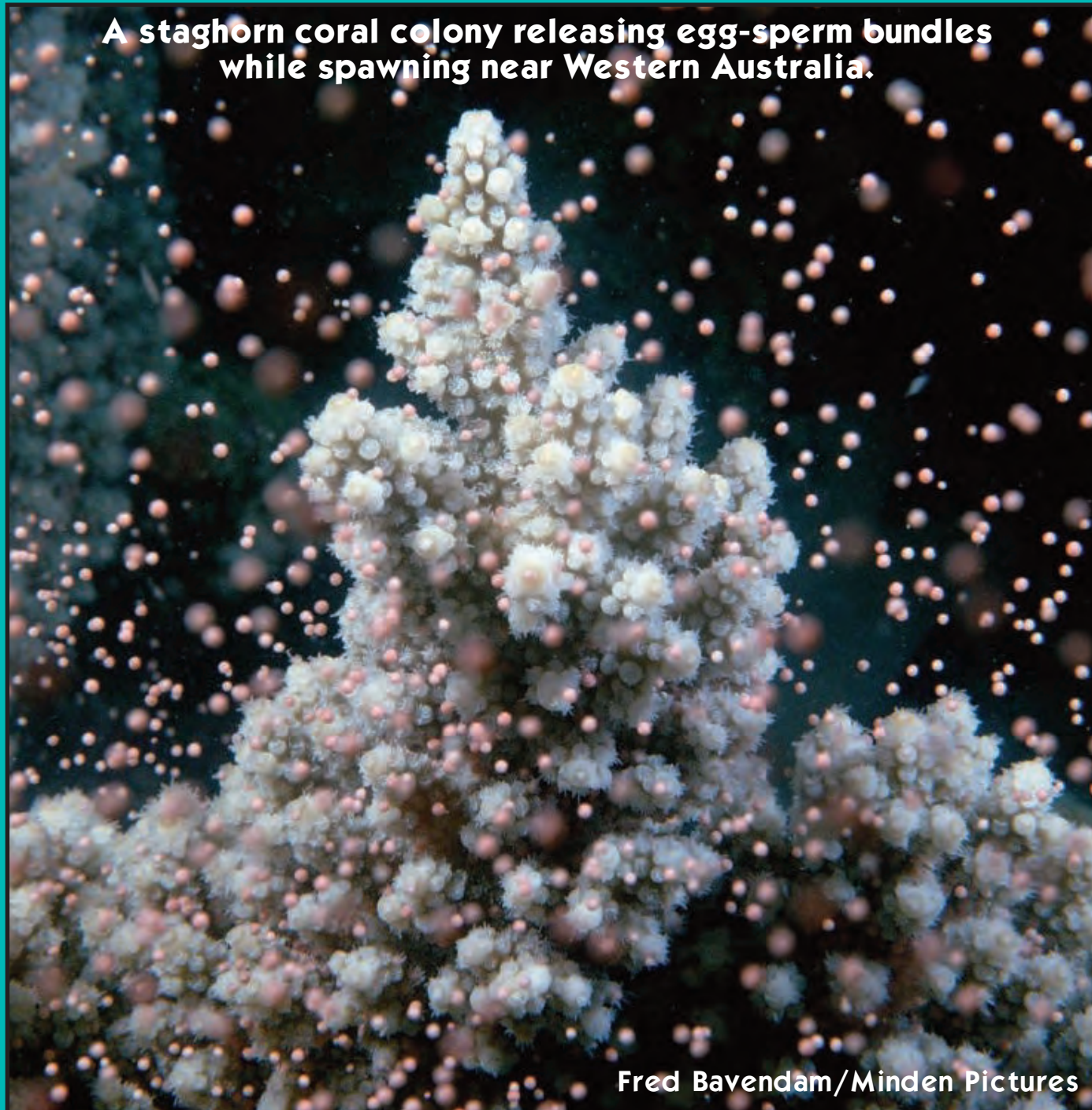


AQUATICA



THE ON-LINE JOURNAL OF THE BROOKLYN AQUARIUM SOCIETY
VOL. 33 SEPTEMBER ~ OCTOBER 2019 No. 1

**A staghorn coral colony releasing egg-sperm bundles
while spawning near Western Australia.**



Fred Bavendam/Minden Pictures



108 YEARS OF EDUCATING AQUARISTS **AQUATICA**

VOL. 33 SEPTEMBER • OCTOBER 2019 NO. 1

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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:

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Brooklyn Aquarium Society

CALENDAR OF EVENTS 2019 ~ 2020



Welcome to a new season
of great speakers, auctions and
fish friends.

SEPT 13 Tullio Dell Aquila - The Facts of Light: Fact & Fiction ~ Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

OCT 11 Giant Fall Auction - Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

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 Yaillo - TBD - Followed by an auction of marine fish, aqua-cultured corals, freshwater fish, plants & dry goods.

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

APR 10 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

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.



Keep aquarium additions healthy



Introducing New Fish into Your Aquarium

Building and maintaining a successful aquarium depends largely on knowing and following best-of-practice procedures based on the collected experience of experts and enthusiasts.

Freshwater Community Aquarium. After outfitting your tank with the necessary equipment to establish the optimal environment for your aquaria, the next step toward success is selecting the species that are compatible with one another.

Our Compatibility Charts will help you select new fish that are most likely to successfully co-exist with established tankmates.

Understand that the chart is a guide only and that fish, like people, are individuals with distinct "personalities". A particular fish may react differently than what is indicated in the chart when exposed to



an unfamiliar environment.

In terms of compatibility, remember that the larger the aquarium, the easier it will be to mix fish with different behaviors. Many species are very territorial, and even more passive fish can exhibit territorial behavior if you try to maintain too many fish in an inappropriately sized aquarium. Also, a fish's behavior will change the longer it is kept in captivity. It is advisable to add

smaller, more passive fish first, gradually working up to larger, more territorial fish.



Introducing New Fish

Correctly introducing new fish to your aquarium is important not only for the health of the new fish, but for your existing fish as well. When incompatible fish are added to an aquarium, the weakest fish will be stressed, which could result in disease that affects all of the inhabitants. For this reason, we highly recommend that all marine aquariums be equipped with a properly sized UV Sterilizer to help further reduce the possibility of disease.


After following the step-by-step Acclimation Procedure for your new fish, here are a few tips we recommend to make the transition to its new home as stress-free as possible for your new tankmate:

- Use a quarantine tank. A quarantine tank is a vital piece of equipment that should be used by all aquarists. In addition to preventing the spread of infectious disease from new arrivals, quarantine tanks allow new fish to get adjusted to a new type of water and food. And, when not in use for acclimating new fish, quarantine tanks double as hospice aquariums for dosing or isolating sick fish
- Provide plenty of hiding places for your new arrival. Rocks, sheltering areas will reduce aggression and thus stress in the aquarium.

- Maintain good water conditions through proper maintenance to ensure a healthy environment during this stressful period.
- Try to add more than one fish at a time to an established aquarium. The chance of one particular individual being singled out and harassed will be minimized.
- Always feed your aquarium before any new fish are introduced. This will help to reduce aggression toward new tankmates.
- Rearrange decorations in the aquarium before

the introduction to distract existing fish and remove established territories. This will help the new fish by putting it on equal ground as new territories are developed by all tankmates.



By following these tips and adhering to the other pre-introduction principles of proper selection and acclimation, your new and existing tankmates will have the best possible opportunity for a smooth transition with minimal stress. 



APPLE SNAILS



One day I purchased fish for a customer including three apple snails; without realizing it one of the bags containing an apple snail fell between my 125-gallon reef aquarium and a 55-gallon freshwater aquarium so we were one apple snail short.

About a month later I came across the bag, to my amazement the snail was still alive! I opened the bag and put him in a 10-gallon tank, it seemed to be fine and apparently was suffering no ill effects, well this certainly sparked my interest and I couldn't wait to get more of these snails.

On my next visit to the wholesaler I purchased six more apple snails and placed them in the same 10-gallon tank. I was always under the impression that snails ate mostly decaying vegetative matter and detritus etc. I took a net full of duckweed, which months earlier I had accidentally introduced into one of my 70-gallon freshwater

aquariums and it covered about three quarters of the 10-gallon tank. Two days later all the duckweed had disappeared in the 10-gallon tank. I placed another net

full in the tank, then I observed the snails feeding. They would go right to it; some would even travel on the surface underneath the duckweed devouring them. Once again the entire net full of duckweed was consumed in two days. I noticed they would also eat the algae on the glass while roaming all over the aquarium. To vary the diet I would also feed them flakes and goldfish sinking pellets.

The pH was kept on the alkaline side between 7.2 and 7.6 as calcium carbonate is essential for shell building. I would also place 1 to 2 drops of vitamins in after every water change which was done 50% every week. Their aquarium was decorated with four small pieces of calcareous rock to help maintain the pH level. Lighting was



a standard 10-gallon fluorescent light.


Filtration was performed with a 200-gallon per hour outside power filter with a sponge on the filter intake. The sponge was essential as you don't want the snails getting caught in the intake. Some make think this level of filtration was over kill but in my opinion there is no such thing as far as filtration goes, there can only be insufficient or under filtration. However, keep in mind that too much of a water current can exhaust and kill slow moving fish.

