

modern AQUARIUM



July 2018
volume XXV
number 5

Greater City Aquarium Society - New York

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Series III Vol. XXV, No. 5 July, 2018

ON THE COVER

In keeping with an issue containing not one, but two articles on swordtails, our cover this month is a pair of Red Alpha lyretail swords. It's easy to see why these colorful livebearers are so popular! Check out "Montezuma's Revenge!" by Joe Ferdenzi, on page 9, and "Sexual Inversion in Swordtails," by Tom Warns, on page 12.

Photo by Jeff Bollbach

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From the Editor

by Dan Radebaugh

This has been a fun issue for me to put together, picking up, as it does, themes from past issues, and even from last month's meeting! Jules Birnbaum checks in with another in his series of filter evaluations, Steve Sica contributes an article on *Telanthera cardinalis*, a beautiful, red-hued plant, and Joe Ferdenzi follows up our discussion on swordtails last month with an article clarifying the differences between the Montezuma swordtails and other, more frequently seen species and strains.

You will probably recall what a lively conversation ensued, including a spirited argument about whether or not swordtails could change sex. Well, Tom Warns researched that question, and presents his findings in an article on page 12. Don't miss it!

I remember how taken we all were with Emily Voigt's presentation at our meeting last September, on her book, **The Dragon Behind the Glass**, though I have to admit I'm not entirely sure whether the enthusiasm for her presentation was more due to the subject matter, or to Ms Voigt herself. At any rate, our exchange article this month is "Keeping Arowanas in the Freshwater Aquarium," by Katherine Barrington, reprinted from **Tanquilizer**, the publication of the Tropical Fish Society of Rhode Island. Ms Barrington cautions that keeping these fish requires a large tank, and I suggest that warning be taken seriously. Putting a potentially 3-foot long fish into a 4-foot long tank is not a recipe for long-term success.

Steven Hinshaw, who has written several articles for us over the past several years, returns (literally, as well as literarily) with an article telling



us about his ongoing collection of Dr. William T. Innes' **Exotic Aquarium Fishes**, as well as other titles, and about his impending move back to the U.S. from a couple of years' residence in Okinawa.

Sue Priest gives us an article called "Little Lefty," which to me epitomizes the best part of being part of a society such as Greater City, where we may, almost unintentionally, pick up a fish that we might not otherwise consider, that turns out to be a delightful addition to our 'family.'

This month's Undergravel Reporter is a well-timed complement to a fairly erudite issue, and Fin Fun shares in this overall tone. Pictures From Our Last Meeting and Fishy Friends Photos round out the issue, along with a reminder about the details of our Breeders Award Program. I hope you enjoy reading this issue as much as I've enjoyed assembling it!









GCAS Programs

2018

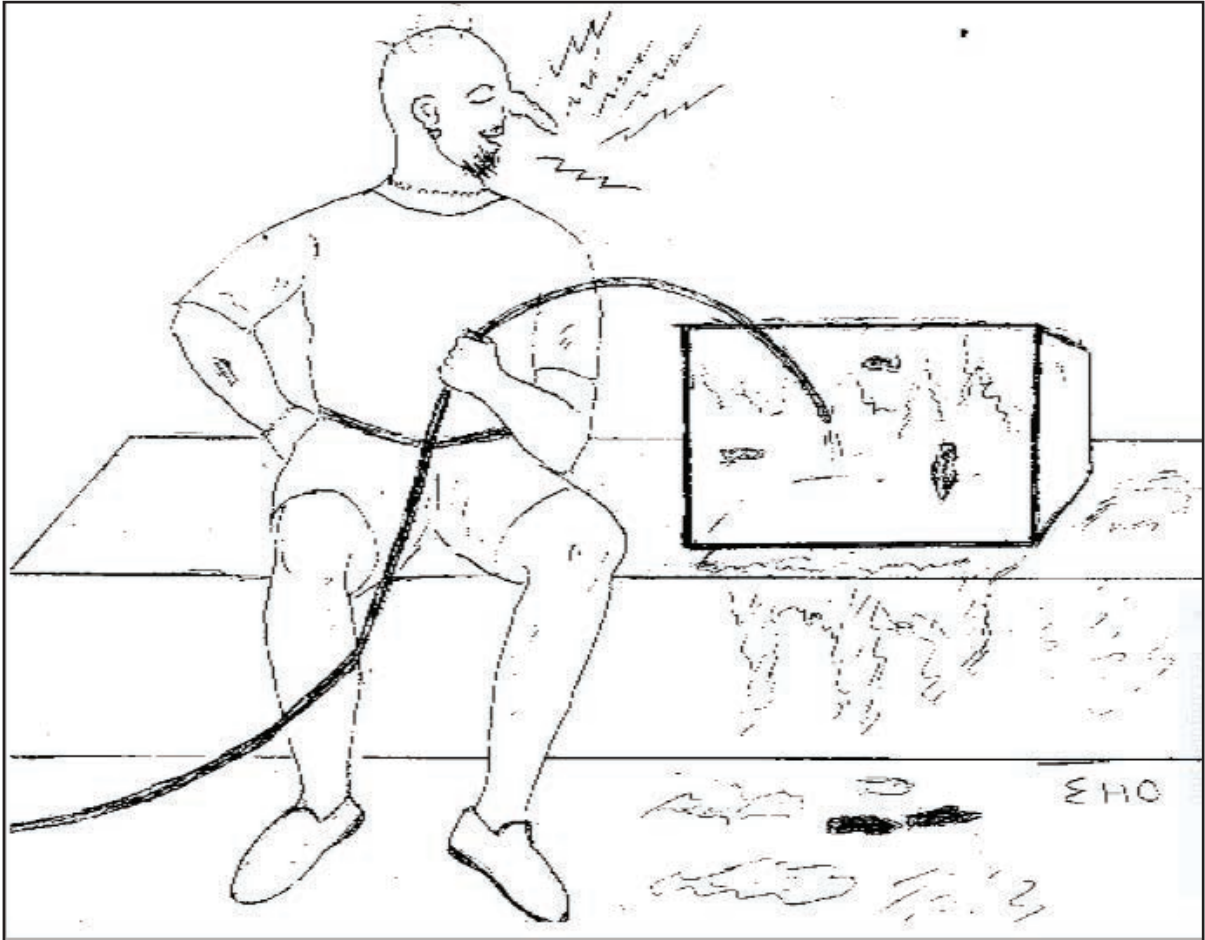
It is our great fortune to have another admirable cast of speakers who have so graciously accepted our invitation to join us throughout the coming season, bringing us their extensive knowledge and experiences. You certainly won't wish to miss a moment of our prominent guests, not to mention the friends, fish, warmth, and camaraderie that accompany each meeting.

