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MISCELLANEOUS PREY RECORDS OF SOLITARY WASPS. I. (HYMENOPTERA: ACULEATA).By KARL V. KROMBEIN,¹ Washington, D. C.

It is my intention to publish from time to time, under this general title, prey records of solitary wasps which have not been included in my separate faunistic studies of limited areas, or which have not been the subject of separate biological notes. In general, the data given will consist of the following: The name of the wasp as determined by the author, except where credited in brackets to another worker; a code number referring to the observation; the locality, date, and time; and name of the prey followed, in brackets, by the authority responsible for that identification.

So far as possible I am depositing these wasps and associated prey in the collection of the U. S. National Museum, so that the identifications may be checked at later dates, should altered taxonomic concepts make this desirable. Each wasp and its prey bear the same code number, which is placed on the pin bearing the insects or, in the case of material preserved in alcohol, in the vial containing them.

It is important that predator and prey remain associated and that they be placed on permanent deposit in an institutional collection. Our taxonomic concepts occasionally change as the years bring us added material, or refined techniques for differentiation, or a more critical approach to the study of a given population. What we recognize today as a single species of wasp may on some future tomorrow be interpreted as several sibling species, or subspecies distinguishable largely on an ethological basis or difference in host preference. It must also be remembered that many solitary wasps store their nests with prey in an immature stage, which today we may be able to determine only to genus, subfamily, or family. Further study of immature forms in subsequent years may make it possible to provide specific identifications for many of these immature specimens.

BETHYLIDAE

Laelius trogodermatis (Ashmead)

A female of this species (81653 A) was captured in Arlington, Va., at 5 p. m. on August 16, 1953. She was dragging over the vertical surface of an unpainted, weathered board a paralyzed der-

¹ Entomology Research Branch, Agricultural Research Service, United States Department of Agriculture.

mestid larva much larger than herself which she held in her mandibles. The dermestid larva, a species of *Trogoderma* [det. W. H. Anderson], was 4.1 mm. long as compared with 2.8 mm. for the wasp. The board over which the wasp was dragging her prey was part of the exterior wall of a disused cowshed attached to my garage, and was 4 feet above the surface of the ground.

The type series of *L. trogodermatis*, consisting of one male and one female, was stated to have been reared from a larva of *Trogoderma tarsale* Melsh. Judging from the disparate size of the prey and wasp recorded above, it seems likely that several eggs would have been deposited eventually on the single larva. Multiple oviposition on one larva of *Anthrenus vorax* (Waterhouse) has been reported recently (Ayyappa and Cheema, 1952. Proc. Indian Acad. Sci., Sect. B, 36: 215-222) for a probable undescribed species of *Laelius* from India.

Since some of the observations recorded below were made on other wasps nesting in the wall of this disused cowshed, it might be well to mention the composition of this nesting area. The south wall is attached to the garage, the east and west walls have stucco exteriors with no nesting sites, and the north wall is composed of unpainted, weatherbeaten boards of Virginia pine, $\frac{3}{4}$ inch thick and 4 to 6 inches wide, nailed to the studding. At some time in the past these boards had a very heavy infestation of an anobiid beetle, *Xyletinus peltatus* (Harris) [det. W. H. Anderson], the larvae of which left a complicated system of anastomosing galleries stuffed with frass. There are now scarcely any of these beetles working in the wood, but their abandoned frass-filled burrows provide an easily excavated site for various xylicolous wasps. Dermestid larvae are found occasionally in the burrows which have been utilized as nesting sites by various wasps, and probably they feed on the mummified remains of prey which have not been consumed by the wasp larvae.

The present prey record for *L. trogodermatis* is of more than ordinary interest because the wasp was dragging the dermestid larva over the surface of the board. Under ordinary circumstances the larva would be paralyzed in the burrow and eggs deposited on it *in situ*. Perhaps in this case the dermestid larva was able to reach the surface before being paralyzed by the wasp's venom.

POMPILIDAE

Auplopus architectus (Say)

A female (92553 A) was captured by my wife on the ground

in Arlington, Va., at 2:15 p. m. on September 25, 1953. The wasp was carrying a paralyzed spider, venter to venter, with the spider's spinnerets grasped in her mandibles. All the spider's legs had been amputated at the apices of the coxae. The spider was a young female salticid, *Phidippus princeps* (Peckham) [det. B. J. Kaston].

Auplopus mellipes (Say)

A female (91750 A) was captured on a screen in my house at Arlington, Va., at 4 p. m. on September 17, 1950. She was dragging a paralyzed salticid spider, *Marpissa undata* (DeGeer) [det. B. J. Kaston], which had all the legs amputated beyond the coxae.

Auplopus nigrellus (Banks)

A female (71853 B) was taken crawling up the side of my house at Arlington, Va., at 2 p. m. on July 18, 1953. She was dragging a young paralyzed clubionid spider, *Trachelas* species, probably *tranquillus* (Hentz) [det. B. J. Kaston]. All the spider's legs except the left foreleg had been amputated at the tips of the coxae.

