



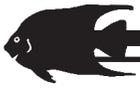
AQUATICA

THE ON-LINE JOURNAL OF THE BROOKLYN AQUARIUM SOCIETY
VOL. 33 NOVEMBER ~ DECEMBER 2019 No. 2

Red-bellied piranha - *Pygocentrus nattereri*



**HOLIDAY
GREETINGS
TO ALL!**



108 YEARS OF EDUCATING AQUARISTS
AQUATICA

VOL. 33 NOVEMBER • DECEMBER 2019 NO. 2

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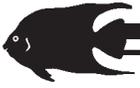
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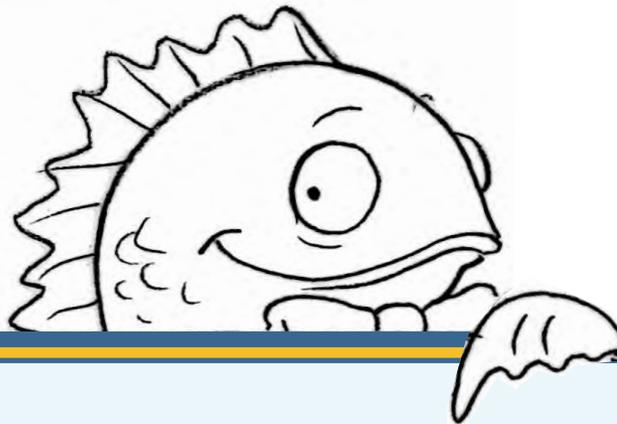
The **Brooklyn Aquarium Society Inc.** is a non-profit organization 501(c) (3) for people interested in the aquarium hobby and the study of aquatic life. The Society meets the 2nd Friday of each month except July and August at the Education Hall of the New York Aquarium at Coney Island, Surf Avenue at West 8th St., at 7:30 PM. Meetings are open to visitors. Refreshments are served. Membership is \$25 per year family / \$20 individual / \$15 for students under 14. Send inquiries or membership checks payable to:

Brooklyn Aquarium Society, c/o Membership Chairperson, P.O. Box 290610, Brooklyn, NY 11229-0011.



Brooklyn Aquarium Society

CALENDAR OF EVENTS 2019 ~ 2020



NOV 8 Lou Ekus - [Tropic Marin] Reef Chemistry Made Easy ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

DEC 13 Holiday Party ~ Members, their families & friends • Fish Bingo & Prizes • BAS awards presentations.
2020

JAN 10 Luis Morales - Fish Photography ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

FEB 14 Joe Yaiullo [topic TBA] ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

MAR 13 Jason D'Ambrosio ~ Stingray Husbandry ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

APR 12 Robert Stark - 25 Years of B-Ionic Reef Keeping and the Simplicity Beyond Complexity ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods

MAY 8 Giant Spring Auction ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

JUN 12 Chad Clayton ~ Copepods are Changing the Face of Aquaculture ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

NO MEETINGS JULY & AUGUST

SEPT 11 Harry Faustmann - Live Foods ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

OCT 9 Giant Fall Auction - Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

NOV 13 TBA

DEC 11 Holiday Party ~ Members, their families & friends • Fish Bingo & Prizes • BAS awards presentations.

All BAS meetings begin at 7:30pm.

No members, other than those donating their help setting up or items for the auction, will be allowed in before that time.



With permission

Jeremy Gay, Thursday 24 February 2011, 11:00 am

Filed under: lifespan longevity oldest live koi, discus, catfish, cichlid, loach, guppy, marinefish



This is a question often asked in the postbag of *Practical Fishkeeping* magazine. Having seen lots of aged fish on my travels, I wanted to find out the length of time some of our aquarium veterans are surviving, and my findings are amazing!

Unfortunately, although some fish die every year through disease or mistakes, the ones that are being cared for properly are going on to reach a truly ripe old age, and that doesn't always seem to be related to species size.

Species selection

I think that as well as researching fish size and water requirements, we should also consider the length of time which they will live. Life is short when you are an avid fishkeeper, as there are so many species to keep and so little time to keep them.

To find out how long a broad selection of aquarium species are living, I posted a blog asking readers to share their experiences.

What I found

My investigations led me to discover that many community species of fish are capable of outliving a cat or a dog, so making themselves a long-term commitment for the fishkeeper.

Take the Clown loach, for example. I found ages up to 24 years reported, and, considering that in that time they can and will reach 30cm/12" in length and are a social species

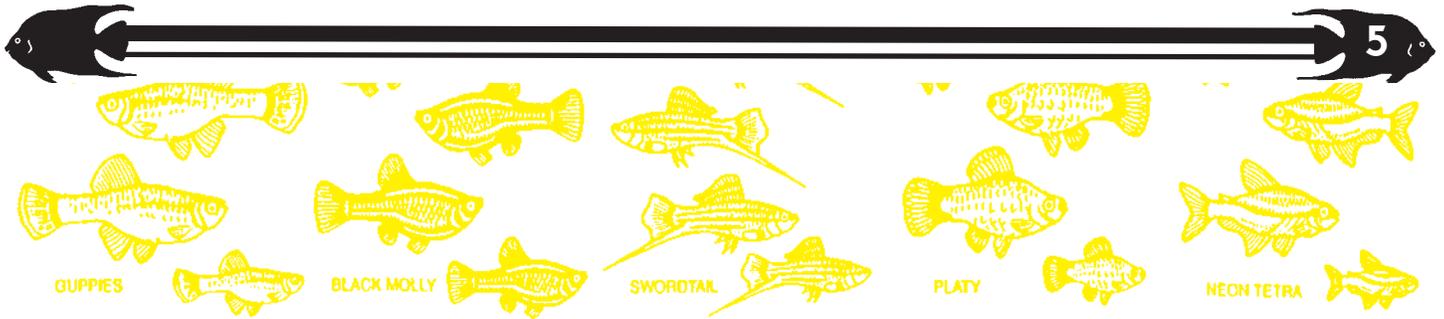
requiring the company of their own kind, the number of enthusiasts who can truly offer them what they need, compared with the number of people who purchase them, is very low indeed.

Twenty five years is a large chunk of anyone's life and who can predict what they will be doing and where they will be living for the next quarter of a century?

It seems it's not always the small species that have the shortest life spans.

Most tetras, rasboras and small barbs can hit five years old, as you might expect, but my investigations showed that some were swimming through to seven, eight and even ten years of age. An Emperor tetra was listed at nine years old and a Neon tetra at ten!

I've listed two fish in the table at the end of this feature with big question marks around them — a nine-year-old guppy and a 12-year-old White Cloud Mountain minnow. If those two cases are true, then these small "short lived" fish species are outliving species like rainbowfish and some cichlids, both of which are normally noted for their longevity. The average life span for a guppy, apart from that one, was a much more average 18 months.



Whether this is good or bad I have yet to decide, but some families, genus and species stood out as being long lived. I've already mentioned the 24-year-old Clown loach, but even smaller loach species seem particularly aged. A 15-year-old Dwarf chain loach has been recorded along with a 17-year-old Kuhli loach.

Then there are the catfish. I would go so far as to say that some catfish are known for being long lived, *Synodontis* in particular, and a *Synodontis schall*, a large syno, is listed at 38 years old. But even smaller synos are hitting the 20 years of age mark and beyond. I found a *S. nigrita* at 19, a *S. flavitaeniatus* at 20 and the small, true upside down catfish, *S. nigriventris*, at 21 years of age.

Other small catfish species continued to surprise me, with *Corydoras* really opening my eyes. The list includes a Bronze corydoras at 11 years old; no surprise there perhaps, but what about a *Corydoras zygatus* at 21?

Lots of 'common plecs' and 'gibbiceps' plecs were registering at the 27, 28 year mark, so that is another good reason why you should think long and hard about introducing one as a solution to controlling a short-term algae problem.

Marines were featured too, even common community species. Mr. **A. B. Hussey** said: "I have been a fishkeeper for 35 years. Started keeping marines in 1992 and have a Regal tang, pair of Clowns and a Humbug, which were my among my first fish purchased." Well done, Mr Hussey, I say.

Extra care

The fact that some specimens are living so long must be a combination of genetics and extra care taken by the fishkeeper. No fish will last very long in poor water conditions, if fed a diet that is poor in nutrients or if kept in a stressful situation. You, the fishkeeper, are responsible for all three of the above and should always put the welfare of the fish first.

I dropped fish health expert, **Dr Peter Burgess**, a line to ask if he knew of any age-related illnesses in fish and anything to look out for.

It seems that old fish are at greater risk of certain diseases and are also less able to withstand unsuitable water conditions or bullying. Spinal deformities can occur in old fish just as they do in humans. And fungus and eye infections increase in older specimens due to less efficient immune systems. Cell mutation is more likely in old fish, resulting in melanomas, as will organ failure, particularly kidney failure.

A tall story?

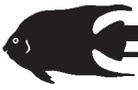
Koi are well known for being long-lived. However, there is one age reference about which I am more than a little skeptical. If it is true and can be scientifically proven then great, but even if it cannot be validated it still makes a great story.

It involves a Japanese Koi carp called Hanako that reportedly lived 226 years. Hanako was owned by **Dr. Komei Koshihara** and lived in a pond in Gifu, Japan, with five other geriatric Koi. In 1966, Dr. Koshihara made a radio broadcast about his favourite fish and the following is taken from the English transcript, which I found on www.vcnet.com:

"This Hanako is still in perfect condition and swimming about majestically in a quiet ravine descending Mount Ontake in a short distance. She weighs 7.5 kilograms and is 70 centimetres in length. She and I are dearest friends. When I call her saying 'Hanako! Hanako!' from the brink of the pond, she unhesitatingly comes swimming to my feet. If I lightly pat her on the head, she looks quite delighted.

"Sometimes I go so far as to take her out of the water and embrace her. At one time a person watching asked me whether I was performing a trick with the carp. Although a fish, she seems to feel that she is dearly loved and it appears that there is some communication of feeling between us. At present, my greatest pleasure is to go to my native place two or three times a month and keep company with Hanako.

"I am often asked how it is that I can tell the age of a fish. As a tree trunk has its annual rings, so a fish has its annual rings on its scales, and we only have to count them to know the age



of a fish. As a matter of course, we ourselves cannot do it. It requires the aid of a specialist and the use of a light microscope.

"Now, what was it that made me think of ascertaining the carp's age? My grandmother on maternal side, who left this world at the advanced age of 93 some eight years ago, is said to have been told by her mother-in-law: 'When I was married into this family, my mother in-law said to me, that carp has been handed down to us from olden times; you must take good care of it.'

