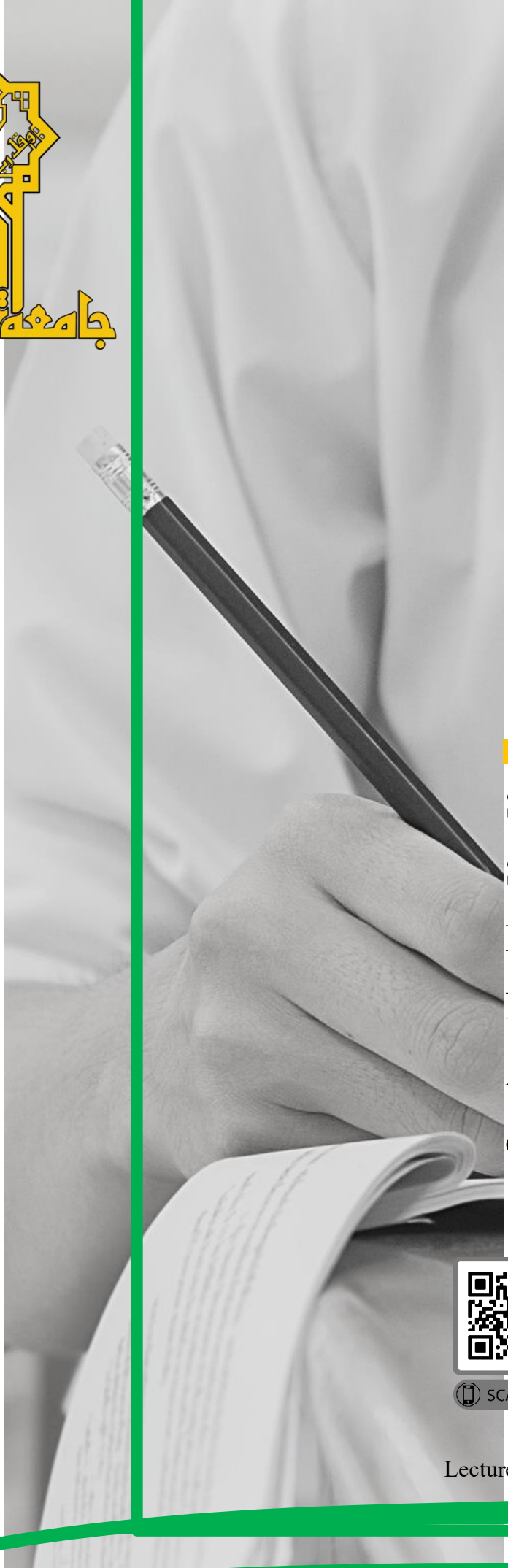

Tikrit University
College of Veterinary Medicine

Nematoda

Subject name: Parasites

Subject year:2024

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Lecture number: 3

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SCAN ME

Lecturers link

Family: Ascaridiidae

Ascaridia galli

Ascaridia is a genus of parasitic roundworms belonging to the ascarids that infects chickens, turkeys, ducks, geese, grouse, quails, pheasants, guinea fowls and other domestic and wild birds. They occur worldwide and are very common in chicken.

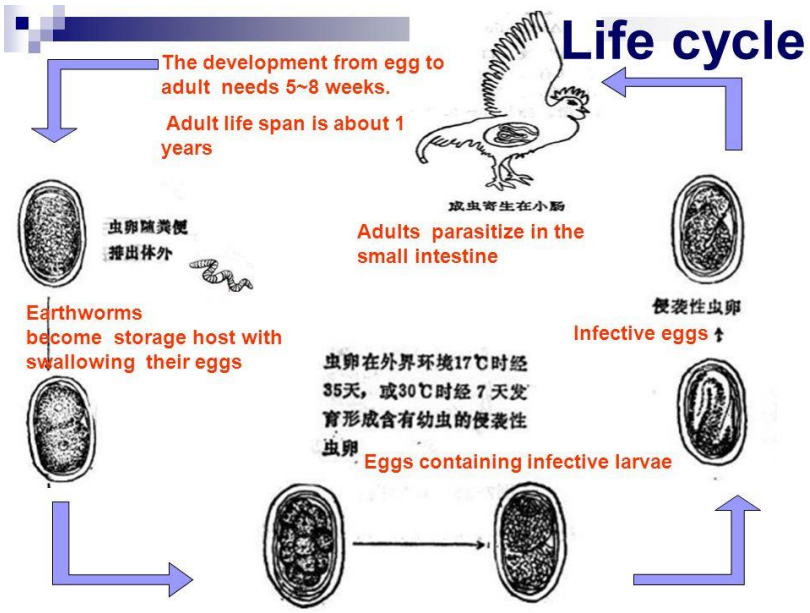
Main properties

It is the largest nematode in birds. The body is semitransparent, creamy-white and cylindrical. The anterior end is characterized by a prominent mouth, which is surrounded by three large tri-lobed lips. The edges of the lips bear teeth-like denticles. The body is entirely covered with a thick proteinaceous structure called cuticle. and cuticular alae are poorly developed. Two conspicuous papillae are situated on the dorsal lip and one on each of the subventral lips. These papillae are the sensory organs of the nematode.

