

Vibriosis

I. Causative Agent and Disease

The genus *Vibrio* contains significant bacterial pathogens of marine fish that cause vibriosis, an acute bacterial septicemia. The primary pathogens include *V. (Listonella) anguillarum*, *V. ordalii* and *V. salmonicida*. In addition, *Vibrio alginolyticus* may occur as a secondary invader and *V. vulnificus* is generally restricted to European and Japanese waters. *Vibrio salmonicida* is reported from Atlantic Canada and Maine in North America and in Norway, Shetland Islands and Faroe Islands in Europe causing cold water vibriosis or Hitra disease mostly in Atlantic salmon. These bacteria are ubiquitous in the marine environment causing typical Gram-negative acute septicemias with bacterial foci, necrosis, hemorrhaging and inflammation in most fish tissues.

II. Host Species

Because vibriosis has occurred in an extensive number of fish species worldwide, most marine fish species are likely to be susceptible. All species of Pacific salmon and trout are susceptible to vibriosis that often involves *V. anguillarum*. Coho salmon seem to be more resistant while chum and Chinook salmon are very susceptible. *V. ordalii* and *V. salmonicida* are principally associated with Pacific and Atlantic salmon, respectively, while *V. vulnificus* most often infects eels causing red pest disease.

III. Clinical Signs

Characteristic clinical signs of vibriosis include inflammation and reddening along the ventral and lateral areas of the fish with petechial hemorrhaging that develops at the base of fins, vent and within the mouth. Acute cases exhibit a darkened body with swollen, cutaneous

lesions that ulcerate, releasing blood. There may also be corneal opacity followed by evulsion of the orbital contents. Internally, the intestine may be distended with a clear, viscous fluid. Hemorrhaging is common in the viscera and around the intestines, with swelling and necrosis of the kidney and spleen.

IV. Transmission

Horizontal transmission occurs from organisms in the water or contact between fish. Outbreaks have occurred in freshwater fish fed carcasses of marine fish. In Alaska, disease does not usually occur until seawater temperatures reach 8°C.

V. Diagnosis

Presumptive diagnosis is made by observing motile, curved Gram-negative bacterial rods in spleen squashes or peripheral blood smears of marine or anadromous fish. Bacteria can be isolated on tryptic soy agar, sometimes requiring 1.5% NaCl. Confirmatory diagnosis is made using biochemical or slide agglutination tests.

VI. Prognosis for Host

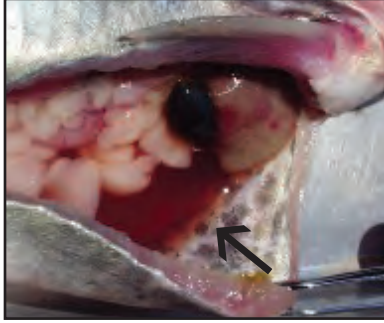
Epizootics of vibriosis in wild fish populations are rare but result in significant fish mortality. When cultured salmonids are reared in seawater net pens the disease is common resulting in high mortality if not treated with antibiotics. Several licensed vaccine preparations for aquaculture have been effective in the control of vibriosis.

VII. Human Health Significance

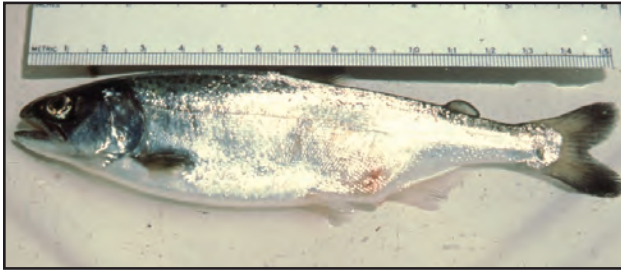
The *Vibrio* species associated with most fish diseases such as *V. anguillarum*, *V. ordalii* and *V. salmonicida* are not considered to be human pathogens.

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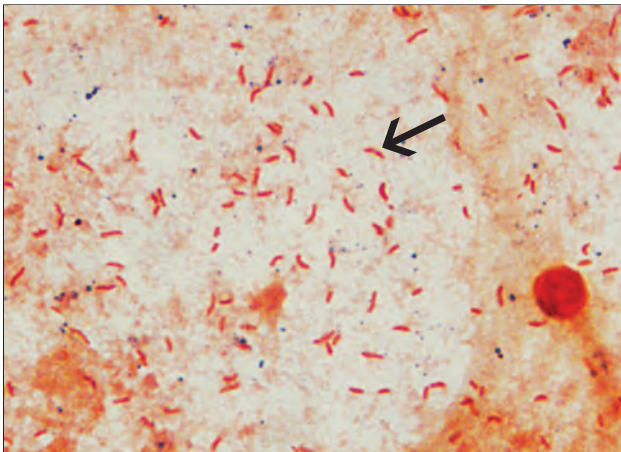
However, several other vibrios are of human health concern including *V. cholerae*, *V. vulnificus*, *V. parahaemolyticus* and occasionally *V. alginolyticus*.



Bloody ascites (arrow) in abdominal cavity typically present in fish with vibriosis.



Coho salmon smolt with small posterior external hemorrhage due to vibriosis.



Gram-negative curved *Vibrio* bacteria (arrow) stained from skin scrape of infected chum salmon juvenile, X 1000.