

1911~ 2012
101 Years of Educating Aquarists



AQUATICA

THE JOURNAL OF THE BROOKLYN AQUARIUM SOCIETY
VOL XXVI JANUARY FEBRUARY 2012 No. 3

JANUARY 13TH EVENT
JOE YAIULLO PRESENTS -
11 YEARS OF FEEDING
L.I. AQUARIUM & EXHIBITION CENTER'S
20,000 GALLON REEF



Photo: Joe Graffagnino



1911~2012 101 Years of Educating Aquarists

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VOL. XXVI JANUARY- FEBRUARY 2012 NO.3

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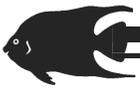
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The **Brooklyn Aquarium Society Inc.** is a non-profit organization 501(c) (3) for people interested in the aquarium hobby and the study of aquatic life. The Society meets the 2nd Friday of each month except July and August at the Education Hall of 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.**

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On occasion, the Brooklyn Aquarium Society uses its mailing list to send notices of interest other than society business to our members. If you do not wish to have your name used in this manner call **the Hotline 718 837- 4455** and leave a message.



BROOKLYN AQUARIUM SOCIETY CALENDAR OF EVENTS ~ 2012

1911 ~ 101 Years of Educating Aquarists ~ 2012

Happy New Year

2012

JAN 13 Joe Yaiullo ~11 Years of Feeding L.I. Aquarium & Exhibition Center's 20,000 Gallon Reef Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

FEB 10 Peter Warny ~ Visits to Various City & State Aquaria ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

MAR 9 Tony Vargas ~ Successful Reef Aquariums from Around the World and How They Got There ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

APR 13 TBA (freshwater)

MAY 11 Giant Spring Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a 55 gal. tank & stand

JUN 8 Todd Gardner ~ Getting Started in Marine Aquaculture ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

JULY/AUGUST ~ NO MEETINGS

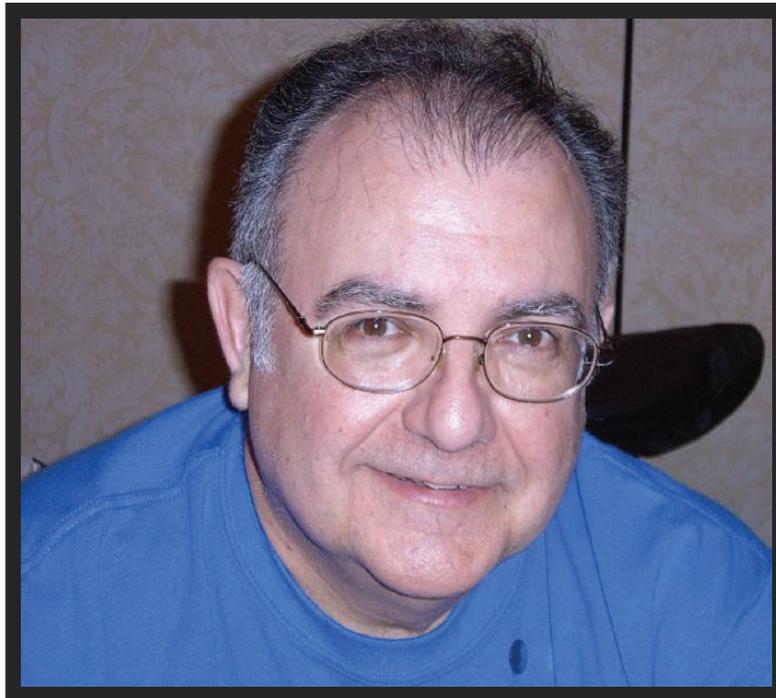
SEPT 14 Mike Hellwig ~ Fish Breeding Contest with Ted Judy ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

OCT 12 Giant Fall Auction ~ Freshwater fish, plants, marine fish, aqua-cultured corals & dry goods, including a 55 gal. tank & stand

NOV 9 Gene Ritter ~ Reef Diving ~ Marine fish, aqua-cultured corals, freshwater fish, plants & dry goods auction

DEC 14 Holiday Party ~ Members, their families and friends, all you can eat sit-down dinner • Fish Bingo & Prizes • BAS Awards presentations.

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In Memorial
Frank Albert Policastro
2/11/1943 ~ 11/11/2011

The world, the Policastro family, the hobby, North Jersey Aquarium Society and the Brooklyn Aquarium Society lost a wonderful human being, Frank Policastro.

Frank, who was 68, died Friday morning, November 11th at 8:30 a.m. of pancreatic cancer at Robert Wood Johnson University Hospital, New Brunswick, NJ. His wife Christine was at his side when he passed.

Frank had been a continuous BAS member for 47 years, since 1964. He became a Board member and served as our treasurer in 1977. He and his family moved to New Jersey where he joined North Jersey Aquarium Society and took on the job of treasurer for them.

In the following years, Frank also became the treasurer for The Northeast Council of Aquarium Societies (NEC).

Along with fish keeping, Frank col-

lected aquarium society publications and memorabilia. A few years ago, he donated copies of the Brooklyn Aquarium Society's publications that he had collected from 1911 to 1970 to John Todaro for our 100th Anniversary Journal, plus an audio recording of some of his memories of the Society in the 1960's and 70's.

The viewing was at Barlow & Zimmer Funeral Home in Hightstown, NJ from Saturday November 12th to Sunday November 13th. A mass was held on Monday the 14th at St David The King RC Church in Princeton, NJ. Frank was buried in Holy Cross Burial Park in South Brunswick, NJ.

Frank will be greatly missed by us all.

John T

Remembering Frank Policastro



My remembrances of Frank go back to the late 1970's when I joined the Brooklyn Aquarium Society. Frank was an officer then and I just attended meetings sporadically. Frank told me that he became interested in raising fish and joined Brooklyn Aquarium Society mainly through former BAS president Fred Samuelson (1962-1963). Frank related to me how he beat Fred at a fish show with his own guppies.

Back then, Fred Samuelson [1962-63] owned a wholesale chemical business on 65th Street, selling floor wax and cleaning stuff for a living. Fred was a champion guppy breeder who had won over 20 trophies showing guppies and first place in an International Guppy Show in Berlin. These guppies were extraordinarily beautiful; in fact, they were featured on the cover of the 1964 August issue of TFH.

Fred invited Frank to his store and since he was still just a kid, his dad, who always liked guppies, drove him to Fred's place of business. When they got there Fred took them to the back room of the store where there were nearly 80 tanks filled with, as Frank said, "phenomenal guppies."

Frank's father bought him 2 or 3 trios at about \$13 each. Fred told him how to care for and breed them.

Well, Frank took good care of the fish and then bred them and entered the fry in a fish show in New Jersey, in the guppies' classes which were large back then, with lots of entries. Frank won first prize in the red guppy class, beating out Fred, with fry born from the fish his dad bought him. He also won second and third place.

Frank told me that Fred came over to him and looked at him and said. "Congratulations, nice work kid." Frank was thrilled at beating Fred with his own fish!

In time, Frank became an officer and BAS Treasurer, and went on to join the North Jersey Aquarium Society and was a founding member of the Jersey Shore Aquarium Society. He and his wife Christine were also officers in the Northeast Council of Aquarium Societies. He was also the proud owner of a retail tropical fish store the Matawan Aquarium in Matawan, New Jersey from 1988 to 1995.

I will always remember Frank as an easy going, laid back guy. Very few things bothered him. Frank was always quick to help and provide knowledge and fish keeping information to beginners and experts alike. Frank's was great guy and will be sorely missed by everyone.

I was proud to call him a friend.

Joe Graffagnino
President, Brooklyn Aquarium Society

Remembering Frank Policastro



Frank Policastro was a fixture at NJAS when I joined the club in 1994. Frank was always referred to as “treasurer for life,” but Frank was much more than that. He was always a positive force for us. In the rather contentious times at NJAS in the late 90’s and early 2000’s, Frank was a constant supporter of all involved. I never heard him say a bad word about anyone. Frank was a tireless worker through our workshops, auctions and “extravaganzas.” He was such an upbeat person with a ready smile and encouragement, and he liked to have fun! Frank loved to eat and it was great fun sharing many dinners with him at board meetings, workshops, and conventions. Christine referred to us as the “good old boys” of NJAS and Frank was certainly one of the best. Frank Policastro will be sorely missed by me, our clubs, and the tropical fish hobby.

Larry Jinks

My deepest sympathy goes out to Christine and the rest of Frank's family. Frank was such a vibrant part of our hobby, but I can only imagine how important he was to his family, and what a great loss this is for them. Frank was one of the people who made others, including me, feel that our hobby was worthwhile because, in large part, people like Frank were part of it -- friendly, generous: that was Frank. At our last meeting, he warmly complimented my club's magazine, and that meant a lot to me because of Frank's stature in the hobby. I will miss him, and I will always remember him.

