

modern AQUARIUM



June 2022
volume XXIX
number 4

Greater City Aquarium Society - New York

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Series III Vol. XXIX, No. 4 June, 2022

ON THE COVER

Our cover photo this month shows a colorful over-and-under tank arrangement. I would certainly find myself spending lots of time in a room with that kind of view! The photo, by Steve Sagona, is from our Greater City Fishy Friends Facebook page.

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From the Editor

by Dan Radebaugh

Great turnout at our meeting last month! Despite continued (and justified) worries about Covid-19, we're starting to look like ourselves again. For my part, I received the latest Pfizer booster shot last week. Quick and easy, with no ill effects this time.

The winners of the 2021 NEC Publication Awards have been announced, and GCAS authors once again did quite well. You will find the detailed results on page 8. A special thanks goes to all our authors, who consistently make my job as Editor a pleasure to perform. Keep up the great work that you've been doing for so long, and keep those articles coming! Remember, we always need more! If you think of something you'd like to say about your fish, or how you and they have fared during these trying times, don't be shy! Send it to me! Especially with our meetings getting back up to speed, your stories of what you've been doing with your fishy projects during the pandemic are something we'd all like to know about! Did you find any unexpected bright spots during all the anxiety? How did you cope? What worked well for you? What didn't? What would you have done differently if you knew then what you know now?

Getting back to the NEC Article Awards, two of the award-winning articles from other clubs are reprinted in this issue. See "Breeding The Black Cory," by Dan McKercher on page 21, and (for you M*A*S*H fans) "The Hot Lip Houligan," by Karen Haas, on page



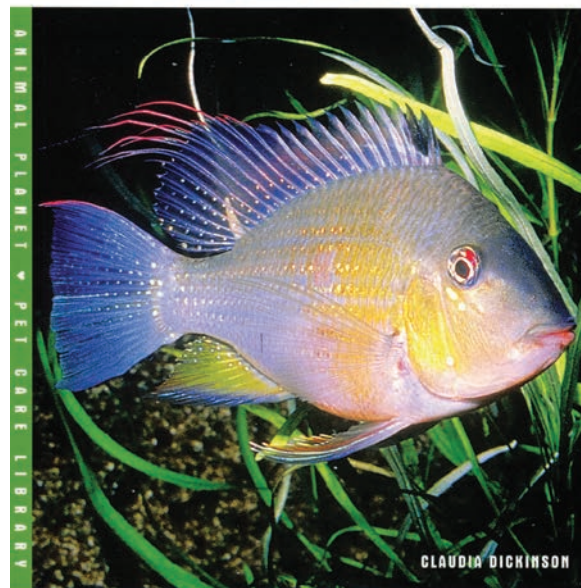
23.

Also be sure to see Dr. Paul Loiselle's article on Nerite snails on page 11. And don't miss our newly resurrected **Modern Aquarium** Cartoon Contest on page 7. You can't win if you don't enter!

Our historical review of cover photos this month features **Modern Aquarium** covers from 2003. As usual, the issue closes with The Undergravel Reporter (this installment is entitled, "Fisheye") and our puzzle page, "Fin Fun."



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

2022

March 2	Scott Dowd <i>Project Piaba</i>
April 6	Rosario LaCorte <i>Images From A Lifetime of Fish Breeding</i>
May 4	Warren Feuer <i>Shell Dwelling Cichlids</i>
June 1	Dr. Enea Parimbelli <i>Voyage in Lake Tanganyika</i>
July 6	Joseph Gurrado <i>Reef Keeping</i>
August 3	A Night at the Auction
September 7	TBA TBD
October 5	TBA TBD
November 2	TBA TBD
December 7	TBA TBD

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 2022 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

For many of our members the start of summer is marked by a routine of moving some of your fish outside. The patios and porches are being swept clean of leaves, and out come the containers and large waterproof flower pots to be filled by April showers. Next go in the water lilies and other aquatic plants, and last but not least, the final ingredient--fish!

Now I have to admit that there are some potential drawbacks to maintaining such seasonal outdoor ponds. Frogs and raccoons can wreak havoc with your little beauties. I had a very bad experience a few years back. On three tables in the shadow of my house I had set up three 50 gallon tanks with water sprite and Java moss. The weather was warm enough after Mother's day, so some of my swordtails, who can cope with a fair temperature change, went into one of the tanks. They only lasted one night!

The next morning my neatly arranged rocks were in disarray, the water sprite didn't look anything like water sprite, and the Java moss was all messed up—if that's even possible. But where were my swordtails? Well, one was floating, minus his belly.

After closer inspection I found two more dead at the bottom of the tank, one live one hiding in the tumbled rocks, and the rest dead and partially eaten on the floor. So when you keep fish outside, watch for those clever raccoons and cover your tanks! Make sure they are raccoon safe! Use tight covers, and good-size stones on your chicken wire. Securing the chicken wire has solved my problem. I have also had no problems with frogs since putting my tanks on tables. If your containers are low to the ground you might be feeding frogs and tadpoles rather than your fish!

Setting up your containers can be fun, and you can take your time. In the fall, however, you can leave them out a little too long, so watch the weather reports. If there's a sudden cold snap you need to be prepared to bring your fish in out of harm's way! In a lazy moment you can go from great benefactor to mass murderer!

Horst





Come join us at the
Greater City Aquarium Society's

100th Anniversary Gala!

Friday, October 7th, 2022 7:30 PM

at

Douglaston Manor
63-20 Commonwealth Blvd
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\$40.00 Per Person

(For a \$70.00 dinner)

Seating is limited so get your tickets now!

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Official Sponsor: ZooMed Labs

Tonight's Speaker: June 1, 2022

Enea Parimbelli

was born in Pavia, Italy and currently works there, but lives with his family in the capital of the Lombardy region, Milan. He has a PhD in biomedical engineering from the University of Pavia and has studied abroad in both Canada and the United States. His first aquarium was a gift from his father when he was five or six years old. It was approximately 10 gallons in size, and at first he kept guppies and platies. He began keeping African cichlids while in high school after his parents purchased a large aquarium.



He started with Lake Malawi cichlids, mostly mbuna, but eventually became hooked on the cichlids of Lake Tanganyika, a passion that has never left him. In September of 2021, one of his dreams came true: a trip to Lake Tanganyika. He enjoyed the exploration of some of the coastline tremendously, and has hopes of returning to Lake Tanganyika to explore other parts. In the meantime, Dr. Parmbelli keeps himself busy with the activities of the Italian Cichlid Association.

Dr. Parimbelli's topic for this evening's presentation will be his *Voyage in Lake Tanganyika*.



May's Caption Winner: Lonnie Goldman



Warning: I Brake for Fish!

