

NOTES ON THE GENUS *EPIPTERA* (HOMOPTERA: ACHILIDAE)¹

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ABSTRACT

Epiptera fusca (Walker) is found in the crevices beneath the loose bark of trees and logs. The structure of the mouthparts relative to their use is discussed. All nymphal instars produce wax-like plumes from glands situated on the last 3 tergites. The plumes are cast and their accumulation sets off a "territory" which excludes most of the other arthropods which also live under loose bark. Some sensory setae on the abdomen are illustrated and discussed.

While collecting arthropods from beneath the loose bark of logs that had been harvested and piled in a field in the Pearl River bottoms at Gainesville, Hancock Co., Mississippi, I repeatedly encountered small aggregations of 6-30 homopteran nymphs. Periodic sampling of the microhabitat from August, 1965, to August, 1966, yielded both nymphs and teneral adults together under the bark. When the teneral forms matured, they were determined as *Epiptera fusca* (Walker). I have since observed that metamorphosis of individuals within an aggregation of nymphs proceeds unevenly so that several nymphal instars, teneral adults, and fully-colored adults may all be found together during March and April.

Little is known of this curious genus of Achilidae. Most papers on the genus have been systematic treatments, Fennah (1950) and that by Beirne (1950) with keys to the Canadian species of the genus including 9 of the 12 known U.S. species. Beirne's only remark on the natural history of the genus is that it is probably associated with conifers. This same observation was made by Savely (1939) who recorded *Epiptera* sp. from beneath the bark of both pines and oaks in a forest near Duke University, Durham, North Carolina. Osborn (1922) published the only observations on the biology of the genus. He collected nymphs and young adults of *E. slossoni* in the Cranberry Lake region of New York during July and August, 1921, from beneath the bark of a standing dead spruce. He also suggested an ecological relationship between *Epiptera* and conifers. In a monograph on the Fulgoroidea of Mississippi, Dozier (1926) listed 5 species of *Epiptera*, noting that *E. opaca* was associated with pine.

In the case of *E. fusca*, a definite preference for conifers does not exist. I have collected this species from beneath the bark of oak, sycamore, gum, and other hardwoods as well as from pine; but there were proportionately many more aggregations and individuals of the species under the bark of the oaks. There were not, however, any nymphs or adults under the bark of either pecan or hackberry, both of which were well represented in the woodpile. Another species in this area, *E. opaca* has been collected only by light traps situated in almost pure stands of pine. The understorey of these pine forests includes very few species or individuals of the hardwoods.

E. slossoni and *E. fusca* have been taken from both hardwoods and conifers. *E. opaca* and *E. pallida* have been found only on pines. Collection records are far too few to make any generalizations on the host preferences

¹ Contribution No. 1355 from the Department of Entomology, the University of Kansas, Lawrence, Kansas.

of this group of insects, but it can be pointed out that the immature stages of all species of *Epiptera* probably do live beneath the loose bark of dead trees.

The logs from which I collected all of my specimens had been lying in a shaded area for 2 years and were densely encrusted with several kinds of fungi both on and beneath the loose bark. This microhabitat is tangibly moist. Probably all species of *Epiptera* feed on fungal hyphae beneath the bark, all instars being structurally adapted for fungivory. Both the mandibles and the maxillae are extremely styliform in the immatures as well as in the adults and extend to the level of the 3rd abdominal sternite in repose. Approximately one-half the length of these organs extends into the loreal region of the head, where muscles coming down from the cephalic horn insert on their apodemes. Unlike aradids which occur in the same microhabitats and have their mouthparts coiled-up in repose, *Epiptera* maintains a straight beak none of which coils into the lorax. It is difficult to imagine just how the insect can manipulate its mouthparts in the restricted space beneath the bark, since the full length of the extended beak exceeds the height of the crevices in which they live.