"When I was told this story, I became very curious to know how long the carp had lived. I found out Hanako's age by the before mentioned method, but you may easily imagine how greatly I was grieved when I was forced to take a scale off her beautiful body. I caught her in a net very cautiously and repeatedly said: 'Excuse me!'

"I took off two scales from different parts of her body by using a strong tweezers. The scales were examined by Professor **Masayoshi Hiro**, D.Sc., Laboratory of Domestic Science, Nagoya Women's College.

"It took two months for him to acquire a satisfactory result. Using the light microscope, he photographed every part of the scales. It seems he took a great deal of trouble. When it was certain beyond doubt that the carp was 215 years old, the two of us exchanged a look of delightful surprise.

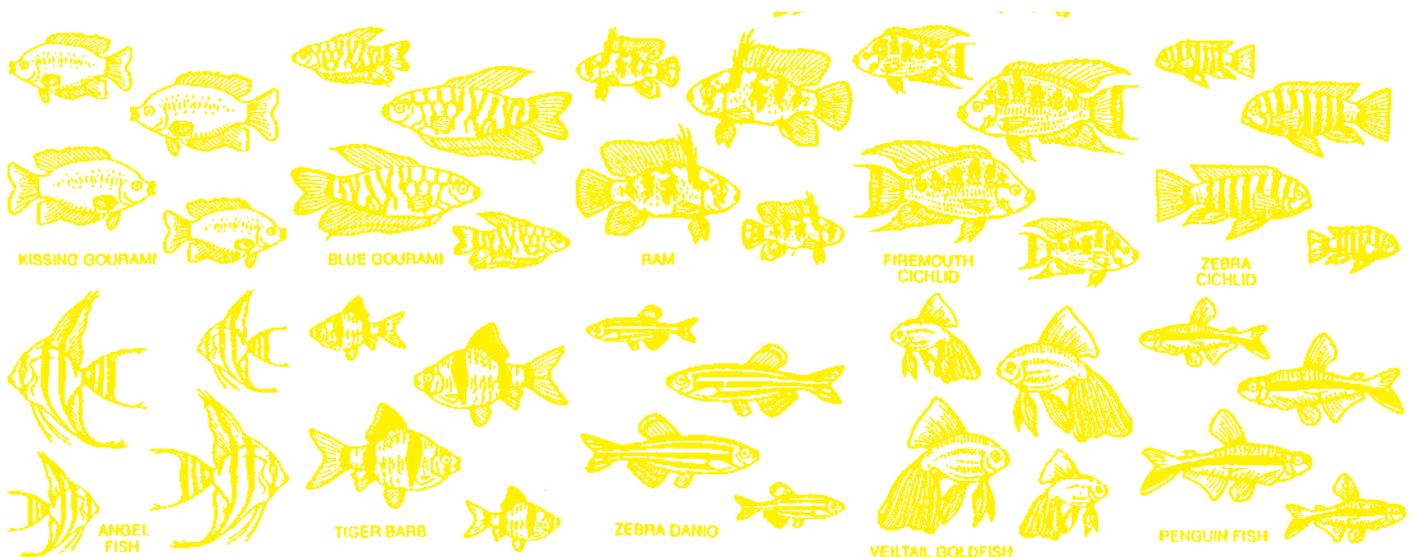
"Then I had the professor examine the remaining five carp in the same pond, three white and two black ones. The examination took one year, and it was found out that three were respectively 168, 153 and 149 years old, and the remaining two were both 139 years old.

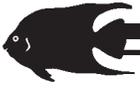
"Those results led us to be convinced that not only are the carp rare ones, but they are a very precious existence from the scientific point of view as well. We must consider, then, in what surroundings and under what conditions these long-lived carp are placed. The pond is located far deep among the mountains of Mino Province. The locality is called Oppara, Higashi-Shirakawa Village, Kamo County, and is about the same distance from Gero Hot Springs on the Takayama Line as from Nakatsugawa City on the Central Line, both lines belonging to the National Railways.

"Nearby there are rustic hot springs called Oppara-onsen. Facing south toward the Pacific on the top of Mount Ontake, you will look down upon the locality at the foot of the mountain. Through the locality runs the Shirakawa, a tributary of the River Hida, which again is the upper reaches of the River Kiso.

"A stream of limpid water never ceases to flow all the year round. It is this water that flows into the pond where Hanako lives and which was carefully constructed with stones in former days. Besides that, pure water trickled from the foot of the mountain streams close by into the pond, making the favourable conditions still more favourable. The pond cannot be called large, only being about five metres square."

Hanako died in 1977 at the age of 226 as the world's oldest animal. The current record holder for longevity is a 400-year-old clam found in waters off Iceland's north coast. The species, *Arctica islandica*, can be aged by measuring the growth rings around its shell. 





Longevity rules OK!

Below is a list of fish and their age as claimed by their owners.

• 3 years

Three lined pencilfish, *Nannostomus trifasciatus*

• 5 years

Red eye tetra, *Moenkhausia sanctaefilomenae*,
Buenos Aires tetra, *Hyphessobrycon anisitsi*,
Black phantom tetra, *Hyphessobrycon megalopterus*,
Cherry barb, *Puntius titteya*,
Swordtail, *Xiphophorus hellerii*,
Sailfin molly, *Poecilia velifera/latipinna*,
African red eye tetra, *Arnoldichthys spilopterus*

• 6 years

X ray tetra, *Pristella maxillaris*,
Festive cichlid, *Mesonauta festivus*,
Uaru, *Uaru amphiacanthoides*,
Gold sucking loach, *Gyrinocheilus aymonieri*,
Tiger barb, *Puntius tetrazona*,
Cardinal tetra, *Paracheirodon axelrodi*,
Harlequin, *Trigonostigma heteromorpha*,
Angelfish, *Pterophyllum scalare*

• 7 years

Golden barb, *Puntius sachsii*
• 8 years
Silver shark, *Balantiocheilus melanopterus*,
Pearl gourami, *Trichopterus leeri*,
Scissortail, *Rasbora trilineana*,
Snakeskin gourami, *Trichogaster pectoralis*

• 9 years

Angelicus catfish, *Synodontis angelicus*, Guppy,
Poecilia reticulata,
Giant danio, *Devario aequipinnatus*,
Emperor tetra, *Nematobrycon palmeri*

• 10 years

Neon tetra, *Paracheirodon innesi*
Wild discus, *Symphysodon* spp.
Black widow, *Gymnocorymbus ternetzi*,
Silver dollar, *Metynnis argenteus*,

Armatus eel, *Mystus armatus*,
Hoplo cat, *Megalechis thoracata*
Congo tetra, *Micralestes interruptus*
Brochis, *Brochis splendens*

Rosy barb, *Puntius conchonius*

• 21 years

Upside down catfish, *Synodontis nigriventris*

• 24 years

Clown loach, *Chromobotia macracanthus*

• 25 years

Bristlenose catfish, *Ancistrus* spp.

• 27 years

Red tailed catfish, *Phractocephalus hemioliopus*

• 28 years

Common pleco, *Liposarcus pardalis*

• 30 years

Ornatipinnis, *Polypterus ornatipinnis*

• 31 years

Pacu, *Colossoma macropomum*

• 37 years

African lungfish, *Protopterus annectens*

• 43 years

Goldfish, *Carassius auratus*

• 73 years

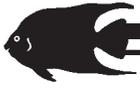
Australian lungfish, *Neoceratodus forsteri*

• 80 years (226 years)

Koi, *Cyprinus carpio*

Note that some of the fish listed are still alive and well, and many would have been over a year old when purchased.





ALL ABOUT ATR PUMPS

Air pumps were once a commonplace piece of aquarium equipment. These days they're much less common. However, there are some applications where air pumps are the perfect choice, and some air pumps are absolutely better than others. Here is a brief guide on when to use air pumps, how to pick the right air pump and some common air pump accessories.

When to Use an Air Pump?

For Energy Efficiency

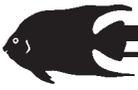
Air pumps increase the dissolved oxygen in an aquarium and create water movement. The main reason fewer air pumps are used these days is that water pumps do both of these jobs more effectively and are cheaper than ever before. However, air pumps use far less energy than water pumps. This is why many fish stores use air pumps and air driven filters rather than water pumps. The operating expense is very important in a business environment and the energy savings can add up with the large number of tanks in a store. If you are concerned with your electric bill, using air pumps rather than water pumps can help.

For Specialized Filters

Sponge filters and undergravel filters, as well as certain algae turf scrubbers and protein skimmers, require air pumps to run. These filters have for decades been proven to be effective for filtration, and they're often some of the most affordable ways to filter a tank. All of the BiOrb Aquariums use air pumps and sponge filters.

For Aesthetics

Many people enjoy watching bubbles in the aquarium. Certain decorations use bubbles to activate decorations or to create interesting bubble and lighting effects.



For Aquariums with CO₂

In planted aquariums using CO₂, excess CO₂ will build up at night because plants only use CO₂ during the day when they photosynthesize. Excess CO₂ can suffocate fish. Using an air pump to pump fresh oxygen into the water will help to reduce the risk of your fish suffocating. Many aquarists who run an air pump to counteract the buildup of CO₂, use a timer to just run the pump at night.

For Moving Fish

If your local fish store is far from you, or you are moving your entire aquarium, using a battery operated air pump is a great way to keep your fish alive when they're being moved. The ViaAqua MillionAir Air Pumps are great for this purpose.

For a Battery Backup

Power outages can be devastating for an aquarium. The most affordable way to protect against power outages is with a battery air pump. The Cobalt Aquatics DC Air Pumps are our favorite choice. Our basic battery backups from ViaAqua can only run on battery power and use D Batteries. They also need to be turned on manually. The Cobalt DC Air Pumps automatically charge the internal battery while plugged in. When the power goes out, the pump automatically switches to battery power and will run for approximately 24 hours before the battery dies. You can also switch the pump to 10 seconds on 10 seconds off to use up the battery more slowly. The Cobalt uses a USB power cord for connecting the pump to a battery bank in order to run the pump even longer.

How to Pick an Air Pump?

Noise

The most important factor for most people when choosing an air pump is the noise. Air pumps are often the loudest piece of equipment on the aquarium. Loud air pumps can be extremely annoying and distract from the beauty of the aquarium. Some of the quietest options we have found are the Tetra Whisper Air Pumps and The Cobalt DC USB Air Pumps.

