Helminthic Endoparasites of Birds

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Acuaria hamulosa (nematode)

Other names: Gizzard worm.

Cause, transmission, and epidemiology: This worm has been reported in Africa, the Americas, Europe, and Asia. It is a nematode in the family Acuariidae. The male worms are 10-14 mm and the females are 16-29 mm long. They have long cuticular cordons, which are irregular and wavy, running 2/3 of the way down the body. The adult worms are found embedded in nodules or abscesses under the keratinized layer of the gizzard.

This species utilizes the grasshoppers, beetles, sandhoppers and weevils as intermediate hosts.

Clinical signs and lesions: Clinical symptoms are mild and characterized by emaciation, weakness, droopiness and anemia. The worm lives underneath the horny lining of the gizzard where it produces soft nodules in the musculature and this weakens the organ. It is associated with glandular degeneration, epithelial necrosis, and inflammatory cell infiltration.

Diagnosis: Presence of embryonated eggs in feces is indicative, but these needs to be differentiated from other spirurid eggs. Confirmatory diagnosis is at post mortem.

Treatment: There is no satisfactory treatment. The feasible control method is rearing the birds on wire.

Prevention: The feasible control method is rearing the birds on wire (off the ground).

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.

Endoparasites: *Ascaridia galli* (nematode)

Cause, transmission, and epidemiology: *Ascaridia galli* is a nematode parasite that causes ascariasis in chickens, guinea fowl, turkeys, geese and other wild birds worldwide. It lives in the small intestine. Adult worms are semi-transparent; males measure 50-76 mm, while female worms are 72- 16 mm long. Their oral opening has 3 large lips and the esophagus has no posterior bulb.

This worm has been reported worldwide. It has a direct life cycle, and earthworms may act as transport hosts.

Clinical signs and lesions: Light to medium infestations may be tolerated without clinical signs; however, heavy infestations may cause diarrhea, intestinal occlusion, intussusceptions, emaciation, anemia and death. There is reduction in egg production, and birds appear unthrifty. Lesions caused by this worm are cattarhal or hemorrhagic enteritis. They have been implicated in some cases of egg peritonitis.

Differential diagnosis: *Hartertia gallinarum*, which has been reported from southern and western Africa, and Asia.

Diagnosis: Diagnosis is through finding eggs in feeces or worms during post mortem.

Treatment: Piperazines work well.

Prevention: Separate young birds from old birds when kept in enclosures. Moisture levels and ventilation should be monitored.

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.

Endoparasites: *Capillaria* species (nematode)

Cause, transmission, and epidemiology: These are small, hairlike worms found in the digestive tract. They include: *Capillaria annulata, C. contorta, C. caudinflata, C. bursata, C. obsignata, and C. anatis*. *C. annulata* and *C. contorta* are found in the crop and esophagus. *Capillaria caudinflata, C. obsignata, C. bursata* and *C. anatis* are found in the intestine. The *Capillaria* species are cosmopolitan.

Capillaria caudinflata and *C. annulata* utilize earthworms as the intermediate hosts. *Capillaria obsignata, C. anatis* have a direct life cycle. *Capillaria contorta* may have a direct or an indirect life cycle.

Clinical signs and lesions: The birds appear weak and emaciated. *Capillaria contorta* and *C. annulata* cause catarrhal or croupous inflammation and thickening of the crop and esophagus. *C. caudinflata, C. bursata, C. obsignata and C. anatis* are associated with hemorrhagic enteritis and bloody diarrhea.

Diagnosis: Diagnosis is through detection of eggs in feces and worms during post mortem.

Treatment: Treatment can be achieved by use of Coumaphos and Febendazoles.

Prevention: Control and prevention is by separation of birds from possible transport and intermediate hosts, and effective cleaning of poultry houses and premises.

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.

Endoparasites: *Davainea proglottina* (cestode)

Cause, transmission, and epidemiology: The worm belongs to the family Davaineidae. It occurs in the duodenal loop, and is found in domestic fowl and other gallinaceous birds in most parts of the world. It has an indirect life cycle, with snails acting as the intermediate hosts.

Clinical signs and lesions: Clinical signs associated with this flatworm parasite are retarded growth, weakness, diarrhea, and nervous disorders characterized by partial or incomplete paralysis of the bird. It is the most pathogenic cestode in poultry, and is associated with nodules on the mucosa and haemorrhagic enteritis in heavy infestations.

Diagnosis: Diagnosis is made by accurate identification of the parasite during necropsy and demonstration of proglottides in feces of birds.

Treatment: Niclosamide is effective for treatment of this infestation.

Prevention: Improvement of sanitary practices and application of approved insecticides to the soil or litter in the premises which interrupts the parasite life cycle by destroying the intermediate host. Separate birds according to species and age groups where possible.

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.

Endoparasites: *Gongylonema ingluvicola* (nematode)

Cause, transmission, and epidemiology: This nematode belongs to the family Gongylonematidae. It is a thread-like worm. Adults are normally found embedded in the epithelium of the crop, esophagus, and sometimes the proventriculus. Male worms are 17-20 mm while females are 32-55 mm long. It is found in chickens, turkeys, partridges and quail. It has been reported in many parts of the world.The parasite has an indirect life cycle and utilizes beetles and cockroaches as the intermediate hosts

Clinical signs and lesions: This nematode parasite creates convoluted tracts in the crop wall. It causes a mild chronic inflammatory reaction with flattening, compression and cornification of the epithelium.

Diagnosis: Definitive diagnosis can be arrived at during post mortem. The parasite has cuticular thickenings, which are oval to round on the anterior aspect. The tail of the male worm has a number of papillae and spicules. The left spicule is slender and longer than the right one.

Treatment: There is no treatment for this infection.

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.

Endoparasites: *Heterakis* species (nematode)

Cause, transmission, and epidemiology: This genus belongs to the family Heterakidae. *Heterakis gallinarum* and *Heterakis isolonche* are important parasites of poultry in Africa. Other species in the genus are *Heterakis dispar,* which has been reported in ducks and geese, and *Heterakis brevispiculum,* found in chickens and guinea fowl. *Heterakis isolonche* has a direct life cycle, but earthworms may serve as a transport host.

Clinical signs and lesions: *Heterakis gallinarum* occurs in the caeca of chickens, guinea fowl, turkeys, ducks, and geese. These are small white worms with 3 lips in the mouth and the eosophageal bulb with a valvular apparatus. Its clinical effects are minimal, but heavy infections do cause thickening of caecal mucosa, petechial haemorrhages, and hepatic granulomas. This parasite is also the carrier of *Histomonas melegridis,* the causal agent for black head. *Heterakis isolonche* occurs in the caecum of chickens, quail, and pheasants. It causes diarrhea, wasting,

emaciation and death. Pathological lesions include confluent nodular (warty) thickening of the caecal wall.

Differential diagnosis: *Ascaridia galli* and other nematode worms. *Subulura* species (*S. brumpti, S. minetti, S. differens, S. strongylina,* and *S. suctoria)* are important as a differential diagnosis, but are not associated with any pathology.

Diagnosis: Diagnosis is made by finding eggs in feces. These eggs must be differentiated with those of *A. galli* and other related worms. Definitive diagnosis is arrived at post mortem by the presence of the worms.

Treatment: Treatment is by use of Phenothiazine.

Prevention: This infection can be minimized by strict sanitation in poultry houses.

Recovery: Once infested birds have shed parasite eggs into the environment, viable eggs will remain until they are removed, which is not feasible. So, after a flock has been infested, new birds cannot be raised on the ground without the risk of infestation. A wire or cement flooring must be introduced to remove or reduce risk to new flocks.