Parasites of Backyard Chickens

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Overview

- Susceptibility and pathogenicity of common parasites of the backyard chicken (*Gallus gallus*) may differ from those seen in other backyard bird species (eg, turkeys, peafowl); appropriate medication and dosages may also differ.[1]
  - This review focuses on how these parasites affect backyard chickens.
- A survey study of necropsied backyard chickens in southern California showed that parasitic infection was responsible for 5% of deaths.[2]
- Housing conditions, population density of birds, and introduction of new birds can affect the intensity of parasitism and subsequent disease.
  - Biosecurity practices are often limited and can contribute to risks.
  - In a survey of backyard flock owners in Colorado, 40% did not quarantine new birds.[3]
- Young birds are frequently more affected by parasites and should be separated from older birds.
- Veterinarians should educate backyard poultry owners about potential parasitic zoonoses.[4]
- The relative prevalence of these parasites varies geographically.
  - A local veterinary extension specialist or equivalent poultry veterinarian advisor can help educate veterinarians and backyard chicken owners on parasites commonly seen in their areas.

Ectoparasites

- Lice, fleas, and mites can enter backyard poultry premises via infected newly introduced birds, as well as on wild birds and rodents.[5,6]
- Removing wild bird feeders; keeping premises clean of feed; preventing contact with wild birds (eg, netting); and quarantining, testing, and treating new birds can reduce these exposures.
- Lice and mites are the most common ectoparasites of backyard fowl (see **Table**, next page).
  - The presence of these ectoparasites has been associated with poor weight gain, reduced egg production, and death.[7]
    - Studies have implicated ectoparasite-associated transmission of infectious agents.[8]
  - Heavy infestations are more likely to lead to negative effects on the host.
  - It is important to examine the cloaca for evidence of ectoparasites.
  - Interval treatment of the host and premises based on the parasite's life cycle length is necessary to resolve flock infestations.

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Table. Comparison of *Dermanyssus gallinae, Ornithonyssus* spp, & Poultry Lice

	Average life cycle length	*Location of life cycle*	*Diagnosis*	*Climate*	*Clinical signs*	*Zoonotic*
Dermanyssus gallinae	2 weeks*	In cracks and crevices of housing; only on host at night to feed	Small (1 mm), slowly moving, gray-to-dark red or black mites in premises	More abundant in warmer seasons	Dermatitis, anemia, restlessness at night	Yes
***Ornithonyssus* spp**	5-7 days	Mostly on host, mites can be transferred through fomites	Small (1 mm), slowly moving, gray-to-dark red or black mites, eggs, and dark excrement near cloaca	*O sylviarum* in cool and temperate climates; *O bursa* in warm and tropical climates	Dermatitis, anemia, poor condition	Yes
Poultry lice	2-3 weeks	Entirely on host	Relatively large (2-4 mm), quick-moving, light-brown insects and egg clusters at the base of feather shafts	More abundant during cooler seasons	Unkempt feathers; Amblycera can cause anemia and skin lesions	No

* In an unfed state, adult mites can survive for long periods of time.

Poultry Lice

- Lice commonly infest backyard chickens (**Figure 1**).
- All poultry lice are chewing lice, and chickens can host more than one species at the same time.[9,10]
- Although species in the Ischnocera suborder tend to only cause feather damage, members of Amblycera (*Menacanthus stramineus* and *M cornutus*) tend to chew on skin and feather quills, which causes blood loss and skin lesions.[10]
- In general, most species of lice are found on the abdomen (including the cloaca), breast, and back.
  - Some species can be found on the neck, wings, and tail.[9]
- During physical examination, note that the number of lice eggs found in clusters at the base of feather shafts can greatly outnumber adults.[11,12]

Dermanyssus gallinae (Red Poultry Mite)

- These mites feed on blood; heavy infestations can cause anemia, decreased weight, and death.[8]
- The parasite lives in cracks and crevices near the resting area of the chicken; it feeds at night.
  - Heavy infestations can alter where the chicken sleeps.[7]
  - Owners may need to retrieve specimens from housing or from chickens at night to determine infestation.
- Mites can increase in numbers quickly and survive for up to 34 weeks without feeding, which can require treatment of the premises.[13]
- These mites can feed on humans and can cause papular dermatitis.[14]

