

#### 4- Viral diseases

Viruses can induce diseases resulting in important economic losses in aquaculture, their infections are impossible to distinguish from bacterial diseases without special laboratory tests. They are difficult to diagnose and there are no specific medications available to cure viral infections of fish, the most important viral infections which affects fish caused by a herpes virus. Viruses are extremely small infectious agents that multiply only within the living cells of a host by using components of the host cells.

#### **INFECTIOUS PANCREATIC NECROSIS (IPN)**

Is an acute to subacute, highly contagious disease of young salmonid fishes. The etiology of IPN is a birnavirus. It has double stranded RNA of the family Birnaviridae, the virus is not affected by lipid solvents. It retains viable in fish tissue frozen and stored at -20 C for five or more years. Incubation period for IPN is not known but depends on the virulence of the virus, water, temperature, susceptibility of the host, may be takes five to seven days.

**Transmission** is directly from gravid female to developing eggs, the Water helps in spreading of infection. Contaminated tools can carry the virus from infected farm to non-infected farm.

**Clinical signs are** fish refuse to take feed gradually, gradual loss of equilibrium, swimming in spiral manner, sudden increase in mortality, ascites and necrosis of pancreatic acinar cells. Fish with advanced cases of the diseases fall to the bottom, alimentary tract become filled with mucus, liver and spleen are usually pale in color.

**For prevention** quarantine and movement restriction will prevent the spreading of the disease, disinfection of tools and utensils with chlorine 10 mg/liter for 1 hour, drying the fish farm for up to 6 months, Fish eggs must be obtained from area free from disease.



**Brown trout / infected with IPN, hyperemia of the liver and pylorus and hemorrhages in pylorus**

#### **SPRING VIREMIA OF CARP (SVC)**

It is a subacute to chronic disease of cultured common carp, it is affected of cyprinids and more specifically of the common carp, caused by *Rhabdovirus carpio*, it is commonly complicated with *Aeromonas* and *pseudomonas* infection. This virus has Single-stranded RNA, optimum temperature for growth is 20-22 C, but can grow between 10 C and 30 C. Most epizootics occur in spring when the pond water begin to warm.

**the transmission** of this disease may be done via water, Leeches and fish lice are suspected to play a role.

Affected fish (**clinical signs**) and characterized by ascites leads to distended abdomen, paleness of gills, and uncoordinated swimming, lay on side, darkening of skin, inflamed and swollen vent, internal hemorrhages. Internally: edema and petechiae on visceral organs, hemorrhagic and necrotic ulcers on skin.

**To prevent** the disease should be quarantine and restriction of movement of infected fish, careful disinfection of the pond after removal of all fish, immunization with inactivated virus that should be done in summer or autumn to prevent outbreaks in spring.



**Spring viraemia of carp. hemorrhagic skin, swollen stomach and exophthalmos**

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**Rainbow trout (*Oncorhynchus mykiss*) with multiple hemorrhages (bleedings) in the dorsal muscles**