March 7	Tom Keegan <i>Fish Bio 101</i>
April 4	Judith Weinberg <i>Starry, Starry Night Cichlids: An inter-species love affair</i>
May 2	Artie Platt <i>Fishroom Tools</i>
June 6	Ask The Experts <i>Joseph Ferdenzi, Moderator</i>
July 11	Salvatore Silvestri <i>Apistogramma and other dwarf cichlids</i>
August 1	A Night at the Auction
September 5	Kevin Kelly <i>Lighting</i>
October 3	Gary Hater <i>Goldfish</i>
November 7	Rusty Wessel <i>TBA</i>
December 5	Holiday Party!

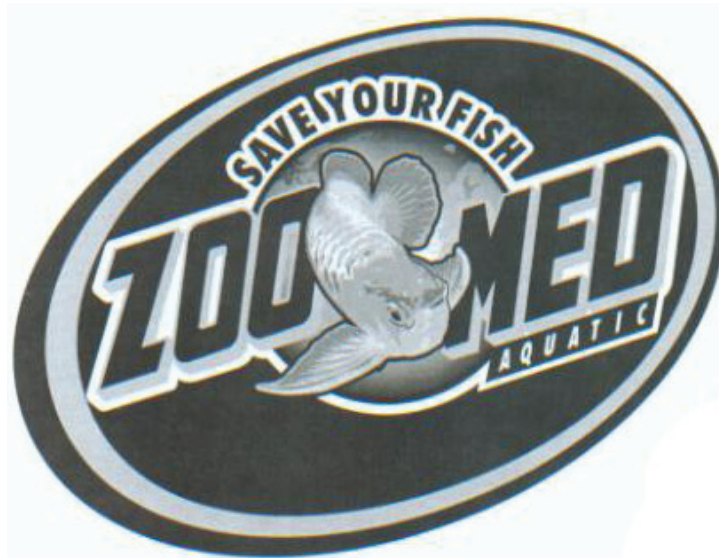
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The Greater City Aquarium Society meets every month, except January and February. Members receive notice of meetings in the mail or by email. For more information, contact: Dan Radebaugh (718) 458-8437 or email gcas@earthlink.net. Find out more, see previous issues, or leave us a message at our Internet Home Page: <http://www.greatercity.net>, <http://www.greatercity.org>, or <http://www.greatercity.com>.

June's Caption Winner: Denver Lettman



Asleep while changing water? “Reckless!”





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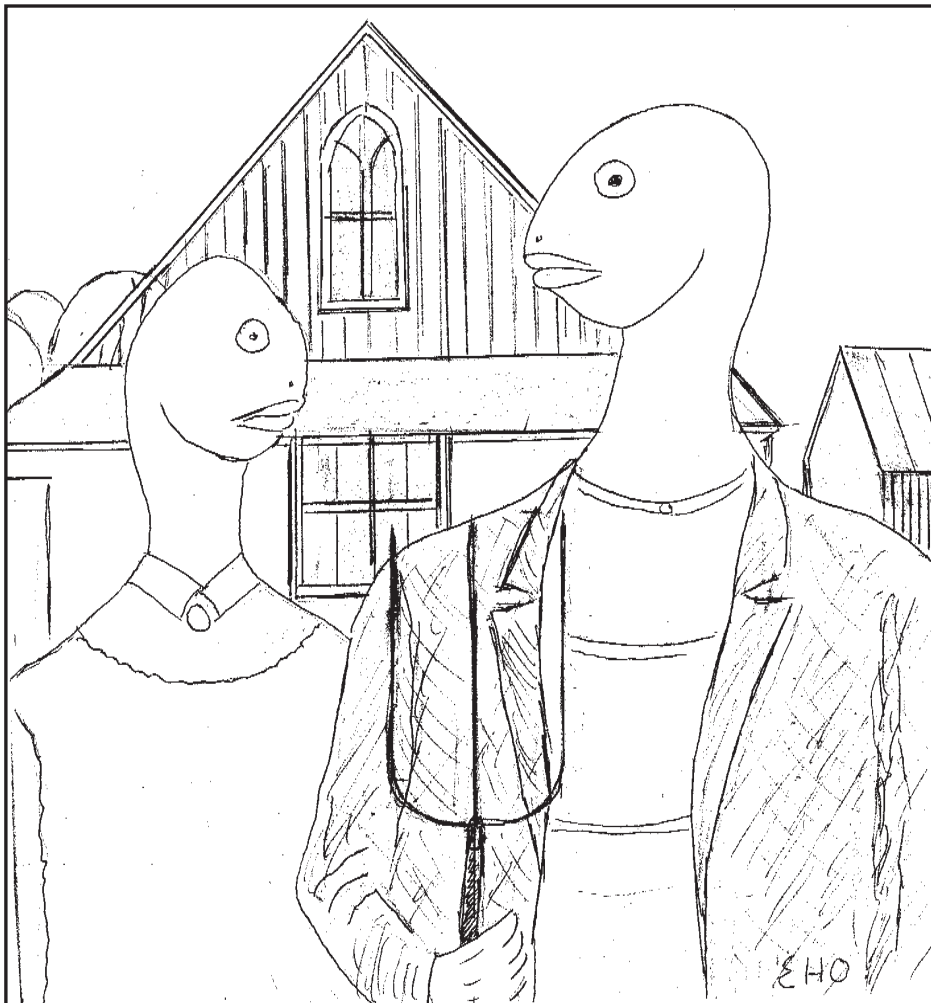
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The Modern Aquarium Cartoon Caption Contest

Modern Aquarium has featured cartoons before. This time though, 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 can turn in to Marsha 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:

Another New Filter Idea?

by Jules Birnbaum

There is nothing new scientifically in the way of filtering aquarium water. I'm not a scientist—I repeat this over and over. However, Dr. Richard Pierce (President of the NEC) had me answer a few questions, and after answering them, he said t h a t I am one (albeit without a degree). I love to experiment with new equipment, and to observe and report on my results.

Circulating bio contactors are relatively new to the hobby. This filter is an entirely biological filter for the purpose of nitrification. The CBC filter does not trap matter, thus never clogs and doesn't need to be serviced. The sole principle is conversion of ammonia (NH₃) to nitrate (NO₃). The media (small white beads) are in constant motion from the top to the bottom of the filter, offering a very large surface area for nitrifying bacteria. Over time the beads get brown, which is a sign they are doing their job.

Joe Gargas, of aquaresearchcenter.com, developed such a filter using PVC parts and small beads (photo below). This CBC filter should be



Aqua Research professional version

combined with your existing canister, sponge, or box filter. If your tank has a bare bottom and you perform weekly water changes, you really don't need anything but a CBC filter. Thus you have saved one annoying maintenance step—cleaning filters. The CBC filter itself takes up very little room.

Joe has been selling this filter for over two years, and so far has sold more than a thousand of them.

I've seen DIY versions on YouTube, but the Joe Gargas version is professionally made. I was willing to spring for two CBC filters to observe first hand how they work. There was no preparation other than attaching an air hose. Fry do not get caught in the CBC filter since they just pass right through.

I will test this CBC filter for the next month, but it does take up extra room in the tank, and of course you need an additional airline. I'm presently working on a DIY version using lava rock from my BBQ

supply. I took a seltzer bottle, cut holes in it, and filled it with the crushed lava rock (great filter material at really no cost), and turned it upside down. I then attached an air line. In order to attach my version of this filter (photo below) to the side of the tank I plan to use small magnets.

