CONIOPTERYGIDS (NEUROPTERA) ON FLORIDA CITRUS TREES[1]

MARTIN H. MUMA[2]
University of Florida, IFAS, Citrus Experiment Station
Lake Alfred, Florida 33850

ABSTRACT

Adults and first instar larvae of *Semidalis vicina* (Hagen) and *Coniopteryx westwoodi* (Fitch), collected and reared from citrus trees in Florida, are described and illustrated.

A coniopterygid was first recorded from Florida citrus groves 15 years ago (Muma, 1955). Adults of the species, identified by S. Parfin as *Coniopteryx vicina* Hagen, were reported to feed on citrus rust mites, *Phyllocoptruta oleivora* (Ashmead), and larvae on coccid crawlers and six-spotted mites, *Eotetranychus sexmaculatus* (Riley). Although the species was mentioned again by Muma (1958) and Muma et al. (1961), no significant additional data were presented until Muma (1967). At that time, the common species, repeatedly identified as *C. vicina*, was shown to have a wide host range with whiteflies seemingly more suitable hosts. The species was reported to be common, except in citrus groves on the lower east coast and in the extreme south, and to attain population peaks coincident with those of whiteflies.

A second species of coniopterygid was recorded from Florida citrus by Muma (1967, p. 287). This species was distinguished from the previously recorded species, *C. vicina*, by an orange to pink-grey instead of a blue-grey body color, by a short, broad, orange egg instead of a long, slender, white egg, and by larval antennae that were much longer instead of only slightly longer than the larval labial palpi. This second species was reported "as yet unidentified."

Recently, a series of adults and larvae were identified by O. S. Flint, minor order specialist, at the United States National Museum, Washington, D. C. Adults were referred to generically as *Coniopteryx* sp. and *Malacomyza* sp.; larvae were referred to as genus and species unknown. Fortunately, records and specimens of females depositing eggs, and larvae hatching from such eggs were retained. It is, therefore, possible to relate the females and first instar larvae of the several identifications obtained from specialists between June 1952 and April 1970.

Although correspondence with interested Neuroptera specialists has indicated some question in the past as to the appropriate generic and specific names for the species involved, there is no question that the 2 indicated genera below of Coniopterygidae frequent Florida citrus trees. Some grove and laboratory characters for distinguishing the species are cited

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[2]Research Associate, Florida State Collection of Arthropods, Division of Plant Industry, Florida Department of Agriculture and Consumer Services, Gainesville.

here along with seasonal and geographic distributional records from Florida citrus. The indicated genera for the 2 species are those accepted by most present-day Neuroptera authorities. Specific names include that selected by S. Parfin and confirmed by M. Meinander for the common species of *Semidalis* Enderlein, 1905, and the only recorded name for an eastern species of *Coniopteryx* for the less common form. The latter generic and specific names have also been confirmed by M. Meinander, University Zoological Museum, Helsinki, Finland.

Two grove-collected, adult females in the collection exhibit a variation in forewing veination distinct from that of either *Semidalis vicina* (Hagen) or *Coniopteryx westwoodi* (Fitch). Furthermore, a series of 8 late instar grove-collected larvae exhibit significant morphological differences from the 2 species recorded here. These specimens indicate that a third species of coniopterygid may be present in Florida citrus groves. Unfortunately, living material of this suspected species has not been available for study, so the form cannot be evaluated here.

Semidalis vicina (Hagen)

Fig. 1 to 4

Coniopteryx vicina Hagen, 1861, Smithsonian Misc. Coll. ? : 197.
Semidalis vicina (Hagen), Enderlein, 1906, Zool. Jahrb. f. Syst. 23: 215.
Coniopteryx vicina Hagen, Banks, 1907, Proc. Entomol. Soc. Wash. 8: 80.
Niphetia vicina (Hagen), Enderlein, 1930, Arch. Klass. Phylog. Ent. 1: 106.

Adult Characters: Over color pale, powdery blue-grey. Head yellow with brown to black eyes. Antennae yellow, darker distally. Legs yellow, darker distally on each segment. Thorax with nota indistinctly to distinctly marked with brown and yellow spots and dark seams on leg coxae and sternites. Abdomen pale brownish yellow with variable bright yellow markings ventrally. Wings blue-grey with a pale, narrow, marginal border.

