



President Corner

A big thanks to Kathy and Dennis Leonard for letting us share their Koi pond and the apple pie. Thanks again.

Southern Arizona Koi Associations twenty-sixth Koi show is almost upon us. If there is anyway you could help out please volunteer to do so. All help is greatly appreciated. This will be our biggest and best show ever. We will have more vendors, more fish, and more people. What else could you ask for? Don't answer that. Hope to see you all there, with fish of course.

The weather is still warm, so please check your fish and your water quality. These are important things to look out for.

For the love of Koi,
Bob Panter
Bob Panter
President SAKA

Algae and How to Control It

Adapted from several posted articles including the Water Garden News and the Smithsonian Botanical Institute via Pond Droppings 2/03

There are thousands of species of algae. Without them there would be no life on earth. "Algae are photosynthetic organisms that occur in most habitats, ranging from marine and freshwater to desert sands and from hot boiling springs to snow and ice. They vary from small, single-celled forms to complex multicellular forms, such as the giant kelps of the eastern Pacific that grow to more than 60 meters in length and form dense marine forests. Algae are found in the fossil record dating back to approximately 3 billion years in the Precambrian. They exhibit a wide

range of reproductive strategies; from simple, asexual cell division to complex forms of sexual reproduction.

Algae are important as primary producers of organic matter at the base of the food chain. They also provide oxygen for other aquatic life. Algae may contribute to mass mortality of other organisms, in cases of algal blooms, but they also contribute to economic well being in the form of food, medicine and other products. In tropical regions, coralline algae can be as important as corals in the formation of reefs."1

Trivia - Many of the white sand beaches in the Caribbean are mostly sun bleached and eroded calcium carbonate remains from green algae.

Algae grow quickly when water is warm, days are long (more sunlight) and organic material accumulates on the pond bottom. Warm water not only increases algae growth directly, but also increases fish metabolism that increases the organic load. Since southwest Florida has all the factors favoring algae growth, it can be a problem for pond keepers. Let's talk about the types of freshwater algae then move on to algae control.

Types of Algae: Planktonic algae thrive on the conditions listed above and will soon turn your pond water pea green making it difficult to see the fish.

These single celled organisms can multiply quickly and can die quickly. If they go through the bloom and die cycle, they can deplete your pond of oxygen and kill all the fish. (Trivia - There are over 8,000 species of green algae.)

Filamentous algae are single celled organisms that attach together to form puffy balls (like cotton balls), furry mats attached to rocks, or floating on the water surface. They can be mats or webs of nondescript green material. Some strands are long and gossamer like, drifting around your pond. It can be attractive until you run your hand through the strands and find the

stringy threads clinging to your fingers.

Short velvet like algae that covers the bottom and everything else in the pond is beneficial. It uses nutrients from the water, provides oxygen during the day and the fish nibble on it. This type of algae cannot be totally eliminated with fish and plants in the pond.

Several species of filamentous algae are particularly adapted to growing on fast-moving water in waterfall areas. These species thrive in the bright sunlight (more energy for photosynthesis) and constant supply of nutrients suspended in the water flowing over the rocks. You can physically remove it if you like. Fish often eat the dislodged algae.

Blue-green algae (cyanobacteria) have received a lot of attention lately especially in Central Florida, due to health risks to humans. This has not been much of a problem in our area and is not usually a problem for pond keepers. (Trivia - Blue-green algae is really a bacteria because it lacks a nuclear membrane.)

Control: The green algae are not particularly bad for a pond, just esthetically undesirable. So, let's talk about algae control.

Mechanical Filters: One of the best actions you can do to maintain clear water is to make sure your mechanical filter is clean and working to capacity. Inspecting your filter more frequently during warmer weather helps avoid problems. In addition to your pump working properly, be certain that it is sized properly to your pond and fish population. Adding fish and fish growing are both factors that require more filtration capacity.

Biological filters: To increase the productivity of your filter system, add nitrifying bacteria. These products contain beneficial bacteria that jump-start your filter. It can take from a few weeks to several months to over a year for a biological filter to reach peak efficiency.

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Besides filter systems, plants help control algae in several ways. Some plants compete for nutrients that could be used by algae. Some plants shade the water to reduce photosynthesis in the shaded area. You can experiment with a variety of plants to help prevent algae and enhance the beauty of your pond.

Underwater plants: Underwater plants are anchored to the pond bottom or planted in underwater pots. Almost any underwater plant can help add oxygen and shade some of the pond. Most underwater plants acquire their nutrition from the soil, so they don't usually reduce the water nutrient load significantly.

Floating plants: Of all the types of plants, floating plants probably remove more nutrients from the water column. Their roots hang in the water with no soil required at all. Consequently they remove nitrogen and phosphorus directly from the water. In addition, they provide shade, thus reducing the light available for photosynthesis.

Floating leaf plants: The broad leaves of many floating leaf plants (lilies) are excellent shade producers. Some experts recommend that 50 to 60 % of your pond surface be shaded either by terrestrial plants (trees and shrubs) or by aquatic plants like lilies.

Marginal or emergent plants: These plants are also helpful in shading areas of your pond, especially the shallowest area prone to algae production.

Rainwater: Rain run-off flowing into your pond is a significant contributor to water nutrient load. (Trivia - 34% of the nitrogen load in Sarasota Bay is from rain.) In addition to nitrogen in the rainwater itself, water that flows over your lawn or planting beds can carry a high quantity of fertilizer. If this is happening in your pond, divert the runoff around the pond by either constructing a berm (mound) or swale (shallow trench).