Joe Ferdenzi

On Friday November 11, 2011 at 8:30am, we lost a close friend, Frank Policastro. He was with his long time companion and wife Christine when he passed. Frank will be truly missed he was a person that gave of himself without expectation of something in return. Frank always approached things with the “KISS” principle in mind. Join me in extending our thoughts and prayers to Christine and Frank’s family in their time of sorrow.

Joe Masi NEC

Remembering Frank Policastro



I remember sitting with Frank as he related to me stories of his early years as a member of the BAS, and I have him to thank for helping me write the History of the Brooklyn Aquarium Society for the Anniversary Journal. One of the interesting stories he related to me was of how he became the BAS's Treasurer. Frank told me it was around 1975 and Marc Saksenberg (1975-76) decided he wanted to be the President of BAS. Now, at that time, Frank said, Marc was the treasurer before he became president and that's when Frank became treasurer.

Frank told me, "Marc handed me a bulging black briefcase with a broken lock, stuffed with papers, that he tied up with a rope to keep it closed. He also handed me \$500 in cash. This was the treasury.

I took home the briefcase tied with a rope and, not being an accountant myself, I said, 'Holy cow, what do I do with this stuff...' I didn't have a clue!

At the time my brother-in-law Bob was an accountant, so the first thing I did was call him and said 'help! I have this briefcase stuffed with papers and \$500 in cash and I have no idea what to do with any of it!' He came over and I said, 'Bob, I can't make heads or tails out of all this stuff.'

So, he took the briefcase and the money and went back to his house. About two weeks later, he came back and handed me the briefcase and the \$500 and said 'This is what you have in cash, \$500.' Then he says, 'I can't make heads or tails out of what this guy did. So forget what he did and just start fresh with the \$500. Take the briefcase, leave the rope on it and put it in a corner and forget about it.' Then he showed me how to start keeping books.

Following my brother-in-law's advice, I started keeping the books, starting fresh with the \$500 they gave me. The first year I was treasurer we had \$500, the second year, \$1,000. As long as I was in charge, the treasury went up about \$500 a year.

Then all the small minded people started asking me questions like...'Frank, when you took over from Marc, did you find anything wrong with the books?'

They said they always wondered how come the treasury usually ended the year with only \$500.

My feeling was that it was just sloppy work, and things got mixed up – but I'm sure he wasn't stealing! I continued to run the treasury for about 9 years and during the whole time no one ever asked the Board to look into how the books were kept before I was treasurer!"

This is testament to how everyone thought of Frank, honest and totally trustworthy.

Frank was a member of the BAS for 47 years and to my knowledge no one ever uttered a bad word about him. I know he will be missed by all whose lives he touched at the BAS, NJAS and the Northeast Council. I'm honored that I was among Frank's friends.

John Todaro,
Editor of BAS publications



Remembering Frank Policastro



When I think of Frank, I think of honesty, dedication, good humor and love of family. He fought a courageous battle, and now he can reap all the goodness he sowed in life! We will miss his smiling face! Rest easy Christine knowing that you and Frank touched so many with your cheerfulness and support, and now we all hold you close to our hearts at this difficult time. We extend our deepest sympathy to you and your family.

Janine & David Banks

You will be missed. If there is a fish room in heaven I know you will have the best.

Vincent Babino, BASNY

Would like to express my sincere condolences to you, Christine, and the rest of the Policastro Family in the passing of Frank. Know that he is at peace now with God. Frank was one of the first people I met when I first joined NJAS many years ago, and the one who made me feel right at home as if he was a friend way before then, as though from the time I first entered the hobby. He always had a pleasant and cheerful disposition about him and rarely wore anything on his face except a smile. I can't say that I ever knew a greater person; a few of equal stature, but none exceeding his demeanor. He was loved by everyone he touched, and will be sorely missed. May he rest in peace now, at his life's journey's end. Please accept my deepest sympathy at this time of sorrow and know that you both will meet again someday.

Raymond Wetzel

We were saddened to hear of the loss of our friend Frank. His battle to beat this dreaded disease has ended. Thank you for your friendship, your kind words to all and most of all being a one of a kind human being. B.A.S. will miss you. God bless your family.

Stu and Denise Hershkowitz



Remembering Frank Policastro



My heart holds you all close in my heart. I had the pleasure of meeting you on my first trip to NYC and you were amazed I had never been there before. I so enjoyed that evening I met you both and wish you all peace at this difficult time. Love to you all.

Pattie Gabriel

Frank, you were a second dad to me and I will miss you very much. When I combine that with what you meant to my kids and my mother, words can't express how important a part you were in my life. RIP.

Ron Colonna

My deepest sympathy to Ron, his Mom, and the rest of the family in the loss of this very special man.

Mary Francis

Frank was a gentleman and a gentle man, someone I was always happy to see and greet at the countless aquarium events he attended and usually worked at over several decades. We shared a love of tropical fish and of the historical literature that accompanied them, and I enjoyed our many conversations about both. I was privileged to share time with him at the recent American Cichlid Association (ACA) convention this past July and his bravery, framed in his ever-present good humor, was inspirational. I and many others will miss his gentle spirit. My heartfelt condolences to his family.

Wayne Leibel

It is with great sadness that I learn of the passing of my friend from the JSAS. My sympathies go out to Frank's family, friends and the members of the JSAS. He will be missed.

David Cohen.



Remembering Frank Policastro



Dear Christine and Family, Bill and I are so sorry about Frank. His love for you and family are what Frank was about. We are thinking of you and are in our every thought and prayers. Frank fought this the best he could and now he can watch over you and family and rest.

Rosalie Kreiser and Bill Kreiser

It is with deepest sympathy to hear of the loss of Frank. Carl will always be grateful for the help and support Frank and his family gave him when he came to work in NY back in the day. We are very sorry that we hadn't seen him in quite some time. He will be missed very much.

Carl and Nancy Pevec

It was a pleasure knowing Mr. P. We send you all our deepest sympathies.

Gerard and Axelle Sandt

I never met you, but I'm a friend of Ron's. Sending heartfelt condolences to the family.

Elyse Costner

My prayers go out to you Christine and the family. May God continue to provide you the strength to move forward without your life partner. I first met Frank, on a cold rainy Friday night in Matawan. He helped me to purchase my first fish tank for my daughter. His patience and kindness will never be forgotten. He has and will always have a special place in my heart. He can now keep that perpetual smile and rest in his Fish Heaven.

Robert Fryar

Our thoughts and prayers go out to the family of a wonderful man, who always had a smile on his face, and even disposition, and a helpful attitude. He was reliable, sharing, caring and pleasant.

He is now at rest with Our Father Who Art in Heaven, free from pain and worry. He will be sorely missed by all.

Michael & Frances Newman, Woodcliff Lake, NJ



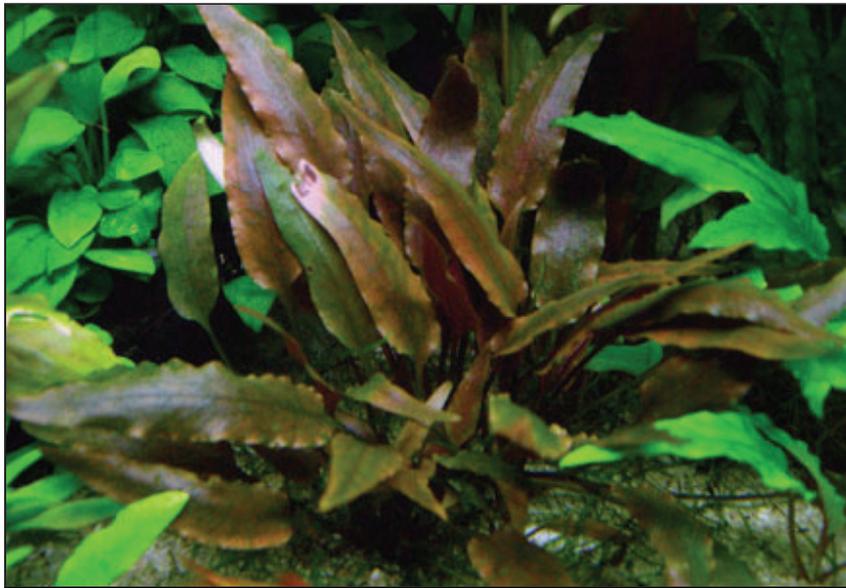
EDITORS NOTE: Members with questions about aquatic plants or setting up a planted tank can contact Isidore (Izzy) Zwerin, our plant editor. You can call him at (646) 269-5926 between 7pm to 10pm, Monday to Friday.

PROPAGATING: *Cryptocoryne walkeri*

C*ryptocoryne walkeri* is a great plant that would be a terrific addition for any aquarium. The plant is suitable for placement in the midground. This plant is extremely hardy and tolerant of a wide range of water and lighting parameters, as are most Crypts.

