
Tampa Bay Aquarium Society
25 Years
St. Pete/Tampa Florida
THE FILTER
Chilatherina sentaniensis
The Original Imported Rainbow
June 2019
Volume 28 Issue 11
TBAS . . . Since 1992
Photo Mike Jacobs . . . 2019

TAMPA BAY AQUARIUM SOCIETY

"THE FILTER"

Tampa/St. Pete, Florida

TBAS

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Rather than me yacking at you how about a photo . . . ☺☺???

***Macrognathus zebrinus* - Zebra spiny eel**

Mike

Mike Jacobs, Editor TBAS Filter

Julidochromis regani "Kipili"

Regan's Julie

Photo by Mike Jacobs 2019

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Juvenile Discus

by Joe Gargas

Introduction

Good care of juveniles is essential if vigorous adult fish are to be produced that will turn out to be active breeders. Much is learned in the process of raising of juveniles that will be valuable later when the time comes to raise future spawns. Beyond this, if mistakes are going to be made in the learning process, then it is better to make them on the cheaper juvenile fish rather than the very expensive larger discus.

Behavior

As is the case with almost any animal, the juvenile stage of life is when activity is at its peak. Few people new to discus appreciate the fact that a healthy juvenile fish must be active or something is amiss. Discus exhibit very different types of behavior depending on whether they are feeling well, on whether they are sick, or whether they are being intimidated by more dominant fish. Dominance hierarchy formation does not really occur until the adolescent stage is reached and territorialism starts to set in as the breeding age approaches. A very experienced discus keeper can look at these fish and know immediately when things are all right and when they are not.

Normal Behavior

Juveniles are highly gregarious and territorialism only becomes apparent as the fish approach sexual maturity. Juveniles instinctively school together; once they achieve a size of 5cm, however, the schooling behavior begins to decrease somewhat. Juveniles raised in isolation will often hide in a corner of the tank and fail to come out regularly for food. Healthy juveniles will be extremely active, rushing to the surface at the front plate of the tank to await feeding if anyone approaches closely enough. When food is dropped into the water they will literally tear it to pieces in a wild feeding frenzy.

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Abnormal Behavior

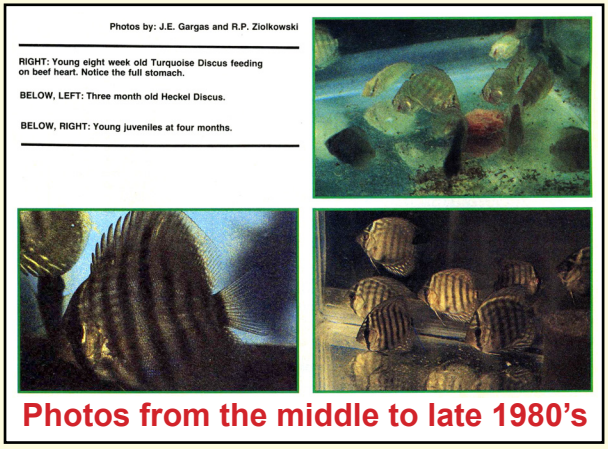
If the fish suddenly begin to depart from this behavior pattern then there has probably been a drop in water quality, or an onset of bacterial disease or a parasitic infestation. Under these circumstances, the fish will go off the feed, they will turn dark, and they may even huddle in the corner or face the rear wall of the tank. If they hover below the surface with a head-up body attitude and gasp for air, there is a serious problem with the water or, much less likely, their gills are heavily infested with parasites. This situation is critical and an immediate water change must be made.

It is necessary to run the tests for pH, ammonia, and nitrite since, if the limits have been grossly exceeded, it may take a few days for the fish to completely recover. During this time many will probably die off. If the water parameter limits have only been moderately exceeded then the fish should return to normal within a few hours after changing the water.

If they do not show improvement within a few hours there could be a bacterial disease and the employment of antibiotics may be necessary. The parasites increase relatively slowly compared to the bacteria; it takes several days for a parasitic infestation to manifest itself in a change in fish behavior.

