Water Quality

Water quality that REALLY MATTERS

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- Koivet.com
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What Constitutes Good Water?

- Why should you care?
- Question and Answer Format

- Water quality is relevant EVERYWHERE!
- Important TO retailers
- Important IN retail!
- Important to Clients!

Why Are EcoSystem Ponds the Best Quality

- Plants
  - Absorb nitrogen
  - Plant Agglutinins
  - Water purification
  - Gas exchange
  - Food for the fish

Why Are EcoSystem Ponds the Best Quality

- Gravel
- Properly managed!!!
  - Biofilm
  - Ambiphrya
  - Agglutinins
  - Food for fish

"Nothing in the world better than a gravel bottom pond, nothing WORSE in the world than a neglected gravel bottom pond."

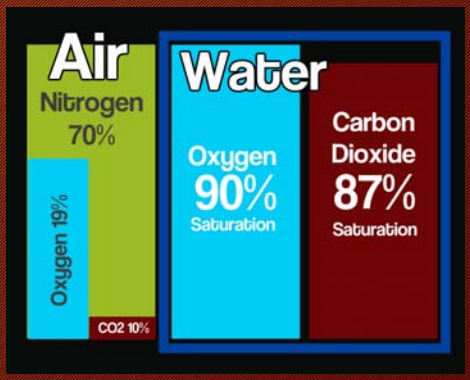
-Dr Erik Johnson

Why Are EcoSystem Ponds the Best Quality

- Oxygen Levels
  - Waterfalls, with draw across to Skimmer
- Carbon Dioxide
  - Degassed by water fall

Do Oxygen and Carbon Dioxide Balance?

- You can have HIGH oxygen levels and HIGH carbon dioxide levels.
- You don't get that in "room" air.
- In "air" for one to go up, the other must go down.
- In water you can have independent levels of both
- Overloaded systems can be stressed by Carbon Dioxide and a sagging pH no matter how high the oxygen levels are.



Oxygen and Carbon Dioxide Levels

- Oxygen sustained by surface agitation and cold water
- Carbon dioxide is removed by surface agitation.
  - But if the system is overloaded, there can be "issues" so watch your organics.
- Should I "legit" test my Oxygen and Carbon Dioxide levels?
  - Probably not.

Alka Seltzer Is Carbon Dioxide

- Yes it's like trapping someone in an elevator and they pass out as the carbon dioxide smothers them.
- Oil of Cloves is better and if we have time I can talk about that.

Plants and Their Gas Impact

- Plants are called “oxygenators”
- People might think they oxygenate all the time
- They only oxygenate during the day while making sugars.
- They grow at night, releasing Carbon Dioxide.
- Carbon dioxide drops PH
- And plants add to the demand for oxygen at night, too.

Do Floating Plants Oxygenate?

- Sure, a little
- But the submerged plants are the real oxygenators.
- Parrots Feather has a top and submerged foliage.
- Hyacinth and Pistia s. and even Water Lilies are not oxygenators.

- Open root plants like Hyacinth and Water Lettuce (pistia stratiotes) make "agglutinins" that flocculate particles, bacteria etc.

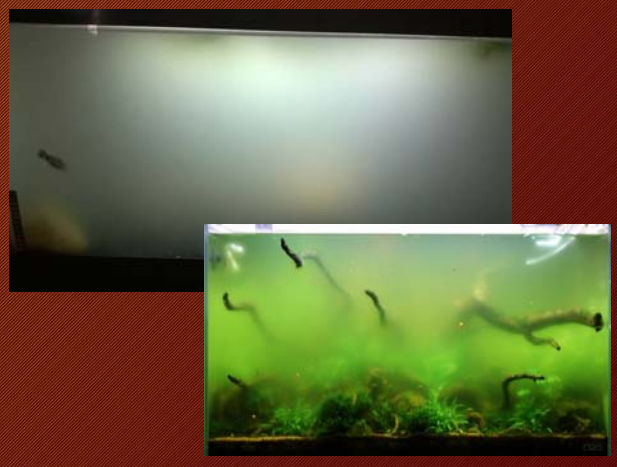
Plants are like "Archers" or hunters.

- Plant agglutinins are the "arrows"
- Particles are the "prey"
- The plant uses the agglutinins to stick the particles together and "bring it down" so it can "eat it".

- You can use plants in "veggie filters" if for some reason you don't want, or can't have Koi with plants.

What Water Quality is MOST important?

- One of them is water CLARITY
- Hazes are a "bad thing" 90% of the time
  - Mineral hazes
  - **Bacterial hazes**
    - THE WORST HAZE you can see bubbles on the water and even smell it sometimes.
  - Algae hazes



Mineral Hazes

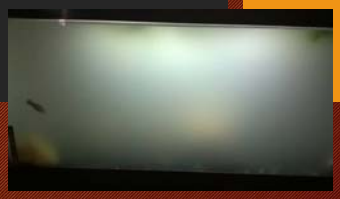
- Simply rock dust.
- Excessive dissolution of some sort of rock / limestone
- SHORT TERM MINERAL HAZES don't matter much unless severe.
- LONG term mineral hazes are significant to gill condition because the gills produce extra mucus to protect themselves, reducing oxygen absorbtion.

