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Lone Star Tick, Amblyomma Americanum

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THE LONE STAR TICK, AMBLYOMMA AMERICANUM

A Contribution Toward a Monograph of the Ticks of Arkansas

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The lone star tick probably accounts for 95 per cent or more of the total tick population in Arkansas. No person, his pets, or domestic animals are immune from attack. It is not only a pest; it may also transmit tularemia and Rocky Mountain fever (Calhoun, 1955).

IDENTIFICATION

The lone star tick derives its name from the conspicuous white spot in the posterior angle of the scutum of the female. Often this spot has tinges of green or red. The male is characteristically marked by two horseshoe shaped areas at the posterior-lateral portion of the body. The whitish spots which form the horseshoe outline may also have tinges of green or red. Usually these markings on both sexes are very white and contrast sharply with the reddish or reddish-brown background of the body.

The palpi of all stages are long, the second segment being much longer than the other segments. This condition is typical of the genus Amblyomma. Since species other than the lone star are seldom taken in Arkansas, this character is of use in distinguishing the lone star nymphs and larvae from the immature stages of other ticks.

The synonomy of the species and the characters of all stages are given by Cooley and Kohls (1944).

GEOGRAPHICAL DISTRIBUTION

This tick is primarily southern in distribution. It is definitely the most important tick species in Arkansas and probably of the neighboring states of Texas, Oklahoma, Missouri, Tennessee, Mississippi, and Louisiana. According to Hooker, et. al. (1912) the type locality for the species

is Pennsylvania or New Jersey. One specimen is reported from Labrador and it has been collected in Guatemala, Guiana, Brazil, and Mexico (Cooley and Kohls, 1944).

In Arkansas it occurs wherever the habitat is suitable. According to Calhoun (1954) there are fewer ticks in eastern Arkansas.

HOSTS

The records of collections show that dogs, cattle, men, and horses are most frequent hosts and in that order of importance. Ground birds are hosts, particularly to the larval stage (Calhoun 1954). Young chickens have proven to be excellent hosts for feeding this stage when maintaining cultures. The cottontail rabbit is host to the immature stages but the writer has not found an adult from the examination of twenty rabbits. Cooley and Kohls (1944) report one male from a cottontail and one hundred adults from a "rabbit."

LIFE AND PERSONAL HISTORY IN ARKANSAS

The ticks pass through the winter as unfed nymphs or adults. Spring collections indicate a ratio of about two nymphs to each adult. They do not pass through the winter as larvae. The overwintered adults begin to attach to cattle in mid-December in northwestern Arkansas and the first females complete engorgement about mid-February. Attachment and engorging of adults continues until early July. The females complete engorgement and drop from the host to the ground where the eggs are deposited in large masses. Under summer conditions of temperature the preoviposition period is about a week and the oviposition period is eleven days. Hatching of the eggs requires 25 days.

The young larvae tend to be gregarious, often forming a tight mass of tiny ticks which pass through a pre-feeding period. Then the mass moves up on low growing grasses or shrubs where the mass hangs ever ready to drop onto a small animal that may pass by. Once on the animal they feed to repletion and drop off in an average of four days.

Molting to the nymphas stage requires twelve days. Since the engorged larvae, from which they

develop, may be scattered or dropped in a cluster, depending on the activity of the host, the nymphs tend to be less gregarious. However, 300-500 have been taken in a space of less than a square yard. This stage must also find a host; the host may be a rabbit, dog, or large animal. Cattle sometimes are infested with large numbers of these ticks. The nymph requires four days to complete feeding, then it drops to the ground.

Molting to the adult stage takes twenty-one days. The adults of a current season ordinarily do not feed, but pass through the winter. It is believed that cessation of feeding is a response to day-length (Lancaster 1955). Feeding of the adult the following spring may take as few as six days or as long as sixteen days. This apparently depends on how favorable the site of attachment is and on whether or not mating occurs. Once the female has become attached she does not move. After feeding a short while she is then ready to be fertilized. Once fertilization occurs the females complete feeding often within a few hours.

Larvae are most plentiful in August; nymphs in April, May, and August; and adults April through June. Larvae have been found from June 10 to October 30. None of the life history stages are readily found in northwestern Arkansas in November and early December.

HABITAT

It has been found (Lancaster 1955) that about 70 per cent of the ticks collected were taken from the brush. Only one to one and one-half per cent were found in open situations such as improved pastures. It is also illustrated that where no cattle were kept the tick population tends to be less. In wooded areas near Huntsville where no cattle had been grazed there were practically no ticks, whereas in woods located in grazing areas, large numbers of ticks were found.