It is, in typical Crypt fashion, slow to get established. Mine took about two months to start growing. Once it gets established it grows well. It will spread via runners and given a little time become quite prolific. The leaves are Lanceolate in shape. Under proper lighting the leaves are reddish brown in color. In less intense lighting, the plant will be more brown than red.

Mine is currently being housed in a 10 gallon aquarium with good light, but no CO₂ enrichment. The water is fairly soft, slightly acidic and temperature of 78° The plant will not do well without adequate water movement. It does not require much in the way of liquid fertilizers, I just add some trace elements a couple of times a week. Like most Crypts, this plant is a heavy root feeder and will



benefit greatly from the use of substrate fertilizers.

The native range of *Cryptocoryne walkeri* is in central Sri Lanka. This is one of those Crypts that is prone to "Crypt Rot" which is disturbing, but there is no cause for panic. Crypt rot is a condition where all the leaves rapidly disintegrate. There is considerable debate in plant circles as to the cause of this. I personally believe that this is just how the plant adapts to a new environment. I keep a variety of Crypts and given time, the plant will regenerate.

Be patient as the regeneration process may take quite some time. Because of this habit, the plant should not be transplanted often. 



A Cure For the Heartbreak of Duckweed!



We have **Joan Snider**, a member of the Otter Valley AS to thank for this wonderful tip a DIY filter for removing duckweed from your aquarium. Joan found it on line at: <http://www.youtube.com/watch?v=VEVvMsp17C4&feature=player-embedded#!>

If you've ever had a tank infected with duckweed, you know that it is just about impossible to get it all out...leave just one plant and within weeks you will have a million of them floating on the top of the water, cutting off light to all the other plants in your tank. If you don't keep goldfish, who love to eat the stuff you're "screwed."

THIS DIY IDEA IS DEVILISHLY SIMPLE AND ACCOMPLISHED IN LESS THEN 10 MINUTES

Here's what you need to make your own duckweed filter:

- 1] 20oz Dasani brand water bottle.
- 1] Maxi-Jet 400 or 600 powerhead.
- A pair of scissors (to cut off label).
- Magic marker to mark where to cut bottom of bottle.
- A soldering iron or soldering gun or a cutting tool Ex: matt knife or Exacto knife.
- Some aquarium filter floss.

Drink the water!

Now cut off label.

Use the Marker to mark the bottom of the bottle, about an inch-and-one-half down around the bottom of the bottle, then up the side and over the middle of the bottom of the bottle to the other side and down to meet the marker line on the other side.

Using the heated soldering iron or soldering gun, slowly follow the line you made, cutting along the line halfway around the bottle then up the side over the top (bottom) of the bottle and down the other side. (If you're confused log onto the web site listed above for a



A Cure For the Heartbreak of Duckweed!

complete visual of what to do.)

You can also use a matt knife or other cutting tool. Just be careful not to cut yourself. Knives can slip when cutting a plastic bottle, hence the soldering iron method.

Once you've cut off half the bottom of the bottle slip the Maxi-Jet powerhead intake into the neck of the bottle; make sure it's hand tight.

(Editors Note: I have found the 20oz Dasani brand water bottle is a perfect fit. Other sizes and brands do not fit as well and you may need to use a rubberband or a small stainless steel hose clamp to hold the bottle in place. Bottles that are not a perfect fit have a tendency to pop off the pump's intake.)

Put a handful of filter floss into the bottle and tamp it down lightly. Now attach the suction cup mounting bracket that comes with the powerhead and mount the powerhead to the inside of

your infected tank **upside down**, so the bottle is on top.

Position the bottle so the cut away part is about 1/8 inch below the waterline, or just enough to capture the duckweed, but not any fish, and you're on your way to relieving your tank of the heartbreak of duckweed!

(Editors Note: You will have to check the bottle for small fish before removing it for cleaning. I have caught a couple of neon size fish in my filter bottle. So check it before cleaning the bottle!)

The duckweed will be drawn into the bottle and captured by the filter floss. Duckweed free water will be recycled back into the tank.

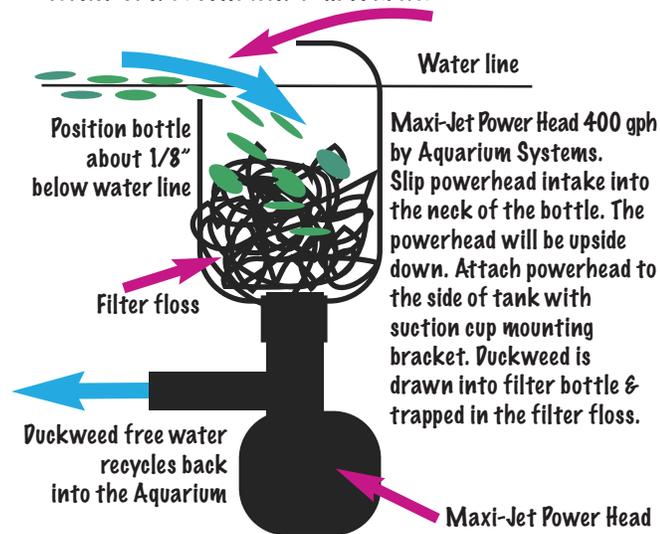
Remove floss and duckweed when water is free of duckweed and dispose of...or give the duckweed away, if you can find someone that wants it! 

The Duckweed DIY Water Bottle Skimmer Filter

Editors Note:

For small tanks (10 gallon etc.) that are not deep enough for the 20 oz bottle, you can cut away the bottle further down or use a smaller bottle so that the cut away part is just below the water line.

20oz DASANI water bottle. Cut away one half of the bottom section of the bottle with a matt knife.



Maxi-Jet Power Head 400 gph by Aquarium Systems. Slip powerhead intake into the neck of the bottle. The powerhead will be upside down. Attach powerhead to the side of tank with suction cup mounting bracket. Duckweed is drawn into filter bottle & trapped in the filter floss.



EDITORS NOTE: Members with questions about aquatic plants or setting up a planted tank can contact **Isidore (Izzy) Zwerin**, our plant editor. You can call him at **(646) 269-5926** between 7pm to 10pm, Monday to Friday.

Editors Note: For all you new members and those members that might need a refresher on planted tanks, I've decided to reprint the wonderfully informative series of articles Izzy wrote when he became *Aquatica's* plant editor back in 2006, September, October issue.



The Practical Plant

Chapter 1

Hello fellow BAS members. I've volunteered to be our new plant editor. My mission is to write a series of articles about successfully establishing and maintaining a planted aquarium. I've been doing it a number of years myself, and hopefully I can spare you some common mistakes, and pass on some tips to make your endeavor easier and more successful.

In this first article, I'd like to warm up and get in the swing of things by going over some reasons why a planted tank is so desirable before we really get into the meat and potatoes of it.

In my opinion, the most compelling reason to want a planted aquarium is the look. It doesn't matter if you like the European or Japanese style of planting, a tank full of lush, healthy plants is eye candy. The European style, known as the "Dutch style," is like a formal garden. Everything is neatly laid out, orderly, and impeccably manicured. A typical "Dutch" planting uses little in the way of driftwood and rocks, but relies more

on neighboring patches of different plants which contrast in color and texture. The Japanese prefer a style known as the "Amano" style, which is intended to mimic a natural setting, a little lighter on the plants and a little heavier on rocks and driftwood. Either style, done right, is just WOW.

There are more practical reasons for a planted tank. Number one on the practical list is improved water quality. Simply put, fish waste is plant food. Aquatic plants differ from terrestrial plants in a number of ways. Most aquatic plants feed primarily thru their leaves, versus the roots as in terrestrial plants (there are exceptions, but



that's a different article). They will absorb Ammonia and Nitrates directly from the water column. Water quality will also be improved by providing more surface area for bacteria to colonize. The beneficial bacteria in your aquarium, upon which you depend to carry out the Nitrogen cycle, do not live in the water column. These bacteria grow on the surfaces. This is why biological filter media is rated by how much surface area it will provide. If you think about it, with all those leaves and stems, a tank full of plants has a lot of surface area. I have kept some pretty heavy fish loads in my planted tanks and never had an issue with water quality.

Another great reason is the elimination of algae. It is a common misconception that excess light is responsible for algae growth. Algae will only grow in your tank if there are excess nutrients in the water column. This is a myth born because a tank typically placed, say, near a window or other strong light source becomes an algae farm, so people incorrectly assumed the light caused it. Not so; what really happens is that your tank probably had excess iron which was not in a form the algae could utilize, but via a process of photoreduction the iron became biologically available. In a mature, established planted aquarium there should not be any excess of nutrients. The plants will out compete the algae for the available nutrients.

