

modern AQUARIUM



October 2021
volume XXVIII
number 8

Greater City Aquarium Society - New York

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Series III Vol. XXVIII, No. 8 October, 2021

ON THE COVER

Our cover photo this month is from the March, 2020 issue of **Modern Aquarium**, and shows Joseph Graffagnino, flanked on his right by ex-president Joe Ferdenzi and on his left by current president Horst Gerber, receiving the GCAS Breeder of the Year award, this one for the year 2019. Rest in peace, Joe!

Photo by Joseph F. Gurrado

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From the Editor

by Dan Radebaugh

Well, here we are again—our second actual meeting since March of 2020! Hopefully this month we won't have to swim home afterward! I understand that what with falling tree branches and heavy rains, it took a couple of our visitors last month as much as four hours to get home, and several of our members had to cope with serious water in their homes when they returned from the meeting!

We were all stunned when we heard the news of Joe Graffagnino's passing. For a few remarks about Joe's contributions to our club and others, please see page 14, which faces an article Joe wrote for us back in 2012. We'll miss you, Joe!

Thanks to Jason Kerner (and of course all of you who were in attendance) we have "Pictures From Our Last Meeting" on page 8. Hooray! It's good to see some of these again!

On page 9 Artie Mayer reminds us to "Support Our Local Fish Stores!" This is good and timely advice. Our local shops have all suffered during this pandemic, and some have had a rougher time of it than others. It's perhaps a little inconvenient to do, but before ordering from an online merchant, maybe find out what's available locally. By all means wear a mask when you visit your local shops, but it isn't in our own long-term best interests to *only* have Amazon as a supplier.

As you come to page ten, you'll see an article by Jack McDonnell on Pearlweed (*Hemianthus micranthemoides*). This is a new plant to me, and a nice-looking one at that. I may very well give it a try.

The following page (11) begins this month's exchange article, "Canopy Light Conversion to LED," by Zenin Skomorowski of the Kitchener-Waterloo Aquarium Society. I know that a few of you have done this kind of conversion, and I am seriously considering giving it a shot myself. These days I use LED lighting on most of my tanks, but I'm not totally happy with how they look—particularly the glare off the glass lid. This is particularly true of the 6-foot tanks, so maybe I'll overcome some of my innate laziness and try this sort of conversion for my 125 once my 6-foot fluorescent bulbs show signs of decay. I replaced the fluorescent fixture on my 220 with a 6-foot LED fixture, and that tank is tall enough that the glare is not a problem. However, the LED strip sags a bit in the middle, so I've had to put pieces of styrofoam in a couple of spots for support. This is the only 6-foot LED fixture I could find, and I sort of see why.

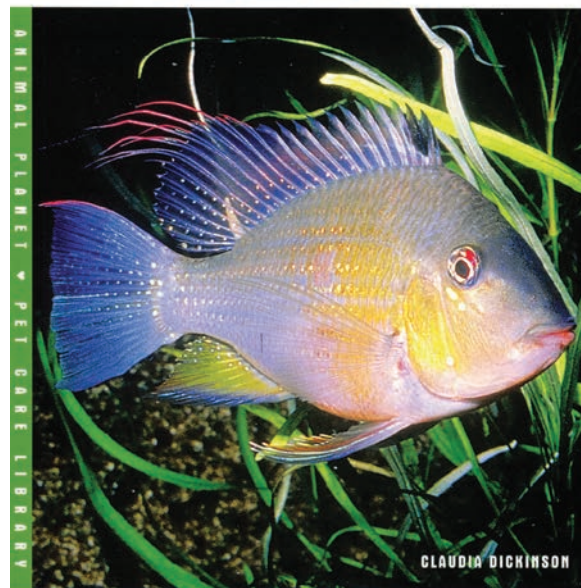


Our survey of **Modern Aquarium** covers continues this month with the covers from 1997. I'm finding this review very interesting. Some of these photographers are still going strong in **Modern Aquarium** today, while others are before my time here and unknown to me.

The issue ends with the Undergravel Reporter's "The 12 Million Year Old Fairy!" followed by this month's FIN FUN puzzle ("Front To Back"). 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

2021

March 3	Joseph Ferdenzi <i>Lake Tanganyika Cichlids (via Zoom)</i>
April 7	Dr. Richard Pierce <i>A Second Look at Tetras (via Zoom)</i>
May 5	Joe Graffagnino <i>A Pond Grew In Brooklyn (via Zoom)</i>
June 2	Markita Savage <i>The Xiphophorus Genetic Stock Center (via Zoom)</i>
July 7	Sal Silvestri <i>Interesting and Unusual Fish I Have Worked With (via Zoom)</i>
August 4	Joseph Ferdenzi <i>A Tour of My Fishroom (via Zoom)</i>
September 1	"Welcome Back" Auction!
October 6	Dr. Ted Coletti (via Zoom) Summer Tubbing!
November 3	TBA
December 1	TBA

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 2021 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

by Horst Gerber

During these pandemically trying times there are many reasons to be thankful. In recent months we have begun to start reconnecting with friends and family, or even take up a new hobby. Do we really need that in addition to our fishkeeping? Well, we could take up mixology classes. I for one am absolutely loving it!

I appreciated seeing so many of you at our September meeting! Despite some lingering concerns about the pandemic and the possibility of lousy weather, many of us just didn't want to go any longer without seeing our friends and feeling normal again. I am also thankful for **Modern Aquarium's** editorial team. Excuse me a moment as I take time to brag about our incredible members! Our monthly magazine is recognized as the leading monthly club magazine in the hobby! And remember – our club is now nearly 100 years old (and that's continuous operation)!



As to the meeting itself, it was a dark and stormy night, or at least the weather folks said that it might be. I considered cancelling the meeting, but how do you contact 90 people to do that with very slight expectation that they would all receive the warning in time? The rain we were seeing up to and even immediately after the meeting wasn't much more than a drizzle. The real rain event didn't happen until well after the meeting had ended and we were all on our way home. When it came though, it really came!

