



THE FILTER



Poecilia reticulata
Red Spot Guppy

September 2019
Volume 29 Issue 2

TBAS . . . Since 1992

Photo Mike Jacobs . . . 2019



TAMPA BAY AQUARIUM SOCIETY

“THE FILTER”

Tampa/St. Pete, Florida

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Hey guys.

Here we are in September watching another hurricane. We hope that everyone is safe and sound. Hopefully Dorian misses us and everyone is ok. If there are any changes or issues with the meeting location will send out notices and let everyone know.

Last month we elected a new Board of Directors for 2020. You can find the list of directors on our website at TBAS1.com. I want to thank everyone for volunteering their time to help make this club great.

For our monthly meeting in September we are having a swap meet. There is no charge for tables and tables are reserved on a first come first served basis. October we have Mr. Dan Connor giving us a talk about his line of Half Black Phillipino Blue Angels. November we are not having a meeting as our normal meeting falls on a holiday plus our annual auction will be on Nov 16th.

Dre

Dre Alvarado, President TBAS



Apistogramma agassizii

Apisto Agassizii

Photo by Mike Jacobs 2019



FACTS ON FISH Permanganate:

by
Joe
Gargas
The Oxidant

This month's article is on permanganate, a substance that I refer to as the aquarist's double-edged sword thanks to its ability to act as both an oxidant and a biocide.

In aquaculture, permanganate is usually encountered as potassium permanganate. It is easily recognized as an intensely purple colored solution when dissolved in water. Even in very low dilutions it can be easily observed by its purple color.

As an oxidizing agent, permanganate rapidly oxidizes organic compounds down to oxygenated products that are non-toxic and readily biodegradable.

As permanganate is expended in the oxidation reactions, it will turn into the inert brown precipitate of manganese dioxide, MnO_2 .

The presence of dissolved organic compounds increases the **Chemical Oxygen Demand (COD)** of the water, which in turn elevates the amount of permanganate required to oxidize these compounds.

When using permanganate, the **COD** of the water should be low. This is best done using new water free of organic compounds. Stable permanganate concentrates are easily maintained in water with a low **COD**.

If the **COD** of the water is high, it will require more permanganate to oxidize the organic compounds before a stable permanganate concentration can be achieved.

This will produce much of the dirty brown precipitate of manganese dioxide, which must then be filtered out. It is best to avoid this by reducing dissolved organics as much as possible before permanganate treating.

Never use permanganate if fry are present!

If new water cannot be used, then carbon filtration should be employed to reduced dissolved organic compounds as much as possible before permanganate

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testing begins.

Particulates must also be filtered out since permanganate cannot reach pathogens buried within dirt or detritus particles.

Redox Potential

As a strong chemical oxidant, permanganate immediately raises the redox potential and reduces the chemical oxygen demand by rapidly oxidizing any organics, cyanides, phenols, nitrites, inorganic and organic sulfides or any other reductants present, as well as the toxins produced by pathogenic bacteria.

| ppm KMnO_4 Based On the Addition of 1% KMnO_4 | | |
|---|----------------------|---------------------|
| ml of 1% KMnO_4 | volume of tank water | ppm KMnO_4 |
| 1 | 10 gallons | 2.4 |
| 2 | 10 gallons | 4.7 |
| 3 | 10 gallons | 7.1 |
| 4 | 10 gallons | 9.4 |
| 5 | 10 gallons | 11.8 |

Permanganate can be added to existing tank water to oxidize dyes (such as malachite green drugs) or chemical reducing agents, (reductants such as formaldehyde) to inert non-toxic oxygenated compounds.

This very quickly improves the water quality, so that in the pond culture offish it is primarily used as an oxidant and only secondarily as a biocide.

Beyond this, permanganate is so reactive that it oxidizes organic matter on contact; this means that even where it does find an opening large enough to accept the hydration sphere, it reacts before it can travel very far down the pore. The oxidation of organic material produces carboxylic acids which will cause the pH to fall if the water is inadequately buffered. The oxidation products themselves are non-toxic and are generally biodegradable.

Permanganate does not raise the dissolved oxygen (**DO**), but what it does is to reduce the **Biological Oxygen Demand (BOD)** and it slightly reduces the **COD**.

