

# Genus : Habronema

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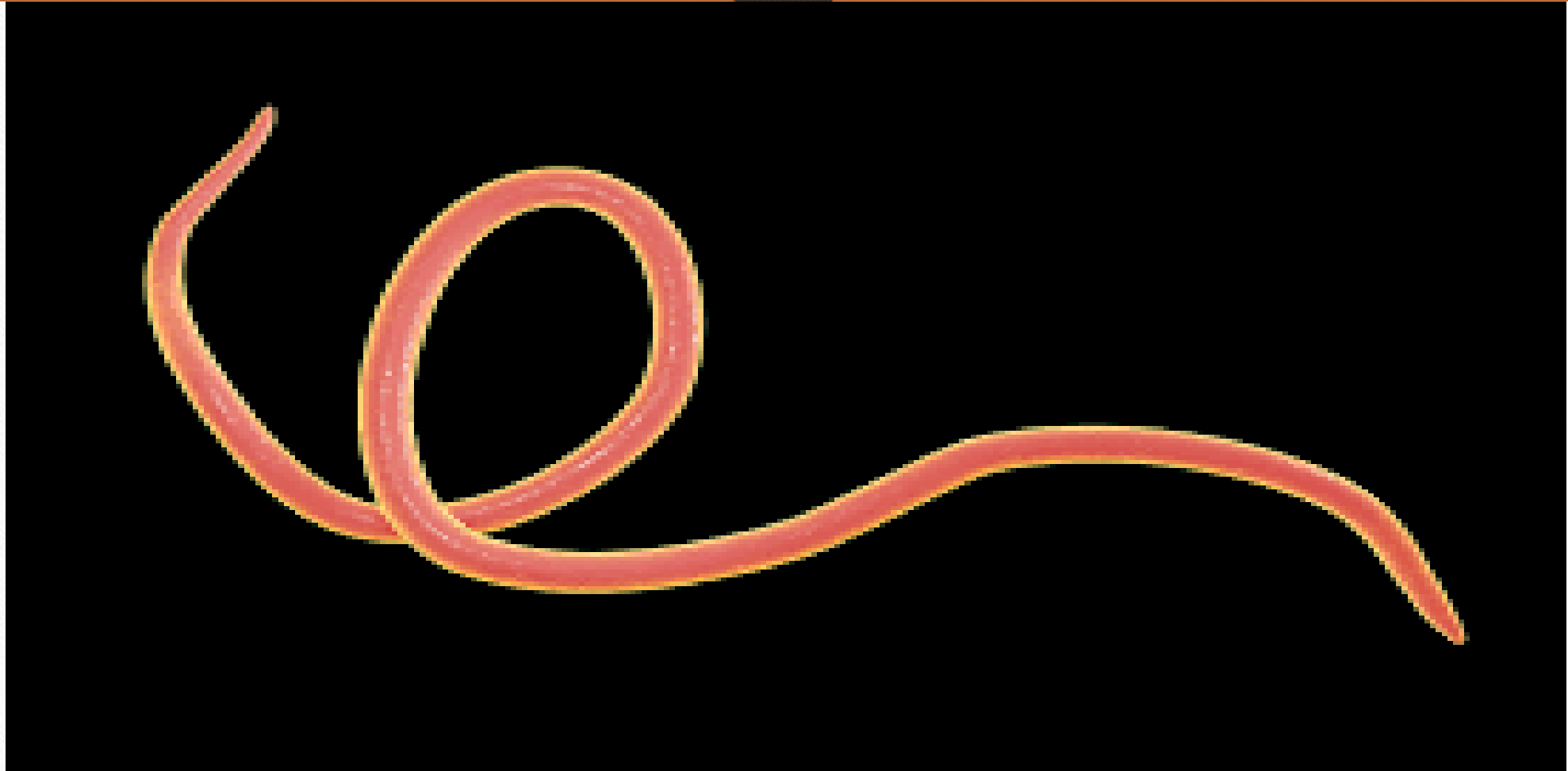
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# Habronema : Morphology

- *Habronema* commonly known as stomach worm found in horses.
- Adult has two lateral lips, dorsal and ventral lips may also be present.
- Buccal capsule cylindrical and chitinous.
- Oesophagus is divided into two parts, a short anterior muscular and long posterior glandular portion.