The Modern Aquarium Cartoon Caption Contest

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



Your Caption:

Your Name:

Northeast Council of Aquarium Societies



2021 Article Competition Awards

Open Category

- 1st **“Carpy Diem”** by Dan Radebaugh GCAS
A very interesting story of the long history of the development of the Goldfish by the Chinese and the Koi by the Japanese from the rather drab Carp species.
- 2nd **“Why Do We Keep Fish?”** by Abigail Weinberg GCAS
A well written investigation into the motivations that attract people to keep fish in a home environment, from a single tank to a dedicated fish house containing thousands of gallons and a multitude of aquariums.
- 3rd **“My Life With Fish”** by Jason Gold GCAS
The life story of an aquarist’s fifty-year fascination with fish and plants that started at a very early age. Despite reticent parents, multiple moves and limited accommodations for fish keeping the author persisted and took advantage of whatever resources were available to satisfy his desire to be a fish keeper.

Breeding Category

- 1st **“Island Killifish”** by Joe Ferdenzi GCAS
A discussion of four Killifish varieties that are endemic to a particular island, and their keeping in a home aquarium.
- 2nd **“Breeding the Black Cory”** by Dan McKercher (direct submission to NEC)
A story of the process to identify the cause of death of Cory fry and the formulation of a corrective treatment.
- 3rd **“The Hot Lip Hooligan”** by Karen Haas (Aquarium Club of Lancaster County)
A story about the rare and endangered cichlid *Stomatepia mariae* found in the Western Africa crater lake Barombi-Mbo. A very informative description of its native environment, its closest relatives, and its care and breeding in a home situation.

Humor Category

- 1st **“New York Harbor Is Alive”** by Jules Birnbaum GCAS
Although a stretch to be called humor this is an interesting article about the multitude of iconic items found in the harbor.
- 2nd None Submitted
- 3rd None Submitted

Junior Category

- 1st None Submitted
- 2nd None Submitted
- 3rd None Submitted

Continuing Columns Category

- 1st **The Undergravel Reporter** by Anonymous GCAS
- 2nd **From the Editor** by Dan Radebaugh GCAS
- 3rd **President’s Message** by Horst Gerber GCAS

Note: The sweep of this category by the Greater City Aquarium Society brings to mind the saying: “You Have to Be In It to Win It”



Pictures From Our Last Meeting

Photos by Leonard Ramroop



Jason Kerner, summoning the spirits of Warren Feuer and Joe Ferdenzi for the evening's presentation.



Dan Radebaugh, Ed Vukich, and Jules Birnbaum taking care of business.



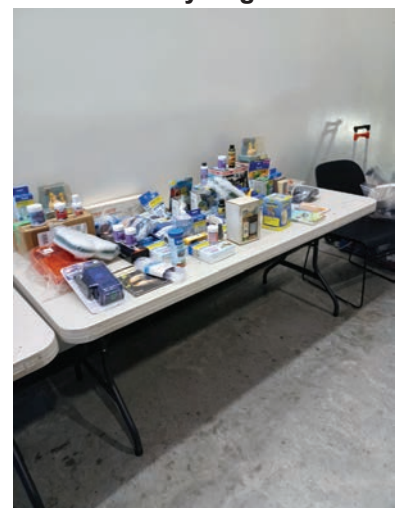
The best turnout we've enjoyed since the onset of Covid.



President Horst presents Dan Radebaugh with a couple of author awards from the NEC.



Time to get the auction going! A few of the items are shown below. Plenty of great stuff!



Keystone Clash

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Gargas



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Neritina gagates Lamarck 1810

by Dr. Paul Loiselle



Figure 1. A Zebra Nerite, *Neritina gagates*, grazing algae from the surface of a Java Fern leaf. Neritid snails preferentially graze on the solid surfaces provided by wood, rocks or even a tank's walls.

I have not been a great fan of snails in the aquarium, regarding them as at best a waste of space and at worst a self-inflicted plague. Therefore devoting this month's essay to a snail comes as much of a surprise to me as it probably does to its readers. However, as I have come to learn, some snails can indeed be very useful additions to an aquarium. *Neritina gagates* is a representative of the Family Neritidae, a small family comprising 16 genera of tropical and subtropically distributed operculate snails that can be found from sub- and intertidal marine through brackish and even freshwater estuarine habitats. Ten species of *Neritina* are known to inhabit brackish and fresh waters, the majority native to the Indo-Pacific region (Strong et al., 2008).

The subject of this essay is usually marketed as either the Zebra Nerite or as *Neritina natalensis*. Given the color pattern of its shell, its common name Zebra Nerite is both descriptive and appropriate. As its species name proclaims, *N. natalensis* is native to the east coast of Africa, a region which is not a significant focus of the aquarium trade. However, the Zebra Nerite of the aquarium trade is *Neritina gagates*, a southeast Asian species exported from Singapore. The conflation of these two species is understandable as the shells of both species have a similar color pattern. However, the dark stripes on that of *N. natalensis* are wider than those of *N. gagates*.

A persistent growth of "hard" green algae on the rear glass of a five gallon tank situated in a west-facing window was the rationale for my initial purchase of Zebra Nerites. On the strength of an informative article (Wistermann-Hildebrand, 2013) on aquarium snails that made mention in passing of the ability of neritid snails to eradicate such encrusting algae, I ordered a trio each of *N. gagates* and another neritid, the so-called Red Onion Snail, *Vittina semiconica*. Despite slow-drip acclimation, for reasons known only to themselves the Red Onion Snails failed to thrive in their new home. The Zebra Nerite, on the other hand, settled in nicely, immediately sought out the algae-covered surface and within two days had completely cleared it. They then proceeded to eliminate the band of blue-green algae that had grown immediately above the water line of their tank.

Encouraged by this efficient display of molluscan algivory, I moved the trio of *N. gagates* to another small tank where both encrusting and filamentous green algae had become problematic. Within a week's time, both tank glass and plant leaves were algae-free. Up to this time, the Zebra Nerites had had only nano-fish as tankmates. On the strength of their performance to date, I decided to try neritids as algae control agents in a twenty-nine gallon tank housing Lake Victoria cichlids that consistently supported a heavy growth of brown algae on its sides, back and

Reprinted from the North Jersey Aquarium Society's Reporter February 2021. This article also appeared in the December, 2021 issue of *Amazons*.



Figure 2. The underside of a grazing Zebra Nerite. The oval structure visible to the lower right is the snail's mouth. Note the absence of the sensory tentacles that make snails so vulnerable to harassment by many species of fish.



Figure 3. *Vittina semiconica* is another regularly imported neritid species. How it got its trade name, Red Onion Snail, is rather a mystery, as is neither red nor does it resemble an onion!

furnishings. Within three weeks, this tank was also algae free. Of the original sextet I purchased, five are still alive and active six months after their introduction and all appear to have grown a bit in the interval.

The results of further experimentation have proven more ambiguous. Half of the next sextet of *N. gagates* purchased were dead within a week of their arrival, leaving only two survivors in a twenty-nine gallon tank and one in a twenty gallon tank. As the three tanks in question have identical water chemistry and the same acclimation protocol was used for the different shipments, it is difficult to escape the conclusion that the deceased animals were themselves compromised in some manner. This highlights an unavoidable down side to neritid snails as algae control agents. While the prior experiences of wild-caught animals certainly influence their survival prospects and longevity in captivity, potential buyers' ignorance of this history unavoidably makes their purchase something of a gamble.

