

External

Parasites

of

Poultry

TEXAS A&M UNIVERSITY
TEXAS AGRICULTURAL EXTENSION SERVICE
J. E. Hutchison, Director, College Station, Texas

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THE AUTHORS

Manning A. Price, Associate Professor, Department of Entomology
Philip J. Hamman, Associate Extension Entomologist
Weldon H. Newton, Extension Entomologist
TEXAS A&M UNIVERSITY

EXTERNAL PARASITES OF POULTRY

Texas poultry producers annually lose millions of dollars to external parasite damage resulting in sick and dead birds, higher feed costs, reduced gains, lowered egg production and carcass downgrading. Because a better knowledge of these parasites and their damage can aid in reducing poultry mortality and economic losses, this publication will review for the poultry producer the important external parasites found in Texas.

For specific control measures, see MP-691, Texas Guide for Controlling External Parasites of Livestock and Poultry.

TICKS

Fowl tick, *Argas persicus* (Oken)

The adult fowl tick ("chicken tick" or "blue bug") is flat, leathery, eight-legged, thin-bodied, eggshaped, reddish to blue-black and $\frac{1}{4}$ to $\frac{1}{2}$ inch long. The un-engorged nymphal stage is grayish with eight legs.

Distribution and hosts. The fowl tick, generally found in southern states, attacks practically all species of domestic fowls. Chickens seem to be preferred hosts, but it also attacks larger wild birds including turkeys and vultures.

Life history and habits. This pest usually winters as an adult or in the second nymphal stage. Eggs are deposited in poultry house crevices, ground cracks or any adult hiding place. After securing a blood meal, the adult female deposits eggs in small bunches of 25 to 245. During her lifetime she may deposit seven or more batches of eggs, with an average deposition of 600 to 700.

Eight to 21 days are required for eggs to hatch. The six-legged larvae locates a suitable host and engorges on blood for 4 to 10 days, then drops to the ground, crawls into a hiding place and molts in 5 to 7 days, transforming into the first eight-legged nymphal stage.

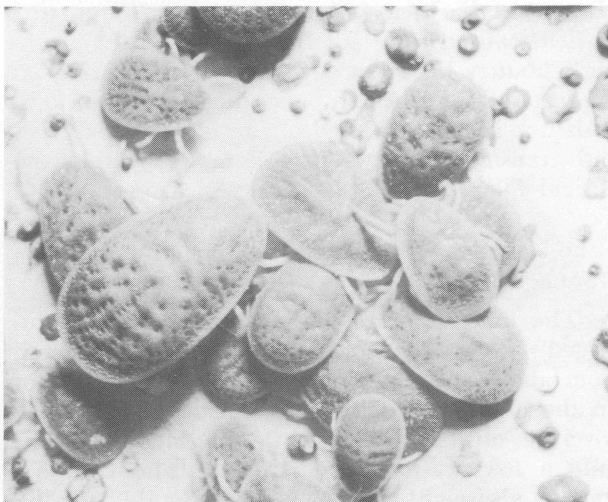


Fig. 1. Fowl ticks, commonly known as "blue bugs."

Nymphs usually feed upon the host at night or in subdued light, engorging with blood in 30 to 60 minutes. They leave the host and molt to the next nymphal stage in 7 to 12 days. There are usually two and sometimes three nymphal stages.

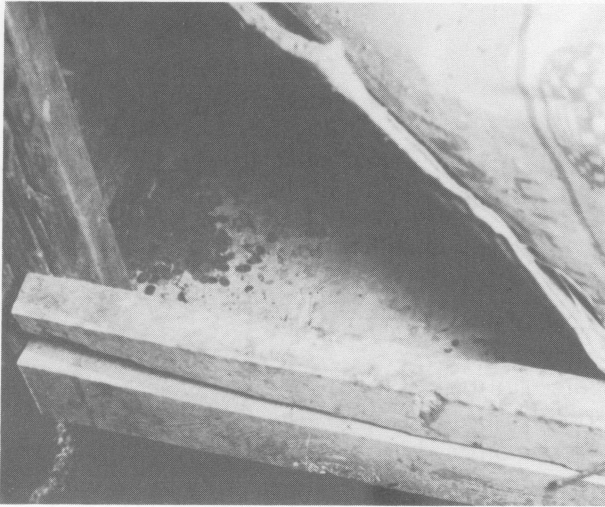


Fig. 2. Typical hiding place for fowl ticks.

Importance and nature of damage. Birds are weakened from blood loss and irritation and, when attacked by large numbers of ticks, may die. Ticks cause an unthrifty flock showing signs of dull, ragged plumage, diarrhea and poor production.

In some areas of the world, including the United States, the fowl tick transmits fowl spirochaetosis, a fatal disease of chickens, geese, turkeys, guinea fowls and other fowl. Symptoms of the disease are diarrhea, followed by a loss of appetite, ruffled feathers, pale comb and cessation of perching. Poultry lie down with their heads resting on the ground and usually die during convulsions. This tick is also suspected of causing fowl paralysis and transmitting fowl piroplasmiasis outside the United States.

Lone star tick, *Amblyomma americanum* (Linnaeus)

The lone star tick, chestnut brown and eight-legged, has a pear-shaped outline when viewed from above. The female has a pale whitish spot on the hindmost part of the scutum (a shield-like covering on the back), while the male exhibits only a few scattered pale spots. The nymphal stage is also eight-legged, but considerably smaller than adults and light to dark tan. The active six-legged larvae are straw-colored and smaller than the nymphal or adult stages.

Distribution and hosts. The lone star tick has a wide and scattered distribution in the southeastern and south central United States. Generally, it occurs from southern Iowa eastward to the Atlantic Coast and southward through East Texas and into Mexico. This species shows little host preference. It apparently attaches to any

warm-blooded animal it contacts. Larvae, nymphs and adults attack dogs, cattle, man, horses, hogs and other animals. Larvae and nymphs are prevalent on small mammals and birds, but adults rarely are found on these hosts. Larvae have been found on 40 species of birds including turkeys.

