

# THE FILTER

March 2021  
Volume 30 Issue 7

TAMPA BAY  
AQUARIUM  
SOCIETY



ST. PETE/TAMPA  
FLORIDA

*Betta Macrostoma*  
Brunei Beauty

**TBAS . . . Since 1992**

Photo: Internet



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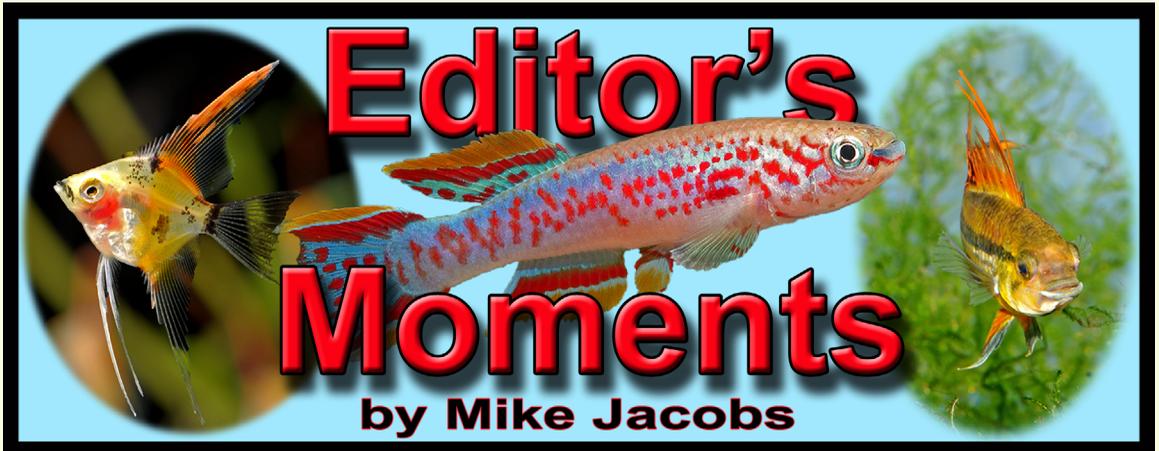
## “THE FILTER”

Tampa/St. Pete, Florida

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We have a TRUE MEETING this month!!!

Clarion Inn Tampa - Brandon  
 9331 E Adamo Drive  
 Tampa, FL 33619

It is in the EAST, heart of Tampa and we will be getting a map to you folks before the meeting takes place, Monday, March 8th, for sure!!! It will be great fun to see all of you folks again!!!!

We are not too sure EXACTLY what we are going to do just yet, who is talking or what we are going to do but rest assured we will have a GREAT, GREAT time!!!



See you all soon,

*Mike*

Mike Jacobs, Editor

***Pterophyllum scalare***

**Smokey Angelfish**

Photo by Mike Jacobs 2017

# Keeping & Spawning *Betta Macrostoma*

By: BASIL HOLUBIS

Let's start by saying . . . I never wanted this fish. They came to stay with me when my friend Sal Silvestri (NAS President) moved and had to breakdown his fish room. Since I keep soft water fish with rainwater being my secret weapon and I live closest to Sal, I guess I



***Betta Macrostoma***

was the easy choice to “babysit”. So, Sal gave me a trio with instructions to keep them in at least a 29-gallon tank with lots of cover and plants and a tight lid! I got them home in May after Sal gave them to me at our Norwalk monthly meeting. I forgot I had even said yes to take them. Home we go to a 20 long with lots of plants, tubes to hide in, a temperature of 75° and a tight glass canopy.

Not really interested in the fish, I gave them the same live foods as all my other fish. Lots of mosquito larvae, earthworms, and my other secret weapon – live black worms.

Now about the fish . . . this fish reminds me of a snakehead; a big mouth. Females are plain with a gray color and the males have all the color. They can be nasty, and I’m surprised they are not extinct! As I had a trio, 4” male and two 3” females, there was constant bickering between the females resulting usually with the smaller girl hiding in the plants till feeding time.

The plants and tubes are really for the male’s protection after spawning. Male *Macrostoma* are mouth brooders. After spawning he retreats into cover to incubate his eggs and fry. Removal of the females removes pressure on the male to spawn again. The more you feed them, the more alert they become to your presence. They’re best with meaty foods but they will eat flake. Flakes for breakfast and worms for dinner.