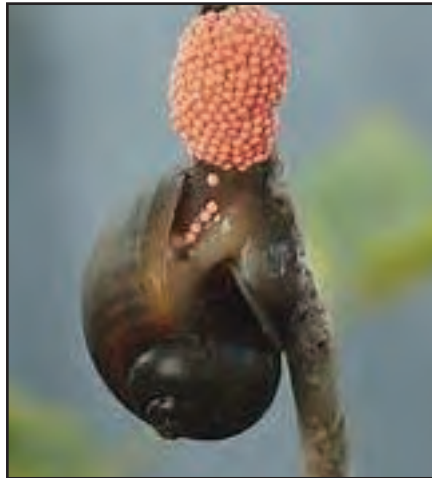
After a few months I noticed the snails had laid a large cluster of eggs that was approximately the size of a quarter with about 25 to 30 orange eggs. This was remarkably large in comparison to the size of the snails, which were approximately an inch and quarter to an inch and a half in circumference; although I have seen apple snail shells 3 inches in circumferences. I assumed the eggs they laid on the glass at the surface of the water were viable and fertile, because on a few occasions I notice the snails all over themselves assuming they were breeding. I never observed

the eggs hatching and I never saw any baby snails. I believe that the snails not hatching was due to the tank water evaporating and the eggs simply didn't have the moisture they needed.

Apple snails are very interesting, and obviously very hardy if they can last in a small plastic bag even though it was packed in oxygen, it was in there for 30 days without food and in low light so no algae to eat. When this happened it certainly sparked my interest in this little amazing invertebrate. I hope that I sparked your interest in these amazing little creatures.

I have kept apple snails with tadpoles, African clawed frogs , and goldfish but they can be kept with most fishes. I would be cautious keeping them in a planted tanks they might eat soft leafed plants. Where ever you keep your apple snails make sure you make daily inventory counts, a large dead apple snail can pollute a small aquarium pretty quickly. I'd like to remind

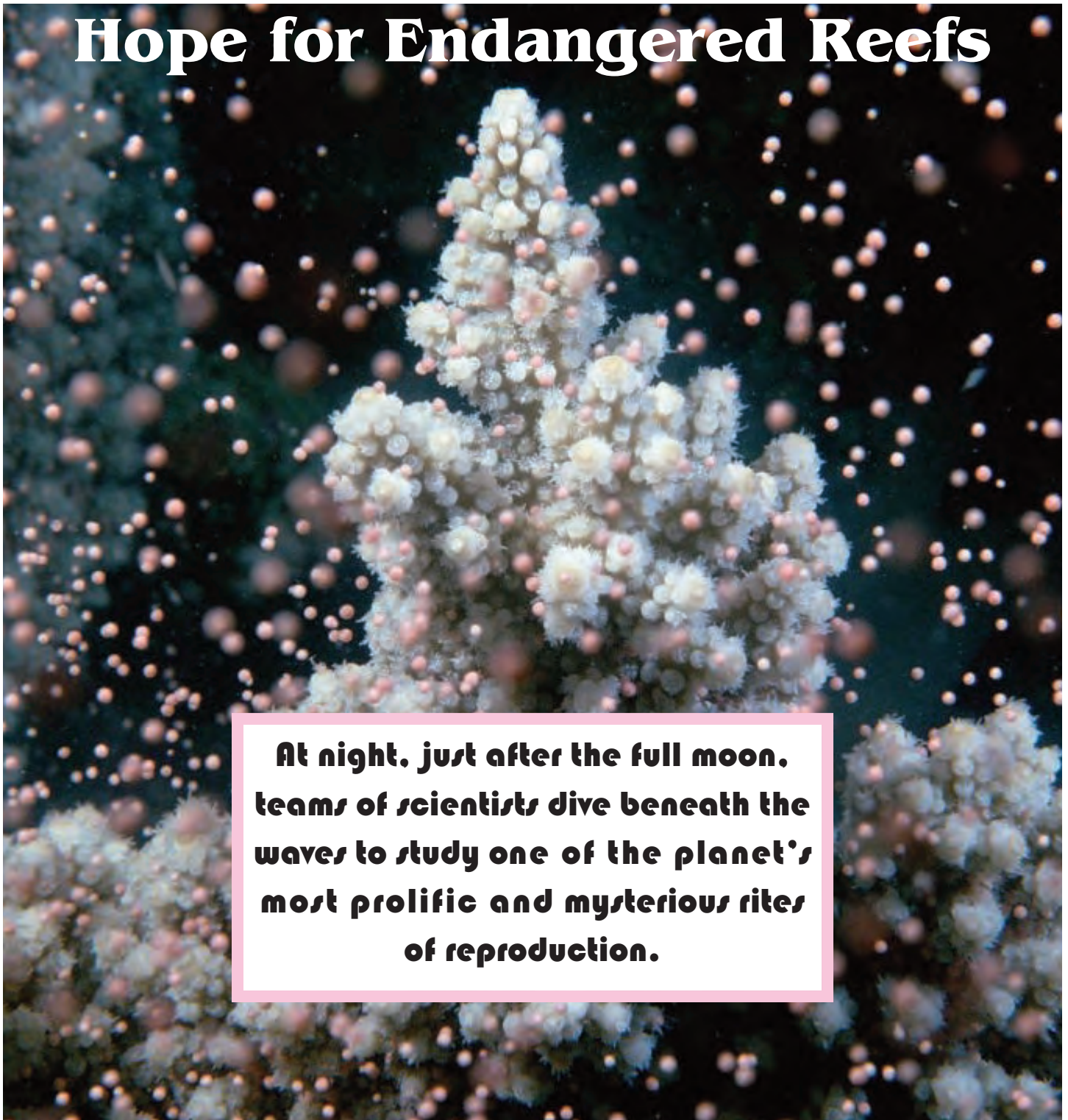
you that loaches favorite food are snails, so don't put any type of loach in a tank with snails unless you have a tank were you want to eradicate the snails. 



Al



In Secrets of Coral Spawning, Hope for Endangered Reefs



At night, just after the full moon, teams of scientists dive beneath the waves to study one of the planet's most prolific and mysterious rites of reproduction.



It's coral behaving badly — or very nicely, depending on your point of view. Warm ocean waters suddenly teem with trillions of eggs and sperm that swirl in the currents and merge to form new life, a profligate frenzy that can leave the ocean's surface awash in pink flotsam.

Globally, hundreds of species of coral engage in primordial rites of mass spawning tied to seasonally warming waters and the lunar cycle.

"It's like an underwater snowstorm," said **Emma L. Hickerson**, a veteran diver and research coordinator at the Flower Garden Banks, a coral reef 100 miles off Texas in the Gulf of Mexico.

Corals are giant colonies of tiny creatures. Each small animal has a central mouth and feeding tentacles, and secretes a stony substance around its base that binds the colony together. The reefs nurture a riot of marine species and fish stocks that feed millions of people.

Studies of the procreative dance are considered vital for helping save beleaguered coral reefs around the globe, including the Great Barrier Reef off Australia. It has suffered repeated bouts of mass bleaching, mainly attributed to declining water quality and rising temperatures because of climate change. The hope is that a better understanding of coral reproduction will aid recovery, and strengthen efforts to limit coastal pollutants and sediments that can interfere with successful coral spawning.

"A big concern is the ability to recover from the severe bleaching events," said **Emily Howells**, a coral researcher at New York University who studies the reproductive cycle.

The spectacular nature of the rite can make the research seem all the more urgent. A lucky diver waiting for the annual event might see a coral head laden with individual sex cells that look visibly swollen and ripe for release.

"Then, all of the sudden, one goes off and,

poof, they all do," said Ms. Hickerson of Flower Garden Banks. "They all release at the same time."

"It's like a wave at a stadium," she added. "You see it start at one side and go across. It's amazing. You can't make this stuff up."

In nighttime dives of recent years, videographers, including Ms. Hickerson, have taken lights and cameras beneath the waves to document the natural wonder, at times zooming in so close that viewers can see the swelling and release of individual eggs.

Shallow reefs are the main venue. But scientists in recent years have also deployed tethered robots to survey deep reefs. Surprisingly, given the diminished light and cooler temperatures,

they have discovered that deep corals can also spawn as a group, at times in synchrony with their shallow kin.

"Many people thought mass spawns did not occur in many places," said **Sally A. Keith**, a coral ecologist at the University of Copenhagen. "It's amazing how little is known about such a large-scale phenomenon."

Punctual Reproduction

As often in romance, timing is everything. If corals shed their sex cells just minutes out of sync with neighbors, the odds of reproductive success are greatly reduced.

Indeed, scientists have discovered that the group sex can be remarkably punctual, its onset typically at a precise but poorly understood time after dusk. A brain coral at Flower Garden Banks released its gametes within two minutes of its reproductive frenzy the previous year.

The liberated eggs and sperm are buoyant. They float upward through warm ocean waters to merge near the surface and, at times, form giant pink slicks containing millions of coral embryos. Recent studies have shown that the drifting youngsters can ride surface currents for hundreds of





miles and descend to found new colonies and reefs.

While scientists have learned a lot since discovering the rite decades ago, much remains unknown, especially about the exact mix of environmental factors that trigger the synchronized frenzies, which scientists call broadcast spawning. Some researchers, divers and spectators have waited patiently for coral mingling that, at least during their visits, never materialized.

Last month, Dr. Keith and 11 colleagues issued a note of caution in *Proceedings of the Royal Society of London*, considered the world's oldest publisher of scientific journals. Disentangling the proximate cues and underlying mechanisms, they wrote, "remains a significant challenge."

For centuries, scientists thought that stony corals reproduced mainly by brooding offspring and bringing forth live young.

That dogma began to crumble when graduate students at James Cook University in Australia followed a trail of clues to a nighttime mass spawning event on the Great Barrier Reef. In 1984, their discovery made the cover of *Science* magazine.

