

Finformation

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Next Meeting – March 21

(a week earlier than usual)

Stephan Tanner

on European tanks & breeding
whiptails and bristlenose catfish

Brian Ahmer

on *Betta brownorum*

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NEWSLETTER

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Nonprofit publications are permitted to reprint GPASI articles. Mail two copies of reprint to GPASI editor.

Back issues of *Finformation* are available in full color online at
<http://shene.killi.net/gpasi/Finformation.html>

NEWSLETTER ART

Betta splendens cover art and show flyer by Kathy Bintrim. Original cover drawing will be auctioned at the next meeting.

MEMBERSHIP

DUES are \$20 a year per family or street address.

To become a member, write to us or see Steve Gibbs at the next meeting. Visit GPASI2002.TRIPOD.COM

Unless otherwise specified below, **General Meetings** are held at the **Pittsburgh Civic Garden Center** in Mellon Park at the Corner of **5th and Shady Avenues**.
DOORS OPEN AT 7 PM

2003 General Meeting Dates

Mar 21

Apr 25 at the Palace Inn

May 30 • June 27

July 25 • Aug 22 • Sept 26

Oct 31 • Nov 21

The Board of Directors meets at 7pm at Elmer's Aquarium in Monroeville on the following dates:

Apr 7 • May 5

June 9 • July 7 • Aug 4

Sept 8 • Oct 6 • Nov 3

All members and suggestions for discussion are welcome. Contact a board member for meeting confirmation.

Upcoming GPASI Events

Next General Meeting

The next general meeting will be on **Friday, March 21** at the Civic Garden Center in Mellon Park. The doors open at 7 p.m. Make sure you get to the meeting on time: we will have two guest speakers from Ohio State University and will start promptly.

Stephan Tanner will discuss spawning bristlenose and whiptail catfish along and will tell us how to construct a European-style breeding aquarium. He is a research scientist in the Department of Human Cancer Genetics at Ohio State University. A zoologist by training, Stephan now works on cancer and inherited disorders in molecular biology. He has been an aquarium hobbyist for 20 years, with 10 years experience in the aquarium trade. He is editor-in-chief of the German publication *Barbs, Tetras, Loaches, Catfish (BSSW)* <http://www.bssw-online.de/>. He is also interested in water plants, and belongs to a group that is mainly interested in sword plants (*Echinodorus*): <http://homepages.compuserve.de/wasserpflanzen/index.htm>.

Brian Ahmer will be talking about the spawning and raising of the awesome and prized *Betta brownorum*. Currently Assistant Professor of Microbiology at Ohio State University. Brian's research concerns bacterial virulence and communication, concentrating on Salmonella. He teaches microbial genetics. A life-long fish hobbyist, Brian finally got a house with a fish room three years ago, hooray! Visit his website at <http://www.angelfire.com/or/biggestbri>.



Betta brownorum

Message from GPASI President Mike Solito

Once upon a time the GPASI had great fish shows every year. They strove to make each aquarium show better than the last. More speakers, bigger hall (the Convention Center), more fish on display. Our club turned out one of the biggest aquarium shows in the United States. Many of you can remember these shows and likely want to go back to the "heyday" of the Greater Pittsburgh Aquarium Society fish shows. These shows were mostly in the 90s and they were great events.

We are about to have a show that will take you all back to the days of great aquarium shows. We have managed to organize a great group of aquarists from all over Western Pennsylvania with one goal in mind: to show off our club's great history and to make this show something to be proud of. In conjunction with PACA, the local killifish club, we are going to show off both clubs' ability to promote the tropical fish hobby. Please come to the show and bring your fish.

Club News

Reminder about April Meeting Change

Remember that the April 25 meeting has been moved to the Palace Inn in Monroeville, where members will be able to work on setting up the show for Saturday and Sunday and then hear guest speaker Bob Goldstein talk about collecting fish in South America. The doors will open at 7 p.m.

Since we will be having a big auction on Sunday, the only auction items allowed at the Friday meeting will be BAP and AHAP submissions.

GPASI Aquarium Fish Show 03

This month, you will find the contents of the show brochure included in your *Finformation*. Starting on page 7, you will find the rules for showing and auctioning fish, along with other information that will make the show a great experience for you.

Banquet Reservations Due by Mar. 29

You need to plan ahead in order to reserve a place at the GPASI banquet on Saturday, April 26 at 6. We will have a great after-banquet speaker. You can choose from these dinner entrees: chicken parmesan, hot vegetarian platter, or roast top sirloin. All dinners will come with salad, rolls, fruit cup, dessert, coffee, and soft drinks. Please send your name and address, your payment, and your dinner order (how many of which main dishes) to GPASI, c/o Jim Davidson, 1453 Woodbine St., Pittsburgh, PA, 15201. Check should be payable to GPASI. Dinner is \$22.00 per person and must be pre-paid by March 29.

Speakers for Coming Months

Watch *Finformation* for more information about these speakers who will be visiting our club: **Mike Wells** in May on discus < <http://www.adiscusdream.com/> > ; **Dan Woodland** in August on "Fishkeeping: Hobby or Disease?"; **Cheryl Sanders** on goldfish in September.

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~ There can be no club without its members. If there is anything that you would like to do for GPASI, just let one of us know. We'd be happy to have you as part of the team. ~

Wet Science

***Rivulus marmoratus:* Hermaphroditic Killie Sallie S. Boggs, PhD**

In the present article I will address a subject suggested to me by our editor. She said, "At the recent auction, there was a lot of interest in that killie when you said that it was hermaphroditic. Several people were curious about how that works: can it breed without ever interacting with another of its kind? Or given the opportunity, will those fish fertilize each others' eggs to broaden the gene pool?"

At least three modes of reproduction--heterosexual, hermaphroditic, and parthenogenetic--are found in fishes. In the most common form, heterosexual reproduction, there are separate male and female parents, but even here there is considerable variation. In some live-bearing fishes, the female is able to store sperm for up to 8 or even 10 months, and this sperm is used to fertilize new batches of eggs as they develop. In some cases, a female may carry sperm from several males at once. Heterosexual reproduction is known as dioecy,

where male and female reproductive organs are in separate individuals and each individual is of only one sex. Because of recombinational events between the chromosomes from the male and female, all the offspring are different from each other and from the parents.