Water quality is key. They want clean water with a 6-6.5 pH

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range. Lots of food equals lots of water changes. They need clean water. I kept them at 80°F all summer. The result was the male disappearing and hiding for almost 21 days. Then one morning I was feeding and I saw little black fry. They were just released and were about the size of baby guppies.

I always have live baby brine shrimp on hand. I hatch daily for feeding mostly everything in my fish room. I threw in a cup full and watched the clumps of java moss and slowly the little ones came out . . . I counted 15.



***Betta Macrostoma***

The parents are OK with fry, but after about a week I moved them, easier to catch 2 fish. As I said before, these fish do not like each other. Even at ½” they like to bicker. They grow fast and should be split up into groups to raise the most possible. 2” at 6

months is about right.

*Betta Macrostoma* is from the Island of Borneo, off Asia. This name means “Big Mouth”. They are protected and are illegal to export. Most of these fish come through Thailand. This is not a beginner’s fish, but is well worth the effort if you are willing to pay the price! Now that I have “awakened” to all the different Betta species, many of them mouth brooders, many of them small and peaceful but all interesting to keep. I now keep one or two species full time. Maybe will try Betta Rubra, peaceful mouth brooder who are affordable, available and a good starter Betta. Go online and check ‘em out. Bettas – they ain’t just fightin fish!

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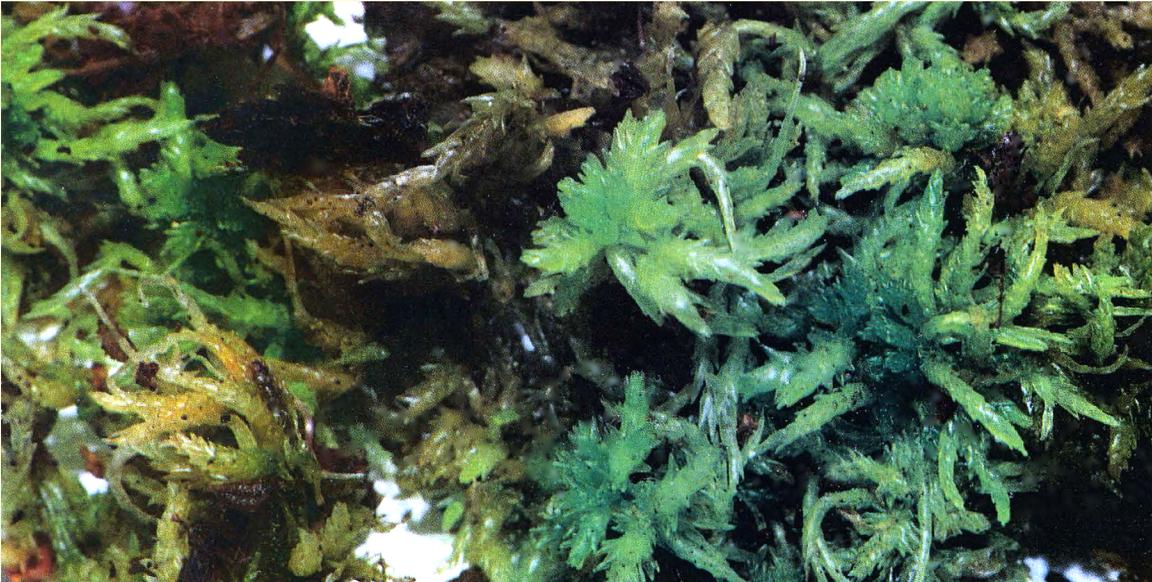
Taken from **The Wet Pet Gazette**, a publication of the **Norwalk Aquarium Society (NAS)**. Published Nov 18, 2020 and reprinted with the permission of the author.

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*A Time-Honored Water Treatment—*  
*... an “Oldie” but “GOODIE” - by Joe Gargas*

**PEAT**



Sphagnum sp. moss. The dried moss is often used as animal bedding or substrate for growing certain plants. A lot of horticultural peat moss also derives from this simple plant. Photo by M. Walls.

