
VIRAL DISEASES IN FISH

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WHAT IS DISEASE??

A particular **abnormal condition** that negatively affects the structure or function of part or all of an organism and not due to any external injury

PATHOLOGY

It studies **fish** defensive mechanism against **diseases and its treatment**. Areas of interest of **pathology** is regularly covered include host-pathogen relationships, studies of **fish** pathogens, pathophysiology, diagnostic m.methods, therapy, epidemiology, descriptions of new diseases

Pathogen?

Disease causing agent is called pathogen.

CAUSES OF DISEASES IN FISH

- ✘ Bad water quality
- ✘ Inappropriate diet
- ✘ Temperature (too high or too low)
- ✘ Stress
- ✘ Viral diseases
- ✘ Fungal infections
- ✘ Bacterial infections
- ✘ Parasites

SYMPTOMS OF FISH ILL

- ✘ **Colour** may fade out / change
- ✘ Body shape, condition and / or behaviour will be abnormal
- ✘ The fish may refuse to feed or overfeed and trailing faeces appear at vent.
- ✘ Condition of the fins and gills will deteriorate. Fins may be clamped close to body.
- ✘ The fish may **not keep its** swimming position.
- ✘ There may be signs of injuries, growths or abnormalities.

WHAT IS VIRUS??

- ✘ Viruses are small infectious bodies that replicate themselves inside the cells of living things.
- ✘ Viruses spread in a variety of ways: through direct contact, through air or water, by their host animals being eaten by another, or even by being shed in feces

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- ✘ Viruses are transmitted from one host to the other through a structure called “**virion**”.
 - ✘ Viruses are classified mainly based on external structure, shape, size, capsid structure, RNA and DNA nucleic acids.
 - ✘ Viruses cause disease by weakening the host tissue or by forming tumors in the host tissues.
 - ✘ There is no treatment for viral diseases, only **prophylactic measures** have to be taken up.

VIRAL DISEASES IN FISH

- × Viral hemohorrhagic septicaemia
- × Infectious pancreatic necrosis
- × Infective haematopoietic necrosis
- × Channel catfish viral disease
- × Lymphocystis
- × Spring viremia of carp

VIRAL HAEMORRHAGIC SEPTICAEMIA (VHS)

- ✘ It is first time discovered by **Schaperclaus** (1941) and later on confirmed by **Zwillenberg**(1965).
- ✘ The virus is a member of the family Rhabdoviridae.
- ✘ This disease becomes suddenly chronic causing very high mortality rate.
- ✘ The growth rate of the fish decreases earlier.
- ✘ Viral haemorrhagic septicemia (VHS) is a deadly infectious.

CAUSATIVE AGENT

- ✘ **Viral hemorrhagic septicemia (VHS)** is caused by the *Viral hemorrhagic septicemia virus* (VHSV).

Transmission

- ✘ VHSV can be spread from fish to fish through water transfer, as well as through contaminated eggs.

SYMPTOMS

- ✘ Fish that become infected experience hemorrhaging of their internal organs, skin, and muscle.
- ✘ The kidney and liver are the most affected organs.
- ✘ Bleeding in air bladder, kidney swelling, bleeding in gills and fins, liver discolouration etc. are important symptoms.
- ✘ Fishes show abnormal movement and position in water.
- ✘ swollen eyes ,general anaemic condition, reduced haemoglobin percentage,swollen belly,haemorrhages in the air-bladder and in the muscles,red intestine ,pale gills etc.are of the



TREATMENT AND CONTROL

- There is no effective treatment of VHS disease.
- Fishes should be brought from the uncontaminated farms.
- Infected or dead fishes should be immediately removed.
- High stocking densities should always be avoided.
- Fatty food should be avoided and vitaminous food should be preferred.
- Disinfected ponds with clean bottoms should be selected.

INFECTIOUS PANCREATIC NECROSIS (IPN)

- ✘ Infectious pancreatic necrosis (IPN) is a severe viral disease of salmonid fish.
- ✘ It is also viral disease which causes heavy mortality of young trout. It is very common in fry and young fish.
- ✘ This disease mainly affects young salmonids, such as trout or salmon, of less than six months, although adult fish may carry the virus without showing symptoms.

CAUSATIVE AGENT

- ✘ It is caused by *infectious pancreatic necrosis virus*, which is a member of the Birnaviridae family.

TRANSMISSION

- ✘ A typical transmission of the disease from parents to progeny via the egg, and is probably one of the main factors for the geographical spread of IPN (Hill 1977).

SYMPTOMS

- ✘ When the fishes are infected they revolve on their longitudinal axis.
- ✘ They swim without any sense of direction and finally becomes unable to move.
- ✘ They become dark in colour.
- ✘ The eyes protrude and the stomach and intestine are filled with a whitish liquid.
- ✘ The gall bladder shows sign of necrosis, both liver and spleen are pale.
- ✘ Intestine is filled with mucous.

