

Parasitic diseases of fishes

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Metazoan Diseases - Metazoan Parasite include the myxozoans, helminths, crustacean annelids and molluscs common in both wild and cultured fish. All have direct life cycle, but the period of their life cycle in which they act as fish parasites varies considerably with the species concerned.

Whirling Disease - Whirling disease is a chronic inflammatory disease in Salmonid fish caused by the myxozoan parasite *Snyxobolus cerebralis*, which is characterised primarily by the tight circular movements due to spinal cord constriction and brain stem compression in infected fish (Rose et al 2000). It occurs worldwide and rainbow trout are most susceptible to disease, although the parasite is able to infect numerous species of Salmonid fishes.

The disease attacks the cartilage. The development and severity whirling disease depends on the age and size of host. Young fishes are more vulnerable to infection. It causes infections in spine causing fish tail to turn black and spine to curve. Infections in head cartilage causes head and jaw deformities, while infection in auditory capsule causes young trout to become disoriented and chase their tails in a whirling motion. Permanent deformities of the head spine and operculum are caused by cartilage damage associated inflammation and interference with normal bone development. (Heedrick et al. 1999, Mac Connell and Vincent 2002)

② Proliferative Kidney diseases -

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Proliferative Kidney disease (PKD) is caused by metacystodine Parasite *Tetracapsuloides bryozoaenae*, is a wide spread disease that cause significant losses among Salmonides in western Europe and ~~North~~ North America. The disease is characterized by a chronic inflammation of the anterior and posterior kidney, which is caused by a massive accumulation of lymphocytes and extensive granuloma formation (Ferguson 1981, Clifton Hadley et al. 1986)

Fish are infected by parasite spores released from bryozoans, which are the ~~invertebrate~~ invertebrate hosts of the parasite. The parasite invades the fish through skin and gills and afterwards invades inner organs, with kidneys being the main target organ for further development. Infections and clinical signs are dependent on environmental temperature. It primarily affects fingerling fish and usually results in 100% morbidity in an affected farm, with upto 20% mortality.

Diseases caused by Crustaceans -

All foraminifera number of crustaceans have evolved to become dependent on certain animals for existence. Those clearly associated with fishes can cause disease problems, Parasitic crustaceans are among the among the most serious gill and skin parasites of fish world wide. They may be found attached to external surface of marine and fresh water fish.

Parasitic copepods have a complex life cycle with different larval

Stages, between each of which is a moult. Eggs hatch to release free swimming nauplius larvae which after several stages becomes adult copepod.

Common crustacean Parasitic infection in Brachistomatid finfish in coastal and Estuarine Zones.

Order	Subclass/ Family	Genus	Characteristics
Crustacea	Branchiura Argulusidae	Argulus spp.	Body broad and flat covered anteriorly with dorsal shield with a pair of compound eyes, hooks and barbs, which it uses to attach to the fins gills and skin of its host. Second maxillae usually form prehensile suckers.
Crustacea	Copepoda Caligidae	Caligus spp. Lepeoptherium sp. Ancesteris sp.	Transparent cephalothorax covered dorsally by a sub-circular shield, with a pair of suckers on the frontal edge of the body and four pairs of legs, vestigial abdomen in some species found in large numbers of gills and body surface with different stages of life cycle in the same host.
Crustacea	Ergasilidae	Ergasilus spp.	Cephalothorax constituting half or more of body length, the second antennae are modified for clinging to the host moderate to large no of gills

Ceratomyxidae	Plerocercariae	Few in number but large in size, feed on gill tissues and blood, seriously damage the tissues
Ceratomyxidae	Levinseniidae sp.	Body unsegmented, with its anterior part deeply embedded in host tissue with the help of a hold fast organ, infect nostril, skin, fin, gill, buccal cavity.
Isopoda Cymothoidea	Cymothoa	Entire dorsal surface of body divided into many narrow segments, eyes are sessile, parasite immovably attached to buccal, buccal or branchial cavity of fish.

Control of parasitic diseases -

- 1) Mass treatment of fish pond with dimethyl carbamate.
- 2) Use of albendazole and ivermectin for mass drug administration