At this point you might say this idea is a waste of time because you still need another filter to remove solid wastes. I'm working on getting some filter material somewhere into a DIY unit but this means more maintenance. If your tank has no substrate, just clean the tank bottom and perform weekly 50% water changes. You really don't need anything more to remove solid wastes. Now you have a filter that needs no maintenance.



DIY version: Seltzer bottle, lava rock, 2 magnets used to attach to side of tank

This is only my hobby, and do not plan on making it a business, which of course would ruin the fun. I do not want to compete with the pros. I will probably purchase the Joe Gargas professional version. Please don't call me a gadget lover, since it won't change me. I'm not a scientist, just a retiree with 33 tanks who is having fun.



Montezuma's Revenge!

Confusing Hobbyists About The True Montezuma Swordtail

by Joseph Ferdenzi



The *helleri* and *montezumae* swordtails are both beautiful fish, but once you have seen a true *montezumae* there is no mistaking them. Take a look at the photo at the bottom of this page. *That* is a Montezuma swordtail! The differences are most glaring in the males. The dorsal is a different shape, the body length is different, and perhaps most strikingly, the length of the sword in proportion to the body is

One of the first, if not the first tropical fish I ever kept was a red variety of the classic swordtail, *Xiphophorus helleri*. Over the years I have never lost my fascination with swordtails—the males have one of the most unique caudal fins known to hobbyists—the famous ‘sword tail’ from which its common name is derived.

As my involvement in the hobby has grown, so has my ability to acquire species of swordtails other than *helleri*. So too, my increasing hobby experiences reaffirmed the existence of the long-standing mix-up among hobbyists as to what is really the fabled Montezuma swordtail.

Many hobbyists would believe that the swordtail depicted in the photo above is a Montezuma swordtail. It is not. Essentially, the misconception has arisen that any *helleri* with black spotting is a Montezuma swordtail. That misconception is unfortunate because it gives rise to all kinds of pernicious confusion at society auctions, fish shows, and other components of our hobby. Once upon a time, before the Internet, this confusion could almost be forgiven, because the true Montezuma swordtail was very rare in the hobby, and the literature on it was almost non-existent. Therefore few people in the hobby really knew what it looked like.

much greater in the *montezumae*.

Now mind you, the original *helleri* have very long and magnificent swordtails. Many hobbyists are not even aware of this, because most of the swordtails we see in the hobby are derived from crosses with platies (*Xiphophorus maculatus* or *variatus*). Since platies have no swords, those crosses, though resulting in a kaleidoscope of colors beyond green, have relatively shorter swords.

One of the reasons for being a member of an aquarium society is to stay informed. I hope this article has, in some small measure, served that purpose.



Red Is The New Green

Story and Photos by Stephen Sica

Many years ago I had a fascination with red aquarium plants. I would search pet stores on weekends in my desire to find and purchase a red plant. I would stare at them in pet store tanks while store clerks would suspiciously eye me and ask, “Can I help you?” When I would ask a question, some clerks would respond that this specific plant was difficult to maintain for such and such a reason. It sounded good to me. Some would say that it requires high lighting and/or carbon dioxide. Many had no idea, and a few would say anything. I guess I looked ignorant (I was), and they wanted to sell something.

As a matter of fact, I was recently in Fish Town, on Northern Boulevard in Queens, midday on a Thursday, and asked an unfamiliar looking clerk for “three paleatus catfish.” He immediately went to the smaller *Corydoras panda*, pointed, and said, “this?” I walked past the clerk to a corner of the store where the *Corydoras paleatus* tank was inconspicuously situated, and pointed. I probably should have been more specific in my description.

The employee was probably inexperienced and did not know one catfish from another. I don’t intend to be critical, because my own fish knowledge is often wanting. A non-fishkeeper friend once asked me why one cichlid was killing all the others in its tank. I responded that “I think it’s hungry!” Same for the people who wanted to sell me red plants. They were “hungry” to make a sale. Of course, I was entirely eager to purchase those plants.

Once I got my hands on those red plants, the interesting part would begin. After I planted them in my aquarium, I would observe them like any hobbyist would, to observe their growth and condition. Many would fade to green after a few weeks. Worse yet, I often would harm or even kill them before they lost their reddish luster. I fought hard to maintain both my enthusiasm and my red plants. If I was in a good groove and feeling lucky, like “Dirty Harry” of film fame, I would kill them *after* they changed from red to green. This pleased me somewhat, because I could say to myself that I had successfully kept a red plant alive,

if only for a few weeks. I seem to have specialized in keeping *Rotala rotundifolia* whenever I could find this plant in a pet store.

My strategy for plant keeping was plain gravel substrate and compact T-5 fluorescent lighting. If I remembered, every now and then I would jab a nourishment plant stick into the gravel. This formula did nothing to help me grow plants, though it may have helped me grow lots of ugly hair algae, which I’d try to scrape off the plants with my fingernails.

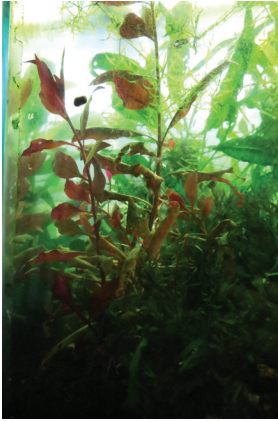
One day a few years ago, my friend Jean-Michel retired and decided that he wanted to have a fish tank, because he enjoyed fish and had had one as a youth in France. I sold him my thirty-six gallon bow-front tank and stand, because he wouldn’t accept it as a retirement gift. He lives three blocks away, so I visit his apartment fairly often. He had rigged up a homemade CO₂ system using yeast and a one liter soda bottle. During a holiday visit a few months ago I noticed that he was growing a beautiful red plant. It was magnificent! I kept my eye on the plant, and in February or March asked him if I could have a few shoots the next time that he trimmed it. He did so immediately. I asked him its name but he had no idea. He told me that he had purchased it at PetSmart.



I planted three shoots of the red plant *Telanthra cardinalis* on the far left in the foreground of this twenty gallon tall aquarium. These shoots were trimmed from a parent plant. One shoot floated to surface and I failed to replant it. The remaining two red shoots, followed by another short mystery third one, became the current plant.



Photo on left shows a close-up of *Telanthra cardinalis*, shortly after initial planting, with betta (a GCAS auction purchase) in the foreground. Photo on right is similar view, without the betta.



These photos were taken almost two months after the *cardinalis* was planted in the aquarium.

I took my new red plant home. My aquarium is only twenty gallons, with limited room, so I planted the shoots in the front left corner, because that was readily accessible to me. A shoot floated away, but two took hold. In April, Donna and I visited our local PetSmart to make a purchase for our dog Cordelia. I went to the plant section, which consisted of a rack of prepackaged plants in small bags and plastic tubes. There was only one type of red plant in the rack, and it was labeled *Telanthera cardinalis*, also known as *Alternanthera reineckii* “*cardinalis*.” Later, at home, I found the plant listed on the internet mostly as *Alternanthera reineckii* “*cardinalis*.” It is currently available on eBay from a vendor in California for \$15.99, including shipping. PetSmart’s price is \$11.99.



