

## Exotic disease

**Spring viraemia of carp (SVC)**

SVC in common carp (*Cyprinus carpio*); note characteristic haemorrhagic skin, swollen stomach and exophthalmos ('popeye')



Source: HJ Schlotfeldt

**Signs of disease**

**Important:** *Animals with disease may show one or more of the signs below, but the pathogen may still be present in the absence of any signs.*

**Disease signs at the farm, tank or pond level are:**

- mortality rates of 30–100%
- lethargy
- separation from shoal
- lethargic swimming
- accumulation of fish at the water inlet and sides of the pond.

**Gross pathological signs are:**

- exophthalmos (popeye)
- swollen abdomen and a protruding vent
- possibly a trailing white or yellowish faecal cast
- petechial (pinpoint) haemorrhages of the skin, gills and eyes
- haemorrhages on skin and base of fins and around the vent
- darker body colour, with pale gills
- diffuse swelling and haemorrhage of internal organs and degeneration of gill lamellae
- ascites (fluid in abdominal cavity)
- intestines containing mucous instead of food.

### Microscopic pathological signs are:

- liver hyperaemia and oedematous perivasculitis
- pericarditis and infiltration of the myocardium
- hyaline degeneration and vacuolation of the renal tubules, which are clogged with casts
- inflammatory and hyperaemic changes in all major organs.

### Disease agent

SVC virus is a rhabdovirus that is closely related to infectious haematopoietic necrosis virus and viral haemorrhagic septicaemia virus.

### Host range

Species known to be susceptible to SVC are listed below.

Common name	Scientific name
Bighead carp <sup>a</sup>	<i>Aristichthys nobilis</i>
Common carp and koi carp <sup>a</sup>	<i>Cyprinus carpio</i> (species most susceptible)
Common roach	<i>Rutilus rutilus</i>
Crucian carp <sup>a</sup>	<i>Carassius carassius</i>
Goldfish <sup>a</sup>	<i>Carassius auratus</i>
Grass carp <sup>a</sup>	<i>Ctenopharyngodon idellus</i>
Guppy	<i>Poecilia reticulata</i> (also known as <i>Lebistes reticulatus</i> )
Ide or orfe <sup>a</sup>	<i>Leuciscus idus</i>
Pike <sup>a</sup>	<i>Esox lucius</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Rainbow trout <sup>a</sup>	<i>Oncorhynchus mykiss</i>
Silver carp <sup>a</sup>	<i>Hypophthalmichthys molitrix</i>
Tench <sup>a</sup>	<i>Tinca tinca</i>
Wels catfish or sheatfish <sup>a</sup>	<i>Silurus glanis</i>
Zebrafish	<i>Danio rerio</i>

<sup>a</sup> Naturally susceptible (other species have been shown to be experimentally susceptible).

Non-fish carriers include the species listed below.

Common name	Scientific name
Fish louse	<i>Argulus foliaceus</i>
Grey heron	<i>Ardea cinerea</i>
Leeches	<i>Piscicola</i> spp.

### Presence in Australia

**EXOTIC DISEASE—not present in Australia.**

### Epidemiology

- SVC is very contagious among common carp.
- Clinical disease is linked closely to environmental disturbances.
- Mortality rate is usually less than 40% but can range from 5% to 100%, with younger fish (<1 year old) being more susceptible.

- Fry are susceptible to disease at temperatures up to 23 °C.
- Disease may also occur in older fish (>1 year), usually when water temperatures are between 11 °C and 17 °C (associated with the stress of an abnormally cold spring in Europe, and possibly due to cold temperatures weakening the fish's immune system during the spring).
- Fish that survive SVC are presumed to carry the virus.
- Outbreaks are most likely to occur with increased stress levels, such as around the time of spawning, and coincide with increased levels of virus excreted with spawning fluids.
- Transmission of the virus to uninfected fish is horizontal, and the virus enters fish through the gills and skin.
- The virus enters the water in faeces, urine and spawning fluids. Transport of live infected fish, contaminated water and contaminated eggs of infected fish (suggestive of vertical transmission) contributes to disease spread.
- Blood-sucking parasites such as anchor worm and leeches can transmit the virus from fish to fish.
- Stressors (e.g. overcrowding) can trigger an outbreak in apparently healthy populations.

### Differential diagnosis

The list of similar diseases below refers only to the diseases covered by this field guide. Gross pathological signs may be representative of a number of diseases not included in this guide, which therefore should not be used to provide a definitive diagnosis, but rather as a tool to help identify the listed diseases that most closely account for the gross signs.

### Similar diseases

Enteric red mouth disease, enteric septicaemia of catfish, infection with *Aeromonas salmonicida*—atypical strains, koi herpesvirus disease

### Sample collection

Due to the uncertainty in differentiating diseases using only gross pathological signs, and because some aquatic animal disease agents might pose a risk to humans, only trained personnel should collect samples. You should phone your state or territory hotline number and report your observations if you are not appropriately trained. If samples have to be collected, the agency taking your call will provide advice on the appropriate course of action. Local or district fisheries or veterinary authorities may also provide advice regarding sampling.

### Emergency disease hotline

The national disease hotline number is 1800 675 888. This number will put you in contact with the appropriate state or territory agency.

### Further reading

The accepted procedures for a conclusive diagnosis of SVC are summarised in the World Organisation for Animal Health Manual of diagnostic tests for aquatic animals 2011, available at [www.oie.int/en/international-standard-setting/aquatic-manual/access-online](http://www.oie.int/en/international-standard-setting/aquatic-manual/access-online).

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