A. galli is diecious with distinct sexual dimorphism. Females are considerably longer and more robust, with vulva opening at the middle portion (approximately midway from anterior and posterior ends) of the body and anus at the posterior end of the body. The tail end of females is characteristically blunt and straight. Males are relatively shorter and smaller, with a distinct pointed and curved tail.. There are also ten pairs of caudal papillae towards the tail region of the body, and they are arranged linearly in well-defined groups such as precloacal (3 pairs), cloacal (1 pair), post-cloacal (1 pair) and subterminal (3 pairs) papillae.

Life Cycle

1- The life cycle of A.galli is direct, involving two principal populations; the sexually mature parasite in the gastrointestinal tract and the infective stage (L3) the in form of a resistant egg in the environment.
2- **The eggs** are passed with the faeces of the host and develop in the open.
2- The infective stage (L3) is reached in 10 to 20 days or longer depending on temperature and relative humidity.
3- **Occasionally, earthworms** can ingest *A.galli* eggs and transmit these to chickens, but this is not the principal route of transmission.
4- The life cycle is completed when the infective eggs are ingested by new hosts through contaminated water or feed.
5- The eggs containing the **L3-larvae** are mechanically transported to the duodenum. The larvae are protected by the three layers covering the eggs until they reach the duodenum or jejunum, where they hatch within 24 hours.
6- During hatching the mature coiled larvae protrude the anterior end of the egg through an opening in the shell moving out to the lumen of the intestine.



Pathogenicity

The nematode infects fowl of all ages, but the greatest degree of damage is often found in young birds under 12 weeks of age. Heavy infection is the major cause of weight depression and reduced egg production in poultry husbandry. In severe infections, intestinal blockage can occur. Unthriftiness, drooping of the wings, bleaching of the head and emaciation. It also causes loss of blood, reduced blood sugar content, increased urates, shrunken thymus glands, retarded growth and greatly increased mortality. In heavy infections, adult worms may move up the oviduct and be found in hens' eggs, and sometimes they are also found in the birds' feces

Diagnosis

It is based on detection of typical eggs in the feces and/or on identification of the worms after necropsy.

Treatment

Piperazine is the drug of choice

Family: Oxyuridae

Oxyuris equi

Oxyuris equi is a species of parasitic roundworms that infects horses and other equids (e.g. donkeys, mules, etc). They are found worldwide but prevalence varies from region to region.

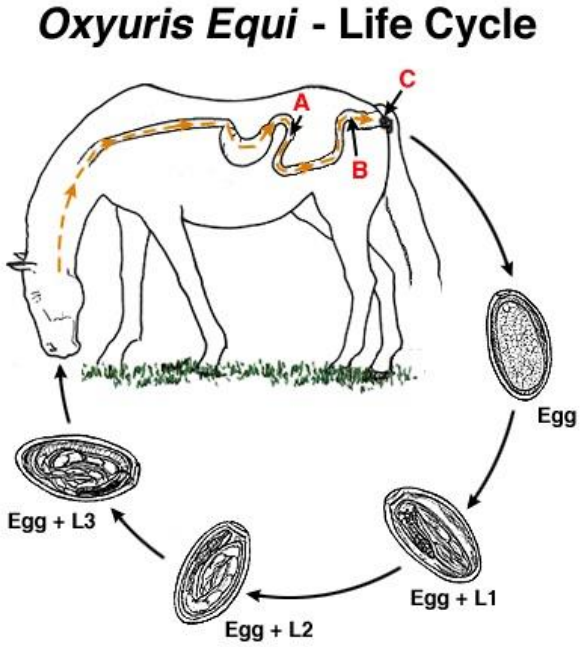
Main properties

Adult *Oxyuris* female worms are a to 150 mm long with a very long pin-like tail of variable length. Males are much smaller, only 9 to 12 mm long. Typical for this species is the long pin-like tail. The worm's body has a whitish color and is covered with a **cuticle**, which is flexible but rather tough. The female **ovaries** are large and the uteri end in an opening called the **vulva.** Males have only one rather long chitinous **spicule** for attaching to the female during copulation.

The **eggs** measure about 40x90 um, are elongated, slightly flattened on one side, have a thick envelope and an operculum at one of the poles. Infective eggs contain mostly a single larva often coiled.

Life cycle

Adult female worms migrate out of the anus and lay eggs on the perianal skin. The eggs, which are covered with a sticky fluid, adhere to the area. Depending on temperature, the eggs embryonated and become infective in 3 to 5 days. The host animal may increase the severity of its infection by biting at the larvae and ingesting them. Eggs can also drop into feed and water, and be ingested as a result. Ingested larvae penetrate the lining of the colon, where they feed on the mucosa. Maturity is reached in 4 to 5 months.



