

Notes on the Bionomics of the Mantispidae (Neuroptera: Planipennia)

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Because information on the hypermetamorphic Mantispidae is scarce, it is believed that the following three notes on their bionomics will be of interest. All of the specimens, on which these observations are based, are in the collection of the United States National Museum.

I am grateful to the late J. C. Bridwell (Lignum, Virginia) and G. B. Vogt (Entomology Research Division, U. S. Department of Agriculture) for making certain mantispid specimens available for study; to W. J. Gertsch (American Museum Natural History) for the identification of a spider egg-sac; to J. F. Gates Clarke (Smithsonian Institution) for helpful suggestions in the preparation of the manuscript; to R. E. Crabill (same institution) for providing the approved names of the spiders; to K. V. Krombein (Entomology Research Division, U. S. Department of Agriculture) for supplying the current names of the vespid wasps; and to C. W. Sabrosky and W. W. Wirth (same Division) for the determination of the sarcophagid.

MANTISPID HOSTS

Three cocoons of the green mantispid, *Mantispa viridis* Walker (tentatively determined until a revision of the Mantispidae is completed; in the genus *Mantispilla*, according to Enderlein's key, 1910, pp. 341-349), in two similar spider egg-sacs, were collected by the late J. C. Bridwell in "late 1951," at Lignum, Virginia, on the underside of a plank buried in grass. The adults emerged "early in 1952," according to Mr. Bridwell. One of the egg-sac halves, containing one cocoon, was sent to Dr. W. J. Gertsch, who kindly identified it as the sac of a spider, *Agelenopsis* sp., prob. *pennsylvanica* Koch, a familiar grass spider in the area. The cocoons, which are approximately 9 mm. long and 7 mm. wide, are composed of a dense, thick, white outer portion (about 1 mm. thick), and a much thinner

and considerably more loosely woven, pale yellow inner lining. The two light gray spider egg-sacs are each about 1.8 cm. in diameter. It was interesting to note that two mantispid larvae were able to complete their development in one spider egg-sac, without one destroying the other.

Host records for the hypermetamorphic Mantispidae are scarce in the literature, and can be summarized as follows:

Host	Mantispid	Reference
Spider egg-sacs and spiders		
<i>Agelena naevia</i> Walckenaer	<i>Mantispa fuscicornis</i> Banks as <i>fuscicornis</i>	Kaston, 1938, p. 147
<i>Arctosa littoralis</i> (Hentz) = <i>A. cinerea</i> (Fabricius)	1st stage mantispid larvae	Hungerford, 1939, p. 265
<i>Clubiona</i> sp.	<i>Mantispa</i> sp.	Rogenhofer, in Brauer, 1869, p. 833
<i>Cupiennis sallei</i> (Keyserling)	<i>Mantispa viridis</i> Walker?	Milliron, 1940, p. 358
<i>Drassodes hypocrita</i> (Simon)	<i>Mantispa styriaca</i> Poda	Poujade, 1898, p. 347
<i>Drassid</i>	<i>Mantispa styriaca</i> Poda	Main, 1931, p. 26
<i>Lycosa</i> sp.	<i>Mantispa styriaca</i> Poda	Rogenhofer, 1862, p. 583
<i>Lycosa inquilina</i> Koch = <i>Tarentula barbipes</i>	<i>Mantispa styriaca</i> Poda	Brauer, 1869, p. 833
<i>Philaeus militaris</i> (Hentz)	<i>Mantispa interrupta</i> Say	Smith, 1934, p. 124
<i>Thomisus</i> sp.	<i>Mantispa</i> sp.	Brauer, 1869, p. 834
Vespid wasp nests		
<i>Polybia occidentalis scutellaris</i> (White)	<i>Symphrasia varia</i> (Walker)	White, 1841, p. 322; Walker, 1853, p. 212; Smith, 1863, p. 501; Westwood, 1867, p. 506; Hagen, 1877, p. 210; Brauer, 1887, p. 213
<i>Polybia rejecta</i> (Fabricius)? (honey "bereitenden" wasp)	<i>Symphrasia varia</i> (Walker) <i>Mantispa</i> sp.	Rogenhofer, 1862, p. 585
Noctuid moth pupae		
<i>Xylomyges curialis</i> Grote	<i>Plega signata</i> (Hagen)	Woglum, 1935, p. 119