Runoff with high pH: If the run-off flows over a concrete patio and then into the pond, it can also raise the pH of your pond water. This is especially true if the concrete is less than one year old. Higher pH contributes to algae growth. A pH closer to neutral will decrease algae growth. Cement, limestone and marble will raise the pH of the water therefore contributing to algae growth. Invest in a pH testing kit.

Sludge: Another factor that makes algae control difficult is a lot of sludge (dirt and decaying organic debris) in the bottom of the pond. Bacteria products may help decompose this sludge but you should not expect them to totally get rid of large amounts on their own.

If you have an inch or so of sludge on the bottom of your pond remove as much of this as possible by hand (scooping, vacuuming, etc.).

Ultraviolet clarifier: If you cannot control the green water you may want to consider the addition of an ultraviolet sterilizer for your pond. An ultraviolet sterilizer will kill all of the algae that pass around the ultraviolet light. These units are sized according to your pump's flow rate and the number of gallons in your pond. The dead algae is then picked up by the filter to be washed away or broken down by bacteria if you use a biological filter.

Enzymes: Biological clarifiers (enzymes) help break down organic material (algae food) in the pond. Some commercially available products contain nitrifying bacteria as an added bonus. These products help prevent but are not an algaecide. Adding enzymes and bacteria help by building up the bottom of the food pyramid. This contributes to maintaining a balanced ecosystem in your pond.

No fish pond: If you have a pond without fish, you can use fountain chemicals to control the algae. One product that works very well and economically is Fountec. It is safe for

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plants, birds and other animals but it can NOT be used with fish.

Fish ponds without plants: You may have a pond with fish but no plants in which case you can use Pond Blocks. This is a slow release algaecide that will kill the algae (both single cell and multi cell algae). One block will last about a month and treat 250 gallons of pond water. Remember this is NOT safe for most plants.

Summary:

- * Reduce the organic load as much as possible. Fertilizers belong in the lawn (if at all), not in the pond.
- * Keep sludge to a minimum. Organic matter on your pond bottom is algae food.
- * Don't over feed you fish. Many of them will graze on algae if they are not over fed.
- * Don't over stock your pond. One goldfish per 5 sq.ft. And one Koi per 10 sq.ft. are good rules for most ponds.
- * Install an adequate size biological filter and give it time to work. This could take several months.
- * Use many aquatic plants to shade your pond and reduce nutrient loads in the water.
- * Use biological treatments (enzymes and bacteria) and give them time to work.
- * The best pond is a balanced pond.

One of the most interesting and challenging aspects of Koi and pond keeping is establishing and maintaining a balanced aquatic ecosystem. Since an ecosystem is a dynamic living group of organisms, our job is usually a matter of fine tuning or maintaining the balance, removing overgrown or unwanted plant material or adding water.

1 Smithsonian Institute:
<http://www.nmnh.si.edu/botany/projects/algae/AlgIntro.htm>

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BARLEY STRAW

This item came to us by Mike Dresner, who said he is sick and tired of not seeing his fish.

BARLEY STRAW BUNDLES are inexpensive and healthier for your fish and plants than chemicals. Barley straw has been used for centuries in Europe to control unwanted algae in lakes, ponds and home water gardens. It has been proven environmentally safe and is an inexpensive way to control algae.

TYPE OF STRAW TO USE: Barley straw is more effective and works for longer periods than wheat or other straws. The variety of barley straw does not seem to have any effect on the performance. Hay should never be used as it increases algae growth and it decomposes very rapidly which may cause a deoxygenation of the water. Barley straw will not kill existing algae but will prevent new growth from forming.

CONTROLLING ALGAE WITH BARLEY STRAW: The growth rate of algae makes it very difficult to control. There are many forms of algae and most are susceptible to herbicide use. The problem with using herbicides is that it also will kill your other plants and once the chemical is gone from the water, the regrowth of algae will reappear and subsequently become worse years later.

HOW DOES BARLEY STRAW WORK: As the straw rots in the water, a chemical is released which inhibits the growth of algae. The temperature of the water is an important factor. If the water temp is 40 degrees it may take up to 6 weeks for the straw to become active. When the water temperature is above 40 degrees the straw becomes active faster. In about a week the straw should begin to release its chemical, given sufficient sunlight and oxygen. Well oxygenated conditions are essential to ensure the straw will decompose and produce its chemical. If the straw is in a compacted state with restricted water movement through the straw, the effectiveness is extremely reduced.

WILL BARLEY STRAW HARM FISH OR PLANTS: Barley straw does not harm fish or plant life. Actually in most cases it increases the invertebrate population providing a food source for fish. In fish farms and hatcheries where straw has been used, there are reports of improved gill function and better overall fish health.

WHERE TO APPLY THE STRAW: In water gardens and smaller ponds, the straw should be wrapped loosely in some type of netting that will allow water to flow through. To be most effective, place the bundle of straw in or near a water fall or stream. As the straw rots it will sink. Some sort of float (cork or plastic bottle) should be attached to keep it partially out of the water. The straw needs a continuous flow of water. Keeping the straw oxygenated will help spread the released chemical throughout the pond.

WHEN SHOULD BARLEY STRAW BE ADDED: Barley straw should be added very early in the spring before algae growth develops. The chemical released by the straw is effective in preventing algae growth rather than killing it. It is best to apply when the water temp is low. Time should be given (about 30 days) for the straw to become active. Once activated, the straw will continue to inhibit algae growth for up to 6 months. A replacement bundle should be added before the first bundle is completely decomposed. Two applications should be enough for one year. Ponds that have a high content of suspended mud it may be necessary to add more straw than in clear waters as the chemical that is given off from the straw is inactivated by the mud.