### **Introduction**

I received many inquiries asking me to answer questions regarding water desalinating equipment such as a reverse osmosis or deionization. I also get a lot questions regarding the use of different types of apparatus along with how-to questions. For example, one gentleman wrote to me and asked me what would be the best way to reduce the conductivity of an already established tank. I asked him what the conductivity was to begin with, and he replied that he does not know because he does not have a conductivity meter. It appears there are a lot of hobbyist (pet stores & wholesalers as well) that want the easy way out meaning they want to make a change without knowing if a change really needs to be made-which goes back to the old saying, “If a little is good, more is better.” Often, many

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of the questions that I receive reveal a lack of basic understanding about water chemistry and how equipment like reverse osmosis or deionization really achieve their effects.

Many people will never succeed in fish breeding because they have become so hopelessly mired in expensive and troublesome technology that they no longer have any time left to spend learning about the species of fish they are working with. I still stress the importance about having the proper equipment, but right now I am speaking to breeders and advanced hobbyists. Before purchasing the fish, make sure you have the correct testing equipment to perform basic water analysis and don't forget a gram scale. Eventually you will have to treat some sort of disease, whether it be bacterial or parasitic, and you'll need a gram scale to weigh the proper doses of the medication you're using. If your fish are extremely expensive, it is of the utmost importance that the correct doses be used.



Natural black water-this swampy mangrove river in Africa has soft acid water, high in humic content. This is a typical tropical dystrophic aquatic system; in cooler climates, such water is normally found in bogs-where you also find . . . peat! Photo by A. Mancini.

When I recommend to these people that they start out by treating their water with peat, they are usually surprised. Some of them no doubt have never heard about peat treatment (also known as peat softening), while others regard this as an obsolete method of water treatment. When I was in Singapore, I visited breeders and was surprised that they used the leaves of the Chinese umbrella tree and also banana leaves to treat water. Banana leaves acidify and soften water, and leaves from a Chinese umbrella tree will acidify water slightly while adding tannins. This is the first in a series of articles on various types of water treatment. I'm starting from the least technical-peat-and working my way up to the use of ozone. Last month I prefaced this series with the article on chemical terminology.

## Why Peat

Peat is a natural ion exchange medium. Most species of fish that

require low conductivity, low pH, low hardness water come from what are known as dystrophic waters. Dystrophic waters usually have a dark brown color, caused chiefly by a rich content of humic matter. The typical sediment on the bottom consists of material that has only slightly decomposed- peat and mud. High humic acid concentrations and low bicarbonate (alkalinity) make dystrophic waters very acidic, with a pH value of around 4.4 or less. Such waters also have a low nutrient content. Only a small number of aquatic organisms can tolerate such extreme conditions, but a few actually need such conditions to survive. Among aquarium specimens, there are a few problematic fish that belong to this group such as discus, uaru, dwarf cichlids, tetras, killies and some Anabantoids. Among other things, problems arise from the fact that dystrophic waters are so hostile to living forms that even bacteria and other microorganisms do not live there, so when the fish are put in the aquarium, they are defenseless against bacterial attack because they have never had to develop an immune response. In cold areas of the world, dystrophic waters usually occur in the form of bog waters, and in tropical areas they are usually called black waters, such as the Rio Negro in South America.

## What is Peat?

Peat is a breakdown product made of plant material which develops



*Microgeophagus altispinosa*. Rams, discus, tetras-fish from blackwater Amazonia -thrive in water treated with peat. Photo by MP & C Piednoir.

in a state completely sealed off from air (incarbonisation). Peat can have a highly variable character determined by the original nature of its plant material. its special way of developing, and its age. It contains complicated mixtures of numerous compounds, such as organic acids, resins, waxes, hormones, and salts, which among other things determine the slightly acidic to neutral reaction that peat has. In the aquarium, keeping peat as a substrate has been used for breeding purposes for many killifish species (annuals),

which dive into the peat to deposit their eggs. I once had a pair of *Cynolebias nigripinnis* housed in a 10-gallon tank in which there were two wine glasses full of peat. Both fish would disappear into the glasses and emerge some time later after laying their eggs in the peat. The peat was eventually dried out and placed back into water about 6 months later. The result was more than 500 fry!