Contrary to the case with most aquarium fish, this problem cannot be side-stepped by purchasing aquarium bred animals. Neritid snails have a pelagic veliger larval stage that spends a considerable time as a component of marine plankton. Thus although contented females will deposit copious numbers of minute white egg capsules on any solid surface they encounter, including the shells of other *N. gagates*, the resulting larvae die immediately on emergence. Thus neritid snails cannot breed successfully in the closed system of a freshwater aquarium. While some may regard this as decided down side, anyone who has experienced a plague of ramshorn or Malaysian trumpet snails is likely to regard it as one of neritid snails' strong points!

Another aspect of their biology that needs to be taken into account when employing neritids as algae control agents derives from the fact that as animals that live in an intertidal or estuarine situation, they possess the ability to both leave the water and survive a considerable time outside of it. Like all neritids, *N. gagates* is quite capable of climbing out of its aquarium should it find conditions therein not to its liking.

Excessively warm water, low dissolved oxygen levels or elevated concentrations of dissolved metabolites will provoke such an exodus. The aquarist who finds representatives of his molluscan algae control team on the floor beneath his tank rather than diligently at work within it should not automatically assume the worst. Placing these apparently desiccated escapees in a container of water is often all that is required to re-animate them.

Such excursions are most often provoked by either low pH values or hunger. Neritid snails emphatically do not appreciate pH values less than 7.0. If production of egg capsules can be taken as an index of well-being, *N. gagates* seems to prefer carbonate hardness values in excess of 5°DH and conductivity values greater than 100 µSiemens/cm². That said, a tight-fitting cover on their tank provides additional insurance against episodes of neritid wanderlust.

Matching the number of snails to a tank's carrying capacity will avoid hunger-driven excursions, but achieving such a balance is more an art than a science. My window-placed five gallon tank supports a trio of Zebra Nerites comfortably and the quintet sharing a twenty-nine gallon tank with an assortment of haplochromines has not thus far shown any inclination to climb out of the tank in search of better grazing. To date, while these snails have never shown any interest in animal-based prepared foods, I have observed them grazing on algae wafers formulated for loricatorid carfishes. Whether such a diet is sufficient to satisfy neritid nutritional needs over the long haul is very much an open question. Finally, while *N. gagates* will eat a wide selection of algae, it shows a clear preference for green and brown algae. Blue-green algae are only consumed after the available supply of the more favored types is exhausted. This suggests that the nature of the algae available to this species may also have a bearing upon its well-being and longevity.

While not as effective in eradicating an established plague of filamentous algae as *Crossocheilus* or *Garra* species, the constant grazing of neritids will usually prevent such a situation from

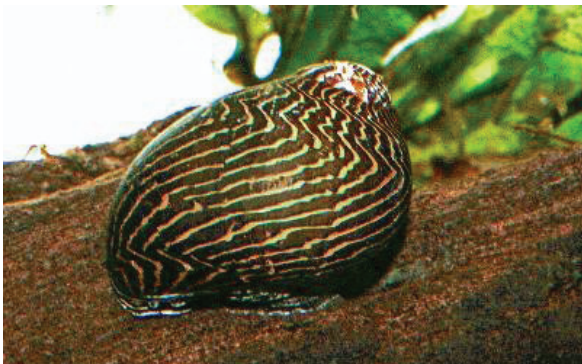


Figure 4. *Neritodryas dubia* is another Indo-Pacific neritid marketed under the trade name Zebra Nerite. Its appetite for encrusting algae is comparable to that of *N. gagates*.

ever developing. Additionally, individual Zebra Nerites have a limited capacity to consume algae. This dictates that a substantial number of these snails would be required to control algal growth in large aquaria. Neritids are not inexpensive and the cost

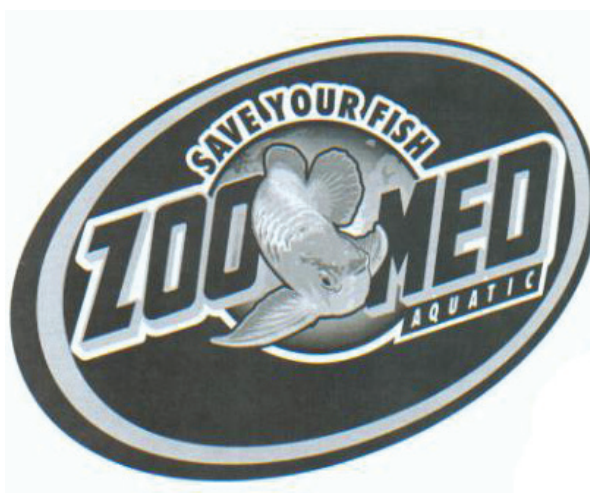
of implementing such a scheme is likely to limit the appeal of this approach to algae control. However, the small size of *N. gagates* makes it a better choice for controlling algae in nano-aquaria than representatives of either of these algivorous cyprinid genera, while the more limited scope of the task to which these snails would be set makes their use a cost-effective strategy. Readers looking for a low-maintenance approach to controlling algae in small tanks should give *N. gagates* a try. I predict they will be as pleasantly surprised by its performance as I was!



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Strong, E. E., Gargomiy, O., Porter, W. F. and P. Bouchet. 2008. Global diversity of gastropods (Gastropoda, Mollusca) in freshwater. *Hydrobiologia*. **595**: 149 - 166.

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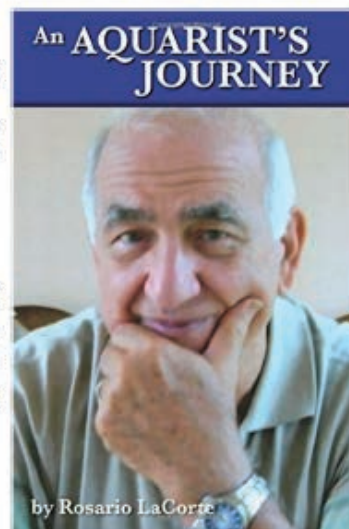


An Aquarist's Journey

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

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

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



Carpy Diem!

Part II: The Fantastic Four & The Rise of the Silver Surfer

by Dan Radebaugh



Silver carp on the Illinois River. Photo by Nerissa Michaels.¹

Reprinted from *Modern Aquarium*, Series III Vol. XVIII, No. 6 August, 2011

As I mentioned in Part I (*Modern Aquarium* May, 2011 and reprinted in last November's issue) of this 2-part series, despite the somewhat controversial history of the common carp here in the USA, the species making the big splash in the press these days are the so-called Asian carp: the grass carp (*Ctenopharyngodon idella*), the silver carp (*Hypophthalmichthys molitrix*), the bighead carp (*Hypophthalmichthys nobilis*), and the black carp (*Mylopharyngodon piceus*). Known in their native China as "the four famous domestic fishes," these 'new' fish have been cultivated as important food fish in China for centuries. Native to the large rivers of eastern Asia, they require large rivers in which to successfully spawn.