If you visit the live plant display at your local PetSmart, you might find a red ‘*cardinalis*’ wrapped in a small plastic bag inserted into a cardboard sleeve. My neighborhood store had about five in stock when I took this photo. I do not necessarily endorse PetSmart as the source for this plant. It is available online from several vendors.

AquariumPlants.com calls the plant *Telanthera*, and describes it as “a strong plant that will give you the addition of deep red colors, under high light.” It further states that the plant will grow to the surface of the aquarium with medium to high lighting. Stems will require trimming and can be replanted, which is what I did with Jean-Michel’s trimmings.



My latest photo of ‘*cardinalis*’ shows the tallest stem protruding above the duckweed covered surface. A quarter inch sheet of clear plexiglass is just above the plant covering the aquarium.

Several online stores sell this plant for various amounts in the above price range. This plant may be popular, as I discovered that it is often out of stock. There are other websites that sell this and other plants. I just happened to choose AquariumPlants.com for convenience. As I’m wrapping up this story on a cool Sunday afternoon in May, I just checked my red plant with its two shoots. I’m happy to report that it’s alive and growing. What more can you ask?



On May 30, Cindy and Jean-Michel came to our house for dinner. J-M told me that he had to trim his plant because it was growing so much. He gave me a few trimmings; some with roots. I noticed that his plant was a brighter shade of red than mine. I hope that my plant is not fading!



Sexual Inversion In Swordtails?

Separating Fact from Fiction

by Tom Warns

Last month's meeting featured some spirited debate regarding one topic that has apparently divided aquarists for generations—can swordtails really change sex from female to male?

Several club members stated that this phenomenon had happened to them; fish that had at one point presented as large, plump females suddenly turned into males in a matter of weeks. But there was understandably some doubt as to whether such an unusual feat could really take place, and plenty of reason to wonder if those esteemed aquarists were simply mistaken.

A quick glance at online fish fora highlights the divisions we witnessed in June. The posts on the topic usually go something like this: one person states that a female swordtail, often in a tank filled only with females, starts to develop a gonopodium and “turns into” a male.

The responses took several forms. Some swordtail keepers disbelieved simply because they had kept swordtails and had never seen the phenomenon themselves (show me the stigmata, they might have said 2,000 years ago). Another common response posited that swordtails can in fact change their appearance and mimic males when they are placed in an all-female environment. All along, however, the reproductive organs of the fish never actually changed. Perhaps the most common explanation was simply that the original poster had misidentified the swordtail, and that the alleged female-turned-male was a late-blooming male all along.

With the normally authoritative online message boards and fora failing to yield a clear answer, it was time to turn to Google's younger brother with a master's degree, Google Scholar. Some searching revealed a study published by Italian researcher Elso Lodi in 1980 that addressed this exact question. Thankfully, the study was written in English!

Lodi's article, titled “Sex Inversion in domesticated strains of the swordtail, *Xiphophorus helleri* Heckel (Pisces, Osteichthyes),” laid out the debate among scientists going back to the 1920s; can swordtails truly change sex, or experience what is called “sex inversion?” Lodi's answer was an emphatic yes.

Lodi started by breeding swordtails and isolating them at birth under close observation in single tanks. Once the females reached sexual maturity and were confirmed to be gravid, they were mated once in their isolation tanks to confirm that they could breed as females. After the females bred successfully once, they were placed in a larger tank with other females. Once the swordtails were in tanks with females only, Lodi noticed a familiar phenomenon happen—some of the females began to develop the secondary sex characteristics of male swordtails, including most prominently the gonopodium.



The next question Lodi confronted was whether the swordtails truly switched sexes, or if they just took on the appearance of male swordtails. Some of the newly transitioned female-to-male swordtails, particularly the swordtails that had transitioned at an older age, were unable to inseminate the female swordtails; those

swordtails were considered “arrhenoid” females.

Just as many of the female-to-male swordtails, however, were able to inseminate virgin female swordtails and produce offspring. Lodi noticed particularly that those swordtails that transitioned at a relatively early age were the ones that successfully mated as females and males. Lodi was also interested to find that females impregnated by these female-to-male (sex-inverted) swordtails produced broods that had almost a 3:1 ratio of females to males. Was it possible that the swordtails had actually developed male reproductive organs? Had they undergone a true sex-inversion?

Lodi confirmed that they had. He dissected both normal males and sex-inverted males, and found that both had gonads. The normal males had bilobed gonads, whereas the sex-inverted males had a single oval-shaped lobe. Both sets of gonads contained sperm.

Lodi's experiment thus confirmed that sexual inversion was possible, and verified several instances. His experiment also showed why there was so much confusion over the topic, as there were instances of swordtails that merely assumed the appearance of the opposite sex without developing the concomitant set of reproductive organs.

The paper concluded by trying to explain why and how the process worked. One theory advanced by Lodi is that in swordtails, sex is not binary like in humans, who either have a Y chromosome or do not. Instead, swordtails' sex may be polygenic, meaning that it is controlled by a number of genes. Lodi theorized that the genetic factors which determine sex are "balanced" in many swordtails, and that the "male" factors in some juveniles cannot overcome the female factors at the first stage of life. A tipping point, however, may be reached later in life based on environmental factors (such as an overwhelming number of females vs. males) that allows the balance of genetic factors to swing in the opposite direction, triggering a sex inversion. Based on his observation about sex inversion in younger and older swordtails, it may be that the tipping point must be early on, or the genetic factors cannot be overcome such that true sex inversion occurs.

Another possibility is that some types of swordtails contain a consistent population of hermaphrodites. Lodi theorized that swordtails may have become hybridized in such a way that sexual hermaphroditism became relatively widespread. If previous researchers were experimenting with swordtails that had not yet been hybridized, then it is possible that sex inversion would never have occurred in their research.

So that's your answer folks. Swordtails can do the seemingly impossible, and actually "switch" their sex. Reflecting back on the question that sparked this whole article, one has to ask: when will we cease to be amazed by what our wonderful aquatic friends are capable of?



Fig. 1. — Bilobed male gonad of *Xiphophorus belleri*.



Fig. 2. — Sex inverted gonad of *Xiphophorus belleri*.



Swordtail photo from FishkeepingAdvice.com

Okinawa, EAF's, FWA's, and More!

Story and Photos by Steven Hinshaw



Hi All! Am getting ready to head back the US! I have lots of conversational stories about living in Okinawa, and of course, about how they keep fish! I have especially enjoyed seeing how people here, if not the culture in general, incorporate the natural world around them in their lives—regardless of whether they live in the country or the city!