**MANGROVE RIVULUS**

Order - Cyprinodontiformes
Family - Aplocheilidae
Genus - *Rivulus*
Species - *marmoratus*
Photo by D. Scott Taylor

Parthenogenesis and hermaphroditism are non-dioecious modes of reproduction exist and these are quite variable, and often very complex.

Hermaphroditic organisms possess both male and female reproductive organs (ova and testes) in the same animal. In hermaphroditic reproduction, since a single fish is both male and female, it can produce both eggs and sperm (either at the same time or at different times), and may or may not mate with other similar hermaphroditic fishes. External self-fertilization occurs in one hermaphroditic fish, which sheds egg and sperm simultaneously. In another (*Rivulus marmoratus*), internal self-fertilization may occur. In certain fishes there is a time sequence of hermaphroditism, young fishes reversing their sex as they grow older (e.g., clown anemone fish).

In parthenogenetic reproduction, unfertilized eggs develop into embryos. This is known to exist in at least one fish species, *Poecilia formosa*, of the Amazon River; however, even though development proceeds without fertilization in some of these females, mating with a male is still required to stimulate egg development. Thus, some people say they are not truly parthenogenetic. With parthenogenesis one or more genomes are inherited clonally. The offspring are all clones of the mom. I have discussed this mode of reproduction in previous articles. Daphnia and brine shrimp both use this method when conditions are ideal and change to dioecy when conditions are threatening and they need to produce eggs for the population to survive the threat.

Currently, only a single “freshwater” species of self-fertilizing hermaphroditic fish is known: *Rivulus marmoratus* (Soto et al. 1992, Turner et al. 1992). Simultaneous and sequential hermaphroditic fish are more common and exist within 14 families of teleost fishes (Shapiro 1984).

Fish Profile

The mangrove rivulus is found in the tropical and subtropical areas of the western Atlantic/Caribbean basin from central Florida to the Bahamas and Caribbean, south to Brazil including the Yucatan and Venezuela. This range closely parallels that of the range of the red mangrove tree. The fish’s most northern range is Florida, where it is relatively rare. In Florida, it is found along the Atlantic coast, north to Indian River County and south throughout all of the Keys. On the western coast, the mangrove rivulus may be found north almost to Ft. Myers. The mangrove rivulus is the widest ranging member of the genus.

Although *R. marmoratus* can survive in fresh water, it is primarily a saltwater or brackish water species and occurs rarely in freshwater. Adaptable, it can tolerate salinities from 0-68 parts per thousand. In west Florida it can be found in stagnant, seasonal ponds as well as in mosquito ditches within mangrove habitats. Along the east coast of Florida, it prefers marsh habitats elevated above the intertidal zone. The fish like the protection of crab burrows, particularly those of the great land crab. Researchers have found as many as 26 small fish in one burrow.

These fish can reach 2 inches (5 cm) in length, but they are usually 0.4-1.5 inches (1.0-3.8 cm) long. Hermaphroditic fish attain sexual maturity at 90 days and primary males at 84 days of age. Sexes can be distinguished 8 weeks after fertilization of the egg occurs. Adults may live up to 5 years in captivity.

These fish are hardy. They can survive in moist detritus without water for up to 60 days during periods of drought, or when water is uninhabitable because of lack of dissolved air, or high dissolved sulfide. Aggression among the *R. marmoratus* may cause individuals to move to other bodies of water. They have been seen slithering and flipping across land during the rainy season. They can absorb oxygen and expel carbon dioxide through their skin. Tolerating extremes in temperature and salinity, the mangrove rivulus can survive in areas where few other potentially competitive carnivorous fish species can exist. This is just the type of fish that might survive in my tanks.

The *R. marmoratus* eats all the invertebrates it can get, including ants and flying insects, polychaete worms, gastropods, mollusks, and mosquito larvae. The mangrove rivulus has been observed jumping out of the water to capture termites, returning to the water to swallow its prey. It may also be cannibalistic.

Sexual Dimorphism and Breeding

Though many *R. marmoratus* are hermaphroditic and contain both sex organs and can use them without another fish present, some are separate sexes. The coloration of the hermaphroditic fish is not spectacular. After all they don’t have to attract a mate. The head and body are maroon to dark brown or tan, with small dark spots and speckling on the body, particularly the sides. The dorsal surface is always darker than the creamy ventral surface. This is a good disguise in environments with dark leaf litter substrates. A large dark spot surrounded by a band of yellow is located at the upper base of the caudal fin in the hermaphroditic individuals. When males are present, they lack this dark spot and have a red-orange cast to their flanks and fins. Thus, if you plan to buy one fish in an auction and hope to have offspring, make sure it has a spot on the base of the tail fin.

R. marmoratus can function as hermaphrodites or with two sexes. As a hermaphrodite, a mangrove rivulus is able to fertilize its own eggs internally, producing viable offspring. Each hermaphroditic fish produces both sperm and eggs in its ovotestes. All the offspring are clones of the mom and this fish represents a natural example of cloning by a vertebrate organism.

Males are rarely observed in the wild in Florida, but are more common throughout the Caribbean and Central America. There are two types of males, primary and secondary males. Primary males develop directly from fertilized eggs while secondary males develop from hermaphroditic fish under certain environmental conditions. Therefore, even if the fish has a spot it may not be hermaphroditic.

There is evidence that young fish tend to encourage sexual out-crossing by releasing unfertilized eggs. This usually occurs when both males and females are present. There seems to be an age-dependent shift from female-domination to hermaphroditic-domination, as the population evolves as older populations have significantly higher numbers of hermaphroditic fishes. This hermaphroditic mode of reproduction may be an evolutionary response to the habitation and possible isolation within crab burrows.