Capacity

Air pumps typically have aquarium size recommendation from the manufacturer. Because manufacturers like their pumps to seem powerful, they rate the pump for the largest aquarium possible. It is best to go one or two sizes larger than the manufacturer recommendation, or use two pumps (especially if you like a lot of bubbles).

Head Pressure

Head pressure describes the force of resistance a pump encounters when pumping. The longer the air line attached to the pump, the deeper down in the water the end of the air hose, and the more clogged the air stone on the end of the line, the greater the head pressure. Most air pumps can handle enough head pressure to work on standard aquariums with the pump placed in the stand.

If you want to pump air into an aquarium over 3 feet deep, or you want to have the pump in a different room from your tank, the best pumps are the Coralife Luft Aquarium Air Pumps. These pumps are very powerful but also very loud. Even though the Luft Pumps are very loud, they're also very strong (can handle high head pressure). You could have a Luft Air Pump in the garage and run an air line to a tank in the living room, eliminating most of the sound at the location of the tank.



Replaceable Diaphragms

Over time the rubber diaphragm in an air pump will wear out. If you plan on having the pump for many years, the ability to replace the diaphragm is important. We have diaphragms for Tetra, Danner, Penn-Plax and Coralife air pumps.

Air Pump Accessories

Check Valves

Anyone using an air pump should use a check valve. A check valve stops water from flowing back down your airline. This is very important. If water gets into your air pump it will damage the pump and flood water onto the floor. It can also be a fire hazard.

Airline Tubing

To use an air pump you will need airline tubing. Our favorite airline is the Cobalt Aquatics Black Premium Silicone Airline. It's black and will blend into a black background.

Airstones

Airstones cause the air coming out of your airline to form many small bubbles rather than a few large bubbles. Use lime wood air stones for protein skimmers, small air stones for common use and bubble wands or disks for interesting esthetics.

Ball Valves

Ball valves, such as the Two Little Fishies Airline Hose Micro Ball Valve, allow you to dial down

the flow of your air pump. This is particularly important if you have a line split to multiple airstones or decorations. The air will naturally flow mostly to the closest decoration and the decoration that is farther away will receive very little air flow. Air always follows the path of least resistance. A ball valve will help you to tune the flow so that both airstones receive equal amounts of air.

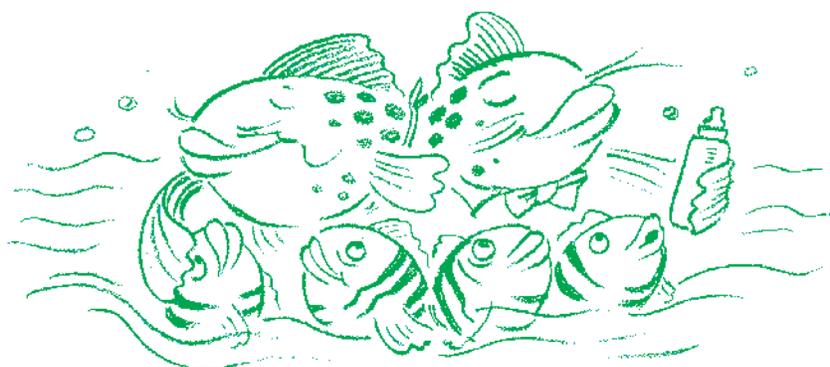
Tees and Manifolds

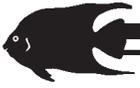
Tees and manifolds split an air line into multiple lines. Tees split the line into two lines while manifolds can split the line into three or more lines. Many manifolds also have built in flow control valves for adjusting the air flow to each line out of the manifold. See Lees Plastic Plastic Tee, 2 Pack and Hagen Elite 4-Way Air Control Valve. 

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Anthony P. Kroeger - BAS

HOW TO SETUP AN
AFRICAN BIOTOPES IN YOUR HOME

PART 2

MALEBO POOL CONGO



Kinshasa and Brazzaville [the capital of the two Congos] are located on the shores of Malebo Pool formerly named Stanley Pool. This is a huge lake formed by the broadening and slowing of the Congo River waters prior to entering the rapids described in part 1 of this series [*Aquatica* Sept/Oct 2019].

This huge lake has a mainly mud and silt substrate; aquatic plants ring the shore and the water moves slowly.

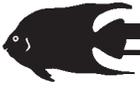
The water is medium/soft, pH is 6.8 or so. This is a clearwater environment, not a blackwater one. There's lots of sunken driftwood and trees here. Malebo Pool is not especially deep and the water is warm with temperatures between 78° and 80°F.

Light levels are high, being an open lake. Since developed cities line its shore, there is minimal shade.

Many of the most popular species of *Synodontis* catfish are caught at and exported from Malebo pool. Among them; *Synodontis angelicus* and the upside down catfish *Synodontis nigriventris*.

The Congo tetra, *Phennacongrommus interruptus* also occur naturally in Malebo Pool. Although I did suggest them for color in part 1, Congo tetras do not inhabit deepwater clefts. The current is simply too strong for them, a problem a home aquarist will never have. Hence my suggestion in part 1.

Cichlids such as the various buffaloheads and other tetras like, *Distichodus sexfasciatus* inhabit



Malebo Pool also.

This gives home aquarists lots of varieties of fish to choose from. For a 55-gallon tank, I suggest a pair of buffaloheads, *Steatocranus casurus*, a school of Congo tetras, *Phennacogrammus interruptus* and a few upside-down catfish.

But what do you need to build your own Malebo pool?

It's actually easy! Start with a 55-gallon tank and a good power filter. I use a natural brown fine gravel mixed with a natural sand substrate. To this substrate, add some coconut coir. Most garden centers sell "bricks" of coir. This is a natural coconut product that absorbs water and becomes mixed with your substrate and "softens" the substrate and gives it a mulmy quality without being messy.

Then add driftwood of your choosing. Lots and lots of it! Build hiding places using the driftwood but leave the front and center of your

setup open for the fish to swim in. Adding peat is not necessary. Remember, Malebo Pool is a clearwater environment not a blackwater one.

Anubius plants from any of the commonly

available species can be used and should be tied with string to the driftwood. Tied en masse, the effects are quite stunning. Use cotton sewing thread, over time the plants will root themselves and the sewing thread will disintegrate.

Now your Malebo Pool is ready for fish.

One other tip; if you can locate your aquarium so natural sunlight lights the tank for part of the day, this will make your Congo tetras glow with beauty and look jawdropping!

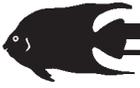
Enjoy your very own Malebo Pool.

Happy Fishkeeping! 



TONY





RED TAIL CATFISH



Phractocephalus hemioliopterus



My first red tail catfish that I acquired was only one inch in length. I placed him in a 20-gallon bare bottom aquarium. Temperature was 80°F, pH 6.8, lighting was a standard 20-gallon fluorescent fixture, filtration was a 200-gallons per hour from an outside powerfilter. I used feeder guppies and small goldfish for him to feed on. On the third day I noticed he wasn't eating. I killed one of the goldfish and put it on the end of skewer, and placed the goldfish right in front of his mouth and the catfish engulfed the dead feeder goldfish. The goldfish was about ½ his size, but he was able to swallow it whole. I kept feeding him in this manner for about a month.

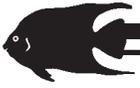
His rate of growth was astonishing, at 2½ inches he were able to catch feeder goldfish on his own. There was always feeders in his tank, so I was constantly checking for ammonia nitrites and

nitrites, and doing water changes when necessary.

It is very important that the water changes are done properly, meaning replacement water should be the same pH and same temperature and of course dechlorinated. I would change 60% of the water every week, and more when necessary.

After a couple of months I varied his diet, giving him small chunks of shrimp, fish fillet, and scallops along with the feeders. He just kept on growing; at 4 inches, I placed him in a 55-gallon aquarium. Filtration was a 300-gallons per hour. I used an outside powerfilter and a large canister filter for optimum water quality. At this size he would eat about 10 goldfish at one feeding. I knew he was full when his belly was distended and all he does is rocks side to side on the bottom of the tank, and I knew it was time for him to eat when his belly was flat, which would be approximately every other day.

The one important thing I noticed about this red tail catfish is that if I did a water change



within 24 hours after his feeding he would regurgitate his food every time. I had to be very careful to see to it that this wouldn't happen, because it would pollute the entire tank, and the only way to correct the situation was to do massive water changes.

When he grew to 10 inches I moved him to his permanent aquarium: a custom 225-gallon acrylic aquarium dimensions 72 inches long X 36 inches wide X 20 inches high. Filtration custom large wet/dry filter with a 1200-gallons per hour pump, water temperature 80°F, bottom was covered with 1 inch inert sand, no other decoration.

At this point it was getting to be expensive buying feeder goldfish, so I substituted goldfish with silversides. Sometimes I would also give him sardines, (although not too often, sardines are too oily) and any other type of small fish or crustation that was available at my local fish market. I would also make trips to the Chinese fish market to buy live saltwater shrimp and live crayfish (one of the advantages of living in a big city). I was amazed at his growth rate; at 6 months, he was 12 inches long.

Now I was in the market to find him tank mates. I had a 15 inch South American arowana in a 125-gallon tank. I took him out and put him in with the red tail. That turned out to be a bad idea, a week later I noticed the arowanas tail was frayed and he had some scales missing on his hindquarter. Obviously the red tail had tried to eat him, so the arowana went back into the 125-gallon tank. I then put four 12 inch red tiger oscars; the red tail didn't seem to bother the oscars.

Over the course of a year I placed an

18 inch gold channel cat, two 15 inch black pacus, and a 17 inch tiger shovelnose catfish in with him. I would feed the red tail twice a week. Water changes were done 2 days after feeding. If

needed, 100% water changes were accomplished by draining 2/3 of the aquarium and then filling while still draining (the draining was accomplished with a 1 inch pool hose draining directly to the sewer drain). This was an easy task; draining was quick and easy.

When the red tail grew to 18 inches, once a month I would put a multi-vitamin down the gullet of the white fish and feed it to the red tail catfish.

The red tail catfish grew to 27 inches in the 225-gallon aquarium.

Then I had a knee operation resulting from a car accident. I fed the fish lightly that morning, and did a water change that evening. I meant to check the tank the next morning, but because of the medications I was on I didn't get down to my basement until early evening the next day. It was too late; the red tail catfish had regurgitated his food, and the whole tank was cloudy, and everything had died.

I have since raised 2 other red tail catfish. The 2nd red tail catfish also grew to 27 inches. The 3rd red tail catfish is now about 8 inches. 



