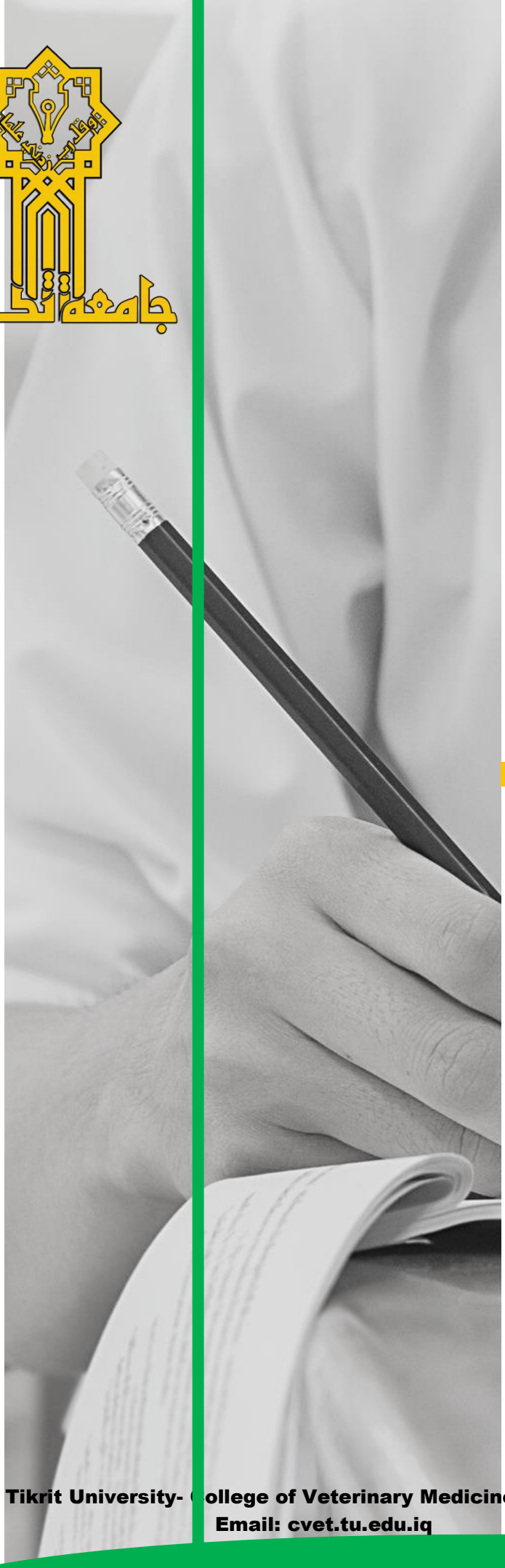

Tikrit University
College of Veterinary Medicine

Nematoda

Subject name: Parasites

Subject year:2024

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Lecture number: 2

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SCAN ME

Lecturers link

Phylum: Nematoda

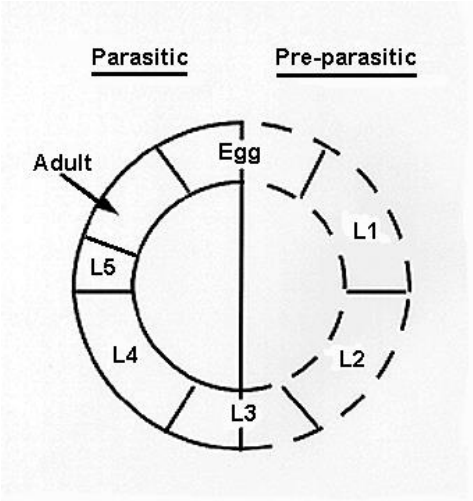
Basic Features:

- Roundworms get their name from their round cross section
- Long thread-like bodies
- Usually very small to microscopic, some parasitic members however may be a metre long
- Simple tube-like gut with a mouth and anus
- No circulatory system, gas exchange and excretion are by diffusion across the body wall
- There is very little superficial difference between nematode species, they all look pretty much like larger or smaller, somewhat fatter or skinnier versions of each other
- Sexual reproduction, sexes separate, no asexual reproduction. Males are usually smaller than the females, the females of some species can deposit over 100,000 eggs per day.

Basic Nematode Life Cycle

- Despite the diversity and complexity of many nematode life cycles, all of them can be related to the same basic pattern.
- This pattern is illustrated by the adjacent figure and consists of two phases, **parasitic and pre-parasitic**.
- **The parasitic phase** takes place inside the definitive host while the **pre-parasitic phase** occurs either as a freeliving phase in the external environment **or** inside a second host, called an intermediate host.

