

Ectoparasites

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These are external parasites of poultry. Ectoparasites found on poultry are in the phylum *Arthropoda*, which is characterized by segmented bodies, jointed appendages and chitinous exoskeleton.

The phylum is divided into two classes: the *Insecta* that includes the orders *Phthiraptera* (lice), *Siphonaptera* (fleas) and *Diptera* (flies and mosquitoes); and the *Arachnida* with the order *Acarina* (ticks and mites).

Ectoparasites are very common in free-range systems, and usually controlled in commercial systems. These parasites may constitute a clinical problem; they can transmit a number of infectious diseases and can also act as transport/ intermediate hosts of a range of helminth parasites.

INSECT ECTOPARASITES: The insects that most often affect poultry are lice, fleas, mosquitoes, and other flies.

POULTRY LICE

All species of lice that affect chickens are in the suborder Mallophaga, and have mouthparts adapted for chewing. They feed on the epithelial debris of the skin of the host, or on feathers of birds. The meso- and metathorax are fused to form one piece behind the prothorax, which is a distinct and separate segment. Lice species affecting chickens are *Menacanthus stramineus*, *Menopon gallinae*, *Cuclotogaster heterographus*, *Lipeurus caponis*, *Goniodes gigas* and *Goniocoites gallinae*.

Occurrence:

1. *Menacanthus stramineus* (body louse)
2. *Menopon gallinae* (shaft louse of poultry)
3. *Cuclotogaster heterographus* (head louse)
4. *Lipeurus caponis* (wing louse)
5. *Goniodes gigas*
6. *Goniocoites gallinae* (fluff louse)

Etiological characteristics:

1. *Menacanthus stramineus* is relatively large, with adults about 3.5 mm in length. It occurs on those parts of the body which are not densely feathered, like the breast, thigh, and around the vent. Its palpi and four-segmented antennae are distinct. The abdominal segments have each two dorsal rows of medium-length bristles. The eggs have filaments on the anterior half of the shell and on the operculum.

2. *Menopon gallinae* occurs largely on the body, thigh, and breast feathers. The adult is about 2 mm in length and pale yellow in color. It has small palpi and a pair of four-segmented antennae folded into grooves in the head. The abdomen has a sparse covering of small to medium-length setae.

3. *Cuclotogaster heterographus* occurs on the head. It has a rounded body with a large, round head. The adult is about 2.5 mm in length. Three long bristles project from each side of the dorsal surface of the head. The abdomen is barrel-shaped in the female and more elongate in the male.

4. *Lipeurus caponis* is an elongated, narrow species, about 2.2 mm in length and 0.3 mm in width. It occurs on the underside of the large wing feathers and moves about very little. The legs are narrow and, characteristically, the hind legs are about twice as long as the first two pairs. There are characteristic small angular projections on the head in front of the antennae.

5. *Goniodes gigas* are large brown lice, about 3 mm in length, and occur on body feathers. The head is concave posteriorly, producing marked angular corners at the posterior margins, and carries two large bristles projecting from each side of its dorsal surface. Its antennae have five segments.

6. *Goniocoites gallinae* is the smallest lice found on poultry, with adults measuring 1 to 1.5 mm in length. The head is rounded, carrying two large bristles that project from each side of its dorsal surface. The antennae have five segments

Clinical signs: On the host, lice cause pruritus, scratching, excoriation, secondary feather damage (as birds pluck their feathers) and irritation, which lead to self-wounding and resultant formation of inflamed and scab covered skin. Chicken lice feed on dry scales, feathers, or scabs on the skin. As lice crawl over the bird, their mouthparts and sharp claws scratch the skin. This constant irritation causes the bird to become nervous and behave abnormally, causing a general unthriftiness and unkempt appearance. Infestation in birds also leads to a drop in egg production, decreased hen

weight, decreased clutch size, and death in young birds. *Menacanthus stramineus* can cause anemia by puncturing soft feather quills and feeding on the blood that oozes out.

Heavy infestations may cause feather damage and irritation but more importantly, are a sign of debility and poor husbandry. They can move directly between hosts or “hitch lifts” on hippoboscids flies.

Special Notes: Lice are permanent ectoparasites, spending their entire life cycle on their host. They tend to remain with single host bird throughout their lives; they are unable to survive for more than 1-2 days off their host. Eggs hatch in 5 to 7 days. Their life cycle from egg to adult is about 3 weeks. As many as 60 eggs are laid by adult female louse and are glued to the host feathers. A pair of lice may produce 120,000 descendants within a few months.

Diagnosis: This is based on clinical signs and identification of lice in plumage, and their eggs (nits) attached to feathers.

Treatment and control: Control of poultry lice requires treating the birds, since lice remain on the bird throughout its life. Birds may be sprayed, dusted or dipped with an appropriate insecticide like permethrin, carbaryl, malathion, or rotenone. Because lice live only a few days off the host, emptying a shed or yard for a week will clean it.

POULTRY FLEAS

Echidnophaga gallinacea (stick tight flea) is the only flea commonly affecting chickens. It may infest a wide variety of birds and mammals; poultry, rodents, rabbits, canids, felids, horses, and occasionally humans may all become infested. Poultry may develop clusters of the fleas around the eyes, comb, wattles, and other bare spots. *Echidnophaga gallinacea* are difficult to remove because their heads are embedded in the host's flesh and they cannot be brushed off.

Occurrence: *Echidnophaga gallinacea* is found in the tropics and subtropics.

Etiological Characteristics: Adults are approximately 1.5 to 4 mm in length, laterally flattened and are black to brown in color. Their head is sharply angled at the front. There are no genal or pronotal ctenidia. On the head behind the antennae are two setae, and in females, a well developed occipital lobe. Thoracic segments are narrowed dorsally. Mouthparts appear large, extending the

length of the forecoxae and projecting from the head conspicuously. The maxillary laciniae are broad and coarse.

Clinical signs: The adult fleas attach to the skin around the face and head, causing severe irritation, nodular formation, and in some cases, blindness. They can cause blood loss, anemia, and even death. The skin over the nodules often becomes ulcerated, and young birds may be killed by heavy infestations.

Special Notes: On fertilization, the female fleas burrow into the skin of the fowl, mainly on the comb, wattles and around the eyes of the birds, resulting in the formation of nodules in which eggs are laid. Hatching occurs within the nodules. The female lays up to 20 eggs at a time and about 400-500 total during her lifetime. Larvae drop to the ground to develop in soil around chicken cages, pupating in two weeks. Adult fleas emerge from pupae and are free-living until breeding occurs. Female fleas then attach to the host and lay eggs to complete the cycle.

Diagnosis: This is based on history, clinical signs, and identification of fleas or flea feces on birds.

Treatment: Managing fleas on birds requires an integrated approach. Both the host bird and the environment must be treated at the same time to be effective. Birds and surroundings should be sprayed with insecticide. Control the fleas by treating the birds, removing them from the infested area for three weeks, and treating the area (removing fecal droppings and litter, and spraying a suitable insecticide) and birds (again) before returning them. Domestic animals having contact with poultry should be treated at the same time. A range of insecticides can be used, namely; organophosphates, carbamates, pyrethrins, and pyrethroids for flea control on the birds.