HOW MUCH TO USE: Volume of water does not have as much importance as surface area does. An average home water garden of 1000 - 3000 gallons of water should only need an 8 ounce bundle of straw in the spring and then again around the beginning of summer. Other articles on barley straw have suggested using less (as little as an ounce of straw per

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1000 gallons of water). I have personally tried 2 ounces in my 1500 gallon pond with no positive results. The algae continued to multiply. Avoid adding excessive amounts of straw especially in extremely hot conditions. Be sure to remove the straw if you're in a climate where the water will freeze. After the algae problem is under control, any other applications of barley straw may be reduced. For ponds less than 1000 gallons, 4 ounces of barley straw should be used.

DOMESTIC VS. IMPORTED The only difference between barley straw grown here and barley straw grown in Scotland is the price! The variety might be different but that has no effect on the ability of the straw to inhibit algae growth.

WHERE CAN I FIND BARLEY STRAW? (The NFKC does not endorse any commercial products. Address and prices are placed here for information purposes only)

NATURAL SOLUTIONS PO Box 114 , Keuka Park, NY 14478-0114

Any questions not answered here may be directed to puddles@a-znet.com

Testing Your Pond Water

Reprinted from Fl. West Coast Koi & Water Garden Club

The following is a brief description of some common water quality problems and the tests that you should routinely make of your pond's water. Remember, water quality is the #1 killer of your wet pets.

pH - is the measure of acidity or alkalinity. Koi and Goldfish can live in a wide range of pH, but 7 to 8 is best. You can raise pH with baking soda. Do not attempt to lower pH without expert help.

Ammonia - is a deadly toxin to fish. It comes from fish waste, decaying food and plant material or unseen dead fish.

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It is best treated through the use of a bio-filter. The only acceptable level of ammonia is ZERO! If your ammonia is high, treat with water changes and reduced feeding.

Nitrite - is detrimental to fish. It comes from the breakdown of ammonia in the bio-filter. The amount of nitrite in your pond should stay below .25 PPM. To treat higher levels, make water changes and clean your filters and pond bottom to cut down on mulm and dirt.

Nitrate - is the last step in the ammonia cycle. Your plants use nitrate as a fertilizer. If nitrate levels get too high, 40 PPM, they can induce a pea-soup algae bloom.

Total Alkalinity - measures the bicarbonate ions in your water. Liner ponds can have dangerously low total alkalinity. Testing should read 80-120 PPM on a dip stick test or around 4-8 DH (4-8 drops of reagent) on the Tetra KH test. You can raise total alkalinity with baking soda.

O2 - is dissolved oxygen in your pond, and is best tested just before sunrise when oxygen levels will be lowest. A low of 7 PPM is the minimum for a healthy Koi pond. To raise dissolved oxygen levels aerate your pond with a waterfall, run water over rocks in a stream, or use a Venturi tee on your ret

What is the Nitrogen Cycle -

As explained by Tom Lansing

With the new season approaching and in light of the cold winter we have had and may continue to have, I thought this article might really help some of the members, who ARE going to see some filter stumbling and major start overs this year. Understanding what is happening can help. Rod Lawton

What is the nitrogen cycle? Good question and I'm about to give you more than you ever wanted to know

on the subject. It's really kind of interesting. In its simplest definition, the Nitrogen Cycle occurs as follows:

1. Fish excrete ammonia from their gills and kidneys. Ammonia also is formed from decaying whatever (leaves, uneaten food, etc.)
2. This ammonia is converted to Nitrite by Nitrosomonas bacteria
3. Nitrite is converted to Nitrate by Nitrobacter bacteria
4. Nitrates, in most cases, are harmless unless at high levels and are consumed by algae, plants or through regular water changes.

One of the most important aspects of successful Koi keeping or any fish keeping for that matter is biological filtration and its function in the nitrogen cycle. I read recently, that the number one reason novice fish keepers become disillusioned with the hobby is the frequency in which they experience high death rates of their aquatic pets after setting up a new system. Statistically, as much as 75% of the fish sold to hobbyists will die within the first 30 days and 2 out of every 3 new hobbyists abandon the hobby within the first year. This data applies to all types of fish but nonetheless, they're pretty staggering statistics. My very first four Koi died in less than 24 hours. For some unknown reason to me at the time, they didn't like all that chlorine I had in the water to keep it clear.

One of the most common reasons for these kill rates is known as 'new tank syndrome' or as your questioner asked, the 'nitrogen cycle.' The fish are simply poisoned by high levels of ammonia (NH₃) that is produced by the bacterial mineralization of fish wastes, excess food, and the decomposition of animal and plant tissues and let's not forget the additional ammonia that is excreted directly into the water by the fish themselves. The effects of ammonia poisoning in fish include: extensive damage to tissues, especially the gills and kidney; physiological imbalances;

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impaired growth; decreased resistance to disease, and; death. Nitrite poisoning inhibits the uptake of oxygen by red blood cells. Known as brown blood disease, the hemoglobin in red blood cells is converted to methemoglobin. This problem is much more severe in fresh water fish than in other marine organisms and can easily cause death.

So, to quickly answer the question these are the 'nitrifying bacteria.'

Nitrosomonas bacteria convert ammonia (NH₃) to nitrite (NO₂)

Nitrobacter bacteria convert nitrite (NO₂) to nitrate (NO₃)

You don't have to go any further but for those interested, here's some additional information/data that I and few others might find interesting.