AI

**MARINE ANGELFISH - PART 5****BIG! BOLD!
BEAUTIFUL!**

The Blue Girdled Angel
Euxhipops navarchus

This Angel is why I am a marine aquarist! The first time I saw one I was still keeping freshwater only. It was in with a clown trigger and a Volitans Lion. Between the three, I was hooked and have been ever since.

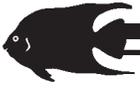
I have a history with this fish too! It is the only fish I ever bet my job on that I could keep it alive!

At the time I was the livestock manger for a regional pet chain's new flagship store. I was

given carte blanche to stock the store. For the main 220-gallon show marine tank I selected an adult Blue girdled angel.

The night before the store was scheduled to open, the regional manager came in and saw the angel and had a fit! He was sure it would die and end upon my daily deadlog.

I bet him a night on the town for my staff of 15 and myself if I kept it alive and sold it. If I lost, I'd pay for his night on the town, pay for the fish and submit my resignation.



I sold the fish 45 days later. It was still gorgeous. I have no idea how much the bill was for the dinner for 16 at the Hilton. I figured it was better not to ask. needless to say the regional manager never questioned my livestock purchases again!

This fish hails for the Philippines, Indonesia and rarely from Australia. This angel grows to about 12" inches.

Not a common fish the demand far exceeds the supply.

Blue girdled's are always expensive so expect to pay a premium price to obtain this fish. Most better stores and online retailers offer limited supply on occasion. The color on this fish is incredible!

Juveniles are a deep blue black with electric neon blue vertical stripes.



Adults are simply stunning. From below the eye up to the top of the nape is a broad blue/black swath. This swath extends down encompassing the ventrals, belly, anal fish and back up to cover the rear 20% of the body up to the dorsal base and the entire caudal peduncle. This entire area is edged in neon blue.

The center of the fish between this irregular "U" shaped swath is screaming orange. Purple/blue polka dots overlay this area on the flanks. Dorsal and caudal fish are tangerine orange, edged in neon blue. A small black dot is in the uppermost read part of the dorsal. The throat is honey brown, snout is bluish/brown. Wow! You've got to see this fish!

This is not a beginners angel, but experienced aquarists should have minimal problems.

A large tank 55-gallons for a juvenile and 180-gallons for an adult. Power or canister filtration, good water, zero ammonia/nitrite, and a temperature between 74° - to 82°F, a salinity of 1.020 - 1.024 are mandatory. I change 25% of its water weekly. Feed this fish the widest variety of commercial foods [frozen, flakes pellets] that you can buy along with fresh greens, spirulina, Caulerpa and a commercial marine angel sponge diet. I never feed this angel any food more than once week. I have had good results feeding this fish both zucchini and kiwi of all things! But all will eat these but many will.

This fish is mid range as far as hardness. Kept in proper conditions it is fairly hardy. Stray from these conditions; especially temperature and water quality and it will catch ick. I find it mid-range in its susceptibility to hile too!

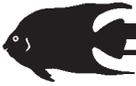
Blue girder angles do fine in most community tanks. This is a peaceful fish but can and will defend itself if it has to. Adults usually ignore a juvenile housed with it, but two adults will fight unless you happen to be lucky enough to obtain a compatible pair. If you want to try and pair yours expect a swap out of specimens before you finally find a compatible pair and even then always watch for any signs of fighting.

In my experience blue girdled angles are not safe in reef tanks. They constantly nibble. although they do not specifically target corals with their nibbling they do seem to acquire a taste for coral in some specimens. Especially adults. Try this angel in a reef tank at your own risk.

That said I still find this angel to be awesome! It is my favorite marine angel and my reason why I am a marine aquarist. Plus no other fish ever got me dinner at the Hilton. 

Happy Fishkeeping.





Christian J. Heede - BAS

An article from *The Bulletin* - October 1916 vol. 3. No. 2

6

THE BULLETIN

Xiphophorus Helleri

(Sword Carrier)

by C. J. HEEDE

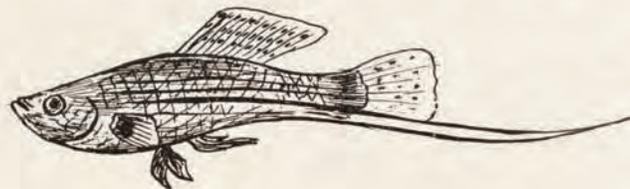
This fancy aquarium fish, which has its habitat in Mexico and Gautemala was first introduced to fanciers in the year 1909, although known to Ichthologists for a long period previously. They thrive exceedingly well in captivity and, being prolific, breed three or four times in a season and will produce from 25 to 150 young at a time.

As the illustration but poorly shows, the male fish have an extension of the body, starting underneath at the root of the caudal fin, or tail, the coloration being wonderfully beautiful and most attractive. The body is reddish silvery color, with reddish punctuations on the dorsal fin, appearing like stripes from gill covers to tail. While this stripe is

The Helleri are great jumpers and the fancier who does not cover his tanks with wire mesh or glass will probably find his adult specimens in a nice state of dryness on the floor the following morning.

They thrive well on Daphnia, finely cut up earth worms, Enchytraen (white worms), raw scraped beef, good artificial fish food, etc.

If the young fish, newly born, are to be kept in the same tank with parents, ample protection must be provided against possible canibalism of the old specimens. This may be accomplished by having plenty of fine leaved plants on the surface of the water, such as Riccia, Utricularia, Minor, etc. while the sandy



single in some specimens, others have from two to four reddish colored stripes with the space between of a goldish hue, the males' body extension or sword being in some specimens greenish, in others orange red, with outside edges of a deep coloration. The females are similarly colored but have no swordlike extension of the body.

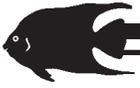
The adult fish is from two to three inches in length, while the sword of the males reaches a similar additional length.

The females do not lay eggs, but produce their young alive, the eggs hatching within her.

The temperature of the water in which these fish should be kept, may range from 75 degrees to 85 degrees Fahrenheit, the latter temperature being desirable in breeding time.

bottom of the tank may likewise be protected by a luxuriant plant growth in which the young may hide themselves. At birth they are of course weak and easily caught by the larger fish, but within an hour or so will have gained strength to swim to the top and there be protected among the plants. The young are of course without the sword tail, but the males born early in the Spring will grow the sword tail the same year, while those born later in the season will be so decorated the following year. Until they are so identified, they cannot be told from the female fish.

To select Xiphophorus for a tank, look for males which have orange red colored swords, as they are prettier and usually have a very elegant shape and a well developed, long sword.



The best part of being fish importer is seeing all the new fish when the boxes are opened. Here are some recent interesting imports from Nigeria! Look for these in stores.

Metallic flagfin shark, *Labeo forshalli*

This shark has not been imported since the 1990's and is rarely seen. Small 1" to 2" inch specimens are now being imported. Typical shark shape with a high extended anterior dorsal in mature specimens. It flicks the dorsal open and shut constantly, hence the flagfin name. Color is a solid metallic silver in the best specimens. Some specimens have a light honey color nape.

Not nearly as territorial as most *Labeo* specimens. They will school together with most similar sized barb species, making for a very interesting mix. Easily fed, accepts all foods. Very hardy. reasonable priced. Good algae eater, loves brush algae! An active shark. A group swimming reminds me of tinfoil barbs. Cover the tank, this shark is an excellent jumper. 

No picture available

**Blue diamond aletes - *Alestes* "Sp. blue".****No picture available**

This tetra is new and undescribed. Its beauty jaw dropping! Its color easily rivals the Congo tetra, *Pheinacogrammus interruptus*. The body is very rounded in shape, quite similar to the African moon tetra, *Bathyaethiops breiseghemi*.

The color is stunning. The entire nape from nose to tail is a broad band of neon blue. Flanks are a solid metallic turquoise blue the belly is white. Their eyes are blue green. Fin rays and fin edges are black. The caudal peduncle contains a large irregularly shaped black swath. The upper flanks vary between metallic turquoise, electric blue and pale gold depending on the lighting. Medium size, the specimens I've seen average about 2" when imported. At the size of 2" the color is excellent and gorgeous.

This is definitely a schooling fish. Individuals that are kept alone show no color and feed poorly. They prefer warm water 76° to 80° F. Their color is much better in warmer water. Soft water is preferred with a pH 6.8 to 7.0. Feed frozen or live foods initially. Eventually they will accept flake foods. A peaceful community fish.

All specimens offered are imported; prices are high! This Tetra is sensitive and ships poorly, so when you find this tetra expect to pay dearly for it.

Blue diamond *Alestes* are hyper-photo sensitive. Rapid light changes will immediately send them into shock and kill them. Cover the tank this tetra will jump.

Gorgeous, new, rare, sensitive, expensive. A beautiful new tetra to challenge every enthusiast. 

African flasher barb - *Narbodes ablates***No picture available**

A very rare gorgeous barb seldom available in the trade. Last documented import was in the 1980's.

A medium size barb. The few I have seen offered are about 2" inches. They do grow larger. Their color is very pleasing. A metallic honey color nose to tail over the nape and down the flanks. Scales are large and very reflective, the scales are edged in silver with a silver/white belly, red eyes and fins have an orange/pink tinge. Very pretty, peaceful with fish half its size or larger. Extremely active schooling fish. Takes most tap water but likes it warm; 76° to 80° F. Do not chill this barb, it catches ick easily. It eats all foods offered. Hardy, provided it's kept warm. Jumps extremely well, so cover the tank.

All specimens offered are wild caught and rare in nature so expect to pay premium prices. Lagos has swallowed up most of its former natural habitat. 

Look for these fish in stores.

In the next issue [Jan/Feb 2020] we'll highlight more new imports.



John Todaro - BAS

From the Brooklyn Aquarium Society's publication
SCRUMPTIOUS MEALS & LIVE FOOD TREATS Compiled, Edited & Written by John Todaro

Delicious Earthworm Snacks



For those of you with large fish that are eating you out of house and home, like cichlids. Most all meat eating fish of any size will gobble up earthworms as a delicious treat.

Cultivating earthworms might just be the answer to your problems, and guess what, you can grow them right in your own home. Yuck!

Earthworms can also be cut up and fed to smaller carnivorous fish. If you're squeamish about cutting up live earthworms (yuck again) and watching them wriggle, you can kill them first by dipping them in boiling water for 10 seconds. Don't forget to cool them down before feeding them to your fish.