Mature eggs are released near the surface of the water. At time of release eggs may be in different stages of development from recently fertilized to near term eggs containing a developing embryo. This is the evidence that fertilization can occur inside the fish and makes *R. marmoratus* unique. Most eggs hatch 16 days after fertilization, although some may take up to 2 weeks longer. Remove eggs if possible because adults often eat them. The number of eggs released by each adult is dependent upon the size of the adult fish as well as the season, but 40-75 eggs are common. Fertilized eggs will only develop if incubated under damp conditions. In the wild they hatch simultaneously with flooding of the mangrove. Thus, changing the salinity may speed or induce hatching.

Because its offspring are clones of the hermaphroditic parent (known as genetic homozygosity), this species is often subjected to toxicology and genetic research. They are considered particularly useful because they are easy to maintain and breed in captivity and they have a short life cycle.

R. marmoratus was once listed as a threatened species in the Gulf of Mexico. Recent surveys have shown that a number of populations exist in Florida where the fish has been down-listed and is considered a species of special concern. In 1999, the National Marine Fisheries Service requested protection for the fish under the Endangered Species Act, but so far, it has not been officially listed as endangered or threatened. The main threats to its survival are habitat degradation and destruction, exposure to pollutants, and environmental alterations of salinity, temperature, and vegetation cover.

Some of the above information came from the following websites:

<http://www.isb.vt.edu/psfs/appendix.htm>

<http://www.flmnh.ufl.edu/fish/Gallery/Descript/MangroveRivulus/MangroveRivulus.html>

Additional information can be found in the following publications:

Biology and ecology of *Rivulus marmoratus*: new insights and a review. *Florida Scientist* 63(4):242-255. 2000. D. Scott Taylor.

Estuarine reconnection of an impounded mangrove salt marsh in the Indian River Lagoon, Florida: short-term changes in fish fauna, *Mangroves and Salt Marshes*, March 1998, pp. 29-36, D. Scott Taylor, Gregg R. Poulakis, Sven R. Kupschus, Craig H. Faunce.

Rivulus Marmoratus : Ecology of Distributional Patterns in Florida and the Central Indian River Lagoon, *Bulletin of Marine Science*, 57(1):202-207. 1995. D. Scott Taylor, Wm. P. Davis and Bruce J. Turner.

Swamp Sleuth: a biologist reveals how one rare hermaphroditic fish survives a long dry spring, *Sea Frontiers*, 1995. D. Scott Taylor.

Room Without a View: until a curious biologist dipped into its home, a tiny fish led its quirky life in well-hidden secrecy, *Natural History*, Sept. 1989. D. Scott Taylor.

<http://w1.mangrove.org:880/video/rivulus.html>

GPASI Aquarium Fish Show 03

Schedule of Events

April 25, 26, 27, 2003 at the Palace Inn, Monroeville, PA
(at Exit 6, PA Turnpike RT 22 & 48)

Friday, April 25

10:00 a.m. Show Set Up - table layout, main air lines, vendors, etc.

6:00 p.m. - 10:00 p.m. Registration of Entries

7:00 p.m.--**GPASI Monthly Club Meeting at Palace Inn**

Speaker - Bob Goldstein, Ph.D. Collecting in Brazil
Everyone Welcome!

Saturday, April 26

9:00 a.m. - 4:00 p.m. Registration of Entries

9:00 a.m. - Fish Room Open to Public

2:30 p.m. - Speaker Bob Goldstein, Ph.D. - Native Fish

4:00 p.m. - Speaker Rusty Wessel - Central American Cichlids

6:00 p.m. - Banquet (fish room & vendors closed)

After Banquet Speaker Mike Schadle - Fish Hobby Quiz

Sunday, April 27

Fish Room closed until completion of judging at about noon

9:00 a.m. Buyer & Seller Auction Registration

11:00 a.m. until finish - HUGE Auction

4:00 p.m. - 8:00 p.m. Show entrees may be removed

Awards will be presented at the close of the auction

Rules for Showing Fish

SHOW ENTRY REQUIREMENTS

1. Anyone may enter in any number of classes with no limitations on the number of entries. Affiliation with GPASI or any other aquarium society is not required.
2. Entries must be placed in the most appropriate class as outlined on the "Class" sheets. An entry may be moved by the judges or show committee if it is not in the proper class. Decisions of the Show Chair are final.
3. Each entry may be entered in only one class. An entry will consist of a single fish, except where the rules state otherwise.
4. All entries of an exhibitor must be registered at one time. This includes the set-up of tanks. Empty tanks left unattended for over 2 hours will be moved aside to make room for other entries. Upon your return, we can squeeze in your entries.
5. Registration will begin on Friday, April 25th, 2003 at 6:00 p.m. and will run until 10:00 p.m. Sat registration starts at 9 a.m. and ends at 4p.m. Exceptions to the stated registration times can be made by the show chairman if advance notification is given. The Show area will close at 6:00 p.m. April 27th, 2003 SHARP!!!! No Exceptions!!!! The Show area will remain closed until judging is completed!
6. Show Area: The show area will be closed to all entrants (except show committee members) beginning at 6:00 p.m. Saturday, April 26, 2003 until judging is completed on Sunday, April 26, 2003.

7. Due to the number of people who walk through the show, it is advisable for local entrants to register their fish as early as possible on Friday. This will alleviate any "getting in the way" trouble for entrants and viewers. GPASI members are urged to have their fish set up before noon on Saturday.8. The registration fee must be paid at the time of registration and will follow this schedule:

\$1.50 US per entry for 1 - 20 entries.

\$30.00 US maximum charge for 20 or more entries.

You can only register under this fee schedule once.

There is no entry fee for the Junior Class entries (under 16 years of age).

