

1979

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A STUDY ON THE SPECIES COMPOSITION OF
MECOPTERA IN MACOUPIN COUNTY, ILLINOIS

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INDEPENDENT STUDY
ZOOLOGY 15990
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INTRODUCTION

The order Mecoptera, commonly referred to as the scorpionflies and hangingflies, are medium-sized, slender bodied insects with a long-faced appearance. The Mecoptera are characterized by four long and narrow membranous wings; the front and hind wings being similar in size and shape. Venation in both wings is rather generalized and consists of numerous cross veins.

The common name for the order is derived from the structure of the male genitalia in the family Panorpidae, which are recurved and bulbous and resemble the sting of a scorpion.

Scorpionflies are of ancient lineage with fossils known from as far back as the Permian. Today relatively few species of Mecoptera exist; fewer than 500 are currently recorded for the world. The scorpionflies and their fossil relatives exhibit many primitive characteristics and are considered among the oldest and most primitive holometabolous insects.

Twenty-one families of Mecoptera are recognized, a dozen of which are represented only by fossils. Of the nine extant families, five are present in North America comprising approximately 80 species with 18 species found in Illinois.

The center of distribution of the Mecoptera, in the United States, is generally accepted as being in the southern Appalachian Mountains. Illinois, with its extensive north-to-south geography, provides a

wide variety of habitats for most groups of Mecoptera.

In Illinois, most Mecoptera are found in humid woods, ravines, and similar areas of dense vegetation.

In the Bittacidae, most species are restricted to the humid, well shaded areas along streams and in bottomlands characterized by jewelweed (Impatiens sp.), stinging wood nettle (Laportea canadensis), gooseberry (Ribes sp.), and multiflora rose (Rosa multiflora).

The habitats of the Panorpidae are quite similar to those of the Bittacidae. They are commonly found near poison ivy (Rhus radicans), waterleaf (Hydrophyllum appendiculatum), jewelweed, and stinging wood nettle.

The habitat of the Meropeidae in Illinois is poorly known. The majority of specimens have been collected in a variety of hardwood forests but mostly at lights or in Malaise traps.

The Boreidae are highly restricted in habitat. They are found only in, or very close to, patches of moss on the ground in the Ozark uplift of Illinois.

PURPOSE

The purpose of this study, through the collection of specimens by the author, was to gain experience in field collection, species identification, faunal composition, and associated habitats of Mecoptera in Macoupin County, Illinois during the summer of 1979.

METHODS AND MATERIALS

Collection trips were originally conducted three times each week from June 1, 1979 to September 1, 1979 with two trips undertaken prior to sunrise and one trip after sunset. Initial collection trips in the evening proved unproductive due to high temperatures and were subsequently discontinued.

Five locations, within the county which possessed suitable habitat, were utilized as collection sites.

A 10 inch diameter nylon collecting net with an 18 inch handle was used to collect specimens of Panorpidae found hanging from the underneath of plant leaves, and Bittacidae found resting on top of leaves. Collection of Meropeidae was done by disturbing rotting logs and leaf litter. All specimens were killed in an ethyl acetate killing jar filled with tissue paper to minimize breakage. They were then pinned, using #3 insect pins, or placed in 80% ETOH.

To aid in species identification of female Panorpa, the genital plate is of taxonomic importance. To reveal the genital plate, the tip of the abdomen basal to the eighth segment was cut off and placed in 10-percent KOH for two hours to remove the soft internal tissues. The tip was then transferred to 70-percent ETOH, and the abdominal terga and sterna were separated with a pair of dissecting points, revealing the genital plate. In identification of males of some species

of Panorpa, clearing the genital bulb in 10-percent KOH may aid in species determination.

Identification of Bittacus, both males and females, consisted of examination of wing venation.

All specimens were identified using keys and supplement information provided by Webb et al. (1975) and representative specimens of species were placed in the Spooner-Riegel insect collection, Eastern Illinois University.

RESULTS

Bittacidae:

Bittacus apicalis Hagen

- 14-VI-79, Beaver Dam State Park, 2females 1male
20-VI-79, Scottville, 1female

Bittacus strigosus Hagen

- 8-VIII-79, Beaver Dam State Park, 3females 1male
9-VIII-79, " " " " , 1female 1male
24-VIII-79, Hettick, 3females

Bittacus stigmaterus Say

- 9-VIII-79, Beaver Dam State Park, 1female
10-VIII-79, " " " " , 2males
13-VIII-79, Hettick, 1female
22-VIII-79, Beaver Dam State Park, 2females 1male

Panorpidae:

Panorpa helena Byers

- 10-VI-79, Scottville, 1female
11-VI-79, Carlinville, 1female 1male
11-VII-79, Standard City, 9females 6males
21-VII-79, Hettick, 2females
28-VII-79, " , 1female 2males
28-VII-79, Carlinville, 3females
29-VII-79, Hettick, 1male
9-VIII-79, Beaver Dam State Park, 1male
10-VIII-79, " " " " , 1female
19-VIII-79, Hettick, 3males
22-VIII-79, Beaver Dam State Park, 1female 3males
23-VIII-79, Hettick, 5females 4males
9-IX-79, Hettick, 1male

DISCUSSION

Data obtained from Webb et al. (1975) showed that three species of Bittacus have been collected from Macoupin County previously. My data supported this, B. apicalis, B. strigosus, and B. stigmaterus were all collected. Two additional species, B. pilicornis and B. occidentis were noted by Webb et al. (1975) as possibly being collected from Macoupin County but I was unable to collect representatives of these species.

Only one species of Fanorpa was collected, F. helena. Webb et al. (1975) states that in addition to this species, F. sigmoides, F. banksi, and F. speciosa have been collected from Macoupin County. Also, three additional species are noted as being possibly collected in Macoupin County, F. nebulosa, F. debilis, and F. anomala. The inability of my study to locate the three species that Webb et al. collected indicates that either they are somewhat rare or my study was not ~~thorough~~ enough. Data supplied by Webb et al. (1975) from Macoupin County show that only one specimen of F. speciosa has been collected while only three specimens of F. sigmoides and F. banksi were collected. This would seem to indicate that these three species are rare in comparison to other species of Mecoptera ~~where~~ numerous collections have been reported.

With regard to the family Heropeidae, no specimens were collected which was expected since Webb et al. (1975) reports this family as being rare in the state of Illinois.

LITERATURE CITED

Webb, D.W., N.D. Penny, J.C. Marlin. 1975. The Mecoptera, or scorpionflies, of Illinois. Il. Nat. Hist. Surv. Bull., 31(7): 251-316.