Nitrifying bacteria are classified as obligate chemolithotrophs. This simply means that they must use inorganic salts as an energy source and generally cannot utilize organic materials. They must oxidize ammonia and nitrites for their energy needs and fix inorganic carbon dioxide (CO₂) to fulfill their carbon requirements. They are largely non-motile (can't move around easily) and must colonize a surface (gravel, sand, synthetic biomed, and the 1001 other filter materials out there) for optimum growth. They secrete a sticky slime matrix, which they use to attach themselves. Species of Nitrosomonas and Nitrobacter are gram negative, mostly rod-shaped, microbes ranging between 0.6-4.0 microns in length. They have evolved to become extremely efficient at converting ammonia and nitrite. One disadvantage is, they have a very slow reproductive rate. Nitrifying bacteria reproduce by binary division. Under optimal conditions, Nitrosomonas may double every 7 hours and Nitrobacter every 13 hours. More realistically, they will double every 15-20 hours.

Nitrobacter and Nitrosomonas bacteria have limited tolerance ranges and are individually sensitive to pH, dissolved

oxygen levels, salt, temperature, and most chemicals. They cannot survive any drying process without killing the organism. Doc Conrad will disagree with the drying process part of that statement but until he supplies me with scientific data, non-anecdotal, science on this subject isn't on his side. In water, they can survive short periods of adverse conditions by utilizing stored materials within the cell. When these materials are depleted, the bacteria die.

There are several species of Nitrosomonas and Nitrobacter bacteria and many strains among those species. Most of the following information can be applied to species of Nitrosomonas and Nitrobacter in general, however, each strain may have specific tolerances to environmental factors and nutrient preferences not shared by other, very closely related, strains. This is why Genesyz (Lymnozyme) coexists with Nitrosomonas and Nitrobacter bacteria; they don't compete for the same food source.

Temperature

The temperature for optimum growth of nitrifying bacteria is between 77-86° F (25-30° C).

Growth rate is decreased by 50% at 64° F (18° C).

Growth rate is decreased by 75% at 46-50° F.

No activity will occur at 39° F (4° C)

Nitrifying bacteria will die at 32° F (0° C).

Nitrifying bacteria will die at 120° F (49° C)

Nitrobacter is less tolerant of low temperatures than Nitrosomonas. In cold water systems, care must be taken to monitor the accumulation of nitrites. Here again, except for a few people I know that feel nitrifying bacteria can survive in freezing water, science isn't on their side. If either of them has found some data to the

contrary, I'd be most interested to see it.

PH

The optimum pH range for Nitrosomonas is between 7.8-8.0.

The optimum pH range for Nitrobacter is between 7.7-8.2

Nitrosomonas growth is inhibited at a pH of 6.5. All nitrification is inhibited if the pH drops to 6.0 or less. Care must be taken to monitor ammonia if the pH begins to drop close to 6.5. At this pH almost all of the ammonia present in the water will be in the mildly toxic, ionized NH₃⁺ state.

Dissolved Oxygen

Maximum nitrification rates will exist if dissolved oxygen (DO) levels exceed 80% saturation. Nitrification will not occur if DO concentrations drop to 2.0 mg/l (ppm) or less. Nitrobacter is more strongly affected by low DO than NITROSOMONAS.

All species of Nitrosomonas use ammonia (NH₃) as an energy source during its conversion to nitrite (NO₂). All species of Nitrobacter use nitrites for their energy source in oxidizing them to nitrate (NO₃).

Chlorine and Chloramines

Before adding bacteria or fish to any aquarium or system, all chlorine must be completely neutralized. Residual chlorine or chloramines will kill Nitrifying bacteria. Most US cities now treat their drinking water with chloramines. Chloramines are more stable than chlorine. It is advisable to test for chlorine with an inexpensive test kit. If you are unsure whether your water has been treated with chloramine, test for ammonia after neutralizing the chlorine. You can also call your local water treatment facility.

The type of chloramines formed is dependent on pH. Most of it exists as either monochloramine (NH₂Cl) or dichloramine (NHCl₂). They are made by adding ammonia to chlorinated water. Commercial chlorine reducing

chemicals, such as sodium thiosulfate (Na₂S₂O₂) break the chlorine/ammonia bond. Chlorine (Cl) is reduced to the harmless chloride ion.

Since dichloramine has two chlorine molecules, a double dose of a chlorine remover, such as sodium thiosulfate, is recommended. Each molecule of chloramine that is reduced will produce one molecule of ammonia. If the chloramine concentration is 2 ppm then your pond will start out with 2 ppm of ammonia. Chlorine Remover will reduce up to 2 ppm of chlorine at recommended dosages. During the warmer months chlorine levels may exceed 2 ppm. A double dose would be required to effectively eliminate the excess chlorine.

There's a character (I mean that in a kind way) in the UK, who believes that adding DO (dissolved oxygen) to one's filtration media is not only wrong, but has disadvantages. He's the only person on the face of the earth that thinks that, as far as I've ever found. Actually, as I stated above, the nitrifying bacteria consume more oxygen than our fish require. I believe that this person feels that given your pond water is oxygenated well, there is enough left over for the nitrifying bacteria in your filters to use. I personally don't want to have to depend on 'left over' oxygen for my nitrifying bacteria. Each one of my filter chambers has (4) air stones each, a total of 45 air stones.

As to good books on aspects of Koi keeping, in my biased opinion and tens of thousands of others, there is only one, 'Koi Kichi' by some relatively unknown British guy named Peter something.

Good luck with your pond and filter system. Tom Lansing



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REVEALING the MAGIC OF MONTMORILLONITE CLAY

By Ray Kong

It is a heartfelt question I frequently hear from Koi hobbyist; "How can I enhance the overall quality and health of my fish?" A more sobering question sometimes follows, "I've spared no expense in building the best Koi pond environment, yet I recently lost several fish. What am I doing wrong?"

