

THE FILTER

January 2021
Volume 30 Issue 5



TAMPA BAY
AQUARIUM
SOCIETY



ST. PETE/TAMPA
FLORIDA

Nothobranchius flagrans
Kabunga CD13-7
Killifish

TBAS . . . Since 1992

Photo Mike Jacobs . . . 2014



TAMPA BAY AQUARIUM SOCIETY

“THE FILTER”

Tampa/St. Pete, Florida

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President's Dharmesh Patel Stuff

Happy New Year Tampa Bay Aquarium Society friends! I hope you all were able to enjoy the holidays as best as one can during these trying times. We at TBAS understand that this past year has been difficult to say the least. We hope that you all have been able to maintain your enthusiasm for the hobby, as we look forward to the day when we can all meet together again as a group. At this time that day is uncertain.

In the mean time, please utilize our forum and our Facebook page to keep that connection with other members. Right now it is very important to keep and maintain friendships made though the club and in general. The isolation that some may feel during these times is widespread. Sometimes all someone needs is a call. Reach out. Be someone's light. I offer this quote by Doe Zantamata, "It is only in our darkest hours that we may discover the true strength of the brilliant light within ourselves that can never, ever, be dimmed."



See you all soon,
Dharmesh
Dharmesh Patel, President TBAS

Poecilia reticulata
Red Multicolor Guppy
Photo by Mike Jacobs 2016

Annualism in Killifish, a Brief Overview:

by Charlie Nunziata



Annualism is the process by which some killifish species have survived for millennia in what appear to be impossible life-lethal environments. Annual killifish reside exclusively in temporary bodies of water in regions that experience annual or semiannual draughts, a “dry season”, typically followed by periods of rain, a “wet season”. The timing of these events is determined by an enormous array of environmental factors and variances in local conditions that are unique to each region.

During the wet season, dry shallow depressions in the ground will fill with water, forming pools, and life seems to explode around them. As the wet season ends, rain events become erratic, then cease entirely. Water levels decline until the pools dry out completely again, extinguishing all water-dependent life. The surface that once served as the bottom of the pool becomes desiccated, and fractures into cracks, large and small, shallow and deep. This dried out depression remains so until the next wet season fills it with water again. Yet despite this apparently lethal environment, there arose a number of killifish species that developed a unique ability to survive. These include species of the African genera *Nothobranchius* and *Callopanchax*, and more than 30 genera from South America.

The developmental cycle is known as annualism: It is enormously complex, and remains a subject of intense scientific inquiry. Central to the process is the unique ability of annual killifish embryos to both survive desiccation, and to suspend growth at various points in their development. Both these capabilities result in eggs that are incredibly durable and able to survive the most demanding environments. The net effect is that there are eggs that are ready to hatch at any time of the year as soon as they are wetted.

Although the life of these temporary pools is a continuum, let’s arbitrarily start with a pool filled with water at a time near the end of the wet season. The killifish living therein have been continually breeding since reaching sexual maturity, typically within some weeks after they hatch. The mating process involves a complex

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Wet Season Actual African Pond Photo Dry Season
Ian Sainthouse, from England, Photos - Ian is a member of the our local Killifish Club!!

series of movements during which the fertilized egg is deposited on or into the bottom substrate. There they remain in a state of suspended animation, with very limited development activity, until the pool completely dries out. This quiescent period is known as Diapause 1.

Initially, the deposited eggs are isolated from the atmosphere, first by the water, and then by the uniformly solid substrate surface typical of the early stages of the dry cycle. As the dry season deepens, the surface cracks, exposing the eggs a mix of atmospheric gasses, fluctuations in temperature and increased levels of



Nothobranchius cardinalis

light. These changing elements provide environmental cues that impact the rate of development and the onset and egress of the diapause stages. During this dry cycle, the eggs experience periods of rapid development, sometimes interspersed by one or two additional diapause; diapause 2 and 3. Although development appears to entirely suspend during these diapause stages, metabolism is actively regulated and organ genes developed that together

impart the ability of eggs to survive for extremely long periods of time, in some species, many years.