Growth Rate

It is important that a rapid growth rate be quickly achieved and that this rate be maintained if the fish are to develop into vigorous adults. Very often inexperienced culturists will fail to achieve and hold the minimum growth rate. There are a number of reasons for this which are listed below, yet few people realize the importance of monitoring growth rate as an indicator of fish health. When growth rates are lagging, the culturist should be attempting to find out what is wrong and correct it before too much time has elapsed. Properly fed and maintained juvenile discus will grow very rapidly and, as a general rule, a properly fed and maintained juvenile should have a fin span of 5 cm by 10 weeks of age. Fish that are less than 4cm by this point in time are probably not going to develop as well as the larger ones.



Photos from the middle to late 1980's

Growth retardation

Retardation in growth is most frequently caused by poor water quality,

poor feeding, parasitic attack, and gill embolism from nitrogen supersatured water. Whatever the case may be, fish which are significantly retarded in growth have very little chance of turning out to be vigorous breeders. An estimation of the age of a juvenile is only possible for a very experienced breeder, but if one sees 5cm fish in an aquarium shop, they should be examined closely to see if they have peaked mouths and relatively large eyes. If this is the case, then the fish are most probably four or five months old and will never grow into a vigorous spawner.

Divergent growth rates

Based on everything that I have seen, growth rates of juvenile fish always tend to diverge even when they are well fed and maintained, although the divergence is not as rapid under better rearing conditions. Growth rate divergence also occurs in game fish hatcheries. Some fish grow faster because they are more aggressive and they seize the food first, or because they are males and hormonal factors promote this. Even if juveniles are segregated by size, the fish within each size group will once again begin to diverge in their growth rates after being segregated.

Feeding

The more frequently juveniles are fed, the faster they will grow. Juveniles will eat constantly but they will never overeat. They should be allowed to eat until their bellies are visibly swollen. Ideally, juvenile discus should always be on the feed. If they go off the feed something is seriously wrong. Check pH, ammonia and nitrite and make a large water change. If feeding declines slowly and the water quality is good, then parasites are suspect.

The frequent feeding, and the resultant loading of the water with fine particulate food matter, plus the heavy loading with metabolic waste products from the fish, will necessitate frequent water changes if growth rates are not to suffer. Although beef heart can form the bulk of their diet, they should be fed other things such as: frozen aquatic insect larvae, frozen mussel larvae, and krill. Growth rates should not be allowed to decline, this means constant feeding and frequent water changes.

Live Food

During the warmer months I culture Daphnia outside in plastic garbage cans. These provide an excellent source of food, particularly for very small fish. Although most fish prefer live food, obtaining Daphnia from ponds containing fish runs the risk of introducing parasites. This can be avoided by the feeding of cultured live foods such as brine shrimp or cultured insect larvae or cultured

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worms. Good growth rates will be achieved on tubifex or black worms if a clean source of these worms can be found.

Frozen Food

I freeze a prepared mixture of beef heart, crustacea (krill), fish, liver and vegetable matter. I also feed straight beef heart. Frozen foods such as frozen insect larvae or frozen mussel larvae are highly recommended since this varies the diet away from being exclusively beef heart.

Vitamins

The addition of vitamins to the food of juveniles will promote growth rates but, after a period of time, the gap in growth rates will be closed by the fish whose food was not vitamin enriched unless there was a critical deficiency in vitamins. A lack of vitamins, particularly ascorbic acid can cause bent vertebrae, shortened gill flaps, and slow healing of sores. According to one author a lack of vitamin B encourages hole-in-the-head (Teufel, 1989) and, according to another, vitamin E promoted growth (Lindner, 1965).

All small, well fed, very, very healthy discus.

Diseases

The more polluted the water, the more likely one is to encounter bacterial or fungal growth due to the high nutrient loading. Conversely, at higher water qualities one is more likely to encounter ectoparasitic protozoans which are introduced with live food and possibly even trematode parasites.