9. All entries must be on the show premises. No Exceptions.

10. No Hybrids are permitted in any classes.

GENERAL REQUIREMENTS

1. All entries must remain in place for the duration of the show which ends at 4:00 p.m. on Sunday, April 27, 2003. Entries will be removed for auction by the show committee or otherwise with prior authorization of the Show Chair. The fish cannot be removed prior to the judge's evaluation of the fish.
2. The show committee reserves the right to remove or require the removal of any entry because of a dead fish, leaking tank, or other malfunctioning equipment.
3. Although show committee personnel will be stationed in the show area at all times, neither GPASI nor the Palace Inn will be responsible for loss or damage to fish or equipment. The public is encouraged to attend the show; therefore, ALL ENTRANTS ARE REQUIRED TO COVER THEIR TANKS AND BOWLS SECURELY, to keep the fish IN and to keep others OUT.
4. Anything remaining in the show area after 8:00 p.m. on Sunday, April 27, 2003 will be removed and become the property of GPASI. (This does not give you an excuse to abandon your trash!)

EQUIPMENT

1. Any size tank may be used as long as it is a flat-sided tank. Standard drum bowls with flat sides are also acceptable. Any kind of tank may be used in the Tank Category.
2. Any tank over 20 gallons in any class must be placed on a separate stand provided by the entrant and must have its own air supply.
3. All tank entries may have air powered filtration and any item necessary for the contentment of the fish inside the tank or bowl. However, the judges may penalize or disqualify for not being able to see the fish because of the items in the tank. The judges must be able to remove any item from the tank in order to judge the fish. Under no circumstances is gravel permitted in a tank or bowl within the fish classes. Some type of substrate is required in the tank classes.
4. ALL TANKS AND BOWLS MUST HAVE SOME TYPE OF SECURE LID.
5. It is suggested that tanks and bowls entered in the species classes have some sort of solid background. This can be painted, "Contact" paper, or whatever. The sides may also be covered. The color and the kind of background chosen is at the entrant's option. Although this is suggested, it is not required.

6. Air will be supplied to within 4 feet of all entries (except free standing tanks.) Entrants must supply their own valves, tubing, airstones, etc. ALL AIR LINES MUST BE CONTROLLED BY VALVES. Upon removal of the valve, entrants are encouraged to seal the hole with some sort of masking tape. This will prevent the loss of air pressure.
7. Heaters will only be allowed in the discus and tank classes. It is the entrant's responsibility to supply their own heating, lighting, extension cords, bowls, tanks, and in some instances, stands. One electrical outlet will be provided for your use (free standing tanks, only.)
8. Treated tap water will be available. Bring your own conditioners! The tap water will be from the local Water Authority and may contain some chemicals.
9. A limited supply of drum bowls, valves, airstones, and tubing will be available for purchase at deliberately outrageous prices on a first-come, first-served basis. Please plan to bring your own.
10. No spray-type window cleaners of any kind (including "organic" cleaners) are permitted in the show area.

Awarding Prizes

1. All efforts will be made to see that judging is completed and all entries are marked prior to noon on Sunday, April 27th, 2003.
2. No entrant will be permitted in the show area during judging, unless by approval of the show chair.
3. ALL DECISIONS OF THE JUDGES ARE FINAL, and are not subject to appeal.

The presentation of the awards will be on April 27th, 2003. Cash!! and an award card will be presented to First, Second, and Third place winners in most classes. (\$10 for first, \$7 for second and \$3 for third) All cash prizes will be handed out to the winners on Sunday, April 27th, 2003.

Trophies will be given out to winners of the 7 divisions (no trophy will be given for the Specialty Division) and the five major award categories listed below.

- A. A trophy will be awarded to the "Best of Show - Fish" and will be chosen from the seven divisional winners (Killifish, Cichlids, Livebearers, Catfish, Egglayers, Goldfish and Juniors). Classes 54 and 55 will be included in this award.
- B. A "Reserve Best of Show - Fish" will be chosen from all entrants. Classes 56, 58, 59, and 60 will be excluded from participation in this award.
- C. The "Best of Show - Cichlid" entry will also be awarded an ACA Medallion.
- D. One President's award will be presented to the entrant who accumulates the most points. Points for this and other awards will be based on the following system: Each Best Of Show = 6 Points, Reserve Best of Show = 5 points, Each Divisional = 4 points, Each First Place = 3 Points, Each Second Place = 2 points, Each Third Place = 1 point

E. The "Jack Wilson Memorial" award will be presented to the current GPASI member who accumulates the most points following the preceding system.

F. The "Challenge Trophy" will be presented to the visiting society that accumulates the most points following the preceding scoring system. The first society listed on your registration form will be the only society awarded any challenge points.

G. A FAAS Medallion will be awarded to the first place Junior Class Winner.

H. The killifish classes will be judged as pairs (1 male and 1 female) per A.K.A sanctioning rules.

NO POINTS WILL BE GIVEN FOR NON-PLACING ENTRIES. Ties will be broken by the number of 1st place awards on down until a winner is determined. These procedures will be followed for all pointed awards.

Rules for Auction

1. Registration for both buyers and sellers will begin at 9:00 a.m. on Sunday, April 27th 2003. The Auction will begin promptly at 11:00 a.m. of the same day.
2. All GPASI member BAP and AHAP items will be auctioned at the beginning of the auction. Donations will be sold during the auction at the auction chair's discretion.
3. Following the sale of the last AHAP item, the auctioneer will move on to items offered for sale by registered sellers. The proceeds from the sale will be split between the seller and GPASI at a ratio of 70% to 30% in favor of the seller.
4. The Auction will be conducted using a ten table system. All items ending in #1 go on Table #1, all ending in #2 go on Table #2, etc. All items ending in #0 go on Table #10. All items with #1, #11, #21 etc will be auctioned first. Following tables to be sold, will be picked at random.
5. There is no maximum or minimum number of bags that can be placed in the auction. However, a maximum of 5 bags of one species or color variety for one seller will be in effect. The auction chair can modify this rule at his discretion if a request is made prior to the day of the auction. Each item will be assigned a seller's code (usually the sellers initials) and a number by the seller, such as PDB - 1. Letter identifications can be pre-registered by phoning Jim Davidson at (412) 781-3938 between 5-9 p.m., ONLY. Only 1 letter identification will be assigned to a household.
6. Only fish and plants will be sold at the auction - no dry goods.
7. Anyone in attendance may purchase or sell items in the auction, but must first register with GPASI as a buyer and/or seller.
8. ALL BIDDERS must have a bidding card whether paying cash or running a tab. Buyers may pay cash at the time of purchase. All registered buyers will be given an account number and be designated as a cash or account buyer. This account number will be used to designate their purchases. The account buyer must sign a bidder's slip that shows the price, item number, and your buyer number agreeing to pay the listed price. Buyers setting up a buyer account will be required to leave identification with the registration table. This is usually a valid driver's license. All other forms of identification must be approved by the show chair. Upon paying your tab you will be

returned your identification. NO EXCEPTIONS WILL BE MADE!! A Buyer Account must be established before making your bid. Auctioneers will only recognize those bidders with the appropriate bidder's cards.