But I think fish really enjoy wrestling with a live earthworm, it's all part of the fun of catching and eating them. Yum!

Here is what you need to grow your own at home, or in the garage. If your wife lets you! Guess what? It's not so yucky! 

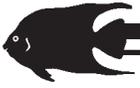
RECIPE

SUPPLIES NEEDED:

- 1) A container with a minimum size of about 20" x 20" X 12". There are plastic storage boxes with covers that can be adapted for use as an earthworm "home."
- 2) You will need to get a starter culture of about 100 worms. The cheapest and easiest way to get earthworms would be at a bait and tackle shop. You can also get them from:
Carolina Biological, 2700 York Road, Burlington, NC 27215-3398
Online catalog: www.carolina.com,
Phone (800)-334-5551 or from
Connecticut Valley Biological,
(800)-628-7748, Fax (800)-355-6813
email: connval@ctvalleybio.com
Website: www.ctvalleybio.com

PREPARATION:

Fill the plastic container with loose garden soil, (without any additives such as fertilizer) mixed with a bucket full of rotting leaves and two raw potatoes chopped into small pieces. Add the worms. The worms should be fed with a cooked mashed potato and cup of oatmeal spread on top of the soil. Put back the damp cloth cover. When the food has been consumed, feed again. Keep the earthworm container covered loosely (don't worry; the worms can't crawl out) or if you must cover the container, drill air holes in it, earthworms have to breathe too. Within a few months, you should see large numbers of young earthworms in the soil. At this point you can start feeding your fish. Periodically gently stir up the soil. Now, you should have a continuous supply of fresh, live, earthworms for your fish. Yum!



BREEDING THE **RED** HUMP GEOPHAGUS

Geophagus steindachneri



Red hump Geos are awesome! Peaceful, hardy, nicely colored, interesting in behavior and easily breedable. They're a good beginners South American cichlid.

Native to the upper reaches of the Rio Magdalena in Columbia wild caught specimens up to 10" inches have been reported. But this geo is so easy to breed all specimens offered for sale are captive bred. In the aquarium they rarely exceed 6" inches.

Color is a pretty light green with all the scales having a metallic green overly. Fins are metallic blue/green striped spotted and edged. The hump is a rusty red.

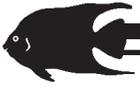
A 55-gallon tank with sand, plants, roots, flowerpots and an oversized power filter is good

for a group of six juveniles.

All geos must have clean, low ammonia/low nitrate water to thrive. All geos dig and produce a lot of waste from being heavy eaters. Always use an extra high capacity power or canister filter with any *Geophagus*. Cover their tank, they can jump.

Most tap water will suit them fine. Keep the temperature between 76 and 78° F. Change at least 50% of their water weekly. 6.8 to 7.2 pH, moderate hardness.

Feeding is easy, they will eat everything!



Frozen bloodworms, live earthworms and blackworms are the best breeding conditioning foods. This geo loves tubifex worms, but feed tubifex sparingly. Too much leads to bloat problems.

Sexing a pair is easy. Males are larger with a much bigger hump. They are mature at 3" inches.

This geo will spawn over rocks or in pits it has dug. An open spawner, the female immediately retrieves and broods the eggs in her mouth. Fry remain in the females mouth until free swimming. Usually about 20 days after spawning. It is easy to see the fry's eyes through the throat of the female. The female will continue to brood free swimming fry in her mouth until they are too



large to fit in her mouth or you remove her, whichever comes first.

Do not feed the female when she is brooding. Fry once released eat all small foods including baby

brine shrimp and crushed flakes. They re easy to raise.

Once the female is done brooding be sure to isolate her in a separate tank and feed her well to fatten her up before returning her to the main tank.

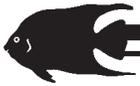
Red hump geos are the best.

Try some soon. 

Happy Fishkeeping.

Tommy





Ryan Curtis - BAS

TheShrimpFarm.com is the place to go for freshwater shrimp. The new owner is **Ryan Curtis**, with a new mailing address: The Shrimp Farm USA, 2401 East Washington St, STE 200 A2, Bloomington, IL 61704 and has set up an Aquarium Shrimp Forum <http://theshrimpfarm.com/forum/index.php>. You can go to this forum and ask questions, talk to other shrimp nuts and discuss anything and everything related to Freshwater Aquarium Shrimp.



Little Red Riding Hood Shrimp

Scientific Name: *Neocaridina Heteropoda*
Var. Red.

Common Name: Little Red Riding Hood Shrimp.

Other Common Name: Rili Shrimp, Red Rili Shrimp.

Temperment: Peaceful.

Breeding: Easy.

Care Level: Easy.

Origin: Taiwan.

Found in Wild: No.

General Water Parameters

pH Range: 6.2-8.0

Temperature Range: 65 - 80

GH Range: 4-12

KH Range: 3-8

TDS Range: 150-250

Life Span: 1-2 years

The Shrimp Farm's Water Parameters:

pH Range: 7.0-7.4

Temperature Range: 68-72

GH Range: 6-8

KH Range: 3-4

TDS Range: 175-200

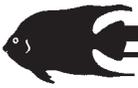
Life Span: 1-2 years

Full Grown Size: 1-1.25"

Gestation Period: 30 days

Approximate Purchase Size: .75"-1"

Ryan



Dwarf Shrimp Compatibility Chart

This chart was designed as a quick reference for freshwater dwarf shrimp compatibility. Even though all of these shrimp will live together without causing deaths, this chart is intended to prevent dwarf shrimp hybridization. 

Common Name	Amano Shrimp	Bamboo Shrimp	Bee Shrimp	Blue Pearl Shrimp	Blue Velvet Shrimp	Bumble Bee Shrimp	Crystal Red Shrimp	Crystal Black Shrimp	Ghost Shrimp	Green Shrimp	Neocaridina heteropoda	Orange Eyed Blue Tiger	Orange Sakura Shrimp	Red Cherry Shrimp	Red Rili Shrimp	Snowball Shrimp	Tiger Shrimp	Yellow Shrimp
Amano Shrimp		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bamboo Shrimp	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bee Shrimp	✓	✓		✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Blue Pearl Shrimp	✓	✓	✓		✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗	✓	✗
Blue Velvet Shrimp	✓	✓	✓	✗		✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗	✓	✗
Bumble Bee Shrimp	✓	✓	✗	✓	✓		✗	✗	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Crystal Red Shrimp	✓	✓	✗	✓	✓	✗		✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Crystal Black Shrimp	✓	✓	✗	✓	✓	✗	✓		✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Ghost Shrimp	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Green Shrimp	✓	✓	✗	✓	✓	✗	✗	✗	✓		✓	✗	✓	✓	✓	✓	✗	✓
Neocaridina heteropoda	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓		✓	✗	✗	✗	✗	✓	✗
Orange Eyed Blue Tiger	✓	✓	✗	✓	✓	✗	✗	✗	✓	✗	✓		✓	✓	✓	✓	✗	✓
Orange Sakura Shrimp	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓		✗	✗	✗	✓	✗
Red Cherry Shrimp	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✗		✗	✗	✓	✗
Red Rili Shrimp	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✗	✗		✗	✓	✗
Snowball Shrimp	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗		✓	✗
Tiger Shrimp	✓	✓	✗	✓	✓	✗	✗	✗	✓	✗	✓	✗	✓	✓	✓	✓		✓
Yellow Shrimp	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗	✓	



Helen Thompson – Staff Writer, *Smithsonian Magazine*
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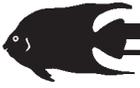
14 Fun Facts About **PIRANHAS**

Piranhas have never had the most darling of reputations.

Just look at the 1978 cult film "Piranha", in which a pack of piranhas escape a military experiment gone wrong and feast on unsuspecting lake-swimmers. Or the 2010 remake, where prehistoric piranhas devour humans in 3D detail. Then and now, Hollywood certainly hasn't done the piranha any favors. But are these freshwater fish the vicious river monsters they're made out to be? Not exactly. Piranhas do indeed have sharp teeth, and many are carnivorous.

But there's a lot of diet variation among species. That's one reason piranhas have proved hard to taxonomically classify. Piranhas are also hard to tell apart in terms of species, diet, coloration, teeth, and even geographic range. This lack of knowledge adds a bit of dark mystery to the creatures. They may not be cute and cuddly, but they are very misunderstood and scientists are rewriting their fearsome stereotype. Here are some facts about them:





1 Piranhas' bad reputation is partially **Teddy Roosevelt's** fault - When Theodore Roosevelt journeyed to South America in 1913, he encountered several different species of piranha. Here's what he had to say about them in his book, *Through the Brazilian Wilderness*; "They are the most ferocious fish in the world. Even the most formidable fish, the sharks or the barracudas, usually attack things smaller than themselves. But the piranhas habitually attack things much larger than themselves. They will snap a finger off a hand incautiously trailed in the water; they mutilate swimmers and

in every river town in Paraguay there are men who have been thus mutilated; they will rend and devour alive any wounded man or beast; for blood in the water excites them to madness. They will

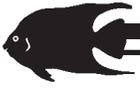


tear wounded wild fowl to pieces; and bite off the tails of big fish as they grow exhausted when fighting after being hooked." Roosevelt went on to recount a tale of a pack of piranhas devouring an entire cow. According to *Mental Floss*, however, locals put on a show for him, extending a net across a river to catch piranhas before he arrived. After storing the fish without food, they tossed a dead cow into the river and released the fish, which naturally devoured the carcass. A fish that can eat a cow makes a great story. Given that Roosevelt was widely read, it's easy to see how the piranha's supervillain image spread.

2 Piranhas have lived in South America for millions of years - Piranhas inhabit the freshwaters of South America from the Orinoco River Basin in Venezuela up to the Paraná River in Argentina. Though estimates vary, around 30 species inhabit the lakes and rivers of South America today. Fossil evidence puts piranha ancestors in the continent's rivers 25 million years ago, but modern piranha genera may have only been around for 1.8 million years. A study suggests that modern species diverged from a common ancestor around 9 million years ago.

Also, when the Atlantic Ocean rose around 5 million years ago expanding into the flood plains of the Amazon, the high salt environment would have been inhospitable to most freshwater fish. It is likely some, like piranhas, escaped upriver to higher altitudes. Hence, genetic analysis suggests that piranhas living above 100 meters in the Amazon region have been around for 3 million years.

3 Piranhas found outside South America are usually pets on the lam - Piranhas attract a certain type of pet lover, and sometimes when the fish gets too large for its aquarium, said pet lover decides its much better off in the local lake. In this manner, piranhas have shown up in local waterways around the globe from Great Britain to China to Texas. It's legal to own a piranha in some areas, but obviously it's never a good idea to release them into the wild as the species could become invasive.