Bacteria

Common Gram negative bacteria which are a normal part of the natural bacterial flora of aquatic systems are: Aeromonas hydrophilia, Pseudomonas fluorescens, Flavobacterium, Edwardsielkl tarda and Columnaris. All of these are capable of mounting a pathogenic attack upon the fish should dissolved organics from decomposing food or fish waste build up high enough in the water to permit their rapid proliferation. Columnaris is particularly dangerous since it has an acute

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form which is usually lethal in about 3 days (Roberts, p 292).

Fungi

I have not experienced any problems with fungi in the raising of juveniles, but it is well known that fungi produce toxins. Feeding trout with moldy food caused liver cancer from the fungal toxins present in the mold. Larval fish are more susceptible to fungal toxins than are eggs or adults (Wyllie & Morehouse, pp. 490-496).

Should fungus develop on the fish, Malachite green is probably what will be recommended to the aquarist but I would hesitate to use it too freely since it has been shown to cause the same stress to fish at 0.1 ppm as formalin at 100 ppm (Oiah, et al, 1982) Moreover, Malachite green is retained in the tissues of fish exposed to only 0.1ppm of the dye (Poe & Wilson, 1983).

Protozoans

The two main classes of protozoans parasitic to fish are the ciliates (ectoparasitic) and the flagellates which are mostly endoparasitic. A group of ciliates called the Trichodinids are frequent parasites of discus. They attach to the skin and gills by means of a ring of teeth but their mouth is at the opposite end of the cell and they feed off bacteria in the water. A flagellate that is another frequent ectoparasite of young discus is Ichthyobodo necatrix (Costia). Both of these protozoans can be treated with salt dips, formaldehyde dips, or with copper but the chelated form is better as a prophylactic than as a treatment. Unless the fish is properly treated and then transferred to a noninfested tank, these protozoans will keep returning and continued treatments will always be necessary.

Monogenic Trematodes

These are ectoparasitic on the skin gills and fins to which they are attracted by means of a ring of microscopic hooks. Monogeneans are usually host specific (Roberts, p 263) 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).

Gyrodactylids are viviparous (live bearing) small worms about 0.3 to 1mm in length. They are able to reproduce very rapidly if conditions permit them to.

Dactylogyrids are oviparous (egg laying) up to 2 mm in length and attach to the gills of fish. Some dactylogyrids parasitizing discus are 0.2 to 0.3 mm in length with 4 central hooks but this species can also parasitize other fish species (Untergasser, p 101).

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Hormone Treating

Juveniles are sometimes treated with testosterone to bring out their coloration at a very early age. Administration of testosterone or estradiol derivatives will not bring out any color patterns aside from those that will be present when the fish reaches sexual maturity and its gonads begin to produce one or the other of these two steroid hormones depending on the sex of the fish. This has the advantage that the prospective buyer knows beforehand what the fish will look like when it reaches adulthood a year later. Admittedly, it is the best way to avoid the purchase of juvenile “solid” fish which turn out to be only striated ones 12 months later, or buying juvenile “greens” which turn out to be browns after you have invested a year in them.

On the other hand abuses of these compounds, particularly the excessive feeding with testosterone derivatives can produce fish which fail to reproduce, or fish which have been sex reversed from female to male and, therefore, will produce predominantly female offspring if they fertilize eggs.

Non-Hormonal Coloring Agents

Although I have not heard of any recent cases of this with discus in North America, it has been reported to have occurred recently in Europe. Among the coloring agents used were: E 123 Amarant (which increases susceptibility to viral infections, E 127 Erythrosin (can cause disturbances to nerve functioning), or E 160 Canthaxathan (can lead to damage to the eyes) (Kohler, June 88). The color caused by these dyes will fade a short time after the food containing these substances is discontinued. Kohler’s article quoted above states that is even possible to buy mussel larvae pre-treated with these dyes.

While it can be argued that use of testosterone or estradiol derivatives on juveniles just long enough to bring out color protects the buyer from buying a fish that is not the designated color variety, the use of dyes or food coloring agents is pure fraud which serves no purpose other than to swindle the buyer.