9. Bidding will be made in increments of one dollar. While the auctioneer may suggest a price to start the bidding, a lower opening bid may be offered by anyone. The minimum bid on any item is one dollar.

10. Acceptable Means of Payment: GPASI will accept Cash in the form of US Currency, a US Money Order, a Cashier's Check in US Funds, or a Traveler's Check in US Funds with proper identification. Personal checks in US funds may be accepted with proper identification. Verification must be recognized in advance. GPASI reserves the right to refuse to accept any personal check.

11. There will be NO EARLY CHECK-OUTS PERMITTED DURING THE AUCTIONING OF THE LAST TWO TABLES. Check-outs (paying for your auction purchases) will resume at the closing of the auction.

12. To place a bid merely raise your bidding card to gain the recognition of the Auctioneer. The Auctioneer can accept only one bid at each price and the decision of the Auctioneer as to who made that bid is final. It is the Bidder's responsibility to communicate the bid to the auctioneer. The auctioneer will not be held responsible for lost bids or inaccurate bids due to lack of communication or the inability of the buyer to get the auctioneer's attention.

13. Bags used to hold items for sale must be clear plastic and of the type used in pet stores. "Baggies", "Zip Locs" or opaque trash bags are unacceptable and will be returned to the seller. Each bag must be sealed by a rubber band or tied shut. "Twist-a-Seals" are not acceptable. The bag should generally contain 1/3 water and 2/3 air. Any item needing rebagged by the show committee will be charged a \$1 rebagging fee that will be deducted from the seller's proceeds. Large or spiked fish must be double-bagged.

14. The seller must have certain required information on the bag in order to properly sell the item. The minimum requirements are: the Seller Code and bag number, Species scientific/common name, quantity in the bag, seller's name and phone number. The information provided must be legible, large enough to read, and unaffected by water. Items to be auctioned will be checked by a member of the auction committee prior to being placed on the auction tables. Any problems with items to be auctioned will be corrected by the seller at this time.

15. The auction chair reserves the right to refuse any fish for sale due to deformity, sick fish, etc.

16. If a buyer experiences problems with a seller's fish, please take up the problem with the seller. It is advisable to let GPASI know of the problem; in that way we can better control next year's auction.

17. Proceeds from the auction will be paid by check to the seller within two weeks of the show. Proceeds will not be deducted from your purchases at the show. You will be expected to pay for your purchases at the time of sale. All sellers' splits will be paid by the stated check.

VENDORS: A number of vendors will be displaying their goods at the show. Many will have goods for sale, some at discounted prices for the event.

MAIL-IN ENTRIES: Mail-in entries accepted only for Killifish classes. All mail-in killie entries will be auctioned on Sunday. For more information on killie class entries contact PAKA - Ross Cronkhite at 412-233-0996

SANCTIONING: ACA and FAAS Sanctioned

SMOKING: Due to City and State Regulations, smoking is not allowed in the show area. Smoking is permitted outside.

Accommodations and Meals

HOTEL RESERVATIONS: The official hotel of the GPASI & PAKA AQUARIUM FISH SHOW 03 All Species Tropical Fish Show and Auction is the Palace Inn, Monroeville Pa 15146 (at Exit 6 PA turnpike. RT 22 & 48) 412-372-5500

The room Rate is \$76.38 per night incl. tax and gratuity for a single queen bed, and \$84.36 for a double queen/single king. Cots are \$8 plus tax. Rooms will be reserved on a first-come, first-served basis. For reservations, call the Palace Inn (412) 372-5500. When calling, mention the GPASI Show or the AQUARIUM SHOW Please make your reservation as soon as possible, giving your expected date and time of arrival and your preference for smoking or non-smoking rooms.

MEALS: A banquet is planned for Saturday evening. Reservations for the banquet must be made in advance (see page 3). Caterers will also have food available at reasonable prices at the show site and there are a number of restaurants in the area.

Judges

Look for more information about our judges in next month's *Finformation*.

Robert Goldstein
Rusty Wessel
Mike Schadle
Jeff Natterer
Jim & Liz Hutchings

Competition Classes and Sponsorships

Below is a list of the competition classes at the Aquarium Fish Show '03 in April. Sponsors are listed to the right of each class. To all the sponsors listed below: thank you for supporting the club and the hobby!

Killies (All Sponsored by PAKA)

ALL MAIL-IN KILLIE ENTRIES WILL BE AUCTIONED AFTER THE SHOW.

Mail-in entries allowed only in killie classes.