Antennae with 26 segments. Head about as long as wide and finely setaceous. Mandibles unidentate with a broad rounded malar lobe; males and females similar. Maxillary palpi 5-segmented with apical segment obovate and provided with a scopula of fine setae covering entire mesal surface. Labial palpi 3-segmented with apical segment longer than 2 subapical segments and provided with a narrow, mesal scopula of fine setae about three-fourths its length; males and females similar. Thoracic and abdominal segments finely setaceous. Legs finely setaceous with 2 sizes of setae on all segments; larger setae more dense on coxae, tibiae, and tarsi; first tibiae with a dense latero-ventral scopula of larger setae on apical half; all tarsi 5-segmented with basal segment of leg 2 and 3 tarsi

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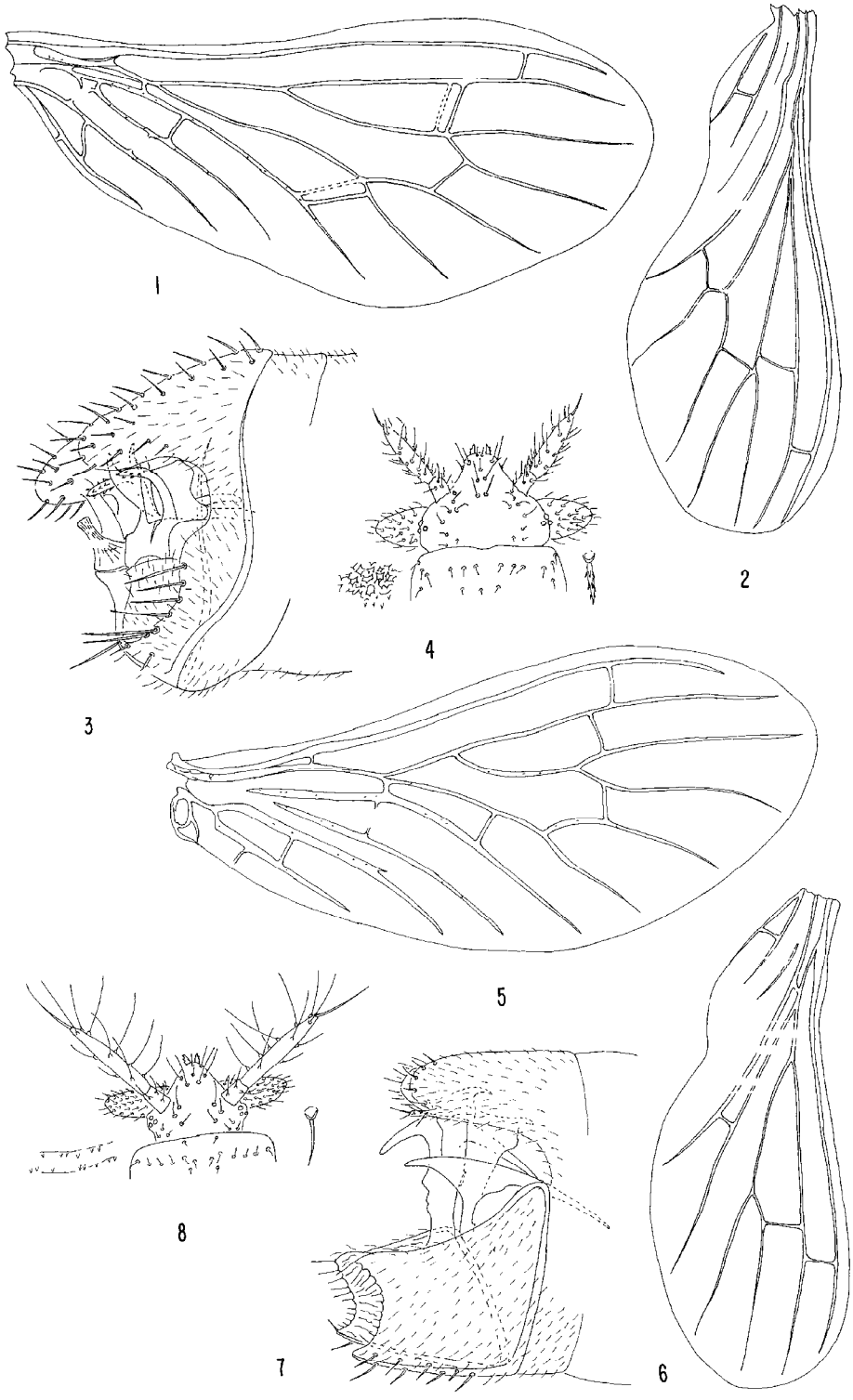
Fig. 1 to 4. *Semidalis vicina* (Hagen). 1. Forewing. 2. Hind wing. 3. Lateral view of male genitalia. 4. Dorsal view of first instar larval head, mouthparts, antennae, setation and dorsal derm pattern.

