



President: Diane Giangrande	pres@atlantakoiclub.org
Vice-President: Marlon Tiller	vp@atlantakoiclub.org
Secretary: Kim Munie	scribe@atlantakoiclub.org
Treasurer: Angie Jones	money@atlantakoiclub.org
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Membership Rhonda Eubanks	membership@atlantakoiclub.org
Auction Chair Diane Giangrande	koishow@atlantakoiclub.org
Koi Show Chairs: Diane Giangrande	koishow@atlantakoiclub.org
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AKCA Director: (vacant)	
Volunteer Coordinator: (vacant)	
Newsletter Editor: Bob Chaffer	editor@atlantakoiclub.org
Webmaster: Cynthia Landon	wizard@atlantakoiclub.org
Koi Rescue: Chase Tomkosky	rescue@atlantakoiclub.org

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## February, 2022

### By the Pond

### Happy February, everyone.

I don't know about you, but I cannot wait for spring! As miserable as it is, I hope you are all keeping up with your water changes - it is important for your koi. Coming out of winter is stressful for your fish so having the best water quality possible is important to help them with the transition. There are some great articles on the web site about coming out of cold weather that are worth the read. The articles can be found here: <https://atlantakoiclub.org/club-articles>.

I am excited to announce that it looks like we will be having a Pond Tour this year. We have a committee that will be running the tour. They will give an update at the meeting.

Our next big event will be the auction on April 30th - everyone get ready to put your volunteer hats on :)

Hope to see everyone on the Zoom meeting. **Please note that our next meeting will be on ZOOM, and will be at 3pm February 20th., instead of the 13th. Details will be sent this week.**

### Membership

Welcome to **Rhonda Eubanks**, our new Membership chairwoman!!! Rhonda replaces **Melanie Onushko**, who, for years and years and years and years, has served us very well in this position.

Welcome to our newest members:

**Andrew Sheppard**

**Marlon Ngo**

**Dale and Joy Nicholson**

**Christopher Brown**

**Gillian Brown**

When you see them at our meetings, meet them and greet them!

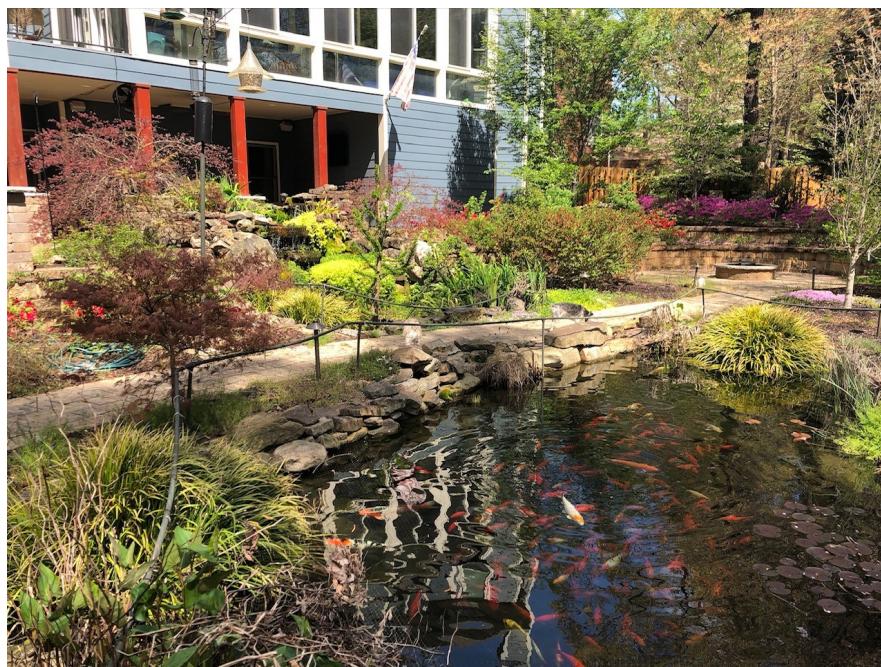
## Water Monitoring System

by Marlon Tiller

David Bitton is the founder of iQTek, an innovative environmental monitoring and control company focused on cutting edge solutions for freshwater applications in aquaculture. Those that attended the Winter Madness event at The Koi Store earlier this month may recall David's presentation of the IQTSonde water quality monitoring system and how the device is able to automate and simplify pond care routines. We are extremely appreciative to have him share his passion for revolutionary technology and water quality management at our meeting this month!