1. *Rivulus* and other New World Non-annuals—Mike Brem, President, CAKC
2. New World Annuals—Curt's Killies
3. *Nothobranchius*—Northern Ohio Killifish Assoc.
4. *Fundulopanchax (Paraphyosemion)*—Exclusively Killies
5. *Fundulopanchax* (all other varieties)—Atlanta Aquarium Society
6. *Chromaphyosemion*—Joel and Robin Antkowiak
7. *Mesoaphyosemion (Calliurium types)*—Lee Harper on behalf of the Keystone Group
8. *Kathetys, Christyi*, and *Diapterons*—Kalamazoo Valley Killi Guys and Sometimes a Girl via James Graham
9. *Aphyosemions* (all other types)—Shene's Killies
10. *Epiplatys* and all other Africans and Eurasian—Scott Graner

Cichlids

11. Angelfish & Discus—Linda's Lovely Angels
12. *Apistogramma*—Al Yunker
13. New World 6" and under—Hanlon's Café
14. New World over 6"—Hanlon's Café
15. *Aulonocara*—Joe Craig
16. Mbunas—Bill Sensor
17. Haplochromines, Lake Malawi—Wilkensburg Aquarium
18. Victorians—Kevin Hosmer
19. *Julidochromis, Chalinochromis*, and *Telmatochromis*—Bill Shreves, Jr and Bill Shreves III
20. *Lamprolongus* and *Neolamprolongus*, Tanganyikan only—Gary Balbo
21. Old World under 4"—West Hills Pet Center
22. Old World cichlids AOV—Hanlon's Café

Livebearers

23. Guppies, Males, Solid color tails—Bob Fulmer Aquatic Enterprises
24. Guppies, Males, All others—Mike Ott
25. Guppies, Females, Half Black—Don Plazek
26. Guppies, Females, All others—Ed Redgate
27. Swordtails, Platies, Mollies, Plain finage—Mary and David Webeck
28. Swordtails, Platies, Mollies, Fancy finage—Armand Sichi, Jr.
29. Livebeares AOV—Marlene Scholze

Catfish

30. *Corydoras, Aspidoras*, and *Brochis*—AllOddballAquatics.com
31. Suckermouth catfish, small, 6" and under—Don Tuttle
32. Suckermouth catfish, over 6"—John Lewis and Stacy Gatto
33. *Synodontis*—Sallie Boggs
34. Catfish AOV—John Shaw, Marineland

Egglayers

35. Sharks and Loaches—Sallie Boggs
36. Rainbowfish—Kathy Bintrim, In Leafy Shadows
37. Rasboras, Danios, and Minnows—West Hills Pet Center
38. Barbs—Mike Parahus
39. Characins 2" and under—Jean Grace
40. Characins over 2"—General Pet Store, Crafton Shopping Center
41. Natives—Jim Graham
42. Egglayers AOV—Mark Short
43. Betta, Male, Double tail—Mike Solito
44. Betta, Male, single tail—Jim Davidson
45. Betta, Female—John Studeny
46. Anabantids under 4"—Hanlon's Café
47. Anabantids, 4" and over—Hanlon's Café

Goldfish

48. Goldfish w/head growth: Orandas, Lionhead, and Pompoms—Walt's Water World
49. Goldfish w/ eye types: Moors, Bubble eyes, Celestials—Crittters, Olympia Shopping Center
50. Fantails, Ryukins, and Pearlscales—John Badd and Tom Badd
51. Goldfish AOV—Guman's

Junior Division

52. Junior Egglayer—The Cox Family
53. Junior Livebearer—The Cox Family

Specialty Classes

54. Sexable Pairs (1 male and 1 female)—Joe Amuso
55. Family (parents and six fry at least 3 months old)—Marshall Davis
56. Aquatic Plants—Cavan Allen
57. Saltwater fish All Varieties (will compete for Best Egglayer in Show)—PMASI, www.pmasi.com
58. Tank Beautiful (Fresh or Salt up to 10 gal.)—Steve Okabayashi
59. Arts and crafts—Youngstown Area Tropical Fish Society
60. Slides and photos—Chili's of Monroeville

1. **Best Of Show**—Python
2. **Reserve Best Of Show**—Elmer's Aquarium
3. **President Award (Most Points In Show)**—Three Guys Aquatics
4. **Jack Wilson Memorial Award (Most Points For GPASI Member)**—Petland, Monroeville
5. **Challenge Trophy (Most Points Visiting Society)**—Pet Supplies "Plus"

AOV = All Other Varieties

Breeders Award Program

The Breeders Award Program (BAP) promotes the keeping and breeding of tropical fish, recognizes and motivates achievement in the hobby, encourages research into the spawning of more difficult species, shares knowledge about breeding techniques, and publishes accounts of spawning techniques. For a description of the classes, awards, and point system, visit the BAP page at gpasi2002.tripod.com. **For the latest standings, visit <http://shene.killi.net/gpasi/Finformation.html>**

Contact BAP Chair Chuck Bialon with questions: bialon@ppg.com.

Recent BAP Submissions—Congratulations to all the breeders.

