DISTRIBUTION OF *TRACHYTHRIPS WATSONI* IN ILLINOIS (THYSANOPTERA: PHLAEOTHRIPIDAE)

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Trachythrips watsoni Hood is a tiny thrips about 1.2 mm. long, seldom seen by biologists in nature. It is, however, a common insect within its range; probably an acre of the proper woodland would contain thousands of individuals. In one collection of ground litter from a woods in Florida, *watsoni* was found to be the second most numerous thrips (Watson, 1945).

Since this thrips is not generally known despite its abundance, a discussion of its features and habits seems worth while.

As a non-biologist once remarked, *Trachythrips watsoni* looks like a miniature alligator even to the extent of being covered by a rough hide. The main points of structural peculiarity, illustrated in figure 1, are: 1. five segmented antennae; 2. head devoid of long setae; 3. extremely long hairs at the tip of the tube; 4. hind coxae farther apart from each other than are the middle pair from each other; 5. bicolored appearance, with head, prothorax, mesothorax and fore legs dark brown, the rest of the body yellow except for dusky spots on the abdomen; 6. completely apterous; in addition to no vestige of wings, the eyes are small, ocelli are lacking, meso and metathoracic sclerites are reduced, and wing holding setae of the abdomen are missing.

In total view this insect appears as sketched in figure 1A. An enlargement of the head, figure 1B, shows the small eyes which are composed of about seven dorsal facets and the absence of ocelli. The first abdominal tergite, figure 1C, is not separated from the following segment by a membrane and completely covers the dorsum. No part of this tergite is differentiated into a median shield as in most other members of the Phlaeothripidae.

Larval *watsoni* can be distinguished at once from all other Illinois thrips by the small size and shape of the fifth antennal segment (see Hood, 1929, p. 322, fig. 8) which eventually becomes fused to the fourth segment upon transformation into the adult stage. Like many phlaeothripids, these larvae are pale yellowish white with much crimson internal pigmentation. Only the apical parts of the antennae, the spines, and the apex of the tube are brown. In comparison to the adult the compound eyes are reduced, with only two facets to each eye in both of the first two instars, as similarly found in many other kinds of larvae.

In addition to size, the second instar larva differs from the first instar by having slightly more crimson subintegumental pigment, especially in the first and second abdominal segments, by more slender elongate an-

