



VIRAL DISEASES III

- **Lymphocystis Disease**
- **Cauliflower Disease**
- **Fish pox**

Lymphocystis Disease

- This disease is a chronic sporadic and tumoral disease characterized by the formation of small and pearl-like nodules on the skin and fins.
- Lymphocystis disease virus (LDV), which is a DNA virus in the genus *Lymphocystivirus* of the family *Iridoviridae*.

Lymphocystis Disease

- Each nodule comprises an individual lymphocystis virus infected cell or lymphocyst of up to 1 mm diameter visible to the naked eye. More generally hypertrophied cells occur singly or grouped together in raspberry-like clusters of numerous appearance.

Lymphocystis Disease

- Fibroblast-like cells cease dividing but continue growing and massively enlarge showing a basophilic cytoplasm and prominent nuclei and nucleoli.
- As the cell enlarges, cytoplasmic inclusions are evident surrounded by halo-like clear areas.
- In mid-age of maturation a hyaline capsule becomes clearly .

Lymphocystis Disease

- Treatment should be focused on decreasing the stress on infected fish to allow the immune system to fight the virus and to decrease the risk of secondary infections.

Cauliflower Disease

- It is a sporadic, chronic disease in the mouth (upper and lower jaw), especially in the dorsal and in various parts of the body, with fibroepithelial, with the appearance of tumors in the appearance of cauliflower.
- The cauliflower disease (stomatopapilloma or orocutaneous papillomatosis) of the European eel *Anguilla anguilla* was first described at the beginning of the 20th century.

Cauliflower Disease

- The cause of the tissue proliferation is unknown. Different viruses, resembling birna-, **orthomyxo-**, and rhabdoviruses, have been detected in or isolated from eels with cauliflower disease.

Cauliflower Disease

- Tumors develop slowly.
- Masses are soft, vascular type structures that reach nut to walnut size.
- Although they are white in the beginning, as they grow in time, they turn brown due to pigmentation.

Cauliflower Disease

- Histopathologically, tumors have vascular and fibroepithelial character.
- Pigmentation is seen in the connective tissue of the capillary vessels and the outer layer of the dermis

Fish pox

- Fish pox, or carp pox, is one of the oldest known diseases of fish, recorded as early as 1563. Fish pox is a chronic skin disease that occurs among several species of propagated cyprinids (koi and common carp). It is also called carp pox, epithelioma papillosum, and papillosum cyprini.

Fish pox

- The etiological agent, of this disease is *Herpesvirus cyprini* which was first reported by B. Hofer in 1904.

Fish pox

- When the immune systems of infected fish are slowed by cold temperatures, the virus sometimes produces a skin disease, but it is rare for fish to die.
- In almost all cases, warmer water temperatures help the fish to recover and the skin to heal. It is likely that these survivors are the source of the virus that infects the next generation.

Fish pox

- The skin disease caused by the carp pox virus is quite easy to recognize.
- Diseased fish have **soft, pink, translucent, wart-like** growths on their skin.

Fish pox

- The growths are **so fragile** that they can usually be removed by gently rubbing a finger over the growth. This is not a good treatment for carp pox because the growth is likely to come back and because the rubbing damages the skin and makes it susceptible to secondary bacterial infection. However, verifying that the growths are **soft** and **fragile** does help to distinguish carp pox from some similar looking tumors

Fish pox

- **External:**
- Superficial lesion on body surface, usually smooth and firms.
- The tumors are milky white to gray and are raised about 1 to 3 mm above the skin on the head, fins, or anywhere on the body surface.
- Dark pigmentation on the affected areas.
- Growth retardation.
- Distended abdomen.
- Exophthalmia.
- Hemorrhage on the operculum and abdomen.

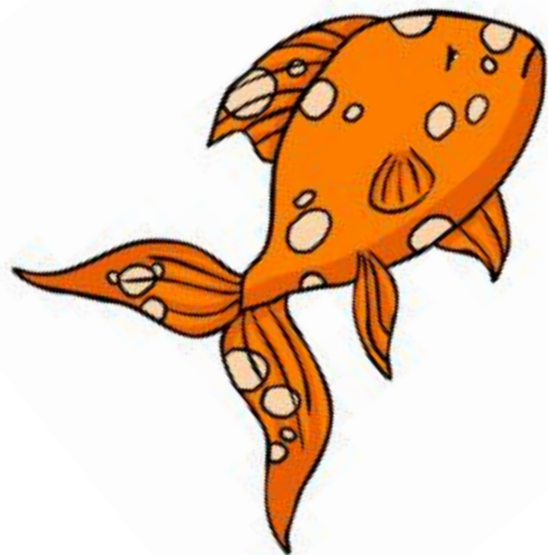
Fish pox

- **Internal:**
- Hyperplasia of epithelium cells/ epithelial hyperplasia.
- Neoplasms with spinal deformities.

Fish pox

- **Histopathology:**
- Epidermal hyperplasia
- Vacuolar degeneration
- Intracytoplasmic inclusion bodies
- Mitoses are common in the outer layers.

Thank you 😊



References for Viral Disease

- Hnath JG. Infectious pancreatic necrosis
http://www.glfc.org/pubs/SpecialPubs/sp83_2/pdf/chap18.pdf.
- Ellis AE, Cavaco A, Petrie A, Lockhart K, Snow M, Collet B (2010) Histology, immunocytochemistry and qRT-PCR analysis of Atlantic salmon, *Salmo salar* L., post-smolts following infection with infectious pancreatic necrosis virus (IPNV). *Journal of Fish Disease*
<https://doi.org/10.1111/j.1365-2761.2010.01174.x>
- Liwen Xu • Juan Feng • Youhua Huang Identification of lymphocystis disease virus from paradise fish *Macropodus opercularis* (LCDV-PF) *Arch Virol* DOI 10.1007/s00705-014-2060-0
<http://jacksevolutionarybiologyblog.blogspot.com/2016/>
- Andor Dospoly, Zoltán L. Tarján , Róbert Glávits , Tamás Müller , Mária Benkő. Full genome sequence of a novel circo-like virus detected in an adult European eel *Anguilla anguilla* showing signs of cauliflower disease *DISEASES OF AQUATIC ORGANISMS Dis Aquat Org.* ol. 109: 107–115, 2014
<http://en.bdfish.org/2011/07/fish-pox-skin-disease-fishes/>
- <https://agrifecdn.tamu.edu/fisheries/files/2013/09/SRAC-Publication-No.-4710-Herpesviruses-in-Fish.pdf>