But individual eggs do not respond uniformly to these cues, and herein lies the key to survival. Within a given clutch, some eggs remain at one or another diapause stage, some resume development at varying rates between the diapause events, and others proceed directly to the final pre-hatching stage. Because of this,



Nothobranchius guntheri



at any given time the substrate will typically hold eggs at virtually every stage of embryonic development, with some always ready to hatch whenever the rains eventually return - this is the key to survival.

When the pond fills with water, the environment immediately around the eggs is drastically altered, triggering those eggs

at full development to hatch, and inducing the others to resume development. The whole process appears magical; There are videos on utube.com that show baby fish swimming in slightly depressed hoof prints that filled with less than an inch of water after a short rain. To the local people, these fishes seem to appear out of nowhere as soon as the seasonal rains return, supporting the legend that fish, supernaturally, 'fall from the sky with rain'. All this aside, the process in its complexity, developed over millions of years of evolution can easily be mistaken for magic; **perhaps it really is!!**



Nothonranchius rachovii Beira



by
Joe
Gargas

FISH NUTRITION

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As I have discussed in earlier columns, water quality is the most important factor in keeping tropical fish.

The second most important factor is nutrition. All fish require energy for growth, repairing damaged tissue due to aggression, bacteria and/ or parasitic attack, for muscle activity, and for reproduction. For freshwater fish, most of the energy is spent osmoregulating. The biological process of utilizing energy is defined as metabolism. The rate at which energy occurs is called the metabolic rate. The metabolic rate in fish is influenced by water temperature, species, age and body size, activity, physical condition and body functions, as well as water chemistry parameters such as oxygen or carbon dioxide saturation, pH and salinity (conductivity).

There are many sources of food available for tropical fish (ornamentals) in the pet industry today. They can be grouped into the following categories:

- Dry foods, which include pellets and flakes;
- Frozen foods, which could be anything from frozen beef hearts to frozen brine shrimp, fish, mussels and frozen insects;
- Live foods, which can be purchased (live brine or tubifex worms) or cultured on the premises (white worms or daphnia, and feeder fish).

VITAMINS & MINERALS

Fish get some minerals from the water. Freshwater fish can absorb essentially all of their calcium requirements from surrounding water since most surface water is high enough in calcium so that a dietary supplement is not necessary.

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The main problem regarding nutrition is that many manufacturers are unaware that fish require vitamins in their diets. One of the most striking nutritional differences between fish and livestock is the inability of fish to synthesize vitamin C (ascorbic acid).

Fish lack the enzyme L-gulonolactone oxidase for synthesis of ascorbic acid from glucose, although most warm-blooded animals (except primates and guinea pigs) have this enzyme. Because of its multiplicity of metabolic functions, the ascorbic acid requirements of animals varies with the function and environment.

For wound healing and response to infection, stresses and environmental toxins, higher than normal amounts of vitamin C are needed. In fact, dietary vitamin C supplementation is now used beneficially in feeds for poultry under high performance and stress conditions.

Aside from this, there are still other compounds necessary which certainly are much reduced in quantity in the body of the fish, but which are still necessary for the physiological processes, and which must be introduced to the fish food. Lack of vitamins cause serious disturbances to health, and can even result in death.

FOR WOUND HEALING AND RESPONSE TO INFECTION, STRESSES AND ENVIRONMENTAL TOXINS, HIGHER THAN NORMAL AMOUNTS OF VITAMIN CARE NEEDED.

Research has demonstrated that an array of vitamin components are present in fermentation systems. The disturbance that occurs from the lack of vitamins is usually not restricted to an individual organ, but instead causes overall damage to the cells which can include an array of life processes.

The addition of vitamins to the food should be by a vitamin complex since they are only effective in their entirety. Admittedly, during symptoms of deficiency, the vitamins can also be increased individually.

By means of the difference in osmotic gradient between the water and the fish, vitamins proceed into the body of the fish in different ways. For freshwater fish, it is advantageous to enrich the food with vitamins. Since the ionic strength of water is less than that of the fish tissue, vitamins added to the water do not readily diffuse into the body. Thus, the remaining vitamins in the water can cause bacteria blooms, affecting the water quality, and depleting the water of oxygen.