Hormones and Sex Reversal

Experiments with young largemouth bass (Micropterns salmoides), 2 to 3cm in size at an age of approximately 5 weeks, in which the fish were fed with 17-alpha-methyltestosterone at 50 micrograms/kg, have shown that females could be masculinized, but conversely, feeding them with estradiol did not significantly skew the sex ratio towards more females. Feeding them containing either testosterone or estradiol was the only method that was 100% certain of changing the sex ratio in either direction (Garrett, 1989)

In another study on grass carp, Ctenopharyngodon idella, 55 day old gynogenetic females were administered methyltestosterone for a 460 to 650 day

period through a capsule implanted intraperitoneally. Out of the 27 fish treated, 5 had testes, 9 and 5 had bisexual gonads, 8 had gonads with no germ cells and 5 had underdeveloped ovaries. No male germ cells were detected in the gonads of untreated gynogenetic females. Spermatozoa taken from sex reversed females remained active from 30 to 90 seconds when placed in water. This is comparable to that of normal brood fish (Jensen et al, 1983).

A study conducted with salmonids in which 17-beta-estradiol was fed to the fry at 20 mg/kg for a period of 0 to 60 days following “swim-up” resulted in an all female population whose gonads were indistinguishable from the ovaries of untreated fish. Feeding this hormone at the same concentration, but for the period of 0 to 40 days produced a population which was 64% females, 21% males and 12% bisexual fish (Johnstone et al, 1979).

Short term dips to bring out the color which are given after sexual differentiation has already occurred naturally, do not necessarily have this effect and fish that are kept in water containing testosterone will gradually lose their color over a period of 30 to 60 days after the hormone is removed.

Hormones and Sex Ratios of Progeny

Sex ratios among the offspring of male tilapia which were sex reversed by testosterone feeding as fry, were significantly different from the usual 1/1 sex ratio in any normal tilapia spawn. Sex reversed males produced sex ratios of (2/1) to (3/1), (females/males) in their offspring (Garrett, 1989).

Discussion

Successful rearing of juvenile discus requires the skills of an advanced aquarist and commercial breeding of this species is a miniature aquaculture project which will require a very high level of technical competence.

The importance of behavior and growth rate as indicators of water quality and fish health have probably not been emphasized enough in earlier literature. Learning to gauge fish growth rates only comes with experience but it is too important to neglect.

There are probably more misconceptions surrounding the use of hormones than anything else in fish culture. They are usually thought of only as something which can sterilize fish but they can have varying effects depending on the how much was applied, for how long and at what stage of life. The fact that females sex reversed to males produce all female offspring has important potential uses in commercial food and game fish culture. The culturist can know beforehand that his entire stock will be female and this enables better control of sex ratios for future breeding. Similar uses may be found in aquarium fish culture.

In the area of water treatment, reverse osmosis is the newest thing to the

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aquarium hobby. The large quantities of low ionic strength water required for spawning made it all but impossible for anyone but commercial hatcheries to breed this species in the past. New developments in membrane technology however, have made it possible to produce reliable reverse osmosis units capable of providing the volumes of low ionic strength water required at prices the aquarist can afford.

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MEMBERSHIP DUES!!!!

Membership Dues for TBAS are due on the anniversary of your sign-up date every year. Please make sure you check the "sign-in" list on the table at every meeting to check your "Dues-Date" . . . Thanks!!!

USE PAYPAL ON THE TBAS WEBSITE . . . TBAS1.COM . . . !!!!!

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Mike Jacobs

Meet the TBAS Member

Hi folks . . . I'm Mike Jacobs and maybe most of you at least recognize me. I have been in TBAS since 1994 (I think). I started going to Board of Directors meetings after being in the club 2-3 months so I have kinda been hanging around "forever" some people might say. I have been doing the TBAS bulletin since maybe 1998 and the TBAS website for maybe the same amount of time.

