

## Chapter 19 - Class Monogenea

Mostly ectoparasitic; 3 endoparasitic species: one in the coelom of elasmobranchs, one in the ureter of freshwater fishes, and one in the urinary bladder of amphibians

As ectoparasites they are usually attached to the gills, scales and fins of fishes

In many cases, these parasites exhibit habitat specialization

Also, monogeneans on the gills of fishes typically take up the same general position while attached

The monogeneans have many of the same basic characteristics that we have seen in other kinds of trematodes

But in addition, they possess a holdfast sucker(s) at the posterior portion of the body called an **opisthaptor**

It often has hooks or anchors (**hamuli**) associated with it

The combination of haptor and hooks serve as an excellent holdfast for the turbulent conditions in which these worms often find themselves

In certain monogeneans the haptor is adapted to hold onto the second gill lamellae of the host fish

In these forms, the haptor is divided into a series of sucker like arms

Also, they may be strengthened with chitinous sclerites called **clamps**

The anterior end of the body has various adhesive and feeding organs, collectively called the **prohaptor**

There are 2 main types of prohaptor:

1) Those that are not connected with the mouth funnel and those that are

In the first case the head end is truncated, lobated or broadly rounded

These worms often bear **head glands** which are important adhesive devices

2) Those in which the prohaptor has specializations of the mouth and buccal funnel

The simplest types have an oral sucker that surrounds the mouth

All monogeneans have a mouth, pharynx, bifurcated intestine, and cecae

There is no anus

Monogeneans on the scales and tail fins of fishes feed on mucus

Those that occur on gills feed on blood (from the branchial capillaries)

## Life Cycle

They have a direct life cycle

Eggs hatch and give rise to a **oncomiracidium**, a ciliated larvae that bears numerous hooks

Thus the larva is adapted for both swimming and attachment

The larvae attach onto the host via their haptor as soon as they come into contact with the host's skin or gills

These larvae have a life span of about 12-24 hrs; if it does not find a host in this time period it will die

The monogenean *Gyrodactylus* is viviparous; there is no larvae with females giving birth to live young

## Life Cycle of *Polystoma integerrimum*

The parasite inhabits the urinary bladder of the adult frog

Under the influence of hormones which appear in the frog's urine, the parasite lays its eggs in the bladder

They pass out of the frog when it goes to breed in water

When the eggs hatch in the water an oncomiracidium arises

When tadpoles hatch, these oncomiracidia attach onto the external gills of these hosts

When the tadpole undergoes metamorphosis the external gills disappear

That is, the branchial region becomes covered with skin to form branchial chambers

At the same time the polystome becomes covered over

These larvae cue in on hormones of the frog that are involved in the metamorphosis from tadpole to adult

Specifically, they undergo accelerated development of their reproductive organs

They become **neotonic** - the individuals produced retain larval characteristics but have the ability to reproduce

The uterus of this neotonic parasite has a single egg which is laid in the branchial chamber

This egg hatches and because it is ciliated it is able to penetrate the spiracle of the older tadpole

When the tadpole is truly metamorphosed the hind limbs are present and the front limbs bud out through the branchial chamber

These budding front limbs create a hole and it is through this hole that the larvae leave and crawl along the body of the host to the cloacal opening where they find their way to the bladder of the host