Ornithonyssus sylviarum (Northern Fowl Mite) & *O bursa* (Tropical Fowl Mite)

- Like the red poultry mite, these mites feed on blood and cause similar clinical signs.
- In one study, mites were found most commonly on the the cloaca, breast, and thighs (**Figure 2**).[15]
  - Mites are found less commonly on the head and neck.[15]
  - Mites, mite eggs, and mite excrement can be seen along the feather shafts.
- The entire life cycle occurs on the host within 5-7 days.[15]
  - Survival off the host is only 21 days, but this is long enough for mites to be transported through fomites.[13]
- Like *D gallinae*, this mite can also cause a self-limiting dermatitis in humans.[14]

Feather Mites

- This group of mites consists of many species in several genera that can infect a variety of wild and domesticated birds.
- Loss of feathers and skin lesions have been associated with species that feed on skin and quills, especially when mite numbers are high.
- These mites may be confused with *O sylvarium* because they feed and live on the host and can also cause skin lesions.[16]

1 **Poultry louse, 20× magnification. Lice species vary in size and shape, but the presence of antennae and 6 legs will help in identification of a louse. They are approximately 2 mm to 4 mm in length and can be visualized on the host with careful examination.**

2 ***Ornithonyssus* sp, 40× magnification. Fresh specimens will have a red/brown pigment from blood ingestion. At less than 1 mm in length, visualization of this mite is more difficult than visualizing lice on the host.**

3 ***Echidnophaga gallinacea*, 40× magnification. The anterior end of the head of the flea is flattened, which differs from the rounded head of the cat flea (*Ctenocephalides felis*). These fleas remain attached during feeding and may be confused with ticks.**

Knemidocoptes mutans (Scaly Leg Mite)

- These mites tend to cause disease in older chickens.
- Subtle signs of lifting of scales can be seen before crusting, thickening, and severe disfigurative disease of the legs occur.
- Deep skin scrapings of affected areas can recover small, round mites with short legs.[17]

Echidnophaga gallinacea (Sticktight Flea)

- Large numbers of fleas can cause death—especially in young chickens—from anemia and secondary infection from the bite lesions (**Figure 3**).
- Female fleas localize on the head and remain attached during feeding, which causes crusted lesions.[18]
- These fleas are more commonly seen in warm and humid regions.
- Wildlife, dogs, cats, and humans in the vicinity of infested flocks are also susceptible.

Other Ectoparasites

- Chickens able to roam in tall grass and wooded areas may be exposed to tick species as well as chigger mites (Trombiculidae).
- *Argas persicus* (fowl tick) is a soft tick that lives in the housing during the day and feeds at night; this can cause disturbances to chickens and alter where they sleep.
- Biting flies in large numbers can also be disruptive to chickens.

Endoparasites

- Backyard chickens are highly susceptible to endoparasites because of contact with soil that can harbor hardy parasite eggs and ingestion of potential intermediate hosts.
  - Prompt feces removal, pen rotation, and pest control can help reduce exposure.
- In a survey of backyard flocks in Michigan, only 1 of 12 flocks were free from intestinal parasites.[19]
  - The most commonly identified intestinal parasites by fecal examination were coccidia (**Figures 4** and **5**, next page), ascarids, and *Capillaria* spp (**Figure 6**, next page).[19]
- Fecal flotation, gross visualization of helminths in feces, and necropsies can be used to diagnose GI parasitic infections.

Eimeria spp (Coccidia)

- Coccidia caused more deaths than all other parasites combined in backyard chickens in California.[2]
- *Eimeria* spp infect different parts of the intestinal tract and cause varying clinical signs.
  - *Eimeria tenella* causes hemorrhage in the cecum.[20]
- Young chickens (<6 weeks of age) are more susceptible to disease and should be kept separate from older chickens or areas where other chickens have been housed during the past year.

