

# 1.2.11 Coldwater Vibriosis

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## A. Name of the Disease and Etiological Agent

Coldwater vibriosis or Hitra disease is caused by *Vibrio salmonicida*.

## B. Known Geographical Range and Host Species of the Disease

### 1. Geographical Range

*Vibrio salmonicida* has only been observed in the marine waters of Norway, Scotland, and Eastern Canada.

### 2. Host Species

Coldwater vibriosis has been observed in Atlantic salmon *Salmo salar* and rainbow trout *Oncorhynchus mykiss*.

## C. Epizootiology

Coldwater vibriosis typically occurs when water temperatures are below 10°C. The disease has been observed in smolts, juveniles, and adults. Water-borne infection is probably the primary means of fish to fish transmission.

## D. Disease Signs

Typical external signs may include hemorrhaging of the skin, the area around the gills, and the vent. Internally, hemorrhaging may be evident in all the organs and at times, in the muscle. The liver may be pale. Histologically, necrosis can be observed in the kidney, muscle, gastro-intestinal tract, spleen, and gills. Gross pathological changes may be absent in some cases.

The coldwater vibriosis that occurred in Canada was in Atlantic salmon and was characterized by extensive ascites with associated visceral hemorrhaging. Significant losses due to the disease were not observed.

## E. Disease Diagnostic Procedures

In addition to observing typical signs, diagnosis of coldwater vibriosis is based on identification of the causative agent. *Vibrio salmonicida* can be grown on standard bacteriological media like tryptic soy with added sodium chloride. Nutrient agar supplemented with 5% sheep blood and 1 to 1.5% sodium chloride is often used for primary isolation. Optimum growth has been observed at a medium salinity of 1.5% sodium chloride and an incubation temperature of 15°C. The bacteria can be isolated from a variety of internal organs and from ascites.

### 1. Presumptive Diagnosis

The genus, *Vibrio*, is presumptively diagnosed on the basis of the following characteristics.

- a. Gram stain reaction: negative
- b. Cell morphology: short (0.5 to 3.0µm), curved rods; motile by polar flagella
- c. Cytochrome oxidase reaction: positive
- d. Glucose O/F medium: fermentative with no gas produced

### 2. Confirmatory Diagnosis

Confirmatory diagnosis is based on a sensitivity to vibriostatic agent 0/129 (2,4-diamino 6,7-diisopropyl pteridine phosphate) and novobiocin. Identification of the specific species *Vibrio salmonicida* is determined serologically, for example, the slide agglutination test or the fluorescent antibody test may be used.

## F. Procedures for Detecting Subclinical Infection

No procedures for detecting latent infections are routinely used.

## G. Procedures for Determining Prior Exposure to the Etiological Agent

No procedures for determining prior exposure are routinely used.

## H. Procedures for Transportation and Storage of Samples to Ensure Maximum Viability and Survival of the Etiological Agent

Samples should be placed in individual sealed plastic bags and labeled appropriately for identification. They should be transported on ice or under refrigeration. Samples should not be stored for more than 72 hours.

## References

- Bruno, D. W., T. S. Hastings, A. E. Ellis, and R. Wootten. 1985. Outbreak of a coldwater vibriosis in Atlantic salmon in Scotland. *Bulletin of the European Association of Fish Pathologists* 5:62-63.

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- Egidius, E., K. Andersen, E. Clausen, and J. Raa. 1981. Coldwater vibriosis or 'Hitra disease' in Norwegian salmonid farming. *Journal of Fish Diseases* 4:353-354.
- Egidius, E., O. Soleim, and K. Andersen. 1984. Further observations on cold-water vibriosis or Hitra disease. *Bulletin of the European Association of Fish Pathologists* 4:50-51.
- Egidius, E., R. Wiik, K. Andersen, K. A. Hoff, and B. Hjeltnes. 1986. *Vibrio salmonicida* sp. nov., a new fish pathogen. *International Journal of Systematic Bacteriology* 36:518-520.