Maybe the best reason to have a planted tank is that you will have healthier fish. Besides improving water quality, it will help relieve fish stress. Most aquarium fish are really paranoid about becoming a meal for another fish. In a planted tank, they are never far from a good hiding

spot. This helps them to relax and display more natural behavior, improve their color and make them more disease-resistant. I often hear people say that they have fish that they never see because they are always hiding. I keep *Ancistrus* (also known as bristle nose plecos) in most of my tanks; this family of fish is known to hide a lot. Not mine. They are out grazing all day in full view. For these reasons I even keep plants in my hospital/quarantine tank. This seems to help new arrivals acclimate faster. The trick here is to put the plants in a small flower pot so that they can be easily removed for cleaning or if you have to medicate the fish with something the plants can't tolerate,

Here's another good reason. You may be on vacation or just not paying close attention and your fish surprise you with an unexpected spawning. The fry will have a much better chance of surviving by hiding in the plants. They will also be able to forage there among the leaves for micro-organisms to feed on.

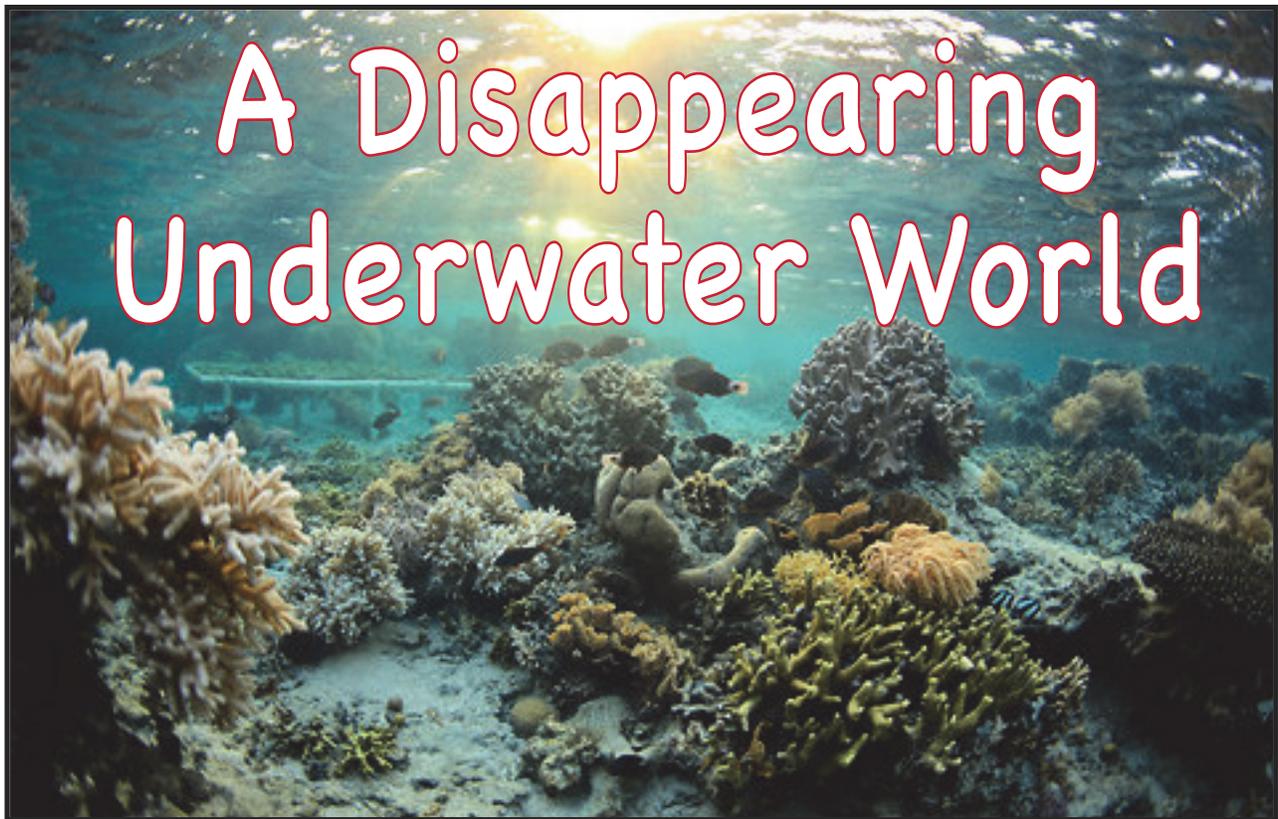
The last point in favor of planted tanks is that it adds a new dimension to the hobby. Living in an apartment, I don't have a garden and if I try bringing potted plants into the house, my cats treat them like a salad bar. So I can do my gardening in a glass box out of their reach. Too bad kitty.

I hope these are enough good reasons for you to try out your own aquatic jungle. In my next article, I will discuss the hardware you will need to get the best results; talk to you then. 

Algae will only grow in your tank if there are excess nutrients in the water column.



Next issue March/April:
Hardware requirements needed for a successful planted aquarium.



Despite my growing up in Kentucky, not having a passport until my early 20s and not seeing a tropical coral reef until I was in graduate school, whenever I step off a plane in the tropics, I feel like I've come home. The organic, fungal smell of heavy tropical humidity is somehow comforting and "right" for me; I also associate it with coral reefs, and a wonderful, but disappearing, underwater world that has become a major focus of my life's work.



Mark Hay
Reading the Ship

After 28 hours of flying, layovers, slow immigration and customs lines and a long in-country bus ride, I finally arrive in Votua Village on the coral coast of Viti Levu, Fiji, where my group has established a small lab to work on the ecology of coral reefs. We chose Votua Village because the villagers here have been especially proactive in establishing and protecting an area of their reef (a Marine Protected Area). They welcomed us, wanting to know more about how to best conserve their reef and associated resources.

Reef preservation, much less recovery, is a daunting challenge. In the 30 years I've worked on reefs in the Caribbean, Indian Ocean and tropical Pacific, we have learned more about reef function and the processes that keep them healthy, but these processes are degrading rapidly and reefs worldwide seem to be in a biotic death spiral. I have two sons in their 20s and cannot show them an average Caribbean reef like the ones I worked on when they were born, much less a "good" one. Healthy Caribbean reefs have disappeared in that short time.



Photo: Mark Hay Looking down at the study site.

When my sons were born, an average Caribbean reef was covered by 50 to 60 percent live coral; today it is 5 to 10 percent. This is the equivalent of losing pine forests from Georgia or aspens from the Rocky Mountains in less than 30 years. During this same period, the Great Barrier Reef in Australia lost about 50 percent of its coral cover. Worldwide, coral reefs are being converted to seaweed-covered meadows that do not support the biodiverse assemblage of species that allow a reef to function.

With reef loss, the villagers of Fiji lose food security (fish from the sea), the protection from storm surge that the reef provides, income from tourists who come to Fiji for its beautiful reefs, and many other critical ecosystem services that are the lifeblood of tropical island nations and peoples.

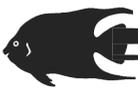
Reef loss results from a host of synergistic and growing environmental insults: overfishing, global change, ocean acidification, pollution, coral disease. What can local villagers do to preserve reefs when so many of the stresses are global? Will local efforts to manage fishing and pollution be enough, or will global-scale ocean warming and acidification kill the reefs anyway? The long-term answer is unclear, but the short-term results are promising. When fishing is prohibited, the intact food web on a reef helps it recover from even large-scale climate stresses, disease outbreaks, etc.



Photos: E. Hunter Hay, top; Ian Markham
Comparison of the Marine Protected Area, top,
and an adjacent area where fishing is allowed.

Our present work in Fiji focuses on determining how seaweeds affect corals (some seaweeds poison corals when they come into contact); which fishes best control the most damaging seaweeds (by eating them despite the bioactive chemicals they produce); and how villagers might limit or focus fishing practices to leave critical components of the food web intact, allowing corals, fishes, seaweeds, and villagers to sustainably coexist in a way that preserves reef presence and function. Much of this work is focused on understanding chemical signals in the sea and how transmission of these chemicals among organisms constitutes the language of life on a reef, altering organism behaviors in ways that can facilitate reef health and recovery or, if interfered with, cause reef decline and initiate the biotic death spiral that modern reefs seem to be experiencing. 🐟





Dan Hagan runs TheShrimpFarm.com.

The place to go for dwarf freshwater shrimp.

Shrimp are the perfect aquatic inhabitants for your under water planted garden. If you're interested in keeping dwarf freshwater shrimp or have a question about them, go to Dan's blog site and ask your question. It's a great site with reliable and accurate information on dwarf shrimp.

Black King Kong Shrimp



The Black King Kong Shrimp is the selectively and very rare variant of the Bee Shrimp (at left) and is also the wild type of the Crystal Red Shrimp and the high priced Panda Shrimp. (Caridina Sp.)

www.TheShrimpFarm.com

Scientific Name:

Caridina cf. cantonensis

Other Scientific Names: N/A

Common Name:

King Kong Shrimp, Black King Kong, BKK

Other Common Names:

N/A

Origin: South East Asia

Found in the wild: No

pH Range: 5.8 - 6.8 Ideal pH 6.2

Temperature Range: 62° - 72°

Ideal Temperature: 68°F

Hardness Range: -1-2 dkh

Ideal Hardness: 6.2 dkh

Life Span: 1 - 2 years

Size: 1 - 2 inches

Gestation Period: 30 days

Diet: Omnivore

Special Notes

As with all aquatic invertebrates, it is important to make sure copper does not get into the aquarium. Copper is toxic to all Dwarf Shrimp. Many medications contain elevated levels of copper, so it is recommended not to medicate an aquarium with Dwarf Shrimp in it. 