Life history and habits: This species is a three-host tick; it infests and leaves a host during each stage of growth. It prefers woodland or brushy areas. Females deposit 5,000 to 7,000 eggs which require approximately 32 days to hatch. The young, known as larvae or "seed ticks," crawl about actively in large bunches on the ground and climb on vegetation. When a host approaches, they attach themselves and feed 4 to 5 days. They leave the host and molt in 8-26 days into the eight-legged nymph. The nymphs feed on another host 3 to 5 days, then leave the host to molt to adult males and females in another 13 to 46 days. Adults infest a third host and females engorge 11 to 24 days during which time mating occurs. Females increase rapidly in size before dropping to the ground to deposit eggs. A life cycle requires about one year.

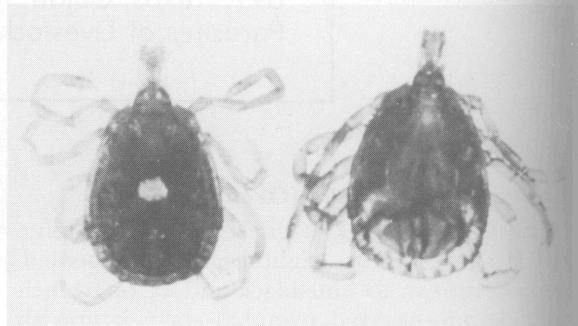


Fig. 3. Lone star tick. Left, unengorged female; right, male.

Importance and nature of damage. The lone star tick is economically important as an external parasite and as a vector of human diseases. Its mouthparts are long, allowing deep tissue penetration. Birds become droopy, anemic, listless and stop laying. In some areas the death of young chickens and turkeys has been attributed to attacks by larvae.

Gulf Coast tick, *Amblyomma maculatum* (Koch)

The Gulf Coast tick is narrower than the lone star tick when viewed from above. Both sexes are chestnut brown. Males have a series of white connected lines on the scutum and females have light and dark contrasting colors. Nymphs and larvae are similar to those of the lone star tick.

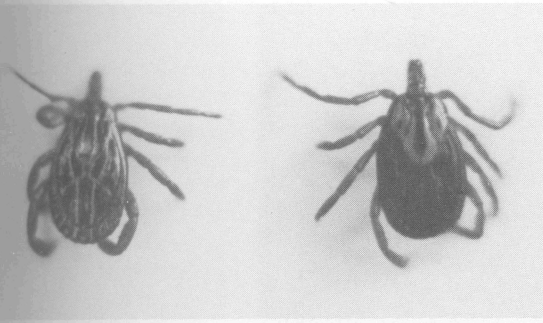


Fig. 4. Gulf coast tick. Left, male; right, unengorged female.

Distribution and hosts. The Gulf Coast tick is distributed along the Atlantic Coast from Virginia south through Florida and west along the Gulf Coast into Texas, ranging inland for about 150 miles. These ticks decrease in number further inland. Adults attack wild and domestic animals including dogs, cattle, horses, sheep, goats, wolf and man. Larvae and nymphs attack birds principally, but also are found on small mammals.

Life history and habits. Usually 15,000 to 19,000 eggs are deposited on surface soil, but occasionally the female places them in a shallow excavation. They hatch in 19 to 28 days. Larvae soon congregate on the lower surface of stems and leaves and remain inactive 1 to 2 days. They apparently are stimulated by animal odor and crawl to the edge of the leaf. If they fail to attach to an animal, they return to the plant base. While feeding on a host, larvae may crawl about individually, but are usually in small groups. The larval feeding period is 3½ to 7 days.

After engorging, larvae detach when the host is active during the day and hide in low vegetation. The motionless larva, glued into place by a wax-like secretion, molts in 9 to 12 days.

Activities of nymphs are similar to those of larvae except that they do not flock together. They remain concealed until a host approaches. When the host is near, they crawl in its direction, making temporary stops at terminal parts of the vegetation. After attaching to a host, nymphs engorge 4½ to 7 days and leave the host. The molting period is approximately 20 days during the summer. Nymphs that engorge in the fall and winter do not molt until spring. Longevity of the nymphs is 2 to 6 months.

During warm months adults live 7 to 8 months, but those passing the winter live longer. The male precedes the female in host-seeking activity. Adults attach almost exclusively inside the ear pinna of larger animals, but some may be found

outside the ear and occasionally on the neck. Adults engorge and mate in 4 to 7 days.

POULTRY LICE

Poultry lice are wingless, six-legged insects with a flattened body and broadly rounded head. Chewing mouthparts fitted with prominent serrated teeth are located on the ventral side of the head, just behind the apex. The legs are large and all species that live on birds have two claws on the distal end of each tarsus. The following are some of the more important species that have been reported on domestic fowls in the Americas:

Chicken head louse, *Cuclotogaster heterographa* (Nitzsch)

This common domestic chicken parasite is distributed worldwide. It is normally found in the head feathers and neck.

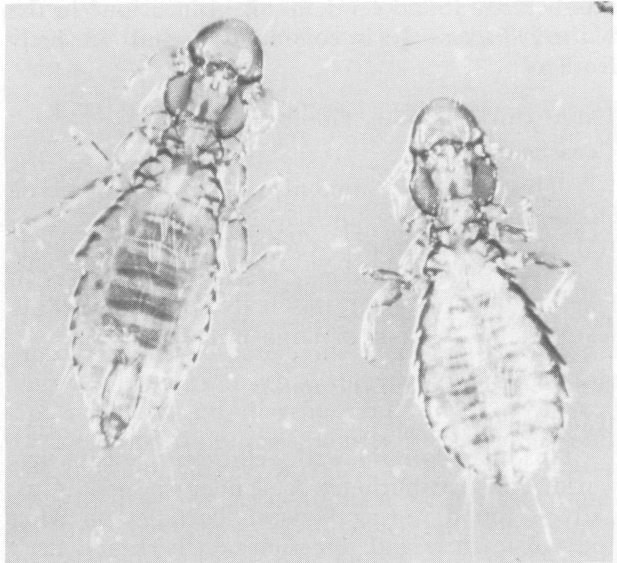


Fig. 5. Chicken head louse, *Cuclotogaster heterographa*.