Member Name	Month	Genus	Species	Class	Points	Further Information
Gary Balbo	1/03	<i>Microgeophagus</i>	<i>altispinosa</i>	8	10	
		<i>Corydoras</i>	<i>simulatus</i>	11	20	
		<i>Hypancistrus</i>	<i>zebra</i>	11	40	*
	2/03	<i>Nomorhamphus</i>	<i>celebensis</i>	1	15	halfbeak
		<i>Capoeta</i>	<i>tetrazona</i>	3	10	
Charles Bialon	1/03	<i>Neolamprologus</i>	<i>gracilis</i>	7	15	
		<i>Brachyrhaphis</i>	<i>rosewithae</i>	1	5	*
		<i>Poecilia</i>	<i>salvatoris</i>	1	5	* mollie
Eric Bodrock	1/03	<i>Poecilia</i>	<i>perugiae</i>	1	5	
		<i>Cyphotilapia</i>	<i>frontosa</i>	7	20	Mpimbwe blue
		<i>Nanochromis</i>	<i>parilus</i>	7	10	
		<i>Apistogramma</i>	<i>borellii</i>	8	10	
	2/03	<i>Aphanius</i>	<i>mento</i>	9	10	
		<i>Corydoras</i>	<i>duplicareus</i>	11	20	*
		<i>Poecilia</i>	<i>vittata</i>	1	5	cuban limia
		<i>Glossolepis</i>	<i>maculosus</i>	4	10	*
Wallace Cox	1/03	<i>Corydoras</i>	<i>reynoldsi</i>	11	20	*
	2/03	<i>Neolamprologus</i>	<i>tetracanthus</i>	7	15	
Robert Fullmer	1/03	<i>Macropodus</i>	<i>opercularis</i>	2	5	paradise fish
	1/03	<i>Xenotoca</i>	<i>eiseni</i>	1	10	red-tail goodeid
Scott Graner	1/03	<i>Labidochromis</i>	<i>caeruleus</i>	7	10	electric yellows
		<i>Neolamprologus</i>	<i>leleupi</i>	7	15	
		<i>Aplocheilichthys</i>	<i>nimbaensis</i>	9	10	*
William Montgomery	1/03	<i>Pseudoepiplatys</i>	<i>annulatus</i>	9	20	
		<i>Xenotoca</i>	<i>eiseni</i>	1	10	red-tail goodeid
		<i>Xiphophorus</i>	<i>helleri</i>	1	5	swordtails
Linda and Ted Neill	2/03	<i>Xiphophorus</i>	<i>maculatus</i>	1	5	platies
		<i>Xiphophorus</i>	<i>variatus</i>	1	5	platies
		<i>Limnaea</i>	<i>stagnalis</i>	14	5	* common snails
Samantha Ott	1/03	<i>Poecilia</i>	<i>reticulata</i>	1	5	guppies
	1/03	<i>Xiphophorus</i>	<i>maculatus</i>	1	5	platies
Bob Perciavalle	1/03	<i>Xiphophorus</i>	<i>helleri</i>	1	5	swordtails - red
	1/03	<i>Corydoras</i>	<i>aeneus</i>	11	15	albino
	1/03	<i>Corydoras</i>	<i>paleatus</i>	11	15	
	2/03	<i>Poecilia</i>	<i>chica</i>	1	5	
Donald Plazek	1/03	<i>Poecilia</i>	<i>reticulata</i>	1	5	
		<i>Archocentrus</i>	<i>spilurus</i>	8	10	
Richard Reiter	2/03	<i>Poecilia</i>	<i>reticulata</i>	1	5	neon guppy
Walter Roth	1/03	<i>Haplochromis</i>	sp (#44)	7	10	bright tail reds
Pete Scaletto	1/03	<i>Tanichthys</i>	<i>albonubes</i>	4	5	white clouds
Mark Short	1/03	<i>Ceruithium</i>	<i>strercusmocarum</i>	13	5	* saltwater snails
	2/03	<i>Ameca</i>	<i>splendens</i>	1	10	butterfly goodeid

		<i>Apitasia</i>	<i>pallida</i>	13	5	anemone
Mike Solito	1/03	<i>Apistogramma</i>	<i>macmasteri</i>	8	10	
	1/03	<i>Apistogramma</i>	sp (mouthbrooder)	8	10	
Richard Wiley	1/03	<i>Trichogaster</i>	<i>leeri</i>	2	10	pearl gourami
	1/03	<i>Labidochromis</i>	<i>caeruleus</i>	7	10	
	1/03	<i>Archocentrus</i>	<i>spilurus</i>	8	10	
Ray Yutzy	1/03	<i>Neolamprologus</i>	<i>gracilis</i>	7	15	

* = first time spawn by any current BAP participant!

Getting Started with Planted Aquariums

Plant Nutrition and Chemistry Cavan Allen

The last two parts of this series dealt with lighting and carbon dioxide (CO₂) supplementation. This month, we'll tackle plant nutrition and water chemistry.

You can keep plants healthy and control algae growth by the same means. As long as lighting and CO₂ are present in adequate levels and nutrients are in their proper ranges, plant growth will be strong while algae will barely be present. Simply put, vigorously growing plants equal a tough time for algae.

MACRONUTRIENTS are nutrients that plants use in fairly large quantities. They are calcium, magnesium, nitrogen, phosphorus, sulfur, and potassium.

Calcium and magnesium will usually be present in sufficient quantities in tap water and make up what is known as general hardness (GH). As long as extremes of hardness are avoided, most plants will be fine. If the water is around 4 GH or less, calcium and magnesium may be in short supply, causing deficiencies that may lead to deformed leaves and even a cessation of growth. There are a few plants originating from very soft waters that cannot tolerate excess calcium and magnesium, but most are happy with a GH of up to about 15, so most tap water will be adequate for normal growth. Correction of extreme values by dilution with RO or distilled water or building GH with water reconstitution products is rarely necessary. In nature, the ratio of calcium to magnesium is usually around 4/1 to 3/1. Very occasionally, most or all of a water supply's general hardness will be made up of either calcium or magnesium, leading to a deficiency of one or the other. That's quite rare, but it does happen. If all other tank parameters are proper and stunting and deformed leaves still occur, consult the water company to find out the ratio and correct it if it's out of balance.

Don't overlook nitrogen and phosphate levels. Nitrate levels should ALWAYS be limited to the range of 5 to 10ppm. Phosphate levels should be around .2-.5ppm. Levels of either that are too low will lead to problems that are just as severe if not worse than levels that are too high. Without enough of one or the other or both, plants become limited by the missing nutrient or nutrients and their health is compromised. Certain types of algae (including beard and staghorn) and cyanobacteria may then gain the upper hand. Too much nitrate and phosphate, and a tank may become an "algae farm" of hair algae. Tanks with lower light and carbon dioxide levels will probably not need supplementation of either nitrate or phosphate. As light and CO₂ levels rise, however, plant growth will speed up and necessitate their addition (high levels in the source water may reduce this need or even negate it). The main thing to keep in mind is that the goal is BALANCE, and not trying to restrict nutrients at all costs or going overboard with supplementation. Read that last sentence again. It is without question one of the most important things to learn about keeping successful planted aquariums.

Nitrate can be added very economically as potassium nitrate (kno₃) from a hydroponics supply store or as one of the new nitrogen supplements made by makers of aquarium plant products. I've been using Seachem's Flourish Nitrogen, which is a 50/50 combination of nitrate and complexed (and therefore safe to fish) ammonium with good results. Many, if not all plants prefer the ammonium form of nitrogen to nitrate, so that product may give them a slight boost. I do not recommend adding nitrogen as sodium nitrate or urea, the latter being a main component of many fertilizers made for terrestrial plants.

