and Awards Banquet meeting. Bowl shows are open to all members of GCAS. Rules are as follows:

- Only current GCAS members may enter fish in the Bowl Show.
- There is a limit of 2 entries per member per meeting.
- Unlike some other clubs, every month is an “open” Bowl Show at the GCAS (i.e., there is no “theme,” such as that one month cichlids are judged, the next livebearers, the next anabantoids, etc.).
- Any fish that wins any prize (1st, 2nd, or 3rd) may not be entered again in the same meeting year.
- B.Y.O.B. (Bring Your Own Bowl!) Entrants are responsible for providing suitable containers and suitable water for their fish. These containers must be clear on at least three sides.
- Only one fish per container (i.e., no “pairs”).
- No plants, ornaments, or equipment (filters, airstones, etc.) are allowed in the judging tank (an external mirror, or opaque cards between containers is acceptable, as is a cover that does not obstruct side viewing).
- Points are awarded: 5 points for 1st Place, 3 for 2nd Place, and 1 for 3rd Place.
- Ribbons are awarded: blue for 1st Place, red for 2nd Place, and green for 3rd Place.
- The person with the most points at the end of the meeting season receives the Walter Hubel Bowl Show Champion trophy at the Awards Banquet.
- The decision of the judge(s) is final.
- A running UNOFFICIAL total of the points awarded is printed in **Modern Aquarium**. Only the tally of points maintained by the Bowl Show Coordinator is official.
- **In case of ties:**
 - 1st Tiebreaker – most 1st Places
 - 2nd Tiebreaker – most 2nd Places
 - 3rd Tiebreaker – most entries

A Deep Dive into Brooklyn's Shallowest Goldfish Habitat

by Thomas Warns



New Yorkers are nothing else if not resourceful. That has been on display this summer, when residents turned the puddle underneath a leaky fire hydrant into the “Bed-Stuy Goldfish Pond.” Located at the corner of Tompkins Avenue and Hancock Street, the pond sprung up in early August when Je-Quan Irving and a few other residents “took it upon [them]selves to spruce up this little area” by dropping dozens of small goldfish into the “pond” (perhaps puddle is more appropriate).

The founders of the pond claim that it is extremely popular with neighborhood children, who have added decorations to the habitat. The founders also state that it is a “peaceful and tranquil” addition to the neighborhood. Co-founder Hajj-Malik Lovick stated that the pond brings “joy” to the children of the neighborhood, and that the fish are thriving and even reproducing. The third co-founder, Floyd Washington, added that the pond “brings conversation in the community,” and that they’re “helping” the goldfish. While some question whether that last statement is true, no one disputes that

the pond has drawn attention to this block of Bed-Stuy.

The Bed-Stuy Goldfish Pond (sometimes called “Gavs Fish Pond”) is roughly one and a half inches deep, and reporting from the beginning of its existence (around August 8th) stated that the goldfish were sharing a space with “cigarette butts, rusty beer bottle caps, AAA batteries, plastic costume pearls, rocks, pistachio shells, glass shards, the eraser end of a broken pencil, and lip gloss in a squeeze bottle.” Those two facts have undoubtedly attracted a lot of criticism from some members of the community. While more recent photos appear to show a habitat cleared of debris (and in fact filled with decorations), the pond also lacks any filtration, and the water flowing in from the fire hydrant is not treated (though perhaps supporters of the goldfish are adding Stress Coat or Prime). Predators such as rats, birds, and raccoons should find it easy to scoop up a snack given how shallow the habitat is. The shallow habitat means the goldfish are subjected to extreme temperature swings. In a bad enough storm, the goldfish could be washed away into a storm drain.

Members of the community have called 311 to report the pond several times, according to New York City records, and many have complained about the pond online. Veterinarian Benjamin Rosenbloom, founder of New York City-based Wet Pet Vet, told the **New York Post** that “keeping these fish in a sidewalk puddle is animal cruelty.” Veterinarian Julius Tepper, who runs the Long Island Fish Hospital, noted that the water is likely polluted from the environment and storm runoff (which is hard to argue with given the debris on your average New York City street). PETA has described the Bed-Stuy Fish Pond as “inhumane” and stated that it is actively trying to re-home the fish.

One resident was apparently so troubled by the fish pond that she removed over 30 fish one night and re-homed them in a more appropriate habitat. Mr. Irving and the founders of the Bed-Stuy Goldfish Pond claim that the fish were stolen. The resident claimed she “liberated” the goldfish, and added that her offer to the founders to rehome the goldfish in a proper aquarium was rebuffed.

The story took on a racial dynamic when the White residents responsible for the nighttime rescue operation revealed their identities to the media, with one of the resident stating, “I’m very aware of the optics of a white yuppie coming here and telling this man who’s lived in the neighborhood his whole life that he doesn’t know what he’s doing, I do sympathize with that. I just don’t want to watch 40 fish suffocate in a puddle from their own waste.” That woman, Emily Campbell, described herself as a lifelong fish enthusiast who previously worked in aquaponics.

Whether characterized as theft or an act of mercy, the goldfish heist in early August prompted a number of changes to the pond. Back in early August, Mr. Irving said his plans were to remove the goldfish from the pond in the fall and pass them out to the children in the neighborhood. Their plan was to then reintroduce new goldfish in the spring, into a wider pond. Now, Mr. Irving and the founders

of the Bed-Stuy Goldfish Pond say that pond is monitored 24/7, and that they intend to make the pond permanent. Perhaps the heist, and the growing divide in the community, has made them more determined than ever to keep the fish in the pond.

They have started a GoFundMe which aims to raise a few thousand dollars for protective plexiglass and a filtration system (it appears more than one GoFundMe page has been established, making it difficult to know how much they have raised). The founders claim that this will allow the goldfish to survive the winter in the pond. It is difficult to fathom how the managers of the fish pond can prevent such a shallow puddle from completely freezing over during the first cold snap of the upcoming winter—an occurrence which would, to state the obvious, be fatal to all inhabitants of the fish pond.

Separate and apart from the raging debate over whether the goldfish in the Bed-Stuy Goldfish Pond are being abused is a much more practical concern: the impromptu goldfish habitat is interfering with a fire hydrant. The City’s Department of Environmental Protection’s Deputy Commissioner for Public Affairs and Communications Beth DeFalco stated that it was imperative that workers be permitted to service all fire hydrants, and fix any leaking hydrants.

