

THE FILTER

TAMPA BAY
AQUARIUM
SOCIETY

25
Years



ST. PETE/TAMPA
FLORIDA



Poecilia reticulata
Blue Mosaic Guppy

TBAS . . . Since 1992

May 2018

Volume 27 Issue 10

Photo Mike Jacobs . . . 2018



TAMPA BAY AQUARIUM SOCIETY

"THE FILTER"

Tampa/St. Pete, Florida

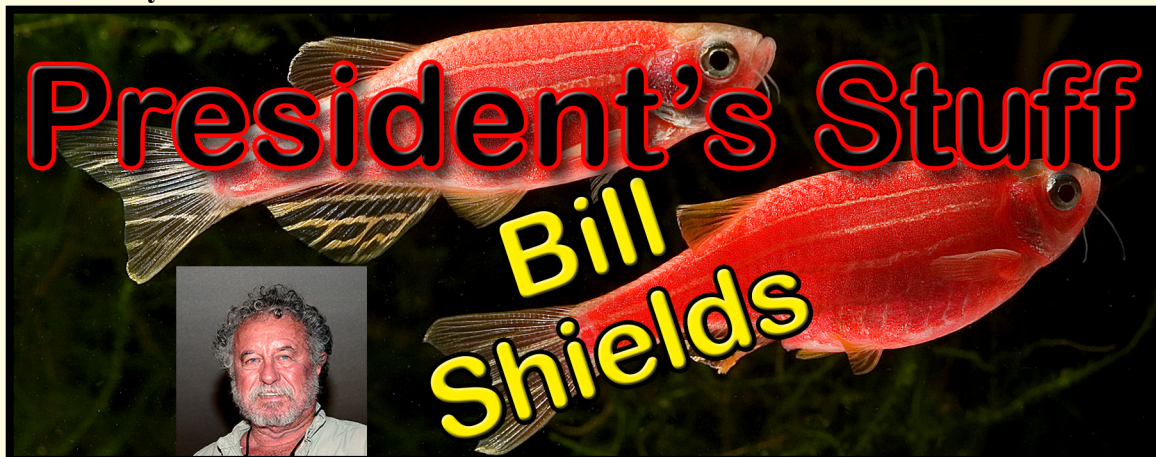
TBAS

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Thanks to Chuck Rambo for his trip down memory lane. I really enjoyed this history of our hobby from a long time fellow hobbyist. He was also impressed that we actually had a member, Thelma, that had actual been at the Crystal Palace in London before it burned down. I got to hang out with the group for a while the next day and introduced them to Fred's Market. It was a great time with some dedicated hobbyist.

Congratulations to the Aquatic Club of Pasco for the success of their annual auction. They auctioned 763 bags and had a great turn out. Check out their Facebook page for pictures.

The time is actually here for the First Coast Betta Show at our May 14th meeting - Participation is open to all that wish to participate. The IBC will provide certified judges and there will be multiple classes (see flyer for specifics). Registration forms are attached at the bottom. Registration form must be submitted NLT the Wednesday prior to the monthly meeting either by email or snail mail to:

Aurelia Ogles:	aureliaogles@gmail.com
	or
Bill Little:	blittle1942@gmail.com

Left Click on
Email Address
to Send

Make sure to get your paper work done and submitted to Bill Little or Aurelia Ogles. The forms are up on the Forum and the TBAS FaceBook page.

The forum is being used more frequently and is a great repository for some valuable information. Take advantage of this great free resource and sign up today.

Just talked to Al Starkey, who has been in and out of St Joseph Hospital North, and he is slowly recovering. He is being discharged again . He said to thank everyone that signed the cards for him.

Bill

Bill Shields, President, TBAS



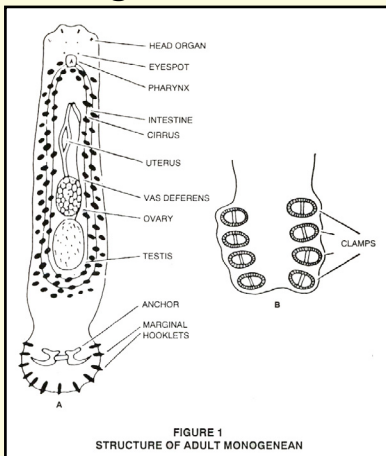
Introduction to the Ectoparasites

Ectoparasites are parasites which cling to the external surfaces of the fish such as the gills, skin, and fins. Although ciliated protozoans often colonize the external surface of fish, they generally do not feed from the body fluids or tissue of the host, and they will not be treated in this article.