Substances that are released by peat have a beneficial effect on the growth of plants, especially on their root system. These substances stop fungi and bacteria from growing too prolifically. It is widely believed that the substances found in peat help stimulate breeding of many fish species. Through personal experiences and studies I also concur with this finding.

## The Purchase and Use of Peat

Peat is not usually available in American aquarium shops, but it can be obtained at a reasonable cost from a gardening supply store, where it is sold in large bales. The peat should be crumbly, since it contains various parts of decomposed plants. Peat from Canada is generally of high quality, since the fields where it is obtained have usually not been treated with pesticides, herbicides or fertilizers.



Many killifish, like this *Cynolebias nigripinnis*, are best kept in peat-treated water. In addition, many killie breeders use peat as a spawning medium.

Approximately one kilogram, 2.2 pounds. of acidic peat (3.5 - 4.0 pH) will treat 100 gallons of water. If the water has an initial conductivity of 300 Microsiemens, total dissolved solids of approximately 160 mg/l, a total hardness of 140-160 mg/l as  $\text{CaCO}_3$ , and a pH of 7.7, depending on the type of filter used (canister filters with a slow flow rate are recommended for this type of application). within a day's time the hardness will drop down to 40 mg/l, the conductivity to around 160

Microsiemens. TDS to around 80 mg/l. with a pH in the 6.5 range.

## The pH of Peat

It is best to purchase a large bale of peat. On the bale it is usually marked what the pH in  $\text{H}_2\text{O}$  is of that peat. If this information is not on the bale, you can contact the manufacturer of the peat, and they will gladly supply the information for you. Peat will range anywhere from a pH of 3.2 to 6.8, or even 7.0. It is important to remember that the lower the pH, the more chemically active it is, and a peat with a low pH will treat a larger volume of water. It is my experience that peat with a acidic pH in the range of 3.5 to 4.5 is ideal for water treatment.

## The Boiling of Peat

The peat should never be boiled or rinsed with water prior to use since this can render it ineffective for water treatment (Sterba, page 436).

Killifish breeders do boil peat prior to using it, but in this case the peat is only used as a substrate for egg deposit and not for water treatment.

## Fertilizers

The peat should not contain fertilizers. An indication of the presence of fertilizers is an increase in the phosphate ( $\text{PO}_4^{-3}$ ) ion concentration in the water after peat treating. Since all peat contains some ammonia, testing for ammonia as a indication of the presence of fertilizers is not easy to do unless one knows exactly what weight of dry peat was added to what volume of water and how much ammonia to expect in the absence of fertilizers. I have never had a problem with fertilizers in peat that I buy from the gardening supply stores, though it is something to watch out for.

## Insecticides

Since testing for the presence of trace amounts of these compounds can only be performed by a chemical laboratory using gas chromatography and mass spectrometry, the aquarist is left to improvise his own test. One method is to place a small spider or ant in a small vial with peat. If the ant or spider die within a few hours, the peat probably contains insecticides, and it should not be used .

## Tannins in Peat

During the peat treatment, the water will acquire a slight amber color from the tannins in the peat. This color can enhance the colors of some species of fish and is very similar to a natural environment. However, some may object to this color if they are only interested in the ion exchange properties of peat. If it is desired to remove the tannin, a flocculating agent (water clarifier) can be used and added to the water. This process will clear up the water quite nicely; however. it is not recommend to perform this procedure (flocculation) in water that is soft with low conductivity, as sudden death of the fish may result from osmoregulatory failure.

## The Peat Filter

In Europe this is called a peat bomb. The best way to use peat is to load it in a canister filter with a thin layer of filter fiber before and after the peat. Canister filters are preferred because the water has more contact time with the peat. The most important thing to remember is contact time between the water and the peat-in other words, the flow must be slow. In such a setup, the slow flow usually will happen automatically due to the density of the peat.

The filter will be placed in a recycle loop on a water-safe vessel holding the water to be treated, such as a plastic 55-gallon drum or a

household garbage can. If a garbage container is used, clean it very thoroughly before using it for peat treating; even a brand new can should be rinsed out with bleach solution. If this vessel is white in color, the color change of the water can be observed in the peat treatment process.