The meeting itself—our first in-person meeting since March of 2020—turned out to be a modest success. I counted 25 people. Everyone had their vaccination documentation in order, so there was no griping on that score. There were plenty of goodies to munch on, and there was a surprisingly good auction, though with only 25 people in attendance, selling prices were ridiculously low.

Going home, however, was the ride from Hell, at least if your vision of Hell includes blinding rain, flooded streets and wind-blown tree limbs. Our visitors from Norwalk had a tree fall on their car on the way home. I made it home with my treasures with no disasters, though it took a couple of hours due to flooded streets. Some of our members returned home to find several inches of water on their floors, so I guess I didn't have it so bad, all in all.

Reminder! Pandemic rules and regulations for meetings at the Queens Botanical Garden are dictated by the city. If in doubt about these rules, call them and ask! Or email our Editor, Dan Radebaugh, at gcas@earthlink.net.

At least for me, it's exciting to see our wonderful magazine in print again. Since March of 2020 almost every issue has been distributed by email. It's great to see a printed copy again! Remember the slogan, "Only YOU can prevent forest fires"? Well, it's also true that "Only our members can give life to this club and to our magazine!" Like to see all these great articles? Well, send us some! We produce an issue every month from March through December, so we ALWAYS NEED MORE! And we always want to READ more! If you have a new project, or thoughts about an old one, tell us about it. Just email it to us at the address mentioned above! We're back to life again—let's live it the right way! On the facing page are some screen shots of our most recent online meeting. Thanks go to Jason Kerner for doing the technical heavy lifting! Sadly, one of those pictured, Joe Graffagnino (look for the white arrow), is no longer with us. Joe was always willing to give free advice on how to breed new and difficult fish. He will certainly leave lasting memories with all whom he crossed paths with in this life. Farewell, Joe—till we meet again!

Horst



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NEWS FROM THE NEC

PIJAC Legislative Update in Aquatics (and other news) April 2021

Peach Reid, PIJAC Board Member

Moss Balls – Zebra Mussels (live and dead), the poster child for aquatic invasive species, these were recently found in various locations by the USFWS (United States Fish & Wildlife Service). They reached out to PIJAC to not only share these findings, but asked for PIJAC's assistance in developing guidelines in how to destroy them. PIJAC staff and members of PIJAC's Aquatic Committee worked together and created a document that also went out as a Pet Alert, and which has been distributed within the pet care community. We are in the process of reaching out to the water garden & center community as well, also including major retailers such as Amazon and Wal-Mart.

Hawaii - Earlier this year, there was a government ruling that NO fish collection is permitted, period.

The (PIJAC) Environmental Impact Studies' 45 day public comment periods are now closed for Oahu, and ending soon for the Big Island. The fisher community has been reaching out for support by the people who are in support of the fisheries. There is a big contingent of public aquariums and scientists weighing in in our favor, and lots of activist comments against. There will be a ruling at some point in the next few months.

PETA is putting pressure on Korean Air to stop carrying *Bettas*, which are bred and grown in Thailand. Flights from Thailand and other overseas countries are still not back to pre-COVID times, so it remains challenging to get shipments in. Additionally, fish shortages are still prevalent—domestic and imported—as consumer demand for fish (and all pets) continues.

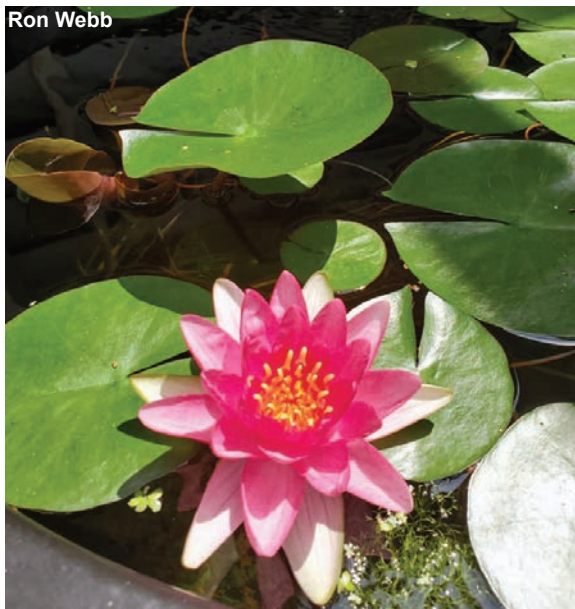
“Lacey Act Amendments of 2021” (S.626) - As currently written, this would broaden the powers of the Secretary of the Interior to declare by regulation and emergency designation to prohibit the importation of any species of wild mammals, wild birds, fish (including mollusks and crustaceans), amphibians and reptiles, or the offspring or eggs of any such species when seen as injurious to human beings, or in the interest of various environmental and agricultural resources. This is proposed largely in reaction to COVID-19, and could be disastrous for the entire pet trade. PIJAC is closely monitoring, and is prepared to meet with legislators who understand the implications, and the difference between responsible and irresponsible importation and trade.



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!



Pictures From Our Last Meeting

Photos by Jason Kerner



President Horst welcomes us all to our first in-person meeting since March of 2020!



A few of the surprisingly many auction items.



The crowd eagerly awaits the beginning of our auction!



After our long hiatus the crowd is growing restless...



Auctioneer Ed Vukich awaits the first item.



Support Our Local Fish Stores!

Story and Photos by Artie Mayer

The other day, I visited one of a handful of my “go-to” local fish stores. This was not a visit borne out of necessity, but a “spur of the moment” urge to drop by, maybe pick up anything interesting fish-wise, and perhaps some foods. After returning the greetings I received from the front-end cashier, I made my way down the first aisle, surrounded by attractive tanks on both sides. I came upon a woman who was carefully checking out a fish. “Anything interesting?” I asked her. She said that the Electric Blue Acara grabbed her attention but she was reluctant to purchase it because she was afraid that, like other vividly-colored fish she had bought in the past, this one would lose its color. I then went into the explanation about how these “electric blues” are products of genetic alteration and that the fish maintain the color and breed true.

