

KOI HERPES VIRUS



This devastating disease could affect you and the koi you sell; find out more about it.

BY ERIK JOHNSON

Koi Herpes Virus (KHV) is a subject that every water garden professional should be in tune with because it's destined to play a role in our future, and your customers may ask about it. The following is a user-friendly explanation of KHV, and if you want to have answers when your

customers bring the subject up, it's well worth reading. If you want to take things one step further, you may want to participate, or even ask your customers if they'd like to participate, in the Fight Against KHV Fundraiser that North American Water Garden Society is now sponsoring. For details on the fundraiser visit www.nawgs.org.

The koi herpes virus was first formally described in Israel around 1998 after some Japanese fish that were infected with this disease were received there. The virus infects the epidermis (skin) of the koi and causes these superficial cells to die and slough away. Serious damage is done to the skin, fins and gills. As the skin dies away, a loss of osmotic integrity (the skin's ability to resist water and retain proteins) and bacterial infections contribute to fish death.

THERE'S NO CURE

KHV is only infectious to koi (not goldfish), and when the virus infects a group of fish, one could expect to lose upwards of 90 percent of the group. There is no cure for the viral infection; however, it appears that controlling bacterial infections and providing considerable heat (86° F) reduces the symptoms in fish that are not seriously affected enough to die. With heating, some confirmed cases have had losses reduced to as low as 16 percent. The virus is primarily spread directly from fish to fish. Of course, it is also possible to spread the virus through nets or splashed water.

The most common route of infection is via new fish, which are added to the resident population without adequate or lengthy quarantine. In other cases, old fish are returned with infection after a simple breeding loan. This has happened several times; therefore, all fish being added to, or returned to, a resident collection should have some interval of quarantine.

KHV remains latent in populations of fish that are held below its ideal operating temperature, which happens to be above 64-68° F. Fish held in cool water, under 68° F, can harbor the virus for lengthy periods, and the virus will not activate until the fish is warmed into the low 70s.

DIAGNOSIS

KHV is difficult to diagnose because growing the virus in cell culture is difficult. Worse, the virus appears at varying times in varying quantities in the infected tissues. If one were to biopsy the gill looking for the virus on the wrong day, the virus would not show up there, and the diagnosis would be lost. In general, biopsy of liver and kidney tissue is the most accurate place to find the virus to make the diagnosis, which should be conducted only by a professional.

There are many local extension services that may test fish. Contact a nearby university to find out if they have an animal or fish disease diagnostics laboratory and to find out more information.

IDENTIFYING

Testing is desired to determine several things that are not clearly known at the present time. Do we know for sure it's a herpes virus? If KHV is not a herpes virus, we can expect many different behaviors from this virus, including a "no carrier" state in the survivors, which would be a very good thing. If the virus is, in fact, a herpes virus, then we would make an assumption that even if heated, the virus is present in the fish after successful recovery and could be considered infectious at least at some time in the future. We would also like to determine once and for all if the survivors are, in fact, immune to the virus, or if they carry the virus. These are two different results and two different studies.

Top: KHV infects the epidermis of the koi and causes superficial cells to die and slough away.

Bottom: In general, biopsy of liver and kidney tissue is the most accurate place to find the virus to make a diagnosis. (Photos courtesy of Aquascape Designs)

If this is a viral infection that is not eliminated by heating and does have a “carrier state” after successful recovery, a vaccine to stop the virus needs to be developed. The vaccine would have to be very effective, and it would have to be deployed with such prejudice that it would intercept 100 percent of field infections before the virus has a chance to mutate into something else that would elude the vaccine.

HOW DOES THIS AFFECT YOU?

By not generating the above answers, there will be several outcomes that will impact the water gardening industry and you. If the “carrier state” of the virus is not determined after infection or heating, hobbyists stand to continue to lose fish and collections. This erosion of hobbyist success with koi will result in declining expenditures on this hobby and all aspects of the industry will lose out.

If this virus is not controlled through a better understanding of what it actually is and how it works, the losses to breeders and farmers could devastate the production side of the industry. If the virus lingers and is eventually perceived as a threat to the domestic fisheries of the United States, the U.S. government will deal with it with extreme prejudice in favor of the fisherman and bait fisheries, not the hobbyist. Commerce in these fish might be impacted, and if found infected, millions of fish could die. Industry support and the retail hobbyist side of the market, will certainly be crushed.

Finally, if a vaccine is developed, it could have a positive economic impact not only on the U.S. koi market, but also on the world koi market. Hobbyist confidence would climb along with discretionary spending on this hobby. U.S. industry support could be rewarded with a profitable product that could be licensed in several ways for the benefit of both the industry that supported it, and the hobbyist who depends upon it.

Erik Johnson, DVM, is a nationally recognized fish veterinarian and has authored many books on koi, including Koi Health and Disease. He can be contacted via his Web site, www.koivet.com.

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Light rings

Super Bright Submersible LED Light Rings are light sources used to shine on running water at fountain water outlets, waterfalls, water spray nozzles or any water activity. Each LED ring comes with a low-voltage transformer, 33-foot-long submersible cord, and three sizes with 6, 12 or 24 white LEDs available. Mico Inc. (626) 258-2928. **Write in 1411**

Bronze fountains

Made of the new Aggre-Bronze material, the Katas are the newest items added to this line. With the look of real bronze, its finish holds up to all the elements and is part of the Aggre-Stone line/faux stone surface that is primarily made of fiberglass. This bronze line can also be brightened or patinaed just like real bronze. The Kata is 40x40 inches and weighs 78 lbs. The Mini-Kata is 29x28 inches and weighs 44 lbs. Oracle Fountains, part of Ecosphere Associates, Inc. (520) 888-0084. **Write in 1412**



Water feature

This waterfall feature is built to be stacked and can be combined with others to create a taller, more dramatic waterfall. It is cast from real stone and provides the soothing, natural sound of falling water. Dekorra Products LLC. (888) 635-8585. **Write in 1405**



Fountain

The Snarley Lion self-contained fountain is suitable for both indoor and outdoor use. It comes in five colors with a fitted pump. The Tuscan finish is shown, and the fountain measures 18x15x10 inches. Ornate Products. (480) 251-1647. **Write in 1413**

Filter

The Laguna Power Flo Filter Falls and Skimmer Filter feature three large-capacity filter chambers, mechanical filtration media pad, chemical filtration media and biological filtration media. The filter chambers have convenient handles allowing easy removal for cleaning. Laguna filters also feature winterizing and water drainage, and both come with a mechanical filter pad and Laguna Biosphere Biological Filtration Media. These units can be used to filter 5,000 gal. separately or up to 10,000 gal. when used in tandem. Rolf C. Hagen (USA) Corp. (800) 225-2700. **Write in 1416**



Fish retail system

This efficient and versatile fish retailing system can house large quantities of fish for sale and can easily be disassembled if needed. It comes complete with a biological filtration system, UV light, pump and all of the plumbing accessories needed for assembly. Aquatic Gardens & Koi Co., Inc. (800) 822-5459. **Write in 1401**



Waterfall

These waterfalls are unlike most other manufacturing processes in that they are not painted; the color is actually absorbed into the skin of the waterfall for long-lasting color that is fade-resistant. There is a limited 10-year warranty on the waterfalls. Aaron's Enterprises, Inc. (989) 723-6463. **Write in 1400**