Parasitic crustaceans are relatively rare in comparison to the extremely common monogeneans: gyrodactylus and dactylogyrus which usually occur together on discus. These monogeneans are externally parasitic hook worms which attach to the skin or gills. They can be viviparous, meaning livebearing, or oviparous, meaning egg laying. They are very significant parasites of fish which cause extensive losses in commercial culture. They are extremely common among aquarium and pond cultured fish and they have been cited as being the number one killer of juvenile discus.

Fortunately, chemical treatment to eliminate them is relatively fast and effective due to the fact that they live on the external surfaces of the fish where water soluble chemicals can easily reach them. Treatment will have to be repeated, however, especially in the case of the egg laying dactylogyrus.

Monogeneans - Structure (Fig. 1)



These are usually ectoparasites possessing one or more hooks in the rear of their body by which means they attach themselves to the skin or gills of the host fish. They may also possess chitinous sucking discs. There are no intermediate hosts in the life cycle. They all have an organ of attachment at the posterior end known as a haptor which is equipped with hooks and or clamps or suckers. They also usually have another anchoring organ at the anterior end as well (Roberts, 1989, p. 244).

They can produce either eggs or fully developed offspring, and this can occur directly upon the host or

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else proceed through free swimming ciliated larvae which find a new host (Reichenbach-Klinke and Elkan, p. 67).

Monogeneans are usually host specific and are most often introduced into the aquarium with an infected fish. Infected parent fish transfer them to all including the smallest of their fry (Untergasser, p. 100).

A recent German survey conducted by STUA (Staatliches Tierärztliches Untersuchungsamt [State Veterinary 6 Examining Office]) in Stuttgart, revealed that the skin of 14.3% of the symphysodon specimens submitted was parasitized by dactylogyrus, and 7.1% by gyrodactylus. The gills of 14.3% of the symphysodon submitted were massively parasitized by dactylogyrus and/or gyrodactylus. Scaelare specimens on the other hand were skin parasitized only by *Ichthyophthirius multifiliis* (Hartmann, 1989).

Symptoms of Host Fish

These gill worms literally tear out small pieces of the gill as they feed. Seriously affected fish are retarded in their growth rate. I noticed that infected juvenile fish would respire at a very high rate, and that after feeding they would go to the surface and gasp for air.

Treatment:

The live monogeneans can be readily killed by formaldehyde, malachite green, potassium permanganate or other oxidants, however, the concentrations required to kill the eggs of dactylogyrus would be lethal to the fish so that the treatment must be repeated at least two more times , once every third or fourth day thereafter (Kohler, June, 90). The fish should not be returned to the tank in which they were treated until it, as well as connecting equipment and siphon hoses, have been cleaned out with a strong solution of bleach to kill any remaining eggs of dactylogyrus.

(A) Formalin

Always maintain strong aeration when using formalin , since it reacts with oxygen, thereby reducing the dissolved oxygen concentration in the water. One hour dips of 200 ppm formalin can be applied with good results on juvenile discus. If the fish must be treated in the tank in which they were originally residing, then a very large water change should be made before the addition of formalin, and again after the dip time has expired. Alternately , a long term treatment of the water with a lower concentration of formalin can be used. A very large water change should be made and formalin added to maintain a 10 to 15 ppm concentration. This should be repeated on the second and the third day as well. Tests conducted at Alabama Polytechnic Institute in Auburn, Alabama, showed that 99% control of

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gyrodactylus could be obtained in aquarium with 10 to 15 ppm formalin over a 72 hour period (Allison, 1957).

(B) Potassium Permanganate, $KMnO_4$

Tests “conducted at Alabama Polytechnic Institute in Auburn, Alabama, reported better than 99% control of gyrodactylogyrus after a single treatment of 3 to 4 ppm potassium permanganate (Allison, 1957). I have found that potassium permanganate is stressful to juvenile discus so that formalin would probably be a safer treatment for the less experienced aquarist.