Fluff louse, *Gonicotes gallinae* (DeGeer)

This species, common on domestic chickens, is distributed worldwide. One of the smallest poultry louse species, it is found most often in fluff at the base of feathers on the back and around the vent area.

Brown chicken louse, *Goniodes dissimilis* Denny

This common parasite of domestic chickens appears to have worldwide distribution. Limited

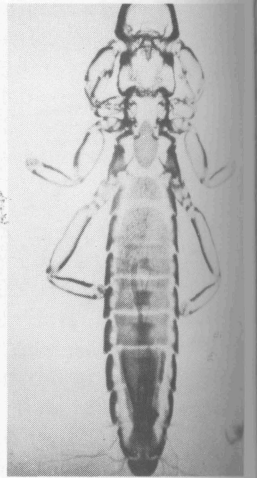
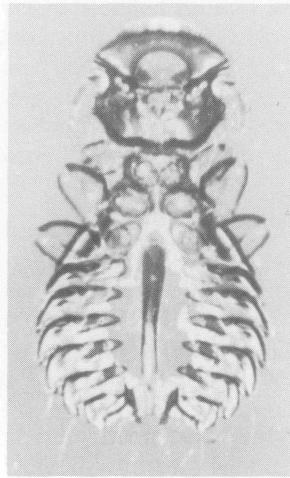
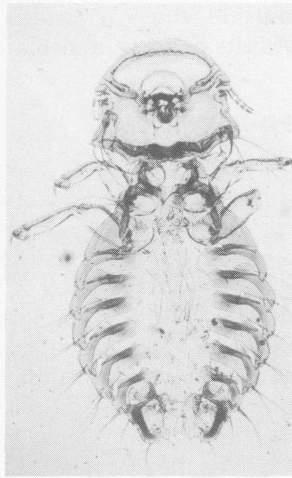


Fig. 6. Fluff louse, *Goniocotes gallinae*.

Fig. 7. Brown chicken louse, *Goniodes dissimilis*.

Fig. 8. Large chicken louse, *Goniodes gigas*.

Fig. 9. Wing louse, *Lipeurus caponis*.

numbers are found on domestic guinea fowl in the United States. It is commonly found on body feathers.

Large chicken louse, *Goniodes gigas* (Taschenberg)

This species commonly occurs on domestic chickens and guinea fowls in North America, Central America, Europe, Australia and Africa. It is a large louse which may reach 5 millimeters in length. It occurs on the body and among the feathers, but seldom in large numbers.

Wing louse, *Lipeurus caponis* (Linnaeus)

This common domestic chicken parasite has worldwide distribution. A slender species, it usually is found resting between barbules on wing and tail feathers and sometimes on back and neck feathers.

Chicken body louse, *Menacanthus stramineus* (Nitzsch)

This species, common on domestic chickens, turkeys and wild turkeys, is the most common louse found on chickens in Texas. Domestic guinea fowls, peafowls, quail and pheasants hatched by infested chickens are usually attacked. Occasional specimens are also found on domestic ducks and geese, but they do not appear to reproduce on these fowls. It is found where feathers are less dense, as around the vent.

***Menacanthus pallidulus* (Neuman) —**

No common name

This species has worldwide distribution and infests the domestic chicken. United States rec-

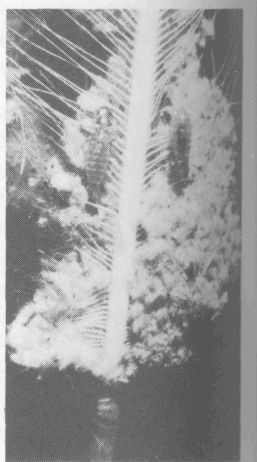
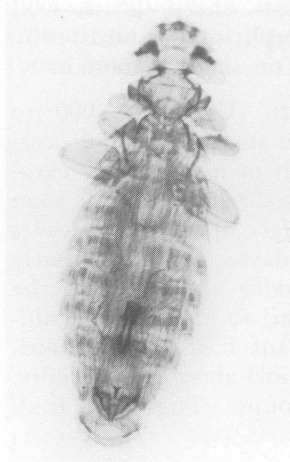


Fig. 10. Chicken body louse, *Menacanthus stramineus*.

Fig. 11. Chicken body lice and egg clusters near the base of a feather.

ords of this parasite are few because it often is identified as an immature chicken body louse.

***Menacanthus cornutus* (Schommer) —**

No common name

This species is common on chickens in Oklahoma and Alabama. It probably has been confused with *Menacanthus pallidulus*.

Shaft louse, *Menopon gallinae* (Linnaeus)

This species, common on domestic chickens and domestic guinea fowls, is worldwide in distribution. The shaft louse habitually rests on feather shafts but quickly runs onto the body when disturbed.

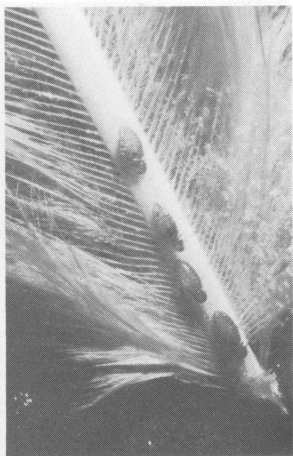


Fig. 12. Shaft louse, *Menopon gallinae*.

Fig. 13. Shaft lice in characteristic resting position on shaft of feather.