This reduces the amount of dissolved oxygen required by bacteria to satisfy the **BOD**. Potassium permanganate added at four ppm does not inhibit nitrification.

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Low Diffusivity

An ion must disperse its electrostatic charge through a large surrounding sphere of attached water molecules called the “hydration sphere.” The hydration sphere surrounding the ion is generally too large to penetrate through any pores in cellular membranes.

For these reasons, permanganate is not capable of diffusing through cellular membranes of pathogens, or of entering into dirt or detritus particles.

Pathogens embedded within particulate matter are thus protected from permanganate, and the water must therefore be well filtered to remove particulates before permanganate can be used as a disinfectant.

Monitoring Concentration

Permanganate concentrations can be monitored by means of a commercially available colorimeter, which can be purchased from suppliers of water testing equipment.

As permanganate quickly reacts with any organic matter present, turning into a brown suspension of manganese dioxide, declining permanganate concentrations can be observed by loss of the purple color.

At concentrations less than 0.5 ppm, the purple color is not so easily visible. However, the Ortho-tolidine test kit which is used for chlorine can still be used to test for permanganate at concentrations less than 0.05 ppm. The manufacturer will provide a correction factor to convert from chlorine to permanganate concentrations upon request.

Neutralization

Excess permanganate concentrations can be instantly reduced by any of the reducing agents used for dechlorination, such as sodium thiosulfate. Reduction or neutralization of permanganate produces the inert brown precipitate of manganese dioxide, MnO_2 , which can be filtered out by a particulate filter.

Permanganate reacts with carbon on contact, so that carbon filtration will both reduce permanganate and remove the brown MnO_2 precipitate. If a high concentration of permanganate is being used, some salt should be added to the water to assist the fish in osmoregulation in the event that body slime is lost during the treatment.

Toxicity

The toxicity of permanganate to fish increases as the temperature drops, and as the pH and hardness increase. Additionally, a given species of fish will be more resistant to permanganate toxicity as its size increases.

The smaller the fish are, the less their tolerance to permanganate. And so,

permanganate is not recommended with small fry of any species. Since prolonged exposure to high permanganate concentrations is damaging to the slime layer, fish should not be exposed to high permanganate concentrations in water of low ionic strength.

A Simple Test to Determine Your Water Quality

1. Remove one gallon of water.
2. Add one level tablespoon of fresh baking soda (sodium bicarbonate) to the water sample and stir to completely dissolve.
3. Add one drop of a four percent solution of potassium permanganate to the water sample. Stir. A pinkish color will be produced in the water.
4. Note the time. Remove approximately one glass cup of water from the gallon sample.
5. Place on a white piece of paper and allow the sample to stand undisturbed while observing the time.
6. If permanganate-oxidizable substances are present in the water sample, the color will change from its original pinkish hue to brownish, to yellowish and sometimes to colorless. The time it takes for the color to change is directly dependent upon the concentration of oxidizable substances in the water. The information below determines the appropriate action that must be taken:
 - *Color changes to yellow or colorless in less than five minutes.*
Oxidizable substances are at a dangerous level. Use potassium permanganate. Do at least a 50 percent water change. Clean filter and replace carbon. Retest water after 24 hours.
 - *Color changes to yellowish or colorless in five to 10 minutes.*
Oxidizable substances are at a stressful level. Use potassium permanganate. Do at least a 25 percent water change. Clean filter and replace carbon.
 - *Color changes to yellowish or colorless in 10 to 15 minutes.*
Oxidizable substances are low and pose no immediate threat. Perform a small water change, clean the filter and replace the carbon.
 - *No color change for at least 25 minutes.*
Oxidizable substances are low, requiring no action. Continue with your normal maintenance procedure.

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 . . . !!!!!



It happened again! I was chatting with the new receptionist at the office while I worked on her tank and she was telling me about the 20 gallon tank that she and her husband had just set up. When I asked her what kind of fish they got she told me “two small Oscars.” I winced and asked her why they bought fish that get so large for such a small tank. She answered that the fish only grow to the size of the tank. I groaned and explained to her that it is a myth that fish only grow to the size of the tank and that she would need a larger tank in a few months. I think the guy who came up with the idea that fish only grow to the size of the tank should be locked up on a closet with a bucket for a toilet that never gets emptied! Does that sound too harsh? Well that is how a fish is living if it is not growing!