DIAGNOSIS

- ✘ Clinical disease may be characterised by a swollen abdomen or eyes, darkening of the skin, spiral swimming.
- ✘ Diagnostic methods for the detection of the disease include: characteristic histological pancreatic lesion, indirect fluorescent antibody testing, ELISA, and virus culture.
- ✘ Surviving fish should recover within one to two weeks.

TREATMENT AND CONTROL

- ✘ There is no effective medicine for this disease, however, Economon(1963) has suggested the use of *povidoneiodine* which may be useful in controlling the disease.

SPRING VIRAEamia OF CARP(SVC)

- ✦ Spring viraemia of carp, also known as **Swim Bladder Inflammation** is caused by a rhabdovirus called *Rhabdovirus carpio*.
- ✦ It is listed as a notifiable disease under the World Organisation for Animal Health.
- ✦ Spring viraemia of carp virus has been shown to infect a wide variety of fish species including silver carp, grass carp, crucian carp, and bighead carp.

TRANSMISSION

- ✘ Transmission is by direct contact or through the water and by movement of live infected fish.
- ✘ The virus enters most often through the gills.

SYMPTOMS

- ✘ The fishes become dark in colour.
- ✘ Distended abdomen, haemorrhage in gills and skin and loss of balance are important signs of this infection.
- ✘ Exophthalmia (pop-eye)
- ✘ Anemia and pale gills
- ✘ Edema (swelling due to excess fluid)
- ✘ Widespread hemorrhaging.



TREATMENT AND CONTROL

- ✘ There is no treatment once infected.
- ✘ The virus is inactivated by lipid solvents, heating $>60^{\circ}\text{C}$ for 15 minutes, glycerol, ozone, gamma radiation, UV light, extremes of pH, formalin and both acid and alkaline solvents. Virus infectivity is retained in tap water and mud for 6 weeks.

CHANNEL CATFISH VIRUS (CCV)

- ✘ Channel Catfish virus is a member of the *Alloherpesviridae* family that causes disease in catfish.
- ✘ CCVD is caused by a **herpesvirus**.
- ✘ It is known to affect Blue and Channel catfish.
- ✘ The disease mainly occurs in fish that are less than one year old (fry and fingerlings) or smaller than 15 cm in length.

TRANSMISSION

- ✘ CCVD is thought to mainly spread vertically, from brood stock to young fish via the egg.
- ✘ Horizontal transmission of the disease also occurs directly from the virus shed in water, and from the virus carried by animal vectors.

SYMPTOMS

- ✘ Fish hangs vertically in water showing loss of balance.
- ✘ Haemorrhage of visceral organs may be seen in this disease.
- ✘ Intestine is filled with yellow mucous fluid, bleeding of internal organs, musculature and air-bladder.
- ✘ Swollen abdomen.
- ✘ Exophthalmos (popeye).



DIAGNOSIS

- ✦ CCV can be detected in water containing infected fish and organs of diseased fish by virus neutralisation, fluorescent antibody testing, ELISA or PCR.
- ✦ FAT and ELISA should be used for diagnosis of clinically infected fish while virus neutralisation or PCR should be used to detect carrier fish.
- ✦ Lesions are seen on the liver, kidney and many other internal organs both histologically and grossly on postmortem examination.

TREATMENT AND CONTROL

- ✘ There is no available treatment.
- ✘ Stress and high stocking densities should be avoided to reduce disease occurrence.
- ✘ Appropriate quarantine and hygiene measures should be employed to prevent spread of disease.
- ✘ The virus is sensitive to acidic pH, heat and UV light and is inactivated by pond mud and sea water.

EPIZOOTIC ULCERATIVE SYNDROME

- ✘ Fish cancer
- ✘ Mainly affect the indian major carps

CAUSATIVE AGENT

Rhabdo virus

SYMPTOMS

- ✘ Haemorrhagic ulcers on body.,fins,gills
- ✘ Kidney,liver affected
- ✘ Degeneration of epidermis
- ✘ Histopathological change in gills
- ✘ Respiration affected

TREATMENT

- ✘ Quicklime application
- ✘ Dip treatment



LYMPHOCYSTIS

- ✘ Common viral disease
- ✘ Cause infection in both fresh and marine water fishes

CAUSATIVE AGENT

- ✘ Lymphocystisvirus



CHRIS GRONDAHL

KOI HERPESVIRUS DISEASE

Highly contagious virus that causes significant morbidity and mortality in **common carp**

CAUSATIVE AGENT

koi herpesvirus

TRANSMISSION

- ✘ direct contact with infected fish
- ✘ Contact with fluids from infected fish.

TREATMENT

- ✘ Attenuated live vaccines for prevention of KHV



THANK YOU