

External Parasitic Copepods

I. *Causative Agent and Disease*

A variety of different parasitic copepods can cause external infestations of freshwater and marine fish. Some members of the group are commonly referred to as fish lice. They are frequently found on the body, around the mouth, and on the gills. Members of the order Copepoda commonly found in Alaska include the genera *Lernaea* (anchor worm) in both fresh and marine waters, *Salmincola* (discussed in next section) in freshwater and *Lepeophtheirus* (seallice) in marine waters. Fish infested with external parasitic copepods are often lethargic and may flash or rub against substrate. In heavy infestations, the skin may appear opaque due to the production of mucus and the fins may be frayed. Epidermal and gill tissues may become necrotic with secondary infections by fungi and bacteria. These parasites are found worldwide.

II. *Host Species*

A variety of different freshwater and marine fishes are susceptible to infestations from these copepods.

III. *Clinical Signs*

Parasitized fish may act listless and lethargic. Mechanical abrasion due to the attachment and/or feeding by the copepods is common resulting in frayed fins, gill hyperplasia, and patchy epidermal damage and necrosis. Infections with secondary pathogens often occur.

IV. *Transmission*

Most of these organisms have a direct life cycle involving a number of free-living and larval stages. Transmission is through contact with an infective free-swimming stage of the organism in the water column. The infective stage at-

taches to the fish where it goes through a number of larval stages before becoming an adult.

V. *Diagnosis*

The larger parasites can be seen with the naked eye. Definitive identification is based on microscopic morphologies of body parts and structures.

VI. *Prognosis for Host*

The prognosis for the host depends on the specific parasite, tissue location and numbers present. If parasite numbers are small, fish normally survive with little adverse effects unless the copepods are anchor worms that destroy one or both eyes. This can result in blindness and death of the host by starvation or predation. When present in large numbers, such as *Lepeophtheirus* in seawater netpens, significant fish losses may result. SLICE is a drug used in Canada and Europe for eliminating fish lice in seawater netpens and is approved for use in the US under an INAD permit.

VII. *Human Health Significance*

There are no human health concerns associated with these organisms.

ARTHROPODS



Lepeophtheirus salmonis copepod from the surface of a salmonid fish.



Left: *Lepeophtheirus* on coho salmon; **Right:** *Phrixocephalus cincinnatus* (anchor worm) embedded in the eye of an arrowtooth flounder.