4 Piranha teeth are pretty intense but replaceable - Piranhas are known for their razor-sharp teeth and relentless bite. The word piranha literally translates to “tooth fish” in the Brazilian language Tupí. Adults have a single row of interlocking teeth lining the jaw. True piranhas have tricuspid teeth, with a more pronounced middle cuspid or crown, about 4 millimeters tall. The shape of a piranha’s tooth is frequently compared to that of a blade and is clearly adapted to suit their meat-eating diet. The actual tooth enamel structure is similar to that of sharks. It’s not uncommon for piranhas to lose teeth throughout their lifetime. But, while sharks replace their teeth individually, piranhas replace their teeth in quarters multiple times throughout their lifespan, which reaches up to eight years in captivity. A piranha with half of its lower jaw chompers missing isn’t unusual.



5 A strong bite runs in the family - Though they are hardly as menacing as fiction suggests, piranhas do bite with quite a bit of force. In Scientific Reports, researchers found that black (or redeye) piranhas (*Serrasalmus rhombeus*)—the largest of modern species—bite with a maximum force of 72 pounds (three times their body weight). Using a tooth fossil model, they found that piranhas’ 10-million-year-old extinct ancestor, *Megapiranha paranensis*, had a jaw-tip bite force (the force that jaw muscles can exert through the very tip of its jaw) of as high as 1,068 pounds. For reference, the *M. paranensis* when alive weighed only 10 kilograms (about 22 pounds), so that’s roughly 50 times the animal’s body weight. Science notes that T. rex’s estimated

bite force is three times higher than that of this ancient piranha, but the king of reptiles also weighed a lot more. *M. paranensis* had two rows of teeth while modern piranhas have just one. It’s not clear exactly what this ancient fish ate, but whatever it was, it must have required some serious chomps.

6 Humans and capybaras are only part of the diet if these prey are dead or dying - The idea that a piranha could rip a human to shreds is probably more legend than fact. For the curious, Popular Science spoke to some experts who estimate that stripping the flesh from a 180

pound human in 5 minutes would require approximately 300 to 500 piranhas. Cases of heart attack and epilepsy that ended with the afflicted drowning in a South American river do show evidence of piranha nibbles, but in those instances, the victim was already deceased when piranhas got involved.

While the myth of the man-eating piranha belong to movies, the Internet has a wealth of mysterious footage of piranha packs taking down capybaras. Some piranhas do eat small mammals, but as with humans, it’s usually when the unfortunate animal is already dead or gravely injured.

7 Some piranhas are carnivores - A typical piranha diet consists of insects, fish, crustaceans, worms, carrion, seeds, and other plant material. A red-bellied piranha (*Pygocentrus nattereri*) eats about one-eighth of its average body mass. Crustaceans, bugs, and scavenged scraps make up the largest chunk of their meals, but the balance of this diet can shift depending on the fish’s age and the food sources available. Occasionally when resources



are low and competition for food is high, piranhas have been known to take a chunk out of a fellow piranha, living or dead. Even weirder, wimple piranhas (*Catoprion mento*) feed on fish scales, which contain a protein mucus layer that's surprisingly nutritious.

3 And some are vegetarians - Despite their flesh-eating reputation, many piranhas are omnivorous, eating more seeds than meat, and some even subsist on plants alone. For example, in the Amazonian rapids of the Trombetas basin in Pará, Brazil, scientists discovered that *Tometes camunani* lives solely off of riverweeds. Piranhas' closest relative, the pacu or tambaqui fish (*Colossoma macropomum*), also lives on a mostly meatfree diet. Pacus closely resemble some piranha species in size and coloration, and thus, are often sold at fish markets as "vegetarian piranhas" as well as other less flattering nicknames.



9 When hunting prey, piranhas go for the tail and eyes - A 1972 study in red-bellied piranhas found that the fish most frequently attacked goldfish in a lab setting beginning with their prey's tail and/or eyes. The researchers concluded that such an attack strategy would effectively immobilize piranhas' opponents and prove useful for survival.

10 Piranhas bark - From anecdotes and observational research, scientists have known for a while that redbellied piranhas make bark-like noises when caught by fishermen. Upon further examination, a team of Belgian scientists found that they make three distinctive types of vocalization in different situations. In a visual staring contest with another fish, they start making quick calls that sound similar to barks, meant as a warning along the lines of, "Don't mess with me, buddy." In the act of actually circling or fighting another fish, piranhas emit low grunts or thud sounds, which researchers believe communicates more of a direct threat to the other fish. The fish makes these two sounds using its swimbladder, a gas-containing organ that keeps fish afloat. Piranhas contract and relax muscles around the swimbladder to make noises of different frequencies. The third vocalization? Should the opposing fish not back down, the piranha will gnash its teeth together and chase.

11 Piranhas stay in packs for safety, not strength - Part of piranhas' fierce reputation stems from the fact that they often swim in packs or shoals. Red-bellied piranhas are particularly known as pack hunters. Though it might seem an advantageous hunting technique—more fish could theoretically take down a larger foe—the behavior actually stems from fear. Piranhas aren't apex predators; they themselves are prey to caimans, birds, river dolphins, and other large pescatarian fish. So traveling in shoals has the effect of protecting the inner fish from attack. Further, shoals tend to have a hierarchy of larger, older fish towards the center and younger fish on the outer edges, suggesting that safety might be the true motivation. In 2005, researchers looked at shoal formation in captive



red-bellied piranhas and found that the fish both breathed easier in larger shoals and responded more calmly to simulated predator attacks. The researchers also observed wild piranhas forming larger shoals in shallow waters where they might be more vulnerable.

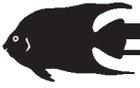
12 They'll only attack you if you mess with them or their eggs - Though piranhas have a reputation for attacking, there's not much evidence to support the legend.

Like grizzly bears, wolves, sharks, and pretty much any large scary thing with teeth, piranhas will leave you alone if you leave them alone. Black piranhas and redbellied piranhas are considered the most dangerous and aggressive toward humans. Nonetheless, South American swimmers typically emerge from piranha-infested waters without loss of flesh. For swimmers, the danger comes when the water level is low, prey is scarce, or you disturb its spawn buried in the riverbed basically situations where the fish either feel really threatened or really hungry, and thus become more aggressive. For fishermen, untangling a piranha from a net or a hook is where things get dicey. In most cases, if they bite you, they usually bite you once and usually go for the toes or feet.

13 Piranhas are attracted to noise, splashing, and blood - A 2007 study linked noise, splashing, and spilling food, fish, or blood into the river with three instances of piranha attacks on humans in Suriname. Piranhas might be naturally attuned to pick up on the sound of fruits and nuts falling from trees and hitting the water and thus mistake splashing children for the noise associated with food. As for blood, it likely does not render a piranha senseless as the movies would suggest, but piranhas can smell a drop of blood in 200 liters of water. So, if you are a bleeding rambunctious child, a cool dip in the Amazon might not be the best idea.

14 They're great grilled or in soup - In some parts of the Amazon, eating piranha is considered taboo—a common cultural perception for predatory fish—while others are convinced it's an aphrodisiac. Piranha soup is popular in Brazil's Pantanal region, but many choose to serve the fish grilled on a banana leaf with tomatoes and limes for garnish. Put the myth of evil piranhas to bed, and instead enjoy a nice bowl of piranha soup. 





Scientists Single Out a Suspect in Starfish Carnage:

Warming Oceans



A sunflower star off Alaska. Their limbs can number between 16 and 24 and can span four feet across.

Credit: Jennifer Idol/Stocktrek Images, via Science Source

In 2013, starfish — including the morning sun star, the richly hued ochre star and the sunflower star, whose limbs can span four feet across — started dying by the millions along the Pacific Coast from Mexico to Alaska.

They were succumbing to a wasting disease. It began with white lesions on their limbs, the dissolution of the surrounding flesh, a loss of limbs and finally death. Understanding, let alone solving, the problem would take research.

One day, shortly after the epidemic began, **Drew Harvell**, a professor of ecology and evolutionary biology at Cornell University who had been sounding the alarm about the disease, received a curious letter.

“I received a \$400 check in the mail from a group of schoolchildren from Arkansas,” Dr. Harvell said. “These kids were so upset about the idea of starfish disappearing from the oceans that they went out and they did this fund-raiser and raised 400 bucks for us to help in our research. I never asked them to do this. They just did. Dr. Harvell matched it with her own money, and a donor kicked in quite a bit more. “That was what funded some of our early surveys,” she



said. “These kids, who none of them had been to the Pacific Ocean, but they just needed to know those stars were there.”

One of the ultimate results of the children’s donation, a paper that sheds some light on the decline of the starfish, also known as sea stars, was published Wednesday in the journal *Science Advances*. The main suspect: our warming oceans.

In 2013, parts of the Pacific Ocean became unusually warm as part of a broader marine heat wave, nicknamed the Blob, that would last through 2015 and that was very likely exacerbated by human-caused global warming. But while the ocean warmed, it didn’t warm evenly, making it hard to tell if the heat wave was contributing to the starfish deaths.

In the study, which was led jointly by Cornell and the University of California, Davis,

Dr. Harvell and her colleagues compiled data from citizen-scientists and the National Oceanic and Atmospheric Administration. Then, they compared changes in the sunflower star population with changes in ocean temperature during the outbreak.

While the disease affected 20 species of starfish, the researchers focused on the sunflower star because it was especially hard hit and because there was good historical data on its population before the epidemic.

The researchers found that the die-off of the sunflower star matched the pattern of heat spreading through the ocean.

The researchers found that the die-off of the sunflower star matched the pattern of heat spreading through the ocean.



Images taken 20 days apart off British Columbia in October 2012, the outset of a starfish wasting disease.

Credit: Neil McDaniel

According to **Rebecca Vega Thurber**, an associate professor of environmental microbiology at Oregon State University, who was not involved in the study, “What’s really exciting about this paper is the really strong correspondence between this temperature anomaly that occurred during that year when the sea stars started dying.”

Everywhere the warming went, the sunflower stars sickened and died.

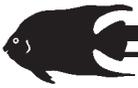
The study showed a correlation between warming temperatures and the spread of the

disease, not a direct cause. But it corroborates a hypothesis that was initially questioned because the virus that researchers think is responsible also shows up in healthy sea stars.