Whereas the goldfish (*Carassius auratus*) and the common carp (*Cyprinus carpio*) have been with us here in North America for around 200 years, these new four only began arriving here during our lifetimes (well, my lifetime anyway). Another difference between the Old Guard and the new Fantastic Four is that while both the goldfish and the common carp (as koi) have been and continue to be favorites of

ornamental fishkeepers like us, the "Asian carp" have been imported for what can perhaps best be described as utilitarian—even industrial—purposes.

While the culture of the common carp for human consumption is no longer of much commercial importance in the USA, certain other fish species *have* become commercially viable. One of these species is the channel catfish, *Ictalurus punctatus*, which is not only popular among anglers, but also among shoppers at your local grocery store. You'll even find them available as cute little juveniles in tropical fish shops. I suggest self-restraint—they get really big, and eat a lot. Channel cats are farmed extensively in the South, most notably in Mississippi and Arkansas. Discussing fish farming isn't of course the purpose of this article, but there is a connection. As those of you who have maintained outdoor fish ponds (maybe even some of you who keep only indoor aquariums) have probably experienced, algae can become a problem—even if you aren't stocking your ponds to the max and feeding your fish boo-coos of food in order to grow them to market size as rapidly as possible. Think of all those nutrients together with all that sunlight. Talk about

going green! What's a catfish farmer to do? Hmmm, maybe keep something else in the pond that will eat the algae—something that might even become a



Bighead carp. Photo: <http://www.sea-ex.com/thailand/angling/big-head-carp.htm>.

secondary cash crop as well? Perhaps a filter-feeder of some sort? Well, do we have a fish for you!

The bighead carp, *Hypophthalmichthys nobilis*, seems to have first been brought to this country in 1972 by an aquaculturist in Arkansas to help maintain water quality in culture ponds. It was subsequently studied by the Arkansas Fish & Game Commission and Auburn University to assess potential benefits and impacts. A filter-feeder, the bighead's diet is primarily zooplankton, and it grows very rapidly. By the 1980s some of these fish had begun to appear in the Ohio and Mississippi rivers, probably as escapees from aquaculture facilities. Many more escaped during the great Mississippi flood of 1993, and more still as a result of Hurricane Katrina. Intentional though illegal introductions also occurred in several states, including Oklahoma and California.²



Bighead carp distribution (USGS). See legend on page 18.

Because of its fast growth rate, ravenous appetite, and large size (the record for bow-fishing is 92 pounds³), the assumption has been that the bighead carp would devastate native fish populations should it reach the Great Lakes, though actual studies don't seem to unequivocally support this conclusion². Of course studies have likewise failed to prove that this carp actually does improve the water quality in culture ponds. Regarding direct impact on native fishes, the bighead's main diet being zooplankton, all larval fishes (fry) would be on the menu, as well as some small adult fishes. As to competitive impact, a study in 2008 showed that as adults the bighead carp and silver carp in the Missouri and Mississippi systems do have dietary overlap with the native bighead buffalo (*Ictiobus cyprinellus*) and the gizzard shad (*Dorosoma petenense*), but not much with the paddlefish (*Polyodon spathula*).² In March, 2011 the bighead

WHAT IS THE LACEY ACT?

The Lacey Act of 1900, introduced by Iowa Senator John F. Lacey, and signed into law by President William McKinley, was the first federal law protecting wildlife. At the time, illegal commercial hunting was devastating many species of game, including wild birds. Poaching was carried out in one state, and the animals were sold in another. The law prohibited the transportation of illegally taken animals across state lines, and began to address some of the potential problems of introducing non-native birds and animals into ecosystems.

The law has been amended several times, and today its chief application is to prevent the spread of potentially injurious non-native species of plants and animals by making it illegal to "import, export, transport, sell, receive, acquire, or purchase in interstate or foreign commerce any plant in violation of the laws of the United States, a State, an Indian tribe, or any foreign law that protects plants,"⁴ though commercial hunting is still an important component of the act, what with the increasing international and domestic wildlife trafficking.

The Lacey Act does have its critics. Many complaints revolve around what might be called "common sense" failures by those responsible for enforcement. One example given by Wikipedia is the case in 2000 of four Americans who were convicted, three of them serving 8-year prison sentences each. Their crime—importing lobster tails from Honduras in plastic bags rather than in cardboard boxes as prescribed by Honduran law. This despite the fact that Honduras was no longer enforcing that regulation.⁵

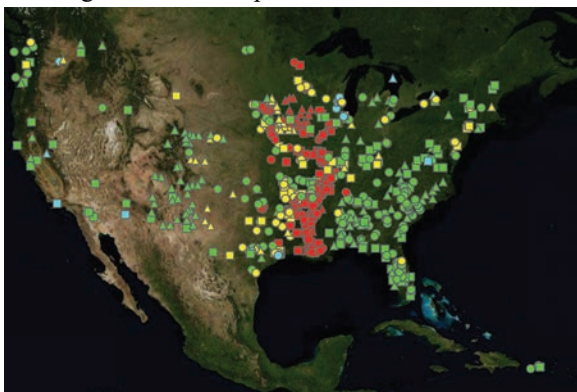
On the other hand, just a cursory overview of headlines will show how creative people can be at breaking *any* law if they think they can make some money by doing so. Despite its faults, the Lacey Act is an important tool for protecting animals, both domestically and abroad.



Grass carp. Photo courtesy of U.S. Fish & Wildlife Service.

carp was declared an “injurious species” under the Lacey Act by the U.S. Fish & Wildlife Service.

The only species in its genus, **the grass carp, *Ctenopharyngodon idella***, has for centuries been cultivated in China for food, but in Europe and North America its primary use has been aquatic weed control. In North America it is also known as the white Amur (a name invented for marketing purposes, as it avoids the term “carp,” which Americans don’t like). A true vegetarian, this fish does not exhibit the bottom feeding behavior that we associate with the goldfish or the common carp. They “will not control emergent species such as cattail or bulrush, or floating leaved species such as water shield or water lily. Even among preferred submergent plant species, selectivity and consumption rate varies widely according to a vast array of factors including water temperature, dissolved oxygen and presence or absence of attached algae.”⁶ As fry they are omnivorous, but soon come to prefer filamentous algae. At about six inches they switch to rooted succulent submergents, feeding by shearing off the weed tips.⁷



Grass carp distribution (USGS). See legend on page 18. Though not pictured on this map, the grass carp also currently inhabits Hawaii.

