Observations on the Behavior of *Mallophora fautrix* Osten Sacken

(Diptera: Asilidae)

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Mallophora fautrix subspecies *bromleyi* Curran (Cole and Pritchard, 1964) is a robust asilid with a close mimetic resemblance to the bumblebee *Bombus sonorus* Say (see Plate 53, Linsley 1960). Linsley has provided a brief account of the ethology of this species (under the name *M. bromleyi*) with emphasis on the prey taken. The purpose of this paper is to offer additional information, largely on the mating and oviposition behavior of the fly. My observations were made during the first two weeks of August 1973 at a site near Cave Creek, approximately 2 km east of Portal, Arizona and 1 km north on the road to San Simon. The flies were abundant in an area of dense vegetation watered by a small irrigation ditch; the predominant plant was *Conyza coulteri* Gray although scattered cockleburrs, *Xanthium saccharatum* Wallroth, and other desert vegetation were also present (see Linsley and Cazier, 1972, for a description of the locality and its flora).

Mating behavior.—Asilid activity at the site began at about 0900–0930 Mountain Standard time and continued at a high level until about 1230. The morning was apparently devoted primarily to reproductive behavior in as much as I never saw a fly with prey during this time despite the presence of many individuals. Males flew from one perch to another with brief intervals of rest. In the course of their flights they frequently hovered with the hindlegs widespread near conspicuous burrs, large seed heads, and perched individuals of the same species. They then darted at these objects sometimes striking a plant part repeatedly before flying away. They also pursued conspecific individuals in the air in a noisy, bobbing "roller-coaster" flight which often carried them 3–4 m high.

Although the onset of copulation was not observed, I did see five attempted matings (1020–1245) and four coupled pairs (1000–1205). Males struck and attempted to grasp perched or egg-laying females. If successful they would fall to the ground holding their would-be mate firmly. They then probed with their abdomen in an effort to achieve genital coupling. In the cases of attempted matings that I watched the male was often oriented with respect to the female in ways that made

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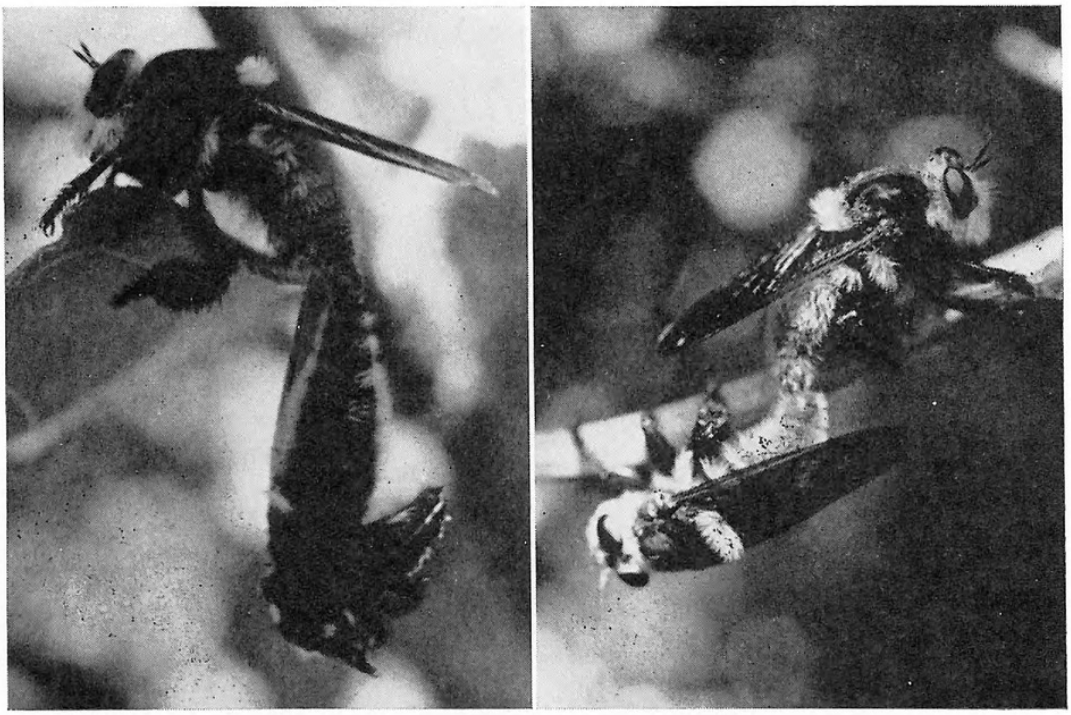

FIG. 1. Two positions assumed by copulating *Mallophora fautrix*.

copulation impossible (for example, one male held the female by her abdomen while probing her head and thorax) and sooner or later the the pair broke apart. Mating pairs (Fig. 1) were typically observed clinging to the vegetation in the tail-to-tail position, while disturbed pairs flew from one area to another with one fly trailing behind the other.