While I don't profess to know all the answers when it comes to Koi health I have spent a number of years investigating natural clays. And in a slightly round about way. I believe I may have discovered something important that just may apply to your Koi's environment that I would like to share with you.

We all agree that the environment (water) our Koi live in is very important. However there is a tendency for all of us to look at our ponds primarily from an aesthetic prospective. While appearances are justifiably important to us, the pond water is the actual world in which our Koi live. They have a different perspective. To get in touch with our fish's view of their world, we need to go back to their homeland.

In Japan, Koi are raised in controlled ponds and natural lakes for the first year of their development. The breeders hold back the premium Tossai (1-year-old Koi) for a second and third year of growth in the ponds, in order to give the Koi the very best possible environment to reach its ultimate potential. Many of the top award-winning Koi in Japan have been grown for a number of years in the breeders' mud ponds, where all the elements are there for them. When these Koi are removed from the ponds, they exhibit excellent body conformation, a strong luster with deep color, and sharp pattern separation. These prize-winning fish have also developed a strong immune

system, producing a Koi who should live a strong, healthy life for many years to come. The number of prize-winning Koi that come from those ponds over the years of competition is compelling. I began asking, "Is there something special in the pond or lake water that helps these fish to be champions?"

The Secret of Asian Ponds Revealed

The natural "mud" in many of these ponds is, in reality, a form of clay containing Montmorillonite. When Calcium-based Montmorillonite clay is present, it provides nutrients and detoxifies the water. These ideal conditions, combined with the lush natural micro-organisms that flourish in the mud, I believe, result in beautiful, healthy Koi. The nutrients from the clay in the water transfer into the internal systems of the fish, subsequently improving their overall health and appearance.

Today, newer Koi hobbyists and some with more than a little experience may not be aware of the importance of Calcium Montmorillonite in the pond environment. We create beautiful ponds and install the best, modern filtration systems, yet our Koi sometimes go through some pretty awful times. We are upset to see sick fish, less vibrant colors, and poor overall health. Unhealthy fish can be frustrating for anyone who truly loves this hobby.

Please don't assume that I am not supportive of today's filtration systems. These systems do a marvelous job in achieving clear water. But they alone cannot remove all the toxins and water-borne pathogens that can harm your fish. Toxins and pathogens are invisible, yet their presence in our clear-water ponds can harm our fish. Fish that live in toxic water can overstress their immune systems in an effort to stay healthy. Eventually, if conditions don't improve, they are likely to get sick, even though the filter is doing its job and the pond water seems clear.

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A healthy immune system in our fish is vital to their ability to resist water-borne diseases. Beyond the ability of our filtration systems or chemicals, how do we ensure that our fish can thrive in the best possible environment?

Learn about "Living Clay"

Montmorillonite clays are among the highest and richest natural form of essential mineral elements on earth. Additionally, it is in a form that is highly absorbable by plants, animals and humans. It is this very fine (scientists call it "highly fragmented") form that is key. For hundreds of years, domestic and wild animals have been observed eating it wherever these deposits were found on the surface in various parts of the world.

Two Types of Montmorillonite Clay

There are two types of Montmorillonite Clay, Sodium and Calcium. Montmorillonite Clays are also called Bentonite Clays and visa versa. The name comes from the location of a commercial deposit near Fort Benton, Wyoming in the northwestern part of the U.S. Both clays are in the Smectite family of clays and are known as aluminum/silica colloidal mineral.

Sodium Montmorillonite is used in industry in things like plaster board, oil well drilling mud, cat litter, shoe polish, grease, concrete, dynamite, matches, crayons, and cleaning agents to mention a few.

Calcium Montmorillonite, also known as "living clay", is edible and principally consists of minerals that enhance the production of enzymes in all living organisms. It is found in various parts of the world and each area has its own unique fingerprint of purity and mineral content.

Some Montmorillonite clays are very high in the nutritional mineral elements while others have very little. They all have over 60 micro, macro, and trace mineral elements in various percentages. Usually the better

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deposits have a higher content of calcium, sometimes by as much as several hundred percent. Some deposits contain only a small amount of Montmorillonite while others are naturally pure mineral-rich, depending on its source origin and formation.

When it comes to Koi and other animal foods, the premium grades often include Calcium Montmorillonite Clay as a nutritional supplement. There are numerous university studies explaining the benefits and synthesis of Montmorillonite Clay to our fish's diet by sprinkling it on moistened food pellets or directly adding mineral clay in rock form to the water. Some premium Koi foods already contain this nutrient.

Connecting the Value of Clay to Our World & Our Koi

Soils are a living organism and all nutrients in the world emanate from the earth's soil. Plant live by a process called "plant root nutrient up take" and sunlight. The food that we grow and eat also is fed to the animals we consume to live. All these nutrients transfer to man or animals when ingested. Additionally Montmorillonite Clays are negatively charged by nature. This charge not only detoxifies water through flocculation it detoxifies all living things that ingest it.

Even in clear water conditions, toxins and other bacteria are present, as they are too small in size to see. When introduced in water, the ionic negatively charged clay platelets attach to the positively charged toxins, decomposed organic carbons, pathogens and so forth. When these micro-particulates meet, they agglomerate/micro-encapsulate, gain mass and weight there-by becoming filterable. (Please pardon my scientific lingo).

Extensive studies with various farm animals, poultry, as well as fish, have shown that the volume of foods they eat is reduced when clay material supplements are added to their diet, all

the while, the animals are gaining weight. These minerals in Montmorillonite clay act as a catalyst and aid in the digestive process.