## **Water Quality Monitoring During Peat Treatment**

When treating with peat, it is best to monitor the hardness and let the hardness be your guide. Do not monitor the peat treatment by the reduction of pH. While it is true that the pH will fall as the water is softened, this can be deceptive, since the peat is giving up Hydrogen (W) in exchange for other cations. Depending on what the alkalinity is, the water can have at this time an increase of CO<sup>2</sup> and this will give a low pH value until any excess carbon dioxide is gassed off, but then the pH will usually bounce back. So it is a good idea to ignore the pH during treatment and monitor hardness instead.

## **How to Determine When Your Peat Is Exhausted**

To determine when the peat is exhausted, the hardness on the discharge of the peat filter should be tested and compared to the hardness of the water that enters the peat filter. This means test the water in the vessel, then test the water exiting the filter. If the readings are the same, the peat has been exhausted and should be discarded. Even peat that is not exhausted should not be stored wet, since the growth of anaerobic bacteria could result in the production of hydrogen sulfide gas - H<sub>2</sub>S. Hydrogen sulfide gas has the odor of rotten eggs and is extremely toxic for all oxygen dependent forms of life.

## **Discussion**

My first experience with water treatment was using peat to reduce the conductivity and the hardness. This application worked very well until my operation became too large. In a large scale operation, peat can become rather messy. Otherwise, peat filtration is a cheap, reliable means of reducing the conductivity and hardness. With peat treatment, there are no membranes, resins, or extremes of pH and ionic strength to trouble the operator and endanger the fish. I know of many cases where people were unable to spawn fish or hatch eggs for many weeks or even months until they found what the problem was with their deionization or reverse osmosis equipment. It never occurred to these same people that they could have simply softened and reduced the conductivity of their water with peat and saved themselves much time, trouble, and money.

One of the oldest and one of the first discus breeders (even before Jack Wattley) was Clarence McDaniels of Independence, Missouri. Relatively

unknown, he bred wild discus, (particularly Peruvian Greens) in the late 40s early 50s. His water came from the Missouri River with a hardness of about 300 parts per million. He was a very successful breeder, but he did not use anything but peat. His breeding water, however, was soft about 60 mg/l as  $\text{CaCO}_3$  - and the pH was right around neutral. I know this is so because I analyzed it!

Many killifish breeders, dwarf cichlid breeders, and others use nothing other than peat to treat their water. All these people that I have met over the years have always been successful with peat despite the wide variation in their local water composition provided by their water utility, and especially in the case of killie breeders, a wide variation in water spawning requirements of the many different species.

The first people to breed softwater fish back in the early 50s had no means available other than using rain water or peat to treat their water, since reverse osmosis or deionization were not yet available. Despite this, these people succeeded in breeding many species whose water requirements and spawning behavior were almost totally unknown. Perhaps some inexpensive and low tech reliability needs to be brought back into water treating.

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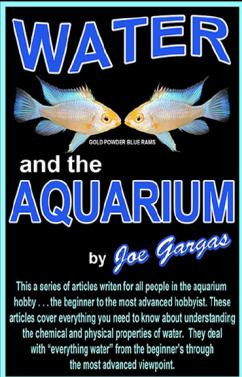
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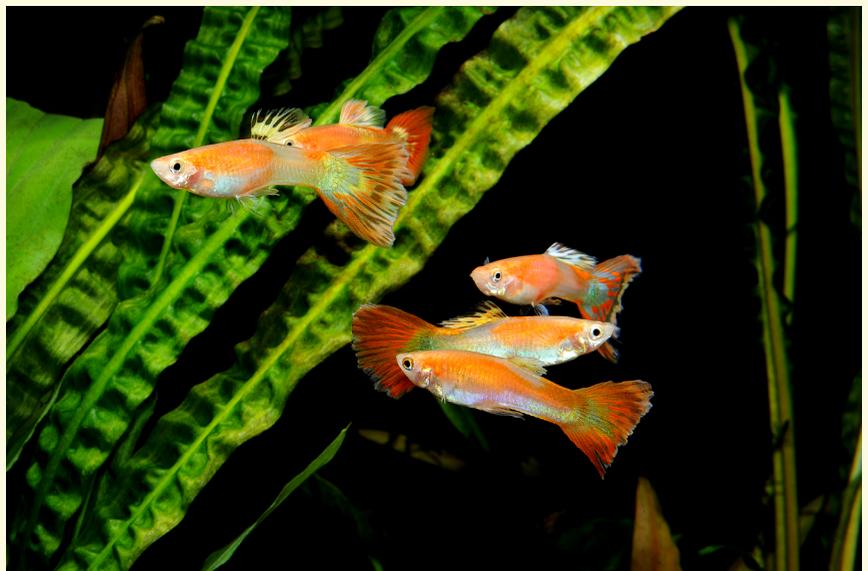
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# SOMETHING TO SEE!!! Part 3