I capped off my comments by showing her a photo of my Electric Blue Acara (see photo at right) and not only was she sold, but she asked if we could exchange phone numbers in order to further exchange fish experiences, which I was pleased to do. By the time I left the store, I had purchased a pair of Boesemani Rainbows (*Melanotaenia boesemani*) and some freeze-dried foods, but more importantly, I had made a new hobbyist friend. As Joe Ferdenzi’s wonderful tour of his fishroom museum made clear to us, our fish-keeping hobby is much more than tanks of fish and self-satisfaction with hobby-related successes; our hobby provides each of us with many opportunities for meaningful socialization. We, if inclined, enter into enduring friendships with others who share our love of this hobby.

In the August edition of our great magazine, President Horst Gerber laments the fact that “stores have been closing right and left” and wonders how many of them are still with us and how many have given up the ghost. This trend we have all noticed, and it is a real gut punch to our hobby. In my opinion, the socialization that exists for us hobbyists when visiting favorite LFSs is second only to the socialization that exists at aquarium society meetings. We all know how much the pandemic has deprived us of the interpersonal communications that are the highlight of each monthly meeting. While a great group of members, led by Jason Kerner, was able to give us “the next best thing”

to being together, our need to just talk with each other was demonstrated when, following the formal conclusion of our August meeting, conversation continued for an addition hour and a half, with Jason continuing to record the going-on.

The point I wish to make here is not about the socialization that comes with in-person meetings and how we can enhance this—that is a subject for another essay. At this moment, as we return to in-person meetings, I want to encourage everyone to visit their local fish stores!

We all have eased into the habit of ordering livestock and dry goods and accessories online. I know that many difficult-to-obtain varieties of fish are available through these sites, but I strongly recommend that we all go out to visit the stores, and let the personnel know you are an involved hobbyist who is a society member. Many will give you deals of all kinds, especially after you establish yourself as a “regular” who wants to support their efforts. If we lose our retail

stores, we will have lost a major partner in our hobby. We will discuss ways that our clubs and retail stores can mutually support each other in the near future.



Pearlweed

Hemianthus micranthemoides

Story and Photos by Jack McDonnell
Barrier Island Aquatics

The aquarium hobby has many different species of aquatic plants that can handle a wide variety of conditions. There are a few plants you can always recommend to anyone in this hobby that without a doubt will do well for them.

A plant that I have always had great success with is pearlweed (*Hemianthus micranthemoides*), a plant that is native to the United States. I first found out about this plant through a YouTube video a few years back. My first thought was that this plant requires CO2 and strong lighting, but I happily found out that I was incorrect. As I read more about this plant I found out that it can handle a broad range of water conditions and that this plant was extremely versatile. Once I decided I wanted to purchase some pearlweed I began looking around online and found an advertisement on eBay. The advertisement said “10 stems of pearlweed for \$10.50,” so I decided to give it a try. At the time I had only worked with a few species of plants and had had minimal success.

During that time I was setting up a low-tech thirty gallon aquarium in which I wanted to start a colony of rainbow tiger Endlers (*Poecilia wingei*). Part of my goal with this aquarium was to have a heavily planted aquarium that the fish could thrive in. This was accomplished. At this time in my fishkeeping career I was using mostly T8 lights on all of my aquariums. This plant came in the mail in the form of clippings, which made me nervous due to the fact that it had no roots. But I planted it in the substrate anyway, and within a few weeks I noticed substantial growth from these clippings. I saw online that many aquarists would use this plant as a carpet that covered a majority of their substrate, and this was the ultimate goal for me with this plant.

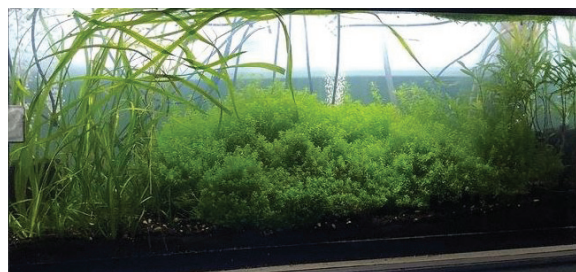
As time went by I started seeing large amounts of growth in the pearlweed. I was very excited to see how well this plant had done in my aquarium, so I began researching different methods of propagating it. I was very surprised to see that there were so many simple ways to grow it out. I began cutting the already established stems in half and replanting them into the substrate with great success, seeing that they had

rooted fairly quickly and were keeping up in growth with the already established plants I had received from Ebay. As time went on this plant began to flourish in the aquarium. I had no space left on the substrate to place anymore plants. The rainbow tiger Endler colony was booming. I would go to feed the colony every day and see loads of fish of all sizes darting out of this thick carpet to eat their food.



The Pearlweed is the low plant in the right foreground of the tank.

lighting. I have also used fertilizers with it, which I would have to say is pointless, because this plant will take off for you regardless of lighting and/or fertilization. I have also grown it immersed in a hang-on-back filter, where it did just fine. In fact I think this is almost more gorgeous than the plant growing in the water. This is a great beginner's plant that can also satisfy a seasoned veteran of the aquarium hobby!



In conclusion, this is a very fun simple plant to keep in your aquarium. Over the past few years I have given samples to many aquarium hobbyists and enthusiasts, the majority of whom have told me they've had wonderful results with it. I enthusiastically suggest anyone to give pearlweed a try. Special thanks to Joseph Ferdenzi for giving me the opportunity to write this article for **Modern Aquarium**. I am very happy to have made a small contribution to this great magazine.



Canopy Light Conversion To LED

Photos & article by Zenin Skomorowski, KWAS

I have been in this hobby for several decades and have many aquariums with an older fluorescent lighting canopy. I usually replace fluorescent tubes every 12 to 24 months, depending on when they are on sale. The tubes for aquariums cost anywhere from 10 to 25 dollars depending on the colour temperature, spectrum, quality of manufacture, and so on. In the past few years, LED lighting has become more readily available and the cost of switching over has come down considerably. The LED lights last a very long time, 20 years or more, and use much less electricity.