(C) Mebendazole, $C_{16}H_{13}N_3O$ [Fig. 2]

Mebendazole, 5-benzoyl-2-benzimidazolecarbamic acid methyl ester, is a slightly yellow powder which is practically insoluble in water, alcohol, chloroform, ether, and dilute mineral acids, but it is soluble in DMSO (dimethyl sulfoxide) and it is freely soluble in formic acid. The LD50 (LD50 is the dosage which is lethal to 50% of the test animals) in mice, rats, and chickens exceeded 80 mg/kg. It has been marketed under the trade names: Bantanol , Lomper, Mebenvet, Noverme, Ovitelmin, Pantelmin, Telmin, Vermicidin , Vermirax , and Vermox (Merck, 5647 , lith Ed.) . Mebendazole 5% can be applied at 2 mg per liter (Schmitz , Sept. 1988). Mebendazole must first be dissolved in the minimum quantity of DMSO (dimethyl sulfoxide) and the resulting solution added to the tank water. Flubenol 5%, may be substituted with less risk to the fish due to the much higher LD₅₀, see Flubendazole below.

(D) Flubendazole $C_{16}H_{12}FN_3O_3$ [Fig. 2 below]

Flubendazole, 5-(p-fluorobenzoyl)- 2-benzimidazolecarbamic acid methyl ester, is simply Mebendazole with a flourine atom attached. The LD50 in mice , rats , and guinea pigs exceeded 2560 mg/kg. It has been marketed under the names: Flubenol, Flumoxal , Flumoxane, Fluvermal (Merck, 4050, 11th Ed.). The German literature recommends Flubenol 5% dissolved in the minimum volume of DMSO (dimethyl sulfoxide) be added to the tank water at 2 mg per liter (Kohler, March 89). Flubendazole is manufactured by the Belgian Pharmaceutical firm Janssen, but their tests have shown that no more than 80% of worm eggs are killed, even by high doses of this compound (Kohler, June 90).

(E) Praziquantel $C_{19}H_{24}N_2O_2$ [Fig. 2 below]

Praziquantel, 2-Cyc lohexylcarbonyl - 1,2,3,6,7,1 lbhexahydropyrazino [2, 1, -a] isoquinolin-4-one, occurs as a white crystalline powder which is only very slightly soluble in water, but is soluble in alcohol. The oral LD₅₀ in mice and rats exceeds 2000 to 3000 mg/kg . It has been marketed under the names: Biltric ide,

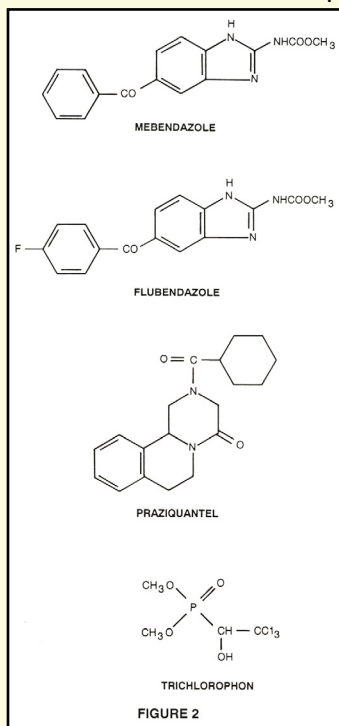
Cesol, and Droncit (Merck, 7714, 11th Ed .)

Praziquantel is rapidly absorbed after oral administration, reaching a peak concentration in the blood plasma 1 to 3 hours later. It undergoes rapid metabolism in the liver so that it has a half life of only about 1-1½ hrs. (Martindale, p. 64). It is effective against cestodes, digeneans, and monogeneans, but not against nematodes or protozoans.

Schmahl recommends 10 mg/liter for 3 hours at 20°C, 68°F, as a bath against monogeneans since at this exposure no adult gyrodactylus remained on the skin of the fish; juvenile worms however, were not affected until an exposure time of 16 hours (Schmahl and Taraschewski , 1987). *Dactylogyrus vastator* did not drop from the gills even when killed by Praziquantel whereas *Dactylogyrus extensus* often dropped from the gills (Schmahl and Mehlhorn, 1985). At the higher temperatures discus are often maintained at 30°C, 86°F, it would be reasonable to expect this effect in about 1½ hours.

Praziquantel causes vacuoles to open under the skin and crater like holes to form in the skin surface of monogeneans, particularly in the area of the haptor, the result is severe damage to the skin of the monogenean. At 50 ppm Praziquantel, after one hour the test fish, sticklebacks, swam upside down, but they recovered in freshwater (Schmahl and Taraschewski, 1987).