*Danio rerio*,  
Glowfish Sunburst  
Orange



*Poecilia reticulata*,  
Sunray  
Guppies

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## What About Saltwater ICK?

Saltwater tropical fish are not immune to parasite infection caused by a sudden drop in temperature. The most common parasite is the dinoflagellate *Amyloodinium ocellatum*.

It acts very similarly to the freshwater infestation, so most marine hobbyists call it white spot or ICK. Saltwater ick attaches to the gills and skin of its host and will impair respiratory functions and can suffocate the fish. The fish will rub against the decorations and the bottom trying to get the parasite off, and the breathing rate will increase as the fish tries to get enough oxygen. In the wild, the number of parasites on a given fish is usually low and does not kill the fish. However, in a closed system, like an aquarium, the number of parasites can multiply unchecked to the point of killing the fish in as little as twelve hours.

There are several different treatments that can be used on the fish depending on the situation. A freshwater dip for 5 to 10 minutes will bring quick relief to the infected fish, however, in large, heavily decorated tanks, catching the fish may not be feasible. In fish only tanks, copper treatments can be used. The drawback to copper is that it is a slow-acting medication and it will bind with the coral or any calcium-based material like crushed coral gravel. This makes it very difficult to remove from the tank after the treatment is done. Formalin medications can be used and are faster acting, but they reduce the amount of oxygen in the water and the fish are already having a hard enough time breathing.

The best medication that I have found to fight saltwater ick is a Tetra product called TetraMedica Marin-Oomed. It is a non-antibiotic,

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Quinine-based treatment that can even be used with live corals and invertebrates. Dosage dilutions vary according to the type of livestock in your tank . . . inverts, hard coral, soft coral, etc. Be sure to follow the manufacturer's instructions.

A few years ago I had a 75 gallon reef tank with hard and soft corals and several fish in it. I noticed my fish scraping on the corals and I did a quick water change, but they continued to scrape. Soon they began to lay at the bottom of the tank, breathing rapidly. Catching the fish was out off the question because of all of the corals in the tank. The Tetra Marin-Oomed had only been on the market for a couple of months and I had not tried it before. I read the instructions (which at that time were not as detailed as they are today), and treated my tank according to the manufacturer's dosage for corals. Lo and behold, by the next day, my fish were remarkably improved and in a few days they were back to normal. The medication has a Quinine hydrochloride dihydrate base and has proven very effective. I have since recommended it to other people and they have had very good results. Oomed is not recommended for use with some sea urchins and sea cucumbers species which can release toxins into the water when stressed.

With or without invertebrates in a marine tank, I would recommend using Tetra Marin-Oomed for saltwater ick. It has less problems than the other treatments and it does not disturb the filtration in the tank. Until next month, keep those fish happy and healthy.

