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THE PRESENCE OF THE GENUS HEMEROBIUS IN HAWAII WITH A NOTE ON THE WING VENATION OF NESOBIELLA HOSPES (PERKINS) (Neuroptera: Hemerobiidae)

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Zimmerman's recent (1957) revision of the Hemerobiidae of Hawaii has put the study of the Hawaiian species of this family on a more secure basis so that it has now become possible to make determinations of specimens of these lacewings with some degree of certainty. During the past few years I have been engaged in the work of identifying the specimens of this family which I collected during a stay in the Hawaiian Islands in the years 1947–1949. During the course of this work, I was greatly surprised to find among the other material two male specimens of the species *Hemerobius pacificus* Banks, 1897. As members of the widespread genus *Hemerobius* have not yet been recognized from Hawaii, it was decided to publish these notes at this time.

The specimens, both males, were taken at night at an acetylene-light trap on the island of Hawaii, the specific locale being 8 km NW of the site of the Kilauea Military Camp on the SW slope of Mauna Loa volcano at an altitude of 1650 m. They were both collected on 16. X. 1948. One of these specimens will be deposited in the collection of the Museum of Comparative Zoology, Harvard University, while the other specimen will be retained in my personal collection.

The taxonomic status of *H. pacificus* has been treated by Carpenter (1940) and Gurney (1948), while I have recently studied specimens of this species throughout its range having had the opportunity of examining the extensive series of *H. pacificus* contained in the collections of the Museum of Comparative Zoology, U. S. National Museum and the Canadian National Collection. This species is one of the more common brown lacewings along the Pacific coasts of British Columbia and the states of Washington, Oregon, and California. Either *H. pacificus* or a closely related species occurs in the Great Basin, Chiricahua and Sonoran Deserts of the United States and Mexico and extends south through Mexico and Central America as far as Colombia in northern South America. The exact taxonomic status of this more southern form need not concern us here, although I intend to treat

this problem in a subsequent paper. It is sufficient for the moment to note that males from populations of *H. pacificus* occurring along the western coasts of Canada and the United States can be reliably differentiated from males from Mexico or from farther south.

Comparison of the specimens from Hawaii with the various populations from the mainland show that the Hawaiian males are representative of the form of *H. pacificus* occurring along the west-coastal areas of Canada and the United States. In spite of the rather remote locale at which these Hawaiian specimens were collected, it seems likely to me that this species has been recently introduced by man from this west-coastal area and that it is actually more wide-spread, at least on the island of Hawaii, than its seeming absence from other collections would otherwise indicate.