“That trigger, in the case of this paper, seems to be temperature,” Dr. Vega Thurber said.

Dr. Vega Thurber pointed out that the presence of a particular pathogen does not necessarily mean a disease will develop.

For example, if you’ve had chickenpox you are carrying the virus that causes shingles.



Roughly a third of carriers will develop the disease, but two-thirds won't. It takes something to prompt its emergence.

Heat has also been implicated as a trigger in the spread of a fungus that is wiping out frog and toad populations around the globe, as well as in coral diseases. In fact, when corals bleach or lose their symbiotic algae because of warming oceans, it's typically disease that ultimately kills them.

There are things we can do to help marine life, Dr. Harvell said. We can replant seagrass beds and protect mangroves, for instance. But, ultimately, we need to stop climate change, she said. The world's oceans have absorbed more than 90 percent of the atmospheric heat humans have caused by releasing greenhouse gases.

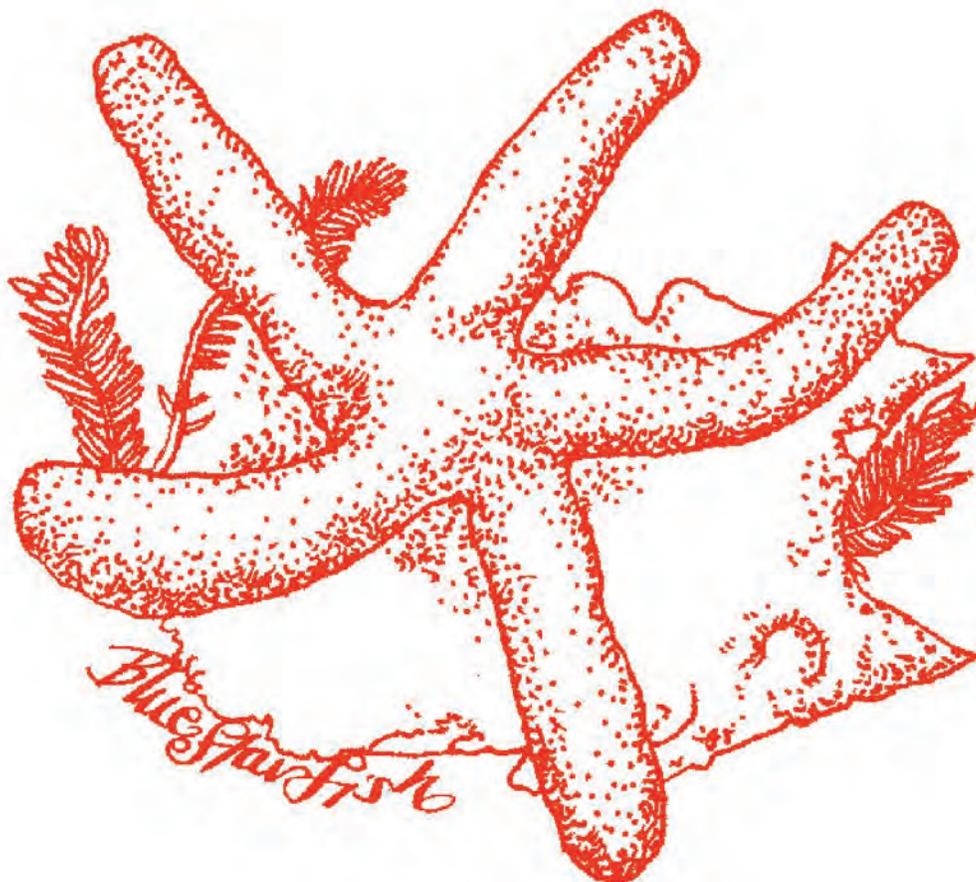
While some affected sea stars have begun to return to American waters on the West Coast, the sunflower star has not returned off the lower 48 states.

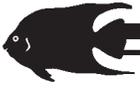
But last summer, on the south coast of Alaska, researchers saw a glimmer of hope: the reappearance of sunflower stars, which had disappeared from Prince William Sound during the outbreak.

"We don't know where exactly they came from," said **Brenda Konar**, a professor of marine biology at the University of Alaska, Fairbanks, who was not involved in the Science Advances study. "They were pretty small and we don't know if they're going to survive. So we're really curious about what we'll see next summer."

If they make a comeback, the Arkansas students, who are now teenagers, will likely be delighted. 

Kendra Pierre-Louis is a reporter on the climate team. Before joining The Times in 2017, she covered science and the environment for Popular Science. @kendrawrites





Corydoras Look-a-likes



Corydoras rabauti



Corydoras zygatus

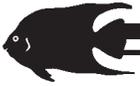
More than thirty years after I first spawned and raised the two look-alike species *Corydoras rabauti* La Monte, 1941 and *Corydoras zygatus* Eigenmann & Allen, 1942 there is still a great deal of debate as to which one is which. Here I will try to eliminate all doubt.

The first point to establish is the fact that we are indeed looking at two distinct species, when the type specimens were examined, the differences between them were very small and the debate was whether in fact they were one and the same species. I spawned *Corydoras zygatus* on 21st April 1980 and then three months later on 23rd July my *Corydoras rabauti* spawned. Here I must say that I had not set out to prove anything, other than that I could successfully induce Corydoras species to breed. I had at that time successfully spawned and raised sixteen species, keeping detailed notes on all of them, especially the patterns of

the developing fry. This was something that had interested me from my very first Corydoras spawning, the tiny fry of *Corydoras pygmaeus* were so different from the adults I thought it would be something worth keeping notes on.

Several specimens of fry from each spawning, along with an adult female from each spawning group were preserved and sent to **Dr's Nijssen** and **Isbrücker** for examination. Their conclusion was that they were indeed two distinct species having almost identical adult color patterns.

So how do we tell these species apart, with some difficulty I may say? Having kept both species



for more than twenty years, I have become quite adept at separating them. The biggest setback is that they are usually imported together, although they come from different localities, because of

their color pattern similarity they are very often mixed together at holding stations prior to being exported.



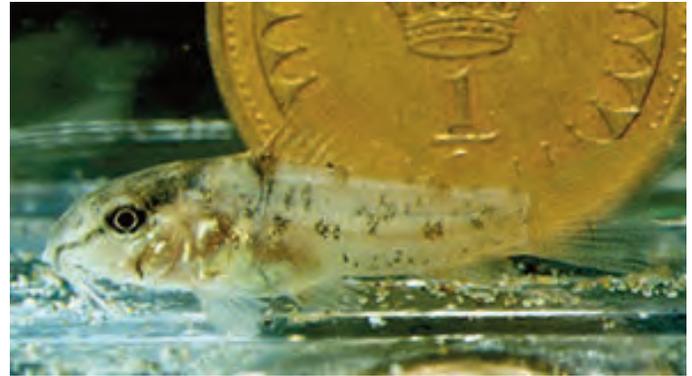
Corydoras rabauti at 6 – 7 weeks

Corydoras rabauti

Size: mature adults: males 45 mm females 50 mm.

Color pattern:

Body reddish tan, lighter on the belly. A dark broad dark grey band extends posteriorly, from the centre of the head just below the dorsal fin spine and along the dorsal scutes to the caudal peduncle. From where it extends across and down into the ventral scutes, then into the lower caudal fin. The band has a matt appearance with very little if any metallic overlay. There is a bright orange patch below the dark band and above the eye, positioned in line with the dorsal fin spine.



Corydoras zygatus at 6 – 7 weeks

Corydoras zygatus

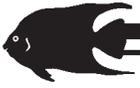
Size: mature adults: males 65 mm females 70 mm.

Color pattern:

Body light reddish tan, lighter on the belly. A dark broad dark grey band extends posteriorly, from the centre of the head just below the dorsal fin spine, along the dorsal scutes to the caudal peduncle and does not pass either into the caudal fin or onto the ventral scutes. There is a metallic green sheen covering the dark band. There is in most specimens a break in the band, which occurs on the scute adjacent to the dorsal fin spine. There is a light pink/orange patch below the band just above the eye. 

There is also another area where these two species differ; this is in the eggs that they produce. A single female *Corydoras zygatus* can produce in excess of 600 eggs in one spawning session. A *Corydoras rabauti* female on the other hand only produces up to 100 eggs. There is also a difference in egg size and the number laid at a time. *Corydoras zygatus* lays 1.0 mm diameter eggs and produces them in groups of 4 – 12 at each mating. *Corydoras rabauti* lays eggs that are nearly twice the size at 1.75 mm diameter but only produces 3 – 6 at each mating. The sites favoured to deposit their eggs by each of these species also vary. *Corydoras zygatus* prefer to deposit their eggs on solid objects near to the surface of the water; *Corydoras rabauti* however like to lay their eggs in a variety of places and at all depths, mostly they favour fine leaf plants such as Java moss, or the fine roots of plants like Java fern.

Originally there was another species involved, *Corydoras myersi* Miranda Ribeiro, 1942 this proved to be a synonym of *Corydoras rabauti*, although I still see the name being used today.



THE FISH FIRST AID KIT

When you travel any distance with fish and they are going to be in a show tank or in an ice chest in a hotel room for an indefinite period of time, you will always need something to help them survive. According, we have devised a "first aid kit." if you will, for our fish.

The first few choices are obvious if you are attending and auction. You will always need bags, rubber bands, black felt markers, and nets. Bag Buddies are tablets that contain water conditioners as well as a mild sedative so your fish do not stress out while being in bags.

A siphon hose is one of those "just in case" items, as are plastic cups and scissors. Clear boxing tape comes in handy when you are selling pairs or breeding groups of fish and you need something to keep all the bags together. It can also be used to tape down lids of styrofoam boxes to keep them from flying off during transit.

A large hang-on-filter box makes an excellent bag holder. They prevent your bags of water from collapsing all over the floor while you are attempting to put fish in them. A small rectangular trash can will work just as well.

When you are traveling to a new part of the country, you should test that area's water to help determine what you need to add to the water your fish will be in so they are more comfortable.

Novaqua and Amquel condition the water as well as remove harmful chemicals. Baking soda adjusts pH, and sea salt adds trace elements. We hope that we are never stopped and searched by law enforcement officials; they would throw is in jail if they found all our "white powdery substances" in those little containers.

If your fish are in show or rental tanks you can either carry lids to fit the tanks or stretch plastic wrap over them. They will keep the fish in the tanks and maintain water temperature at an acceptable range.

When on a trip, we carry our own bacteria-laden sponge filters in an ice chest or a five-gallon bucket. Plus you need the air pumps and air line tubing to run them, as well as numerous electrical outlets; therefore the need for the five-way electrical outlet strip.