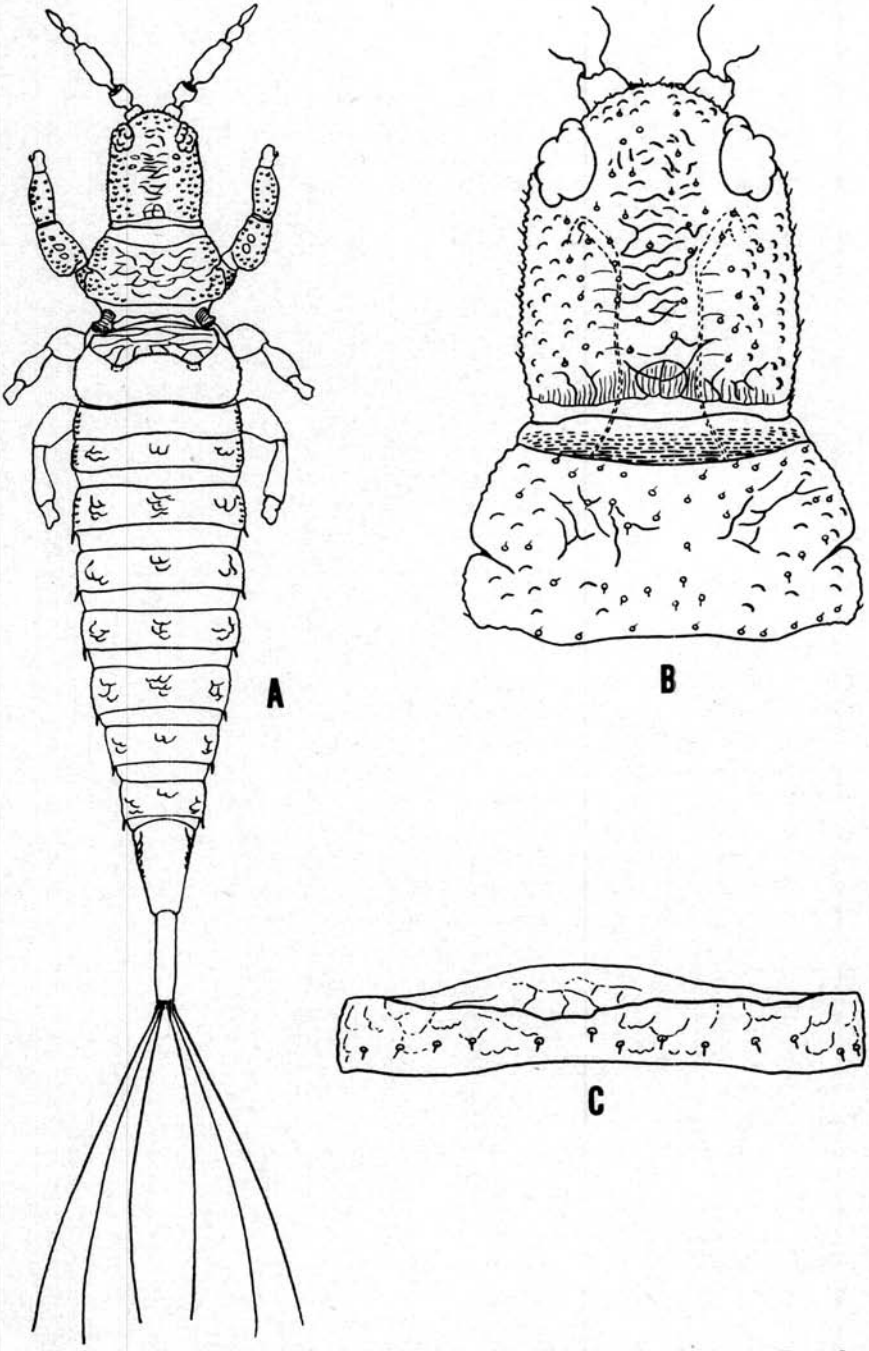

FIG. 1.—*Trachythrips watsoni* Hood. A. Dorsal view of female. B. Dorsal view of head and prothorax. C. Tergum of first abdominal segment.

tennae, by the reduction of latero-ventral cheek callosities, and by the abrupt curving of the inner spines of the first antennal segment which is straight in the first instar. The two long setae borne at the tip of the tube are not unique, although these setae are longer than homologous setae in other genera. Details of the second instar larva were figured by Hood in 1929, page 322.

The pupal stages have yet to be discovered.

Very little is known of the life history or of the environmental factors that affect this species. No account has ever been published on the exact ecological niche they occupy or on their feeding habits. They have been collected chiefly by means of Berlese funnels, being recovered from ground litter brought back to the laboratory. Specimens extracted by this Berlese funnel method are recovered dead from the preservative used. As far as I know, no one has ever seen them alive in their natural habitat.

From an examination of the conditions of the adults and by noting the time of occurrence of larvae it is possible to determine the yearly number of generations. Eggs appear in the abdomens of females at definite periods, and teneral specimens which are assumed to have emerged recently as adults likewise are found during definite seasons. Such data indicate that there are three generations in the yearly cycle in Illinois.

Adults overwinter, then presumably they mate and lay their eggs during April. From these eggs come the spring generation. Later in midsummer a second generation appears, followed by a third generation in early fall. It is this fall generation that spends the winter in hibernation and gives rise to the spring generation.

