

Koi Herpesvirus Disease

Alternate Names: Cyprinid Herpesvirus-3 Infection, KHV, carp interstitial nephritis, gill necrosis virus.

Species Affected: Carp species of all ages (common carp, Koi carp, hybrids).

What causes Koi herpesvirus disease? Cyprinid Herpesvirus-3, a highly contagious virus which can survive in water for at least 4 hours depending on water temperature.

How is KHV transmitted? Sick fish contaminate water and equipment around them with KHV shed in their feces, urine, gills, eggs, and skin. The virus enters susceptible fish through the gills and the intestine. Although it has not been proven, it is possible that mussels, freshwater shrimp, and migratory wild ducks could act as vectors for KHV. Virus survivors may carry the KHV for a long time.

What are the clinical signs of KHV? Signs of infection can be seen 3 to 21 days after fish are placed in contaminated water, or after contaminated fish are mixed with susceptible fish. Disease and mortality are greater with water temperatures between 18C and 28C. Signs of KHV include:

- Loss of appetite
- Erratic, slow and weary swimming,
- Fish separate from the group and gather at the pond shore or water inlets gasping at the water surface.
- Increased mortality, up to 90% fish die
- Changes on the skin and fins start with patchy red or white irregular spots which progress to ulcers. There is more mucus on the skin. (fish are slimier)
- Pale and swollen gills. Faster breathing.
- Sunken eyes

What are the consequences of KHV? Severe losses with up to 90% mortality. Fish that survive infection are long term KHV carriers that can infect other fish.

How is KHV detected? Based on clinical signs and history of new fish introductions. KHV confirmation is done by laboratory tests including histopathology of gill, kidney, and spleen (examination of tissues using a microscope) and PCR (Polymerase Chain Reaction, a molecular test to detect viral DNA).

How is KHV prevented? Preventing viral exposure is extremely important. Good biosecurity and husbandry practices include not bringing live fish into Canada without appropriate federal permits, obtaining fish from a KHV-free source, keeping fish into quarantine tanks for 4 weeks prior to adding them into local ponds, cleaning all equipment, clothing, and footwear after visiting aquaculture sites, not using finfish bought at retail stores as bait for catching fish, breeding and/or restocking with resistant carp species.

How can KHV be treated? There is no treatment for KHV.

Is KHV a reportable disease? Yes, because of its severity and consequences KHV is a reportable disease and all suspect and confirmed cases in British Columbia must be reported within 24 hours to the [Office of the Chief Veterinarian](#) and to the [Canadian Food Inspection agency](#)

Is KHV zoonotic (transmitted from animals to humans)? No

References:

- OIE. (2019, November 14). *Infection with Koi Herpesvirus*. https://www.oie.int/fileadmin/Home/eng/Health_standards/aahm/current/2.3.06_KHV.pdf
- Canadian Food Inspection Agency. Koi Herpesvirus Disease. <https://inspection.canada.ca/animal-health/aquatic-animals/diseases/reportable-diseases/koi-herpesvirus/eng/1336681689001/1336681772583>