### Kim Munie's pond

He says that he is looking forward to spring!



### Do you have a photo of your pond to share?

Each year, about eight members host our gatherings at their house, when we get a chance to see their ponds. We have over 100 members who most likely have ponds to hold their fish in. Our pond tours also enable us to see a few more of those ponds. But there are a lot more ponds to see.

Each month, we'd like to feature a member's pond in this newsletter. We have a wide variety of ponds ranging in size from 300 to 38,000 gallons.

How about sharing a photo of your pond with our club members. Please provide some information to go along with the photos, such as size, depth, gallons, plus any special equipment or comments.

Please submit your article to [editor@atlantakoiclub.org](mailto:editor@atlantakoiclub.org)

Ps: If you don't send us some photos, you'll be seeing an awful lot of photos of the editor's pond!!!

## Spring die offs...

Erik L Johnson DVM      Atlanta Koi Newsletter, 1993

A much requested topic which I have picked up in parts over the last few months: discussing water quality and specific parasites, and even bacterial pathogens. You see, these are all related in that phenomena called Spring Die-Offs.

Over winter, your fish are chilled, they do not eat, and they hang out on the bottom in the mulm, where all the bacteria and latent parasites hang out. If I died and had to come back, I would want to come back as a fluke in the average pond, about mid-March. Think about it:

All those fish hadn't had an oral infusion of food nor vitamins (especially C) in 4 months. Their immune activity is nowhere. They are just laying there on the bottom in the water where bugs like to live. As water temperatures climb, pond bacteria start breaking down fish wastes and mulm. Ammonia appears. These ammonia levels are TWICE as toxic to spring (catabolic) fish than to over-summer-d fish. This is only added stress for the victim. Slowly these Ammonias are converted by Nitrosomonas into toxic Nitrite. Nitrites burn the fish and complex their red blood cells. More stress. Nitrobacter kicks in and converts it to Nitrate, which causes an algal bloom. Algae consume oxygen. Also, as the water warms up, the water carries less and less oxygen. pH may fall as the pond bacteria start their work. Parasites shake off the sleepies, and start eating on the stressed, cold fish.

Certain bacteria can and do function very well at near- freezing, let alone at higher temperatures. Aeromonas bacteria set in anywhere, a parasite punches a hole in the fish defenses. Ulcer disease gets a start. Some Aeromonas, (perhaps A. punctata) goes to the kidney and some of the fish swell up and die. Somebody suggests you dump a gallon of Formaldehyde (DeSaFin) into your pond. No luck, it must not be parasites. Must be some sort of super-virus. Who knows. I give up. Make a will.

It needn't be that way. Whether you are looking at this preventatively or if the Die-Off has begun, let me make a check-list of epidemiology to use to get you started in the Optimum Health Care Process:

- 1) Testing pH will alert you early to pH problems and may even help you detect the earliest stirrings of your filter bacteria. You'd be an idiot not to test at least weekly. Since most pH problems are in the low range, use of Crushed coral or Dolomite in filter bags or installation of some limestone into the pond can help. Quick-lime should not be used. Sodium bicarbonate is also an easy solution. Coral, Dolomite, and Limestone acts to harden water also. Less important in concrete ponds, but very important in lined ponds.
- 2) Regular testing of Ammonia with the Aquarium Pharmaceuticals brand (or Hach or even LaMotte Chemicals) test kit is smart and will save you a lot of fish. (Tetra Test is conspicuously absent from this list for good reasons which I will not enumerate but you could consult some of the owners of fish-less ponds to see why)
- 3) Monitoring temperature regularly will also alert you to pond activity and health. When the temps are consistently higher, you may be more alert to parasite symptoms, flashing, etc.
- 4) Nitrites should be monitored. Even without Ammonias, Nitrite may appear as a result of anaerobic bacteria reversing Nitrate to Nitrite in low oxygen pockets. Be sure, especially in springtime.
- 5) Be sure the pond is mulm-less and clean by March 15. Be sure-to wring out filter media in a vessel full of pond water by the same deadline. Be sure to correct or buffer pH by that time also. The less debris and mulm there is in the spring, the less fuel there is for the Ammonia factory. Protect the fish from pH drops by buffering before the drops are scheduled to begin.