Callochromis macrops



Lake Tanganyika holds many different species of fish. The majority of these fish cannot be found anywhere else in the world. When one finds a rare fish within a domain of rare species, then this is truly a “jewel” of a fish. *Callochromis* species is this jewel. This species is a mouth brooding African cichlid. There are four types of *Callochromis* species: *Callochromis pleurospilus* and *Callochromis stappersii* are the smallest and grow to approximately 3 - 4 inches (11 cm). *Callochromis melanostigma* and *Callochromis macrops* are slightly larger.

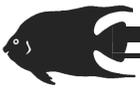
The species I would like to discuss today is the *Callochromis macrops*. The species can attain a length of approximately 4-5 inches (12-16 cm), males slightly larger than females. The females are silver to a beige/brown color. The males are truly spectacular in coloration. The males develop black dorsal and anal fins. The dominant males possess bright orange to yellow egg spots on their dorsal fins, which is richly displayed by the black background color of the fin. The body is a deep orange color that truly shines when in breeding mode. There are several color variants throughout Lake Tanganyika. These fish, although small in stature, require large areas for grazing and for the males to establish territories.

Callochromis macrops require hard, alkaline water conditions (7.6 - 8.3 pH and 8 - 12 GH) to keep them happy. These are sand sifting cichlids that, in the wild, stay in the shallow waters sifting through the sand to find their food. They are schooling fish. Spawning for these fish, in the wild, has the males creating large sand pits or cones, which they stay over and try to entice the females to spawn. In the aquarium they enjoy inverted clay pots or open coconut shells that resemble a hollowed out pit type structure. These fish prefer food high in protein. I would recommend that

you alternate flake or pellet food with frozen or live daphnia, blood or black worms, mosquito larvae, brine shrimp or crushed snails. A group of 5 to 7 fish in a 55 - 75 gallon tank would be adequate. There should be only one dominant male as these fish are quite aggressive to their own species. When breeding, they have been known to do battle with other species larger than twice their size.

Breeding these fish can be a challenge. Start with conditioning the fish with regular water changes and live or frozen food two to three times daily for ten to twelve days. The females are very nervous and will spit or eat the eggs if chased frequently.

Once a female is holding eggs, she will go to a quiet area to be left alone. The hobbyist now has the dilemma of leaving the fish alone and hoping that she will hold the eggs and/or fry for fifteen (15) days in which the majority of mouth brooding cichlids will then hold full term (28 days) or removing the female and strip her of the eggs. I prefer allowing the female to go full term. However, with this species I waited through four (4) cycles. The first time I removed the female to a plastic holding trap that stayed within the tank. The good part is that no other fish can attack her; the bad part is that she has very little room to



maneuver. The next day I found 4 eggs still in the trap with her. I tried hatching them artificially but they did not hatch. The other times she spit or swallowed them by the fourth day. On the 5th attempt I stripped her almost immediately and found 21 eggs. I tried hatching them artificially but only 12 eggs became fertile and out of that only 3 eggs hatched. The fry did not last one week. I asked several friends for help and the consensus was to strip her and artificially hatch the eggs but have crushed coral in the filter or the tank to maintain the hardness of the water. In my filters I use charcoal, ammonia pellets and now crushed coral.

I find that with these ingredients there is never an ammonia spike or a pH fluctuation, and the water stays hard and alkaline.

On the next attempt, which usually comes every month, I stripped the female of 23 fry. All the eggs hatched and I moved them to a 2-gallon tank with dolomite as the gravel and a bubble corner filter with charcoal and crushed coral. These fish are very delicate, as I have lost several moving them to larger "grow out" tanks. Always use the "drip" method for moving these fish. [The drip method is having a bag filled with the same water the fish came in at 1/3 filled. Using airline tubing that is tied in a loose knot in the middle as a siphon tube, start adding the water that the fish will be going into at a slow drip pace. Add an equal amount of water to the bag and then let sit for 15 minutes before adding the fish to the new tank. This will reduce stress on the fish while slowly acclimating them to the new water conditions]. Feed the fry, after the egg sack is gone, newly hatched brine shrimp, cut up live black worms, crushed flake food and frozen baby

daphnia or cutup frozen black worms. When feeding frozen food I prefer **Hikari** brand because they add vitamins to their products. I understand that several other companies are starting to add vitamins also, so always check the label before

buying frozen, bag or canned foods.

I first became interested in this species when my friend **Les Deutsch** sent me a photograph of this little beauty and asked if I wanted some for my very own?



I naturally jumped at the chance to have this "rare jewel" in my collection. I obtained a total of six young fish, which, in time, consisted of a dominant male, a subordinate male and four females. It took these fish almost a full year to start breeding. It is important that you have non-aggressive fish mates with this species. I am keeping them with Rainbow fish, *ancistrus* catfish and African peacock species in a 180-gallon tank. These are beautiful fish that add color and flair to any aquarium. I highly recommend that you get a few to enjoy, as they will brighten up any African tank. 🐟

References:

Back to Nature Guide to Tanganyikan Cichlids, by Ad Konings, published by Back To Nature in 1996, pages 36 - 37.

Exchange Editor's Report



The Exchange Editor's job is reading publications from different clubs and suggesting items of interest to our members. This month's has a bit of a different flair to it. Most of it was taken from clubs across the country that we communicate with.

The Underwater News, **Pioneer Valley Aquarium Society**, March 2011. Resealing an Old Aquarium Tank by **Nick Spinelli**, first published in January 2007 taken from Aquarticles.com. An excellent article with 15 step-by-step photos. If you are going to reseal an aquarium, this article is for you.

Paradise Press, **Long Island Aquarium Society**, March 2011. Go For It! by **Vinny Kreyling**. This is a great article on the need for GFIs (ground fault interrupters) in a fish room. Lucky, by Vinny Kreyling. He discusses pet superstores vs. Local fish shops.

It's a Fact of Life in The View...From The Other Side of the Tank, by **Margaret Peterson**. Margaret tells of losing a large number of *frontosa* when they sprayed the ceiling with lacquer spray prior to painting. Be wary of toxic fumes.

Fish Talk, **Atlanta Area Aquarium Association**, Georgia, Jan. 2011 Exciting News from Ken Seiders at the Lettuce Box... By **Ken Seiders**. Ken

talks about maintaining his pond in the winter in Georgia and trimming plants in overgrown indoor tanks.

Rockin' In the Rift Lakes by **Michael A. Risko, Jr.** Julidochromis transcriptus – The Masked Julie and Julidochromis transcriptus "Zaire Black." Michael writes about these dwarf cichlids from the Congo. Breeding *Corydoras adolfi*, by **Steve Smith** (reprinted from Fincinnati newsletter), a spawning report on this South American catfish.

Cichlidae Communique #184, **Pacific Coast Cichlid Association** (California) Jan/Feb 2011.

Chitande Island Lake Malawi, by **Pam Chin**. Pam writes about her visit to this island in Lake Malawi. There are great photos here.

Better Lucky Than Good, by **Michael Pyle** (first printed in CC#156). Michael writes about his success with *Julidochromis regani* "Sumbu", a Lake Tanganyika cichlid.

Ask Pam #98, by Pam Chin again. Pam answers questions with great expertise in her regular column about cichlids.



New Hampshire Aquarium Society, *The Granite-Fisher*, Volume 20, Number 4 April 2011. **Jonathan Farrand** writes an article titled “Progression of a Planted Tank, Tank growth and Development: Stage One.” He notes how a lot can change when you decide to keep aquarium plants, especially when you let Mother Nature do the work.

Diamond State Aquarium Society, *The Gravel Gossip*, Volume 48, Nos. 6, September 2011, The Amateur Hour by **Bob Berdoulay**. Nice story of Bob’s early life growing up in New York City, his introduction to the fish hobby and the need to keep the “mom and pop” stores in business. Go to them and buy from them and they will survive.

Tank Topics, **Greater Akron Aquarium Society**, (Ohio). The Dirt on Soil-less Worm Culture, by **Joe Reich**. Joe gives directions and has photos of how to set up a worm culture in a plastic food container with plastic needlepoint canvas and dry cat food pellets.

Cryptocoryne usteriana, by **Dave Williamson**. Dave writes about propagating this aquarium plant.