Ms. DeFalco warned that damaged or leaking hydrants can reduce water pressure in nearby hydrants in the event of a real emergency, and complained that while crews have shut off the fire hydrant several times, the managers of the Bed-Stuy Goldfish Pond repeatedly open the hydrant to get water flowing back into the pond. Ms. DeFalco told the **New York Post** that “We love goldfish also, but we know there is a better home for them than on a sidewalk.”

It is hard to call the Bed-Stuy Goldfish Pond founders animal abusers, as some have said, given their obvious care for the goldfish and desire to improve the community. Whatever the founders’ initial intentions, however, they must be clearly aware by now

that their effort to keep the goldfish in the puddle beneath a fire hydrant is misguided, and doomed to fail in the long run. Hopefully they will agree to voluntarily re-home the goldfish before the weather gets cold, and the fish will have long, healthy lives ahead of them. If not, it's likely that they will be remembered more for the tragic demise of the goldfish than for the very real joy they have brought the community in the last month.

P.S. As this article was about to be published, several sources reported that the fish pond was vandalized overnight. The perpetrators tore up the pond, throwing decorations all over the street and killing at least five fish,

according to the fish pond's founders. The ultimate fate of the goldfish puddle remains unclear.



Sources:

[Bed-Stuy's makeshift goldfish pond is going strong, but not without controversy • Brooklyn Paper](#)
[Brooklyn fire hydrant fish pond creators launch GoFundMe – NBC New York](#)
[NYC residents rally to keep goldfish swimming in hydrant puddle through winter as activists call it animal abuse \(nypost.com\)](#)
[Brooklyn puddle being used as sidewalk 'fish pond' \(nypost.com\)](#)



GCAS Happenings September

A WARM WELCOME BACK TO RENEWING GCAS MEMBERS EVELYN EAGAN AND STEVE MILLER!

Last Month's Bowl Show Winners:

NO BOWL SHOW LAST MONTH

UNOFFICIAL 2024 BOWL SHOW TOTALS TO DATE:

RICHIE WAIZMAN 8 BILL AMELY 3 STEPHEN SICA 3

Here are some aquarium societies in the Metropolitan New York area:

GREATER CITY AQUARIUM SOCIETY

Next Meeting: October 2, 2024

Speaker Topic: Fishrooms

GCAS Meets the first Wednesday of the month (except January & February) at 7:30pm:
Alley Pond Environmental Center
22465 76th Ave - Oakland Gardens, NY 11364

Contact: Joseph Ferdenzi (516) 484-0944

E-mail: GCAS@Earthlink.net

Website: <http://www.greatercity.net>

BROOKLYN AQUARIUM SOCIETY

Meets the 2nd Friday of the month (except July and August) at 7:30pm: New York Aquarium - Education Hall, Brooklyn, NY 11229

Call: BAS Events Hotline: (718) 837-4455

Website: <http://www.brooklynaquariumsociety.org>

LONG ISLAND AQUARIUM SOCIETY

Meets: 2nd Fridays (except July and August) 8:00pm.

Meetings are held at AMVETS Post 48, 660 Hawkins Avenue, Ronkoncoma, NY 11779

Website: <https://ncasweb.thechinesequest.com/>

NASSAU COUNTY AQUARIUM SOCIETY

Meets: 2nd Tuesday of the month (except July and August) at 7:30 PM. Meetings are held at:

Molloy University - 1000 Hempstead Ave, Rockville Center, NY, Barbara H. Hagan Center for Nursing, Room 239

Contact: Mike Foran (516) 798-6766

Website: <https://www.nassaucountyaquariumsociety.org/>



Mister Jules and his Brine Shrimp Rules

by Jules Birnbaum

I did not make up the name “Mr. Jules.” Every time I walked into our bank, the tellers having trouble with pronouncing my last name began calling me, “Mr. Jules.” Much has been written about feeding Brine Shrimp to smaller fish and their fry. I will be reviewing here my method of using this live food for feeding my fish.

Why Brine Shrimp in the first place? This is a genus of aquatic crustaceans popularly known as Brine Shrimp or Sea Monkeys. They are very small, and you can feed them to fry soon after the fry have hatched. Since these ‘sea monkeys’ are constantly moving, the fry immediately recognize them as food. This is helpful because there are several species of my killifish fry that will not eat anything that is not moving. Brine Shrimp are rich in essential nutrients and high in lipids and unsaturated fats.

There are several online retailers that market brine shrimp eggs ready for hatching. I have found the most reliable source is Brine Shrimp Direct. They sell a 16 oz. can for about \$50 plus shipping, which has become very expensive, so I always also combine an order with some of their high quality flake or pellet fish food.

Once I receive the eggs, I store the can in our freezer until they are ready for use. Before storing, some aquarists take out some eggs for use in the next few weeks. I also do this sometimes, but by opening the container it exposes the eggs. When I am ready, I defrost the can of eggs, and when the can is at room temperature I open the can and pour out the amount of eggs I will be using for the next couple of weeks. These eggs for current use will be kept in a sealed small container in my fishroom. The can of remaining eggs is kept in a refrigerator.

Hatching the eggs can be tricky, but I use a one-quart hatchery purchased from Aquarium Co-Op. Brine Shrimp Direct also sells a hatchery. Mine hangs on a fish tank, saving me some space. After filling the hatching container with the warm sink water, two tablespoons of Kosher salt are added. I then add one tablespoon of eggs. An air hose is placed in the hatching container since circulating the eggs is a must. I do not add anything to bring up the pH as some recommend. However, a high pH is recommended for a better hatch rate.

The next step is to remove the air hose and place a light under the hatching container for approximately five minutes, giving the shrimp time to be attracted to the light.

Eggs should hatch in 24 hours, but sometimes I wait for a hatch as much as 36 hours. The valve at the bottom of the hatching container is opened, and the shrimp are collected in a plastic take-out soup container. The eggs are then run through a special fine brine shrimp net and rinsed with fresh tank water. The newly hatched brine shrimp are placed in a container with fresh tank water in it. I use a turkey baster to feed each tank.

In order to avoid a bacteria bloom, make sure everything is cleaned after finishing up. There are many ways of hatching brine shrimp. This is one that seems to work for me.