FIG. 2. The flight periods of the bumblebee *B. sonorus* and its mimic, *Mallophora fautrix*, at the Portal site. Data collected on 10 August (0830–1100 Mountain Standard Time) and 12 August (1100–1400) 1973. Black boxes indicate that at least one flying bee or asilid was seen during a five min. interval within five m. of the observer. On 13 August observations between 1400–1700 produced just three sightings of a bumblebee and one of the asilid.

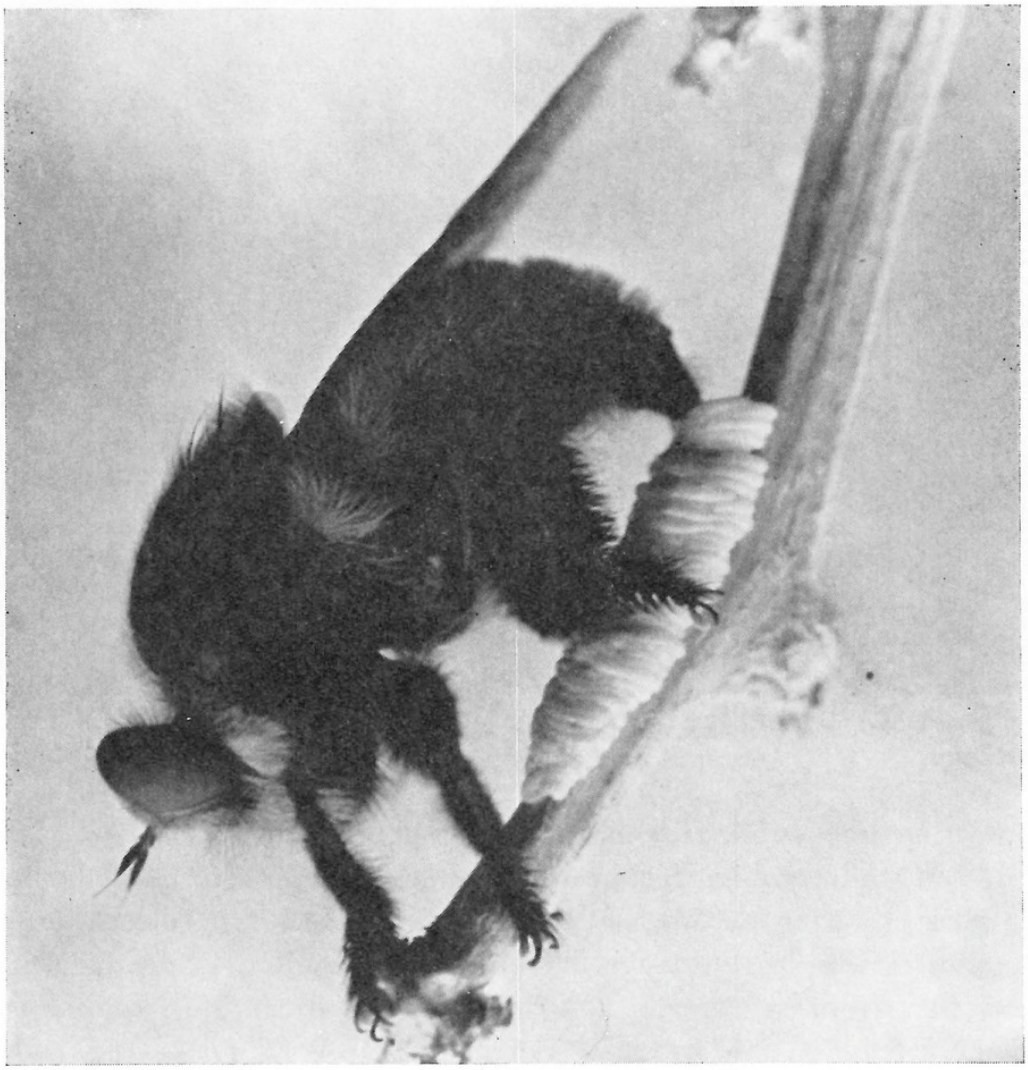

FIG. 3. A female *Mallophora fautrix* in the act of producing an egg case. Note that the case is constructed of thin coils of white oothecal material.