Fig. 14. Large turkey louse, *Chelopistes meleagridis*.

Fig. 15. Slender turkey louse, *Oxylipeurus polytrapezius polytrapezius*.

Large turkey louse, *Chelopistes meleagridis* (Nitzsch)

This common species usually is found on turkeys among body feathers, particularly those on the neck and breast.

Slender turkey louse, *Oxylipeurus polytrapezius polytrapezius* (Burmeister)

This species is found most frequently among the wing feathers of turkeys.

Life history and habits of poultry lice. Poultry lice generally become more abundant in summer than in cold weather, but all stages usually can be found on the host in winter. These chewing lice are permanent parasites, spending all life

stages, generation after generation, on the same bird. Normally they never leave the host's body, except when passing from one fowl to another, particularly from old to young birds. Eggs, cemented to the feathers, are oval in shape, generally white, and often beautifully ornamented with fine spines. Although laid singly, they may be abundant enough to form dense clusters on the fluffy feathers of badly infested chickens. Eggs hatch in a few days or weeks and young nymphs closely resemble parent lice except for being smaller and paler. They at once begin running about and feeding, and during the next few weeks pass through several molts, gradually assuming adult size, form and coloration.

Chicken head louse eggs hatch in 5 to 7 days, and the three nymphal instars require an additional 25 to 42 days to reach maturity.

The life cycle of the chicken body louse is slightly shorter. Eggs hatch in about a week and nymphs reach maturity after an additional 9 to 13 days. The chicken body louse fastens eggs to basal barbs on feather shafts, especially below the vent.

Eggs of the shaft louse, small body louse or common body louse are fastened to the base of feathers and hatch in 2 or 3 weeks.

Importance and nature of damage. Poultry lice do not suck blood. However, some species may ingest blood exuding from irritated areas or from young emerging feathers. Most species chew dry skin scales, feathers or scabs on the skin. Irritation from mouthparts and sharp claws causes a nervous condition that prevents sleep, causes appetite loss and diarrhea and makes weakened fowls susceptible to poultry diseases. Young chickens and turkeys brooded by lousy hens often are killed by the great numbers of lice that transfer from the hen to them almost as soon as they hatch from the eggs. The most serious effect upon older fowls is a reduction in egg production. Infested fowls are drowsy, have droopy wings and ruffled feathers, refuse to eat and gradually become emaciated. When the feathers are parted, lice can be seen running about on the skin in great numbers, particularly below the vent, on the head and under the wings. In Texas, the head louse and chicken body louse are the most important species on domestic chickens.

POULTRY MITES

Many types of mites attack poultry. They vary in size and structure, but usually are small with mouthparts located on the anterior end of the body. They breathe by air tubes or directly through the body surface. There are usually no clearly defined body divisions.

Mites usually are found on or under skin or feathers, but a few may be found in body tissues, feather quills or body passages such as the air sac. Stages consist of adult males and females, eggs, six-legged larvae that may or may not feed and usually two eight-legged nymphal stages, both, or in some cases only one, of which feed.

These mites usually live by piercing the skin or tissue and sucking out blood or body fluids, or by biting bits of skin or feathers. This irritation and injury may kill fowls. Some species transmit serious and often fatal disease-producing organisms.

Chicken mite, *Dermanyssus gallinae* (DeGeer)

Distribution and hosts. This mite occurs in tropical and temperate zones where domestic fowl or caged birds are kept. All kinds of domestic poultry and many wild birds are attacked.

Life history and habits. Mites feed during two nymphal stages and several times as adults. They feed at night or in subdued light under natural conditions. Setting hens may be attacked during the day. Eggs are rarely deposited on the host. Each female lays several batches of three to seven eggs, or about 32 eggs during her lifetime. Mites may survive 4 to 5 months in empty poultry houses during summer and longer during winter. Eggs hatch in 2 to 3 days and the non-feeding larvae develop in 1 to 2 days. The first and second nymphal stages last 1 to 2 days each and the second nymphal stage feeds as soon as it molts. The female usually deposits eggs 1 day after feeding. The complete cycle may require only 7 days, but during cool weather it may require 6 weeks or more.

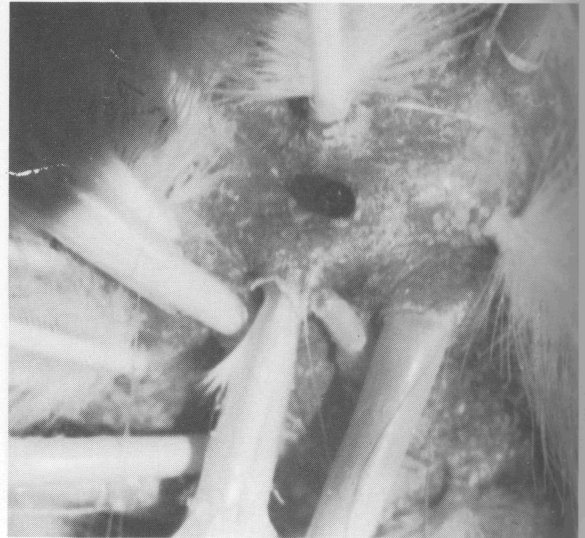


Fig. 17. Chicken mite attached to host.

Importance and nature of damage. These parasites suck blood and, when present in large numbers, lower the vitality of poultry and cause anemia from blood loss. Egg production may be reduced, depending on the number of mites present. Young chickens and setting hens may die from blood loss if the infestation becomes severe. Infested fowls show a grayish to blackish feather discoloration. Feathers may become matted and frequently scabs form, especially around the vent. This mite also is a vector of fowl spirochaetosis.

Northern fowl mite, *Ornithonyssus sylviarum* (Canestrini and Fanzago)

Distribution and hosts. This mite occurs throughout the entire temperate regions of the



Fig. 16. Chicken mite, *Dermanyssus gallinae*, off host.