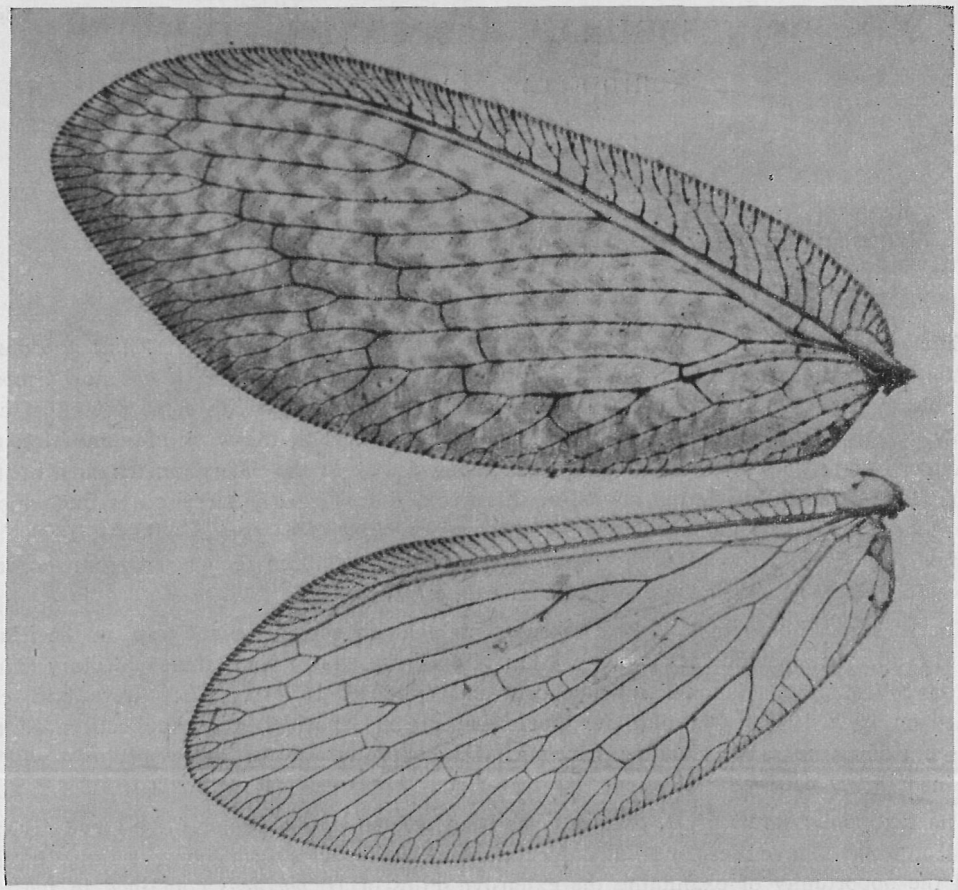

Fig. 1. Left wings of a ♂ of *Hemerobius pacificus* Banks. Specimen taken 8 km northwest of Kilauea Military Camp, Island of Hawaii; elevation 1650 m; 16. X. 1948; E. G. MacLeod leg. Total length of fore wing 10.94 mm.

In this connection it is important to note that Zimmerman, who was unaware of the presence of *Hemerobius* in Hawaii when his studies were conducted, has figured the right wings of a specimen of this genus (1957, figs. 2 and 9) under the name *Nesobiella hospes* (Perkins). Judging from the asymmetrical apex of the fore wing shown in his photograph,

due to the nearly straight distal posterior margin of the wing, it is likely that these figures represent an additional specimen of *H. pacificus* as this is a distinctive feature which this species shares with only a few close relatives. (Compare with fig. 1 of the present paper).

N. hospes (fig. 2) has a much broader fore wing, the basal portion of the costal area being particulary broadened. In addition, *N. hospes* has a taxonomically important cross vein in the fore wing between the most basal branch arising from the radius (the MA of Carpenter's terminology) and the 1st branch of the media (MP_{1+2} of Carpenter) near the most basal fork of the media. This cross vein is present in many other hemerobiid genera, but is absent in *Hemerobius*. An additional cross vein, of more variable occurrence in the Hemerobiidae, is also present in *N. hopses* between the two most basal branches arising from the stem of the radius. This vein, which is located directly above the preceding