Flight activity.—The period of considerable flight activity coincided closely with the time when the fly's abundant model, *B. sonorus*, was also active in the area (Fig. 2). Whether the synchronous flight periods reflect a common thermal constraint on energetic flight for both species or whether selection has favored flies which time their conspicuous aerial reproductive activities to match the flight period of the model could not be determined. Perhaps both factors are responsible for the daily pattern of activity of *M. fautrix*.

Egg-laying.—Females laid eggs between 1035–1245 (N = 10). As Linsley surmised (1960), this species places its egg cluster at the tip of dried weed stems (especially *Conyza coulteri*) at a height of 1–2 m above the ground. Females first alighted head-up on a suitable site and then moved about probing with their abdomen, apparently searching

for an open area on which to place the egg case. Having located such a site, the females then curled their abdomen and began to exude a thin coil of white foam (Fig. 3). By moving their abdominal tip back and forth in a semi-circle the insects created a half-cylinder with a cavity which was filled with masses of eggs at short intervals. Egg cases ranged in size from 0.5–2.0 cm; females were sometimes interrupted in the midst of egg-laying by a male (three observations).

DISCUSSION

Lavigne and Holland (1969) have summarized the information available on the courtship and oviposition behavior of the Asilidae (see also Lavigne, 1970a, b; Rogers and Lavigne, 1972, for additional details). Although complex courtship displays have evolved in a few genera of asilids, most members of this family omit this component of reproductive behavior. *Mallophora fautrix* appears to belong with the majority in this regard although, as noted, males will hover near certain objects (*e.g.* burrs) with their hind legs extended. This behavior could conceivably provide a female with a courtship signal. In addition, the function of the oscillating flights may also be related to courtship although this remains speculative.

The oviposition behavior observed for this species is unusual for the Asilidae. Apparently only species of *Mallophora* and *Mallophorina* produce chalky egg cases and place them on open stems. However, a small number of asilids, including some species of the closely allied genus *Protomachus*, oviposit on vegetation, generally in some protected site, such as the florets of a grass or the space between a grass stem and leaf (Lavigne and Holland, 1959).

ACKNOWLEDGMENTS

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SCIENTIFIC NOTE

Lepturine Longhorns Collected on Chinquapin Bloom (Coleoptera: Cerambycidae).—The forested regions of western Oregon are moderately rich in members of the cerambycid tribe Lepturini. Adults of most species of these anthophilous beetles appear in the spring and early summer and collectively visit the blossoms of a wide variety of herbaceous and woody plants. Periods of activity vary with altitudinal distribution but usually by late July many species and their host flowers have disappeared. However, there are some lepturines which fly throughout July and August in the middle elevations of the Cascades, and for these chinquapin appears to be a favored and important source of pollen. Giant chinquapin, *Chrysolepsis chrysophylla* (Dougl. ex Hood.) Hjelmquist, is widely distributed in the Cascade and Coast ranges and its showy catkins of creamy white, heavily fragrant flowers are commonly in evidence from July to early September. Eleven species of longhorns were collected on chinquapin blossoms as follows: *Anoplodera amabilis* LeC., *A. canadensis* Oliv., *A. chrysocoma* Kirby, *A. crassicornis* LeC., *A. crassipes* LeC., *A. dehiscens* LeC., *A. dolorosa* LeC., *A. tibialis* LeC., *Leptura obliterata* Hald., *L. propinqua* Bland. and *Stenocorus flavolineatus* (LeC.). Species diversity and abundance varied with locality except for *A. canadensis* and *S. flavolineatus* which were represented by single specimens. Collection records include: ½ mile east of Suttle Lake Junction, Jefferson County, August 1, 1973; three miles east of Santiam Pass, Jefferson County, August 1, 1973 and; 13.2 miles south of Marion Forks, Linn County, August 4, 1973. *A. crassicornis* has been found abundantly on chinquapin on Doak Mountain, Klamath County, along with a few specimens of *A. amabilis* and *A. dehiscens*.—RICHARD L. PENROSE AND RICHARD L. WESTCOTT, *Oregon Department of Agriculture, Salem 97310.*