Brine Shrimp — *Artemia salina*
Photo from Temu.com

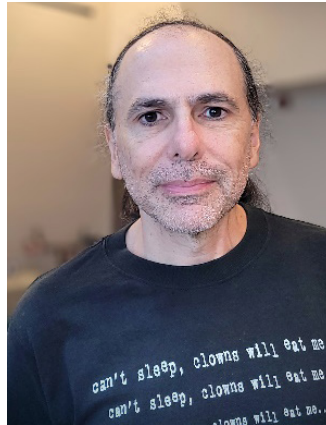


Who Are We?

by Marsha Radebaugh

In its 100+ years of existence, Greater City Aquarium Society has had a membership of thousands. Each month, with the exception of those during the Pandemic, our meetings have an average of 40 – 60 members and visitors in attendance. We all know who the “stars” are, the officers, presenters, regular runners, etc. are individuals well known to the rest of us. There are those, however, who quietly and consistently attend most if not all meetings. We sit beside each other, sometimes chatting, sometimes not, without any idea who are neighbors are outside of this room. Well, I think it’s time we found out. As Membership Chair, I have the opportunity to meet and greet each of you, checking you in and handing you your Modern Aquarium issue, your door prize ticket and collecting dues. I know who you are! But do you? So, going forward, as often as I can, I’m going to select a loyal member and introduce him or her to the rest of you in this column.

Meet Scott Peters!



As a child growing up in Brooklyn, New York, Scott’s dad and his dad’s sisters had several fish tanks in their home. They used to take him along on their ventures to local pet shops for supplies and more fish. When he was 11, Scott was presented with his very own 10-gallon setup. Thus, an aquarist was born!

As the years went on, buoyed by his love for and fascination with nature, Scott’s dedication never flagged. As he puts it, he was “bitten by the bug early and never recovered from it.” He used to like to go wandering in the woods, bringing home toads and other critters. And now, of an age that allowed him to wander the city independently, he visited various, some now historical aquarium shops, even in

Chinatown, such as Aquarium Stock and Ed’s Tropical Aquarium, always searching for that next fish. As Scott says, “A lot of people get discouraged after their first fish dies.” Not Scott.

Still in his teens, “multiple tank syndrome” struck. Many of the shops in Brooklyn posted flyers about the Brooklyn Aquarium Society, touting their auctions, etc. And so he started going to meetings, and eventually joined the Society. At one of the early auctions he attended, he bought a 29-gallon Metaframe tank, struggling to carry it home. That was 17 years ago!

Soon after, he graduated to breeding, as the BAS auctions were a good place to sell his fry. In 2011 he also began selling them online at Aquabid. About eight years ago, someone reached out to him on

Aquabid with interest in purchasing some fish. When they discussed shipping, etc., the guy said he lived in the city and would be happy to pick them up. So he did! He also told Scott about another fish club; one he'd heard about, but had never gone to. Yes, that was Greater City Aquarium Society, and the customer inviting him to a meeting was none other than our very own current Vice President, Ed Vukich! Thanks to Ed, Scott has trekked to Queens from Coney Island almost every month for these last eight years. Now that's dedication!

Nowadays, living in his own one-bedroom apartment in Brooklyn, Scott has graduated to 11 tanks, from 10 to 30 gallons, and keeps and breeds South African cichlids, West African dwarf cichlids, Killies and Anabantoids. One of his favorites among them is the Spadetail Checkerboard Cichlid (*Dicrossus maculatus*). You can see from the photos the beauty, variety and level of care



***Dicrossus maculatus* male**

his collection exhibits. He's a pretty good photographer too!

He still wanders the city and further for his business, selling T-shirts at various conventions such as comic book, horror, science fiction and nostalgia.

So here you have the evolution of one of the many dedicated aquarists we are fortunate to have in our club!



Amatitlania nanolutea



***Apistogramma panduro* female**



Betta smaragdina



Chromaphyseoscion bitaeniatus

This Deadly Fish Is Threatening Our Seafood Supply

by Allison Arnold



gettyimages-1399078949© yusufkayaoğlu / 500px - Getty Images

The lionfish most likely got its name from the 18 venomous spines that fan out across its body like a lion's mane. Get stung by one and you could experience pain and swelling, and even paralysis. This stunning brown-and white-striped fish, also known as *Pterois volitans*, is popular in the global aquarium trade, which is probably how it ended up as an invasive species in the Gulf of Mexico and Western Atlantic, far from its native waters in Asia.

The vicious lionfish, first spotted in the U.S. off Florida's Dania Beach in 1985, will eat nearly any fish that crosses its path, not unlike its mammalian namesake. Lionfish have been known to feed on at least 50 species, from the parrotfish that keep coral reefs healthy to the economically vital grouper and snapper that

are popular in restaurants. They are much more voracious outside of their native South Pacific and Indian Oceans, according to Amy Lee, Communications and Engagement Manager at Reef Environmental Educational Foundation (REEF). Females spawn about two million eggs per year, and in the early 2000s lionfish began spreading throughout the Gulf of Mexico and Caribbean at alarming rates. If an area has enough lionfish, they can reduce the chances that native fish will reach adulthood by about 79 percent, according to one study.

"We've all accepted that they're here and we're not going to eradicate them from this area—they are just too prolific and they reproduce too frequently for that to be a reality for us," said Lee.

→

The non-native lionfish doesn't have any predators. But now that they're so ubiquitous throughout the Caribbean, Gulf of Mexico, and up the East Coast as far north as Rhode Island, humans have taken on that role. Lionfish swim amongst coral reefs and shipwrecks, so they can't be caught with a hook and line. The only way to hunt them is by diving below the ocean's surface and spearing them one by one.

Killing lionfish isn't just a fun way to spend a day in Florida; it's vital to protecting the ecosystem. "If efforts to hunt lionfish stopped, they would increase in numbers again and exert a lot of pressure on the native fish communities," said Andrew Ibarra, former REEF intern and recreational lionfish hunter.

In early September, Ibarra competed in the 14th annual Florida Keys Lionfish Derby & Festival, where the goal is to catch as many lionfish as possible. In preparation for the hunt, Ibarra's team, Men of Science, got their boat ready, mapped out diving spots, and gathered all of their equipment: scuba gear, spears, and safety tools. Alarms were then set for 4 a.m.