(Continued from previous page)

6) As water temps begin to rise, say 55 degrees or better, there should be a lot of water agitation/aeration. Pumps equipped with Venturi air-mixing systems, or in smaller ponds, a few good sized airstones will ensure good mixing of lower water layers with the surface. Later, these are less important as fish adapt to temperate waters.

7) By March 15 you should have a bunch of sleepy fish in some really clean, well-oxygenated water in clean ponds, with no potential for unpleasant environmental surprises. When the water warms up, all systems will function optimally and all the fish will have to contend with are early-bird parasites and bacteria. Whose numbers were decimated by your timely removal of their breeding grounds.

## **IMPORTANT POND REMINDERS FOR SPRING**

**\*PLEASE DO NOT PERFORM A TOTAL POND AND FILTER CLEAN-OUT IN THE SPRING.**

By: Chuck and Connie Jones AKC 1993

It is very tempting to do a "Spring Cleaning" by removing all the fish, water and filter material, but it can spell BIG problems. The koi and goldfish have been dormant or semi-dormant and have lived off of stored body fats put on in the fall. They are now thin or emaciated. Their total immune systems do not begin to function again until the water temperature stays above 58 degrees F. Disease organisms have been dormant with the fish in water temperatures below 45 degrees F. As the water temperature rises above 45 degrees, the disease organisms begin to rapidly reproduce.

A total clean-out of the pond puts a tremendous amount of shock and stress on fish that have very little stored body fats left and immune systems that are not yet functioning. The total clean-out may also damage the nitrifying bacteria in your filter. The nitrifying bacteria are responsible for breaking down the liquid waste product of the fish (Ammonia to Nitrite to less toxic Nitrate). This results in elevated Ammonia and Nitrite levels in your pond - another stress on your fish.

The disease organisms will not be totally removed by a full clean-out and will actually reproduce very rapidly due to rising water temperatures and fish hosts that have no functioning immune systems. The BEST way to maintain the pond is to have been keeping it clean every month of the year. Now that I have eliminated just about everybody out of that method, what now? Do partial clean-outs approximately one month apart. First clean the solid debris off the bottom with about a 30% water change. If you have a mechanical filter separate from the biological filter, clean the mechanical filter. The next month change 30% more water; clean the biological filter (with pond water if possible). Then clean the mechanical filter. Doing these cleanings in stages reduces the amount of stress to the fish and the nitrifying bacteria.

If you have Water lilies or Lotus in your pond, as the temperature begins to warm you will notice new small leaves forming on the plants. Begin fertilizing between March 1 - March 15 in the Southeast and for other areas of the country, begin fertilizing when you see the first leaf growth on the plants. Remember to place the fertilizer tablets in the corners of the containers away from the tuber; push the tablet all the way under the soil and place some soil back over the tablet so that it fertilizes the plant and not your pond. Lotus need 4 tablets and Water lilies need 2 tablets EACH MONTH during the growing season.

## WHAT'S IN A NAME?

KOI are usually identified by their color, markings and scales. Learning the meanings of a few Japanese words can help in remembering their correct names.

SHOWA and TAISHO refer to the emperor during whose reign these fish were either developed or were extremely popular. The TAISHO Era was 1912-26. The SHOWA Era was 1926-89.

OGON, meaning gold, money or wealth, describes a metallic fish of only one color. Other metallic fish names include the words for gold, KIN and silver, GIN. Some OGON have DOITSU OR PARRACHINA scales.

DOITSU, means German and refers to the type of scale pattern where there are scales only along the dorsal and lateral lines.

TANCHO, named for the large white crane which has a red spot on its head, identifies a fish with a red patch on its head.

### Single color koi are called:

SHIROMUJI, shiro (white) muji (self-colored). These are generally considered "uninspiring".

BENI (orangy red) and AKA (red) mean solid red color fish. If there are red patches, the name includes HI (another word for red). A BENEGOI is an all-red fish. Goi means the same as koi, the change being made for phonetic reasons.