Fig. 5 to 8. *Coniopteryx westwoodi* (Fitch). 5. Forewing. 6. Hind wing. 7. Lateral view of male genitalia. 8. Dorsal view of first instar larval head, mouthparts, antennae, setation and dorsal derm pattern.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almost equal in length to combined length of apical segments; posterior tibiae slightly longer than femora. Wings finely setaceous; size and venation as in Fig. 1 and 2. Variation in position of forewing cross veins is indicated by dotted lines. Male genitalia as shown in Fig. 3.

First Instar Larval Characters: Nine laboratory hatched, unfed, first instar larvae vary from 1.84 to 2.91 mm in length from tip of labrum to tip of abdomen. Dorsal and lateral thoracic and abdominal setae short, thick, and serrate; ventral thoracic and abdominal setae short and setaceous. Derm predominately reticulate to granulate dorsally and striate ventrally. Legs 5-segmented with tibio-tarsus swollen but distinctly longer than slender femur; dorsal leg setae weakly serrate except for a pair of slender, curved, blunt-tipped setae that curve over tarsal claws. Labial palpi 2-segmented with apical segment triangular and armed with a ventral ovate scopula of fine setaceous setae about two-thirds the length of the segment and about as long as basal segment. Antennae 2-segmented with elongate apical segment shorter than labial palpi; antennal setae short and weakly serrate. Mandibles and maxillae acicular with the mandibles having 3 ectal serrations. Three ocelli located on each side behind antennae. Prothorax with 1 pair of spiracles; abdomen with 7 pairs of spiracles. Larval head, mouthparts, antennae and dorsal derm pattern are shown in Fig. 4.

Florida Records: Adults; 2 females resting on subterminal orange twigs, Deland, 29 April 1952 by K. E. and M. H. Muma; 1 male collected from orange grove, Lake Garfield, 5 May 1952 by T. B. Hallam; 1 male collected from citrus 2 miles south of Lakeland, 10 March 1952 by T. B. Hallam; 1 female collected from 'Parson Brown' orange south of Haines City, 20 June 1952 by T. B. Hallam; 7 males and 1 female on citrus, Minneola, 2 October 1965 by M. H. Muma and H. L. Greene; 1 female on grapefruit 2 miles south of Lake Wales, 16 June 1952 by T. B. Hallam; 1 female and 1 male on orange, DeLand, 6 May 1952 by M. H. Muma; 2 females and 1 male on citrus two and one-half miles north of Crescent City, 7 May 1952 by H. Holtsberg; 2 females on citrus three and one-half miles northeast of DeLand, 7 June 1952 by H. Holtsberg; 1 female and 1 male on citrus 3 miles north of Seville, 11 February 1953 by H. Holtsberg; 1 female and 1 male on citrus, Lake Thonotasassa, 7 July 1952 by K. Townsend; 1 female on citrus 3 miles north of Seville, 19 August 1953 by H. Holtsberg; 3 males on citrus two and one-half miles north of Crescent City, 8 July 1953 by H. Holtsberg; 7 females and 6 males, Minneola, 2 October 1965 from citrus trees by M. H. Muma, A. G. Selhime, and D. W. Clancy; 1 male on citrus, Haines City, 29 January 1964 by M. H. Muma, H. L. Greene, and R. F. Kanavel; 1 female and 2 males on citrus, Waverly, 22 May 1964 by M. H. Muma and H. L. Greene.

