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Lecture title: Musca

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Summary: Musca

Musca

Hosts

Members of this non-biting genus are not obligatory parasites,

but they can feed on a wide variety of animal secretions and are

especially attracted to wounds.

Species

Musca domestica (house fly)

M. autumnalis (face fly)

Distribution: Worldwide

life cycle holometabolous

Genus Stomoxys

Stomoxys calcitrans, (stable fly or biting housefly)

The bites of this fly are painful and it is a vector of

- several protozoal and helminth diseases of animals

-mechanical transmitter of Trypanosomes.

- Also acts as an intermediate host of Habronema

Host

Most animals and man.

Distribution Worldwide

Life cycle Both male and female flies feed on blood.

The complete life cycle from egg to adult fly may take 12-60

days depending mainly on temperature.

Family Calliphoridae

Species Chrysomya bezziana (Screw Worm — Old world screw-worm)

Hosts Cattle, sheep, dogs and occasionally humans

Identification

- C. bezziana is a blue/green fly, with 4 longitudinal black stripes, and

around 8-10mm in length. They are similar to Calliphora spp., and are of

the family Calliphoridae

Life Cycle C. bezziana is an obligate agent of myiasis.

- The female lays eggs in fresh open wounds or body orifices.

-Eggs then hatch and the larvae begin to penetrate the skin.

-The larvae then mature and begin to pupate, before becoming fully

reproductive adults. The complete life cycle from egg to adult is 2-3

weeks

Family Ostridae

Genus Oestrus

Species: Oestrus ovis

Oestrus Larvae of this genus spend the parasitic period in the air

passages of the hosts and are commonly referred to as `nasal bots'

Hosts: Sheep and goats

Distribution: Worldwide.

Adults

Grey flies about 1.0 em long, with small black spots on the abdomen

and a covering of short brown hairs .

Larvae

Mature larvae in the nasal passages are about 3.0 cm long, yellowish-

white, tapering anteriorly with a prominent `step' posteriorly.

Each segment has a dark transverse band dorsally.

Genus Gasterophilus (is a genus of parasitic flies ,commonly known as

horse bot or bot flies)

Hosts Horses and donkeys. Site

Species Gasterophilus intestinalis

G. nasalis

Worldwide distribution

Gasterophilus intestinalis is a species of botfly that parasitizes horses

and other equines.

The morphology of this parasitic fly can be described in terms of its

adult and larval stages:

Adult Morphology:

• Size: The adult Gasterophilus intestinalis is medium-sized, typically

measuring around 8–10 mm in length.

• Color: The adult fly has a yellowish or orange-brown body with large,

dark, and prominent eyes. The body may have a slightly translucent or

shiny appearance.

• Wings: The wings are transparent with a slight brownish tint, and they have a characteristic pattern of dark spots. The wings are broad and nearly oval in shape, adapted for flying.

• Antennae: Short and simple, the antennae are located near the eyes.

• Legs: The legs are relatively short and adapted for walking on the body of the host animal.

Larval Morphology:

• Size: The larvae (often called “bots”) are larger than the adults, measuring up to 2.5 cm in length in their final stage.

• Color: The larvae are typically creamy or white, with darker mouthparts. As they develop, they become more elongated and cylindrical.

• Shape: The larvae are cylindrical, with a distinct, segmented body that helps them move through the digestive tract of the host.

• Mouthparts: The mouthparts of the larvae are equipped with hooks, which they use to anchor themselves to the mucosal lining of the host’s stomach or intestines.

• Posterior end: The posterior end of the larvae has a hook-like structure that helps in attachment within the host.

Morphological Features:

• The adults are adapted for flying, with large eyes and wings, while the

larvae are well-adapted for their parasitic lifestyle, with hooks for attachment in the host's digestive system.