Scientists speculated that the moon's phase was important in the ritual because it controlled the tides. But the tides during spawning events turned out to be low in some places and high in others, and scientists now say the moon most likely acts as a visual stimulus to the choreographed sex.

How do eyeless creatures monitor the moon's phases and determine when the time is right to start mingling?

The breakthrough came after **Oren Levy**, a young Israeli scientist, traveled to Australia to study at the University of Queensland. Dr. Levy was fascinated by a class of photoreceptors known as cryptochromes. Originally found in plants, they had also been identified among insects and mammals. Dr. Levy wondered if corals might possess the complex molecules as well.

In 2007, he and six other scientists from Australia, Israel and the United States reported in *Science* that corals do have primitive photoreceptors, if not true eyes. In experiments, they found that the photosensitive chemicals responded to moonlight as admirably as, well, human lovers.

Increasingly, scientists track how environmental changes can disturb the procreative dance. In papers in December and February, a team of Swiss and Australian scientists reported that sediment particles from dredging and other ocean disturbances can adhere to eggs and sperm, blocking their journey to the surface and reducing the odds of successful fertilization.

"The potential of sediments to sink coral gametes," the scientists wrote, "highlights the need to carefully manage the timing of turbidity-generating human activities near reefs during spawning periods."

The Role of Seasonal Temperatures

Another recent finding concerns the central role of rising seasonal temperatures. Scientists tracking the rite globally have found that, in the Northern Hemisphere, the reproductive frenzy moves northward in a wave as springtime warmth



starts to raise the temperature of normally cool ocean waters.

With notable exceptions, the peak season of mass coral spawning seems to run from January to March in low latitudes, March to May in middle latitudes, and June to October in high latitudes.

Dr. Howells of the New York University branch in Abu Dhabi, joined colleagues to map the latitude effect for reported spawning events in the Indian Ocean and its arms, as well as the Red Sea. The rising warmth, they said in a recent paper, coincided with the northward movement of the seasonal rite.

The team focused its own research on the Gulf of Oman, a northern arm of the Arabian Sea.



During 2013, the reproductive whirl began in April. But the next year, it started in May.

Why the monthlong delay? The team reported that the average sea temperature at the study site before the 2014 event was cooler by 1.5 degrees Celsius, or 2.7 degrees Fahrenheit. The reproductive lag, the scientists reported, most likely arose from coral responding to “the optimal temperature window.”

The team studies the relatively warm seas of the Middle East as a laboratory for understanding how climate change might affect reefs elsewhere. This week in Hawaii, an international conference of more than 2,000 reef scientists, policymakers and others are struggling to find better ways of protecting the vital ecosystems. NASA this year began flying an instrument-laden jet to map global coral reefs as a means of monitoring their health.

Spawning Tourism Trade

In the Florida Keys, at relatively high latitudes, the reefs tend to go into their reproductive phase in late summer.

Last year, the big day off Key Largo turned out to be Aug. 5, five days after the full moon of July 31. Divers marveled as staghorn corals, a spiky reef builder that can grow as much as eight inches a year, released clouds of eggs and sperm.

Research teams and dive companies try to predict the exact time these love-fests happen, since they’ve become tourist attractions. “Space Available on One-of-a-Kind Reef Trips to See Coral Spawning,” said a headline at reef.org, an environmental foundation in Key Largo.

The prospective full moon this year is August 18, and tentative forecasts for Key Largo point to late that month for the reproductive frenzy. Ms. Hickerson, of Flower Garden Banks, one of 14 marine parks run by the National Oceanic and Atmospheric Administration and the northernmost coral reef on the nation’s continental shelf, expects the big night to be August 25. 🐟

Acropora millepora coral release egg and sperm bundles simultaneously.
Credit David Doubilet/National Geographic Creative





Eric Bodrock

Reprinted from *Fineformation*, August 2017
The publication of the Greater Pittsburgh Aquarium Society

WHAT I FEED MY PLECOSTOMUS



Probably the most often asked question I get is: “What do you feed your plecos?” As with any fish, the more varied the diet the better and this holds true for plecostomus as well.

Regardless of genus or species, I always keep wood in the tank with them. As fry, even with full egg sacs, I believe it is vital for success in raising them to have some seasoned wood available for them to graze on. By seasoned, I mean wood taken from an established tank which is already soaked, soft, and has a biofilm (a thin film of bacteria) covering it, not a dry piece off the shelf. In addition, for fry, seasoned leaves also provide this vital biofilm and works as well as wood. I personally use oak

leaf litter in quite a few of my tanks so there is always some available if needed when fry are on hand.

The types of wood I use are Beech and Alder, but there are a good many types that are safe to use. Some quick research online will assist with what is acceptable to use and which are not, such as Pine.

Now as you read on, please keep in mind, species that eat/require more meaty foods in the wild get more of the meaty type of foods. *Ancistrus* get more of the wood diet with some



vegetable based foods and omnivores get a good mix of it all. This all boils down to knowing what your fish should be eating.

Frozen foods are some of the better types of the foods I offer. The ones I use regularly include: Bloodworms, Shrimp (what we eat!), most of the Repashy gel types and earthworms. The sinking dry foods that I use most often include: Sera Catfish Chips & VipaChips. Earthworm, Krill, Shrimp, Carnivore, Blackworm and Spirulina pellets.

With dry foods my thinking is that each type is made with different ingredients and may provide a slightly different nutritional value than the next, so occasional feedings, even if it is only once every couple of weeks, gives your fish a little better balanced diet. Foods that I have that fit into this category include, in no particular order: an assortment of New Life Specrum pellets, Plecocaine, Hikari Wafers, Xtreme Cat Scrapers & Catfish PeeWee, Trout Chow, and anything I receive in a raffle or as a door prize....all you hobbyist who attend shows, conventions or club

meetings know about those!

With all of that said, another factor to look at is that in every tank of plecos I maintain, I keep active, open water fish with them. This keeps them relaxed as they know some large predator isn't lurking above them ready to cause problems!

The bottom feeders will have the opportunity to feed on what those fish are being feed as well. That would mostly be a wide selection of about a dozen types of specialty and commonly used flake foods and often live baby brine shrimp.

Live blackworms, canned green beans, and seasonal live daphnia & mosquito larvae.

All too often I see hobbyists spending good money on nice fish and have disastrous results, or at best minimal success just maintaining them, because they feed one or two of the cheapest foods they can find, with a "special treat" of something decent once a week!

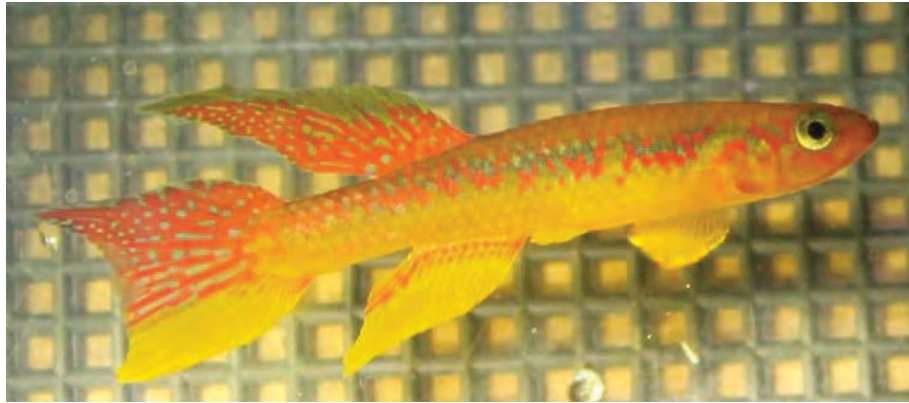
All fish need to have a good, proper diet to thrive and reproduce. 🐟





Dick VanHyfte -EIAA - BAP report
Reprinted from *FinFlap* June 2017
The publication of the Eastern Iowa Aquarium Association

Aphyosemion wachtersi **Obilly**



At the October, 2015 EIAA auction, a good friend and killifish hobbyist, sold a trio of *Aphyosemion wachtersi*. The friend had no success in breeding these fish so decided to part with them. I was not there when these fish went on sale, so my son Lee bid on them, thinking that I may be interested. I did decide to work with these and started to do some research on their requirements. I found very little information available, but did find that they had some peculiarities. My research showed that they liked soft water, were sensitive to water impurities and liked cool water (by tropical fish standards). I also found out that they did not sex out until 8 months of age, or so, and one reference stated that they had to be around a year old to produce viable eggs. At that time, I had no idea of the age of the fish, but knew that they must be at least 8 months old.

The water they were in was extremely hard, so I had to take a considerable length of time to acclimate them to soft water. I finally got them from the starting conductivity of 600 ppm down to about 100 ppm after about a month. The temperature in my fish area was already fairly

cool going into the winter months, so I did not make any special attempt to lower the temperature. They readily accepted the various live and frozen foods I offered. Some long strand fiber peat moss was put on the bottom of their 5-gallon aquarium, a sponge filter was fitted, some Christmas moss added, and a spawning mop with float put into



place. I kept the water level fairly low, so only about 3-gallons of water was in the aquarium.

I now just

went into normal water change and feeding routine, just waiting for eggs to appear. So I waited, and waited and waited some more. I could not get them to produce eggs. I added black water extract and Spawn Aid, but still no results. Sometime in this waiting period, one of the females died, leaving me with just a pair.