"Competing in these derbies is a fantastic time," he said. "The friendly competition creates a great atmosphere to connect and educate people about lionfish," he said.

After two days of hunting from dawn to dusk, a record 1,898 lionfish were caught by 22 diving teams. Men of Science won first place in its division for spearing a total of 156 lionfish.

But it's not all bloodshed. The derby is as much about education and lionfish awareness as it is a free-for-all of spear hunters. Following the derby, there's a festival with lionfish-filleting demonstrations, vendors selling jewelry made out of fins and spikes, and chefs preparing fresh lionfish tacos and ceviche. "People are really surprised to hear that you can eat it," Lee said. She prefers her lionfish sweet potato-encrusted.

REEF keeps 20 percent of the lionfish harvested during the derby for educational purposes. What's not eaten of Ibarra's bounty, he sells to local restaurants. The light, flaky fish has become a common dish at restaurants throughout the Keys.

"Not a single part of the fish went to waste!" Ibarra said. This year he threw a party to celebrate his team's win and prepared a variety of lionfish dishes. Fins and spines were given to his friend who makes jewelry,



Men of Science team: Chris Reynolds, Andrew Ibarra, Jim Brittsan, and Rick Hayden. © Maddie Brownfield



Marilyn Steadman, Michael Ryan, Cassandra Clark, and Doug Hoffman are part of the Barnacles team. They caught the largest lionfish in the derby, which was almost 17 inches. © Maddie Brownfield

and the carcasses were donated to a local farm for fertilizer.

In addition to the annual derby, REEF also hosts workshops and culinary events as part of its Invasive Species Program. “Equipping divers with the tools and the knowledge that they would need to go out and fish for them, just recreationally or commercially, if they’re inclined, has actually been shown to be really successful,” said Lee.

The Florida Keys derby is just one of several organized tournaments that help fight the proliferation of lionfish. And it’s fair to say that the movement to kill lionfish didn’t take off only because of environmentalists, but also the spearfishing.

“It’s kind of like whack-a-mole,” said Brady Hale, board chairman of the Ocean Strike Team, a nonprofit that promotes ocean conservation. “It’s not very hard, but it’s very rewarding because you’re doing good for the environment.” He’s also the marketing

director for the Emerald Coast Open in Destin-Fort Walton Beach, the world’s largest lionfish tournament, where divers compete for prize money totaling over \$100,000.

Destin-Fort Walton Beach is known as the “lionfish capital of the world,” and this year, at the fourth annual tournament, 24,699 lionfish were caught—a new record, almost double last year’s catch.

Whether you’re in it for the sport or the ecosystem, when it comes to lionfish, everyone has a stake in the game. You might not refer to yourself as an environmentalist, but maybe you like diving and fishing, or just want to protect the local fishing industry. Unlike other species, there are no limits on how many you can catch, which makes it a goldmine for fishermen. It’s always open season.

Lee compares lionfish control to weeding a garden. “It’s all about routine removals,” she said. “And single-day events like lionfish

derbies have actually been known to reduce the lionfish population significantly.” She says that there are some places in the Keys where you might not even see any lionfish these days because the local diving community has been so active in their removal.

But if lionfish are so abundant—and tasty—why aren’t we eating more of it? It’s a matter of logistics and economies of scale.

The development of large-scale lionfish fisheries has proven difficult. Unlike, say, shrimp or flounder, lionfish can’t be caught with large trawl nets. And while some lionfish-specific traps have been in development, there’s nothing like that being used yet.

This presents a conundrum: How can fishermen create a consistent supply of lionfish to meet demand? And how can they do it without harming other commercial fishing industries?

Alex Fogg, coastal resource manager for Destin-Fort Walton Beach, is a lionfish expert who’s been involved in everything from research and control to derbies and commercialization since 2010. “Lionfish were a problem,” he said, “but now that they have established themselves in the ecosystem, at the expense of native species, we can now look at them as an opportunity or even a benefit to tourism, recreation, and the seafood industry.”

Fogg claims the biggest barrier to a lionfish industry is supporting the demand. “Many restaurants want to buy lionfish,” he said, “but since the most efficient method of harvest is scuba diving, the amount of lionfish harvest is relatively low compared to other fisheries that utilize trawl or longline

techniques where thousands of pounds of fish can be harvested in a short amount of time.” And this is why you probably don’t see lionfish at your local restaurant or supermarket.

He noted that as the lionfish population changes, so do divers’ preferences, creating an “ebb and flow” in the market. While large-scale harvests would be the ideal solution, lionfish is currently more of a supplement to a commercial fisherman’s income or extra money for divers. He considers it a high-end, artisanal fish that should be sold at a premium price, thus keeping an incentive for divers to harvest them.

Lionfish is far from the first invasive species to cause problems U.S. waters—and it won’t be the last. Zebra mussels, European green crabs, and Asian carp are just a few examples. European green crabs have little meat, so they’re more likely to end up as bait rather than on a plate. Tamworth Distilling in New Hampshire has even been using them to make whiskey.

Asian carp, which infiltrated U.S. rivers in the 1970s, have mostly been used as bait and fertilizer due to the stigma around carp. The fish was rebranded as Copi to appeal to American appetites and has been served in dining halls at the University of Illinois.

Eventually, invasive species find their place, but not without human intervention. At the other end of the spear, the lionfish is still met with only one predator—one with a dive mask.

“Definitely it would be a problem if people stopped hunting them, they would come back, I think with a vengeance,” said Hale. “And I think we’re starting to see a resurgence in the population.”

Editor’s Note:

Longtime readers of **Modern Aquarium** will recall that our own Stephen Sica wrote articles on the development of this “Lionfish problem” some years back. Look for: “The Bahamian Lionfish” (April 2008) and “Lionfish Invade Cayman Islands” (July 2010).

See Less to Move Better!

Dynamic Schooling of Fish

by Susumu Ito and Nariya Uchida

Sometimes less is more. Researchers accurately modeled dynamic fish schooling by incorporating the tendency of fish to focus on a single visual target instead of the whole school, as well as other visual cues.