A good source of phosphate is potassium phosphate. Alternatively, you may use a commercial aquarium plant supplement. Nitrate and phosphate additions should definitely not be approached haphazardly! I strongly recommend doing the following. Start by getting quality test kits for both. Test the tank water and the water you will be using for water changes. If supplementation is required, start with very small additions of what is in short supply and gradually increase the amount until the target levels are reached and maintained over time. You will soon get into a regular dosing routine and only have to test occasionally to make sure everything is all right. With experience, you will be able to tell if nitrate and phosphate levels are where they should be based of plant response and what types of algae, if any, appear. Changing light bulbs, removing large amounts of plant matter, and so on might require starting over.

Potassium is next. When plants are growing well, making sure they have enough potassium is very important! It plays a major part in the biological processes of plants. If it's not present in large enough quantities, nothing will grow as healthy and lush as it would otherwise. Adding potassium sulfate (again from a hydroponics supply store) works well and also supplies additional sulfur that the plants need. Like with the other macronutrients, potassium is available as supplements by aquarium product manufacturers. A potassium level of 20 parts per million or so is a good level to shoot for. Finding out potassium levels in your tap water and either dosing potassium sulfate with web-based dosage calculators or going with a manufacturer's recommendation for a commercial supplement are good ways to accomplish that goal. There are few potassium tests available, and those that are are expensive and difficult to use. Save your money for a different kit, since it is pretty hard to overdose potassium and higher than necessary levels are not normally something to worry about. When in doubt as to how much potassium to add, go with more rather than less.

MICRO NUTRIENTS are used in smaller amounts by plants and include iron, boron, manganese, and molybdenum. While plants don't use as many micronutrients as macros, micronutrients are no less important. A variety of commercial supplements like Seachem's Flourish and Tropica's Master Grow are available and work quite well. Some people use hydroponics trace mixes with good results. Note that most manufacturers' dosage recommendations are conservative and are merely starting points. Tanks that have higher light and more plants will require more.

Iron is used by plants in larger amounts than other trace elements and is available on its own. Adding iron in addition to the regular micronutrient supplements helps because putting in enough trace element additives to get the required iron level (about .1ppm) might lead to too many traces.

I feel a few words about test kits should be helpful. Basically, there are cheap hobbyist-grade kits and more expensive ones that offer greater precision, reliability, and ease of use. For tanks with lower light and CO₂ levels, using an inexpensive kit that will give you a "ballpark" estimate of how much of a certain nutrient is present is fine. As I mentioned before, I would definitely not go without better kits (especially nitrate) for aquariums with higher light and CO₂. Keeping a close eye on nutrient levels is much more important in such situations. Lamotte makes a great nitrogen kit that lets you compare the test water against water samples of known values. It is not inexpensive, but you get what you pay for.

That doesn't really apply so much to GH and KH kits, though; so most hobbyist-grade test kits are adequate. I use the Aquarium Pharmaceuticals kit, and I imagine most others are fine as well.

That's it for now. Stay tuned for the next spine-tingling installment of Getting Started with Planted Aquariums! ■

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The following businesses have given GPASI the fuel it needs to have a great year. Please support the sponsors below and thank them for helping to make this club a success.

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(continued next page)

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Upcoming Events of Interest

- March 28-30 Northeast Council of Aquarium Societies (NEC) Convention
in Farmington, CT
- April 4 -6 American Livebearers Association (ALA) Convention, Canton, OH
Contact Rich Serva (330) 650-4613
- April 13 Medina Auction, Wadsworth, Ohio
Contact Earl Steffensen (330) 896-3314
- April 26-27 GPASI Show and Auction, Pittsburgh, PA**
Contact Mike Solito (412) 571-2418
- July 12-13 Medina Show, Wadsworth, Ohio
Contact Earl Steffensen (330) 896-3314
- August 16-17 Youngstown Area Tropical Fish Society (YATFS) Show and Auction
Contact Curt Smith (330) 824-2653
- October 5 Medina Auction, Wadsworth, Ohio
Contact Earl Steffensen (330) 896-3314
- October 19 YATFS Auction
Contact Curt Smith (330) 824-2653
- Ongoing Reptile Swaps at Palace Inn in Monroeville, PA
Contact Herb Ellerbach (412) 361-0835

GPASI Marketplace

Laura and Ross Cronkhite have some **tanks to sell**. Call Laura and Ross Cronkhite
(412) 233-0996 or lauross@libcom.com:

- Three 55 gallon tanks - \$40 each
- One 38 gallon tank with wrought iron stand - \$40
- Two 29 gallon tanks - \$25 each
- Four 20 gallon divided tanks - \$20 each
- Nine 20 gallon high tanks - \$16 each

Larry Brown wants to **buy some long-finned oscars**. Please call (304) 797-0503.

Walter Roth has **plastic bags to sell in 100 count packages**. Sizes are 6 x 12", 8 x 15", 10 x 20". Call (724) 449-9651.

To let other members know about aquarium-related items you'd like to buy, sell, or trade,
contact Jean Grace at (412) 441-1106 or jgrace@pitt.edu.

See what evolves...



AQUARIUM FISH SHOW 03

1ST 2ND 3RD CASH PRIZES, SPEAKERS, RAFFLES, BANQUET, VENDORS, AUCTION

Saturday & Sunday,
April 26 & 27th, 2003

at the Palace Inn,
Monroeville, PA
just off PA Turnpike Exit 6

Fri., April 25th
10am - 4pm pre-show setup
GPASI Monthly Meeting
at Palace Inn - 7pm
Lecturer - Bob Goldstein, Ph.D.
Public Invited!

2 JUNIOR CLASSES
no entry fees
Junior Livebearer
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Killifish
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HUGE AUCTION - Sunday 27th - 11AM

For more information, contact GPASI show committee chairperson Mike Solito - 412-571-2418
or PAKA show committee chairperson Ross Cronkrite - 412-233-0996

<http://gpasi2002.tripod.com/>

GPASI, P.O. Box 22452, Pittsburgh, PA 15222-0452

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GPASI

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March 2003