Fig. 18. Northern fowl mite, *Ornithonyssus sylviarum*.

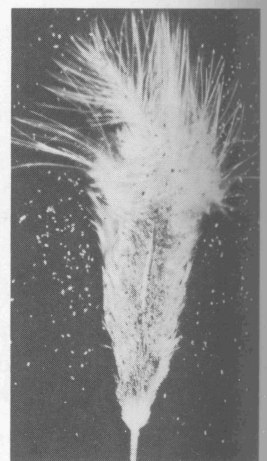


Fig. 19. Feather showing heavy northern fowl mite infestation.

world. It attacks domestic fowl and many wild birds.

Life history and habits. Eggs are deposited primarily on the host. Adult mites spend most of their lives on the host, but during heavy infestations may be found on debris in the nest, on roosts, in cracks and on poultry house walls. They usually live on the host, but may survive 2 or 3 weeks at room temperature, off the host.

Eggs hatch in 1 to 2 days and the non-feeding larval stage develops in less than a day. The first nymphal stage (protonymph) feeds twice and develops in 1 or 2 days but the second nymphal stage (deutonymph) does not feed and develops in less than a day. The complete cycle may be as short as 5 to 7 days.

Tropical fowl mite, *Ornithonyssus bursa* (Berlese)

Distribution and hosts. This mite is widely distributed throughout warmer regions of the world. In the United States it occurs from New York to Florida and Texas. Poultry, pigeons, sparrows and other birds are hosts.

Life history and habits. Eggs are deposited on the host or in the nest. Many eggs are found in the fluff of feathers, especially around the vent. Adults probably feed intermittently since they spend considerable time on the host. They normally are found only on the host or in nests and can live only about 10 days off bird hosts.

The entire life cycle is not known. Eggs hatch in about 3 days and the non-feeding larval stage completes its development in about 17 hours. The first nymphal stage develops in 1 to 2 days, but the development period for the second nymphal stage is unknown.

Scaly-leg mite, *Knemidocoptes mutans* (Robin and Lanquentin)

The female is small with a round body and short stubby legs. Only 1/50 to 1/100 of an inch long, they must be magnified to be seen. Young are at first six-legged and development from that point is simple metamorphosis through two eight-legged nymphal stages.

Distribution and hosts. The scaly-leg mite is distributed widely throughout the world, but its distribution in Texas is not accurately known.

This mite attacks poultry, including chickens and turkeys which are common hosts. The scaly-leg mite also has been reported on pheasants, partridges, bullfinches, goldfinches and many passerine birds. Wild birds may transmit the mites to domestic flocks, but experimental data is not conclusive.

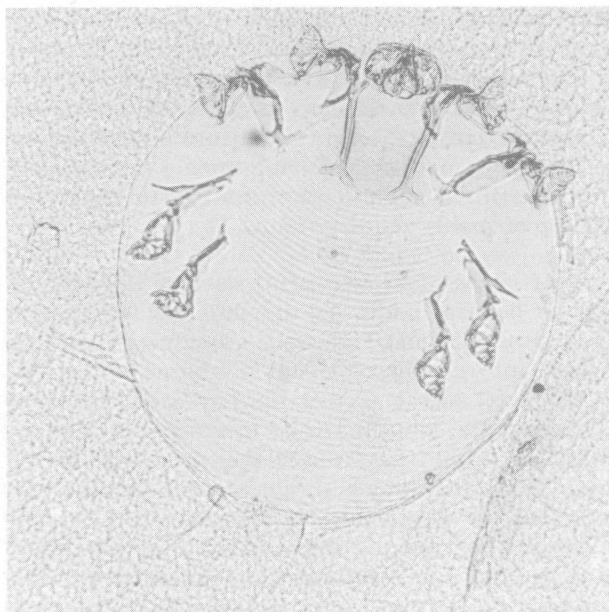


Fig. 20. Scaly-leg mite, *Knemidocoptes mutans*.

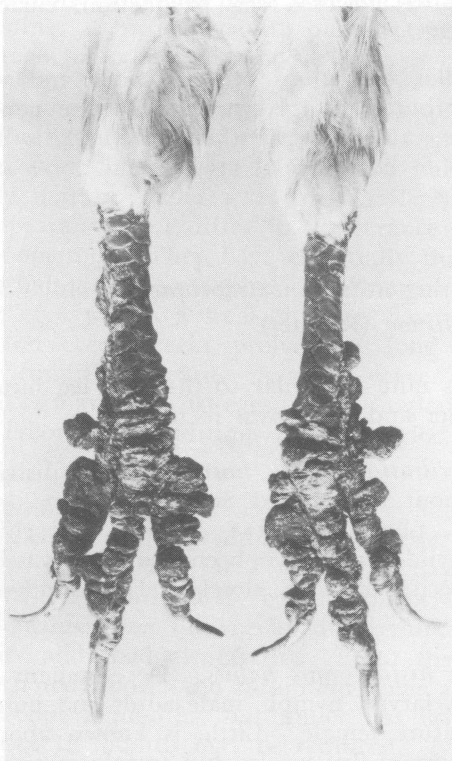


Fig. 21. Scaly-leg mite damage on host (photo courtesy of USDA).

Life history and habits. Little is known about the life history and habits of this species. Females burrow under scales on the feet and legs and deposit eggs. They begin laying a short time after

they burrow under the skin and continue to oviposit for about 2 months. Eggs hatch in about 5 days into six-legged larvae that soon molt into nymphs. Nymphs develop into mature males and immature females. The immature female transforms into a mature egg-laying female shortly after she is fertilized. The cycle from egg to egg-laying female probably requires 10 to 14 days.