Brauer (1869, pp. 833-834) observed that the larvae of the Palearctic *Mantispa styriaca* Poda did not appear to like the lenticular green egg-sacs of *Lycosa fluviatilis* Blackwall, but (*loc. cit.*, p. 836) stated that the white, spherical egg-sacs of the following spiders are suitable for rearing the mantispids: *Lycosa inquilina* Koch = *Tarentula barbipes* (Sundevall), *Arc-tosa allodroma* Koch = *A. cinerea* (Fabricius) and *Dolomedes* Latreille.

LONGEVITY IN THE MANTISPIDAE

A female of *Mantispa viridis* was kept alive by the writer for a period of eighty-one days, dying on December 17. It was collected in flight just before dusk by Mr. G. B. Vogt as it was about to alight on a hop hornbeam tree near a rock outcrop located at an angle between Difficult Run, Virginia, and the Potomac River on September 28, 1955. No insects other than a small roach nymph, which was rejected, were offered to the mantispid, but bits of fruit such as peach, plum, grapes and cucumber were placed near the top of the small jar ($2\frac{1}{2}$ oz.) in which the specimen was confined. It was not seen to feed on the fruit, although it appeared attracted, even reaching for the fruit with its forelegs. Water was splashed on it daily, and grass and chickweed kept in the jar. It was frequently seen to pass its forelegs and tarsi through its mouth. The day before death, it fell into about $\frac{1}{4}$ " water, which had accumulated in the jar from the daily splashings, and after it was rescued, it became inactive and died the next day. Upon dissection, a moderate amount of fat was found next to the body wall of the abdomen, but eggs were not apparent.

The above longevity record for an adult mantispid in captivity is greater than that of Hungerford (1936, p. 70), who was able to keep a female of *M. interrupta* Say alive sixty-seven days, from July 19 to September 24, by giving it "a few drops of water each day and a housefly or other insect for food." Milliron (1940, p. 359) fed a mantispid (from Central America?), which was tentatively determined as *viridis*, ten to fifteen drosophilid flies between October 30th and November 7th, when the mantispid died. Thus it is seen that *M. viridis* may overwinter as an adult in its natural habitat. Smith (1934, p. 124) suggested that *M. interrupta* and *M. sayi* may overwinter as adults because some were taken in October in Kansas. Viets (1941, pp. 70-71) reared an adult of *M. interrupta* from an egg. The parent was collected in the summer in Michigan and the adult offspring emerged two months and five days after the egg was laid. This might indicate hibernation by the adult. Brauer (1869, p. 833), however, after approximately sixteen

years of research, found that the Palaearctic *styriaca* Poda overwintered as a larva and did not seek a spider egg-sac until spring. Main (1931, p. 26) made similar observations on *styriaca*.

SARCOPHAGID INVADER OF A MANTISPA

A sarcophagid larva (Diptera, Sarcophagidae), approximately 3 mm. long, identified by W. W. Wirth and C. W. Sabrosky, was found by the writer in the abdomen of a male of *M. interrupta* from Victoria, Texas, when it was dissected. It is not known whether the mantispid was alive or dead when the sarcophagid entered.

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Three New Species of Haploneurion Kohl (Hymenoptera: Psammocharidae) from Chile

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Townes, in his paper ¹ on the Nearctic wasps of the Subfamilies Pepsinae and Cerapalinae, places the species of this Genus and those of the Genus *Sphictostethus* Kohl in the Genus *Priocnemis* Schiødte. The writer cannot agree with this. Both of these Genera have outstanding characters which are distinctly different from those in *Priocnemis*. These differences are even greater than is usual between genera. The following key for the *females* (no males are known for the Genus *Haploneurion*) will show these differences.

1. Fore wings with *two* cubital cells; second recurrent vein meets second cubital cell from about *apical fifth* to slightly apical of the second intercubital vein; second intercubital vein strongly bowed outward on anterior third, the second cubital

¹ Townes, H. 1957. U. S. Nat. Mus. Bulletin 209.



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