Schools of fish are able to pull off complex, co-ordinated maneuvers without ever colliding with one another. They move in unison but don't follow a leader. To try and understand the intricacies of collective animal behaviour, researchers from Tohoku University have developed a model that simulates the group motion of fish based on visual cues. Incorporating the tendency that fish focus on nearby quickly moving fish, the model uncovers the mechanism behind dynamic fish schooling.

"Fish have a wide angle of view and can detect many other fish in a school," explains Susumu Ito, "However, a recent experimental finding shows that each fish selects a single fish from a few targets and traces its motion. It is a spectacular example of selective decision making."

Attending to every single fish in the school would require an immense amount of information to be processed.

Similar to how we can focus on just the words we are reading amongst a page of text, fish can focus on the most salient target that determines their next move. While the fish swimming directly in front may seem like the best option, it's actually fish who are slightly on the sides that tend to draw attention.

Ito and his team constructed a model that takes visual attention into account to elucidate the role of selective visual interaction in a large group of fish. It incorporates the feature of retinal ganglion cells that fire preferentially for targets that are closer and moving more quickly.

Visual attention is then guided in the direction of the strongest signal. Only fish that fall within that spotlight of visual attention can influence the motion of the individual fish.

Using numerical simulations, the team of

researchers found that when a fish is following three targets swimming in a row, it tends to be attracted to the leftward or rightward target, as they have a larger apparent size. A slender

fish facing straight ahead viewed directly from behind will look much smaller than a fish exposing its longer profile view.

These results replicate the selective tracking motion seen in previous experiments. Furthermore, the model reproduced various collective patterns of fish schools: a rotating vortex, straight, random and turning. In the turning pattern, fish repeatedly alternate between straight and rotating motion, so that the school dynamically reshapes itself.

"The selective tracking behavior is observed also in locust and fly," adds Ito. "We expect to extend the model to the group motion of various organisms in the future. A three-dimensional version of the model may also be able to explain the formation of a huge fish school known as the bait-ball."

Reference:

Susumu Ito, Nariya Uchida. Selective decision-making and collective behavior of fish by the motion of visual attention. PNAS Nexus, 2024; 3 (7) DOI: 10.1093/pnasnexus/page264
MLA, APA, Chicago, Tohoku University. "See less to move better: Dynamic schooling of fish by visual selection and focus." ScienceDaily, 24 July 2024 <www.sciencedaily.com/releases/2024/07/240724123106.htm>.



My Microworm Recipe

by ALEXANDER PRIEST

Reprinted from *Modern Aquarium*, August, 2008

Let's say you've been a member of an aquarium society for over 15 years, and have even convinced some members that you know how to take care of fish. Now the President of the society knows better — he's been to your house many times. But he's the kind of guy who never has anything bad to say about anyone or anything. So even though he hates castles and bricks in aquariums, he invariably compliments my 90 gallon community tank, which has both. (Since the castle is nearly 20 years old and is no longer made or sold, it has essentially become an historical aquarium artifact. I guess this makes it somewhat respectable to our President, who is also an aquarium history buff!)

Let's also say that you're sitting at home, and the President of the society calls you to ask if he could drop over that evening after work to get some microworms for a recent spawning at his house. You always keep a culture of microworms going, but even if you gave him your entire container, it would not be enough. What to do? Simple! Tell him to come right over, and before he arrives make him up a "supercharged" batch that will produce loads of fry food.

I am not claiming that I have the one best recipe for microworms. I am saying that I have a method that works for me. I have maintained the same microworm culture for over ten years, reviving it back from crashes and even from maggot infestations. I'm going to share my method with you, and debunk a number of commonly held misconceptions.

Microworms (*Panagrellus redivivus*) are endemic to the leaf litter of the forest floor. They belong to the phylum *Aschelminthes* and the class *Nematoda* (roundworms). While "roundworms" may evoke thoughts of the pork tapeworm, hookworms, pinworms and similar parasites, microworms only feed on microscopic organisms, such as yeast, and pose no threat to fish or humans.

Microworms are an excellent first food for fry. They are also popular with many small adult fish, including tetras, guppies, and corys (which especially seem to appreciate the fact that they stay on the bottom of the tank, waiting to be gobbled up). I routinely feed them to my tank of Endler's livebearers.

The size of a microworm at its earliest stage after being hatched is 0.25 - 0.35 mm (that's 0.00984 - 0.01378 inches — even smaller than a newly hatched brine shrimp!).

Before I give you my recipe, I'm going to correct two commonly held misconceptions about microworms and their culturing. First, you do not

need to use mature tank water, deionized, or reverse osmosis water, or dechlorinated tap water when preparing the media. I use warm tapwater only. Second, adding vitamins or supplements will not produce healthier or more nutritious microworms. Microworms feed on yeast; the cereal, mashed potato, or other medium is what the yeast feeds on.

I've read some articles saying that it is not necessary to use yeast in every mixture. The authors of those articles contend that if you take some of the worm/food/yeast mixture from an active container, there will be enough yeast to start a second culture. This is true, as long as you don't really need an active and vigorous new culture any time soon.

While preparing for an article in this magazine nearly seven years ago, I performed several experiments. In one experiment, I mixed two identical batches of cereal and water (measuring the amount of each) and put them into two identically sized and shaped containers. I added the same amount of culture media, from the same source, to each. The only difference was that I added yeast to one batch, but not to the other. After four days, the batch with yeast added was producing enough worms to harvest. After a week, the other batch barely showed any activity. To that second batch, I added some dissolved yeast, covering half of the media with it. Within less than a day, the side of the container next to the half covered with the dissolved yeast was filled with microworms, while the other half barely showed any activity. The conclusion I draw from this is that the yeast is an absolutely essential ingredient in every batch, if you want fast microworm growth.

The more yeast you use, the more vigorous will be the growth of microworms. On the other hand, the more yeast you use, the sooner the culture will go bad. Basically, adding yeast accelerates everything.

To grow microworms at home using my method, you will need:

- A "starter" culture of microworms
- At least two plastic containers, with lids
- A "starchy" culture (food) media
- Yeast
- Water

You can get a starter culture from another aquarist (one of the benefits of belonging to an aquarium society), or from commercial sources. Microworm starter cultures can even be found on Internet auction sites, such as AquaBid.com or eBay.com.



Any brand of unflavored baby oatmeal should work.

