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Fish Protozoa, arthropoda

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White spot disease

- Cause : Icthyophthirius muliphilus
- Ciliated organism
- Has macronucleus and micronucleus

Life cycle

- The organism mature in the host skin to trophont
- It leaves the host after 10-20 days
- It form a jelly cover around itself to help it to attach to the rocks
- it multiply by binary fission forming large number of tomite
- It form cilia and go outside the cover as a theront(Infective stage)
- It is transmitted to the host by contact with theront , infected fish , contaminated plant , snail or water

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Symptoms

- Emaciation , anaemia , lethargy
- White spots on skin , gill and fins
- Inflammation of the epidermis due invasion of the tomite with its rotatory movement
- Inflammation of the gills leads to suffocation

Whirling disease
Black tail disease

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- Cause :Myxosoma cerebralis
- Location :1- Auditory organs
  2-Cartilage
  2-Nerve

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Life cycle

- The fish containing large number of spores die and the spores release in water
- The spores is ingested by the tubifex worm
- Inside the worm triactinomyxon spores areformed
- The other fish become infected by either contact with the spore or by ingestion of the tubifex worm containing spores.
- The spores penetrate the epithelial cells f the skin , gill, fins , digestive tract and cartilage .

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Triactinomyxon spores

- They have 3 polar capsules and 3 grapple like appendage
- They can live for 10-20 years

Pathogenicity

- Black tail coloration due to destruction of pigment motor nerve at 26th vertebrae
- Imbalance and whirling movement
- Deformation of head , skeleton due to destruction of the cartilage
- White spots under skin and cartilage
- Emaciation in chronic infection due to fish become unable to eat

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Ectoparasites of fish

- 1- Crustacean parasites
- 2- Protozoa:
- a- Chilodonella
- b- Trichodina
- 3-Myxospora
- a- Henneguya

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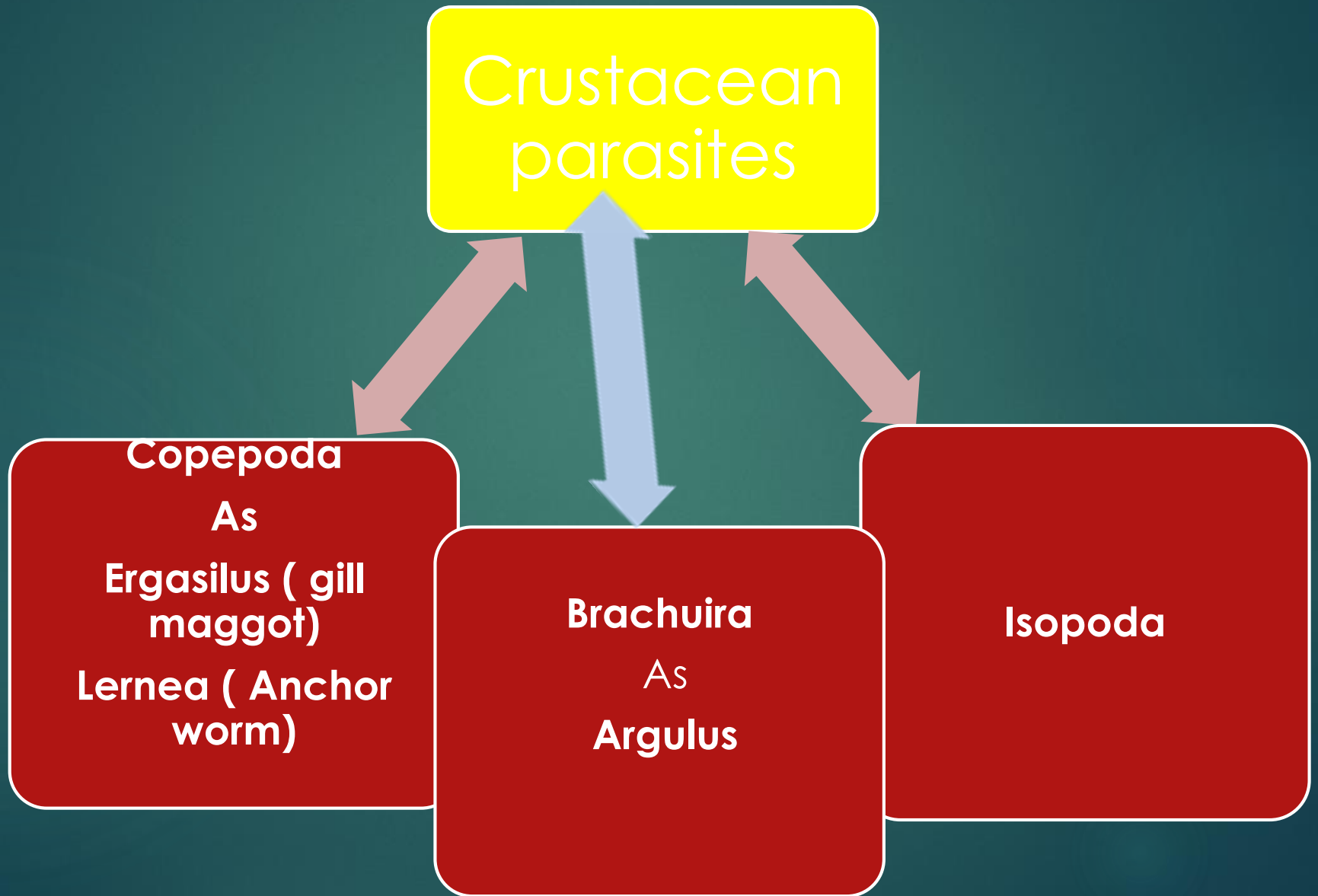