Importance and nature of damage. The burrowing beneath scales on the feet and legs results in a powdery material that accumulates and is bound into a scab of serum discharge. Also, affected feet and legs usually have red blotches. Glands in the mouthparts of mites may secrete an irritating fluid that causes the serum discharge and the reddish blotches. Eventually the feet and legs may be covered with these crusts or scabs. Mites are beneath the crusts in small oval vesicles. Due to irritation caused by mite infestation, poultry pick at the crusty formation. As formations extend over the feet and legs, they interfere with joint flexion and cause lameness. Severe infestations may cause the loss of one or more toes, loss of appetite, lowered egg production, emaciation and death.

Similar conditions on the comb and wattles are attributed to this species, but the condition may be caused by another mite. This species appears to be confined to feet and non-feathered leg parts.

Depluming mite, *Knemidocoptes laevis* var. *gallinae* (Railliet)

This mite is similar to the scaly-leg mite, but is smaller and more oval in shape.

Distribution and hosts. It is distributed throughout the United States and hosts include pigeons, pheasants, geese, canaries and chickens. Many wild birds have been found infested with this species or with closely related undescribed species.

Life history and habits. Development stages are egg, larvae, nymph, male adult and immature and mature female. Little is known about the life history of this species, but transformation from immature to mature female is thought to occur after fertilization. The fertilized female begins laying eggs within a few hours after starting to burrow and continues at 2 or 3 day intervals for about 2 months. Eggs hatch in about 5 days. The cycle from egg to egg-laying female requires 10 to 14 days. Less than 10 percent of the eggs mature into adults.

Importance and nature of damage. The depluming mite burrows into skin at the base of feathers, on the back, top of the wings, around the vent and on the breast and thighs. It causes intensive itching, often resulting in feather pulling. Fowls may lose feathers over large areas of the body. Infestations, especially noticeable in spring and summer, may disappear in autumn.

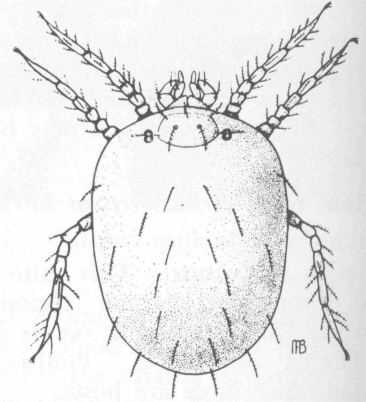


Fig. 22. Larva of a chigger mite, *Trombicula alfreddugesi* (photo courtesy of USDA).

CHIGGERS

Trombicula (Eutrombicula) splendens (Ewing), *T. alfreddugesi* (Oudemans), *T. batatas* (Linne), *Neoschongastia americana americana* (Hirst)

Chiggers are also known as red bugs, jiggers, harvest mites and other common names. Adults usually are covered with dense feathered hairs that give them a velvety appearance. They are often bright red, with a figure eight-shaped body about 1 millimeter long. The parasitic larvae are about 1/150 inch long, reddish or straw colored and not as densely covered with feathered hairs as the adult. Larvae are barely visible to the naked eye.

Over 700 species are known, but only three or four are important parasites in the United States.

Distribution and hosts. *T. splendens*. This species is not as widely distributed as *T. alfreddugesi*, but their ranges frequently overlap. It is confined primarily to the eastern half of the United States but ranges into Texas. It prefers more moist habitations than the common chigger, *T. alfreddugesi*, such as swamps, bogs and rotten logs. The season pattern is also similar to *T. alfreddugesi*. This species feeds on mammals, birds, reptiles and amphibians, but reptiles, especially snakes and turtles, appear to be the most common natural host.

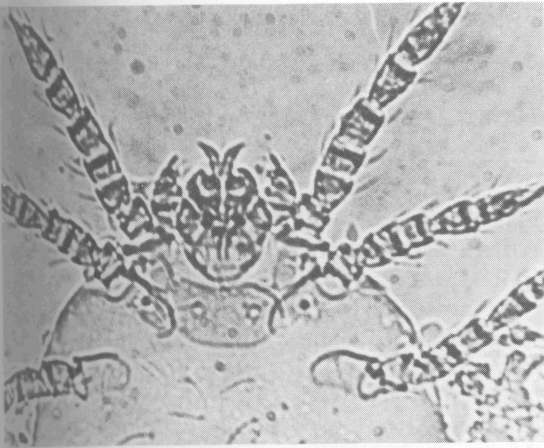


Fig. 23. Anterior portion of the poultry chigger, *Neoschongastia americana americana*.

T. alfreddugesi. This is the most common and widespread species in the United States. It ranges from New England and eastern Canada, west to Nebraska and California, south to Florida and Texas and extends into Mexico, Central and South America and the West Indies. Larvae are most abundant in transitional areas between forests and grasslands and along the margins of swamps. Berry patches and thickets are favored, but they have been collected in most habitats. It is active in the north from July to September, but in southern Florida it may be encountered throughout the year. This species is found on a wide variety of hosts including man, fowls, reptiles, amphibians and mammals.

T. batatas. This species exists primarily in tropical areas and ranges from the United States to Brazil. It prefers open, sunlit grassy areas, especially where domestic animals are kept, but it is not abundant in jungles or wooded areas. It attacks human beings, domestic animals and poultry, but ground inhabiting birds seem to be preferred hosts.

Neoschongastia americana americana (Hirst)

The range of this chigger extends across the southern states from the Carolinas to California. It is more abundant in areas having hard soils that crack open during hot dry summers, and in areas where there are rock outcroppings. Seasonal activity begins in late April or May, reaches a peak in June and declines in late July or August. There may be an increase in September or October, and by late October or November it disappears from hosts. Domestic hosts are turkeys and chickens. Wild hosts include quail, woodpeckers and other wild birds.