I could replace the entire fluorescent lighting canopy with a new LED fixture, but they do not look the same. I am also a bit of a Do-It-Yourself person, and I hesitate just throwing the entire canopy out or trying to sell them to other hobbyists. They are probably eying a conversion to LED lighting as well. I prefer to reuse or retrofit the existing canopy to retain the same look on the top of the aquarium, but get better performance at a lower electricity cost.

I purchased a 24-inch under the kitchen cupboard dual LED strip light at Canadian Tire for about \$40. It looks like a dual fluorescent tube fixture, but it is actually two rows of LEDs under a plastic cover made to look like fluorescent tubes. You can find less expensive fixtures, but they seemed too flimsy for me, and the transformer/LED driver unit was hanging from the power cord. I prefer to have it in the fixture as this one does. There are other single strip lights and flat ribbon lights available at Canadian Tire/Home Depot/Lowes/Home Hardware. The unit I bought has to be wired and does not come with a switch, whereas some others have a plug-in cord and a switch. Take a look and see what will work for you.

Before you begin, I want to point out that you are dealing with an electrical device, that could harm you. If you are not confident in your do-it-yourself ability with electricity, then buy a pre-made ready to plug in unit or consult with someone who is familiar with wiring for lights.



New LED and OLD Canopy Hood



Single T12 lamp in old canopy

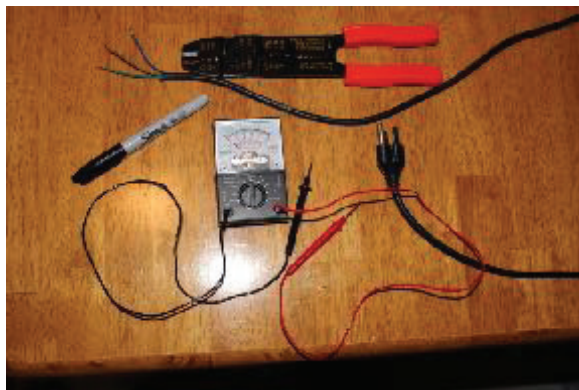


Screws holding the old unit to the hood



Old unit removed.

Reprinted from the Kitchener-Waterloo Aquarium Society's *Fins & Tales*, January, 2019



Using continuity tester to determine which wires are the plug prongs



Knock out port in new unit to accept the power cable.



Knot in power cable and switch with wire connectors

Step 1. Remove the old fluorescent tube, mounting hardware, ballast, starter. You will usually find some screws holding the entire assembly to the canopy/hood.

Step 2. Detach the wiring from the switch and the unit itself.

Step 3. Open up the new unit and locate the black, white and green wire. The black brings the power, the white completes the circuit and the green grounds the fixture. You may have to knock out an entry port in the new unit for the power cable.

In this case, the old unit had only a 2-wire cord from the wall plug, no ground wire. I had a 3-wire power cable from an old computer monitor that I sent to E-cycle. I reused that power cable here with the new lighting unit. That 3-wire power cable had different color wires inside, so I had to use a continuity tester to determine which wire to use for ground, black and white, and marked them as such on the plug prongs.

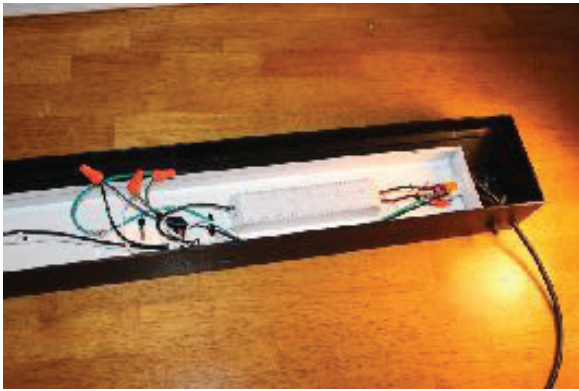
Step 4. I chose to reuse the screw mounts in the canopy hood for attaching the new unit. I drilled holes in the new unit to line up with the existing screw mounts in the canopy hood.

You may also have to drill new holes in the old canopy hood to accommodate the power cable and the on/off switch in a new location.

Step 5. A knot was tied in the new power cable so it does not pull out of the canopy.

Step 6. The black wire from the power cable is connected to the switch, then to the lighting unit. The white wire is connected directly. These connections are done by twisting the bare wires together, then securing with a connector. No bare wires should be showing, if they are, take the connector off, trim the bare wires a bit shorter and put the connector back on. The green ground wire gets secured using a nut on a grounding screw on the new unit itself.

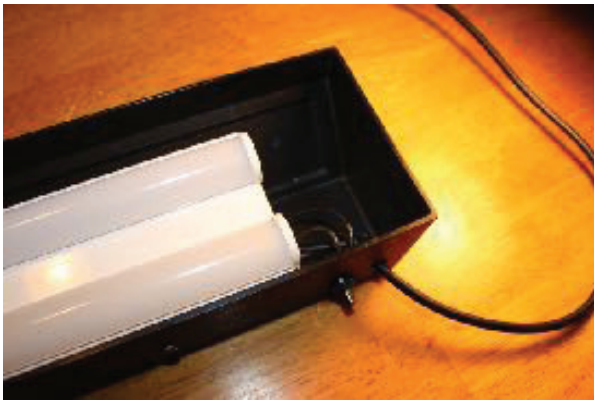
Step 7. After the new unit is mounted and wires are connected, snap on the LED cover, plug it in and turn it on with the switch. If it does not come on, you will have to unplug it, take off the cover and check all the connections. Remove the connectors, re-twist the wires and put the connectors back on.



Wires connected, power transformer and LED driver



Ready for test!.