Apparently eggs are laid one at a time over a period of about one month. A single female may not have this long period of oviposition, but within the population eggs will be produced for at least this interval. Females with eggs, females without eggs, males, and first and second instar larvae have been collected at the same moment from one sample of dead leaves in midsummer. Newly emerged adults have been found in Missouri as late as October 10. The earliest record of a fully formed egg within a female, possibly ready for laying, was April 5 at Flora, Ill., although undoubtedly, egg formation and laying happens even earlier farther southward.

Adult females can be collected every month of the year; males have been found during all months except January, February, and March, but since males have been taken in early April, presumably they also overwinter. Like many other thrips, the larvae and adults live together gregariously, apparently forming a loose association because of their habits rather than a social organization. Inasmuch as they occur in leaf mould and rotting wood in woodlands or in *Andropogon* clumps near the forest edge, it is reasonable to suppose that they feed on fungi that grow in these places.

In Illinois, *Trachythrips watsoni* is present in the southern third of the state ranging as far north as Calhoun and Effingham counties. This northern limit approaches the

limit of the cypress, mistletoe, and other plants and animals we generally consider as part of the southern biota. From more than five hundred Berlese samples taken throughout the state, *watsoni* has been recovered only in places marked in figure 2. When the northern limit at about Effingham was detected, special trips were made to secure additional samples north of this line in order to learn the exact northern boundary. In spite of the efforts to gather and examine more samples, no appreciable expansion of the range has been found to date.

Illinois is but a small portion of the total range of *watsoni*. Records in the existing literature and supplemental records from the collections of the Illinois Natural History Survey show their range to be extensive as indicated on the accompanying map of North America, figure 3. Their eastern distribution is similar to many other southern species in that they occur commonly in the deep south extending northwestward up the Mississippi Valley and northeastward up the east coast as far north as Massachusetts.

The discovery of this thrips in California was somewhat surprising. Aside from some very slight differences, the single California specimen that I have examined seems to be conspecific with the Eastern species.

The most amazing record of their distribution, in view of the known United States range, is the single record from near the Arctic Circle in the Northwest Territories of Canada. The specimen concerned was recovered from a ground sample of grass debris taken by Mr. H. C. Hanson inside an ancient Eskimo stone

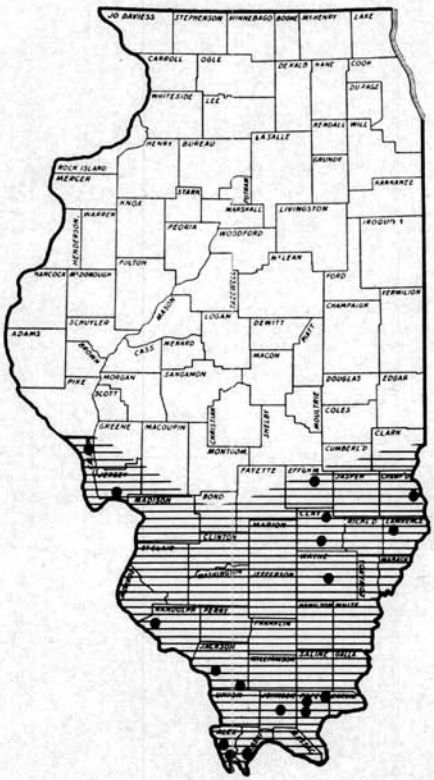

FIG. 2.—The distribution of *Trachythrips watsoni* in Illinois. Solid circles mark the general localities from which specimens have been collected.

cache. In all respects it is like Eastern specimens. Unless this sample was contaminated after it had been brought back to Illinois where the material was sorted, cold temperature alone must not be the northward limiting factor at Effingham, Ill.