The idea that fish grow to the size of the tank was developed in the early years of aquarium keeping when hobbyist didn't do water changes. Often hobbyists would find that fish died after a water change. Little did they know then that they were waiting too long between water changes and changing too much of it (like all of it!). Water quality parameters such as pH and ammonia may have been radically different after the water change, because all the fish waste that had built up from not doing a water change was removed. That level of detoxification severely shocks the fish, often leading to death. Now hobbyists have learned that partial water changes on a regular basis is the way to go. Typically, fish secrete a hormone that stunts the growth rate of like species. When water changes are not made the hormone builds up (as well as fish wastes and ammonia) and stunts

the fish. However, this does not completely stop the growth of a fish, but does slow it down. Large fish kept in small tanks also develop deformed spines and fins from not having the proper room to move about or from an improper diet (but that is an article for another time). I have seen fish that could not turn around in the tanks they were kept in. One of these was an Oscar raised in a 10 gallon tank for three years. When the water changes for the Oscar go to be once a week, the owner decided to trade in the fish. I put the humpbacked fish in a 200 gallon pond. The fins were kinked and the tail was short, giving the body a squashed appearance. I kept the Oscar in the pond and fed it a good diet loaded with vitamins and minerals. It took about a year, but finally the body did straighten out. The fins and tail also repaired themselves to a more normal appearance.

Of all the myths about fish keeping, this one makes me cringe every time I hear it. This is a major cause of fish death and of new hobbyists giving up. Always find out how big a fish will get and remember that the larger fish often live a long time, 10 years or more. Until next month, keep those fish happy and healthy!



<http://www.sks1.com>

Did you ever think of KILLIFISH???
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SKS meetings!!! See the ad to
the left!

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TBAS PRESENTS IT'S 2019 ANNUAL AUCTION

WHEN: Saturday, November 16, 2019

WHERE:

**Plant City High School Community Center
605 N Collins St
Plant City, FL 33563**

Old red brick 3 story

1914 Plant City High School Building.

see www.tbasauction.com complete for directions

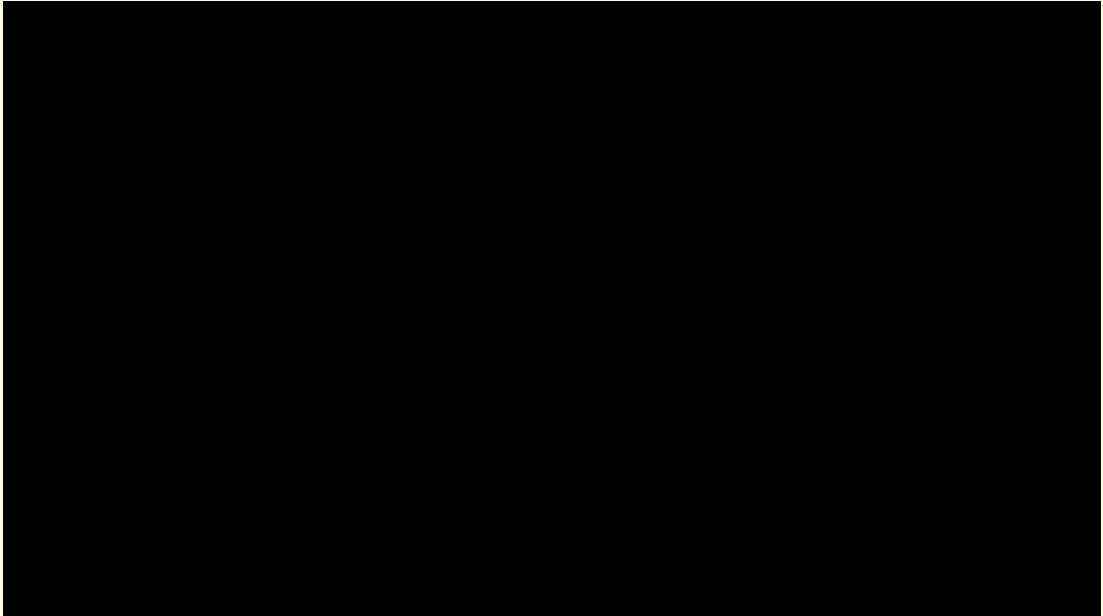
TIME: Doors Open 8:00am

AUCTION TIME: 10:00am - 5:00pm

INFORMATION: www.tbasauction.com

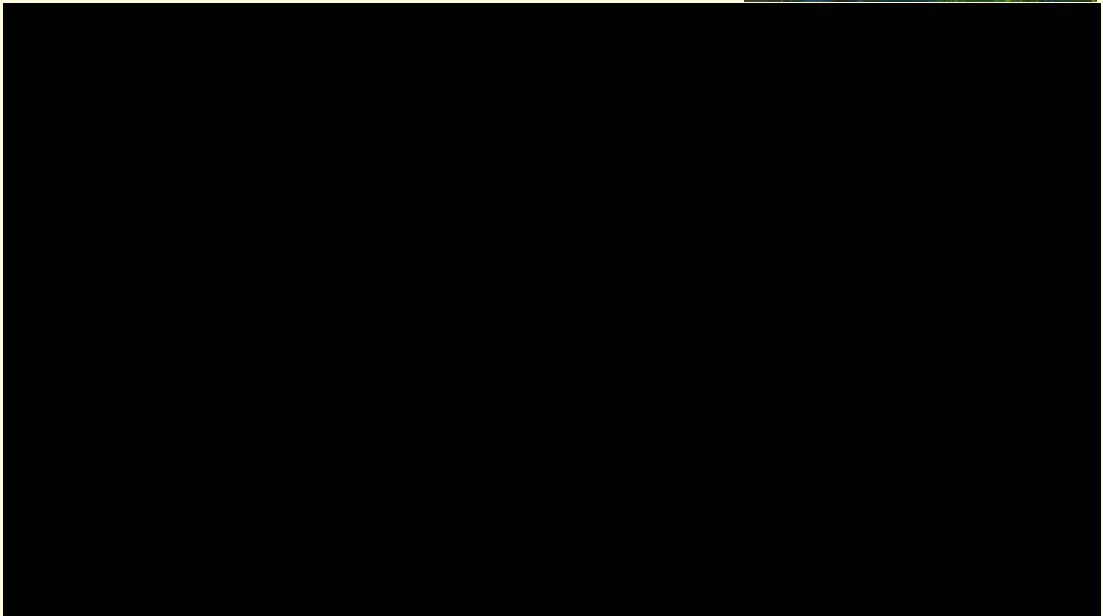
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No new or used dry goods by participants.
All species of plants and fish but no more
than 3 bags per species with the exception
of varieties.



Click on the

to See Video



THE BEST KOI ANGELFISH IN THE UNIVERSE

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**Rosey Red
Danios**

A PAGE TO FILL . . . SO 2 PHOTOS . . . 😊 😊 😊 !!!



**Mixed
Goldfish**

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Catching Wild Bettas in THAILAND for breeding conservation!