A noted German scientist, Julius Stumpf, wrote in 1916, "The curative properties of clay are founded in its special physical characteristics, above all in the distribution of its minute particles. Individual clay particles are smaller than many bacteria. If infected mucus membranes are more or less flooded with clay, the bacteria are completely surrounded by clay particles and are thus separated from their source of nourishment and become imbedded in the organic material. Growth and the survivability of the bacteria are thus halted almost instantaneously and from this is explained the strikingly speed abatement of the symptoms of infections and or symptoms of poisoning and acute infectious diseases of the alimentary canal."

Lessons Learned

Nature is the best teacher and the closer we are to a natural pond the better off our fish will be. We can also learn a lot from those prize winning natural Koi environments and apply the same principles to our own Koi ponds.

The bottoms of most champion breeders' ponds are lined with natural clay. We can learn from their insight. Natural, edible calcium Montmorillonite clay can play a vital role in your fish's diet. It can be done through fish food that already contains Montmorillonite clay as an additive, or by adding it directly into your pond water. Being a natural product, it cannot be overdosed. Your Koi will benefit from the increased nutrient sources and improved water conditions.

Fish Math

by Todo

A few days ago I was teaching a lesson on volume and what happens to objects when they grow. I used an

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example of a Koi in a pond. Perhaps you'd like to hear some of it. You get a new fish and introduce it to your pond. For argument and to make the math simple, let the fish be 5 inches long, 2 inches deep and ½ inch wide. (5x2x½). This fish takes up 5 cubic inches. It eats, breaths, evacuates waste and generally does fish stuff. Its impact on your pond's system is rather small.

Fast forward a year and after good care our Koi is now twice its size (10x4x1). It now takes up 40 cubic inches. The ratio of its volume from one year to the next is 5 to 40, or 1:8. It is still doing fish stuff, but at 8 times the rate.

Another year and it is 15 inches long (15x6x1½). The volume is now 135 cubic inches, a ratio of 1:27 from when it was introduced to the pond.

If you have five or six of these fish growing and living in your pond, it doesn't take a mathematician to see how these fish can quickly overcome a pond or its filter system's ability to support a quality environment. So, when stocking a new pond or adding fish to an existing pond remember that fish don't just grow in length, but in all directions

Fish Math II

by Todo

Last month I did a little about how fish growth effects the biomass of your pond. Here is a related article I found on rec.pond

The USDA Watergardening publicatiohttp://ag.ansc.purdue.edu/aquanic/publicat/usda_rac/efs/srac/435fs.pdf offers this "consensus" fish stocking guideline: Un aerated pond: up to one 12" fish per 10 square feet of surface area. Aerated: up to one 12" fish per 2 to 3 square feet. and says conservative hobbyists stay well below these guidelines. To apply this to smaller fish, note that while their weight goes up almost with length cubed, their metabolic rate goes down with length. So feeding rate, oxygen

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demand, and stocking rate go with length squared, as a rough guide. So stocking four times as many fish, of half the length, is roughly equivalent. Until they grow! Pushing these guidelines requires good aeration and biofiltration, keeping the temperature from getting too high, not overfeeding, and increases the risk of losses during spring cycling. So there isn't a fixed stocking formula, but a range of difficulty. The rates the USDA gives elsewhere for professional aquaculture are much higher, acknowledging they can't be competitive without pushing the limits. That's in ponds designed with optimal aeration and filtration, not for appearance. It also demands full-time husbandry and accepts some losses.

So You Want to Know What Goes on in A Koi Show?

By Debby Tibbetts, Edited by Tom Ayers

These are some of the many different jobs and activities that go on during a Koi Show. On November 11-13, 2005 SAKA will be have its 26th Annual Koi Show.

Don't feel that you have to know to do any of these jobs? We will be more than glad to train you to help you perform the task. Remember, at on time somebody took the time to teach us. All we would like to do is share our experiences. Here are some of the jobs at the show and their duties:

Show Chairperson

- Oversees all committees and makes sure they are getting things done on time
- Makes final decisions on sizes and classes and awards to be given out.
- Makes final decision on disqualification due to disease.
- Makes final decision on any controversy that may arise.
- Prepare opening speech and introduces judges.
- Selects a committee to select the AKCA Koi Award Fish.
- Procure Head Judge and at least one Candidate Judge for the show.

- Mail these judges a copy of SAKA rules and regulations two weeks before the show.

Site Selection

- Find available site from Friday 9:00am to Sunday 6:00pm.
- Site must have level area about 60' X 30' and 50' X 50' for vendors
- Site must have 2 water hose bibs and 2 electrical outlets.
- Get permission for use of land on dates needed in writing
- If they need proof of insurance see your AKCA representative.
- Provide 200 feet of hoses, 2 heavy-duty electric cords and 8 -8 foot tables and 12 chairs.

Set Up & Take Down

- Pick up at storage and return to storage - tanks, tents, netting, clothes, pins, air pump, air lines, Tori gate, "Show" billboard, flag pole bucket, air stones, SAKA flag with poles, Tub of Towels, Clorox.
- Provide - bring a pocketknife, hammer, string or electric ties, 3 tubs/floaters and 2 nets,
- Provide tanks signs for every size and class (Japanese Style) Tank # for English Style.
- Provide tank signs for major award winners. (in computer program)

Trophies

- Determine sizes and classes
- Get with chairperson to determine what sizes, classes and awards will be given out
- Assemble or purchase trophies as needed
- Order AKCA Koi Award Trophy
- Delivery of Trophies
- deliver trophies to show site Saturday 10:00am and setup display table
- Deliver trophies and winners board to banquet site Saturday Night.
- Judges
- Make arrangements for judges pick up and return to airport
- Make arrangements for judge's hotel rooms
- SAKA will pay for Head Judge room for Friday and Saturday only and all meals Saturday and Sunday and Friday night Dinner (Judge & Spouse)