Clinical signs

Some ulceration in the intestine can result from the feeding of larvae on the mucosa. Most of the clinical significance results from the intense itching caused by the sticky fluid surrounding pinworm eggs. In addition to loss of condition and poor appearance, horses suffer from self-inflicted wounds resulting from biting and scratching. Such wounds are subject to secondary bacterial infection. Severe cases can lead to nervousness and anorexia. Rubbing and scratching of the perianal region causes irritation, dull hair coat and loss of hair – a condition known as rat-tail.

Diagnosis

Masses of whitish-yellow eggs may be seen in the perianal region. Transparent adhesive tape can be used to collect eggs for microscopic examination

Treatment

Cleanliness and frequent changes of bedding will restrict reinfection.
Treatment will eliminate intestinal worms.

Family: Heterakidae

Heterakis gallinarum

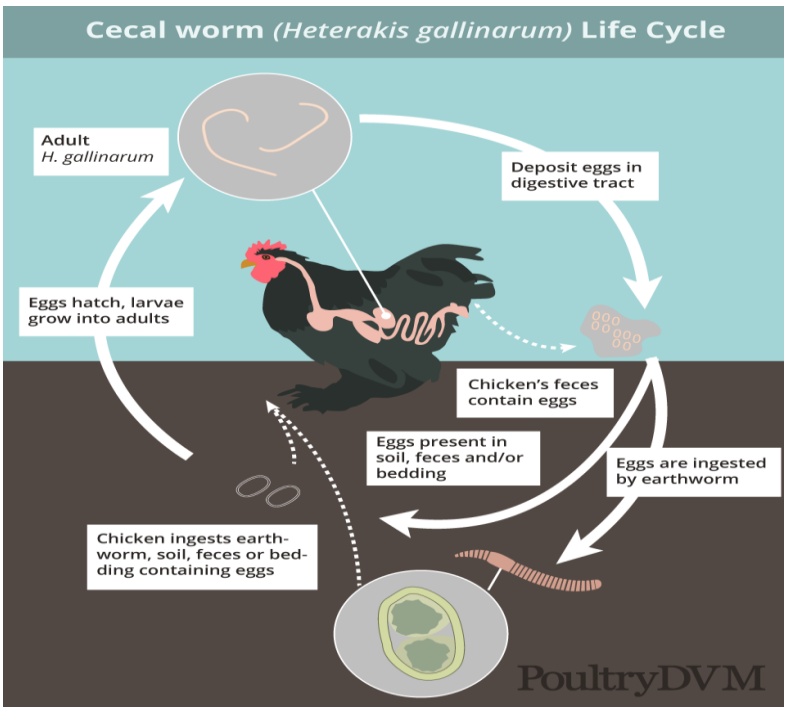
Heterakis gallinarum is a nematode parasite that lives in the cecum of some galliform birds, particularly in ground feeders such as domestic chickens and turkeys. It causes infection that is mildly pathogenic. However it often carries a protozoan parasite *Histomonas meleagridis* which causes of histomoniasis, blackhead disease

Main properties

Heterakis gallinarum has a typical roundworm morphology with features such as a cuticle, an esophagus ending in a valved bulb, and three papillae-lined lips and alae. Alae, which run almost the entire length of the body, are ridges formed by the thickening of the cuticle that may act as receptors for molecules which stimulate reproduction. Adult female and male cecal worms differ in length, with the female (10 to 15 mm) generally being larger than the male (7 to 13 mm). Both sexes have a pointed tail, males having a precloacal sucker at the posterior end. The eggs of H. gallinarum are approximately 65-77 by 35-48 μm, with visibly thick, smooth shells.

Life cycle

The eggs develop to the infective stage in 12 to 14 days at 22 C and can remain infective for 4 years in soil. Infection occurs when eggs are eaten. The second stage juveniles hatch in the gizzard or duodenum and pass down to the ceca. Most complete their development in the lumen, but some penetrate the mucosa, where they remain for 2 to 5 days without further development. Returning to the lumen they mature, about 14 days after infection. If eaten by an earthworm, the juvenile may hatch and become dormant in the worm's tissues, remaining infective to chickens for at least a year.



Pathogenicity and clinical sign

In heavy infections the cecal mucosa may thicken and bleed slightly. Generally speaking, *Heterakis* is not highly pathogenic in itself. However, a flagellate protozoan, *Histomonas meleagridis*, is transmitted between birds within eggs of the nematode. This protozoan is the etiological agent of histomoniasis, a particularly serious disease in turkeys. The protozoan is eaten by the nematode and multiplies in the worm's intestinal cells, in the ovaries, and, finally, in the embryo within the egg. Hatching of the worm within a new host releases *Histomonas*. One parasite acts as a true intermediate host and vector of another.

Diagnosis

Commonly is through the presence of eggs in host feces.

Treatment

Effective treatment is by using mebendazole, which is normally distributed to a flock of birds in their food and water. In addition, rearing the birds on hardware cloth assists in the elimination this parasite. Free-range chickens can also be infected