I have greatly enjoyed having patio ponds in earthen vessels with lillies and fish! There's a wonderful Okinawan Tree Frog that lays its bubble nest above even the slightest of water sources: crotches of trees, old tires, abandoned upturned concrete pipes, and water so green and anoxic and hot! I am mystified how the tadpoles survive, but they bob up and down getting gulps of surface air, making the water surface look like a bubbling witch's cauldron! I have pictures, but maybe for later!

For now though, here are some pictures, and a short discussion of my continued quest for the complete set of Dr. William T. Innes' book, **Exotic Aquarium Fishes**. A couple of brief notes to start:

1) Still trying to locate and secure a 5th Edition **EAF** (1944) and 11th Edition **EAF** (1950) with their dust jackets. No luck.

To ship them home safely, all the books have been wrapped in acid free paper and placed in the acid free, foam board lined boxes I constructed for them, with special spaces for desiccant packets I constructed. Note the handles on the sides are not to carry them (though of course you can use them for that), but were put there so that the movers can't set them on end. I do that for my crates so that things get stacked properly, thereby avoiding the risk of spillage or internal damage. Works great for my brittle cast iron skillet collection!

2) In my continued quest for those two **EAF**'s, I acquired a short series of **Fresh Water Aquaria**, starting from 1890 and going through 1937—seven editions.



I first learned of this book when my daughter was looking at auction lots of books on eBay. People are selling vintage books for home decor—arranging them in color schemes or texture or topics. People buy them up as “art” for their walls and shelving. Often you can find uncommon titles in these lots, and get them cheaply, as the sellers have no idea about the books as books; they are selling them as decorations!

I found **Fresh Water Aquaria** this way while looking for **EAFs**. Finding variations and editions of **FWA** became a happy distraction from the lack of success with **EAFs**!

These older books often do not have obvious dates on them, so I have had to ask sellers for clues—such as the date of an ad in the book, or an inscription—so there are clues! Then you get into detective mode—wondering why there is mention of Part 1 and Part 2 in the title page, only to find out that books have been combined into a one volume set. See the picture of the parents and offspring, for example. **Fresh Water Aquaria** bonded to **Marine Aquaria** becomes **The Book of Aquaria**! And it is stated as such in the title pages.



1 - 7 editions set FWA (front)

When I first started looking for a 1st edition, I missed an opportunity by minutes. As I was asking the seller questions, someone else scooped it up online. The seller had it right in his hands! This was by email in the UK.

The picture showed a book with all-green boards, not the decorated ones, so I was asking for verification of the edition. Of course it may have been misrepresented and may have been an older edition, but all the editions I have from the 2nd on (**all**!) state their edition number. The 3rd edition has the snail and water beetle, and the forth to seventh are plain, dark green boards. Although I thought I had seen a 3rd edition with no snail or beetle—even though I had ordered it! But nothing has come in the mail, and my records have become confused! One dealer actually had the book listed in the UK and in the States, and

it turned out I had bought the book twice. It was located in the UK, but they only refunded me the States price, which was much, much less (and with free shipping, even though it came from the UK). I said as much, and complained that they should have reimbursed me the UK price and shipping!!! Crickets!

One bookseller claims that the earliest 1st edition out there is the decorated one with ad dates of 1893. So it appears I have the earliest printing of the 1st edition. And also a later printing of 1894! Maybe the all green boards of the 3rd and 1st editions are unicorns. What I do have is a good looking set that makes me happy. But I also believe in unicorns!!! They must be out there!.

I supposed I'll display my extra 1st edition **FWA** (the later one) with the **Marine Aquaria** and their offspring (F1) **The Book of Aquaria** !! Then the other set stands alone as well! I do have an extra 6th, both in equal condition, so I'll probably put that up on eBay. My internal debate for the extra 7th: I like the one with the darker green boards, as it matches the other books better, but the spine does not have bright lettering like the lighter colored one, and there is a stain on the lighter colored one. A previous owner of the darker colored one pasted a “John Hems” label over the “Bateman” mark. Or maybe the publisher did that to show that it was no longer Bateman's book, but now Hems' book?! I had considered removing that label, but second thought says I should not.

Maybe some of you readers have insight to these late 19th and early 20th century books, AND hopefully you may even have the two **EAF**'s I still need!!!

Looks like we are headed for Scott Air Force Base in southern Illinois! Packing as I key in this note! Will be there late summer!



1 - 7 editions set FWA spines



Upcotted breeding parents and F1



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!



Joe Gurrado



Ruben Lugo



Joe Gurrado



Joe Gurrado



Ruben Lugo



Keeping Arowanas in the Freshwater Aquarium

by Katherine Barrington

The Arowana is a very large but graceful fish that makes a very interesting freshwater tank inhabitant.

There are countless different species of freshwater fish on the planet, and not all of them are suitable for captivity. However, if you have enough tank space and take the time to learn about their needs, the Arowana is a very unique type of fish that can be kept in the freshwater tank at home. There are several different types to choose from. In this article you will learn the basics about these beautiful fish and receive some tips for keeping them in your own tank.

What is an Arowana?

The Arowana is a type of bony freshwater fish that belongs to the family Osteoglossidae. These fish also carry the name “bonytongues,” and are known for their elongated bodies which are covered in a mosaic of thick, heavy scales. Arowanas have bony heads, and soft rays on the anal and dorsal fins, but their ventral and pectoral fins are very small compared to the size of the fish.

The nickname of these fish, ‘bonytongues,’ was given in reference to the fact that they possess a toothed bone on the floor of their mouth. This bony ‘tongue’ allows the fish to bite against the teeth located on the roof of its mouth. Another unique adaptation this type of fish exhibits is the ability to breathe air using their swim bladder organ.

Fish belonging to the family Osteoglossidae are carnivores—they eat everything from fish and insects to birds perched on branches overhanging the water. Different species of Arowana can be found all over the world: in parts of South America, Africa, Asia, and Australia. Technically, the one African species of Arowana belongs to a different family—Arapaimidae—which also includes numerous species of arapaimas or pirarucus. Despite being carnivorous, Arowanas do not typically eat their own young. In fact, several species exhibit advanced parental care, building elaborate nests to protect their young after hatching. All Arowanas are mouth-brooders, which

means that the parents hold the eggs in their mouths after spawning until the eggs hatch.

Popular Species of Arowana

1. Asian Arowana (*Scleropages formosus*)

The name Asian Arowana is given to several different varieties of Arowana that can be found throughout Southeast Asia, where they tend to inhabit blackwater rivers and other slow-moving waters. The different varieties of Asian Arowana are distinguished mainly by color; examples include the Green Asian, Silver Asian, Red Asian, Red-Tailed Golden and Blue Malayan. Most Asian



Arowanas grow up to 35 inches in length, so they need very large aquaria. These fish prefer soft and slightly acidic water in the 75°F to 86°F range.

2. African Arowana (*Heterotis niloticus*)

Although this species is known as an Arowana, it is actually more closely related to arapaimas. The main difference between this and other Arowanas is that the African Arowana feeds primarily on plankton. This species grows fairly large, reaching lengths up to a meter and weights up to 22 pounds (10 kg). African Arowanas are usually gray or brown in color, often with a bronze sheen, though juveniles exhibit dark horizontal bands.