The fish were reasonably attractive but I started to become disenchanted, figuring that a lot of effort was going to these non-productive fish. I felt certain that I had to be in their spawning



window, and I was running out of time. Most killies just don't live that long. I did keep them fed and properly maintained. I moved the fish to a low location to ensure that they had low temperatures. I seldom saw the fish since they usually hid quite well when I tried to check them out. Finally, one day in early winter of 2016, I got a chance to see the pair in fair light. To my surprise, the male had developed very nice fin extensions, a lyretail and much better color. Suddenly, my interest returned. I checked out the photos of this species on the web and found that my fish obviously were much more attractive than those photos. This was exciting. We now believe that the fish must obtain considerable age (for a killie) before showing the full color and fin development potential. Upon conferring with Lee, I discovered that my spawning pair are over 3 years old. They do not show any signs of senility yet and are quite productive. We believe that most of the photos available in the hobby are of relatively young fish. The photo accompanying this article is of the male of my spawning pair.

I decided to really put some effort into getting this fish to spawn. I decided to try cooler conditions, so lowered the aquarium to the bottom shelf in one of my coolest areas.


I dropped the conductivity slowly to about 70 ppm and made more frequent water changes. I also added more tannin stained water from soaking catappa leaves. The temperature in the aquarium was down to 67° to 70° F.

Sometimes, the temperature would get as low as 65°F. The fish reacted by showing even better color and deportment. I could also see the caudal fin lyres extending even more. I was starting to get a few eggs, but all were infertile. I even found one fry swimming in the aquarium in December.

Many possibilities started to occur to me. Is it possible that these fish only produce viable eggs as they obtain an advanced age? Do I need

to change some water parameters to tune into the correct conditions? I elected to drop the conductivity even further. Once I got to 60 ppm, some good eggs started to be produced. I dropped the conductivity down to a range of 45 to 50 ppm and continued to add acidified "Catappa Leaf extract". The results were great. I now started to get about 90 percent fertility and the hatch rate was fairly high. The eggs tended to fungus when left on the bottom of a dish so I placed the eggs into one of my mesh bottomed hatcher tubes. Incubation conditions were the same as those found in the parents' aquarium. When fry hatched, I often fed them BBS while still in the hatching tubes. I was harvesting over 15 eggs per week and these took about 3 weeks to hatch. The fry are then moved from the hatch tube into plastic shoeboxes. Feeding with microworms and BBS continued. Growth was slow and water was monitored for cleanliness.

I now have about 40 fry and another 30 good eggs. I imagine that I will have to maintain them for 8 months before distributing, except for the BAP juveniles, to ensure both sexes are present. I am anxious to see the coloration on the fry to see if they carry the remarkable attributes of the parents.

I would recommend this fish to killifish hobbyists that are more advanced, and have a lot of patience. One of the spawning tricks is to keep this species alive long enough to spawn. This is obviously a long life killie that will test the hobbyist's expertise. I am interested in finding out how long my spawning pair of *wachtersi* will look good and remain productive. 

References:

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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 upon 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 angels 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.



Juvenile blue girdled angel

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 fin 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 fin are tangerine orange, edged in neon blue. A small black dot is in the uppermost rear 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° - 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 a week. I have had good results feeding this fish both zucchini and kiwi of all things! Not 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 Ich too!

Blue girdled angels 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 angels 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 corals of some specimens. Especially adults.

That said I still find this angel to be awe some! 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.

Tony



Joe Graffagnino - BAS

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ARTICLE FROM THE FILES WORTH READING AGAIN



I have bred many species of fish, but I have never seen black eggs. I was amazed when I saw them and from a West African cichlid no less. I obtained a breeding pair of *Tilapia snyderi* from fellow fish breeder **Vinny Babino**. Vinny informed me that these are very beautiful fish, with striking color markings. They are aggressive fish when spawning and protecting their young, and they are the gift that continues to give – once they start spawning, you can't get them to stop.

Tilapia snyderi are the smallest of all *Tilapia* and they hail from Lake Bermin in Cameroon, West Africa. This species' common name is "Snyder's dwarf tilapia." There are three colors that these species can display, based on their mood and especially during breeding. They can go from a pale bland color to a green, to a red. In breeding dress, both the male and female are absolutely stunning with a green top that goes to the middle of their body (lateral line) which extends from the head through the anal fin. The lower portion of the body is an orange red. But that's not all -- the face changes color as the mouth becomes a dark black, while the lips become pure white -- truly amazing coloration on a fish that gets no larger than 4 - 5 inches.

When I received this beautiful pair of fish, I realized they were too large for a 20-gallon aquarium, so I quickly did some rearranging and since I believe in species tanks I kept them by themselves. After less than one month in their new home, they started moving large amounts of gravel in the tank. They really like to landscape. Four days after the landscaping began, the female took up residence in a small clay breeding cave that had an opening the size of a thumb. It was obvious that the male could not enter. I assumed

that they would lay their eggs on the glass bottom since they made it bare by moving all the gravel away. A day or two later I used a flashlight to see into the cave and lo and behold! I saw around 20 or so black eggs.

A few days later, they must have hatched because the parents moved the fry one foot away from the cave and under a piece of coral. I was worried for the fry because this tank was overrun with Malaysian burrowing snails, who I thought may go for the babies. However, within a few days my snail problem was a problem no more. After their yolk sacs disappeared and the fry started free swimming, I fed them microworms, vinegar eels and frozen baby brine shrimp. The fry grew quickly and they tended to clone each other, for although I initially counted around 20 eggs, I now counted about 80 swimming fry.

I would highly recommend this beautiful, but aggressive West African cichlid as a welcome addition to a species only tank. Also, this fish is on the endangered list of fish species, so maintaining this fish will help it from becoming extinct in the wild. Please share this wonderful fish with other members of local fish clubs and let everyone enjoy them. 



New to the Aquarium Hobby? 12 Considerations



Aquariums are a wonderful hobby, providing hours of restful, beautiful entertainment. They can be a great way for children to learn about ecosystems, and they can help to relieve the stress of everyday life. They do require some work, thought, and planning, and this article will help you to get started.

Your first consideration should be whether you can give your fish the care, time, and patience that they will need from you. Fish can be a large time and financial commitment, because they need special attention and equipment. And, since different fish have different needs, a trip to the library, book store, or one of many online resources makes a good starting point. For every kind of fish that you consider, you should address the following twelve areas of concern.

1. Start-up cost and fish type 2. Aquarium size and placement 3. Patience and the nitrogen cycle 4. Filtration equipment 5. Ultraviolet (UV)

sterilizers 6. Aquarium lighting. 7. Heaters and thermometers 8. Test kits and the addition of chemicals 9. Food and supplements 10. Health control 11. Buying healthy fish from the start 12. Do not forget the live plants

1. Start-up Cost and Fish Type Keeping aquarium fish typically has a fairly high start-up cost. This is mostly due to all the equipment needed to provide the fish with a proper environment. Purchasing an aquarium, filters, lights, and other essentials can add up quickly if you are not careful. Fish themselves can range from inexpensive to very expensive for special or rare species. For a beginning freshwater fish enthusiast, a typical aquarium



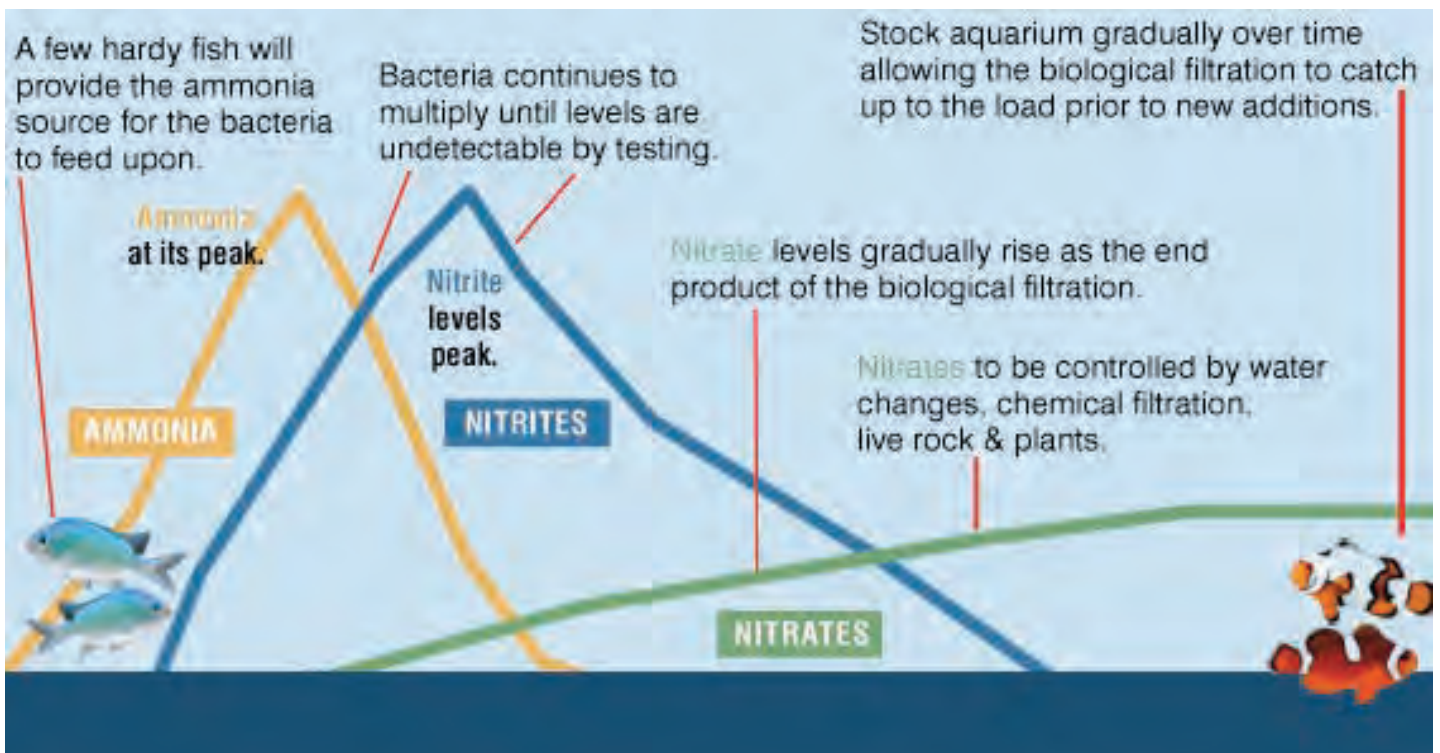
start-up cost can range from \$200 and up, depending on the types of fish and equipment selected. Marine (saltwater) fish and marine tank setups will cost more than freshwater setups. In both cases, the larger the tank the higher the cost will be.

