

THE MATING HABITS OF SOME SAWFLIES.

By S. A. ROHWER, *Branch of Forest Insects, Bureau of Entomology.*

There is very little information concerning the mating habits of sawflies published and it is believed that the following observations are worth recording. Especially is this true if the writer's belief, that the value of a character cannot be properly rated until its function or relation to the life cycle of the species is understood, can be considered feasible. Taxonomists of sawflies have so far paid very little attention to the male genitalia, but when these parts are used for taxonomic purposes it is very probable that in many groups it will be found that the concavity-shape and structure of the cochlearium will offer valuable characters. The shape and length of the penis and preputium will offer other useful characters.

The terminology of the male genitalia used in this paper is that given by Hartig in "Die familien der Blattwespen und Holzwespen" Berlin, 1860.

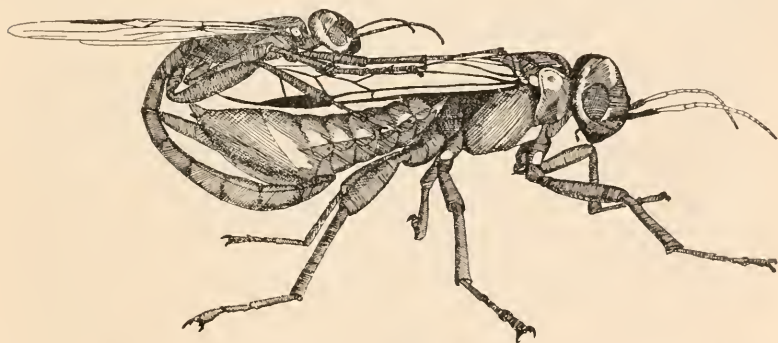


Fig. 1. *Xiphydria maculata* Say. Male and female in coitu. (Drawing by Wm. Middleton.)

XIPHYDRIA MACULATA SAY.

This species emerges early in the spring and from the notes available it would seem that every female mates. The notes on copulation presented here are summarized from many observations. In no case was there any courting and mating usually occurred whenever two sexually active individuals of opposite sexes came in close promixity. There is a great variation in size of individuals of this species but, as far as the observations went, size played no part in determining whether two individuals would mate.

In copulation the male rides on the back of the female curving the tip of his abdomen under the tip of her abdomen so the cochlearii of the extended genitalia grasps the side of the knob at the base of the sheath and the hypopygidium fits over the knob. The use of the preputium and penis was not observed. During copulation which lasts about 90 seconds there is a contraction and expansion of the muscles of the stipes so there is a strong push and pull motion. The wings are held flat against the body. The legs of the female are placed in the usual position assumed when resting, i.e., the fore legs directed anteriorly, the middle legs almost at right angles, the hind legs slightly posteriorly. The antennæ may be held still or waved slightly.

DIPRION LECONTEI (FITCH).

These notes dealing with the mating habits of *Diprion lecontei* are summarized from extensive notes on this species which have been accumulated at the Eastern Station of Branch of Forest Insects, and the material used came from localities covering most of the range of the species although most of the detailed notes were made on material collected near Falls Church, Va.

In the life history of this species there are some interesting and unusual conditions. The one which concerns this paper may be summarized as follows: In the first generation mating is the rule while in the second it is exceptional. In localities where there is only one generation mating normally occurs and there is a preponderance of males; in localities where there are two or more generations mating occurs normally only during the first, but in such localities mating may be witnessed throughout most of the season because of the great overlapping of generations. There is no courtship in this species, and the females of the first generation take as active a part in finding a mate as does the male while the females of the second generation will fight and may kill a male rather than mate. During copulation the wings are held flat against the body; the legs are spread rather far apart, the fore legs projecting anteriorly, the middle slightly anteriorly and the hind posteriorly; the antennæ are usually moved slowly up and down.

Copulation lasts about 100 seconds and is accomplished by the two individuals facing in opposite directions and the extreme end of the male abdomen being bent at an obtuse angle because of the truncate abdomen of the female. The hypopygidium of the male fits over the knob at the base of the sheath, the cochlearii grasp the sides of the knob in the manner of a ball and socket joint while the position occupied by the preputii and penis was not observed although they are probably used as in *Euura macgillivrayi*.