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Pond Tour

- Organize a small pond tour for about 3 or 4 ponds
- Provide transportation for the judges and spouses to view the ponds.
-

Photography

- Take photos of the top 6 winners on Sunday AM
- Submit Photos
- Develop film (two copies of each print
- Send a negative and snap shot of each winning fish with owner's name and award won to KOI USA no later than December 1.
- Send negative and a snap shot to Debby Tibbetts for " Koi of the Year" & "Champion of Champions"
- Obtain a large tub for photographing the fish

Advertising

- Radio, Newspapers, Pet magazines about the show and action.
- Make a poster/flyer and distribute to garden centers, pet stores, and feed.
- Send flyer and/or Rules & Regulations to Tucson Koi Society and Valley of the Sun Koi Club and other clubs in the region

Water Quality

- Test water for pH, Chlorine, Ammonia, O2, and Nitrite
- Test water supply Friday before filling tanks
- Need to make sure we have water test kit, salt (non iodized), dechlor, amquel, nova agua, etc.

Raffle/SAKA Booth

- Obtain raffle items
- Make flyer telling about raffle
- Make tickets and distribute a minimum of 10 tickets and a flyer to each member for them to sell.
- Get SAKA pamphlets, KOI USA, SAKA membership applications, etc for handouts.
- Have pencils, a potential member sign up sheet, and change.
- Take entry money, banquet money, auction, etc

Auction

- Obtain fish (form members, vendors, etc)

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- Receive fish at the show site Friday evening & early Saturday morning and up to before the action.
- Help provide tow tubs/pans, a net, bags, rubber bands, o2 and some boxes.
- Provide numbers for bidders to hold and bid on fish.
- Set up a system to keep track of the highest bidder.
- The following people will be needed as the auction is going on: an auctioneer (Brent), one person to keep track of winning bidders, one person to net and tub the fish, one person to bag the fish, and one person to collect the money.

Banquet

- Book a reservation for Saturday night Dinner
- Approximately 40 -50 people a 7:00p.m.
- Price range of no more \$20.00 per person including tax and gratuity and coffee and tea.
- If alcohol is severed, it will be handled "NO HOST"
- Do not guarantee the number of people; you will confirm number of people 4 days prior and again on Saturday at noon.
- Plan and present a menu
- Ask for a quiet corner or area so we can have an awards ceremony
- Obtain and set up table for trophies and awards
- Have a head table for the judges, spouses, Show Chairperson, and SAKA president and spouses
- Pay the bill (obtain a check from the treasurer)

Security

- Make a schedule of volunteers to be at the show site.
- Arrange for security for Friday 7:00 p.m. to Saturday 7:00am and Saturday 6:00 p.m. to Sunday 6:00 am
- Get or arrange to have flood lights

Fish Check IN/OUT

- Provide the following items: extra entry forms and Rules & Regulations have pen, pencils and clip boards, measuring device and net.
- Check and inspect each fish for signs of disease.

- Measure and classify each fish as they arrive (owner/agent must be present)
- Fill out an entry form, checking off each fish in the proper size, classification and tank number.
- Help take photos of all the entered fish.
- Send the owner, with entry form to raffle committee booth to pay entry fees (all entries not paid by Judging are disqualified)
- Judging Score Keeper
- Show the judges which tank will be judged next
- Keep track of moveups and 4th place.
- Avoid unnecessary conversation with judges
- Keep people back from getting in the way of the judges and fish handles
- Help provide a microphone for a judge's commentary

Lunch Saturday

- Arrange to have a light lunch to be brought to the show site on Saturday @ 1:00 p.m.
- Expect 30 people (Judges, handlers, exhibitors, restrations and SAKA info table people
- Have beverages (sodas or other beverages depending on the weather) at the show site for Saturday
- Judges eat first

Vendors

- Obtain and confirm a minimum of 5 vendors
- SAKA will provide one 8 foot table and 2 chairs for all booths.
- Fish vendors, we will provide an tent (11 X 11), amquil, salt, and Nova Aqua, vendors will provide there own bags, O2, nets, pans, rubber bands, and tanks are available at \$10.00 per tank.

As you can see it takes a lot of people to put on a great show. So if you see something that you might like to do or learn how to do, please ask or sign up for one of the tasks. The Show Chairperson clip board will be available every month.

If you think you might be able to help in one or more of these jobs or would like to learn how to do one of these jobs please sign up at the next

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meeting. It is a great chance to learn more about the hobby.