A typical tropical freshwater aquarium can safely support one inch of fish per gallon of water, although this will vary with the amount of water surface area. (More surface area allows more oxygen, which supports more fish. Fish length is calculated at full-grown size, less the tail measurement.) Some fish are schooling fish, which by nature are more comfortable in bigger groups. Other fish may not like to be in an aquarium with any others of their own species. And, if they are territorial - as most marine fish and some freshwater fish can be - they will need more room in the aquarium than the average one-inch per gallon.

Both marine and freshwater setups have benefits and drawbacks. Marine fish are more colorful and beautiful, but require a higher level of care and expertise, so for a beginning fish enthusiast, a freshwater aquarium is recommended. Freshwater aquariums tend to be easier to main-

tain than marine aquariums because there are fewer water parameters to worry about.

2. Aquarium Size and Placement A good way to determine the size and type of aquarium you need to purchase is to get an idea of what kind of fish you find attractive. Your choice will be further restricted by where you can place the tank in your home, and by your budget. But as a general guideline, bigger is better. If you buy a larger aquarium than you think you need at first, it gives you room to add more fish later, if you choose to do so. The larger aquarium will also have more water, which can help dilute chemicals or other substances that may pollute the aquarium and cause illness in fish. No matter what size aquarium you choose, be sure that you can locate it somewhere with a level, sturdy, support surface, and where it is not in danger of being bumped into or knocked over. You should also keep your aquarium away from heater vents, windows, or doors, as these can produce harmful temperature fluctuations. Proximity to windows is also not recommended for aquariums, because it can allow too much light into the tank. Excess light





leads to algae buildup, and you will quickly find yourself fighting a losing battle.

3. Patience and the Nitrogen Cycle* You may think that because your water starts out fine as you begin your setup, that it will remain that way. Not true. As you add fish to your aquarium, their waste produces harmful chemicals. Fortunately, nature provides a solution in the form of bacteria that break down these toxic chemicals into relatively harmless chemicals. The process nature uses to eliminate toxins from the tank is called the nitrogen cycle. Fish excrete toxic ammonia as part of respiration, and decaying fish waste and uneaten food produces additional ammonia. As the nitrogen cycle begins, the ammonia is converted by special kinds of bacteria into nitrites (which are also harmful), and these are then converted into nitrates. Excess nitrates can be controlled through routine water changes. The bacteria required for this process build slowly on the surface of your filters and gravel or substrate, and the process can take up to six weeks, starting from the day that you first add fish to your aquarium.

Developing enough bacteria to maintain the health of your aquarium requires both time and patience on the part of the beginning aquarium hobbyist. You will need time to "cycle" the tank. There are various recommendations on how to accomplish this. The number one rule is to go slowly. This means, at first, you may only add some plants. After about two weeks, add a few hardy fish which are tolerant of changing water conditions. You should start with fewer fish than your aquarium can hold, then add any additional fish over a period of weeks, allowing the ecosystem in the aquarium to readjust (recycle) in between. Each step needs to be gradual so the bacteria have enough time to multiply and break down the increasing amount of waste products.

Until the nitrogen cycle is established, it can be a stressful time for new fish and for you. It is a good idea to have an ammonia test kit on

hand to monitor the nitrogen cycle by testing the water regularly. Despite the temptation to make changes to your aquarium, it is important that you not intervene unless ammonia or nitrite levels become intolerably high for long periods of time (temporary highs in both ammonia and nitrite levels are a part of the process). You should also avoid adding too many fish while the nitrogen cycle is being established, because you will disrupt the bacterial growth. As the cycle naturally progresses, the fish already in the aquarium can gradually adjust to changing water conditions with slightly elevated ammonia or nitrites. New fish might find these levels deadly.

Once the nitrogen cycle is completed, your aquarium will be able to detoxify constant levels of ammonia and other chemicals as long as you maintain the bacteria colony. Keeping those colonies healthy, or optimizing the amount of bacteria in the aquarium, can be a function of the type of filtration equipment that you choose to use.

*This classic method to cycling aquariums represents a traditional approach. Modern innovations have significantly reduced the length of the cycling process. Please take A New Look at Cycling for a quicker modern approach to establishing a functioning biological filter in your new aquarium set-up.

4. Filtration Equipment Determining the right filtration equipment is one of the most confusing but important choices that you will need to make. Essentially, aquarium filters work in three different ways.

Biological filtration takes advantage of the natural bacterial process involved in the nitrogen cycle. Biological filter media provide larger surfaces for beneficial bacteria to colonize, ensure that water passes through the colonies, and help to protect those bacteria from being disturbed. Mechanical filtration removes unsightly particles from the aquarium. This may include fish excrement, sludge, uneaten food, or dust. Tank water is



passed through a mechanical filter media, and the particles are strained out. To prevent build-up, the filter media must be cleaned regularly.

Chemical filtration can remove some dissolved wastes from the water which a mechanical

filter is unable to take care of. When water passes through a chemical filter media, the filter media chemically bonds with the waste molecules and holds onto them, thereby removing them from the aquarium.

Different filters offer various combinations of each filtration method:

- **Canister filters** incorporate various types of media under pressure to accomplish the three types of filtration. When under pressure, water is forced through media that it would not normally pass, thus providing us with great mechanical filtration. Biological filtration is accomplished with various types of media, such as Ceramic rings, and sponges. Chemical media can be any number of carbon or resins, or a combination thereof. Canisters are slightly more difficult to maintain, but allow the greatest flexibility with different types of media, and the best mechanical filtration.

- **Power filters** provide the convenience of a filter that hangs off of the back of the tank, and media changes are generally simple and convenient. Most of these types of filters use a cartridge, making media replacement



extremely convenient. Some will also employ a permanent type of biological filtration such as a sponge or bio-wheel. They are good all-around filters and great for smaller aquariums (55-gallons or less). Larger aquariums may warrant more than one, or upgrade to a different type of filtration.

- **Wet/Dry filters** use a biological media, such as Bio-balls, or Bio-Wheels, to provide a very efficient biological filter. The water is usually distributed through a drip plate or spray bar across the biological media. This allows for optimum biological efficiency, and gas exchange. A wet/dry filter will typically use a sponge or other type of media for mechanical filtration. Chemical filtration may be added by the user.

5. Ultraviolet (UV) Sterilizers UV sterilizers can be used in the control of free-floating algae, bacteria, viruses, fungus, and even some parasites. UV sterilizers incorporate a germicidal or UV lamp in which the ultraviolet rays affect certain organisms based on the amount of ultraviolet rays they are exposed to. The effectiveness is based directly on the flow rate of the water through the sterilizer, the wattage and diameter of the sterilizer itself, and the size of the aquarium. UV sterilizers are particularly beneficial in reef aquariums and marine fish-only aquariums. While some freshwater aquariums will use a UV sterilizer, they are not nearly as common and not considered essential equipment. If a larger UV sterilizer is used to

control parasites as well as bacteria, be aware that they can generate a lot of heat and may increase the need of a chiller in large reef aquariums.

6. Aquarium Lighting Proper lighting is essential for tanks containing live plants, or marine animals that are dependent on light for food. Good lighting will also make the aquarium and the animals within look more attractive. Since the animals are no longer exposed to natural sunlight, providing the proper spectrum and intensity is vital for their overall good health.

7. Heaters and Thermometers No matter what kind of fish you choose, they will have fairly specific temperature requirements. The water temperature in an aquarium must remain constant; if the



temperature fluctuates too much, your fish can become stressed, which can lead to illness. Most fish need a water temperature between 75 and 80°F. If you have one species in your aquarium, you can set the temperature specifically to reflect their needs. If, however, you have multiple species, 76 or 77°F is a safe temperature range. Marine aquariums may require more attention to keep a consistent temperature, as they tend to need more light, which can warm the water.

8. Test Kits and the Addition of Conditioners, Supplements, and Additives The welfare of your new aquarium is dependent on its water quality. You will find that you need to purchase various chemicals and additives to help it achieve and maintain the proper balance for good water quality. Depending on the fish that you choose, you may need special pH adjusters and buffers, or salt and trace element additives. Water conditioners are a must for removing chlorine and harmful chemicals from tap water, and test kits are essential to ensure that your water quality begins and remains at viable levels.