Larvae; 3 first instar hatched in laboratory after 2 October 1965 by H. L. Greene; 8 first instar hatched in laboratory after 6 May 1970 by H. L. Greene; 1 second instar from citrus leaf infested with sixspotted mites, Winter Haven, 6 April 1953 by M. H. Muma; 1 second instar on orange tree, Weirsdale, 9 July 1952 by M. H. Muma; 4 second instar laboratory-reared, 7 November 1963 by H. L. Greene; 5 third instar laboratory-reared, 14 November 1963 by H. L. Greene; 1 fourth instar which died in laboratory after spinning cocoon, 3 November 1963 by M. H. Muma and H. L.

Greene; 1 fourth instar which died in laboratory after spinning cocoon, 19 November 1963 by M. H. Muma and H. L. Greene.

Coniopteryx westwoodi (Fitch)

Fig. 5 to 8

Aleuronia westwoodi Fitch, 1856, 1st and 2nd Rep.—Insects of N.Y., 96-98.
Coniopteryx westwoodi (Fitch), Enderlein, 1906, Zool. Jahrb. Abth. f. Syst. 23: 205.
Malacomyza westwoodi (Fitch), Banks, 1907, Proc. Entomol. Soc. Wash. 8: 84.
Coniopteryx westwoodi (Fitch), Enderlein, 1930, Arch. Klass. Phylog. Ent. 1: 108.

Adult Characters: Over color pale, powdery blue-grey. Head yellow with brown eyes. Antennae pale brown, lighter basally. Legs pale brown, darker at union of femora and tibiae. Thorax pale brown with nota and sternites distinctly marked with yellow and brown spots and indistinct to distinct dark seams on leg coxae and sternites. Abdomen pink to orange. Wings uniformly blue-grey.

Antennae with 26 segments. Head about as long as wide and finely setaceous. Mandibles unidentate with broad, rounded malar lobe; malar lobe indistinct on male. Maxillary palpi 5-segmented with apical segment obovate and provided with a scopula of fine setae covering entire mesal surface. Labial palpi 3-segmented with the apical segment about as long as 2 subapical segments and provided with a broad scopula of fine setae that covers most of the mesal surface; male has apical segment shorter than subapical segments. Thoracic and abdominal segments finely setaceous; abdomen also with transverse bands of much larger setae. Legs finely setaceous with 2 sizes of setae on all segments; larger setae more dense on coxae, tibiae, and tarsi; first tibiae with dense scopula of longer setae on apical two-thirds of both ventral and lateral surfaces; all tarsi 5-segmented with basal segment of leg 2 and 3 tarsi distinctly longer than combined length of apical segments; posterior tibiae much longer than femora. Wings finely setaceous; size and venation as in Fig. 5 and 6. No positional variation in forewing cross veins was noted on the three available specimens. Male genitalia as shown in Fig. 7.

First Instar Larval Characters: Nine laboratory hatched, unfed first instar larvae vary from 1.53 to 2.44 mm in length from tip of labrum to tip of abdomen. Dorsal, lateral, and ventral setae short and setaceous. Derm predominately smooth to granulate dorsally and striate to granulate ventrally. Legs 5-segmented with tibio-tarsus slender but longer than swollen femur; leg setae short and setaceous except for dorsal terminal pair of slender curved knobbed setae that curve above tarsal claws. Labial palpi 2-segmented with apical segment elongate and armed with a ventral elongate scopula of fine setaceous setae about three-fourths the length of the segment, and more than twice as long as basal segment. Antennae 2-segmented with elongate apical segment longer than labial palpi; antennal setae elongate and setaceous. Mandibles and maxillae acicular with the mandibles having 3 ectal serrations. Three ocelli located on each side behind antennae. Prothorax with 1 pair of spiracles; abdomen with 7 pairs

of spiracles. Larval head, mouthparts, antennae, and dorsal derm pattern are shown in Fig. 8.

Florida Records: Adults; 1 female on 1 orange tree, Lake Alfred, 30 January 1964 by M. H. Muma and H. L. Greene; 1 female on orange tree, Lake Alfred, 18 February 1965 by M. H. Muma and H. L. Greene; 1 male on citrus, Lake Alfred, 10 May 1966 by M. H. Muma and H. L. Greene.

Larvae; 7 first instar hatched in laboratory between 30 January 1964 and 20 February 1964 by H. L. Greene; 2 first instar hatched in laboratory after 18 February 1965 by H. L. Greene; 1 third instar collected on citrus 5 miles northeast of Cocoa Merritt Island 18 January 1966 by H. Holtsberg.

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