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- Intestine is simple without any diverticula.
- The male have unequal spicules, gubernaculum present and bears 4 pairs of preanal, 1 pair adanal and 2 pairs of postanal pedunculated papillae, 3 pairs of sessile papillae also present,
- Male have also a spirally twisted tail.



Source- google

*Habronema megastoma*

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Source- google

*Habronema megastoma*

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*Draschia spp.*

# *Draschia megastoma*

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# Habronema : Life cycle

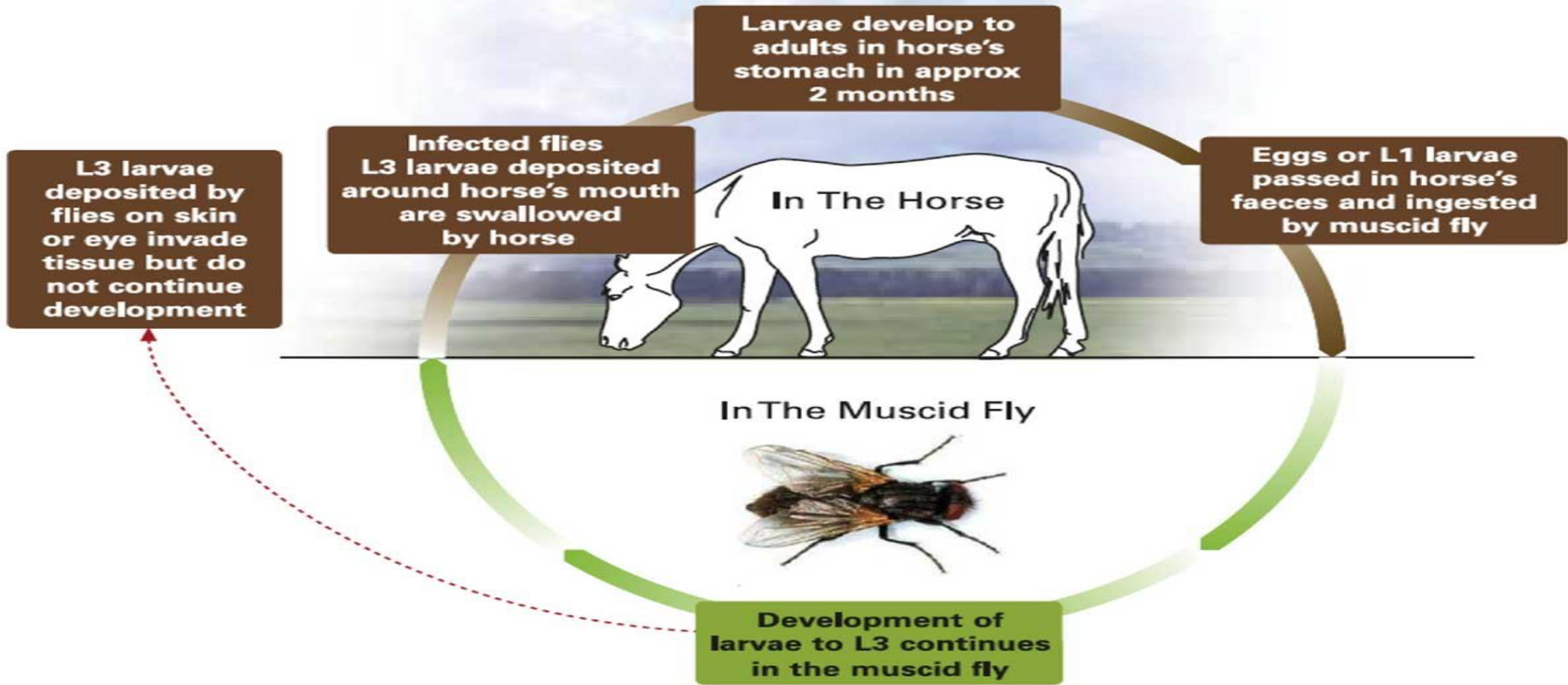
- They have an indirect life cycle, with intermediate hosts mainly-  
Houseflies (*Musca domestica*) - *Habronema muscae* and *Draschia megastoma*  
Stable flies (*Stomoxys calcitrans*) - *Habronema microstoma*.
- Adult female worms lay eggs or release L1-larvae in the stomach of the horses that are passed with the feces.
- These larvae are ingested by fly maggots found in the horse manure. They further develop to infective L3 larvae inside the maggots within about 2 weeks.
- The fly maggots complete their development to adult flies. The infective L3 larvae migrate to the mouth of the flies from where they are deposited on the final host (horses, donkeys, etc.) visited by the flies.