New location of holes drilled for the switch & power cable



Entire Underside

Hood In Service

I hope this gives you some insight into converting your old canopy to LED lights, another chapter in this fish keeping hobby that we enjoy.



Joe Graffagnino

In Memoriam

by Dan Radebaugh

By now most of you probably know that our friend Joseph Graffagnino passed away on September 8, 2021, due to Covid-19 and complications.

Joe was a great friend to the entire aquarium hobby. While his first love in the hobby was almost certainly his beloved Brooklyn Aquarium Society, he was very active in our own Greater City Aquarium Society, and most likely in a few others as well. When I became president of Greater City, Joe made sure that I met some of the luminaries of the BAS, so that we could all work together where possible to enhance cooperation and success among the many clubs in the surrounding metropolitan area.

An avid breeder of fishes, Joe won our Don Sanford Breeder of the Year Award in 2011, 2012, and 2016. He graciously took over our Breeders Award Program back in mid-2019, after Warren Feuer had retired from that post. Joe and I worked assiduously to make sure that our record keeping was compatible with our respective software and methodologies. Needless to say, the pandemic has presented some difficulties for us in this area; all the more so with Joe's tragic passing.

A prolific writer, Joe authored several books, along with many articles for our own **Modern Aquarium** as well as for other aquarium magazines. A published author, his biography on Amazon tells us that "Joseph A. Graffagnino started writing advice and troubleshooting technical telecommunication articles in the late 1980's. Articles on cellular telephones,



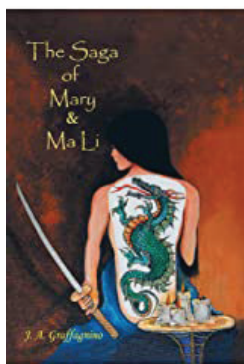
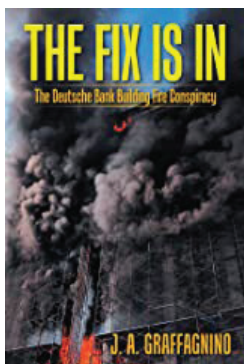
and voice/data paging systems have been published in **Fuel Oil and Oil Heat Magazine** and **Real Estate Today Magazine**. A man of diverse interests, Joe has written extensively on his passion for tropical fish. His articles have been published in national and international magazines. These in-depth articles have been published along with his photographs of these aquatic creatures in **Aquarium Fish Magazine** (AFM, now known as **Aquarium Fish International**), **Freshwater and Marine Aquarium** magazine (FAMA), and **Tropical Fish Hobbyist** magazine (TFH). He has also been published

in the American Cichlid Association publication **Buntbarshe Bulletin**, along with numerous local aquarium society publications throughout the United States and England. His expertise in aquatic life has led to guest speaker engagements at aquarium societies throughout the Northeast."

Joe's first short story, a thriller fiction titled "**The Taxi**" was published in February 2010 in the web-based **Necrology Shorts**.

Joe's books include **The Fix Is In**, about the Deutsche Bank Fire in which he tragically lost his fireman son Joseph, **The Saga of Mary & Ma Li**, **Ma Li and Mary**, and **Fantasy & Horror**, which contains 13 stories of intrigue and suspense.

Joe was one of the good guys in our hobby. Always ready to help if needed, if he said he would do something, he did it. We'll miss you, Joe!



Trials & Tribulations

with

Betta macrostoma

by Joseph Graffagnino

My friend Al Priest asked if I would attempt to breed a difficult fish—*Betta macrostoma*. Al had some crazy idea that I was an accomplished fish breeder. His goal was to have other hobbyists raise and spawn this difficult species. Al believes, and I agree, that endangered species should be held by aquarists who are capable of maintaining and, hopefully, spawning the species. If a tank crash in one hobbyist's home wipes out that hobbyist's entire colony, other hobbyists will still have that species, reducing the likelihood of its total loss to the hobby. If this can be accomplished locally, imagine what could be done on a global scale?

I admit that I enjoy a challenge, especially in trying to breed difficult tropical fish. I enjoy all types of freshwater fish species, and have had a modicum of success in the spawning and raising of their fry. In the anabantoid family, I have worked with several types of gouramies, paradise fish, ctenopomas and bettas. I must admit that various species in the *Betta* genus have proven to be the most challenging. I have been unsuccessful with *Betta machachai* (blue form), *Betta smaragdina*, *Betta livida*, *Betta coccina*, *Betta imbellis*, and *Betta tussyae*. I have been successful with *Betta splendens*, *Betta channoides*, and *Betta unimaculata*, and have had partial success with *Betta albimarginata*, *Betta brownorum*, and *Betta macrostoma*. What I mean by partial success is that these fish bred for me, but either the eggs didn't hatch, the fry didn't survive the mandatory 60 day limit to qualify as a successful breeding, or the fry quantity was less than the limit required for Breeders Award Points (either 6 or 10 depending on various aquarium society rules).

Al had made it known that *Betta macrostoma* was especially difficult to maintain, and breeding was even more challenging. I know of other experienced hobbyists who have tried and failed to keep this species. The only aquarist I know of with the skill (or luck?) to persevere and succeed with this species is Al Priest. He mentioned to me that I would need an adequate sized aquarium, the correct aquatic environment, a tightly covered aquarium (this species

is an accomplished escape artist), and that it is a fussy eater. The *crème de la crème* was that if the female doesn't like the male she will kill him. Great! Just what I need, a black widow/praying mantis with fins!

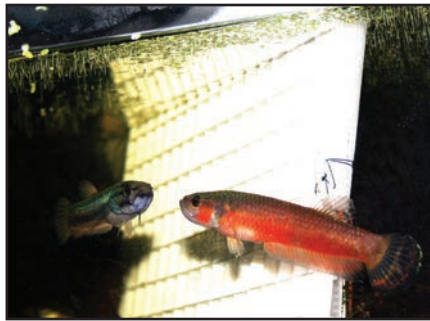
I needed to do my homework before I could accept a pair of these beautiful and complicated fish.