We have literally amazed people with our "fish first aid kit." It has taken us several trips to amass the list of things we take. We probably have more things than we need, but our philosophy is that it's better to take it and not need it, than to need it and not have it.

Hopefully our learning experiences will be of assistance to you the next time you are traveling with fish, and will make your trip a success. 

OUR FISH FIRST AID KIT

The following items are put in a large covered Rubbermaid container:

1. Fish bags - various sizes as needed.
2. Rubber bands.
3. Nets.
4. Bag Buddies.
5. Siphon hose.
6. Novaquel.
7. Amquel.
8. Baking soda.
9. Sea salt.
10. Test kits or test strips.
11. Fish foods.
12. Black felt-tipped permanent marker.
13. Larger hang-on-filter box.
14. Plastic cups.
15. Bacteria-laden sponge filters.
16. 5-gallon bucket with lid.
17. Clear placking tape.
18. Air pumps or battery powered air pumps.
19. airline tubing.
20. Five-way electrical outlet strip.
21. Clear plastic wrap.
22. Scissors.



Exchange Editors Report



The **Raleigh Aquarium Society** has an interesting article called The Cuban Lima in their October newsletter, published in July 1989 by **Bob Goldstein** who traveled to Hawaii for a billfish conference. He wrote about different fish species that he brings home and breeds such as sailfin Mollies and types of *Poecilia vittata* (was called *Lima vittata*). He also describes what he has learned to have them multiply. And even though these were basic livebearers he was still happy to have them.

North Jersey Aquarium Society, September newsletter had information on the elephant nose tropical fish. They are not a beginner fish hobbyist's choice. The fish is nocturnal and a carnivore. This species of fish is very sensitive to chemicals thus it is difficult to

maintain a well-balanced environment. They also mentioned the type of diet they have such as black worms, frozen or alive. They are peaceful fish that need planted aquariums and open space with driftwood for hiding during the day.

In the **Bucks County Aquarium Society** October newsletter there was an article by **Tony Patti**. He spoke about his experience at the 2019 Keystone Clash in West Harrisburg, PA. He said when here-entered the fish hobby the Bucks County Aquarium Society was the only fish related club he participated in until he went to the **Keystone Clash** and for him, it was a great experience. He mentioned that there were 125 pre-registered attendees, 11 presentations, 18 vendors and 350 fish there. 



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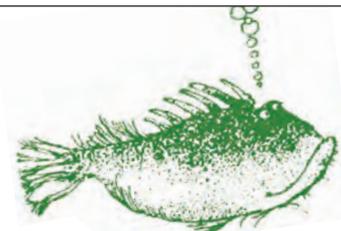
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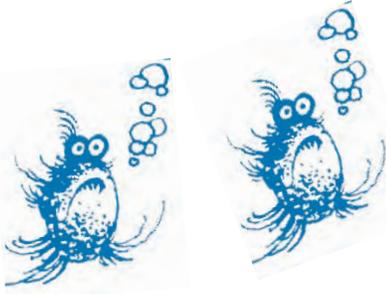
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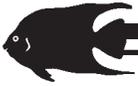
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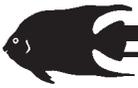
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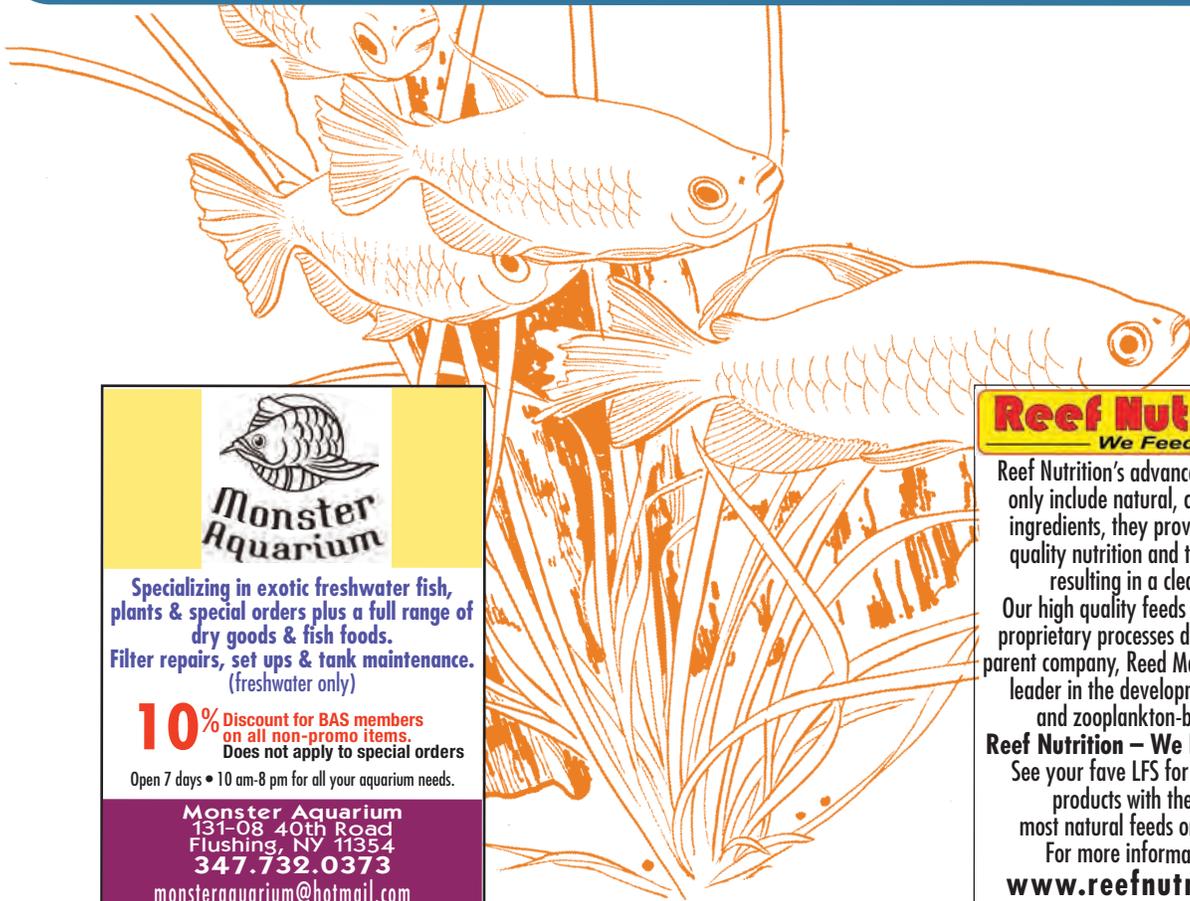
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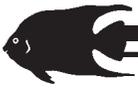
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Your Membership Card is your Passport to Becoming an "Educated Aquarist." Don't lose it. Put it in your wallet or purse. You'll need it to attend Monthly Events and get discounts at participating pet stores.

YOUR MEMBERSHIP BENEFITS INCLUDE:

Free Admission to all general meetings, held on the 2nd Friday of the month (except July & August) at 7:30 pm at the Education Hall of the New York Aquarium, Coney Island, Surf Avenue at West 8th Street, Brooklyn, N.Y. The Society presents expert speakers on all aspects of the hobby, from freshwater fish to marine aquatic life.

Breeder Awards Program (BAP) – Certificates and trophies awarded.

General meetings are open to the public (a \$5 donation is requested for non-members, good towards membership that evening). Free parking and free refreshments.

Special Interest Groups (SIGs) hold meetings, free at members' homes, for members only. Here's your chance to network with members with the same interests. Discuss, ask questions, learn, teach and develop your expertise in freshwater and/or marine aquarium keeping.

Aquatica, The Journal of the Brooklyn Aquarium Society, our bi-monthly (5 issues except July & August) award winning publication is on our web site. Each issue is filled with articles on both marine and freshwater aquaria keeping. Articles can be downloaded.

The **BAS Bulletin**. All members receive our monthly (10 issues except July & August) Newsletter, the **BAS Bulletin** via email, keeping members up to date on the latest events at the Society, notices of interest and monthly regional society events. All non-commercial members are entitled to a free clas-

sified want ad in each issue, to sell, give away or request fish or dry goods.

The **BAS is on-line at BASNY.org**.

You'll find up-to-date information about our monthly events, links to other aquarium societies in the US and stores, manufacturers and related aquarium sites. We have an on-line library with downloadable articles. We have our own BAS forum, where you can interact with other freshwater, marine or reef members and post free hobby-related classifieds where members sell and trade fish, corals, plants and equipment.

BAS Hotline: For the latest information, call the BAS 24 hour Hotline 718 837-4455 for event and inclement weather information. If you need advice on fish keeping, breeding or where you can find rare or hard to find fish, you can often get help calling the Hotline. Help from the Hotline is always free.

Volunteer: The Brooklyn Aquarium Society is an organization run by volunteers. Without them, there would be no BAS. Volunteers help set up events, write articles, coordinate projects, assist and work on committees, help at auctions and meetings. Join in, help, learn and have fun doing it. Call **Steven Matassa**, President (718) 238-1792.

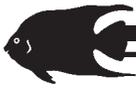
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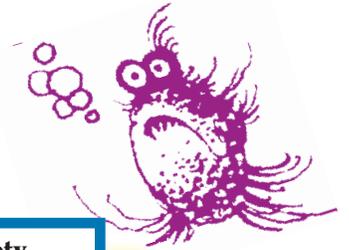


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1yr. \$20	2yr. \$36	3yr. \$51	4yr. \$68	1yr. \$25	2yr. \$45	3yr. \$63	4yr. \$85	(UNDER 18 YEARS)

*If family membership, please list all family members. **Only first two listed will have voting rights.**

1 _____ 2 _____ 3 _____

4 _____ 5 _____ 6 _____

Number of tanks marine freshwater **Do you breed fish?**
[yes] [no]

If yes, what types do you breed: _____

Special interest (if any) _____

How did you hear about BAS [friend] [dealer] [flyer] [*Aquatica*] [mag ad] [online] other _____

To volunteer check [yes] [no] A board member will contact you if you check yes.

On occasion, the Brooklyn Aquarium Society uses its mailing list to send notices of interest to our members.

If you **DO NOT** wish to receive these mailings please check here

Official use

Member number: _____ Type of membership [F] [I] [S] Date paid: _____ Board approved date _____ Amount paid: _____ Renewal/member since _____