9. Food and Supplements Diet is an important element to ensure healthy fish, and the ideal diet goes beyond the basic "flaked" foods available in most stores. Flaked foods are sufficient for your fish, but feeding your fish flakes every day can be comparable to you eating nothing but rice every day and can eventually become quite boring.

There are different options when it comes to your fish's diet, but the key thing to remember is that a varied diet is best. Plan on rotating fish

food periodically and on providing supplements or vitamin boosters for added nutrition. This way the fish will be sure to receive all the nutrients they need and will remain active.

Some fish enthusiasts prefer live food. You may hear a good deal of debate about this topic as you progress in your hobby. Live food has its own set of risks and benefits and is a big enough issue that it should be left alone by beginners. Freeze-dried foods and pellets make good alternatives, as do items like zooplankton and krill, which can be purchased.

10. Health Control Illness - it happens to all living things. At one time or another, your fish may become sick. While at first you may feel helpless, do not worry; there are a number of ways you can treat your sick fish in your own home. While most of the treatments depend on the specific ailment, it is a good idea to plan ahead and get another tank set up to use as a "quarantine tank". This is also useful before adding new fish to an existing aquarium. By separating the sick fish, you can speed up the healing process and at the same time, reduce the risk of spreading the illness to other fish. Fish ailments can be caused by a variety of sources. The most common causes of sickness are fungal, bacterial, or parasitic in nature. You will need treatments for each of the main types, and it is best to keep these on hand before disaster strikes.

Before you go to buy your fish, you will need to set up your aquarium and have it running for at least 3-4 weeks beforehand to ensure that the nitrogen cycle is complete and all mechanical equipment is functioning properly. Once you are ready to buy, a reputable online retailer or pet store is a good place for beginners to buy their fish. You should decide in advance what species of fish you want and how many you want, so you can avoid temptation or pressure from pet store clerks to purchase something inappropriate. Remember that initially only a few of the hardest species should be purchased, then after several



weeks of allowing your aquarium to mature, additional fish can be purchased. There are also some things to keep in mind when you are picking out your fish in the store. Specifically, the fish should:

- **Be alert**
- **Be active, but not hyperactive or skittish**
- **Have clear eyes**
- **Have full, but not bloated stomachs**
- **Have well-shaped fins that are in good condition**
- **Be breathing steadily, without laboring to breathe**
- **Appear clean and colorful, without unnatural spots or excess slime.**

Be certain to get the fish home quickly, and ask the clerk to add extra water to the bag if you are going to drive more than fifteen minutes or so. Float the bag of fish in your aquarium to give it time to adjust to the water temperature. And, if you have made adjustments to pH or other chemical levels, gradually add water from your aquarium to the bag of fish over the next hour to give the fish time to acclimate. During this process, be careful to never add water from the fish store to the water in your aquarium. Remember, as a general rule of thumb, a tropical freshwater aquarium can safely support one inch of fish per gallon of water, though this increases with larger aquariums.




Related Information:

- [How to Set Up An Aquarium: Aquarium Basics](#)
- [Aquarium Set-up: Step-by-step Guide to Creating a Reef Aquarium](#)
- [Aquarium Set-up: Step-by-step Guide to Setting Up a Planted Aquarium](#)



12. Do Not Forget the Live Plants While live plants may be intimidating to some new freshwater aquarists, they do not have to be. If you acquire some of the hardier species, they can thrive in most aquariums and are notably beneficial in controlling algae, improving water quality, reducing stress for the fish, and making your aquarium look more natural and beautiful. If you will have plants, provide at least 1.5 watts of lamp power for every gallon of water in the aquarium (2-3 watts is better). Choose a medium to fine gravel substrate, and ideally, add a slow release fertilizer.

By following these few simple rules, you should have your aquarium up and running smoothly in 6-8 weeks. Remember that a larger tank is easier to regulate and allows a greater variety of species. While a 10-gallon tank may initially appear a little cheaper, a 29-gallon tank is a better starter tank and is going to provide a better environment for your fish, and a more diverse population of fish. 

- [Aquarium Set-up: Freshwater Aquariums Easy to Set Up, Very Easy to Maintain](#)
- [Aquarium Set-up: Fish-Only-With-Live-Rock Aquariums](#)



ARTICLE FROM THE FILES
WORTH READING AGAIN



Breeding Dwarf Red Tail Shrimp

With the growing popularity of planted aquaria, the freshwater invertebrates are enjoying an increased demand as well. It's understandable since many of them are ideal for these setups. A few months back, I ran across some of these shrimp in **Animals and Things**. This is a pet shop over in Woodbridge NJ, one of the few local places I can think of which carry freshwater shrimp with any regularity. I purchased all they had and put them in my 25-gallon guppy tank.

They are very happy in there and have been breeding. These shrimp belong to the genera *Caridina*. There are over 120 different species of *Caridina* shrimp. It is almost impossible to identify these shrimp to the species level. The freshwater shrimp hobby is going thru much the same identity crisis as South American catfish, many of which are being identified by a number. *Caridina* shrimp are (for now) being identified by their common names or simply as a *Caridina* species or something else equally inaccurate.

Identification issues aside, this shrimp is fairly distinctive. They are very small. Adults will max out at about 3/4", females being slightly

larger than males. Since the females carry their eggs under their abdomen, they are deeper bodied. Viewed from the side, their bodies are translucent. When viewed from above they are basically a dark brown with a row of triangles running down their back. These triangles are tan in color and are oriented pointing forward (I would have named them the arrow shrimp). The females, when carrying eggs, will become more intensely colored. *Caridina* shrimp have tiny claws and are completely harmless.

Their preferred water conditions make them compatible with fish like Guppies. And like guppies, they can be delicate at first, but when fully acclimated



and settled in are quite hardy. They will do fine at room temperature. They can tolerate temperatures up to 28°C but in the long run they will do best a little cooler (23°-25°C). The pH should be slightly acidic; 6.5-6.8 is fine. GH is important to these guys. Water which is too soft will not provide them with enough minerals to properly form their shells. I keep my GH in the range of 6°-7°, but do not allow it to exceed 10°. Many fish keepers raise their GH with Epsom salt. Epsom salt is composed of Magnesium Sulfate. While this may be fine for fish, I cannot endorse it for raising shrimp. The shells of shrimp are composed primarily of calcium, so magnesium is not really addressing their needs. I use Seachem's Equilibrium and or Seachem's Live Bearer Salt which contain a broader spectrum of minerals.

You can keep them in a small nano tank, but a mature planted aquarium is best. In the wild, these shrimp congregate in dense populations, so don't just get a few; get as many as you can. The *Caridina* shrimp are true omnivores. They will eat virtually anything organic. Food pellets, frozen foods like bloodworms and brine shrimp, algae, decaying plant leaves, dead fish and even the bio-film covering everything in your fish tank are all on the menu. For the most part I let them eat the algae, or the occasional tidbit that my Guppies might miss. Hikari produces a specialty food called Crab Cuisine. It is developed for crustaceans and is high in minerals. I feed them some of this product at least once a week.

They will reproduce on their own, requiring nothing more than normal maintenance. The eggs are relatively large for such a small animal. They will range in number from about 20-40. The female will attach the eggs to her abdomen until they hatch. These eggs can range in color from a kind of dirty amber to a greenish color. The term for a female carrying eggs is "in Berry." The newly

hatched shrimp are very tiny, but they are fully formed. They hatch in 28-33 days. Since the adults will not bother the hatchlings they do not need to be removed. The hatchlings are quite self sufficient. They will forage for food on their own, so no special feeding regime is required. The newly hatched shrimp will be almost impossible to find due to their small size and a habit of hiding among the plant leaves. When they get up to about 1/4" long they become less inhibited and you will start to see them everywhere. They do grow

quickly when young.

I know this all sounds incredibly easy, but they do have a couple of special requirements that you will need to address. As any reef keeper can tell you, invertebrates are extremely sensitive to Copper. Even trace amounts can



wipe them out.

Freshwater invertebrates have that same sensitivity. Obviously any medication that contains copper is out of the question, but Copper can get into your system by unanticipated means. If you have Copper water pipes in your home, you need to let the water run for a while prior to use because water standing in your pipes can absorb some Copper. You should also draw cold water and bring it up to temperature, since less Copper will dissolve in cold water than hot.

Another way that Copper sneaks into your system is by food. Some commercially prepared fish foods will contain Copper salts and are not suitable, so read that ingredient label. Their other special requirement is Iodine. The shrimp need this to molt properly. Make sure you use Iodine and not Iodide. I use Kent Marine Iodine and dose at a rate of 1/4 teaspoon per 25 gallons with my weekly 50-75% water change.

That's all that's required, so have fun. 



HOW TO SETUP AN

AFRICAN BIOTOPES IN YOUR AQUARIUM

PART 1

Deep Water Congo River



Biotopes are basically the environment which your fishes live in nature. Properly recreated, they give our fish a sense of security and normalcy, as well as giving us a view into the fishes normal behaviors.

Africa has many different aquatic biotopes. For part one of this series I will focus on the Congo River deepwater environments.

The Congo river is one of the largest rivers on the planet. Draining most of central Africa. It runs wide and deep with considerable current. South of Kinshasa [the capital of Congo] and south of Malebo Pool is a huge series of towering rapids. These rapids extend many miles thru clefts of broken rocks. The huge volume of the Congo River's flow is forced through these deep, narrow rock clefts on its way to the Atlantic Ocean. These clefts can be very deep, and the water is murky due to all the turbulence and low light levels. The deepest clefts are dark as night all day and lesser clefts have some limited light.