My studies included speaking with other hobbyists and researching reliable websites. *Betta macrostoma* is commonly called the Brunei beauty, spotfin betta, peacock betta and the orangecheck betta (because of the orange-red coloration males exhibit; the females by comparison are a grayish brown). When in breeding mode the male gets brighter, and the female exhibits very dark horizontal banding on her normally gray body, with a green coloration on the top of her back.

This species is found in the nation of Brunei and the Malaysian state of Sarawak, each of which are on the island of Borneo, in Southeast Asia. This species is on the CARES (Conservation, Awareness & Recognition Endangered Species Preservation Program) list as a Threatened species marked as Vulnerable. The country of Brunei has forbidden exportation of the species from their country, and made it illegal to house this species in a home aquarium.

Betta macrostoma's natural environment includes two main ecosystems. One location has fast-flowing, clear water near waterfalls, and the other environment consists of slow-moving streams and peat swamps, littered with plant roots and submerged leaf litter, making the water brown and acidic. In an aquarium this species requires many caves and hideouts, driftwood, Java fern, Java moss, and floating plants such as duckweed and fairy moss. Their natural diet is insects and small invertebrates, such as snails and shrimp. In an aquarium, young fish will take betta pellets, but adult fish prefer frozen brine shrimp, krill, blood worms, or live brine shrimp or blackworms. I have tried live guppies, as well as pellet and flake food, but with no success. The guppies they just ignored.

When I introduced a pair into an aquarium that had hiding places, caves, driftwood, live plants, a good cover of floating plants, and a tank divider, the male



Male (right) and female *Betta macrostoma*.

Reprinted from the September 2012 issue of *Modern Aquarium*, Series III Vol. XIX, No. 7

BETTA MACROSTOMA: VITAL STATS

Did I mention that this species is difficult to maintain? From what I have heard and read, *B. macrostoma* is comfortable within the following parameters:

Temperature: 68 to 80 degrees Fahrenheit. Use higher temperatures to promote spawning.

pH: 3.0 to 6.0

Water Hardness: 0 to 90 PPM (very soft!)

Aquarium size: A forty gallon tank for a pair of fish is recommended. I housed a pair in a 15 gallon-wide aquarium (24" L x 12" W x 12" H) that had a tank divider; the assumption being that anabantoids would prefer length and width over depth.

Lighting: Subdued. A low-wattage fluorescent. In retrospect I think a blue or red cover over the bulb would have dimmed the lighting more and been better. Bettas don't enjoy bright or even semi-bright lighting.

Filtration: Large sponge filter, or corner filter with charcoal and ammonia chips. I should have added peat pellets, but instead I used almond leaves and Tetra's Blackwater Extract.

Maximum Size: 3½ to 4½ inches for adults.

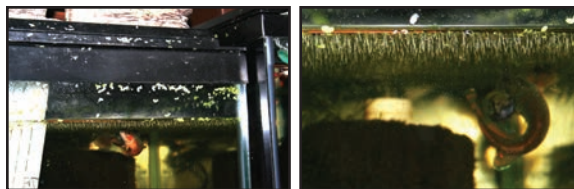
Diet: Carnivore (see details in main text).

was very excited to see the female. He would continue to try to attract her, and attempted innovative ways to get around, over, or through the tank divider to be by her side. The problem invariably was that she just wasn't in the mood for him, and within a few moments she would start to chase him all around her area, trying her best to bite his head off. There was no doubt who was the boss in that couple.



Female heavy with eggs.

Once the fish grew accustomed to their environment, they settled in nicely. When the female was ready to spawn she would undulate her body in an "S" shape in front of the male. Her colors would change within minutes, going from a gray-brown to a black horizontal pair of lines that were separated by light gray. Her back would turn a dark green. The male, in response, would become brighter in his orange/red coloration. At this point I would either



Left: Beginning of the embrace. Right: The embrace.

move or just remove the tank divider. The pair would then circle each other, while rising in the water until they were just below the surface. The female would lay still while the male wrapped himself around her stomach area and squeezed out her eggs. The female would then dive down to catch the eggs in her mouth. After she had collected several eggs, she would clasp onto the male's gonopodium, from which she draws his milt to fertilize the eggs. With several now-fertilized eggs in her mouth, the pair would go to the bottom of the tank, where the female would spit the fertilized eggs into the male's mouth. They would continue this process until the female was stripped of eggs, leaving the male holding all the fertilized eggs in his buccal cavity, where he kept them until they hatched—usually in 20 to 22 days.



Above: Transfer of eggs.

Left: Female dives for eggs and milt.

Problems:

The male ate the eggs within hours of holding them. Possible reasons are that he was a juvenile fish and not mature enough to hold the eggs, the pH was too high, he saw movement within or outside the tank, the female harassed him, or the eggs weren't fertile. The pair spawned again 12 days later with the same results.

You can't strip and artificially hatch *Betta macrostoma* eggs because the oblong-shaped eggs are soft. They would crumble in a hatchery unless they were a few weeks old, when they become firmer and closer to hatching. I had mixed results with stripping eggs from another *Betta* mouthbrooder, *Betta unimaculata*. One time I removed 69 eggs from a brooding male, but only 9 of those eggs hatched. Another time I stripped him of 80 eggs, and 22 of them hatched. Around the fifth time I left him alone, and he released approximately 70 live fry. Obviously it pays to allow him to hatch his own eggs.

My biggest problem was maintaining a low pH. My tap water comes out at 7.0. I do not have a reverse osmosis (RO) unit, nor do I have access to rainwater, so the best way I've found to achieve low pH is via

a Brita® water filter. A Brita filter knocks my water down to 5.5 pH. This is great for a 5 gallon tank, but of course larger tanks become a problem. This species demands frequent (50% weekly) water changes. If I stretch out the water changes to biweekly or longer, the acidity remains, but organic pollutants build up, creating other problems such as “sudden death syndrome,” where a fish just dies for no apparent reason (this may be the result of infected or dying live food or frozen food that went bad). Or the fish might die from a bacterial and/or fungus infection, or cloudy eyes (also a bacterial infection which comes from dirty water), or the fish may just stop eating and waste away.