Life history and habits. Chiggers differ from mites in their life cycle. The life cycle of most chiggers is egg, deutovum (larvae enclosed in a membrane in addition to the egg shell), larval, nymphochrysalis (quiescent stage that transforms to the nymph), nymphal, imagochrysalis (the quiescent stage that transforms into the adult) and the adult stage. Eggs usually are deposited singly in the soil. After a 4 to 6-day incubation period, the egg hatches into the deutovum, which remains in the egg shell fragments for about a week before the six-legged larva emerges. Larvae crawl around rapidly in search of a host and may survive 2 weeks or more without a host. The larval chigger usually feeds only once. It most often requires 1 to 4 days to complete feeding, but in some instances may require up to a month for engorgement. When the feeding is complete, larvae drop to the ground, burrow into upper layers of the soil and become quiescent. Within the larval skin the nymphochrysalis develops and, about a week later, the eight-legged nymph emerges.

The nymph is larger, has a figure eight-shaped body, is more hairy and has a non-functional genital opening. It probably feeds on insect eggs and early stages of other arthropods.

After about a week nymphs enter a quiescent stage, the nymphochrysalis, and emerge as adults in another week. Adults are larger, more hairy and sexually mature. The sexes are similar in size and appearance, but differ in appearance of the genital opening. They have essentially the same feeding habits as the nymphs. Adults are ready to deposit eggs within a week and egg laying continues for several weeks, probably as long as favorable conditions exist. Some observers have counted as many as 4,764 eggs from a single female, under laboratory conditions over a period of 23 days.

A minimum time for a complete cycle of the common chigger, *T. alfreddugesi* is 55 days, for *T. splendens* 50 days, and for *T. batatas* 71 days. The length of time required for completion of the life cycle depends upon the species, soil, temperature, humidity and food availability. From the three species noted above, the minimum time appears to be about 2 months; but under less favorable conditions 12 months may be required. Number of generations per year varies from one to three in the temperate zones to continuous breeding in the tropics. In temperate zones hibernation probably occurs in the adult stage.

Importance and nature of damage. *Neoschongastia americana americana* is the most abundant external parasite on turkeys grown on ranges that have rocky outcroppings or hard soils that crack

during summer when they become dry. Chiggers feed in clusters on the thighs, breast, underside of wings and around the vent. These clusters result in scabby lesions that require about 3 weeks to heal after engorged chiggers leave the host. These lesions and scabs result in downgrading of turkeys, a loss that may average more than a dollar per bird.

Chiggers normally do not burrow into the skin or suck blood. When the chigger is firmly attached, it injects a digestive enzyme into the wound that liquifies host tissue. It sucks up the partially digested, liquified host tissue, leaving a tube called a stylostome. The digestive enzyme that hydrolyzes the host's tissues is probably responsible for the severe irritation and raised bump that results from chigger "bites." The larval stage is the only parasitic stage in the chigger life cycle.

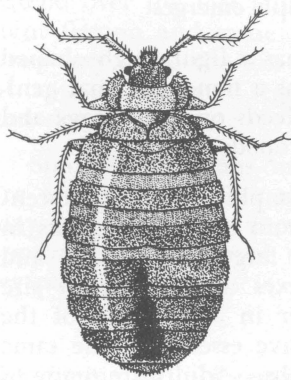


Fig. 24. Engorged bed bug, *Cimex lectularis*.

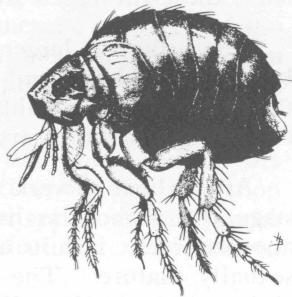


Fig. 25. Sticktight flea, *Echidnophaga gallinacea* (photo courtesy of USDA).

BED BUG

The common bed bug, *Cimex lectularis* Linnaeus, and several of its relatives frequently infest poultry. They hide, breed and lay eggs in nests, behind nest boxes, under loose boards and wall cracks, roosts and roof. At night, nymphs and adults find their way to sleeping hens and suck their blood. They are rarely found on fowls in daytime. Setting hens suffer especially from these pests and may leave their nests. Small black spots of bed bug excreta may be seen on eggs and in cracks.

Life history and habits. The female lays 70 to 200 eggs in cracks; 6 to 17 days later they hatch into nymphs. Bugs remain in the nymphal stage 1 to 2 months, feeding at night before they emerge as adults.

STICKTIGHT OR SOUTHERN CHICKEN FLEA

Distribution and hosts. This flea, *Echidnophaga gallinacea* (Westw.), exists in the southern United States from South Carolina to California. It attacks poultry, cats, dogs, horses and man.

Life history and habits. Adult males and females are found on the heads of fowls. Females remain attached by their mouthparts in the same spot as long as 2 or 3 weeks. During this time eggs are laid, being thrown with considerable force from the female's vagina. Eggs hatch on the ground in 2 days to 2 weeks. The slender white larvae feed on excreta of the adult fleas, filth in cracks or litter on the poultry house floor or on the ground in dry, protected places. After a growing period of 2 weeks to 1 month, they spin silken cocoons covered with dust and dirt in which pupal transformation occurs. Adults attach to the host in about a week and feed about 1 week before females begin laying eggs. Only one to five eggs are laid at a time. The life cycle may be completed in 1 or 2 months. The pest thrives best in dry, cool weather in which adults may live several months.

Importance and nature of damage. In the south and southwest, fleas imbed themselves sometimes in clusters about the face, eyes, ear lobes, comb and wattles of poultry so that they cannot be brushed off. Young fowls are often killed and egg production and growth are reduced by loss of blood and irritation caused by bites.



Fig. 26. Sticktight fleas attached about the head of hen.

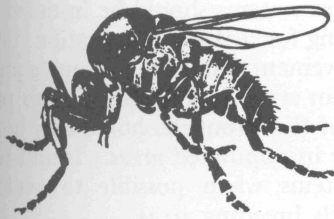


Fig. 27. A black fly or turkey gnat, *Simulium* sp.