Historically, *watsoni* was initially discovered in northwestern Florida in 1928. In February 1933, Drs. Ross and Mohr of the Illinois Natural History Survey took the first specimen from Illinois, and in the same year Professor Watson, for whom the species was named, published records of them from three ad-

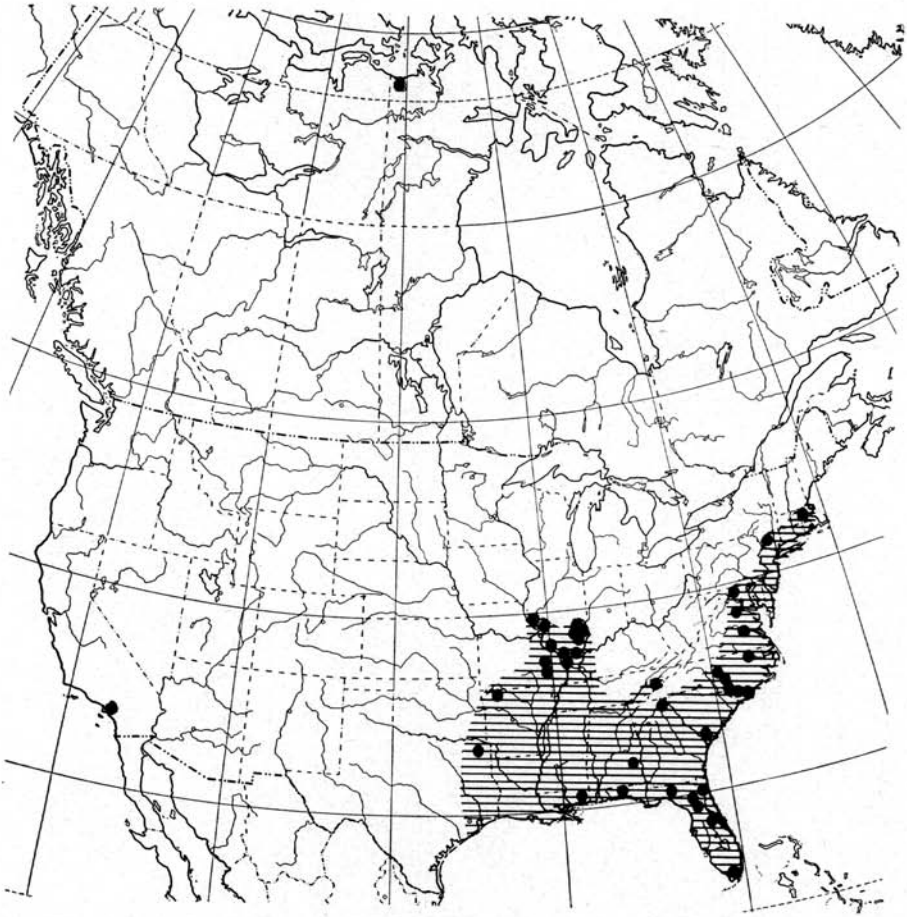

FIG. 3.—The total known distribution of *Trachythrips watsoni*. Range continuity between populations surmised only for the southeastern United States region. Northwest Territories record doubtful.

ditional states: Tennessee, Georgia, and South Carolina. From 1934 to 1945, the knowledge of the range of *watsoni* was extended north to southern New York and westward to southern Mississippi. Our records herein mentioned further increase the known range north up the Mississippi Valley to include regions in Illinois.

To the south, at least from Acapulco and Chiapas, Mexico, to Panama, *watsoni* is replaced by another species, *T. albipes*. In southern Florida and in the West Indies a third species, *T. fairchildi*, occurs with some overlapping of range with *watsoni* in Florida. Two species extremely similar to *watsoni* have been described from Texas, but the given differences of these two species are minor and possibly the two may be variants or subspecies of *watsoni*. Three other species have been de-

scribed from Panama or South America. The genus *Trachythrips* belongs entirely to the Western Hemisphere.

Many persons have collected and donated specimens of *watsoni* to the Illinois Natural History Survey. Most of the extralimital material came from collembolists who found them incidental to their own collecting. Our Survey staff collected the many Illinois specimens. To all of these entomologists, I extend my appreciation for the opportunity they have given me to study this distinctive thysanopteron.

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