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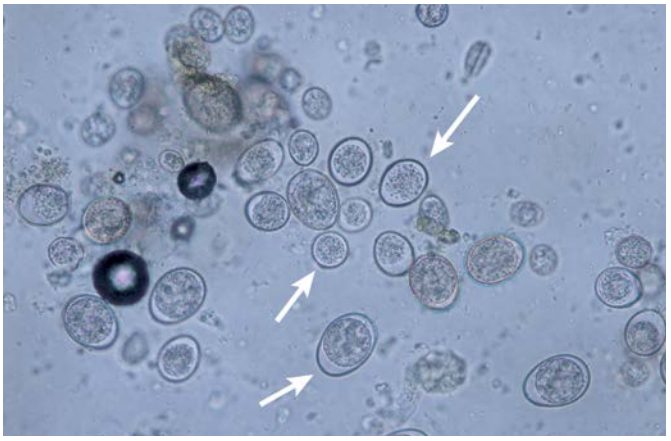

4 ***Eimeria*** **spp oocysts, 400× magnification. Several *Eimeria* species are present in this fecal flotation specimen.**

5 **Sporulated *Eimeria* sp oocysts, 1250× magnification. This infective stage is seen in feces that are not freshly collected.**

6 ***Ascaridia*** **sp (left) and *Capillaria* sp (right), 40× magnification. These 2 parasite eggs were detected by fecal flotation.** Photo courtesy of Michael W. Dryden, DVM, PhD, DACVM, Kansas State University.

- Coccidia are species-specific.
  - Different species of birds will be infected with different species of *Eimeria*.
  - *Eimeria* oocysts will occasionally be detected from fecal examination of cats and dogs that are exposed to the same environment as chickens.
  - These oocysts are ingested, but they do not infect these animals; they are passed in the feces unaltered.

Davainea proglottina, *Raillietina* spp (Tapeworms)

- Because of the transmission of these parasites by intermediate hosts (eg, ants, snails, slugs, beetles), the prevalence of tapeworms in backyard poultry has the potential to be high.[21]
- Tapeworms may number in the thousands in the small intestine, which can interfere with weight gain and potentially cause catarrhal enteritis.
- Motile tapeworm segments may be seen in the fresh feces.
- Cleaning of chicken manure and controlling pests can help reduce transmission.

Ascaridia galli (Roundworm)

- *Ascaridia galli* is one of the most common helminth parasites in free-range and backyard chickens.[22]
- In experimentally infected chickens, decreased weight gain was the most common clinical sign.[7]
- *Ascaridia galli* may increase the susceptibility of chickens to *Salmonella* spp infection through immune response disturbances and mechanical transmission by migrating larval worms.[23,24]

Heterakis gallinarum (Cecal Worm)

- This parasite is capable of transmitting the disease-causing protozoan *Histomonas meleagridis*.
  - Although mortality from *H meleagridis* mostly occurs in turkey and game birds, chickens can also be affected by this parasite.
  - Clinical signs are similar to coccidiosis.[25]
  - Clients should be advised to house their chickens separate from game birds.

Capillaria (Aonchotheca) caudinflata (Hair Worm)

- Moderate-to-severe infections can cause inflammation and sloughing of the intestinal epithelium.[26,27]

Syngamus trachea (Gape Worm)

- These worms live in the trachea and can cause airway irritation and obstruction.[26]

Management

- Depending on the size of the flock, a herd health approach to management of parasites and diseases may be more appropriate than elimination of parasites in individual birds.
  - Examination and parasite detection can be performed on a subset of birds using pooled samples.
  - Necropsy can help diagnose a parasite problem in the flock.
  - Consider submitting specimens to a diagnostician specialized in identifying chicken parasites.
- Advise clients to bring newly purchased birds for a thorough examination, and provide education about quarantine procedures.
  - A local extension service may provide educational materials on biosecurity for backyard-chicken owners.
  - A 30-day quarantine period is a good practice for avian infectious agents.
  - Clients should care for the quarantined birds last and use different shoes, clothing, and equipment.
- Even if the chickens are kept as pets, backyard flocks are still considered food animals, and appropriate withdrawal times should be followed for all approved medications.
  - A local veterinary extension specialist or equivalent poultry veterinarian advisor will be a good resource for advice on proper use of pesticides and pharmaceuticals. ■ cb

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