Ageniella (*Ageniella*) *partita* Banks

I caught a female (81350 A) [det. H. K. Townes] on the ground in open woods at Dunn Loring, Fairfax County, Va., on August 13, 1950 about 3 p. m. It was being closely pursued by two females of the cleptoparasitic pompilid, *Ceropales hatoda* Brimley [det. H. K. Townes]. The *Ageniella* was not carrying a spider.

AMPULICIDAE

Dolichurus greenei Rohwer

A female was captured at Dunn Loring, Fairfax County, Va., at 2 p. m. on August 22, 1948, dragging over leaf litter on the ground in open woods a paralyzed third instar blattid nymph of a species of *Parcoblatta* [det. A. B. Gurney].

SPHECIDAE

Diodontus atratus parcinosas Pate

This form nests in abandoned anobiid burrows in the habitat described above under *Laelius trogodermatis* (Ashmead). One female (72653 A) was captured as she hovered in the air before her burrow entrance at 4:30 p. m. on July 26, 1953. She carried in her mandibles an alate viviparous female aphid, *Drepanaphis acerifoliae* (Thos.) [det. L. M. Russell]. Three additional females (92653 C, 92653 D, 92653 F) were taken under similar circumstances at

11:15 and 11:20 a. m. and 3:30 p. m. on September 26, 1953. One of them was carrying an alate viviparous female of *Drepanaphis acerifoliae*, and the other two had nymphal aphids which Miss Russell thought probably belonged to the same species.

Stigmus americanus Packard

This species nested in large numbers in deserted anobiid burrows in the habitat described above under *Laelius trogodermatis* (Ashmead). Each of the following females was captured, at the time and date indicated, while crawling on the board near her burrow entrance and carrying in her mandibles an aphid nymph, probably *Drepanaphis acerifoliae* (Thos.) [det. L. M. Russell]:

- 72553 J—4 p. m., July 25, 1953
 9753 A—3 p. m., September 7, 1953
 91253 A—3 p. m., September 12, 1953
 91253 B—3:15 p. m., September 12, 1953
 91953 A—11 a. m., September 19, 1953
 91953 D—3:30 p. m., September 19, 1953
 92053 A—1:30 p. m., September 20, 1953

One of them (9753 A) clutched the rear end of the aphid in her mandibles, and two (91953 A, 91953 D) held the aphid by the head. Two additional *americanus* were captured in the same habitat, each with a nymphal aphid belonging to a species either of *Aphis* or *Anuraphis* [det. L. M. Russell], one of them (72553 I) at 4 p. m. on July 25, 1953, and one (72653 B) at 4:15 p. m. on July 26, 1953. Still another specimen (61651 B) was taken while carrying a nymphal aphid, probably a species of *Chaitophorus* [det. L. M. Russell], on the surface of a standing dead tree with punky wood at Dunn Loring, Fairfax County, Va., at 3 p. m. on June 16, 1951.

Passalococcus annulatus (Say)

This species nested in rather limited numbers in deserted anobiid burrows as described above. One female (92653 A) was captured at 9:30 a. m. on September 26, 1953, while carrying in her mandibles a nymphal aphid, probably *Drepanaphis acerifoliae* (Thos.) [det. L. M. Russell].

Chlorion pennsylvanicum (Linnaeus)

One female (82952 A) of this species was captured at 10 a. m. on August 29, 1952, while flying near the entrance to her burrow in a perpendicular bluff at Kenwood Beach, Chesapeake Bay, Md.

She was carrying a paralyzed, adult male tettigoniid, *Microcentium retinerve* (Burmeister) [det. A. B. Gurney]. About a dozen of these wasps had their burrows in a limited area in this bluff.

Crabro latipes Smith

A female was captured on October 4, 1934, at Ithaca, N. Y., while flying with a paralyzed female house fly, *Musca domestica* L. [det. C. W. Sabrosky].

First report of *Aulacigaster leucopeza* (Mg.) from Baja California, Mexico; California, New Mexico and Idaho: On November 6, 1953, nine larvae of *Aulacigaster leucopeza* (Mg.) were collected from cottonwood slime flux at San Jose, Baja California, by the authors assisted by C. C. Lindt. The larvae were reared to adults and sent to Willis W. Wirth, U.S.D.A., for identification.

This species has been reported from eight eastern states including Maryland, Virginia, New Jersey, New York, Pennsylvania, Indiana, Illinois, and Wisconsin, but has previously been collected only four times from the western United States. Through the kindness of Willis W. Wirth, the following four western records are included in this report: Las Cruces, New Mexico, June 1893, Cockerell, Cloudcroft, New Mexico, on *Pinus ponderosa* infested with *Dendroctonus*, C. J. Hay; from elm sap exudate, Council, Idaho, September 3, 1953, R. W. Portman, A. Dokoloff collected larvae and pupae of *Aulacigaster* (probably this species) from oak slime flux, Mather, California, July 1950.—CHRISTIAN P. CHRISTIANSON AND RAYMOND E. RYCKMAN, Loma Linda, California.

NOTICE

Lepidoptera of New York and Neighboring States, Part III. Noctuidae, by William T. M. Forbes. 409 pp., food index 5 pp. Memoir 329, Cornell University Agricultural Experiment Station. 1954. Price: \$1.50; Part II, \$1.50; Parts II and III, \$2.50. A few copies of Part I are still available for \$1.75. Orders should be sent to:

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