(F) Trichlorophon , $C_4H_8Cl_3O_4P$ [Fig. 2]



This compound, O, O, -Dimethyl-2,2,2-trichloro-1-hydroxyethylphosphonate, is a chlorinated organophosphate which exists as colorless, highly water soluble crystals. The LD50 (LD50 = dosage lethal to 50% of test animals) for rats is 630 mg/kg (Ullmann , Vol. 13 , p. 23 1). It is very toxic when inhaled, swallowed, or spilled on the skin. It can be removed from the skin by washing with soap and water. Animal tests for carcinogenicity were negative (Martindale, p. 59).

It has been marketed as: Clout ,® Dipterex ,® Dylox,® Life Bearer,® Masten ,® Metriphonate,® Neguvon,® and Tugon. ® It is highly stressful to the fish, making them turn dark, become skittish, and increase their respiration rate.

Trichlorophon is an inhibitor of the enzyme acetylcholinesterase, this inhibition causes a continuous flow of stimuli from the nerve cells to the terminal organs until their complete exhaustion . Parasites are affected at a lower dose than are vertebrates (Schmahl and

Taraschewski, 1987).

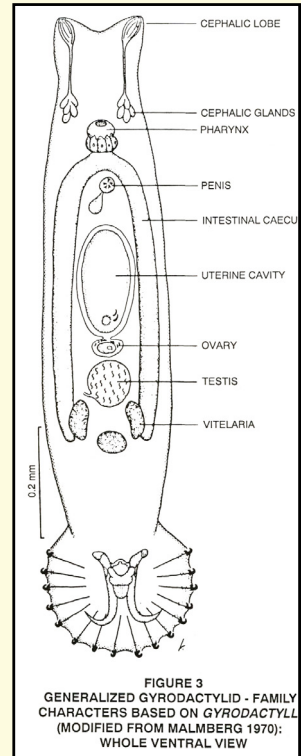
Schmahl recommends trichlorophon as a dip at 10 ppm for 3.5 hrs., but it would be advisable to reduce this to 1.5 hrs. at 30°C, 86°F. Dr. Reeves recommends using trichlorophon at 0.5 ppm daily for five days (Reeves, 1986).

Gyrodactylus, [Fig. 3]

The gyrodactylids are small worms, 0.3 to 1 mm in length which attach to the skin, gills, and fins. Each species is very host specific and may even be specific to a particular site on the host (Roberts, 1989, p. 263). The haptor consists of two large hooks surrounded by 16 smaller hooks (Reichenbach-Klinke & Elkin, 1965 p. 69). A sucker is located on the anterior end. Gyrodactylus usually parasitizes the skin and less frequently, the gills, (Untergasser, p. 100). This monogenean commonly affects discus.

(A) Life Cycle

All the species of this family are viviparous meaning that they produce living young instead of laying eggs. A mature gyrodactylid will contain an embryo which contains another embryo which contains still another embryo so that a mature worm carries three more generations within itself (Untergasser, p. 100). This gives it the capacity for rapid reproduction should favorable conditions arise. Epizootics of gyrodactylids are a sign of poor maintenance conditions and an epizootic of protozoans will often occur at the same time (Roberts, 1989, p. 263).

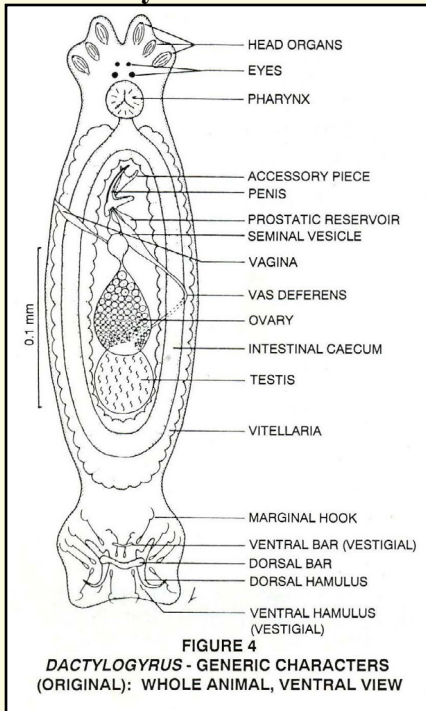


(B) Treatment

Gyrodactylids can be effectively treated with formaldehyde, potassium permanganate or with trichlorophon (Untergasser, p. 128). They can also be treated with anthelmintic compounds, particularly Praziquantel. Since dactylogyrus will usually also be present, however, the treatments will still have to be repeated. See section under Monogeneans regarding treatment.