Grass carp were imported into the USA for the purpose of controlling aquatic weeds without the use of herbicides. The first shipment was received in 1963 by Auburn University, where they were spawned in 1966. A small number of fry were also produced at the Fish Farming Experimental Station in Stuttgart,

Arkansas in 1965.⁸ Following distribution by various state and federal agencies, by 1978 the grass carp was extant in 35 states, and now has been recorded in 45 states.⁹ Opponents of exotic species raised fears that the voracious grass carp would consume all the aquatic vegetation in the country, leaving nothing for the survival of anything else, and so the grass carp was later outlawed in most states. To be fair, if you look in a certain way at what we know of this fish, those concerns were not unfounded. In a closed system (say a pond stocked with grass carp, with no predators or other means of keeping the carp population in check), they can reach high enough densities to consume every plant in the pond, altering the habitat in that body of water for years. While in some situations this might be a good thing, clearly some means of control would be desirable.

In the early 1970s a man in Arkansas named Jim Malone, who was important in the grass carp project, in response to the fears that led to these fish being outlawed, devised a way to hybridize them with bighead carp. The offspring continued to consume aquatic weeds, but were sterile, which encouraged renewed interest in them for weed control.¹⁰ By the 1980s the development of the triploid process (see box above) allowed sterile fish to be produced in large numbers, and has led to still more use of these

WHAT ARE TRIPLOID CARP?

In most animals there are two types of cells in the body—haploid and diploid. During the process of reproduction, haploid cells (male and female) unite to form a diploid zygote, which divide by mitosis to form more diploid cells. Diploid cells contain two complete sets of chromosomes, whereas haploid cells contain only one set. A triploid cell then would contain three complete sets of chromosomes. Triploid cells occur in nature, but rarely, and not with favorable results. Triploid human fetuses for example are usually spontaneously aborted.

As a process applied to fish, immediately after fertilization the eggs are shocked using either hot or cold water. This results in the retention of an extra chromosome set, making the fish that hatch from those eggs incapable of producing viable young. This triploid process allows the creation of large numbers of sterile fish, with the result that population densities can be controlled, while still taking advantage of the biological/commercial usefulness of the fish.

There’s still a rub. In order to produce triploid fish, a fertile population will continue to be required. This still leaves open the possibility that—intentionally, accidentally, or through a natural disaster such as a flood or hurricane—fertile fish could still be released into the ecosystem. So annoying, these living organisms!

fish. In Florida for instance they are important for flood control by preventing aquatic weeds (many of them invasive) from clogging drainage canals. On a more negative note, grass carp imported directly from China are suspected of being the source of an Asian tapeworm *Bothriocephalus opsarichthydis* that has infected the endangered native woundfin, *Plagopterus argentissimus* by way of the red shiner, *Cyprinella lutrensis*.⁹



The black carp. Photo: <http://www.shuanglong6688.com/underwater-world-fish-black-carp.html>

The black carp, *Mylopharyngodon piceus*, presents a similar, though dietarily different story. A molluscivore, the black carp, also known as the snail carp, was first imported into the U.S. in the early 1970s as contaminants in a shipment of grass carp going to Arkansas. Subsequent deliberate introductions in the 1980s were for the purpose of controlling the yellow grub, *Clinostomum margaritum*, in aquaculture ponds.¹¹ As aquarists, probably most of us are at least academically familiar with black spot disease, which is caused by the larvae of parasitic flukes, and causes the appearance of black spots on fish (including the meat). This disease poses no threat to humans, and the organisms are killed in the cooking process. The creature involved has a life cycle that includes multiple hosts, or vectors. Eggs of the parasite hatch and



Fish with black-spot disease. Photo: http://www.fishdeals.com/fish_diseases/black_spot/

infect snails, where the larvae grow and develop until they leave the snail to find a new home—burrowing under a scale into a fish's skin, and forming a black cyst. If the fish is eaten by an aquatic bird or mammal, the larvae mature in that animal's intestine and produce eggs, which may then be returned to the same or another body of water by way of the new host's feces. In the aquarium this disease is not a serious concern, as the organism will be unable to complete its life cycle, and eventually will die.

The yellow grub has a similar life cycle. Dropped into the water in the feces of birds such as herons and egrets, the larvae find a snail, develop, and then target

fish (and in an aquaculture pond, there are lots of fish to target). They burrow inside the fish and form a cyst about the size of a BB. If anyone cuts the nodule open, he'll find a worm inside. Needless to say, this is not a commercially acceptable outcome. How would you feel about finding a worm in your dinner? So what to do? Enter the black carp. Stocked in a pond at a rate of five to ten fish per acre, the carp effectively eliminate the snail population in that pond, thus breaking the life cycle of the grub.

While catfish are quite resistant to the yellow grub, which is an endemic organism, many other farmed fish are not, and the situation for catfish farmers is still quite serious in light of a new parasite, *Bolbophorus confusus*, which has begun showing up in Mississippi delta catfish ponds. *B. confusus* is believed to be an exotic, but no one seems to know from where. This parasite, which uses pelicans and snails as vectors, not only makes the catfish inedible—it actually kills them. Several fish farms have gone out of business in the wake of its appearance.



Black carp distribution (USGS). See legend on page 18.

The Fish & Wildlife Service is currently in the process of listing the black carp as an injurious species under the Lacey Act—a decision that has been quite controversial, with fish farmers feeling seriously betrayed by the agency and rather desperate about their options.¹² Some parties involved in the controversy have suggested chemical treatments to kill the snails, but apparently the chemicals, in addition to adding a marketing problem, are only about 80% effective, versus nearly 100% for the carp. For its part, the FWS is legitimately concerned that, should non-sterile black carp escape and populate the Mississippi, our native mollusk species, two-thirds of which are already threatened or endangered, would be at serious risk.

"The Silver Surfer"

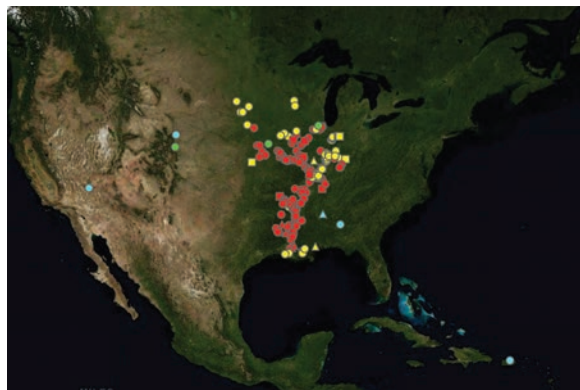
Last but certainly not least on our list of Asian carp invaders is the much-publicized **silver carp**, *Hypophthalmichthys molitrix*. The media attention devoted to images of this fish leaping from the water at the sound of boat motors, and crashing into boaters, fishermen, and water skiers, has almost certainly given the anti-exotic groups sufficient political leverage to successfully press for Lacey Act banning of not only this species (*H. molitrix*) and others; it has also helped

provide needed public awareness of the wider problem of invasive species in general. Interestingly however, the **60 Minutes** episode concerning *H. molitrix* revealed that this fish's manic leaping behavior is unknown in its native China. Current speculation is that specimens originally imported into the US possessed a genetic variant that favored the behavior, and subsequent generations from this variant group are what constitute the now wild population in the Mississippi.