Another problem may occur when you move the fish into another tank—even if it’s a larger tank. This species doesn’t handle stress very well. A move to a new environment could have a fatal effect on them. *Betta macrostoma* is extremely territorial. Moving

them to another aquarium, adding additional fish to an existing aquarium, or even rearranging the items in the aquarium could lead to a fight to the death over territory. Nor does this species tolerate most medications—not even something as mild as Melafix®.

I would enjoy writing about how to raise the fry and how to keep a colony of juvenile fish from not killing each other, but I haven’t gotten that far yet. These fish are very difficult to maintain in an aquarium, so if you can achieve success then you are a dedicated and talented aquarist. I intend to try again to maintain and breed this beautiful and endangered species. *B. macrostoma* is not for everyone, and you must be willing to dedicate your time and the resources necessary for maintaining these demanding fish, but if you succeed, then your accomplishments are truly great.

Resources:

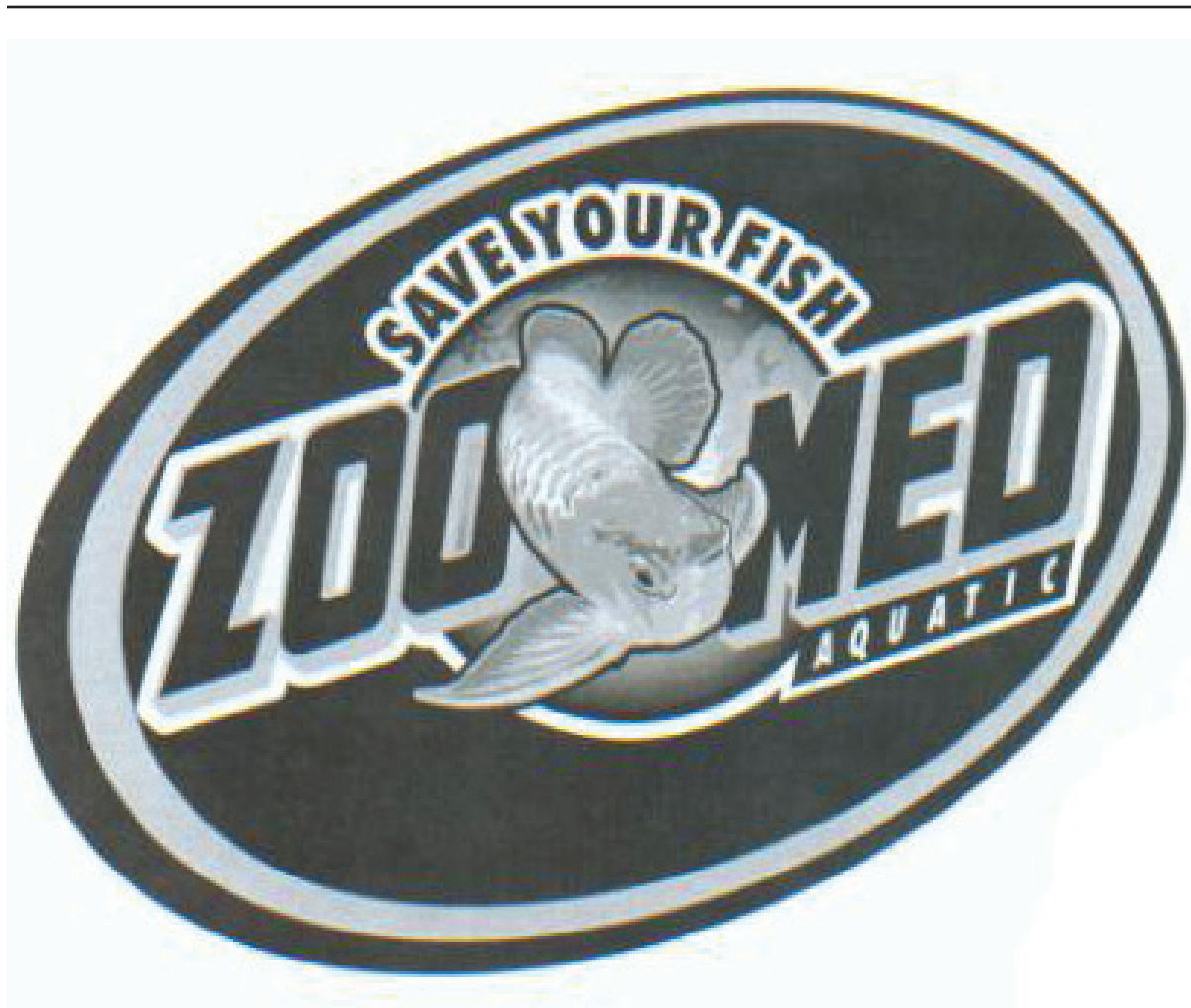


<http://www.tropicalfishresource.com/bettamacrostoma.html>

www.seriouslyfish.com/species/betta-macrostoma

http://aquaworld.netfirms.com/Labyrinthfish/Betta/Betta_macrostoma.htm

Photos by the Author.