Dactylogyrus, [Fig. 4]

Dactylogyrus range in size from 0.1 to 2 mm; the posterior end contains 2 or 4 central hooks and 12, 14, or 16 surrounding hooks depending upon the species. The anterior is doubly forked with a sucker and four or more black eyespots, which are photosensitive so that the larvae are attracted to dark objects such as



the side of a fish. Some dactylogyrids parasitizing discus are 0.2 to 0.3 mm in length with 4 central hooks but this dactylogyrid can also parasitize other fish species (Untergasser, p. 101).

(A) Life Cycle

Since they are hermaphroditic two worms fertilize each other, and a large, 50 micron egg begins to develop in each one. The eggs are covered with small projections. A few of the eggs will remain on the gills but most of them fall to the bottom where they will develop over the course of a few hours to a few days depending upon the temperature. The free swimming ciliated larvae that emerge from the egg must find a host within four hours or else they die, but adult worms can last up until 6 days without a fish host (Untergasser, p. 101).

Once the larvae has attached to the side of the fish it begins crawling slowly forward for two days until it reaches the gills. The larvae will require three to six more days depending upon temperature to reach sexual maturity on the gills. The mature dactylogyrid will live for another eight days (Untergasser, p. 101).

(B) Treatment

Dactylogyrids can be effectively treated with formaldehyde, potassium permanganate or with trichlorophon (Untergasser, p. 128). They can also be treated with several anthelmintic compounds, particularly Praziquantel, see section under Monogeneans regarding treatment. It is recommended to move the treated fish to a new aquarium which does not contain the eggs, but since some eggs can still adhere to the gill filaments, the treatment will still have to be repeated at least two more times at three to four days after the first treatment. Additionally, the infected tank and equipment should be rinsed out with a strong solution of bleach to kill any remaining eggs before it is reused.

Crustaceans: Introduction to Parasitic Crustaceans

Parasitic crustaceans are dangerous ectoparasites of both fresh and saltwater fish; they are non-host specific and very widespread. They are divided

into the branchurians and the cope pods. The branchurians are small flat crustaceans up to 1 em in size, the most common of which is Argulus. It has been shown that Argulus acts as a vector for viral diseases (Cusack & Cone, 1986).

Parasitic crustaceans can be anchored such as Lerneia or freely moving such as Argulus. Their anchoring appendages are often very complex and they penetrate deeply into the host tissue where they can cause severe tissue damage. It is usually only the female copepods which parasitize fish.

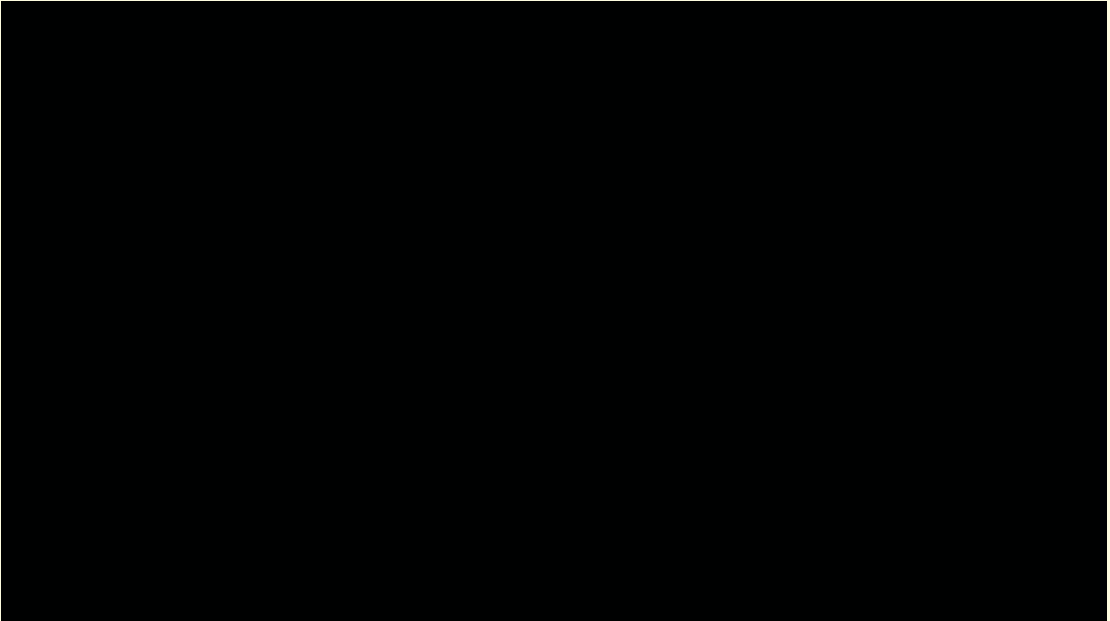
Copepods are usually seen as a mature female carrying two egg cases attached to the side of the fish. Lerneia is the most common copepod parasite of both fresh and saltwater fish, especially young fish which can be killed by only a few parasites.