It is much easier with saltwater fish. Their blood and body tissue

has a lower salt content than the surrounding water, and these fish must drink continually to maintain the water balance in their bodies. By this means, regular intake of vitamins from the water is ensured.

HOLE IN THE HEAD

The condition called “hole in the head” in saltwater fish is thought to be caused through vitamin deficiency. It can be healed by the regular addition of vitamins to the water (entire vitamin complex), and the destruction can be avoided.

In freshwater fish, the hole in the head condition can be caused by both water quality and vitamin deficiency. The accompanying symptoms of this condition, such as *Spironucleus symphysodonis*, *Ichthyophonus hoferi*, or bacteria can indeed occur along with the condition, but usually they are not the cause.

Frequently, the addition of a high vitamin flake food during occurrences of the hole in the head disease in fresh water fish helps the healing of the deep holes and a full recovery from the disease. I usually administer a vitamin A and B complex in the food and in the water.

Aqua Research Center

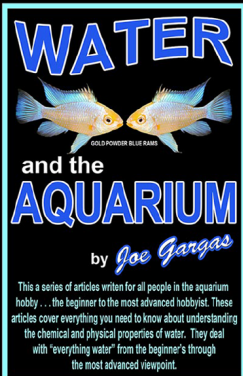
Water Analysis & Interpretation by Joe Gargas

Ph: (813)645-1717

Joe's

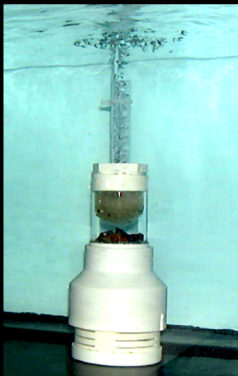
WATER

Book



WATER
and the
AQUARIUM
by Joe Gargas

This a series of articles written for all people in the aquarium hobby ... the beginner to the most advanced hobbyist. These articles cover everything you need to know about understanding the chemical and physical properties of water. They deal with "everything water" from the beginner's through the most advanced viewpoint.



Joe's

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10 Most Beautiful Betta Fish in the World