Silver carp reacting to the sound of a motor boat.

The silver carp's pharyngeal structure allows for finer filtration than does that of its cousin the bighead, so the silver carp's diet leans more toward phytoplankton (plants, algae, bacteria, detritus, etc.) than the bighead's, which is more zooplankton. This carp was introduced into the US in 1973 by a private fish farmer in Arkansas to control phytoplankton in culture ponds, and it has also been widely used in that capacity in sewage treatment lagoons.¹⁰ By the 1980s it had been stocked in several other states, both deliberately and accidentally (for example as contaminants in grass carp shipments).



Silver carp distribution (USGS). See legend in next column.

Silver carp can swim as fast as 23 miles per hour, and can leap as high as ten feet out of the water.¹³ As with the bighead carp, there is fear that should these fish become established in the Great Lakes, they would overwhelm and destroy fisheries that have been painstakingly brought back from devastation by pollution and the sea lamprey. To the end of preventing the carp from gaining access to the Great Lakes, the Corps of Engineers has constructed a "barrier" of

electrical shock generators that they hope will prevent the carp from moving from the Illinois River into Lake Michigan. How successful this system will be is anyone's guess. The other alternative, sealing the artificially created canal links between the lake and the river at Chicago, would cause greatly added cost and inconvenience to industrial transport between those two bodies of water. Minnesota, Ohio, and Michigan joined in a suit to force the closing of the canal, but the Supreme Court recently declined to rule on it.

• Legend	
• ☒	Site Status
• ☐	Accurate
• ☐	Approximate
• ☐	Centroid
• ☐	Established
• ☐	Collected
• ☐	Unknown
• ☐	Failed/Extirpated/Eradicated

Reality check

Wait! We might not be doomed! One of the problems with all the media hysteria and consequent political and scientific hullabaloo is that we just don't know very much about what is really going on. What little research has been done doesn't allow us to go much beyond 2-point data set comparisons (in 1979 the number of gizzard shad in this area of the river was X, and now it is Y), and in a large river system such as the Mississippi/Missouri there are a lot of variables that could affect data collection outcomes and their meanings.

Recent reports from areas where the bighead and silver carp population explosions were first noted have shown large numbers of these fish that



Joe Deters and Erinn Beahan, Arctic Slope Regional Corporation contractors working with U.S. Geological Survey, return to the ramp after collecting silver carp for a study on Omega-3 fatty acids in Feb., 2009. The health of silver carp in the Missouri River has recently started to decline because of lack of food. Courtesy of USGA.

are now underweight, malnourished, and too weak to successfully spawn. The zooplankton supply has grown scarce—rotifers down 50% compared with a study in 1979, and crustacean zooplankton down 90% compared with that same study. Perhaps the drop is a result of the bigmouth and silver carp, perhaps not. The result however, is that there isn't now enough food in the river to support the carp population that has built up from the early 1990s. Scientists are expecting a die-off of the carp, though they don't expect them to disappear from the river.¹⁴

Another, less formal survey published in the Peoria Journal Star's fishing section¹⁵ showed that in spite of the fact that in 2008 silver carp accounted for 51% of all fish collected in the Illinois River's LaGrange Pool, native fish seem to be thriving, with the notable exception of gizzard shad, which have become scarce. The largemouth bass population has actually increased (all those young carp to eat?). The bass and other game species prey on the young carp as well as on young gizzard shad. The carp, however, grow very quickly, whereas the gizzard shad stay vulnerable to predation for much longer.

Commercial fishermen, whose business has been hurt by the reduction in the numbers of bigmouth buffalo and gizzard shad, are slowly beginning to shift their operations to catching bighead and silver carp. The price per pound is relatively low, but the large size of each fish makes up for that to some degree. For this approach to succeed of course, markets must be developed. In this regard, some of the Lacey Act provisions are less than helpful. The market for carp in the United States is now mostly limited to the large Asian-American communities in New York, Chicago,

and California. Traditionally in these cultures, carp are purchased live. The Lacey Act provisions forbidding the possession, sale, or transport of live "injurious organisms" is a real obstacle when it comes to getting these fish to their most likely current market. This is doubly ironic in that all four of these carp are not only highly valued as food fish in their native China, but also seriously overfished. On the other hand, here we are with many more than we want. Surely there's an opportunity here for some creative thinking.

The Future

It is this writer's opinion that we're still far from the end of the Asian carp story. It seems to me unlikely that the electronic barrier on the Illinois River will indefinitely keep the carp out of the Great Lakes, even if the Illinois River were the only potential source for the carps' arrival, which it is not. Nor do I believe there's much likelihood that the Chicago Sanitary and Ship Canal will be sealed. The fact is that silver carp have already been found upriver of the barrier, and carp DNA (but no carp) has been found in Lake Michigan. Further, between 1995 and 2003 five individual bighead carp were found in Lake Erie, though they don't yet seem to have established a breeding population there. Various other schemes are in the works to physically separate the Great Lakes from the Mississippi, but all seem to be years away from implementation, all would be expensive, all would seriously interfere with commerce, and all could ultimately fail. Is it worth it? That's where the political process comes into play. Stay tuned.

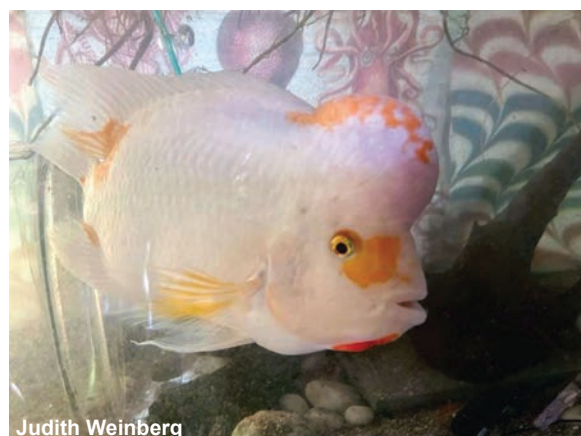


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Fishy Friends' Photos

by Greater City Aquarium Society Fishy Friends

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



Breeding the Black Cory

by Dan McKercher

The black cory came into the aquarium industry years ago. Popular opinion is they are a color variant of the *Corydoras shultzi*. There are others that call them a color variant of *C. aeneus*. They go by a few different popular names. The latest of these is Black Venezuela Cory for some reason. It has nothing to do with the country.

I acquired my breeding group from a few different places. I had them years ago and ended up killing them off rather easily. It seems that these little fellas are much hardier than their ancestors, if they are the same breed at all.

As I remember, the ones years ago never lost their black color. These little guys do wash out every now and then. Sometimes you can see a bit of red in their fins. I have seen them so washed out that they look like a green cory, while other times they get a laser like stripe along their bodies. They do always revert back to black, though. Some say it is due to water conditions, but I have seen all different color forms in the same tank at the same time. Could be attitude, but I am only speculating.