The plastic containers can be anything from a washed out margarine container, to a shoebox. The container only has to be waterproof and have a tight-fitting lid (both to prevent the worms from crawling out over the sides, and to keep the culture medium from drying up). I prefer clear or dark containers to (usually) white margarine containers only because it's easier to see the white microworms as they crawl up the sides.

To prepare the containers, punch several small holes in the lid. The yeast will produce carbon dioxide (CO₂), which needs to be "vented" (and fresh air needs to be able to enter). On the other hand, fruit flies seem to be especially attracted to microworm cultures, so you need many *very small* holes to both vent the mixture and keep fruit flies out. (While fruit flies are also an excellent live

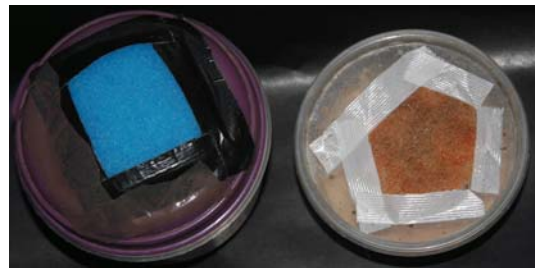


A clear container allows you to see the microworms as they crawl to the sides.

food, those sold as fish food are usually the "wingless" variety, while what you're likely to get in a microworm culture are the kind that fly out and into your house every time you open the container.) If you cut a quarter-dollar size hole in the lid of the container, and tape gauze or a piece of aquarium filter pad over it, this also works quite well.

When culturing microworms, it's best not to put "all your worms in one basket," so to speak. I recommend preparing at least two (preferably three) containers. Once your initial culture is established, start a second culture (then a third) according to the instructions to follow.

The medium I use is unflavored baby oatmeal. I've successfully used both Gerbers and Beech-



Taping filter media over a hole allows air exchange but discourages fruit flies.

Nut brands, and I have no doubt that a comparable store-brand oatmeal for babies would work just as well. Among the experiments I performed seven years ago was to try instant mashed potato mix, as this was one of the most recommended culture media I came across in my research. In my experiment, mashed potato mix resulted in an *extremely* slow growing culture that was, in my opinion, basically unuseable.

Once you have your materials and ingredients, here's how to use them:

- Mix enough baby oatmeal with ordinary, untreated, warm tap water to form a moist paste, about three-quarters of an inch deep in your container.
- Sprinkle enough active dry yeast to lightly cover the surface, moisten and mix gently. The end mix should be moist (you may need to add a bit more water, as oatmeal tends to soak up moisture), but not "soupy." If you added too much water, just add a little more cereal.
- Using a moistened finger or paper towel, clean the sides of the container of any media. (This will save you a lot of work later, because you will be able to harvest worms from the side of the container and use them immediately, without having to first put them into water and syphon them

out to avoid contaminating your tank with yeast and cereal.)

- Add your live culture, spreading it over the prepared cereal/yeast mix.
- Cover and keep the mixture at room temperature. (If you are going away for a while, you can refrigerate a batch – they won't grow much, but if kept moist, they should last much longer.)

You should see the surface of the media “shimmer” with the activity of the worms within a day. Be ready to harvest your first worms as soon as they start climbing up the sides of the container. For the first day or so, it may be necessary to add more water to keep the mixture moist. (It seems that the oatmeal keeps absorbing water for a while.) The easiest way to do this is with a plant mister (get one from your local dollar store).

If you really need microworms FAST (as I did in the story I related at the start of this article), mix yeast with the baby oatmeal. But, also mix some more yeast with water in a separate small container. After stirring and getting out the lumps, pour this on the top of the media. Our President e-mailed me that he was able to feed microworms to his fish from the culture I gave him the next day, and within a few days that culture was “producing worms by the gazillion.”

Harvesting microworms is easy. They crawl out of the food media and onto the sides of the container. If you put sticks in the middle of the media, they will crawl onto the sticks also. If you followed my recommendation to clean the media from the sides of the container, then use your finger to scoop the worms and then just swirl your finger around in the tank to release them. Even if you are “squeamish” about worms, you probably can handle this. These worms are so small that the only thing your naked eye can see is something resembling white foam.

While a worm culture that has gone bad has a *very* bad odor, a healthy culture gives off a faint aroma of yeast or beer. This is where the second (and I use a third, myself) container comes in. Within a week of your first “harvest,” prepare a second container in the same manner as the first. Take some of the worm culture from your first container, and “seed” your second mixture with it. You should get two to three weeks of harvesting from a given batch. Once a week, slightly stir the mixture and if it gets too watery, add a little more cereal. If the growth slows, dissolve some yeast and pour it on the surface of the mix. If the batch starts smelling really bad, throw it out.

Even if the culture smells bad and turns dark and “soupy” it can be revived or used to start a new culture if you can see any “wiggling” at all on the surface. “Supercharge” fresh media with extra yeast and a liquid yeast topcoat, as I described

previously, then add some of the smelly mix on top. You should have a fresh (and sweet-smelling!) culture in a day or two.

If you remember, I mentioned that microworm cultures attract fruit flies. I'm assuming you don't want to release flies into your fishroom every time you feed your fish. Because fruit fly larvae are more sensitive to the cold than are microworms, here's something I've tried with about 85+% success: put the contaminated microworm culture into your refrigerator for a day or two, then carefully take some of the culture that is maggot-free (maggots will show up as large bumps on the surface) to use to start a new culture.

Up to now, I've told you how to culture microworms and how to revive a culture under certain conditions. But, you might ask, “why should I bother, when there are a number of commercial fry foods available?” A good question, and the answers are as follows:

- They are the ideal size for even very small fry.
- They are 76% water and 24% dry matter; 40% of the dry matter is protein and 20% is fat.
- The wiggling of the worms attracts fry.
- Microworms do not swim away.
- Microworms live longer in freshwater than baby brine shrimp.
- Microworms do not cloud water.
- Microworms do not need special equipment to hatch (i.e., airstones, filters, heaters, and/or lights are not required).
- Microworms are inexpensive, as compared to hatching baby brine shrimp.
- Microworms can be cultured continuously. You must keep buying (costly) brine shrimp eggs.
- Except for a culture that has gone bad, microworms do not smell as strongly as many other live foods (grindal worms, for example).

Cheap, easy, long-lasting, clean, and well accepted – what more could you ask for in a fish food? It's too bad that the longest they get is only a millimeter in length, or they'd be great for larger adult fish, as well.