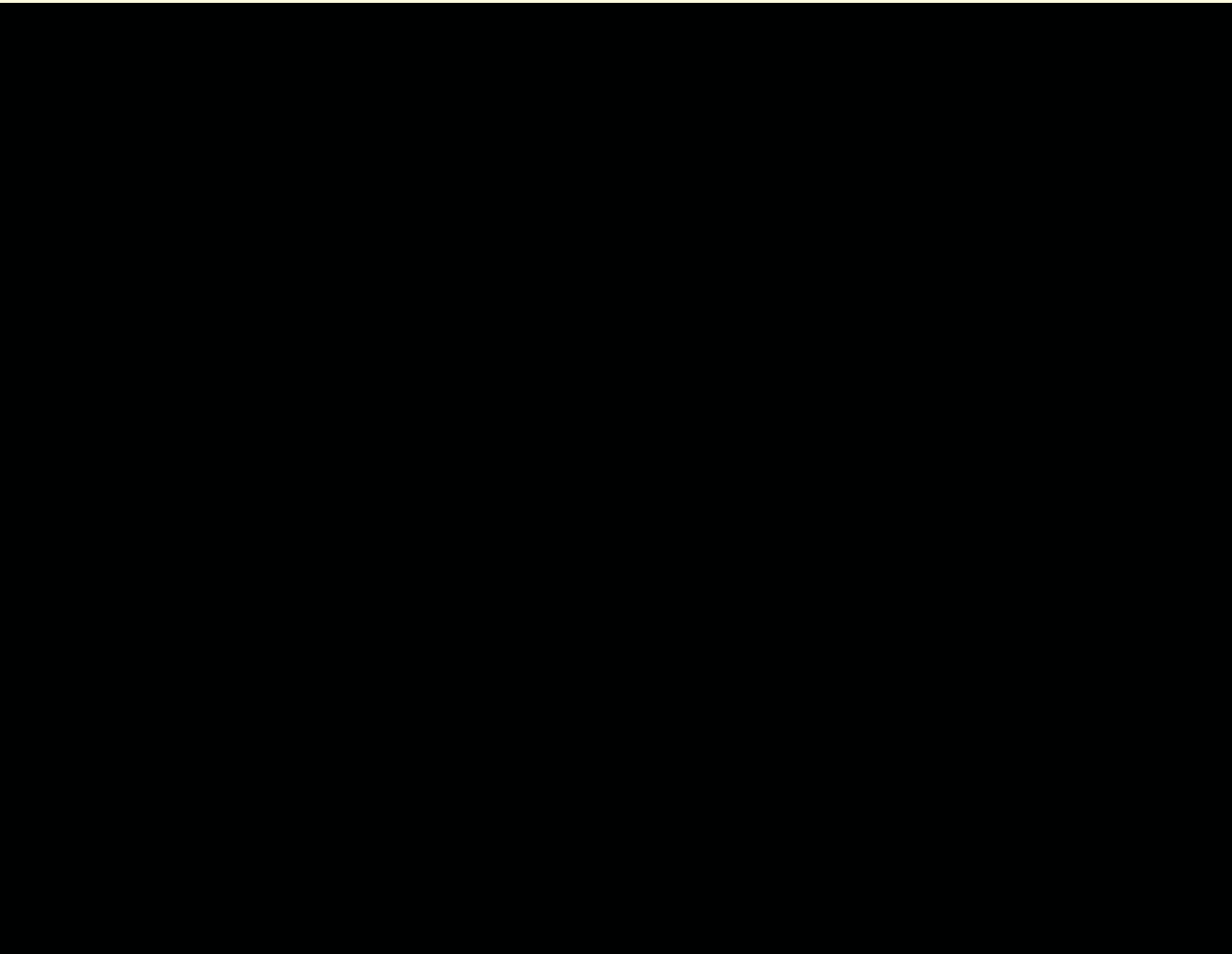
10 MINUTES AND 08 SECONDS LONG!

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20-40 second
"load" the **FIRST**
time!!!



SOMETHING TO SEE!!!!



*Botia
kubotai*,
Burmese
Botia

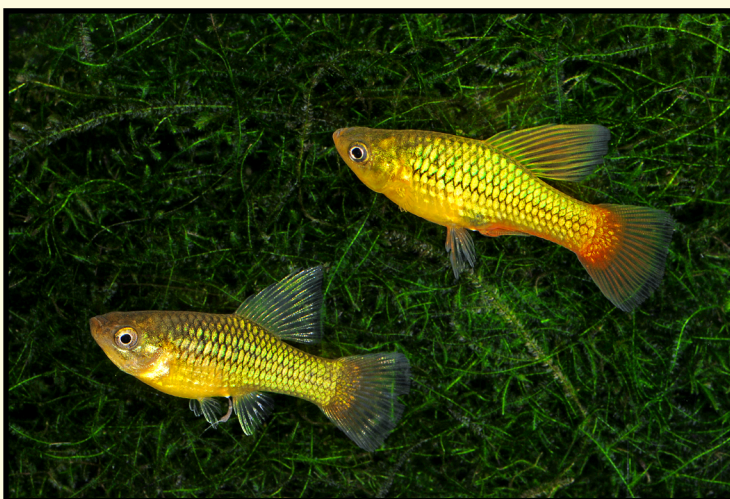


*Herichthys
cyanoguttatus*,
Texas
Cichlid



***Puntius titteya*,**
Albino
Cherry
Barb

***Trichogaster chuna*,**
Gold
Honey
Gourami



***Xiphophorus variatus*,**
Hi-Fin
Variatus



***Devario
sondhii,***
Fireline
Danio



***Apistogramma
Panduro,***
Pandy
Apisto



***Aphyocharax
paraguayensis,***
Panda
Tetra



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, 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.

The logo for Aqua Research Center features the name in a stylized, glowing cyan font with a white outline. The 'A' is particularly large and has a long, thin tail that extends downwards.