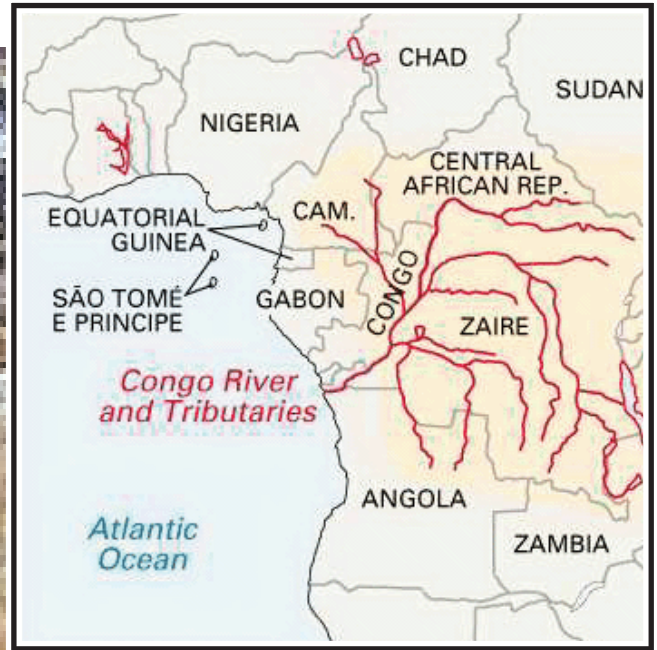
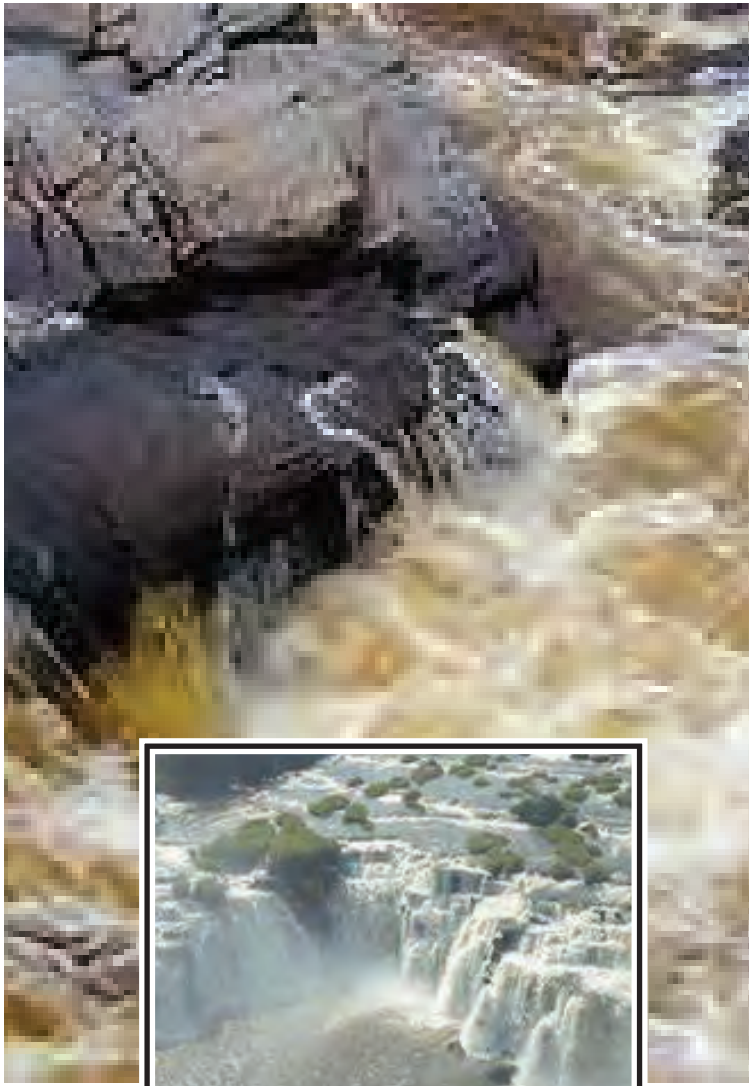
Species such as blind spiny eels, blind *lamprolous* and blind catfish inhabit these deep clefts.

There sighted relative such as the congo spiny eels, *Lamprologus congoensis*, *Teleogramma brichardi* and *Steatocranus tinanti* inhabit the lighted clefts. You can add Congo tetras for color if you wish. Setup for both levels is the same.

Here is what you need and how to do it.

First you need a long, low tank. A 40-gallon long or 55-gallon tank is best. Height is not needed as these fish stay close to the bottom where the current is slower.

As light in these environments is low, use black substrate and low lighting. Do not use plants as there are no plants in this environment.




For rocks I suggest black slate, angled at all different angles. Make as many caves as you can. Build your slate angles/caves/rocks up to at least 2/3rds the height of your tank.

Use the biggest power filter you can afford. These waters boil with current. At a minimum fully turn all the water in your tank 4 times an hour, eight times an hour is even better.

For every 20-gallons of water add 1 powerhead designed for your size tank. So for example; a 55-gallon tank would get 3 powerheads designed for a single 55-gallon tank. Place the 3 powerheads on the short side of the tank and aim their flow so it runs parallel to the tanks longest

sides. Place 2 of the powerheads so their flow is midwater and 1 so its flow is just above the substrate.

These fish love high current and waterflow. Most of the species listed that are not blind will each stake out their own cave so be sure you have created enough caves.

In a standard aquarium setup you will not see their normal darting/high energy bursts of speed that you see in a properly setup deepwater biotope tank. Enjoy this biotope in your home. 

Happy fishkeeping!

Tony



THE SECRET LIFE OF KRILL



The krill is food for whales, sea birds, penguins, squid and seals. But those predators are now in competition with commercial fisheries.

Credit: Gerald and Buff Corsi/Getty Images

SYDNEY, Australia — On an August morning aboard the Nathaniel B. Palmer research vessel floating at the bottom of the world, **Christian Reiss** was listening for acoustic signals bouncing off krill, a pinkish, feathery-limbed crustacean that is the lifeblood of the Antarctic ecosystem.

It was the last month of the Southern Hemisphere winter, and conditions were good: There was no thud from sea ice pancakes bumping together to distort his tests in the clear waters of the South Shetland Islands, about 500 miles south of Cape Horn.

Dr. Reiss, an oceanographer with the National Oceanic and Atmospheric Administration,

and his team were studying where krill live in winter.

Low levels of sea ice gave them access to bays that in previous winters were closed. They wanted to know if a lack of sea ice, where krill gather to feed off the algae that live on the underside, was threatening the ocean's largest biomass. Krill form schools that can be miles long and miles deep.

Whales, sea birds, penguins, squid and seals all feed off krill. And they compete with commercial fisheries in the same waters, who sell the tiny creatures to be used as fish food or to make omega-3 fish oil for human use.

Dr. Reiss's findings are crucial. Two hundred and fifty scientists and policy makers are now



gathered in Hobart, Tasmania, for an annual conference on managing Antarctica's marine life, including how to preserve the krill population. Dr. Reiss's five winter expeditions to the Antarctic showed that large numbers of krill remain in the open sea, in areas where fishing companies trawl for them.

At issue for scientists and policy makers is a measure that limits how much krill large commercial trawlers can vacuum from each of four designated zones of the South Atlantic. The rule, known as Conservation Measure 51-07, expires in November. It forces fishing companies to spread their fishing activity across larger areas to reduce the impact in any one zone.

Without it, penguins, sea birds, whales and other animals that feed on krill around the Antarctic Peninsula will be at risk of undernourishment or starvation.

"There is bound to be a thorough debate around it," Dr. Reiss said in a telephone call from Hobart. "Fisheries want to take all their catch from areas where they already fish. They don't want to take it from areas where they don't fish. That's the opposite of being precautionary."

The Commission for the Conservation of Antarctic Marine Living Resources is made up of the European Union and 24 other nations that have economic or research interests in the Antarctic.

The commission regulates fishing near Antarctica, and works by consensus. If one coun-



Scientists are trying to learn what melting sea ice means for the pinkish, feathery-limbed krill.


Credit: Universal Images Group/Getty Images

try blocks a measure, it fails. Last year, Russia blocked a proposal for two huge marine parks, each larger than Texas. Those parks, and a third, are back on the agenda during two weeks of closed-door meetings, which began Monday.

The Antarctic has long been an area of dispute for conservationists and commercial fishing interests. In 2015, 12 fishing vessels caught about 225,466 tons of krill in three of the designated areas around the Bransfield Strait. "We know the fisheries like to concentrate here," said **Andrea Kavanagh**, a director of the Southern Ocean Sanctuaries Campaign at Pew Charitable Trusts.

During the 1970s and 1980s more fishing took place off the east coast, when the Soviet Union trawled Antarctic waters. But fishing off the Antarctic Peninsula is more profitable. It is close to Chile and more easily accessible, and the weather permits fishing almost year round.

"We need to do a lot more to manage fishing," Ms. Kavanagh said from Washington before leaving for Hobart. She noted that krill are the mainstay of the diet of two threatened penguin species, the chinstrap and the Adélie.

Scientists estimate there could be up to 60 million tons of krill in the South Atlantic, between the tiny island of South Georgia and the Antarctic Peninsula. 