Healthy fish such as these discus, belonging to the author, are free of external parasites due to proper treatment. Mike Jacobs photo

Aqua Research Center
Water Analysis & Interpretation
www.aquaresearchcenter.com
by Joe Gargas
Ph: (813)645-1717

Bill Shields and **Brian Skidmore** of TBAS went to Peru to collect last year - they came home with a LOT of wild fish. Here's a Video of some of Bill Shield's wild Apistos and a photo of his ***Apistogramma urtegai*** just after the fry came out - a very nifty spawning trick!!!!



Video is of a wild *Apistogramma urtegai* before spawning.

Photo of
Apistogramma urtegai
... the fry can be seen
just over the wood log!





A way long time ago . . . about 1968-69 . . . I was a student at Purdue University and I had just gotten married. The wife and my fish tanks (plural . . . 😊 😊 😊) moved into a house on the South side of Lafayette, Indiana and started to go about our business. Then I decided to join the local fish club . . . **GLAS** – **G**reater **L**afayette **A**quarium **S**ociety. I met the president, Bill Dyer (what a grand nice man!!!), and all sorts of the members at the first meeting and the **GLAS** and I was off to the races. It didn't take too long for Bill Dyer (maybe 60 yrs old at the time) to start to talk to me about killifish. I had heard about killifish because I had been reading EVERYTHING I could get my hands on since maybe 1950-51 (5-6 years old). Bill invited me over to his house and he had maybe 20-30 tanks and almost all were stocked with all sorts of different killifish.

Ok . . . I bought my first pair of killifish from Bill and I was home to add killifish to my "heard". As best I recall my first killifish was an **Aphyosemion gardneri** . . . basically a plant spawner and nothing was new except I now had killifish and that was good!

The next time I went to Bill's house . . . maybe 3-4 weeks later he had some other killifish . . . **Nothobranchius**!! He had about a dozen or so and he began to explain how they spawned in nature, He said that **Nothobranchius** spawned in the mud at the bottom of African ponds and when the ponds dried up the eggs stayed in the mud basically dry for from 3 months to up to 7-8-9 months depending on the species of **Nothobranchius**. I had to ask him maybe 3-4 times that night if he REALLY meant that fish eggs dried up in mud and waited for the rains to come in 4-5-6 months . . . YES he said 3-4 times . . . OK – I WAS HOOKED ON **NOTHOBANCHIUS** – BIG TIME!!! Fish that lived in water spawned in bottom mud and it dried for MONTHS and waited for the rain to hatch. Mother Nature had really done her trick this time . . . and I have never lost my love for **Nothobranchius** and I never stop telling people about Mother Nature and her **Nothobranchius**.

Fast forward to the mid 1990's and I was sitting in an SKS (Suncoast Killifish Society) and I wasn't the only one at the meeting that loved **Nothobranchius** but we had a surprise in store. Attending the SKS meeting was a friend of Charlie

Nothobranchius here when the water was high and it was a “perfect” **Nothobranchius** collecting site!

Well, that’s about my story with **Nothobranchius**. Now let’s look at some of the maybe 100’s of different species of **Nothobranchius**.