Water Analysis & Interpretation

www.aquaresearchcenter.com

by Joe Gargas

Ph: (813)645-1717

TBAS January Meeting is a ZOOM Meeting!!!

Join Our Zoom Meeting

<https://us02web.zoom.us/j/89028314699?pwd=UTNQeVZTMIJBYnF1b0NpOEtFWHdZUT09>



Meeting ID: 890 2831 4699

Passcode: 395123

8pm - Monday, January 11 2021

Joe Gargas Talks!!!

“WHAT’S NEW” In Aquarium Fish Keeping!

For the past year many of us aquarist have not been meeting and have been cooped up. During this time I came across new Ideas and products that I will talk about as well as products that I have tested which work quite well and were to get them at the best price.

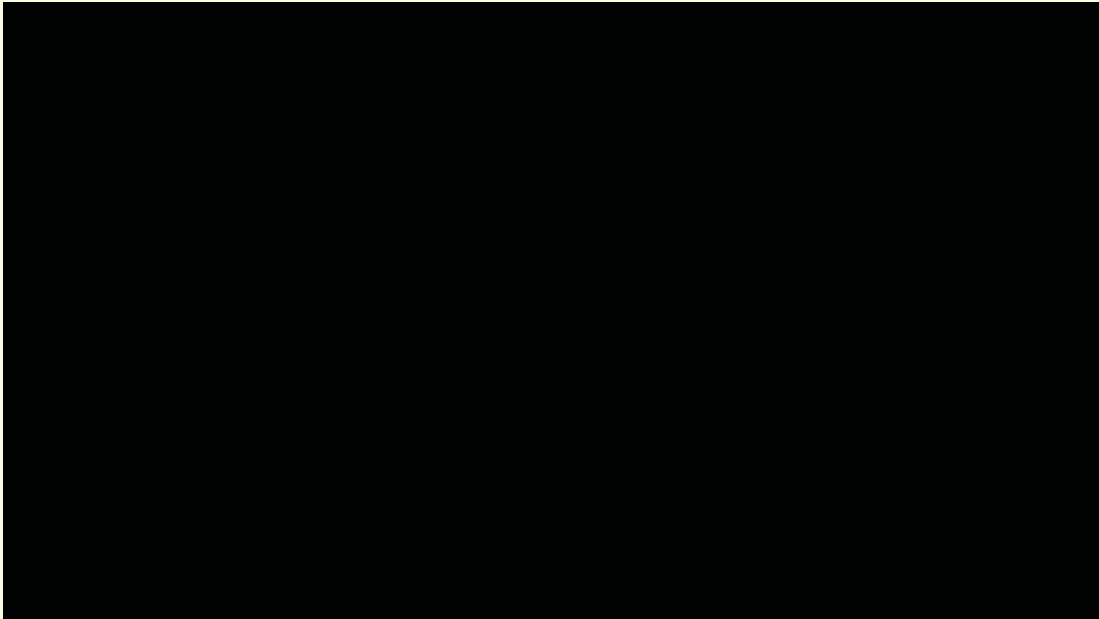
Joe Gargas, a native of the South Suburbs of Chicago, began his interest in Tropical Fish in the mid 60’s when a aunt gave him his first fish tank with guppies. His interested in tropical fish stayed and grew through the teen years which grew into walls of aquariums. In the late 70’s he became a Law Enforcement Officer in the South Suburbs of Chicago. During that time he worked extensively breeding Discus as well as other hard to breed species of fish making extra money in the process. Joe began writing for a number of Aquarium Fish Publications and had a column in one of them that ran for 7 years. He also began teaching a class that he put together at the John G. Shedd Aquarium in Chicago it was “Advanced Freshwater Fish Keeping”. This was a 6 week 6 part course that he gave twice a year.