KIGOI, yellow. KI MATSUBA, since MATSU means pine tree, the yellow fish has a pattern of darker scales which resemble a pine cone.

CHAGOI, brown or buff koi.

KARASU, raven, so a solid black.

NEZU, grey.

ORENJI, orange.

Other key words which help identification:

ASAGI, light pale blue.

BEKKO, meaning tortoise shell.

INAZUMA, lightning patterns.

KABUTO, cap or helmet, a fish with a head of one color and body of another.

KI BEKKO, yellow fish with black markings.

KUCHIBENI, kuchi means mouth, so this is a red-lipped fish.

KUJAKU, peacock, a multicolored fish.

(Continued from previous page)

PARRACHINA, leather, a very white smooth metallic fish.

RIN, scale.

SANKE OR SANSHOKU. SAN means three, SHOKU means color.

SUI, water. Colors show in a rippling pattern.

SUMI, black ink, indicates black patches.

NIDAN, NI means 2, DAN means steps, as in NIDAN KOHAKU, 2 separate areas of red on white background. HAKU is another word for white. SANDAN, SAN means three, YON means four, so SANDAN and YONDAN mean 3 steps and 4 steps.

GOSHIKI, -a five color fish, GO meaning 5, and SHIKI... another word for color.

SHIRO BEKKO, white with black tortoise shell markings.

AKA BEKKO, red with black tortoise shell markings.

SHIRO OGON, white metallic.

KINMATSUBA OR GINMATSUBA, gold or silver with pine cone pattern.

If GOSHIKI means a five color fish, and NI means 2, and SHIKI means color, why do we translate the NI-SHIKI as brocaded carp instead of 2 color fish?

By: SUNNIE BATES AKC 1992

## **Pond Tour Committee**

I would like to thank Cynthia Landon, Gina Horton and Dave Esser for volunteering to be on the newly formed Pond Tour committee along with Gary Montalto as proof reader/editor. If anyone else is interested in joining (many hands make light work) please reach out to Cynthia directly as she is going to schedule a Zoom meeting to discuss. Her email is: [cynthialandon@gmail.com](mailto:cynthialandon@gmail.com). The Pond Tour is a fundraiser for the club and also something that helps us maintain our 501(c)(3) non profit status and is something the community looks forward to. If interested, please reach out prior to the end of the week so Cynthia can schedule the meeting.

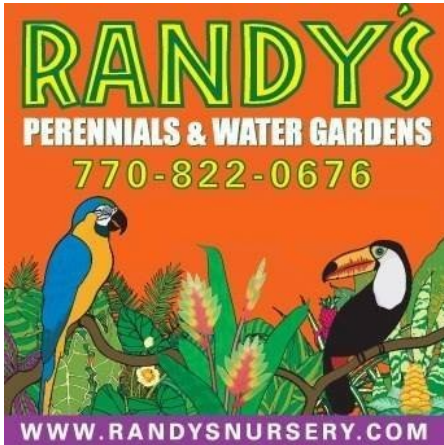
Thanks,

Diane



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## Prazi New Treatment Schedule 2021

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Notes By Helena Hileman

Dr. Boutette practices at veterinary hospitals in Kirkland and Tacoma and also makes house calls. We thanked Dr. Boutette for taking the time to give us this excellent presentation on Praziquantel.

The use of Praziquantel is limited to treating trematodes (flukes) and cestodes tapeworms). Nematodes like hookworms are not affected. Specifically for koi, Prazi treats gill and skin flukes and tapeworms. Gill flukes (*dactylogyrus*) lay eggs which live in the water for about 4 days before becoming flukes. Eggs are not affected by Prazi, so the treatment protocol must take that into account. Skin flukes (*gyrodactylus*) are born live and therefore easier to treat.



Praziquantel's first mechanism of action is to increase permeability of the integument (outer covering) of susceptible worms, which results in an influx of calcium, leading to contractions and paralysis of the worm's musculature. The second mechanism is to inhibit glucose uptake. This forces the worm to use glycogen stores and release lactic acid and the fluke eventually dies.