## Habronema : Life cycle...contd

- They are often deposited on humid parts of the host's body (eyes, nose, lips, genitalia, open wounds, etc.) to which many flies are attracted.
- The infective L3 larvae swallowed by final host and get into the stomach where they complete development to adult worms within about 2 months.

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- Infective L3-larvae can also infect the hosts if they swallow flies (e.g. with the food), or while grooming when they lick their own wounds infected with L3-larvae.
- The occurrence of the flies is seasonal, strongly depends on climatic conditions (temperature, humidity, etc.), The peak seasons for infections is summer and early autumn.



# Habronema life cycle





Source- google

*Musca domestica*, the transmitting agent

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Source- google

*Stomoxys calcitrans*, the vector

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Source- google

## Transmission of Habronema by flies

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# Habronema : Pathogenesis

- Adult as well as young horses are equally affected.
- Adult worms in the stomach (**gastric habronemiasis**) of horses are usually not very pathogenic in light infection.
- A massive infections causes gastritis, colic, and other digestive disorders resulting in weight loss.
- *Draschia megastoma* can causes tumor-like swellings in the stomach wall that can burst and cause fatal peritonitis, but this is rather unusual.
- Infective L3-larvae deposited on the eyes cause **ocular, ophthalmic** or **conjunctival habronemiasis** resulting into inflammation of the eyelids e.g conjunctivitis.  
Infective .
- Small, hazelnut-like nodules can appear around the bronchi.

# Habronema : Pathogenesis...contd

- L3-larvae deposited on skin wounds produce called skin or **cutaneous habronemiasis**, also known as "**summer sores**".
- They produce granulomatous skin reactions (erosions, swellings, etc.) that cause strong itching and Such infected wounds are difficult to heal, can become infected with secondary bacteria and may attract other fly species that can cause myiasis (e.g. screwworms).
- Occasionally, infected L3-larvae deposited on the nostrils can migrate into the lungs of the host and cause **pulmonary habronemiasis**.
- Affected horses may show chronic cough, difficult breathing and reduced performance.



Source- Google

## Summer sore in abdominal region

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# Summer sore

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## Summer sore

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# Equine cutaneous habronemiasis

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# Occular habronemiasis

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## Habronemiasis in hoof

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# Habronemiasis in prepuce region

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# Non-healing granuloma

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# Non-healing granuloma

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# Habronema : Diagnosis

- Clinical signs and symptoms by observing non-healing skin wounds showing reddish to brownish color and containing rice-grain-like calcified material are typical for skin habronemiasis
- Diagnosis of gastric infections is difficult because the small eggs or L1-larvae ~~passed in the feces are easily missed in fecal examinations.~~
- Larvae may be found in scrappings of such wounds.



Source- Google

# Habronemosis

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# Habronema : Prevention & control

- We can minimize the risk of infection by adequate manure management to break the life cycle of the worms.
- Regular manure removal in stables can significantly reduce the fly populations and make it less suitable for maggot development.
- Repellents that keep flies away from horses can also be used, but most of them have a very short effect, only hours or a few days.