Tank Tales, **Aquarium Club of Lancaster County** (Pennsylvania). March 2011. My Dream Tank: On a Fixed Budget, by **Scott McLaughlin**. Scott describes and creates his cichlid tank...great photos. Selecting Your Aquarium, by **Michael Steffen** (Twisted Fisher). Michael gives advice on the placement of your aquarium. Is there electricity close by? Is there access to a water supply? Is there a window nearby? Is the floor level and sturdy? What equipment is needed? (tank, hood

with light, filter, substrate, decorations, etc.) Good article.

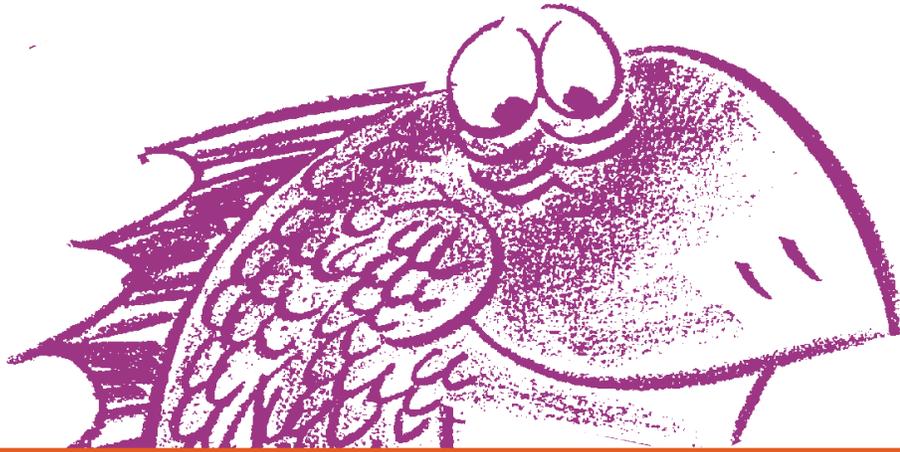
Michael’s Frog Farm: Spawning African Frogs, by **M.J. Shrom** (reprinted from March 1989). M.J. writes about spawning *Xenopus* species of African frogs and how to tell the difference between the dwarf frogs and the regular sized frogs. This is a must read article if you are raising African frogs.

Pisces Press, **Nassau County Aquarium Society**, March 2011. Doctor Fish (*Garra rufa*), by an unknown author. This member of the carp family is found in the wild in parts of Turkey, Iraq, Syria, Jordan and Israel. They are used in spa treatments as they nibble away at dead or dying skin, usually from the feet.

Texas Aquatic Aquarium Plant Ban – Is New York Next???? Proposed legislation in Texas will ban many aquarium plants as potentially invasive, not-native aquatic plants. 

**That’s it for now. See you all next time.
Happy New Year and happy fish reading
everyone.**

STU



WE NEED A FEW GOOD MEMBERS TO HELP RUN THE BAS

We are in need of a **TREASURER** and an **EXCHANGE EDITOR**! Denise Hershkowitz, our treasurer, and her husband Stu, Exchange Editor, will be moving to Florida's sunshine this year. We need members to step up and handle these essential jobs.

We also need a **CORRESPONDING SECRETARY**. This position entails handling all external correspondence, soliciting donations, reminders to speakers and thank yous.

And we have to have an **ASSISTANT EDITOR** to help John Todaro in publishing both the *BAS Bulletin* and the *Aquatica*.

Please contact Joe Graffagnino at 917 922-5108 and he'll fill you in on what the different offices are and what is expected. This is your Society please consider working with us.

Joe Graffagnino





In going through the files I came across an article I wrote and printed in 2001. In rereading it I made some changes and updated some points. I thought I would reprint it for the new members and for those of you that may have missed it the first time around, and for those that could use a refresher on fish behavior.

WHY DO FISH DO WHAT THEY DO?

Understanding fish behavior is often overlooked by aquarium hobbyists but it is important when you keep fish to make them feel as natural as possible in an unnatural world - an aquarium.

We'll be exploring the subject in the following article. What exactly do I mean by fish behavior? They swim around in a tank aimlessly, eat, chase each other once in a while, and look pretty, what do you mean "fish behavior"?

Fish, like all living things, have evolved into what they are over millions of years - their shape, color, size, and how they interact with others of their species and other fishes.

To understand what they do, every good aquarist becomes a fish psychologist, picking up clues on how to keep their fish happy and what fishes are best kept together.

Let's examine what fish do and why they do it. Let's first talk about schooling fish.

Barbs by nature are schooling fish and should be kept in schools. Keeping a Siamese fighting fish, *Betta splendens*, in a tank with one or two tiger barbs, *Capoeta tetrazona*, is generally not a good idea. Barbs are fast swimmers and have a

habit of nipping slower moving fish, while bettas are loners and slow moving with flowing fins. Very tempting for aggressive guys like barbs. But wait a minute! The betta is famous for fighting...they should be able to take care of themselves. Right?

Wrong. Male bettas have been programmed to fight other male bettas and the fights are over mating, ranking order or territory. Throw a betta into a tank with barbs who are schooling fish and not territorial the way bettas are. The barbs' territory is the school, that is if you have established a school.

One, two or three barbs do not a school make. The school itself is the territory of schooling



fish. Its place in the hierarchy of the school becomes the “place” or “territory” of the individual schooling fish. So you have species of fishes that in a sense are speaking different “evolutionary languages.”

An interesting bit of information about barb behavior. If you keep a few barbs in a tank, say two or three, you’ll find they’re generally more aggressive towards each other and their tank mates. What’s going on here? The fish are trying to establish their “pecking order” in the school, but you haven’t given them the proper environmental conditions they’ve been “programmed” to live with and understand. The alpha barb, the largest, most aggressive or strongest, becomes more and more aggressive towards the other two barbs to the point of possibly killing them.

This alpha barb needs to spread his normally aggressive nature among more barbs. Take this

When adding territorial fish to a tank with fish that have established territories, such as cichlids, rearrange the rocks or drift wood, add the new fish and put the lights out. The next “morning” all the fish will be on an even footing and have to stake out their territory anew.

same fish and add another ten or twenty tiger barbs and this alpha fish will now have to divide his attention and aggressiveness among twenty fish to establish his place in the school without unduly harming the other members of the group. His aggressive nature will become modified by the aggressive nature of the others in the group and possibly a new alpha fish will emerge.

In time, all the fish will have found their proper place in the group and their aggressiveness towards each other will lessen... in some cases, they’ll even stop nipping the long-finned fishes that may share the community tank with them.

The safety of the territory of the school, the larger the better, calms them and makes them feel at home. The internal sparring for position in a large group keeps them busy chasing each other and gives them an outlet for their natural aggressive behavior; they simply don’t have the time to nip at or bother other species. By establishing a school in



the aquarium, you have created the environmental and evolutionary conditions schooling fish, whether they be barbs, tetras, danios, or zebras, understand - you are now talking their evolutionary language - "schooling talk." But you are not talking "betta talk"; that's a whole different "language."

What is a schooling tank? How do you set one up?

A schooling tank should be long with plenty of clear swimming space for the fish. If you have plants, keep them towards the back of the tank, when the fish feel they have to hide they will head to these plants.

A tip on introducing schooling fish to a schooling aquarium; buy young fish, and as many as space and your budget allows. They don't all have to be from the same fish store or dealer's tank. If you are interested in breeding them, it might be better to add different genes to the school. On the other hand, there is no telling, once the fish are in a dealer's tank, if they all came from the same spawn. Once you have selected the species of fish, introduce them all

at the same time. It's easier for them to establish their ranking order, "pecking order," this way.

If you introduce new fish to the school do so at night, if you can, or turn off the lights and cover the tank when the new fish are introduced in the daytime and keep the lights off until the next day. When the lights go back on, the fish in most cases, if they are about the same size, will have integrated themselves into the school with little or no aggression.

This strategy holds true for the introduction of any fish into an established aquarium. One more point to add to this little trick. When adding territorial fish to a tank with fish that have established territories, such as cichlids, rearrange

the rocks or driftwood, add the new fish and put the lights out. The next "morning" all the fish will be on an even footing and have to stake out their territory anew. In effect, you have moved all the fish onto a new playing field and everyone is "equal," or as equal as can be in an enclosed aquarium space.

What is it about fish that makes some of them school and others not?

The basic feature of a school is; mutual attraction. The fish react in a similar fashion to external stimulus. Breeding strategies: males and females are in close proximity to each other,

Some fish have the ability to send and receive low voltage electrical charge to help them "feel" the distance of school mates to establish the uniformity of the school.

fostering group spawning and safety in numbers. A large school of fish will confuse a predator looking for a meal. It's not easy to single out a fish to stake, what with all the movement of the school and shifting of fish within it as they swim. Also, a larger compact school might be intimidating to a predator, possibly looking like a much larger fish. Studies have shown that their are no hierarchy be-

haviors among some schooling fish. I believe this can be explained in huge schools or shoals of some species by the fact that aggressiveness is inversely proportioned to the size of the school, in other words, the smaller the school the more aggressive the fish will become towards others. The larger the group, the less aggressive they become.