Praziquantel comes in various forms. The powder form is easy to dose and more cost effective (but is still expensive). The liquid product is the easiest to use for aquariums and small ponds, but it isn't cost effective for large ponds.

Prazi-medicated food was once common until it was discovered that sick Koi often don't eat well. The dosing label for Prazi suggests only one treatment as a bath lasting 2-7 days. This is acceptable for treating internal parasites like tapeworms, but not external parasites like flukes.

The typical dosing for flukes is a 2-3 ppm dose or about 2.5 mg per liter of pond water. To keep it simple, Dr. Boutette says to use 1 gram per 100 gallons of water. You need to repeat this dose every 5-7 days after a 50% water change for a total of 3-6 treatments, especially if you are treating gill flukes.

Praziquantel breaks down and is quickly degraded. It works better and lasts longer in a sterile environment. While in the real world of the Koi pond, there are lots of ways it gets deactivated: 1) It is broken down by microorganisms, including bacteria that live in the sediment and filters of the pond. Some of these organisms actually use Prazi as a source of "food" causing even more rapid breakdown. 2) Plants and organics bind or absorb Prazi. 3) UV light (sunlight and UV sterilizers) degrade the chemical structure of Prazi. Rapid degradation of Prazi is one reason why one dose is not enough to treat flukes.

There are many things to take into account when using Praziquantel. Clean your pond and filters of sediment and do a 50% water change before Prazi to get rid of the organic and microbial load. Always **dechlorinate** replacement water. Care should be taken to slightly over-estimate water volume vs. underestimating for dechlorinators. Remember to include the volume of water in the filters. **Turn off** the UV light before using Prazi. Treat with Prazi in the **evening** so sunlight does not degrade it right away. Remove plants and don't reintroduce them until treatments are complete. Treatment should be based on an accurate diagnosis of finding flukes under the microscope, so as not to further stress sick Koi.

Praziquantel is not very soluble. So Dr. Boutette recommends adding the dose to a 5 gallon container of water and stir vigorously, then add to the pond via the waterfall or skimmer. Members suggested adding a shot of vodka or Proform C to the powder first as you shake it in a gallon baggie before adding it to the 5 gallon bucket of pond water.



If the pond temperature is less than 68 degrees F, it may up to 5-7 treatments, because lower temperatures affect the uptake of Praz. It is likely to not work at all if the temperature is less than 56 degrees.

Flukes cause skin and gill irritation and Koi may start flashing. Both the irritation and flashing can open wounds, increasing the risk for bacterial infection. It is important to treat these secondary bacterial infections appropriately, as Praz has no effect on bacteria.

Dr. Boutette stated again that a high organic load in the pond will diminish the effectiveness of Praz. So try to clean out your pond and filters and do a 50% water change before using Praz.

A member asked about alternatively treating flukes with Dylox (trichlorfon). Dr. Boutette said that while it is cheaper, it is very toxic to the fish and it is an environmental hazard (it's an organophosphate). Among other dangers, water treated with Dylox will eventually reach streams and the ocean, where it will kill flora.

In summary, Praziquantel is the best treatment for flukes and is cost effective if you are sure your Koi actually have flukes (verified with a microscope). For successful treatment, dose with the correct amount, multiple times based on water temperature and pond cleanliness. Turn off UV lights, do a 50% water change, and be sure to clean your pond and filters in advance.

Ps: (editor) Praz is not cheap \$98.95 for a 100 gram container.

## Pipe Diameter Matters

If you want the max flow from gravity systems or want to use the cheapest pump for the desired flow rate plan the pipe diameter to support the desired flow rate. Likely that will yield a savings in capital expenditure (CAPEX) on the price of the pump and a savings in operational expenditure (OPEX) for less power consumed by the pump.

The following are common pipe inside diameter sizes from 1.5" to 6". I pretended they are cubes so there is simpler math. But the relative size difference between the pipe diameter is the point. Note that as you move from 1.5" to 6", the surface is close to doubling each time. That means halving the resistance to the flow of water every time you move up to the next larger pipe size.

$$1.5 \times 1.5 = 2.25$$

$$2 \times 2 = 4$$

$$3 \times 3 = 9$$

$$4 \times 4 = 16$$

$$6 \times 6 = 36$$

Michael Anderson