EUURA MACGILLIVRAYI ROHWER.

The notes on the mating of *Euura macgillivrayi* were made from a number of males and females which issued from galls collected in the type locality by Frank W. Rohwer. In this species there is no real courtship, but when individuals have freshly emerged and are sexually active they are more excited when in close proximity with an individual of opposite sex, as is evidenced by the rapid movement of antennæ and wings. There is, however, very little evidence of a positive power of recognizing the opposite sex because occasionally a male would seize another male or more rarely a female would seize another female. Unlike certain other insects the female of this species takes as active a part in looking for her mate as does the males as is proven by the fact that in a number of instances a female would seize and endeavor to mate with a tired male. In some few instances one female mated with two different males but as far as the observations went no male mated more than once. During copulation the wings are held close against the body or but slightly above it; the legs are spread rather far apart, the fore extending anteriorly, the middle at right angles with the body and the hind distinctly posteriorly.

Copulation occupies about 65 seconds and is accomplished by the two individuals facing in opposite directions. The hypopygidium of the male extends over the knob at the base of the sheath, the cochlearii grasp the sides of the knob after the fashion of a ball and socket joint, while the preputii and penis are inserted in the opening at the base of the sheath. When mating is completed the female endeavors to free herself of the male by using the hind legs and saw or if unsuccessful at first the sheath is used. There is apparently no expansion or contraction of the muscles of the stipes. After mating both sexes "dress" their abdomen with their hind legs.

PTERONIDEA VENTRALIS (SAY).

I have never had an opportunity to observe the mating of this species, and the notes here given are taken from a pair captured in coitu (and remaining connected) by C. T. Greene at Plummer's Island, Md., July 2, 1912, and from pictures taken at Plummer's Island, Md., by H. S. Barber. Mr. Barber's photographs are very interesting and would lead one to infer that the female of this species may mate more than once and with different individuals. From the attitude assumed by the male in figure 1 of plate XXII it is evident that the male is more excitable than the female.

From the pair secured by Mr. Greene the position assumed by certain parts of the genitalia may be described as follows: The hypopygidium fits over the knob at the base of the sheath while the cochlearii grasp the side of the same knob in the manner of a ball and socket joint. The position of the other parts cannot be seen.

HYPARGYRICUS FUMIPENNIS (NORTON).

Mr. J. C. Crawford captured a pair of this species in coitu. on Plummer's Island, Md., April 22, 1915, and notes that they were facing in the opposite directions.

EXPLANATION OF PLATE XXII.

Pteronidea ventralis (Say). A and B—Two perfect individuals, male and female, mating. C, D and E—female which has lost her flagelli being "courted" by three males. In D and E the female is mating with the male at the left. (Photographs by H. S. Barber at Plummer's Island, Md., on leaves of *Salix niger*).

AMETASTEGIA GLABRATA (FALLÉN), A HOLARCTIC SAWFLY.

BY S. A. ROHWER

Branch Forest Insects, Bureau of Entomology, Washington, D. C.

The "dock sawfly," *Ametastegia glabrata* (Fallén), has been known in America for many years and has heretofore been considered as a native species. Whether it is a native holarctic species or whether it was introduced from Europe may never be decided, but it is very certain that the American and European specimens are morphologically identical and inasmuch as they have the same habits it is believed the following synonymy is justifiable. The European synonymy is copied from Enslin.

AMETASTEGIA GLABRATA (FALLÉN).

Tenthredo glabrata Fallén, Svensk. Vet.- Akad. Handl. 1808, p. 108.

Tenthredo (Allantus) agilis Klug, Magaz. Ges. Naturf. Fr. Berlin, VIII, 1814, p. 208.

Tenthredo (Allantus) rufipes Lepeletier, Monog. Tenthred. 1823, p. 81.

Ametastegia fulvipes A. Costa, Rend. Acad. Sc. Napoli, vol. 21, 1882, p. 198.

Taxonus nigrisoma Norton, Proc. Boston Soc. Nat. Hist., vol. 9, 1862, p. 119; Tr. Amer. Ent. Soc., vol. 2, 1868, p. 165; Provancher, Nat. Can., vol. 10, 1878, p. 165; Fauna ent. Canad., Hym. 1883, p. 214; Jack,