Notho. rachovii



Notho. kilomberoensis



Notho. albimarginatus



Notho. nubaensis



Notho. brieri



Notho. fuscotaeniatus



Notho. oestergaardi



Notho. guntheri



Notho. rubripinnis



Notho. symoensi



All females look like this



Notho. kafuensis

All photos above Mike Jacobs

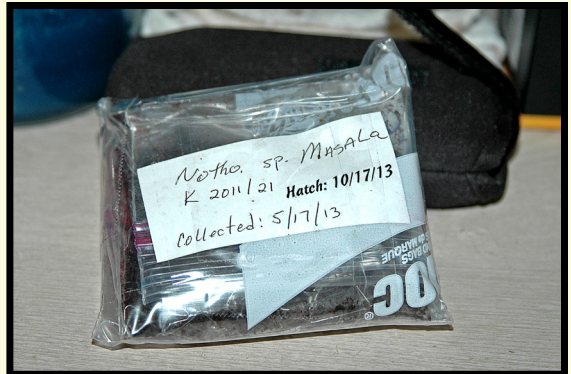
SPAWNING is next in this issue . . . MUD???????

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. . . well . . . peat moss works pretty good in place of mud!!! Right in a 5 gallon tank will do just fine!!! If you have 3-4 pair then a 10 gallon or a 20 gallon tank will probably be necessary!



How do you dry the eggs and store them . . . in Glad Zip Bags!! First you see if you have eggs:



Then put them in a Zip Lock baggie and date it! Hatching is easy when the time comes . . . but a little bit of instruction never hurt anyone. Ask if you are REALLY interested or I'll give a talk some time on the **Nothobranchius** of Africa!



Did you ever think of KILLIFISH???
Come find out about them at the
SKS meetings!!! See the ad to
the left!



While peering in my tank I noticed large holes in my dwarf lilies. This usually means the snails are back. They don't eat my Cryptocorynes which take up most of the tank. I have used freshwater puffers in the past to control them, but the last one I had in my tank seem to like the marble

angels. I moved the puffer to my small backyard pond to control the mosquito larva and he does a great job. Now back to the problem of snails in my tank.

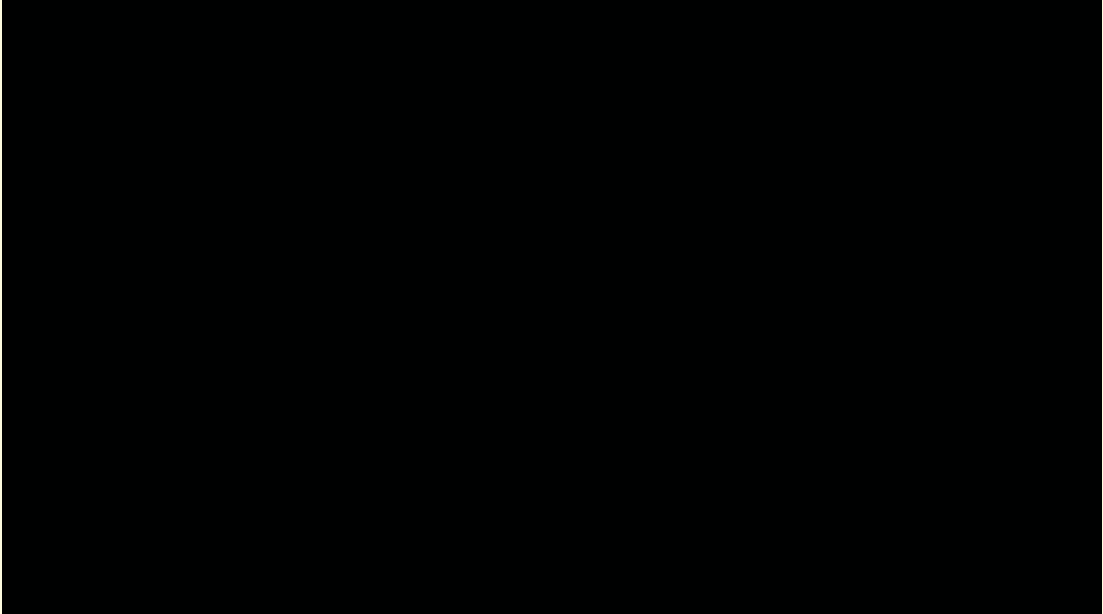
A number of methods can be used for controlling snails. First, there are several chemicals sold that will kill them, but if a large number of snails are present, a mass die-off will pollute the water.

Another way is to use bait. Feed the fish very lightly or not at all. Snails eat a lot of fish food. Wait till a few hours after the lights are off and then take a saucer and place it upside down at the bottom of the tank. On the center of the inverted saucer place a sinking food tablet of any kind and wait about one hour. Then carefully pick up the saucer and throw away the snails that went for the bait. Doing this once a week will help keep them under control.