The behavior of the nymphal instars of all species of *Epiptera* other than *E. fusca* is unknown. All nymphal instars of *E. fusca* possess 3 pairs of large ectodermal glands situated, a pair per segment, on the last 3 abdominal tergites. The exoskeleton in the region of the glands is clearly defined by subrectangular areas (fig. 1a). Microscopically these rectangles are seen to contain hundreds of stellate apertures through which a waxy secretion is continuously exuded, producing 3 pairs of white plumes trailing behind the nymph. The rectangular organ acts as a sieve or die through which the foculent white waxy material comes in large amounts. When an individual wax plume reaches 3-4 mm in length, it either falls off or rubs off, and since the secretion is continuous, another set of full-length plumes is secreted in about 24 hours. Nymphs kept in the laboratory replaced the plumes which I removed in a little less than a day. The areas under the bark of the trees where the nymphs occur are clearly delimited by subcircular to pyriform accumulations of cast-off plumes from 5-30 cm long and 10-13 cm wide.

Although waxy secretions are commonplace in the Homoptera, they may serve a unique function in this instance. There are, for example, many other groups of arthropods to be found under the bark of the same logs — araneids, chelonethids, chilopods, aradids, blattids, tenebrionids, silvanids, scaphidiids, dermapterans, and collembolans. Only the collembolans are found within the cast plume area. It does not seem unreasonable to suppose that the accumulation of plumes serves a protective function as a barrier to most arthropods beneath the bark. The cast plumes are sticky (often adhering to the nymphs), and in over 50 aggregations of them the collembolans were the only other arthropods that ventured within the *Epiptera* zone. In view of the common occurrence of ant-Homoptera associations, it should be noted that no ants were ever found under the bark or in the same logs with *E. fusca*. Another aspect of the ants' absence might be the successional stage of the logs. The ants most commonly found in fallen logs in this area are *Paratrachina* sp., but they seem to prefer trees with a more thoroughly deteriorated heartwood than those occupied by *E. fusca*.

Of additional interest is the occurrence of conspicuous complex sensory

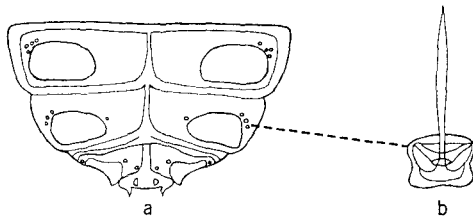


Fig. 1a — The last 3 abdominal terga of *E. fusca*. Note 3 pairs of sub-rectangular areas. b — Sensory seta in each of small circles in a.

setae on the abdomen of the nymphs (fig. 1b). These are characteristically found only in the nymphs and are always in the same relative anatomical position from instar to instar. It occurs to me that they may serve as thigmotactic sensoria and provide the nymph with such information as the height of the crevice in which they live. Since the nymphs scatter (a common fulgorid trait) when the bark is raised, the relative position of the various nymphal instars in relation to crevice height could not be measured. I do not know, for example, whether the younger nymphs occur at the periphery of the cavity and the progressively larger instars in the higher areas but such a distribution would provide reasonable circumstantial evidence of such a thigmotactic response.

Both adults and nymphs are agile jumpers and the adults are capable of short flights. The adults have also been taken in light traps placed close to the logs. Presumably, the fully matured adults mate and seek out new logs. Old brood sites (those cast plume zones) are not reused by successive generations although the same log might well be. Attempts to find eggs in the field or to get adults to oviposit in the laboratory were futile. A single parasite of *Epiptera* is known. Bridwell (1958) discussed the biology of a dryinid wasp, *Ampulicomorpha confusa* which parasitizes the nymphs of *E. fusca*. The parasite appears to be quite rare.

ACKNOWLEDGEMENT

I would like to thank Dr. Lois B. O'Brien of the International Programs in Agriculture, Purdue University for identifying the *Epiptera* as well as many other specimens of Fulgoroidea and for her kind suggestions.

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