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Lecture title: Family Culicidae (Mosquitoes)

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Summary: Family Culicidae (Mosquitoes)

Family Culicidae (Mosquitoes)

Genera Anopheles, Culex and Aedes

Hosts: mammals, reptiles and birds.

Distribution: Worldwide.

General Morphology

-The general morphology of Culicidae, the family of mosquitoes, consists of several key features that allow them to adapt to their environment. Here are the main morphological characteristics:

1. Body Segmentation:

The body is divided into three main parts: head, thorax, and abdomen.

2. Head:

Antennae: Mosquitoes have long, feathery antennae in males and simpler ones in females.

Mouthparts: The proboscis is specialized for piercing and sucking. It is long and slender, with a needle-like structure for feeding on blood or nectar.

Eyes: Large compound eyes, well-developed, provide excellent vision.

3. Thorax:

• The thorax contains the wings and legs.

• Wings: Mosquitoes have two pairs of wings, but only one functional pair, which are long, narrow, and often with scales.

• Legs: They have long, slender legs with specialized tarsal claws, aiding in landing on surfaces.

4. Abdomen:

• The abdomen is long, segmented, and flexible, allowing for expansion

when feeding. It houses reproductive organs and digestive systems.

• In females, the abdomen is more distended when they are gravid (carrying eggs).

5. Scales:

• Many mosquitoes have scales on their wings and bodies, which help in flight and camouflage.

6. Larval and Pupal Stages:

Larvae: Mosquito larvae are aquatic and have a segmented body, a head, and a siphon for breathing at the water's surface.

Pupae: Pupae are mobile and also live in water, and they do not feed but float until they metamorphose into adults.

These features are adapted to the mosquito's life cycle, feeding habits, and reproductive strategies.

Both sexes have long filamentous segmented antennae, pilose in females and plumose in males.

Mosquito larvae, known as wrigglers, must develop in standing water, but they breathe through an air tube at the rear of their bodies.

Life cycle

The life cycle of a mosquito consists of four main stages:

1. Egg: Female mosquitoes lay eggs on the surface of water or in areas where water is likely to accumulate. The eggs hatch in about 2 to 3 days if exposed to water. Some species lay their eggs on damp surfaces, which may be flooded later.

2. Larva: Once the eggs hatch, the mosquito enters the larval stage. The larvae, also known as "wigglers," live in water and feed on organic matter. They molt several times as they grow. This stage usually lasts from a few days to several weeks, depending on environmental factors.

3. Pupa: The larva then transforms into a pupa, often called a "tumblr" due to its distinctive shape. During this stage, the mosquito does not feed, but instead rests and prepares for its transformation into an adult. The pupal stage typically lasts 1 to 4 days.

4. Adult: After the pupal stage, the mosquito emerges as an adult. It usually rests on the water's surface to dry its wings before flying off. Adult mosquitoes seek blood meals for the female to produce eggs, while males feed on nectar. The life span of an adult mosquito ranges from a few days to a few weeks, depending on environmental conditions.

These stages together complete the mosquito life cycle.

Pathogenesis

Anopheles, Culex and Aedes species

transmit both the dog heartworm, Dirofilaria immitis, and one form of avian malaria caused by Plasmodium.

Control

-removal or reduction of available breeding sites by drainage or other means which make these sites unsuitable for larval development.

- Biological control has been attempted by, for example, introducing predatory fish into marshy areas.

Suborder Brachycera

Family Tbanidae Commonly name(horseflies)

Genera of Tabanids

There are 3 genera of Tanaids of veterinary significance,namely

-Tabanus

- Haematopota

- Chrysops.

Hosts: Generally large domestic or wild animals and man, but small mammals and birds may also be attacked.

Species There are over 3000 species of tabanids.

Distribution: Worldwide.

Morphology

- These are medium to large biting flies, up to 2.5cm in length, with wing spans of up to 6.5cm.

- They are generally dark coloured, but may have various stripes or

patches of colour on the abdomen or thorax and even the large eyes, which are dichoptic in the female and holoptic in the male, may be colored.

- The coloration of the wings is useful in differentiating the three major genera

-The mouthparts, which are adapted for slashing/ sponging, are short and strong and always point downwards.

-Male flies have no mandibles and therefore cannot feed on blood

Life cycle

- After a blood meal the female lays batches of several hundred creamy-white or greyish cigar-shaped eggs, on the underside of vegetation or on stones, generally in muddy or marshy areas.

- The eggs hatch in 1-2 weeks and the cylindrical, poorly differentiated larvae drop into the mud or water.

- The larvae are recognized as tabanids by their small black retractable heads.

- They are sluggish and feed either by scavenging on decaying organic matter or by predation on small arthropods including other tabanid larvae.

- Optimally, larval development takes three months, but may extend for up to three years.

- Mature larvae pupate partially buried in mud or soil and the adult fly emerges after 1-3 weeks.

The whole life cycle takes a minimum of 4-5 months or longer if larval development is prolonged.

Pathogenesis

- The pain caused by their bites leads to interrupted feeding, and as a consequence

- These powerful flies may disperse many kilometres from their breeding areas and are most active during hot, sunny days.

- The adult females locate their prey mainly by sight and their bites are deep and painful.

They feed every 3-4 days, and because their feeding is often disturbed

- mechanical vectors of the organisms responsible for such diseases a

Anthrax, Pasteurellosis, Trypanosomiasis, Anaplasmosis

Control

- insecticidal sprays with a residual effect are used in animal houses

and on the animal themselves.

- using dark panels with sticky

-adhesive as traps and there are a number of electrocution grids which

may prove useful in animal houses.

Suborder Cyclorrahpha

Family Muscidae

- This family comprises many biting and non-biting genera, the latter

commonly referred to as nuisance flies.

The major genera of veterinary importance include

- Musca (house flies and related flies)

- Hydrotaea (head fly)

- Stomoxys (stable fly)

- Haematobia (horn fly)