“The Greater City **Conservation** Society”

By Sue Priest

Raise your hand if you know the “official” name of the Bronx Zoo. Hmm. Jim’s hand was the first one up, and in the back I see Al’s (the one that’s married to me). I see a couple more, and I won’t consider it to be cheating if you pull out your Zoo membership card to refresh your memory. The correct answer is “The Wildlife **Conservation** Society.”

Definition of conservation: “a careful preservation and protection of something, especially planned management of a **natural resource**, to prevent exploitation, destruction, or neglect.” Now I’m challenging you to come up with your own definition of a natural resource. I’m still working on mine, but I will come back to you with it later.

You will be glad to know that I am finally getting to the point I want to make, which is that each and every one of us attending this meeting is a conservationist. Whatever brought you here, whatever your contribution, however humble, defines you as a member of this group. What group might that be? Well, for the purpose of this one brief article, I am renaming Greater City as “The Greater City **Conservation** Society.” Wear it proudly!

Most of us are keeping fresh and/or marine tropical fishes. Some of us just love to look at and learn about tropical fishes. Some of us are hoping to win the door prize, which is usually an interesting and informative book, and others of us have their eye on that large container of fish food on the raffle table. Conversation with fellow members can’t be overlooked as a valuable resource. Then there is the

auction, and the Vienna Fingers on the snack table. Last but not least, and at the top of my list, is **Modern Aquarium**. If you are engaging in any of these activities, as well as others I haven’t named, you are a participating conservationist.

I have been tossing around a few different definitions for the term **natural resource** in my brain. I keep reminding myself to adhere to the KISS principle (keep it simple, stupid), so here is what I have come up with. “A natural resource is any life form (plant or animal), which depends on the availability of water to exist.” (This definition excludes rocks, so I’m not sure if it really works!) How does it compare with yours?

Anyway, once you have decided what a natural resource means to you, and you have chosen one in particular, you are ready to devise a planned management thereof. It doesn’t have to be complicated. It doesn’t have to be a fish. It could be a plant or an insect, or even a rock! Just go ahead and “get your hands wet,” so to speak. When you can observe the outcome of your efforts, write it down (again, keep it simple). Then you can share it with the rest of us.

As I bring this brief article to a close, I will return Greater City to its rightful name, “The Greater City **Aquarium** Society,” which I’m sure you can all agree represents the spirit of conservation of all natural resources.

Reference: Webster’s Universal Encyclopedic Dictionary, Barnes and Noble Books, 2002.



Reprinted from *Modern Aquarium*, November, 2019



Pictures From Our Last Meeting

Photos by Jason Kerner & Marsha Radebaugh



Dan & Marsha Radebaugh with Lenny Ramroop, getting ready for a busy evening!
Photo by J.K.



A few of the many auction items!
Photo by J.K.



Our little room this month is starting to fill up!
Photo by J.K.



A view from the back of the hall
Photo by J.K.



Steve Sica seems pleased with the auction goodies.
Photo by M.R.



Dual auctioneers this evening:
Ed Vukich and Joe Ferdenzi
Photo by J.K.



Listen Up! Fish Can Sing!

A series by the Undergravel Reporter

In spite of popular demand to the contrary, this humor and information column continues. As usual, it does NOT necessarily represent the opinions of the Editor, or of the Greater City Aquarium Society.

Move over dolphins and whales: it turns out fish can sing too. It has long been evident that fish can make noise—Aristotle wrote in 350 B.C. that fish “emit certain inarticulate sounds and squeaks.” Anyone who owns a clown loach can tell you about their noisy clicking, which can be quite loud when they’re excited. But as it turns out, fish are capable of doing far more than just make sounds—they legitimately sing to communicate! These findings certainly challenge the public’s perception of the ocean as a place of serene silence.

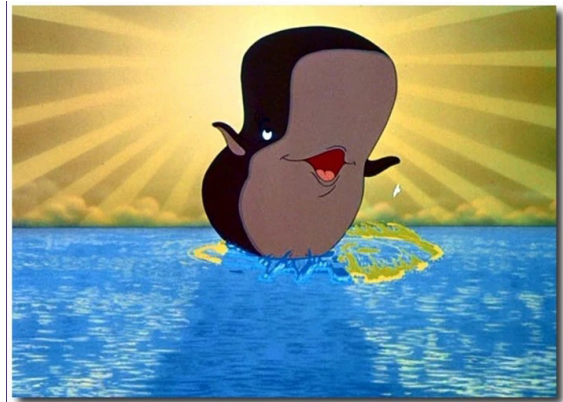
Fish will sometimes sing aggressively when fighting, but apparently it is predominantly done to find a mate. A group of researchers placed instruments (hydrophones) on the bottom of the ocean for six months at a time to record the noises of the ocean. As it turns out, they could hear the fish singing underwater. Indeed, not only do fish sing, they will actually sing together with their conspecifics in a chorus, sometimes for hours at a time during mating season! Apparently the mating call of the black drum fish is so loud during the winter that it keeps some residents of coastal Tampa awake at night!

If you’re wondering how fish can sing without vocal chords, the answer varies. Some, like the Atlantic croaker, have developed specialized sonic muscles that vibrate against the swim bladder. Marine catfish use pectoral fin spines to make a squeaking noise. Species of seahorse and catfish make their sounds by rubbing hard skeletal parts or their teeth together, similar

to the mechanisms used by crickets and cicadas on land. The *Danionella cerebrum*, which is less than an inch long, uses a drumming cartilage that it hits against its swim bladder to produce a noise that would register at about 140 decibels above ground—or about as loud as a gunshot. Only a fraction of the sounds made in water will travel to the surface and then into the air, but that makes it all the more impressive if you can hear your fish when you’re standing near your aquarium.

One of the leaders in the field, whose name is (no joke!) Marie Fish, has compiled a library of recordings from over 150 different species of fish. Researchers are optimistic that acoustic recording could help determine where fish are spawning in order to better study aquatic ecosystems and manage fisheries.

Perhaps Jason Gold can take a hydrophone the next time he goes scuba diving, and share with us the beautiful songs of the ocean!