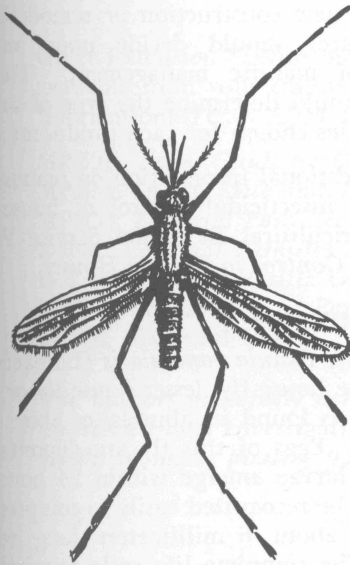


Fig. 28. A mosquito, a blood-sucking parasite and vector of poultry diseases.

BLACK FLIES, BUFFALO GNATS OR TURKEY GNATS

Several kinds of gnats attack poultry. The most common is the turkey gnat, *Simulium* spp., a vector of leucocytozoan parasites which cause a malaria-like disease among turkeys and ducks.

Eggs are deposited on objects on the surface or in flowing water, usually at the water's edge. Most of the eggs must be kept wet or under water to hatch into larvae in 2 to 12 days. Larvae develop in water 1 to 6 weeks before transforming into pupae. Adults emerge after a 4 to 15-day pupal period. Southern buffalo gnats appear during the first warm period of late winter or early spring. The turkey gnat usually appears later in the spring.

MOSQUITOES

Several species of *Aedes* and *Culex* spp. mosquitoes transmit poultry diseases, including bird malaria and fowl pox.

HOUSE FLY

Although house flies, *Musca domestica* (Linnaeus), do not attack tissues, they are serious poultry pests because they transmit tapeworms to the flock. Flies breed in poultry manure, ingest tapeworm eggs and retain them in the gut. Infected flies drop into water and are picked up by the feeding fowl. Flies are also the mechanical carriers of several pathogenic bacteria.

During the summer, house flies mate and may deposit eggs within 3 to 4 days after emerging from pupae. Eggs hatch in 8 to 24 hours. Larvae may mature in $4\frac{1}{2}$ days, or up to $2\frac{1}{2}$ weeks under less favorable conditions. Larvae have three stages of growth and molt their skins at the completion of each stage. The skin of the last larval stage forms a hard, brown puparium inside which the larva pupates and transforms into a fly. Adults may emerge from the puparium as soon as $3\frac{1}{2}$ days, more commonly in $4\frac{1}{2}$ to 5 days, and under adverse conditions several weeks may be required. Thus, a generation of flies commonly is produced every 10 to 14 days when temperature, humidity and other environmental factors are favorable.

The usual range of dispersal of house flies is not well known. Marked flies, however, have been trapped as far as 13 miles from the point of release and up to 6 miles away within 24 hours of release. They commonly may range 1 to 3 miles. The range of dispersal seems strongly influenced by odors, wind, temperature, humidity and other factors.

In Texas, house flies may continue limited development and reproduction during the winter,

although the rate is greatly influenced by prevailing temperatures. Some adults may survive the winter by hibernation, but they probably are unimportant in providing for buildups the following spring. Flies spending the winter as pupae probably provide for the first noticeable large population increase in the spring.

Flies undergo a complete metamorphosis involving four distinct stages of development — egg, larva (maggot), pupa (inactive developmental stage between larva and adult) and adult. Each stage requires a specific environment for development. Each female fly can deposit 400 to 900 eggs during a period of several weeks, in batches of 100-150 eggs each. Under favorable conditions, only a few reproducing females can create tremendous fly populations in succeeding generations. Since total suppression of adults is impossible, the most effective means of achieving fly control is to prevent larval development.

In its natural state, poultry manure is an ideal fly breeding medium. Moisture, temperature and organic matter requirements are adequately furnished in unmanaged poultry wastes. Effective fly control is a problem best solved by manure management whereby the highly suitable fly-breeding environment is altered, modified or eliminated by any feasible means. Chemical insecticides are valuable supplemental fly control tools, but alone they should not be expected to provide completely satisfactory control.

Since manure management is one of the most important considerations on poultry farms, the producer should design his facilities to provide efficient means of manure collection and disposal. No single

specific type of building is applicable to every operation, but certain basic points should be considered. Avoid structures interfering with complete cleanout and sanitation, such as posts and water lines. Water systems should be installed in a manner providing for leak-proof operation. Ventilation and air movement should be adequate and possibly include a fan system. Fly screening to prevent the migration of flies from the house may be necessary particularly in populated areas. Install waste-proof feeding systems when possible to avoid creating additional fly breeding areas.

In many instances, older existing houses can be modified or remodeled to provide for improved manure management.

Before new construction or remodeling begins, the producer should decide upon an effective method of manure management. The method selected should determine the type of construction and facilities chosen for each producer's operation.

For additional information on manure management and insecticidal control of house flies, see Texas Agricultural Extension Service Fact Sheet, L-867, *Fly Control in Poultry Houses*.

LITTLE HOUSE FLY

This fly, *Fannia canicularis* (Linnaeus), known as the little house fly, lesser house fly or hover fly, frequently is found in abundance about the poultry house. Eggs of this fly are deposited on manure and larvae emerge within 24 hours. These larvae can be recognized easily as compressed, spiny organisms about 6 millimeters long when fully grown. The complete life cycle requires 15 to 30 days.

Other Extension Service publications dealing with external parasites of livestock available from your county Extension agent or the Department of Agricultural Information, Texas A&M University, College Station, Texas 77843:

MP-691, *Texas Guide for Controlling External Parasites of Livestock and Poultry*

MP-833, *Insect, Mite and Tick Parasites of Texas Horses*

MP-834, *External Parasites of Texas Sheep and Goats*

L-706, *External Parasites Attacking Swine in Texas*

L-725, *Common Cattle Grubs in Texas*

L-867, *Fly Control in Poultry Houses*

B-1080, *External Parasites of Cattle*

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