Greenwater Hazes

- Algae
- Partial water change
- Reduce feedings
- Cut light
- Algaecides
- UV
- More plants

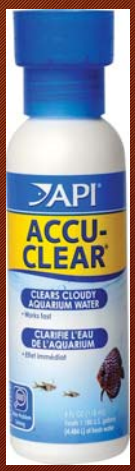
Bacterial Hazes

- Bubbly surface and a notable smell
- Cloudy water
- Fish that are reacting to that with depression
- Dead fish?
- Overfeeding?
- REMEDY: Partial water change, Suspend feeding, SPONGE FILTER AND FLOCCULATING AGENT



Seriously

- A sponge filter and aeration, and some flocculent works WONDERS in hazes.



Question: Nitrates are a Big Deal?

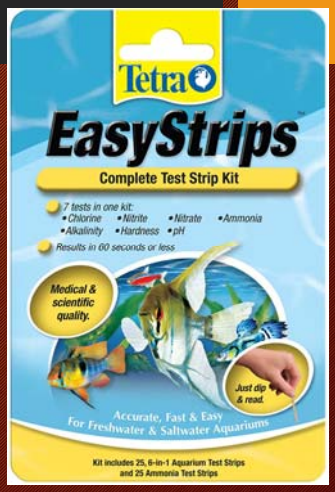
- Nitrates finish the Nitrogen Cycle and is overlooked by all hobbyists
- "Old Water" usually has a lot of Nitrates
- It stunts growth and opens the fish to disease
- Red injected blood vessels in the fins
- Depressed appetite

The Nitrogen Cycle

- A series of nitrogen "accumulations" which are reduced by beneficial "germs"
- People's fish die from:
  - High Ammonia
  - High Nitrite
  - High Nitrate
- Do you really have to know all that?
- NO = YOU JUST HAVE TO KNOW IT'S THERE.

Car Dashboard Light

- All you need is an "alert" that there's a PROBLEM
- A dip-test-strip can tell you "everything's okay" or it can tell you "There's a problem" and it doesn't have to QUANTIFY the result to the tenth of a point. "EasyStrips COMPLETE 7-in-1"
- If a problem shows up, then you deal with it.
- Water changes, salt for nitrites, suspend feeding, ammonia binders….
- BUT BEST OF ALL…



Constant Water Replacement

- 1/8th inch irrigation lines with "emitters"
- 25psi pressure regulator
- Saddle adapter or hose-bib adapter.
- Run open 24 x 7
- Can change up to 20% per day without Chlorine / Chloramine problems. (I've run 40% per day on small systems without event.)

Bioseeding as a Cure for Nitrogen Ills

- Filter "squeezing's" from an established donor system.
- Innoculate the recipient system after dechlorinating, at a suitable temperature with the filtration running to intercept the donated beneficial germs.
- Watch pH for a day or three.
- Aerate

Germs and Bugs in Donor Water?

- Maybe
- But easier to "treat" than 6 weeks of raging nitrogen levels.
- Youtube videos I did will explain everything with illustrations

CROWDING is the Most Important WQ Issue

- Under ¼" of fish per 10 gallons = Almost effortless
- 1" of fish per 10 gallons = Pretty easy
- 1+ inch of fish per 10 gallons = More and more challenging.

- Higher carbon dioxide levels
- Higher feeding rates
- Higher filter loading
- Psychological impact of crowding
- Disease transmission is EASY PEASY

Retail Crowding

- I don't know how a company could be wildly successful without constant water replacement in retail holding facilities.
- Test daily
- And with crowding like you see in retail you have to be "Johnny on the Spot" with medicine, pH support, and remedy of nitrogen issues.
- https://drjohnson.com/phpill/

The Jewels of This Presentation

- Fix your systems up for constant water replacement
- Never face nitrogen problems with chemicals. BIOSEEDING is overnight success. Learn about it.
- Use test strips (7-in-1 "Easystrips" Complete) instead of other kits. All you need is an ALERT to action.
- Be able to tell people IN WHAT WAYS Eco System ponds surpass 'pristine' liner ponds.
- Be able to exploit and explain "Plant Agglutinins"
- Crowding is anything much-over 1" of fish in 10 gallons.

Questions?

- What's the matter with Carbon Dioxide? What water quality parameter does it impact the most?
- What's the worst haze?
- How can we control hazes quickly? When is that NOT practical?
- Why isn't chlorine a "thing" with constant trickle water replacement?
- What happens when you bring a "bug" in with BioSeeding?