Ergasilus (gill maggot)

- **Location : gills**

Infective stage : 5th copepodal stage of the parasite

Mode of infection : contact of the parasite to the fish

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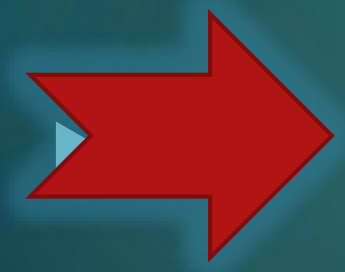
Morphology

- Size:2 mm
- Has cephalothorax and abdomen
- Anteriorly:Two antenna modified into hooks
- Posteriorly:Two V shape egg sacs

Life cycle

- Begins by laying eggs by the female.
- The eggs develop in a week to 6 Nauplius larvae and 5 copepodal stages
- 5^{th} copepodal stage is the infective stage



:Female is the only parasitic stage

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Pathogenicity

- Inflammation , Hyperaemia ,marble appearance of the gill due to grasing of the gills by the parasites
- Severe irritation due to the parasite movement lead to hypertrophy of the gills and excess mucous with asphexia

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Diagnosis

- Samples from the gill filament to see the parasite under microscope

Argulus (fish lice)

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- Location : Skin

Life cycle

- Begin with laying eggs which hatch to small argulus which can attack hot , but it leaves the host for 10 - 60 days to mature to adult stage then attack the host

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Pathogenesis

- The parasite suck large amount of blood and can survive without host for 15 days
- The parasite press its carapace against skin lead to focal ulcer
- The attachment by its sucker lead to circular depression with a linear haemorrhage and surrounded with a red zone

Diagnosis

- The parasite can be seen on the skin of the host

Lernea(Anchor worm)

- **Morphology:**
- **It has an anchor at the head region with a long neck and two sacs at posterior end**

Location

- Skin , gills and fins

Life cycle

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- Egg hatch to ,arva that feed on the mucous depris of the skin
- the larva make several moults till form adult male and female
- Male fertilize the female and die
- The female begins to penetrate the epidermis of the skin by its anchor leaving the remaining part of the body free outside the fish

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Pathogenesis

- 1-Necrosis and ulceration of the skin
- 2-Asphexia due to gill affection
- 3- In chronic infection, the host forms a fibrous capsule around the anchor of the parasite.

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Isopoda

- D/ H: Fish
- Location : Skin , gills , fins , buccal caviy
- The two sex of the parasite are separated
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Pathogenesis

- They are external parasites feeding on the blood of host . Causing severe necrosis in the skin , gills and fins and it causes pressure atrophy to the tongue with necrosis causing dropping of the tounge (Removal of the tongue and the parasite replace the tongue . So the parasites are called tongue eaters.

	Chilodonella cyprini	Trichodina reticulata
Location	Skin , gill, fins	The same
Infective stage	Cyst	trophozoite
Mode of transmission	Contact with the cyst	Contact with the trophozoite
Pathogenesis	Parasite inserts its pharyngeal apparatus in the organs leads to: Inflammation, necrosis , ulceration and excess mucous secretion in the skin Hyperplesia of the gill epithelium with fusion of the gill filament in the gill which leads to suffocation and death	The parasite insert its adhesive hook in the organs causing the same pathogenicity
Symptoms	-excess mucous secretion in the skin, gill -Asphexia -Fish scratch itself against the	The same

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Myxospora Henneguya

Location : Skin , gill

Infective stage :

Mode of infection:

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Forms of Henneguya

- Cutaneous ; White creamy nodule on the skin and may extend to muscle
- Intralamellar: found in the capillary of gill filament and gill lamella
- Interlamellar: Found in the epithelial cells between the gill filament and gill lamella

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Pathogenesis

- On skin : Nodule 1cm found causing Inflammation with excess mucous secretion
- On gill: Nodule found causing hyperplasia of the gill filament and fusion of the gill lamella with difficulties in breathing (The fish is gasping and break the water to breath

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Diagnosis

- Symptoms
- Examination of nodules by opening it to see parasite
- Histopatology