PARASITISM OF *ORCHELIMUM* KATYDIDS (ORTHOPTERA: TETTIGONIIDAE) BY *ORMIA LINEIFRONS* (DIPTERA: TACHINIDAE)

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In the course of keeping *Orchelimum* katydids (Tettigoniidae: Conocephalinae) collected as nymphs and adults from the southeastern U.S. and Washington, D.C., I have obtained a small number of puparia of a parasitic tachinid fly, as follows: two puparia from a single adult male *O. agile* from Gainesville, FL; one puparium from an early instar female *O. pulchellum* from Appling, Columbia Co., GA; one puparium from an adult male *O. silvaticum* and one puparium from an adult male *O. pulchellum* from Montgomery, AL; one puparium from an adult male *O. pulchellum* from Gautier, MS; one puparium from an adult male *O. nigripes* from Fairview-Riverside State Park, LA; and one puparium from an early instar female *O. pulchellum* from Washington, D.C. The host exhibits a characteristic syndrome in response to the parasite: the katydid (nymph or adult) becomes sluggish and a distinct bulge develops in the abdomen. Within a few days, a puparium appears outside of the katydid and the katydid dies.

Three of the pupae were reared in the laboratory (from Louisiana *O. nigripes*, Mississippi *O. pulchellum*, and Alabama *O. pulchellum*) and a representative adult (from the Louisiana *O. nigripes*) was identified as *Ormia lineifrons*. The identified fly has been deposited in the collection of the U.S. National Museum. Since an adult fly was actually reared and identified only from a single *O. nigripes*, the association of *Ormia lineifrons* with the other parasitized *Orchelimum* species (*O. pulchellum, O. silvaticum,* and *O. agile*) must remain tentative, although all the puparia and reared adults appeared to be the same. The only hosts previously known for this fly are *Neoconocephalus* katydids, especially *N. triops* (T. J. Walker 1994 *in litt*., Burk 1982). According to Burk (1982), *O. lineifrons* is attracted to tape recordings of the calling song of *N. triops*; Walker reports (*in litt.*) that each year *O. lineifrons* is attracted in small numbers to mole cricket (*Scapteriscus vicinus*) sound trapping stations, although it does not parasitize mole crickets. (A Brazilian *Ormia* species is currently being used as a biocontrol agent for this introduced cricket in Florida.)

While some acoustically orienting tachinids apparently depend almost entirely on host calling song to locate hosts (e.g., Lakes-Harlan & Heller 1992), this reliance on calling song to locate individual hosts is not always so complete (e.g., Walker & Wineriter 1991). Given that two of seven parasitized *Orchelimum* were nymphs (and hence silent), *O. lineifrons* apparently does not depend strongly (perhaps does not depend at all) on song to find individual *Orchelimum* hosts, although it could be that female flies are attracted to the general area around calling males. In the absence of playback experiments using *Orchelimum* songs and gravid *O. lineifrons* females, it is impossible to assess precisely the role of calling song in *O. lineifrons* host searching behavior. It may be that *O. lineifrons* orients acoustically to *Neoconocephalus* (Burk 1982), the primary host, while other katydids are attacked opportunistically. Observed rates of tachinid parasitism of *Orchelimum* are very low.

Tachinid parasitism of *Orchelimum* katydids has been reported previously only very briefly and generally by Feaver (1983), who observed in her Michigan study pop-

ulation two *O. nigripes* individuals that had been parasitized by an undetermined tachinid. In this note I report the first specific identification of a tachinid parasite of *Orchelimum*.

I thank Dr. N. Woodley of the Systematic Entomology Laboratory of the U.S.D.A. for identifying the fly and Dr. T. J. Walker for providing information on flies, katydids, and crickets. I thank D. J. Funk, M. C. Keese, T. J. Walker, and an anonymous reviewer for their valuable comments on this manuscript. My *Orchelimum* work has been supported by the National Science Foundation, the Washington Biologists' Field Club, the Explorers' Club, the Theodore Roosevelt Fund of the American Museum of Natural History, the Sigma Xi Scientific Society, and the Florida Entomological Society.

Summary

Ormia lineifrons was identified as a parasite of *Orchelimum nigripes* (and, tentatively, of several other species of *Orchelimum* katydids), inhabiting both nymphs and adults. These observations document both a new host genus for *O. lineifrons* and the first specific identification of a tachinid from *Orchelimum*.

References Cited

BURK, T. 1982. Evolutionary significance of predation on sexually signalling males. Florida Entomol. 65: 90-104.

FEAVER, M. 1983. Pair formation in the katydid *Orchelimum nigripes* (Orthoptera: Tettigoniidae), pp. 205-239 *in* D. T. Gwynne and G. K. Morris [eds.], Orthopteran Mating Systems: Sexual Competition in a Diverse Group of Insects. Westview Press, Boulder, CO.

LAKES-HARLAN, R., AND K.-G. HELLER. 1992. Ultrasound-sensitive ears in a parasitoid fly. Naturwissenschaften 79: 224-226.

WALKER, T. J., AND S. A. WINERITER. 1991. Hosts of a phonotactic parasitoid and levels of parasitism (Diptera: Tachinidae: *Ormia ochracea)*. Florida Entomol. 74: 554-559.