No defined leader, alpha fish, exists in a larger school. It may be there, but is overwhelmed by the sheer numbers of fish around it. He or she just can't chase hundreds of other fish and be chased by them without wasting energy, when there are more important things to do, like finding food, avoiding predators and reproducing the species.



What is the mechanism that helps keep schooling fish together? Do they have to see each other? How do they stay together at night or in murky water?

There are a couple of answers to the question and maybe more than will be described here.

Vision is one way they stay together, but not the only way. Some experts believe it's not the primary method of keeping the school together. We are all familiar with the lateral line of a fish which detects vibrations from other fish or water pressure resistance from the fish next to them and other objects. Some fish have the ability to generate weak electrical fields around themselves and any interference in strength of the field can be detected by the fish. They "feel" their environment. Fish also have very highly developed sense of smell. Yes, fish do smell - no jokes please. Their sense of smell may be more highly developed than in higher vertebrates. Their olfactory organs are not used for "breathing," their gills do that job - but only for smelling, to detect food, for navigation, and also for recognizing and finding their own species and avoiding predators, through the detection of pheromones.

All fish release pheromones into the water (all animals release pheromones, including humans. Check out your arm pit, "there's pheromones in them there pits") to attract each other for mating, and identification of each other.

Really, now is that true? Yes. Along with a combination of senses working together keeps the school a unit - sight, hearing, tasting, smelling and touch - what we would call the five senses.

And possibly a sixth, seventh or more senses, unique to fish, "feeling" with their lateral line and the ability to generate electrical fields and the use of sound waves in the water, - sonar. These all help them "feel" their place in space, in a watery world with few points of reference, except the school.

I've often wondered how schooling fish "know" the proper distance between themselves

and other objects the same way when we expand our sense of our own personal space. For example; when we drive a car, to "fill" out to include the four corners of the vehicle as our personal space. Most of us can drive in traffic, and park without hitting each other all the time. In place of a better word, I'll call this a "sixth sense" which allows us to "know where the car ends." With it, we expand our awareness, "our feeling," of the space around us to include the edges of the car. In fish, the lateral line is a real organ that's sensitive to water pressure, and some fish have the ability to send and receive low voltage electric charges, to help them "feel" the distance of school mates to establish the uniformity of the school.

When it comes to breeding strategies, schooling fish are egg-scatters - the *Characidae*, *Cyprinidae* and *Cyprinodontidae*. The majority of that use adhesive eggs which stick to plants; the rest lay non-adhesive eggs which typically fall to the bottom. Nearly all schooling fish eat their eggs if given a chance. In the wild, most breed in groups. What could be more natural in a community of schooling fish?

Typically, the males chase the females until the females discharge their eggs, the males simultaneously fertilizing them. This activity may go on for days in the wild.

Recognizing the opposite sex in schools may not be as important to its members due to the closeness of their living style. Living and swimming in close proximity, side to side, gill to gill, in the wild, it really doesn't seem to matter which male fertilizes which female's eggs. And since the school is always on the move, pair bonding and caring for the young is just impossible.

However, if the hobbyist looks carefully he or she will be able to tell them apart. The male is often slimmer and smaller and is often more colorful. The female is usually "chubbier," less colorful and larger than the male.

Once these fish have been put in an artificial setting, a tank, you must carefully consider the fact that these fish have never developed any sort of parental care instinct and, because of their



normal evolutionary history, never will. This means they'll eat their eggs and fry as fast as they can find them, without a second thought.

The techniques for breeding schooling fish differ somewhat from species to species, and specifics will not be covered in this article. There are general techniques that can be considered that work for most schooling species.

Use the longest tank you have, keep the water level low - 6 to 8 inches is sufficient. With non-adhesive egg species, the eggs have less distance to travel before they reach the safety of the bottom of the tank, which should be covered with either marbles, large pebbles, or a layer of peat moss. A combination of peat moss and marbles works very well.

The peatmoss keeps the water soft and along with the marbles helps preserve more eggs than would otherwise be saved from the parents. The peat moss may also supply certain minerals and nutrients to the eggs and foster the growth of minute foods for the fry to eat.

A pH of 6.0 to 6.5 is suitable for most schooling spawners. The water may take on an amber or brown color; this is of no concern so long as the water is within the proper pH range of the species you're breeding.

In breeding adhesive egg scatters you must place nylon mops in the tank. These are much better than live plants. You can make your own mops from nylon wool bought in a knitting wool store or variety store with a knitting wool section. They can also be bought premade in better pet stores.

I recommend making your own with dark green nylon wool. (I like green strictly for esthetic reasons the fish don't care. You can use any color you chose) The upside of the dark colors is that it is easier for you to see the eggs. The downside is that it makes it easier for the fish to see them too. So remember to remove the fish or the mops after spawning. The mops can be sterilized in hot water and used over and over.

Note: do not use natural sheep's wool as a material for mops. That type of wool will rot and

kill the fish. Take my word on this, I've lost breeding fish by using wool for mops. Don't don't make my mistake.

A trick to keeping the eggs and fish in the same tank safely is to use a glass or plastic divider. When spawning is completed (adhesive egg scatters), place the divider between the mops and the fish, then you will be able to remove the fish at your leisure without disturbing the mops that presumably are full of eggs.

Naturally, being community breeders these fish, in nature, spawn in large numbers of mixed sexes.

Barbs like the rosy barb, *P. conchonius* being a good example of fish that spawn readily when in at least communities of 8 or 12 adult fish in spawning condition. In the wild, this number would be much higher, but in an artificial setting it may be too much, since in any group there will be those that spawn and those that are onlookers, ready to consume the eggs as soon as they are expelled.

A modification that must be made in the species' natural breeding activities is to reduce the number of fish in the spawning tank.

There are two distinct ideas as to how to achieve this. One is to use a trio of two males to one female. This is thought to increase the percentage of eggs that are fertilized. But more often than not, the males spend most of their time chasing each other. The other method is to place one male in with a couple of ripe females. The thought here is that he will not be distracted and will knock himself out chasing and fertilizing eggs from both females, although there's the chance that all the eggs may not be fertilized.

Take your choice; there is no conclusive evidence on either side. In any case, the breeders must be removed or separated from the eggs as soon as breeding activity ceases.

When you have identified your breeders from your "show tank school," it's best to separate the sexes for a few days. Another reason to have a divider glass in your tank. They'll be able to see each other and this, along with the release of



pheromones (remember them) into the water, will help to stimulate spawning. If nothing happens after three or four days, separate the sexes by replacing the divider and feed live food. You should have been feeding them a good diet of live foods all along. Raising the temperature (proper for that species) by 2° or 3° degrees often triggers spawning.

Most schooling fish spawn in the early hours of the morning or when the light is first put on. If you are able to control the light sufficiently you'll have some control over when they spawn, if you would like to observe or take photographs. They seem to like bright light and most spawn near the surface. The reasons for this are not yet clearly understood. It may be safer for the clear and transparent eggs; the bright light may make them harder to see and more of them have a chance to fall to the bottom or adhere to plants and survive.

Spawning near the surface, out in the open, and in large numbers may confuse and discourage their natural predators from leaving the safety of their normal hiding places at the bottom among the rocks and plants they usually inhabit for the scary open spaces and unfamiliar upper levels of the water.

The blind cave tetra, *Astyanax fasciatus* is a fish that has lost its ability to see over countless generations of living in total darkness. It has developed a strong sense of smell and can find food every bit as well as sighted fish. It can also find others of its species with ease, school with them and not bump into rocks or the sides of an aquarium. A combination of lateral line senses, smell and possibly other mechanisms, such as sound pulses by muscular drumming of their swim bladder, may play a part in their remarkable ability to "see" without eyes.

Let's look at other features of fish that you may not have thought of.

When looking for catfish at the aquarium store, keep in mind that catfish with mouths that face forward are catfish that will become predators when they get larger. Catfish like *Chaca bankanensis*, Frogmouth catfish, *Hoplosternum* species, *Hoplias* sp., Channel catfish, *Ictalurus punctatus*, *Parauchenoglanis* sp., *Pseudoplatystoma fasciatum*, shovelmouth catfish, and *Leiarius* sp. may be cute and perfectly harmless when you first buy them, but as they grow larger, they can become predatory and should be kept only with fish they cannot swallow.

Catfish with down facing mouths like *Corydoras* sp., *Hypostomus* sp. and Plecos are not predatory fish and can be safely kept with fish smaller than them. On the other hand, they will go after eggs laid by other fish. As a general rule, all other fish should be removed when you're trying to breed a

pair of fish or you spot fish laying eggs. If you want save the spawn, remove the mating pair of fish to their own private tank.

Why are some fish mouthbrooders and others of the same species are not? What's the advantage in mouth brooding?

The group of fish that are most famous for using this peculiar strategy are the Lake Malawi cichlids. Most all the Malawi cichlids are mouthbrooders. The female parent takes the eggs into her mouth and protects them until they're free swimming. Even then, the parent fish may offer its mouth as a refuge when danger threatens its fry.