3. Silver Arowana (*Osteoglossum bicirrhosum*)

The Silver Arowana is a South American species that can be found in the Amazon, Rupununi, and Oyapock Rivers. This species grows up to 35 inches long, exhibiting a uniform silver coloration throughout its lifespan. They are sometimes called Dragon Fish because of their armor-like scales. These fish tend to inhabit the upper regions of the river, often jumping out of the water to capture prey. Silver Arowanas eat insects, crustaceans, fish, and other animals like birds, bats, and snakes.

4. Black Arowana (*Osteoglossum ferreirai*)

The Black Arowana is another South American species that can be found in the upper Essequibo River basin in Guyana as well as the Negro River

Reprinted from *Tankquillizer* – February 2017 – Tropical Fish Society of Rhode Island

basin in Colombia and Brazil. This species grows up to 35 inches long and it has a dark, iridescent blue or steel-gray coloration as an adult, but a black-and-yellow coloration as a juvenile. These fish require a minimum of 480 gallons to accommodate their size, and they prefer a tank maintained with blackwater additives. Black Arowanas will eat a variety of insects, crustaceans, amphibians, and small fish.

5. Jardini Arowana (*Scleropages jardini*)



This species of Arowana is native to New Guinea and Australia. It is a smaller species of Arowana, growing only to about 24 inches in length. These fish tend to stay in the upper regions of the water column, and they will jump to catch prey, so a tight-fitting lid is needed. Jardini Arowanas are carnivorous, and though they prefer live food, some can learn to accept pellet foods in captivity. This species can be kept with other semi-aggressive fish as long as they are too big for the Arowana to swallow.

Tips for Keeping Arowanas in the Home Tank

Though the specifics vary from one species to another, most Arowanas are solitary fish, though some of them allow the company of other fishes while they are still young. Adult Arowanas tend to be highly aggressive and dominant, though they can sometimes be kept with other semi-aggressive or aggressive



species (as long as they are too large to fit in the Arowana's mouth). Some examples of tankmates you might want to choose include Oscars, tinfoil barbs, green terror cichlids, clown knifefish, and pacus.

In addition to making sure that your Arowana tank is large enough, you also need to make sure it is outfitted with a tight-fitting lid. In the wild, Arowanas have been known to leap more than six feet in the air to pick insects and birds off low-hanging branches. These fish do best on a diet of live and frozen foods, and they require a tank size of at least 150 gallons. In terms of tank decorations, most Arowanas prefer fine gravel substrate with live aquarium plants for decoration. Because the Arowana is so large, you need to leave plenty of open space for swimming; it is best to concentrate your plants and other decorations around the edges of the tank.

Arowanas are a unique but beautiful type of fish that can make for very interesting freshwater tank inhabitants. Because their needs are so specific, and because they grow so large, you need to be careful about cultivating the right tank conditions if you plan to keep Arowanas. Using the information in this article you can successfully plan and maintain your Arowana tank.



Photos:

Preceding page: FishkeepingWorld.com

All others: <https://www.ratemyfishtank.com/blog/species-spotlight-keeping-arowanas-in-the-freshwater-tank>



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Meeting Reminders



Almost every month at least one meeting reminder postcard is returned undelivered. Sometimes the member moved and just forgot to update his or her contact information with Greater City. Other times, well it's a mystery—the address was correct, but the Post Office marked it as “undeliverable.”

Unlike some aquarium societies, at Greater City there is never a charge for non-members to attend, there is no “bidder card fee” to bid on items in our monthly auctions, the refreshments are free to everyone at the meeting, and anyone can purchase raffle tickets. But membership does have its privileges, including this award winning magazine, door prize chances, the ability to participate in our bowl shows, and advance reminders of our meetings. If you have an e-mail account, please consider getting your meeting reminders by e-mail, instead of by postcard. You will be getting two notices (one a week in advance, the other a day in advance) instead of only one, and the chances of non-delivery are virtually none (unless you change your e-mail address). While it's a very small thing, you'll even help the environment by using less paper. An e-mail sign-up sheet is at the membership/Modern Aquarium table, or send an e-mail to gcas-webmaster@usa.net.

Little “Lefty”

Text and Photos by Sue Priest

At a recent GCAS meeting Jeff Bollbach approached me. He asked me “would you be willing to adopt a one-eyed angelfish?” I thought about it briefly, and asked him “does it swim crooked?” He said “sometimes.” He showed me the fish. It looked pretty healthy, and held a certain fishy appeal for me, (don’t they all?), so I said “sure.”

Right away I decided that he (sex?) needed a name. He has an eye on the right side of his head, and no eye on the left. I named him the not-so-obvious choice of “Lefty.” This gave him the distinction of presently being the only named fish under my care.

Lefty quickly settled into my community aquarium, where most of the other fish are also angels. I can always pick him out of the swarm, not because he is little, or because he swims crooked, but because he has a golden sheen, which sets him apart from the others with their silver flanks. Lefty always stands out among the crowd.

Little Lefty thinks he is just as big, if not bigger, than the other angels. He boldly assumes his place among them. At feeding time the other angels are left wondering what happened to this or

that morsel of food which was right in front of their face. Lefty has already swooped in and snatched it up! Swimming slightly sideways

might even be an advantage in this situation.

I don’t think of Lefty as handicapped or disabled in any way. He has proven that he can take care of himself. When it comes to breeding postures and behaviors, well, I’ll just have to wait and see what happens.

It is usually wise to obtain a photo of a fish before you start writing about it. I’m sure no one has ever used the word wisdom in a sentence that includes my name, so now I’m off to get a photo or two of Lefty for your viewing pleasure. (This could take a while!)

There were probably close to 100 people in the room that night, but Jeff singled me out as the sucker (oops-I mean softie). I’m sure that if he had put it in the auction someone would have bought it, but I’m glad I’m the one who took him home. At the rate he is eating he won’t always be little, but he **will** always be **Lefty!**



Pictures From Our Last Meeting

Photos by Joe Gurrado

Bowl Show Winners:



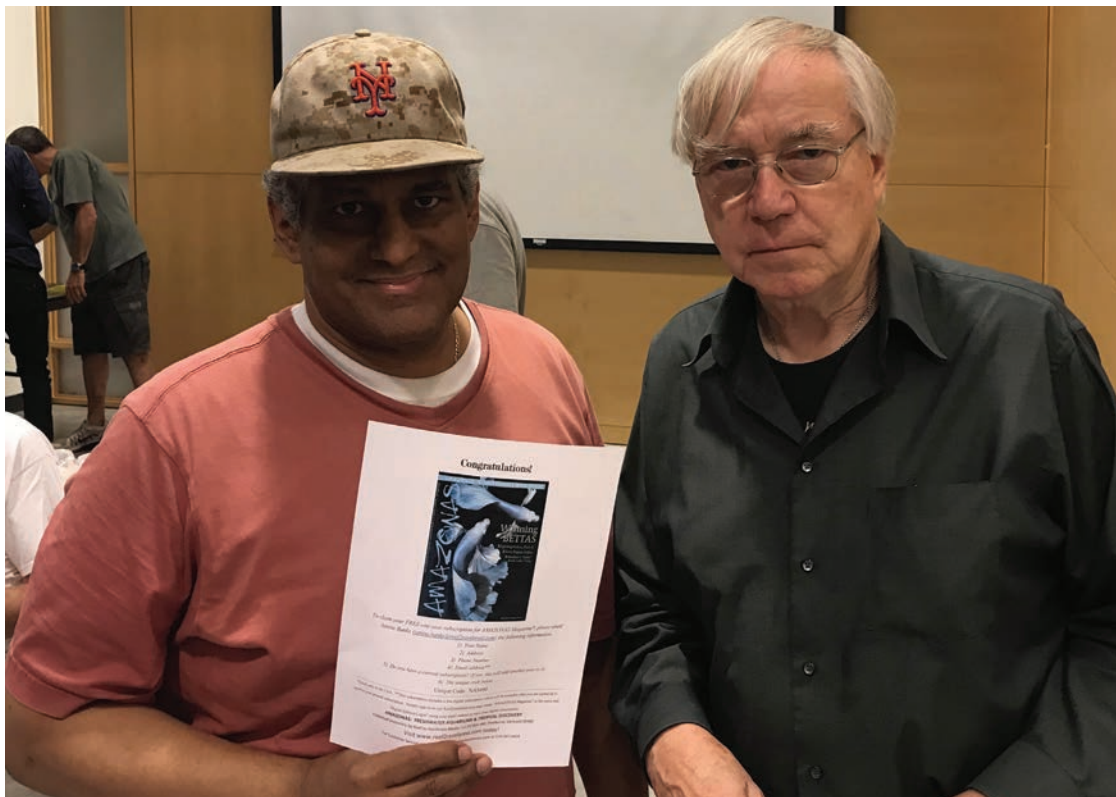
2nd place: Rich Waisman



1st place: Bill Amely



3rd place: Bill Amely



Door Prize winner (subscription to Amazonas) Bill Amely with GCAS President Horst Gerber

GREATER CITY AQUARIUM SOCIETY

NIGHT AT THE AUCTION RULES

SELLERS

1. In the interest of time, auction lots will be limited to fish, plants, live fish food/cultures, and brand new/unused aquatic equipment and dry goods. No other dry goods or used items will be accepted.
2. All items for the auction will be our normal 50/50 split or a 100% donation to the club. Payouts will be available at our next meeting.
3. Labels will be provided to you, and should appear on all lots for proper record keeping. Description samples of your fish for labeling the bag are below:

Proven pair: they spawned and the eggs hatched.

Pair: sexable adult fish; one female and one male.

Trio: sexable adult fish; combination of males and females indicated on the label.

Breeding Group: sexable adult fish; combination of males and females indicated on the label

4. All fish lots should be properly bagged. Please do not use zip lock bags.
5. Please try to arrive early to set up your fish/plants for the auction, as we wish to start promptly.
6. GCAS has the right to refuse any lot due to size, visible defects, sickness, or bagging.
6. Minimum bids are not allowed.
7. Seller must pick up any lots that fail to sell at the end of the auction. Any items left will become the property of GCAS.

BIDDERS:

GCAS will process bidder purchases in only one way: cash on delivery. You pay the runner when he/she delivers the lot to you. The runner will return with the change if there is any. Sorry, no checks or credit cards, cash only.

GCAS will do its best to ensure that all items at the auction are what they are stated to be, but GCAS cannot be held responsible for any mislabeled items. The auctioneer has the FINAL WORD on all bids.



Not-So-Hidden Figures

by Horst Gerber

On a recent drive through Smugglers' Notch I passed a moderately sized house with a yellow, life-size stick figure made of metal tubing, holding a red mailbox under his arm. I stopped to take some pictures, thinking that if I copy that figure it would make a nice addition to all my other stuff. Like I don't have enough else to do. The owners of the house, a couple in their seventies, showed me another sculpture in their front yard, a very intricate, life-size horse, and a cowboy who was watering the horse from his hat. I assumed it was made of fiberglass, but to my surprise it was done in bronze, and had a purchase price that weakened my knees! Adding to my amazement, they informed me that they were awaiting the arrival of two more cowboy sculptures, which were to be delivered within the next couple of days. Now I call that taking your hobby to a whole new level! These sculptures are absolutely magnificent!



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| 2 RICHARD WAIZMAN | BETTA |
| 3 WILLIAM AMELY | BETTA |

UNOFFICIAL 2018 BOWL SHOW TOTALS:

WILLIAM AMELY	23	RICHARD WAIZMAN	12	CARLOTTI DEJAGER	1
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A WARM WELCOME BACK TO RENEWING GCAS MEMBERS JOE GRAFFAGNINO, RON KASMAN, AND ARTIE MAYER!

Meeting times and locations of some of the aquarium societies in the Metropolitan New York City area:

GREATER CITY AQUARIUM SOCIETY

Next Meeting: August 1, 2018

Event: A Night at the Auction

Topic: N/A

Meets: The first Wednesday of each month (except January & February) at 7:30pm:

Queens Botanical Garden

43-50 Main Street - Flushing, NY

Contact: Horst Gerber (718) 885-3071

Email: pilotcove43@gmail.com

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

BIG APPLE GUPPY CLUB

Meets: Last Tuesday each month (except Jan, Feb, July, and August) at 7:30-10:00pm.

Alley Pond Environmental Ctr.: 228-06 Northern Blvd.

Contact: Donald Curtin (718) 631-0538

BROOKLYN AQUARIUM SOCIETY

Next Meeting: September 14, 2018

Speaker: Justin Spall

Event: *Setting Up A Plant Room*

Meets: 2nd Friday of the month (except July and August) at 7:30pm:

NY Aquarium - Education Hall, Brooklyn, NY

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

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

LONG ISLAND AQUARIUM SOCIETY

Next Meeting: September 21, 2018

Speaker: TBA

Topic: TBA

Meets: 3rd Friday of each month (except July and August)

at 8:00 PM. LIAS Meetings are held at SUNY Stony Brook's Maritime Science area. Room 120 in Endeavor Hall on the State University at Stony Brook Campus, Stony Brook, NY 11790

Email: president@liasonline.org

Website: <http://liasonline.org/>

EAST COAST GUPPY ASSOCIATION

Meets: 2nd Tuesday of each month at 8:00 pm.

Alley Pond Environmental Ctr.: 228-06 Northern Blvd.

Contact: Gene Baudier (631) 345-6399

NASSAU COUNTY AQUARIUM SOCIETY

Next Meeting: September 11, 2018

Speaker: TBA

Topic: TBA

Meets: 2nd Tuesday of the month (except July and

August) at 7:30 PM. Molloy College, at 1000 Hempstead Avenue, Rockville Centre, NY, in the PUBLIC SQUARE BUILDING, room 209A. See website for directions.