Laboratory and field studies (Lancaster and McMillan, 1955) indicate that for the habitat to be suitable the relative humidity must be high. These studies show that there is a relationship between ground cover and relative humidity. In open pasture on the days records were made, the relative

humidity averaged 32 per cent, rarely ever going over 60 per cent. This low humidity in the laboratory prevented oviposition and larvae were unable to survive any prolonged period of exposure to it. This accounts for finding most of the ticks in the brushy or wooded areas.

CONTROL

The control of this tick is reasonably well worked out for the situations where control is desired. There are essentially three types of control situations. These are personal protection, protection of pets, and protection of cattle.

The simplest and most effective means of securing personal protection is to avoid areas where large numbers of ticks occur. When this method becomes undesirable, the use of repellents applied to skin or clothing will provide a high degree of protedtion. Any commercial repellent containing appreciable amounts of dimethyl phthalate is adequate for short exposures to tick infestation. For persons who must work or remain in "ticky" areas for long periods, clothing treatment with a formula containing N-Butylacetanilide has been shown to be effective for nearly two weeks (Brennan, 1948). This material cannot be applied directly to the skin.

Protection of pets may be accomplished by frequent observation and treating with a rotenone dust or dip. Hunting dogs, such as beagles, fox or coon hounds, and bird dogs, should be treated frequently enough to prevent the adult females from dropping off and depositing eggs. These eggs hatch and create tick infestations in lawns. As a general rule, treatment of hunting dogs should be made not later than one week after exposure to infestation.

If a tick infestation does develop in a lawn, spraying with DDT, chlordane, or dieldrin will wipe it out if the application is thorough.

The recommendation for the protection of dairy cows is to pasture them on open, improved pastures which can be mowed. This is in line with the programs of the dairy husbandrymen and agronomists. The effectiveness of this is illustrated by the data already presented.

Where open, improved pastures are not obtainable

for dairy cows, methoxychlor at the rate of 8 pounds of 50 per cent wettable powder or 1-1/2 pounds of 25 per cent lindane wettable powder in 100 gallons of water is recommended as a spray. If desired, a mixture of these two ingredients can be applied. Such a mixture combines the quick-killing effect of the lindane with the longer residual of the methoxychlor. Applications should be made every three weeks from the time ticks begin to attach to the cows in spring until July 1.

On beef cattle the principal recommendation is to spray with toxaphene at a rate of 10 pounds of 40 per cent wettable powder in 100 gallons of water every three weeks. Use of toxaphene is not permissible on producing dairy cows because of possible milk contamination. Chlordane, DDT, or BHC or a combination of DDT-BHC may be used on beef cattle (Barnes, 1952).

SUMMARY

The life and seasonal history of the lone star tick is given as it occurs in the vicinity of Fayetteville, Arkansas. Laboratory and field studies on the effect of humidity illustrate the importance of this factor as it affects the abundance of this species.

Control measures for personal protection, protection of pets and domestic animals are given.

LITERATURE CITED

(1) Barnes, Gordon and J. L. Lancaster, Jr. 1952. Protect your cattle. Agri. Ext. Ser. Leaflet No. 137 (Rev.).

(2) Brennan, James. 1948. Field tests with tick repellents. Public Health Reports 63:339-346.

(3) Calhoun, Ernest L. 1954. Natural occurrence of tularemia in the lone star tick, Amblyomma americanum (Linn.), and in dogs in Arkansas. Am. Jour. Trop. Med. and Hyg. 3:360-366.

(4) Calhoun, Ernest L., and Hugh I. Alford, Jr. 1955. Incidence of tularemia and Rocky Mountain spotted fever among common ticks of

Arkansas. Am. Jour. Trop. Med. and Hyg. 4: 310-317.

(5) Cooley, R. A., and Glen M. Kohls, 1944. The genus Amblyomma (Ixodidae) in the United States. Jour. Par. 30:77-111.

(6) Hooker, W. A., F. C. Bishopp, and H. P. Wood. 1912. The life history and bionomics of some North American ticks. USDA Bur. of Ent. Bul. 105.

(7) Lancaster, J. L. 1955. Biology and seasonal history of the lone star tick in Northwest Arkansas. Jour. Econ. Ent. 48:295-297.

(8) Lancaster, J. L. and Harlan McMillan. 1955. The effects of relative humidity on the lone star tick. Jour. Econ. Ent. 48:338-339.