An easier way to control snails is to keep fish that eat them. I have already mentioned the freshwater puffers such as the Figure 8 and the Green Spot, but these can be too aggressive for some tanks. Other fish, including several members of the Botia family, like clown loaches and skunk loaches, also work well. In my 55 gallon live plant tank I keep clown loaches and have not a snail in sight. The other tank is another story. I will be adding several skunk loaches to this tank soon. There are several cichlids that also eat snails, but some of these can be very aggressive and eat plants too.

One of the more time consuming methods is to remove them by hand. The best time to get them is first thing in the morning when the lights come on. They are hungry and are usually close to the top of the tank.

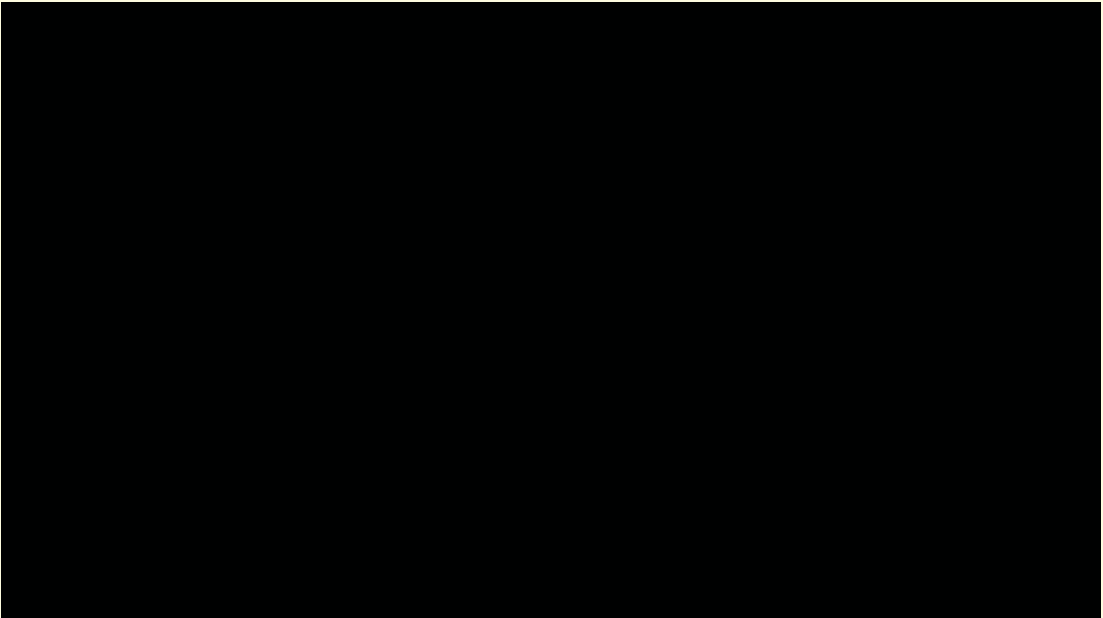
Not all snails are bad. The Malaysian Trumpet snail doesn't each the plants and burrows through the gravel keeping it open and breathing. You can control these by regulating the amount of food they get. Some snails sold at the local retailer are sought after, such as the Apple and Ramshorn, but if you have a snail overpopulation problem try one of these methods to control them. Until next month, happy fish keeping.



Click on the



to See Video



THE BEST KOI ANGELFISH IN THE UNIVERSE

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Royal Farlowella . . . *Sturisoma panamense*

photo: Mike Jacobs 2018

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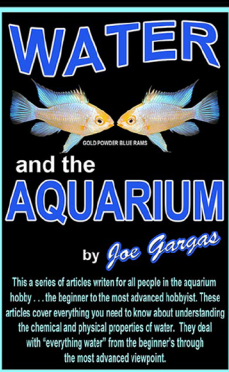


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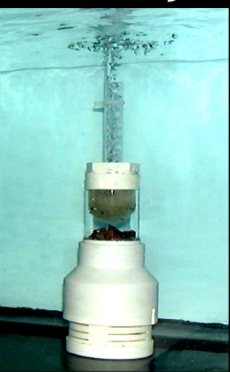


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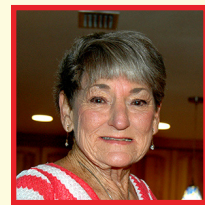
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