

# Your Fish Have "Bugs"

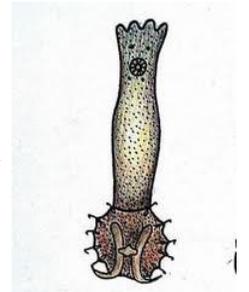
## Part 1

**This is part 1 of a 2 part article that will be presented over the next two newsletters. Enjoy.**



In this article I will attempt to give you a basic understanding of the relationship between your Koi and the many pathogens or possible pathogens that live on and around them. Pathogens are bacteria, parasites and viruses, and a constant threat to the health of our wet pets if not managed properly. Notice I said "managed" because most of these pathogens inhabit your fish or your pond water at all times. Even fish that have been fully treated with all the types of treatments normally utilized in the hobby can still carry a small percentage of these bugs. It is almost impossible to completely eliminate them from the water or the fish. Some of them live deep within the fish where most treatments cannot touch them, and given the right temperature conditions and stressors, can come out from hiding and go to work attacking your fish. It is our job to keep those stress factors to a minimum at least. It is only when they get out of hand or become overpopulated that they usually hurt the fish. You must learn how to keep all this in perspective, and realize that it is your obligation to learn as much about fish health and disease as possible, but at the same time not let it be all consuming.

Prevention and/or the early detection of possible problems are the keys to success. We have all learned the hard way at times, but there is no better teacher than those experiences. Once you have a basic understanding of water quality and its effects on fish, you will have gone a long way in the prevention of any potential health problems. Another key factor in good fish husbandry is the early detection of problems. This is accomplished through the visual interpretation of the fish's body language. They will always give you some sort of sign of impending ill health. If caught early enough, most problems are easily remedied. The next article will be titled "Symptoms of Ill Health" for a more complete listing of the signs of poor health. It will give you a detailed description of how to detect possible problems in the early stages, be it from poor water quality and/or parasites and such by teaching you ways to read the fish's body language.



## The Immune System

As mentioned above, it is important for you to understand that ALL fish can carry parasites and possibly even latent, low level bacterial and viral infections. They can and will act as transmitters and possibly contaminate each other, but may not acquire the problem themselves. Whether or not a fish becomes ill or dies because of it, is directly related to things such as stress factors, the integrity of the individual immune system, water quality, genetics, nutrition, age, environmental factors, etc. If a fish carries only low levels of infection, it is possible that they will build immunities to that particular disease or pathogen, and never show any symptoms or become ill because of them.



The immune system in Koi is very water temperature related. The optimum water temperature range to house Koi would from 70 to 80 degrees Fahrenheit. At these temperatures the immune system is working at its peak performance This is why in many cases, the occurrences of sick fish happens in colder water temperatures when the fish's immune system is in a weakened state.

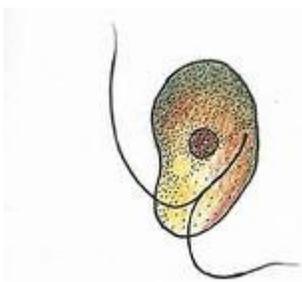
The immune system of fish begins with the layers of skin and scales, which act as physical barriers to stop or detour any potential invaders from penetrating into the organs or bloodstream. This is why it is vital to quickly address any physical breaks in this skin due to injury. Also, fish have an outer coating of slime, which plays a major role in protecting the fish from disease. This slime coat, houses some very important immune related bactericides and fungicides, which are constantly attacking any potential invaders. For this reason it is very important to avoid degrading this slime layer. Poor netting or handling of the fish, as well as poor water quality are the top culprits of disturbing this delicate layer. Never handle fish with dry hands or dry nets, as this will remove the slime very easily. If you must handle the fish, make sure your hands and nets are clean and wet. Much less of the coating will be damaged this way. Try to use a netting material that is made from a soft non-abrasive material as well.



As stated, poor water quality is usually the biggest factor to the detriment of the slime coat. Things such as low pH (below 7 ppm), or any amounts of Ammonia, and Nitrite are just a few considerations.

**I CANNOT STRESS ENOUGH, THAT MAINTAINING GOOD WATER QUALITY IS THE HEART AND SOUL OF FISH HEALTH.**

Currently, throughout the world, there have been outbreaks of some very serious viruses. Most of these are temperature oriented, and only show outward signs in specific temperature ranges. The two most serious viruses are KHV (Koi Herpes Virus) and SVC (Spring Viremia of Carp). These can be deadly to Koi and can cause 100% mortality in the fish population of the infected system. As stated these virus outbreaks tend to be very water temperature dependent in most but not all cases. SVC usually shows itself in the spring at water temperatures between 50 and 68 degrees F. KHV usually shows itself in the spring or fall in water temperatures are in the 70's and especially from 72 to 78 degrees F. Both KHV and SVC are highly contagious and should be officially diagnosed by a qualified lab. This is also the reason you need to be very careful where you buy your fish. There are many comprehensive and strict quarantine protocols that must be done by the retailer/dealer/breeder prior to any fish being sold to the public. Unfortunately, only a small percentage of these commercial operations have these protocols in place



## Parasites

All bodies of water have naturally occurring parasites/pathogens, which will eventually end up in and on the fish that live there. The life cycle of many of these parasites relies on utilizing the fish as a host in order to survive and reproduce. Most of these parasites are microscopic and not visible to the human eye, although some parasites such as mature fish lice (Argulus) and anchor worms (Lernea) are visible.

When a fish is born in a given body of water, it's immune system and slime coat immediately go to work on attacking and controlling the particular parasites and pathogens that live in that particular body of water. Even before they were born, their parents have passed down certain immunities already. It is important as well to understand that not all waters are alike in their population or type of pathogens. So, let's say a particular fish is born into or came from a body of water whose prevalent parasitic residents are primarily Trichodina and Costia. As long as the population of these parasites is not overwhelming, that fish, with good water quality will more than likely be able to keep the numbers at an acceptable and manageable level with no ill effects.



*Joe*

Tune in for Part 2 next month as Joe continues the tour of our ponds.

Thanks Joe.

Joe mentioned many parasites. Could you identify them in the pictures?