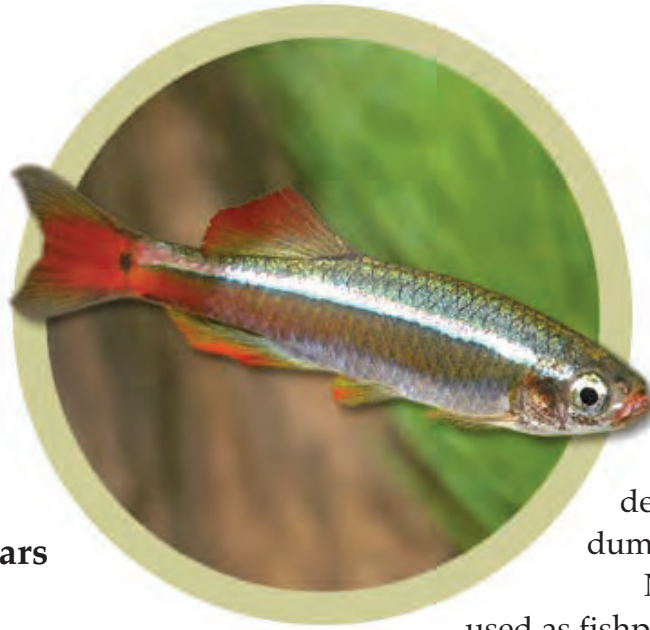




RUB-A-DUB-DUB

BREEDING WHITE CLOUDS IN A TUB!

Tanichthys albonubes



I was just as crazy
about fish 50+ years
ago as I am today.

My father built my first fish pond for me on the shore of Lake Superior at our family's summer camp. It was made of concrete blocks and it enclosed a large natural area 4 feet deep. The blocks were weighted but not sealed so fresh lake water flowed through and around them. I kept perch in that pond.

But just like aquariums, one pond was never enough. When my father remodeled the bathroom the old eagle claw bathtub (the kind of antique tub you pay a fortune for today) was

destined for the garbage dump.

No way! bathtubs could be used as fishponds, hence my second "pond". Cleansed of soap residue we set it in a flat spot in the backyard.

My mother said it was an eyesore! But to me it was a beautiful new pond.

My father added a rubber stoppered drain/stand pipe to keep the water in. Then I filled it with the garden hose.

This was a very simple pool - water plants and fish. That's it. No filters, etc.

To hide the sides of the bathtub pond we planted colorful zinnias and snapdragons



and ornamental millet grass. To hide the white my father and I glued dark brown corkboard down to the water line. I added clean sand as a substrate. The tub was in direct sun so I added hornwort, cabomba and watersprite as plants with a banana plant in a pot in the center. We went to the local nursery and bought *Lysimachia nummularia*

“gold queen” this was pinned to the damp corkboard, it soaked up water from the tub. Over time this plant grew very well and covered the corkboard. My mother said Very pretty and approved.


To the pool tub I added 12 white clouds I bought at Woolworth’s. I fed them every day and they grew very well and were very colorful. They were much too small to interest the raccoons or ravens, so they all survived. I did nothing else with my tub for the rest of the summer.



The water plants grew to fill the tub. The banana plant bloomed and occasionally a few mosquito larvae and daphnia were seen.

I let nature take its course. By labor day the tub had lots of baby white clouds in it. The babies are very brightly colored and look like neon tetras. Many years ago white clouds were often called the poor man’s neons because of that similarity.

When it was starting to get cold at night we brought lots of plants in, as well as 12 gorgeous adult white clouds and over 250 fry. I had tanks full of them.

That was a good summer. Too bad when my family moved I could not take that tub pool with me. I wish I had it now! Maybe again someday. 

Happy fishkeeping!

Tony





SPECIES PROFILE

Scientific Name: *Tanichthys albonubes*.

Common Name: White Cloud Mountain Minnow, Tans Fish, Meteor Minnow.

Distribution: Kwangtung, China', referring to White Cloud Mountain (also known as Mount Baiyun or Baiyunshan) a few miles north of the city of Guangzhou, Guangdong Province, China. This species is probably restricted to the Pearl River Delta region.

pH Range: 6.0 - 8.5.

Temperature Range: 64° - 72°F. [18° - 22°C].

Water Hardness: 5-19dGH.

Size: 1.5 inches.

Temperament: Very peaceful, an ideal resident of a well-maintained community set-up provided its temperature requirements are considered.

Diet: Wild specimens feed on small insects, worms, crustaceans and other zooplankton. In the aquarium it's easily-fed. For the colors offer regular meals of small live and frozen foods such as bloodworm, Daphnia, and Artemia and good quality dried flakes, some of which should include additional plant or algal content.


Sexing: Mature females are usually rounder-bellied and often a little larger than the slimmer, more colorful males.

Breeding: This fish is an egg-scattering, continuous spawner with no parental care. When the fish are in good condition they will spawn often and when a group is maintained alone in a densely-planted, mature aquarium or outdoor container small numbers of fry usually start to appear. Should controlled breeding be required a separate, smaller aquarium can be set up. This should be dimly-lit and the base covered with some kind of mesh large enough so that the eggs can fall through

but small enough so that the adults cannot reach them. The widely available plastic 'grass'-type matting can also be used and works well, as a layer of glass marbles. Alternatively filling much of the tank with a fine-leaved plant such as *Taxiphyllum* spp.[flame moss] or spawning mops can also return decent results. The water itself should be slightly acidic to neutral pH with a temperature towards the upper end of the fishes range, an air-powered sponge filter or air stone(s) to provide oxygenation and water movement.

When the adults are well-conditioned and the females appear gravid one or two pairs should then be introduced, the spawning should take place the following morning. The adults will eat the eggs given the chance and should be removed after 2-3 days maximum.

The eggs should hatch in 48-60 hours and once free-swimming the fry will require infusoria-grade food until large enough to accept microworm and *Artemia nauplii*.

Notes: One of the most ubiquitous species in the aquarium hobby, several ornamental strains are available including 'long-finned', 'golden', 'albino', and 'super red', for which care is identical. *T. albonubes* was discovered by a Chinese scoutmaster named **Tan Kam Fei** in 1932 who passed some specimens on to a local fisheries station, the director of the station chose to honor the collector by naming the newly-erected genus in his honor. 

Reference:

- seriouslyfish.com
- *A Pocket Expert Guide, Tropical Fishes* - Sweeney, Bailey, Norman. Microcosm TFH, 2009





SCALPEL, STITCHES; TIPS FOR SURGEONS SURGEONFISH *that is!*

Surgeonfish also known as tangs, comprise one of the most popular families of marine fishes available to home aquarists.

There's plenty of good reasons for this - stunning colors tops the list! But surgeons/tangs can be a bit tricky to keep. Here are some tips that I use as an importer to keep surgeons/tangs healthy and in good condition.



1 Varied veggies daily - Every day my tangs get a different veggie. Kale, romaine, beans, zucchini, squash, dandelion leaves, etc. You don't want to eat only lettuce your whole life, neither do tangs! By varying what you offer with kale, chard and other greens you give your tangs needed micronutrients, vitamins and minerals too.

One adoptional tip here some [but not all] tangs love fresh broccoli and asparagus! Try it with your fish and see what happens.

2 Single or groups - In your tank keep one or six or more. Rarely you find a pair you can keep together. never house 3 to 5 tangs together. A bully will soon leave you with one! by housing tangs in groups you diffuse their natural aggression so no one fish gets the brunt of being attacked.



3

Natural feeding - Tangs/surgeons browse the reef. Same thing in your tank. Attach all fresh veggies to a holdfast. For frozen brine shrimp baste a dead, clean coral in the brine shrimp.

Let it briefly dry so that the brine shrimp stick on it, then submerge into the tank so your tangs can graze and pick at it

4

Maintain high water quality -

This last tip cannot be stressed enough! poor water quality results in head and lateral line erosion in tangs, especially if compounded by a poor diet.

Keep your ammonia and nitrites to zero and your nitrates low. Test your water quality weekly to insure good health change water often.

Keep your temperature stable too 76° to 78°F. Remember chilled tangs are very sensitive to marine ich, especially *Paracanthus hepatus* and *Acanthurus leucostea* the popular blue and powder tangs.

Follow these 4 tips and enjoy your tangs. 

Happy marine fish keeping.

Tony

Some Tangs/Surgeon fish species

Zanclus cornutus

Moorish Idol One of the toughest saltwater fish to keep in an aquarium due to transport difficulties and diet. These



idols are very expensive and only recommended for the most advanced hobbyists if at all. We would serve them better to leave them on the reef until we can develop better aquarium foods

Acanthurus achilles

Achilles Tang This is another tang that is considered very difficult to keep because it doesn't adapt very well to aquarium life. Hard to get on foods and is known as an "ich magnet". Definitely keep this tang with a cleaner shrimp species.



Paracanthurus hepatus

Blue Tang Another tang that needs lots of swimming room.



They are always on the move and look fantastic. Try not to buy the very small ones though, they don't seem to adapt to the aquarium as well as those 2 inches plus in size

Zebrasoma flavescens

Yellow Tang This is probably the most popular of all tang



species because they might be the hardiest and their canary yellow color looks great. Like other tangs the Yellow Tang is prone to cryptocaryon (saltwater ich). They may be harder to come by and more expensive in the near future if pending legislation in Hawaii passes and bans the export of this species.

Acanthurus japonicus

Powder Brown Tang Adapts to the aquarium much better than the Powder Blue Tang.



Reference :

Fishlore - aquarium fish information



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INDIVIDUAL

1yr. \$20	2yr. \$36	3yr. \$51	4yr. \$68
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FAMILY

1yr. \$25	2yr. \$45	3yr. \$63	4yr. \$85
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[] \$15 STUDENT 1 YEAR
(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 _____