Life cycle of Gasterophilus intestinalist

The life cycle of Gasterophilus intestinalis (the common horse botfly) consists of several stages, which include both parasitic and free-living phases:

1. Eggs: The adult female botfly lays her eggs on the horse's hair, usually on the forelegs, chest, or belly. The eggs are yellowish or white and can be seen individually or in small clusters.
2. Larvae (1st stage): The eggs hatch when the horse licks or bites the areas where the eggs are laid, typically within 1 to 2 weeks. The larvae are very small and start to burrow into the horse's mouth and gums, where they remain for a short time.
3. Larvae (2nd stage): After the larvae mature in the horse's mouth, they move to the stomach, where they attach to the mucosal lining and grow. This stage can last for several months (typically around 10–12 months), causing irritation and sometimes inflammation in the digestive tract.
4. Pupation: Once the larvae mature, they are passed out of the horse in the feces. In the environment, the larvae then burrow into the soil to pupate. They typically remain in this pupal stage for several weeks or months, depending on environmental conditions.
5. Adults (Emergence): After pupation, the adult botfly emerges from the ground and begins the cycle again by laying eggs on horses.

The entire cycle can take a year, with adult flies only living for a short

time—usually a few weeks—during which they focus on reproducing. The larvae are the most damaging stage, as they can cause health problems for horses if present in large numbers.

Pathogenesis

The pathogenesis of Gasterophilus intestinalis (a type of botfly) infection in horses involves the stages of the botfly's life cycle and its interaction with the host's gastrointestinal system. Here's an overview of the pathogenesis:

1. Egg deposition and hatching: The adult female Gasterophilus intestinalis lays its eggs on the host's body, typically on the hairs of the legs, shoulders, or abdomen. These eggs hatch upon contact with the horse's mouth or skin when the horse licks or bites the area. The larvae hatch from the eggs in response to the warmth and moisture from the horse's saliva.
2. Oral cavity colonization: The newly hatched larvae (1st stage larvae) enter the oral cavity of the horse. They may cause mild irritation, leading to slight inflammation in the mucous membranes of the mouth. The larvae feed on the tissues in the mouth and may lead to minor oral ulcers or lesions.
3. Migration to the stomach: The larvae are then swallowed by the horse and enter the stomach, where they burrow into the lining of the stomach and small intestine, particularly in the duodenum. The larvae remain embedded in the stomach mucosa, feeding and growing. This can cause irritation and inflammation at the site of larval attachment.

4. Larval development and tissue damage: As the larvae mature, they progress through the 2nd and 3rd stages. The larvae's feeding activity can lead to local tissue damage, which may result in gastric ulcers, gastritis, or lesions in the stomach lining. This inflammation is typically mild but can be more severe in cases of heavy infestation. The irritation may also cause colic-like symptoms in some cases.

5. Excretion and pupation: Once the larvae reach their full maturity (3rd stage), they detach from the stomach lining and pass into the horse's feces. This marks the end of the larvae's life cycle inside the host. Upon being excreted into the environment, the larvae burrow into the soil, where they pupate and eventually become adult flies, completing the cycle.

Clinical Manifestations:

1- Gastric irritation: The larvae's presence in the stomach causes inflammation, potentially leading to gastritis, ulceration, or superficial lesions.

2- Mild colic signs: In cases of heavy infestation, horses may show signs of discomfort such as mild colic, weight loss, or poor appetite.

3- Secondary infection: In rare cases, secondary bacterial infections could develop at the sites of larvae attachment in the stomach lining.

Control

Methods for Controlling Gasterophilus intestinalis:

1. Fly Control and Prevention:

- Insecticidal sprays: There are topical insecticides that can help kill adult flies or repel them, reducing the chances of flies laying eggs on the horse.

- Fly traps: These are used around stables and pastures to trap adult flies and reduce the fly population.

- Environmental hygiene: Keeping the stable clean and removing manure regularly can help reduce the number of flies, as the flies lay eggs in horse feces.

2. Treatment of the Larvae:

• Anthelmintic medications: These are specifically designed to target bot larvae. Common anthelmintic treatments include drugs such as ivermectin and moxidectin, which are effective at killing larvae in the stomach or intestines. Treatment should typically be done after the flies have laid eggs but before larvae mature into adult bots.

3. Natural Prevention Methods

- Pasture management: Keeping horses away from areas with high numbers of bot flies can help reduce the risk of infection. Fly activity tends to be highest in the summer and fall, so limiting outdoor time during peak fly activity can be beneficial.

- Bot fly repellents: Some herbal or natural repellents may help deter the flies from laying eggs on the horse.

4. Monitoring and Regular Veterinary Care

- Regular check-ups: Horses should be regularly examined for signs of bot infestations, such as stomach ulcers or signs of gastrointestinal

distress. This helps ensure prompt treatment if necessary.