Contact: Harry W. Faustmann, (516) 804-4752.

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

NORTH JERSEY AQUARIUM SOCIETY

Next Meeting: July 21, 2018

Speaker: Ron Harlan

Topic: *Everything You've Wanted to Know About Water, But Were Afraid to Ask*

Meets: 12:30 PM - 3rd Saturday of the month, at Clark Public Library in Union County, just off the Parkway at exit 135

Contact: NJAS Hotline at (732) 332-1392

Email: tcoletti@obius.jnj.com

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

NORWALK AQUARIUM SOCIETY

Next Meeting: August 16, 2018

Speaker: Tony Orso

Topic: *Australian Fish*

Meets: 8:00 P.M. - 3rd Thursday of each month except for July & December at: Earthplace - the Nature Discovery Center - Westport, CT

Contact: Sal Silvestri

Call our toll free number (866) 219-4NAS

Email: salsilv44@yahoo.com

Website: <http://norwalkas.org/>

A new eukaryote

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.

A series by "The Undergravel Reporter"

Have you ever wanted to visit some exotic, far-away place and discover a new species (maybe even have it named after you)? How about a trip to, say an aquarium in San Diego, California?

Since 2008, the SUNY College of Environmental Science and Forestry (ESF) in Syracuse, New York has been compiling a list of the top 10 new species, as determined by an international committee of taxonomists. The list is released annually on May 23, the birthday of Carolus Linnaeus, an 18th-century Swedish botanist considered the father of modern taxonomy.¹

The 11th annual list, compiled by ESF's International Institute for Species Exploration (IISE), includes *Ancoracysta twista*, an entity found in a tropical aquarium at the Scripps Institution of Oceanography in San Diego, California, on a brain coral.

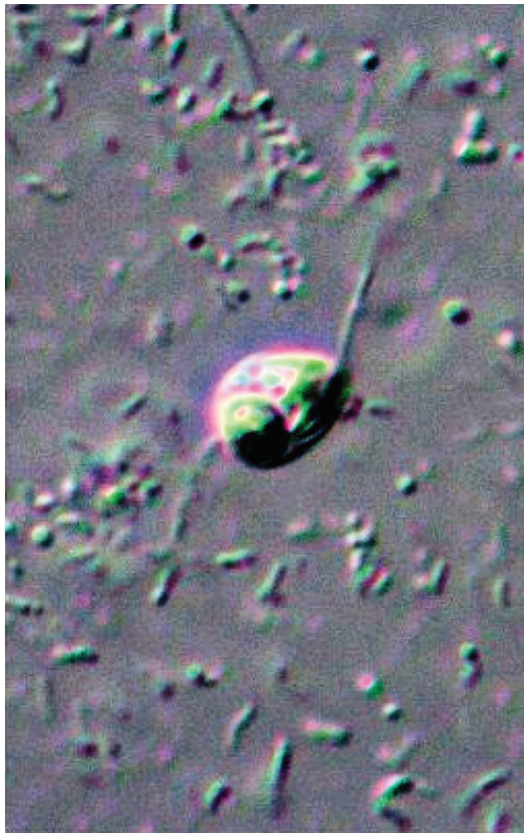
This new single-celled protist has challenged scientists to determine its nearest relatives. It does not fit neatly within any known group and appears to be a previously undiscovered, early lineage of Eukaryota with a uniquely rich mitochondrial genome.

This organism isn't an animal, plant, or fungus but a eukaryote. Its genetic material exists in a nucleus that's bound in a membrane. The new species doesn't fit with any other known groups of protists. This predator uses a whip-like flagellum to move and has organelles like harpoons to help it feed on other protists. The scientific name is derived from the twisting motion that helps the protist swim.

Eukaryotes are organisms with cells in which genetic material is organized in a membrane-bound nucleus. Prokaryotes, like bacteria and archaea, lack such an organized nucleus. Eukaryotes include single-celled

protists as well as multi-celled organisms we commonly think of as animals, plants and fungi.

Ancoracysta twista is a predatory flagellate that uses its whip-like flagella to propel itself and unusual harpoon-like organelles, called ancoracysts, to immobilize other protists on which it feeds. The geographic origin of the species in the wild is not known. The unusually large number of genes in its mitochondrial genome opens a window into the early evolution of eukaryotic organisms.²



References

¹ <https://qz.com/1293543/the-top-10-new-species-of-2018-from-deep-sea-fish-to-tree-climbing-lions/>

² <https://www.esf.edu/communications/view2.asp?newsID=7238>



Fin Fun



Find the dwarf

The *Apistogramma*, commonly known as the Dwarf Cichlid, is a dainty, often brightly colored cichlid. According to Wikipedia, there are currently 92 recognized species in this genus. There are only 19 species names hidden in the puzzle below. See if you can find them all.



AGASSIZI
BARLOWI
BREVIS
CACATUOIDES
ELIZABETHAE
GIBBICEPS
HELKERI

INCONSPICUA
INORNATA
KULLANDERI
LINKEI
MACMASTERI
NIJSSENI
NORBERTI

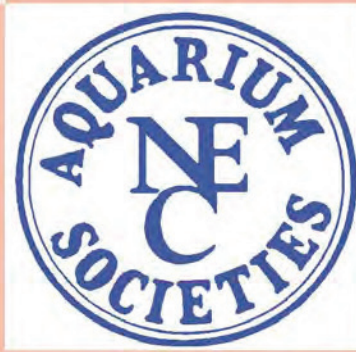
PULCHRA
REGANI
SIMILIS
TAENIATA
TRIFASCIATA

Solution to our last Puzzle:



- 1) Which of these species does not have a labyrinth organ? : Lungfish
- 2) "Soft" water means it: Has few calcium ions
- 3) Dither fish: Bring hiding fishes out
- 4) Carbon is sometimes used in the aquarium to: Absorb impurities
- 5) The person pictured at the top right of this page is: A former GCAS President
- 6) Red leaves on an aquatic plant usually means: It needs bright light
- 7) Catfish: Have barbels
- 8) Ammonia: Is harmful to fish





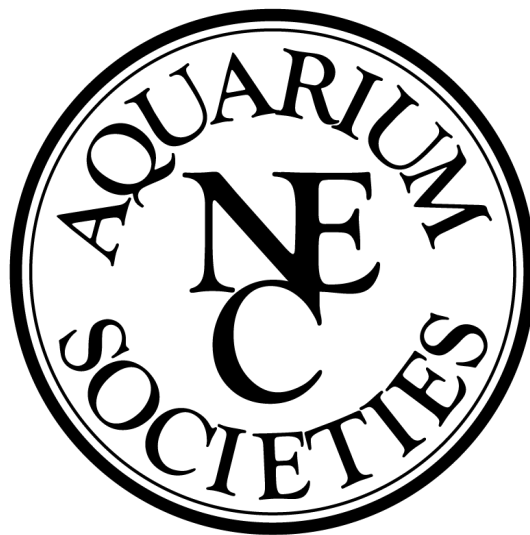
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