I put all nine of them into a 2.5 gallon tank with fine gravel and a sponge filter. They seemed to be fast growers, thinking that it took them under a year to mature enough to breed. Being over 65, time seems to go by much faster than when I was 30. I like to consider this a perk of being older. Waiting for fish to mature does not take as long as it used to in my little mind. They breed the same as most cory's. Females drop the eggs on hard surfaces like glass and sponge filter bases, while the males chase the females around. There is one interesting thing I noticed about the eggs. They are rather small compared to those of other corys that I have bred.

After they deposit their eggs I move the adult fish to another 2.5 gallon tank instead of moving the eggs. They seem to be very prolific once they start to breed. I have had four collections going at the same time. When they are breeding, I have had them breed like every other week or sooner.

I use methylene blue ("MB") on the eggs in an effort to keep them from going bad. I have tried other methods like hydrogen peroxide, alder cones, and a few other items. I have noticed

that you need to be careful with peroxide. It dissolves the sticky stuff on the eggs, and they end up on the bottom of the tank rolling around. MB works best for me. I have had it so that the water is translucent blue to so dark you cannot see through the tank. There was no change on its effectiveness as far as I could tell. Some have had concerns about MB having ill effects on fry/fish, but I have never experienced any such issues.

Typical hatch rate is like 20 – 30%, more or less. Around 50 – 100 eggs each time. This is a wild guess, as counting is a problem with me. I have a bad habit of counting by 10's 1,2,3 etc. till I get to 10. After that I will count 1,2,3,4,5,6,7,8,9, 20 and so on. Problem is when I get to the 10, 20, 30 part I lose track. Then there is the "did I count that egg already" issue. In the end I remind myself that life is too short to count these little buggers, so I usually end up taking a guess. Once the eggs hatch, they are in the wriggler stage for about 3 days. When they go free swimming, they take BBS and micro worms. I have introduced a bit of spirulina algae powder that is soaked in water for a bit so that it sinks to the bottom. I have also used the Algae Dry in tanks of bubble nest fry with great success. It sits on top and slowly starts to sink to the bottom. The tiny fry seem to gobble it up.

The biggest problem I have come across is when the cory fry start to get some size to them. They get to be about ¼ inch and then they start to die off. It was very puzzling to watch them thriving and doing well only to see them kick off after a few days. You know, it is amazing how much help a smart phone can be in the fish room. After losing the 3rd batch of fry, I took a few pics of the fry dead in the bottom of the tank, along with some live fry. I did not notice any issues until I enlarged the pictures, when I saw that the fry were developing fin rot. The dead ones had completely rotted tails along with all the other fins. These little fellas were so small and delicate that I was not sure what if anything I could do to stop it. In desperation, I reached for the potassium permanganate. I wet the end of a toothpick, dipped it into the potassium permanganate ("PP") so to only get a bit on the tip and put it in the tank. After a few times doing this, the tank water got

This article, a direct submission to the NEC's articles competition, won 2nd place in the Breeding Category.

a bit purple/pink. It is interesting how PP turns the water from purple/pink to brown and then just disappears after about an hour or so. It does a great job of clearing cloudy water. I did notice that the fin rot seemed to stop. It was interesting to watch the rotted parts of the fins seem to dissolve with the 1st dose. I did this a few times that day, then did about a 50% water change. The fin rot seemed to start back up the next day a bit, so I repeated the treatment. Hard to see with such little fellas even when blowing up the pics. I did this for 4 days and it seemed to cure the problem. After they got to be about ½ inch the fin rot issue was completely gone and the fins grew back very nicely. If/when I breed these guys again I may try to treat the water during the ¼ to ½ inch time to see if I can avoid this issue completely.

The biggest issue I see with this cory is the price. Most places demand anywhere from \$20 all the way up to \$40 or more each, plus shipping if you buy them online. Seems to be a bit steep for a little cory. I sold a bunch of them for \$10 each at the OCA weekend. It was cool to see some fellow hobbyists get them at somewhat of a reasonable price.

Thanks for reading. And remember, if it holds water, put a fish in it!



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The Hot Lip Houligan

Stomatepia mariae, a BAP story by Karen Haas



This article, from the Aquarium Club of Lancaster County's *Tank Tales*, won 3rd place in the Breeding Category of the NEC's articles competition.

This unique looking and endangered fish is known by a few different names: *Stomatepia mariae*, *Paratilapia mariae*, Nsess (I have no idea how to pronounce that), Alkali Cichlid and more often 'Ugly Fish' when I bring a bag to auction. The etymology of the current genus name is a combination of Greek and Latin. Stoma means mouth and tepia is from the Latin word tepere which means warm. I loosely translate this to mean 'hot mouth' due to the blushing cheeks or gill area. This is the type species for the current genus which was originally described as *Paratilapia* in 1930. Most of us hobbyists assume that this was a recent discovery because Lake Barombi Mbo in Cameroon is so difficult to access.

Lake Barombi Mbo is a crater lake in Western Africa formed by a now inactive volcano. Most of the 15 species of fish that call the lake their home are endemic and considered critically endangered. There are reports of a shrimp, a crab, and a species of sponge that are also endemic to that lake. The main threat to their habitat is considered to be sedimentation and pollution from human activity. It is also possible that large carbon dioxide emissions from the deep lake bottom threaten them as well.

There are two other slightly smaller species in the genus, *S. mongo* which is shaped like a torpedo and *S. pindu* which is most often sports a solid black color and redish eyes. Unfortunately, *S. mariae* is the least popular with aquarists. This needs to change because it needs your help in order for it to stay in the hobby! It can change color from solid black to golden brown with a dark brown horizontal stripe and reddish gill plates. Maybe 'golden goose' can be added to the common names? *S. mariae* has an elongated body with a large mouth. The lower jaw protrudes slightly beyond the upper. All three species are known to be open water swimmers in the middle of the lake and are reported to eat crustaceans and small fish. It is even reported that they kleptoparasitize from the endemic crab species.

I have found *S. mariae* to be easy to maintain in the aquarium. They readily eat flakes, pellets, frozen, live worms and Repashy foods. I have even witnessed them harassing a mouthbrooding female *Geophagus* sp. 'Alto Sinu' in order to force her to spit out her fry. So it appears that they practice paedophagy. They definitely love chasing after live guppies and convict fry. A small school of this species is handy for the

fish breeder to have for disposing of culls. We've had them a few years now, acquired via a New England Cichlid Association auction. I believe they've reached their maximum size of around 6 inches. Our school of 7 adults enjoys swimming in the mid strata of a 125 gallon. Younger fish can be kept in a smaller aquarium and reportedly start breeding at a size of 3 inches.