Willie, The Operatic Whale (1946) 1954
A Walt Disney Cartoon



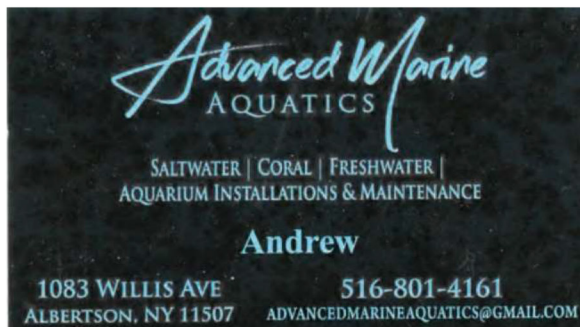
Sources:

<https://www.msn.com/en-us/news/India/do-fish-sing-the-short-answer-is-sort-of/ar-BB1p6zcf>

<https://www.bbc.co.uk/sounds/play/p0fb14pf>

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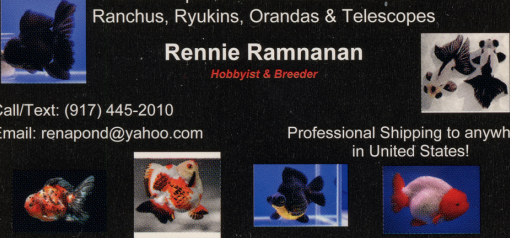
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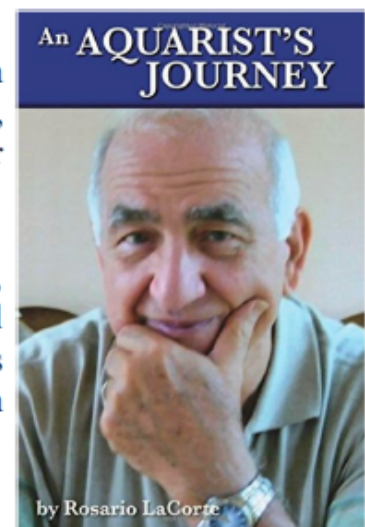


An Aquarist's Journey

Rosario La Corte is one of the world's leading authorities on breeding fish and he has written numerous articles and books, contributing greatly to our understanding of fish and their habits.

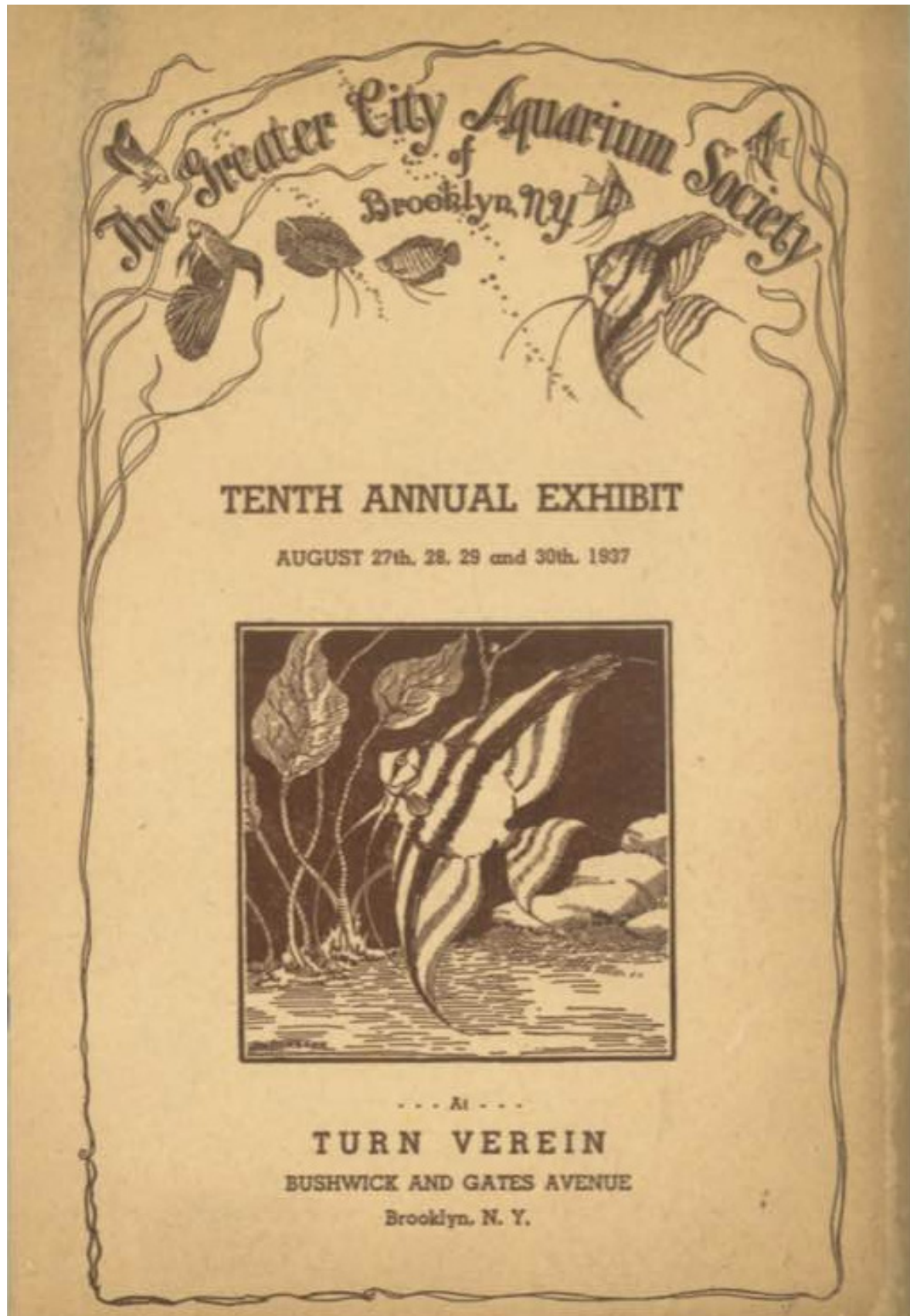
Now, for the first time, here is a compilation of his travels, adventures, successes (and, very occasional failures) all relating to collecting, keeping, and breeding fish, and in his own words (and edited by **Modern Aquarium's** Editor, Dan Radebaugh).

Available in softcover at [Amazon.com](https://www.amazon.com)



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