Compare this technique with cichlids and other fish that are substrate breeders, where the eggs are raised outside of the fish's mouth, and you'll see the advantages.

Most schooling fish spawn in the early hours of the morning or when the light is first put on. If you are able to control the light sufficiently you'll have some control over when they spawn.



- 1] The eggs are better protected against predators.
- 2] The parent fish can move around freely and are not tied to a "nesting spot" and can escape enemies and take its eggs/fry with it.
- 3] Fish that live in marshes, where the water is low in oxygen, can carry their eggs and young to the surface which helps the eggs and fry get the oxygen they need to survive.
- 4] The fish no longer has to fan a supply of fresh water over the eggs because the oxygen is supplied automatically with every breath the fish takes.
- 5] It has been discovered that as the fish tumbles the eggs in its mouth to oxygenate them, it is also coating them with mucous, exuded from special throat glands, that inhibits the growth of bacteria on the eggs.
- 6] Mouthbrooders lay rather large eggs; their young are larger and stronger by the time they leave the safety of their parent's mouth, thereby having a greater chance of survival on their own.
- 7] Fish that live in open waters with few places to hide and crowded waters, gain an advantage in protecting and propagating their genes by mouthbrooding.

Another factor to take into consideration is the pair only has to consort with each other for only the time it takes to spawn and fertilize the eggs. This decreased pair bonding requires certain mechanisms which permit the sexes to recognize each other quickly. This is achieved by a very marked level of dimorphism; the males and females can easily recognize each other by color and shape. (In substrate breeders, the different visual sexual characteristics are generally very difficult to distinguish, it is the behavior patterns which help the fish recognize each other...this means they need more time for courtship and pair bonding.) The strategies of mouthbrooding and of quick recognition of the sexes also has another benefit to the species. The male, once mating has occurred, is no longer needed to care for the eggs. The female must now look after her brood and the male is free to mate with another

female almost immediately.

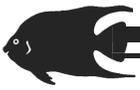
As you would expect there are generally more females born in most Lake Malawi species than males.

The mating behavior of Mbuna are also interesting and quite specialized. In brief, mating follows these lines: Once a female enters a male's territory, he opens his fins, intensifies his color and starts to perform a courtship display, beating his tail and spreading his gillcovers. The male will bend his head and tail towards the female and send a quivering movement down his body from head to tail. The female is at right angles to him. If the female is receptive to these advances, they will swim around in circles. At this point, the spawning will usually follow. The female will usually lay one egg. She will then take it up into her mouth, but wait - the male has not had a chance to fertilize it. This behavior does not seem to make any sense. It is believed that this particular action is part of the fish's adaptation to the open and densely populated habitat it lives in. There are always other fish hanging around and ready to snatch a quick meal. (Of course, in your breeding tank there are no other fish hanging about, right?)

So the question is how do the eggs get fertilized? The answer is right before our eyes and the eyes of the female, on the anal fin of the male. The male's "egg spots" suddenly become clear, their function is to fool the female into believing they are real eggs. She will attempt to pick them up, and as she must get close to the genital area of the male, she inevitably takes in some of the sperm he'll release at this point - and so the eggs are fertilized inside of her mouth. This action will be repeated a number of times throughout the mating cycle. The mating ends when the male starts to become aggressive toward the female and chases her off.

All of this behavior is a function of millions of years of "learned" responses to environmental and evolutionary challenges of survival.

I would think that in breeding Lake Malawi



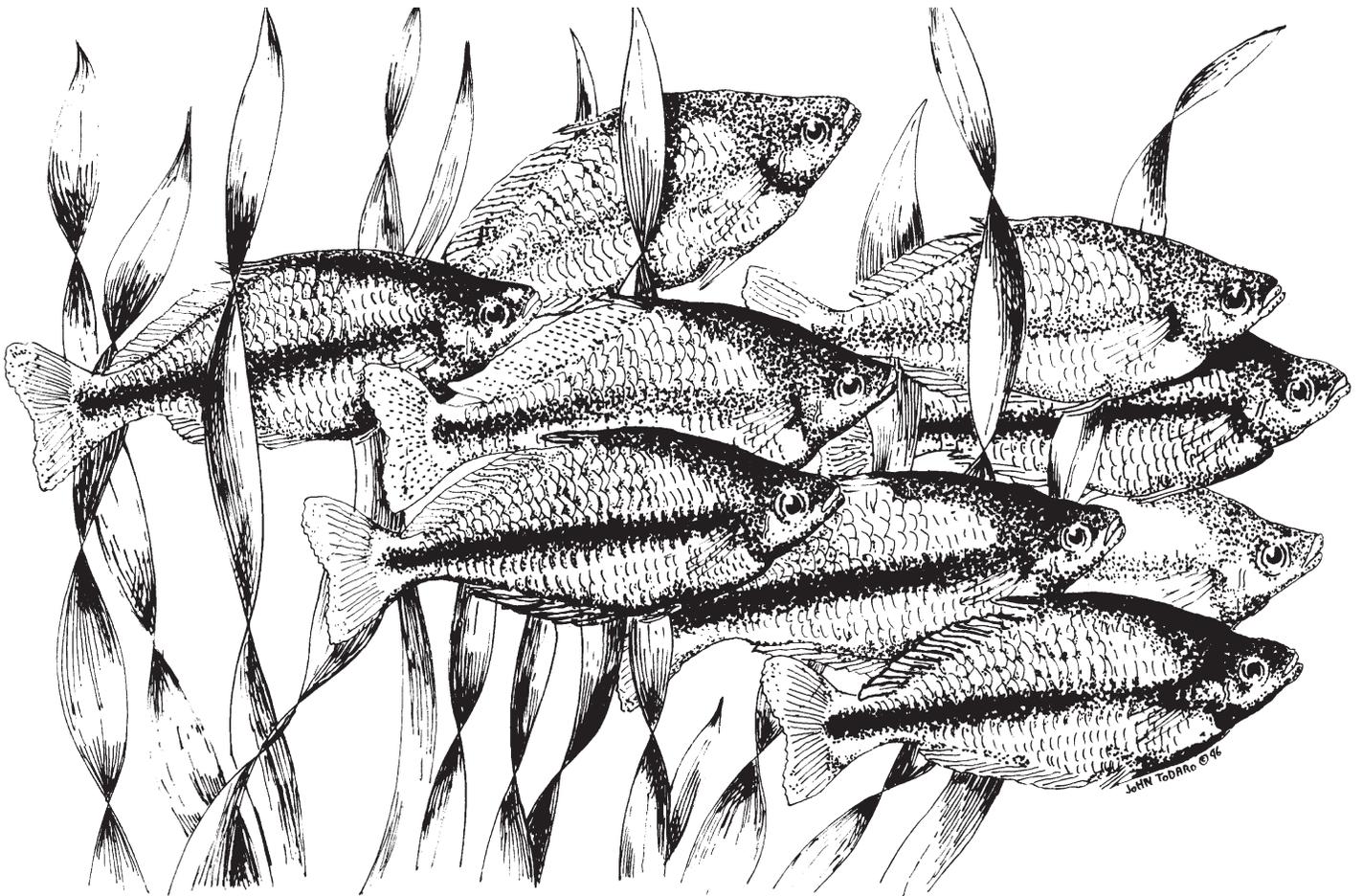
cichlids it might be more natural to supply the male with a choice of females in a tank that has enough hiding places, ex. flower pots or rocky caves for the extra females to hide in, until the breeders have finished spawning. A glass or an egg crate partition then can be dropped to separate the male from the now brooding female. The male can now turn his attention to the other females in the other half of the breeding tank. This might seem a bit off the wall to us at first glance, but might be more natural for the fish. I would be interested to know if any of our breeders have tried this approach and what success they have had.

It should not come as a surprise that fish act differently in aquariums than they do in the wild. For one thing, the size of the tank doesn't allow them to use their natural "fight or flight"

strategies that would protect them in threatening situations, normal school behaviors, or mating rituals, as they would in the wild.

Remember we have changed their playing field and the rules of their game no longer work. Our charge in keeping fish is to make the playing field as natural as we possibly can. When you mix fish from different regions of the world in a community tank, not only are you mixing fish in water they may not thrive in, but you are mixing, in many cases, fish that speak a different "evolutionary language".

Creating regional tanks or species tanks or environmental tanks, ex. a tank filled with only schooling fish that share the same water conditions, and life styles, is a great way to help make fish feel more at home. 





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TYPE & LENGTH of MEMBERSHIP: (CHECK ONE)

INDIVIDUAL				FAMILY				[] \$15 STUDENT 1 YEAR	
1yr.	2yr.	3yr.	4yr.	1yr.	2yr.	3yr.	4yr.	(UNDER 18 YEARS)	
\$20	\$36	\$51	\$68	\$25	\$45	\$63	\$85		

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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.

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Official use

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