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Ted Coletti: Summer Tubbing

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To obtain a copy of Ted's book on this subject, visit <https://www.amazon.com/Tub-Pond-Handbook-Comprehensive-Container/dp/B091W9WLDP/>



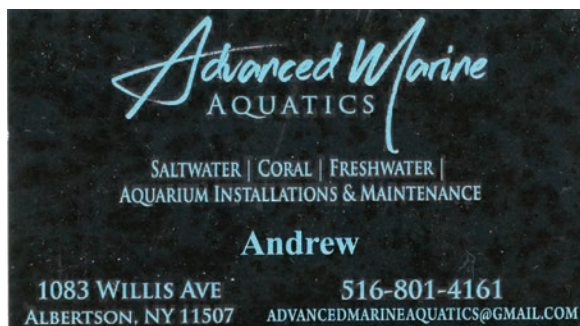


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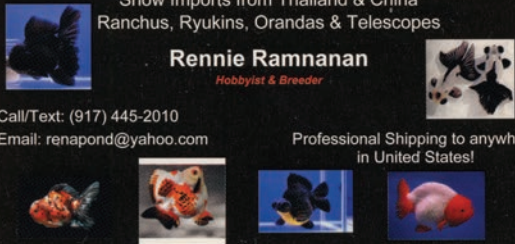
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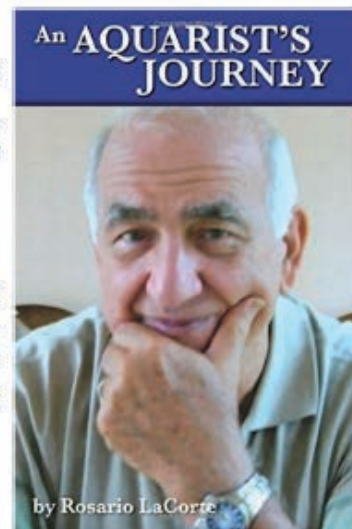
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The 12 Million Year Old Fairy

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.

The genus *Cirrhilabrus* includes over 60 species of fairy wrasse. **Science News** recently reported¹ that the vibrant courtship displays of these small colorful reef fishes may partly be the result of the slow waxing and waning of ice sheets and glaciers.

The article states, “Within the dizzying assembly of colorful reef fishes, fairy wrasses (*Cirrhilabrus*) can’t help but stand out. They are the most species-rich genus in the second most species-rich fish family in the ocean, says Yi-Kai Tea, an ichthyologist at the University of Sydney.”

“That is quite a bit of biodiversity,” says Tea, who notes that new fairy wrasse species are identified every year. Despite this taxonomic footprint, Tea says, scientists knew “next to nothing” about the fairy wrasses’ evolutionary history or why there were so many species.

Tea and his colleagues extracted DNA from 39 different fairy wrasse species, using a method that isolated nearly 1,000 genes from many species at once. Comparing DNA across species, the researchers reconstructed an evolutionary tree, showing how the dozens of fairy wrasse species are interrelated. The team also estimated how long ago these species split from one another.

Fairy wrasses diverged from other wrasses about 12 million years ago in the

Miocene Epoch, the researchers found. But many of the fairy wrasse species emerged only about 1 million to 3 million years ago, in the Pleistocene and late Pliocene Epochs. Tea and his colleagues think the timing of this rapid evolution is tied directly to the geologic history of the region. During the Pliocene and Pleistocene Epochs — when many fairy wrasses diversified — ice ages dramatically changed this seascape. When water became locked up in expansions of ice sheets and glaciers, sea level fell, turning shallow reefs into land bridges, but they also cut off the movement of marine life. This isolation



A male lavender-striped fairy wrasse (*Cirrhilabrus lineatus*) flashes its fins in an elaborate courtship display. YI-KAI TEA

encouraged the evolution of new species on either side of the barrier.

When the glaciers melted again, the waters rose, and the fishes could once again intermix. The rising and falling seas could act like a “species pump,” Tea explains, creating new fairy wrasse species and churning them out into the world every time the barrier dissolved. The team estimates that fairy wrasses infiltrated the Indian Ocean at least five different times this way.

The fairy wrasses’ elaborate mating rituals might also be why there are so many different species, Tea says. Since the wrasses live in large, mixed-species schools, the males are under extra pressure to not only attract a mate, but to make sure she’s of the correct species. A performance with a recognizable arrangement of colors — and in some cases, fluorescence — would come in handy.



Reference:

¹<https://www.sciencenews.org/article/fish-fairy-wrasse-color-evolution-coral-reef-sea-level-ice-age>

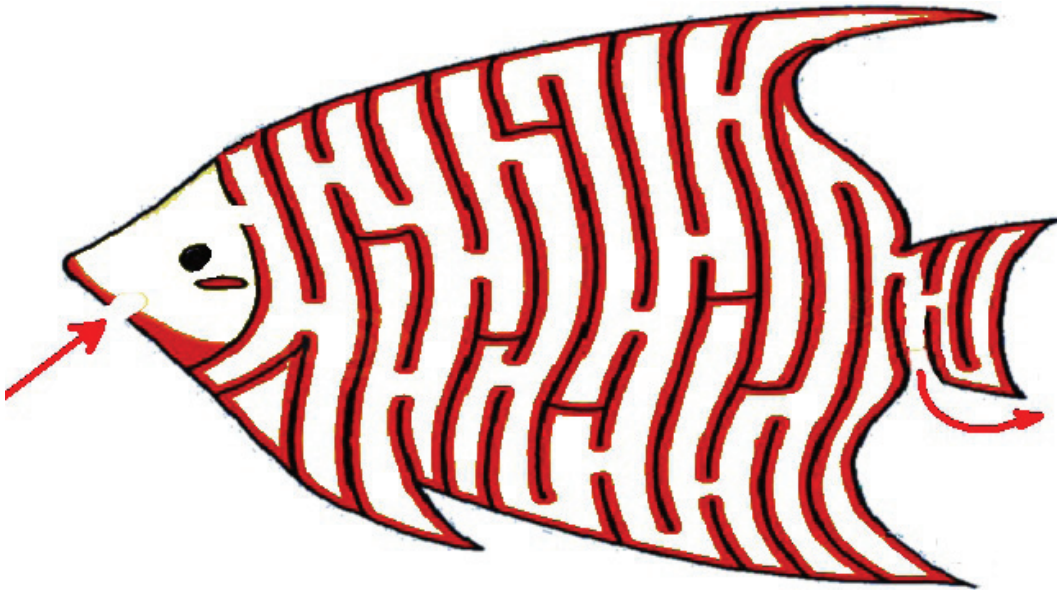


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