There isn't much to be found in the literature about this genus of fish, let alone this species. It reportedly has low fertilization rates and trouble holding fry to full term. I have found this to be true as well. I have been able to witness a couple of spawnings and video recorded one that took place in a large ZooMed floating log. I theorize that one reason for low fertilization rates may be higher water flow movements from aquarium filters as opposed to the tranquil water that I expect they normally would encounter in the wild. I have observed the male apparently laying down milt on the floor of the floating log before the female deposits her eggs in the same spot. I think some of the milt is washed away by average aquarium water movement before the eggs can be laid. I have also noticed that the female does not nip at the male's anal fin like cichlids in the rift lakes are known to do after picking up her eggs. I suppose this shouldn't be a surprise, since *S. mariae* doesn't possess egg spots in its anal fin. Literature has reported this species to be a maternal mouthbrooder. I have not found this to always be true. I observed both sexes picking up the eggs during the spawning in the log, but I have also observed only the female picking up the eggs during spawnings that occurred on a flat rock at or in the opening of a cave.

The spawning that occurred in the log appeared to be a rather large one. We retrieved about 40 fry from the female a couple weeks later. Estimates of 40-80 eggs per spawning do not seem to be exaggerated. I also observed the female in the log spawning instance continue to make several egg laying runs while the male was distracted chasing interlopers away. The eggs in those instances probably were not fertilized or had lower fertilization rates.

Catching a holding female is not going to happen. The literature is accurate in its description about this instance in their life cycle. The female will spit out the eggs or fry long before you can get her into a net. So be prepared to chase down a few dozen fry in the community tank before the other adults can eat them. Or you might be lucky and swoop the net under her as she releases eggs that fall into your net. I assume that this is a defensive mechanism in the wild so that a predator will go after the tender and delicious eggs or fry instead of the adult. She will live to spawn again another day. Several times we have tried to catch a holding female where she has released fully formed free swimming fry. They do seem to be able to hold their offspring long enough for the fry to mature. I'm sure that having well fed adults helps keep them from

harassing holding female conspecifics. We usually start the fry off in a hang-on-tank breeder box, feeding them microworms and powdered dry food. As they grow they will become silver torpedo shapes with a "tilapia" spot at the posterior of the dorsal fin. As they near 3" they'll develop the more attractive adult coloration.

Overall, we have found the Hot Lip Houligan to be easy to keep. They accept prepared foods readily. They will make a beneficial addition to any medium to large scale fish breeding by being able to dispatch unwanted fry and small fish. They don't harass other species that don't fit in their mouths, except for mouth brooding females. They will be on the losing end if kept with more aggressive species, such as convicts. They really aren't houligans after all.



Stomatepia mariae holding

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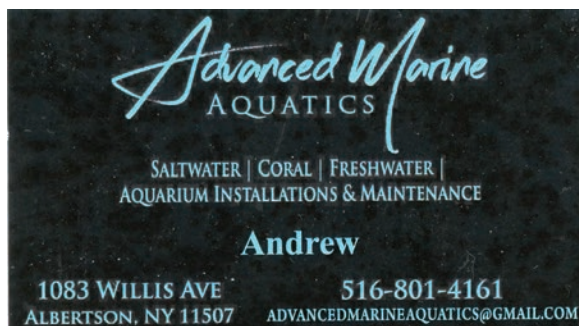
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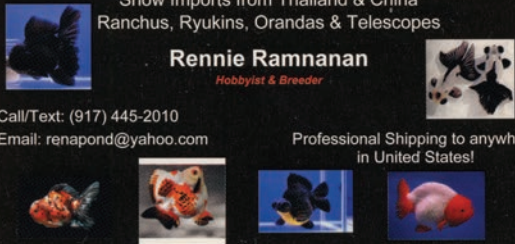
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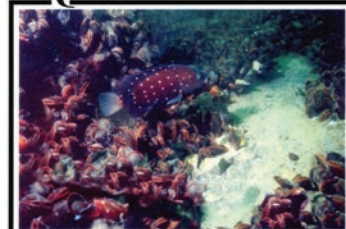
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FISHEYE

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.

Something very freaky is lurking in the deep waters off the California coast, according to KABC TV.¹



Researchers aboard a deep sea vessel spotted a barreleye fish and captured the rare sighting on video.

The bizarre-looking fish can see through its own forehead. It grows up to 6 inches long and lives at a depth of roughly 2,000 feet.

The fish can rotate its eyes upward to see through transparent tissue on its head. This allows it to stealthily track its prey from below.

A fish store in Kuwait was shut down by authorities after it was discovered that the owners were sticking plastic, craft-store “googly eyes” onto their fish in an apparent effort to make their product look fresher. The freshness of a fish can indeed be judged by its eyes. The whiter the fish’s eyes, the more recently it was caught. In this case, the googly eyes did cover up the rotting, yellowish color of the fish’s actual eyes. However, the ruse didn’t exactly go unnoticed.

A video of the googly-eyed fish first started circulating among local WhatsApp users before still images wound up on Twitter, where users had a field day making fun of the ridiculous tactic employed to seemingly sell more fish to the public.



A local newspaper, Al Bayan, originally reported the shutdown of the fish vendor and also posted images of the fake fresh fish to Twitter.

Apparently, this store didn’t want their own fish supply to go to waste and instead opted to try and trick its customers into buying their product, even though the fish they were selling were obviously long past their expiration date.²



References:

¹ <https://abc7news.com/the-barreleye-fish-video-rare-bizarre/11345363/>

² <https://allthatsinteresting.com/weird-news-2018/14>



Fin Fun



TANGANYIKA TANGO

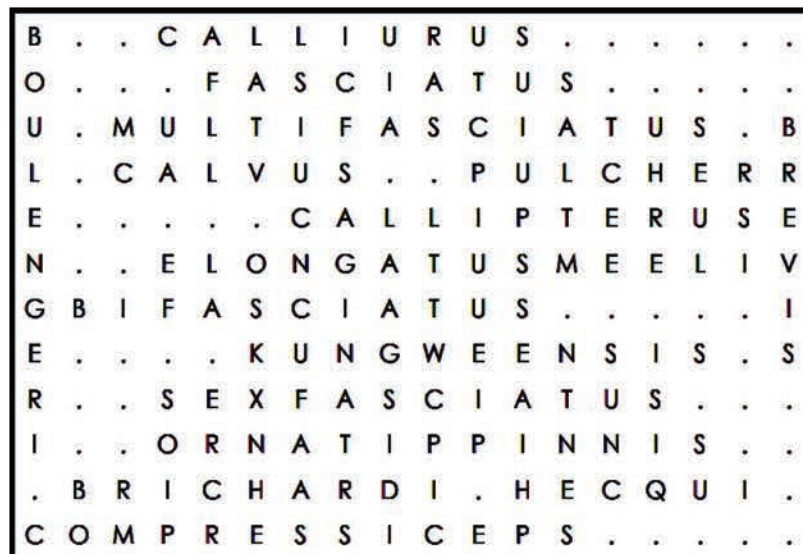
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