I started "caring" for tropical fish when I was about 5 years old (that was 69 years ago). Actually it was my mom's hobby but I took over the fish chores when I was about 5. I had 2 responsibilities then . . . keep the betta fish fed and clean the bowl (2 quart brandy sniffer) and keep the outside goldfish fed and bring them into the basement in the winter. Yes . . . I said bring them in the basement – winter . . . that was in Miller, Indiana (just east of Gary, Indiana – just east of Chicago). That was my start in the hobby!

After a year or two of that and walking to the local pet store to get the fish food and seeing their aquarium tanks I asked my mom to get me an actual REAL tank for my bedroom. Well, you know what happened after that . . . 1 tank became 2, became 3, became 5, became 7 and so on after maybe 2 years and suddenly my fish began to have fry and the cichlids started spawning and I didn't know what to do with the fry except trade the local pet store for more fish food more fish or more tanks. Thant's my beginning and it has NEVER stopped since!! It never stopped through Little League - going to the beach (Lake Michigan was 2 miles away from my house when I was little) - Middle School - High School – football season - swimming season (competition) - baseball season . . . it was always one constant in my life that seemed PERFECT to me. Now folks, I mean I ended up All-City Football, All-County Football, All-City Swimming and All-State Baseball but never once did I ever even consider giving up my aquariums.

When I went off to Purdue University (played baseball there too) I, of course, had a problem. I was to live in a dorm room so I ran into my first fish snag. Well, I sold all my fish to the fish store like always . . . **WELL, ALMOST** . . . because my now wife and I were dating and in the summer of that high school graduation year and she started living in her own apartment . . . you got it . . . she

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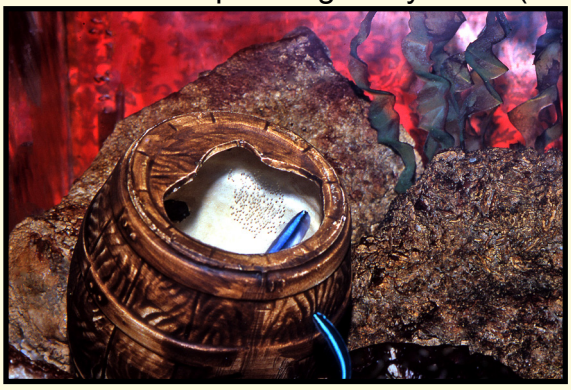
ended up with a tank in her apartment . . . well, that became 2 tanks, and then 3 but she put her foot down at 3 . . . ☺ ☺ ☺ !!!

Then I decided to pledge a fraternity at Purdue and when I moved into the fraternity house my sophomore year there was no reason to not have a tank in my room!!! Actually, all of my frat brothers wanted to take turns feeding them so my fish never lacked for food . . . even if I was in class they got fed by someone. Now . . . eventually I got a 2nd tank for the room and then a 3rd tank and in the 3rd tank I put in a 3-4" Piranha (remember - this was Indiana in 1964). You got it . . . my second tank became my tank for the live feeder goldfish and EVERY TIME I was going to feed the Piranha there was 10-12 guys jammed in the room and everyone was hollering and cheering when the Piranha would "hit" the live goldfish . . . it was really kind of fun. Eventually the Piranha got too big and I took him to the local pet shop and traded him for a smaller one and the process started all over again! What a nifty time we all had with that process!

Eventually I graduated Purdue and married my high school sweetheart and I got a job teaching math at a local middle school (Indiana) . . . we rented a house and I filled the garage with tanks . . . maybe 35-40 of them. After 1 year we bought a 3 bedroom house and well, I took that to mean 2 bedrooms and a fish room!!! I mean, come on, you know???!!!

That's when I started doing saltwater fish . . . 1968. See my photos of the Neon Gobies spawning in my tanks (see below). . . that was maybe 1970 . . .



yes, I save photos THAT LONG!! I could talk saltwater for hours but that's for another time!!