TENTATIVE RAFFLE
PRIZE LIST - 2005 -
LOCAL VENDORS

GRAND PRIZE

25" Color TV
Shaw Chiropractic

KOI POND STUFF

Rancho Del Koi

3400 S. Sahuaro Shadows
\$25 Gift Certificate

Mountain View KOI

3828 Keeley Rd
Hereford, AZ 85615
Pond supplies

Tropics of Tucson

801 E. Fort Lowell
Pond supplies

Magic Gardens

7909 E.22nd St
Pond supplies

Desert Bloom Nursery

11011 E.Tanque Verde
Wind chime

Evergreen Florists

6085 E.22nd St.
\$25 gift certificates

Harlow Gardens

5620 East Pima
Garden art

Carl Ragel's Natural Ponds

2143 N. Country Club
Pond supplies

ARSTY FARTSY STUFF

Don Reece Creations

Custom Wooden Bowl

Dolores Heredia

Package of "fishy" gift cards

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Fountain Center

2515 E.Ft.Lowell
pond / yard art

Poster Warehouse

ElConMall
Koi poster

Mostly Books

6208 E.Speedway
gift cards

Van Kirk Co

302 S.Norris
metal art

Tres Amigos Imports

5975 E.Broadway
yard art

Collecion Mexicana

1101 N. Wilmot #127
Southwestern gift

Pottery Blowout

3840 E. Grant Rd.
ceramic art

Southwest Canyon Creations

5458 E.Pima
southwestern stuff

Patio Pools

9155 E.TanqueVerde#147
bionic koi

Furniture Outlet

3030 E. Grant 85716

EATS

Tony's NY Style Italian Deli

6219 E.22nd St.
2-\$10 gift certificate

Chuy's

7101 E.22nd St.
2-Dinners for 2

The Cottage Bakery

800 N.Kolb
2-\$10 gift certs

Olive'R Twist Restaurant

4915 E.Speedway
\$15 gift certificate

Bear Canyon Dairy Queen

8955 E.TanqueVerde
\$5 gift certificates

The Egg Connection

3114 E.Ft.Lowell
\$20 gift card

Philly's On Speedway

6210 E.Speedway
Lunch for Two

Casa Vallarta

TanqueVerde&BearCanyon
Gift certificate

Grill

100 E.Congress
two "grub" cards

Hometown Buffett

330 S.Wilmot
2 complimentary meals

Taco Tote

1340 N.Wilmot
\$20 gift card

Golden Corral

4380 E.22nd St.
9030 E. Autumn Sage
4 Buffet Meals

FUN STUFF

Reid Park Zoo
Biosphere 2
Az.Sonora Desert Museum
Funtasticks
Tucson Botanical Gardens

SERVICES

Fletcher's Tire

Service Package

Capin Car Wash

6345 E. TanqueVerde
Car wash Certificate Book

A+ locksmith

\$25 Gift certificate

Pronto Printing

122 S.Kolb 85710
printing gift cert

Desert Divers

4837 N.1st.Ave
open water scuba class

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Adobe Car&Van Rental

3150 E.Grant Rd
(2) two day car rental

LOOK & FEEL GOOD

Al "The Motivator" Vishevetsky

Personal training sessions

Body Parts Fitness

6211 E.22nd. St.
free week gym membership

Dr.Noel L Shaw

1101 N. Wilmot#229
\$250 gift Cert.

Sandy Pena L.M.T.

First @ River
½ hr. massage

Isagenix - Debbie Shaw

isagenix 9 day starter pak

Hair By Dye

Diane Wallace
2941 N. Country Club
gift certificate



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Do you know these gentlemen?

If not more on them in next months issus of the newsletter.



Kawarigo Korum

Up Coming Events

September 25, 2005
Shannon Estrella
2:00 pm

October 23, 2005
Faye & Winton Hall



November 11-13, 2005
SAKA 26th Koi Show &
Auction

December 2005
Tom Ayers

January 22, 2006
TBA

September 2005

February 26, 2006
TBA

March 26, 2006
Dan and Martha Cover

April 23, 2006
TBA

May 21, 2006
TBA

June 18, 2006
TBA

**25th Annual AKCA
Seminar**
Buffalo, New York
June 22-25, 2005

**26th Annual AKCA
Seminar**
Phoenix Marriott Mesa
Mesa, Arizona
June 22-24, 2007
Hosted by SAKA & VSKC



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**SAKA 10%
Discount**

With your SAKA Membership Card

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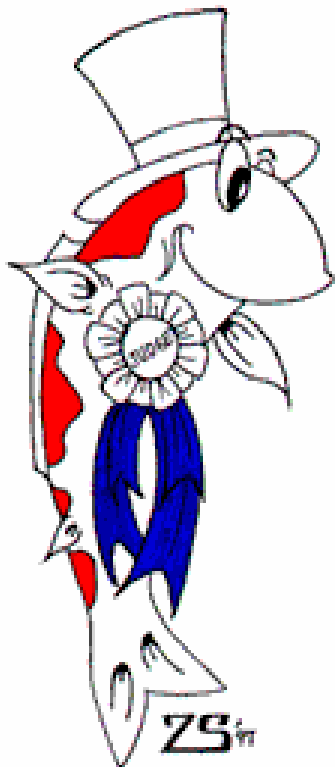
3625 S Country Club Road
Tucson, AZ
792-2244 or
1 (800) 844-2244

**Mountain View Koi
Fish & Aquatic Plants**

3828 Keeling Road,
Herford, AZ
378-3710

Rancho del Koi

3400 S. Sagauro Shadows Drive
Tucson, AZ
886-8797



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AKCA Koi Club members

Club affiliation (for special price)

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Subscribers mailing address

City, State, Zip

Phone number

Method of payment

_____ check made out to "KOI USA"

_____ Visa or Master card

Expiration date _____ - _____
Month year



September 2005



Annual Membership
Dues are \$25.00 per family from
March 1 to February 28 or 29 of the next
year. If paid after August 1 \$17.50,
September 1 \$15.00, October \$12.50,
November \$10.00, December \$7.50.

Membership Type

_____ Renewal
_____ New Member

Name: _____

Address: _____

City: _____

State: _____

Zip: _____

Phone #: _____

E-mail _____

Today's Date: _____

of Koi _____

Years Keeping Koi: _____

Pond size: _____

Would you like to host a meeting?

Would you like to serve on a
committee?

_____ If yes which one?

Make Checks payable to: SAKA

Mail to: Faye & Winton Hall
6775 North Los Arboles Circle
Tucson, AZ 85704-4110