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by Joe Gargas

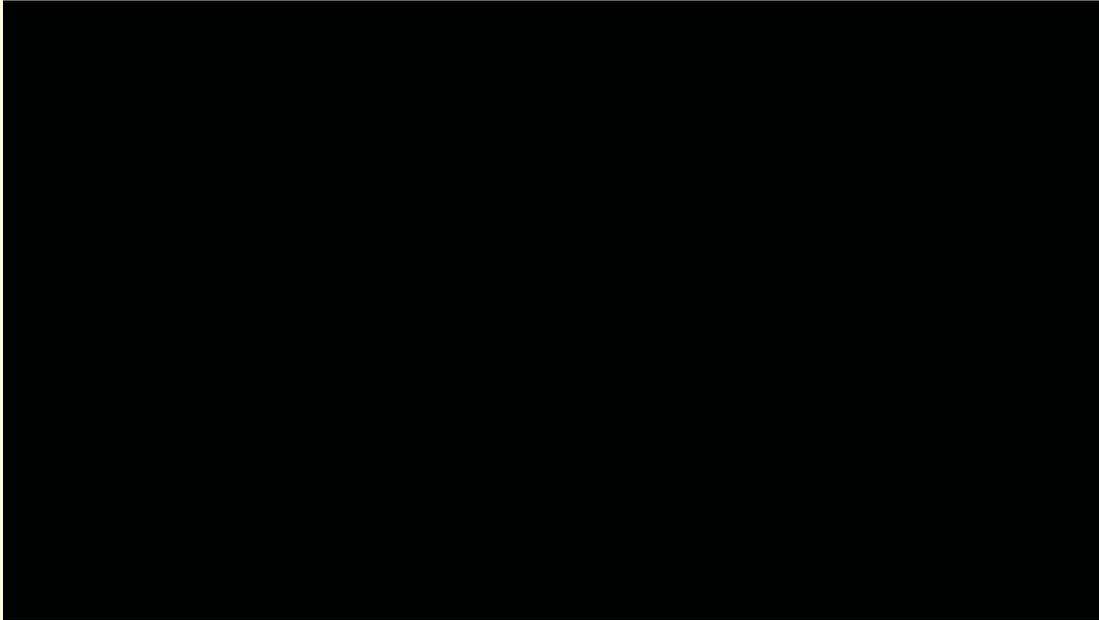
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**Heros severus - Orange Shoulder Severum (from 5D Hatchery)**

photo: Mike Jacobs 2018

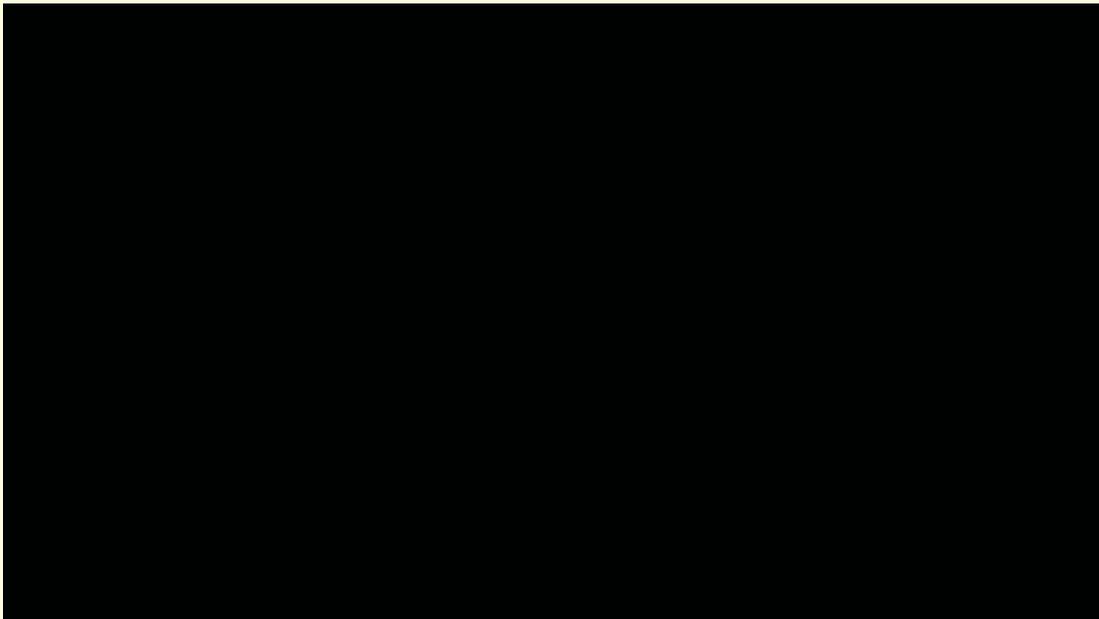
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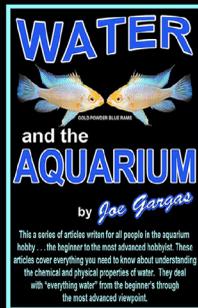
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