

Bacteria Host Interactions in Columnaris Disease

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DESCRIPTION

Columnaris is a bacterial disease that can be external or internal in aquarium fish and can be chronic or acute. Because of its mold-like lesions, the columnaris bacteria (*Flavobacterium columnare*) may be treated with antibiotics and prevented with simple tank maintenance. Columnaris disease can be frequently seen in aquarium fish, particularly live-bearing fish and catfish. It gets its name from columnar-shaped bacteria that are found in almost all aquarium habitats, although it has also been called cotton wool disease, saddleback sickness, guppy disease, or cotton mouth disease. Lesions in chronic instances typically advance slowly and take many days to reach their final stage, fish death. In severe circumstances, the lesions can spread rapidly and can obliterate whole fish populations in a matter of hours.

The majority of columnaris infections starts as white or grey spots or patches on the head, around the fins, or the gills. Initial observations of the lesions could merely include a paler region devoid of the remainder of the fish's regular glossy look. The lesion may become yellow or brown as it grows, and the surrounding skin may take on a reddish tint. The term "saddle-back" is frequently used to describe this symptom because lesions on the back frequently spread down the sides, giving the impression of a saddle. Lesions on the mouth may seem moldy or cottony, and with time, the mouth will corrode. As the infection worsens, the fins will disintegrate and seem ragged. Additionally, the gills may be impacted by the bacteria, which may cause the filaments to fall out and cause fast breathing or gasping from a lack of oxygen absorption. Less frequently, the disease will progress inside with no visible signs. Only a necropsy and bacterial cultures in these situations will reveal the actual cause of death.

The causative of columnaris disease is *Flavobacterium columnare*. Both domesticated and wild freshwater fish are vulnerable, including several kinds of commercially significant fish. Infections with *columnare* can cause skin lesions, fin erosion, and gill necrosis, all of which have a high death rate and cause significant economic losses. Numerous research teams have

carried out investigations to clarify the pathophysiology of columnaris disease, particularly in the last ten years. This has resulted in considerable advancements in understanding the intricate connections between the organism and its host. Despite these attempts, the pathophysiology of columnaris disease is now mostly unknown, which hinders the development of effective preventative and therapeutic methods to treat the condition. In chronic conditions, gill damage takes longer to appear, and skin lesions may also form. Small lesions on the body typically begin as regions of light skin discolorations that are bordered by a clear crimson hue. This starts at the dorsal fin's base. Then, contrary to normal fin rot, fin degeneration takes place, starting with the lesion at the base of the fin and moving to the outer edge. When this happens, the lesions start spreading laterally from their usual spot at the base of the dorsal fin to encircle the fish like a "saddle-back." As a result, the disease is known as "saddle-back sickness". Fin rot is also frequently seen. The region around the adipose fin in rainbow trout may get black and exhibit erosions. The term "peduncle disease" refers to these lesions that spread to the peduncle. Deep ulcers may result from lesions that spread anteriorly, caudally, or even into the deeper skin layers, which expose the muscle. Typically, mucus that is yellowish-white covers the lesions.

CONCLUSION

Regular water changes and tank maintenance, such as sweeping the gravel, help prevent columnaris outbreaks since the bacteria thrive on organic wastes. The fish won't become anxious and more prone to disease if they are fed properly and the water is kept in excellent condition overall. The new fish should be quarantined, and sick fish should be moved to a quarantine tank to stop the introduction and spread of the disease. Nets, specimen containers, and other aquarium equipment should all be cleaned and sanitized before each use to prevent the bacteria from spreading to other tanks. Nets and other materials can be treated using commercially prepared Benzalkonium Chloride solutions (Net Dip or Net Soak), or the materials can be immersed in a solution of 3% hydrogen peroxide.

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