Then we decided to move to Florida and I got a job teaching high school math down here and we bought a house down here . . . it didn't take too long before I had built onto my house a "fish room" . . . not a converted bedroom but an fish room. See the photo to see the drains in the floor and the air exchanger and the tanks . . . no more carrying buckets of water (too many years of that) . . . just drain all of the water onto the floor and replace the water with a hose from the spigots in several places around the room.

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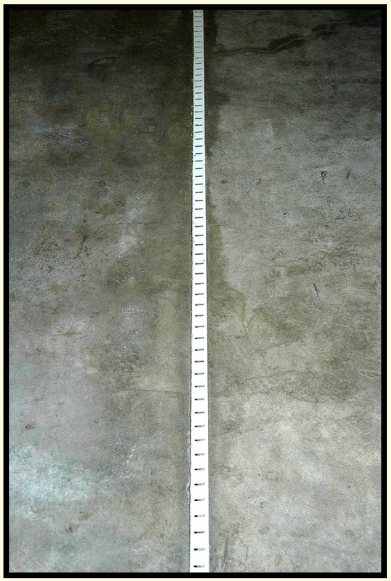
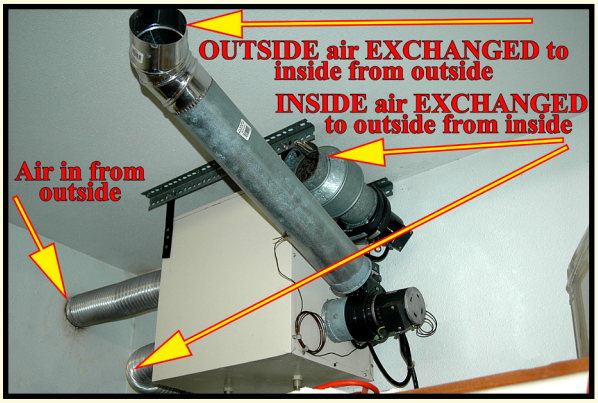
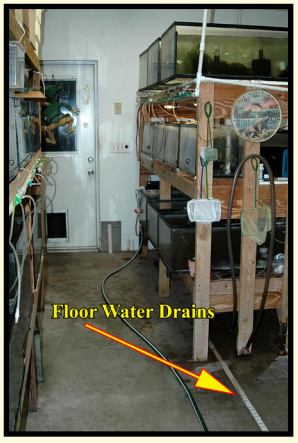


This is the floor drain in the fish room . . . there are 2 of them in the room and each goes the length of the room . . . NO MORE CARRYING BUCKETS!!! Siphon the water right onto the floor and it goes down the drain to outside!



This is the air-exchanger . . . air is taken from outside and exchanged with the inside air. This is a life saver when it comes to mold on the walls and the room acting like a sauna!!! It's actually comportable in the room because of the room air conditioner/heater and it's kept at 79-80 degrees!

My photo tanks!



Room tanks and showing the floor drains. This shows 18 tanks because I know them . . . there are about another 65-70 tanks.

Folks . . . that's me!! Through all of my growing up, through all of my sports, through my relationship with my wife, through everything . . . the constant has been my tropical fish hobby . . . **BUT REALLY, BLAME IT ALL ON MY MOM** . . . ☺ ☺ ☺ **. . . I can't thank her enough**!!!

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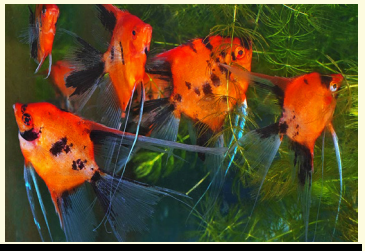

THE BEST KOI ANGELFISH IN THE UNIVERSE

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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 seemed 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.

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***Corydoras venezuelanus* . . . Venezuela's Cory**

photo: Mike Jacobs 2019

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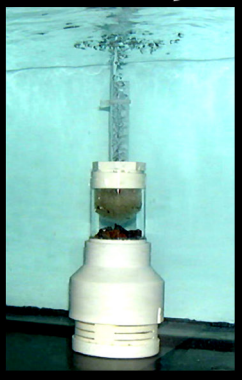
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