In the early 90’s he was approached by the Wardley Corporation in Secaucus, New Jersey (An Aquarium Fish Food Company) and was offered the job as a consultant. At this time he began doing the PIJAC “Freshwater Fish” certification seminar throughout the USA and Canada and the UK speaking on all aspects of the aquarium hobby. In the mid 90’s the Wardley Corporation was bought out by the Hartz Mountain Corporation and Joe was offered the job of the Director of Research for Wardley and he and his family were relocated to the Tampa Bay area where he lives today.

Joe lectured World Wide on behalf of the Wardley Corporation on all aspects of Tropical Fish Keeping and developed many products. He currently has a hatchery were he is breeding Discus, Rams and Angelfish selling to breeders and high end stores across the country and is currently an active member of the TBAS Tampa Bay Aquarium Society. Through his research and expertise he has helped aquarists/hobbyists keep their fish alive and remain in the hobby.

Topics

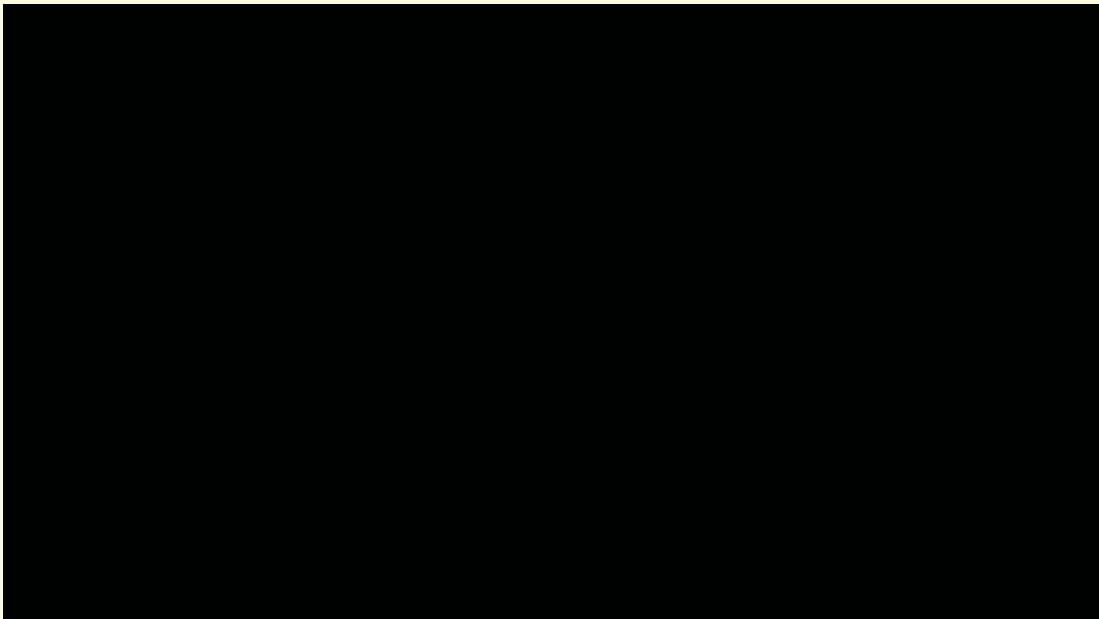
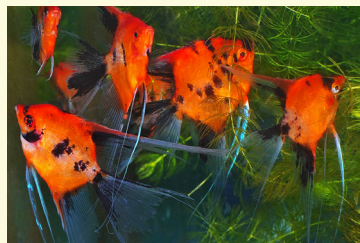
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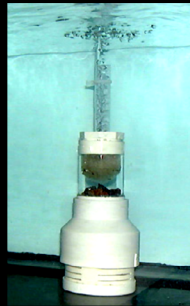
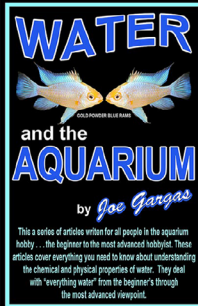
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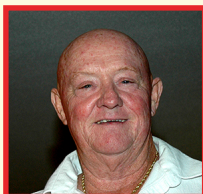


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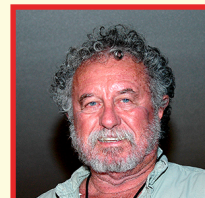
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