- This basic life cycle also consists of **seven stages**, an egg, four larval stages (L2, L2, L3, L4) and two adult stages comprising separate males and females.



Family : Ascaridae

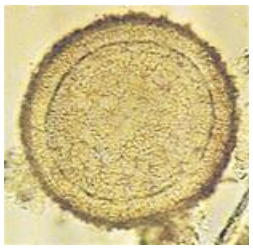
Parascaris equorum

found in the small intestine of equids, especially <2 year olds.

Main properties

Males can reach up to 28 cm length, females up to 50 cm. They have a whitish color and a translucent aspect, and look very much like cooked spaghetti. As in other roundworms, the body of these worms is covered with a **cuticle**, which is flexible but rather tough. It forms two characteristic wing-like projections (cervical alae) in the anterior end. The worms have a tubular **digestive system** with two openings, the mouth and the anus. The mouth has three rather large lips. They also have a **nervous system** but **no excretory organs** and **no circulatory system**, i.e. neither a heart nor blood vessels. The female **ovaries** are large and the uteri end in an opening called the **vulva**. Males have a copulatory bursa with a **single spicule** for attaching to the female during copulation.

The **eggs** are almost spherical, about 90x100 micrometers, and of a brownish color. They have a thick and pitted membrane and contain mostly a single cell (zygote).



Life cycle

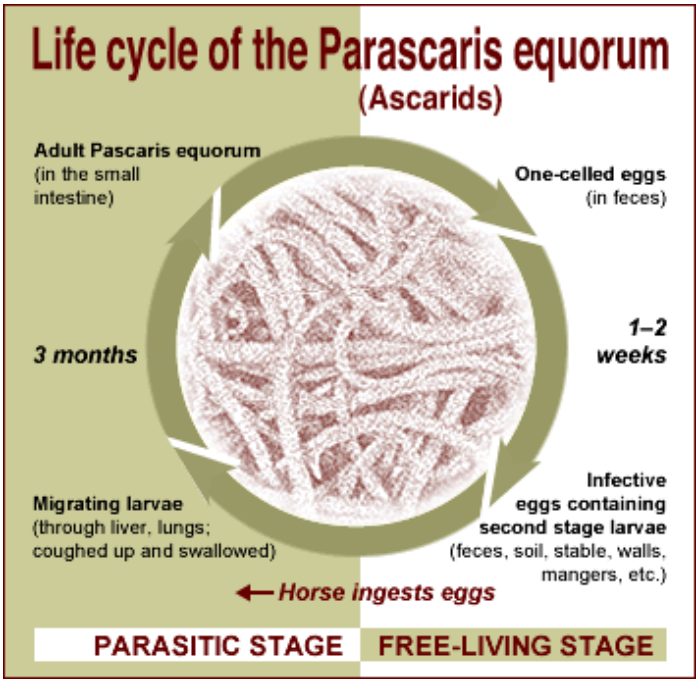
Parascaris equorum has a **direct life cycle**, i.e. there are no intermediate hosts involved. A single female worm can shed more than 150'000 eggs daily, and up to 60 millions yearly.

*Foals become infected after ingesting embryonated **eggs** containing **L2** larvae.

*Larvae emerge from the eggs in the gut, penetrate the gut's wall and are carried to the lungs through the bloodstream or the lymphatic system.

*There they cross the alveolar wall and get to the trachea where they molt to **L3** larvae and migrate further or are coughed to the mouth, to be swallowed. This migration may takes 2 to 3 weeks.

*Once swallowed they reach the small intestine where they molt twice to complete development to **adult worms**, mate and the females start producing eggs. The life span of adult worms in the intestine is about 12 months.



Pathogenicity and clinical signs

Parascaris equorum **can be very harmful to foals**, even fatal. Foals are particularly susceptible to acute infections during the first 6 months after birth but the disease can become manifest in foals of up to 2 years of age.

In adult horses infections are not or only mildly pathogenic because they become immune after exposure. Adult horses may develop a chronic infection with mild or no clinical signs, but remain infected and a source of eggs that will contaminate their environment.

Migration through the **lungs** can cause, cough, fever, difficult breathing (dispnea), loss of appetite and disturbed development. A typical symptom is chloroform smelling of the exhaled air. Secondary infections may also occur. In the gut severe infections can cause enteritis characterized by diarrhea, colic and loss of appetite. Obstruction of the bile duct and even

of the intestine is possible. Gut perforation and peritonitis with fatal outcome may also occur.

Diagnosis

Is based on detection of typical eggs in the feces. However, this works only once adult worms have started shedding eggs in the small intestine, not if the worms have reached only the lungs.