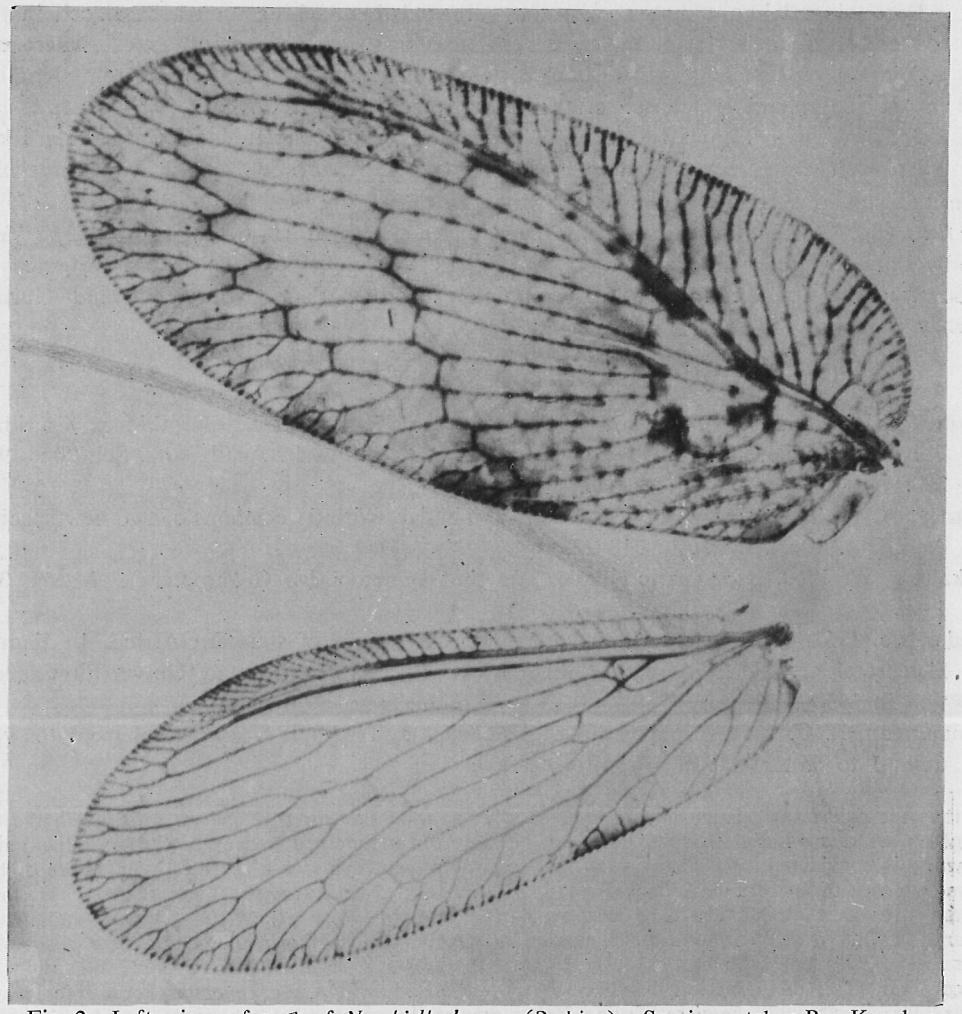

Fig. 2. Left wings of a ♂ of *Nesobiella hospes* (Perkins). Specimen taken Puu Kanehoa, Oahu; XI. 1948; E. G. MacLeod leg. Total length of fore wing 8.13 mm.

cross vein, is also lacking in species of *Hemerobius*. Zimmerman's remaining figures of the head, prothorax and the male genitalia of *N. hospes* (1957, figs. 6 and 10) are completely accurate.

As specimens of *Hemerobius* possess a recurrent humeral vein at the base of the costal space of the fore wing, as do *Sympherobius barberi* (Banks) and *N. hospes* which also occur in Hawaii, attempts to use the generic key of Zimmerman for the preliminary identification of specimens of *H. pacificus* will lead directly to couplet 3, where neither choice of the couplet will seem to apply. The following modification of Zimmerman's key, beginning with couplet 2, will eliminate this ambiguity:

2 (1). Fore wings with an arched, recurrent humeral veinlet arising from near base of subcosta which does not extend out to costal margin but is recurved to root of wing, thus making a basal enclosed cell in costal area (figs. 1, 2)..... 3a

Fore wings without such a recurrent vein and thus lacking such a basal cell in costal area, the 1st costal cross vein running to costal margin ..... **Micromus**[1]

3a. A cross vein present in fore wing between most basal branch arising from stem of radius and 1st branch of the media near 1st fork of media (fig. 2) .... to couplet 3 of Zimmerman's key

No such cross vein present in fore wing (fig. 1)..... **Hemerobius**

In addition to a comparison of the wings to the nearly diagnostic wing shape of *H. pacificus* (fig. 1), the determination of specimens suspected of belonging to *H. pacificus* ideally should include an examination of the genitalia in the case of males. Figures of these structures for *H. pacificus* are contained in the works of Carpenter and Gurney already cited.

LITERATURE CITED

Carpenter, F. M. 1940. A revision of the Nearctic Hemerobiidae, Berothidae, Sisyridae, Polystoechotidae and Dilaridae (Neuroptera). Proc. Amer. Acad. Arts. Sci. **74**: 193–280.

Gurney, A. B. 1948. Notes on Nearctic Hemerobiidae, with descriptions of two new species. Ann. Ent. Soc. Amer. **41**: 213–22.

Nakahara, W. 1960. Systematic studies on the Hemerobiidae (Neuroptera). Mushi **34**: 1–69.

Tjeder, Bo. 1961. Neuroptera Planipennia: The lacewings of southern Africa. 4. Family Hemerobiidae. South African Animal Life: Results of the Lund University Expedition in 1950–1951. **8**: 296–408.

Zimmerman, E. C. 1957. Ephemeroptera, Neuroptera-Trichoptera and supplement to volumes 1 to 5. Insects of Hawaii **6**: 1–209.

1. It is the consensus of most neuropterists that none of the group of genera into which the old genus *Micromus* has been subdivided can be seriously maintained when the fauna of the entire world is considered. Nakahara (1960) has recently presented his case for the maintenance of this multiplicity of small and, in my opinion, weakly-defined genera, while Tjeder (1961) has stated the case against this practice. I have seen no characters which show the requisite uniqueness and stability usually demanded of generic characters. Until a thorough and complete world-wide revision has resulted in the discovery of such characters, it seems most sensible and useful to consider all of these species, including the Hawaiian adventives and endemics heretofore treated as *Archaeomicromus*, *Eumicromus* and *Nesomicromus*, as members of the single world-wide genus *Micromus*.