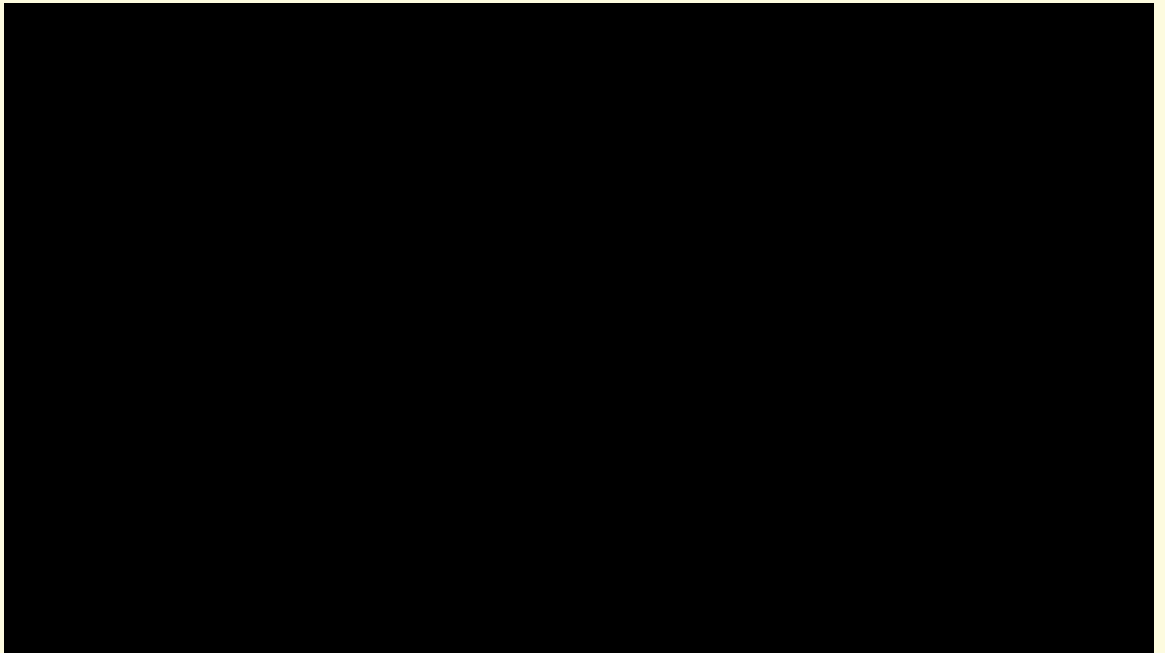
Betta smaragdina - natural habitat

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[to See Video](#)

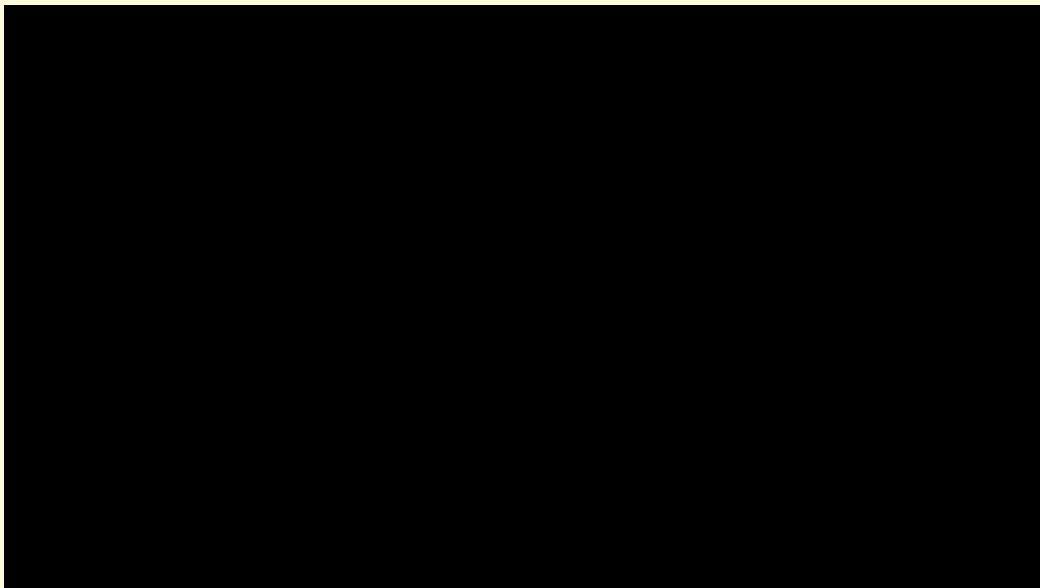
15-30 second
"load" the **FIRST**
time!!!



Angelfish & Eggs



Angelfish & Eggs Video [Click on the](#)  [to See Video](#)





***Chela dadiburjori* . . . Orange Hatchetfish - India**

photo: Mike Jacobs 2018

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alphabetical order

- 1) 5D Tropical Fish
- 2) Segrest Farms

Tampa Bay Tropical Fish Farmers:

alphabetical order

- 1) Amazon Exotics
- 2) BioAquatix
- 3) Carter's Fish Hatchery
- 4) FishEye Aquatics
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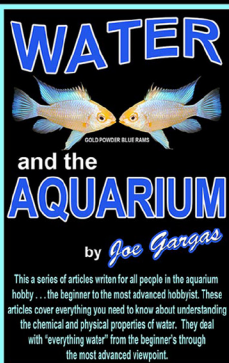


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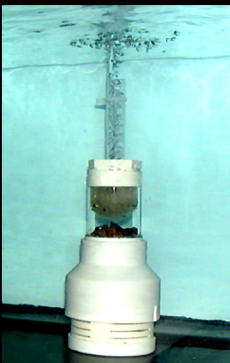


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