

**Podagrion mantis Ashm., a Parasite of Mantis Eggs in Hawaii
(Hymenoptera: Callimomidae)**

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(Presented at the meeting of October 9, 1944)

A SINGLE SPECIMEN of this parasite was collected by Mr. Noel Krauss, on Molokai, May 31, 1943. Its identity and habits were not known at once, but it was suspected that it was an egg-parasite of the introduced Chinese mantid, *Tenodera angustipennis* Sauss., which is so widely distributed in the Hawaiian Islands. Hence, search was made on Oahu for mantis eggs to determine if they might possibly be parasitized. The first evidence of the presence of the parasite on Oahu, was the finding of an ootheca containing exit holes of a parasite, by Dr. Lyon on his garage. This was reported at the meeting of the Hawaiian Entomological Society, January 10, 1944 (this issue, page 214).

From eight oothecae collected February 4, 1944, by Mr. Bianchi and myself, on hibiscus branches and other shrubs and on buildings at the H.S.P.A. substation in upper Manoa Valley, 78 female parasites and nine males issued between Feb. 4 and March 20. This was the first rearing of the parasite. Only females issued during the first ten days, and it appeared that the parasite might be parthenogenetic. The very few males came later.

On Feb. 14 to 17, five of the earlier females that issued as above, and hence, unmated, were placed with an unhatched ootheca. Oviposition was observed. Between March 9 and 17, 148 male parasites issued, the time of development being three to four weeks. No females issued. Six mantids hatched March 16 and 17.

The identity of the parasite was suggested when reference was made to an article by Henry Fox (Ann. Ent. Soc. America, 32: 561-563, 1939), where he discusses *Podagrion mantis* Ashm. as an egg-parasite of the native mantid, *Stagmomantis carolina* (Johannson), in eastern United States, and also of the introduced mantid *Tenodera angustipennis*. Specimens were sent to Dr. Muesebeck, who replied in a letter of March 9, 1944, that Mr. Gahan confirmed the identity as *Podagrion mantis* Ashm.

On March 14, 1944, 25 oothecae were collected at the same locality as the February lot, the most of which were old and had exit holes where parasites had issued. Five of the oothecae were more recent, and from one of them 35 female and four male parasites issued between March 15 and 30. Nothing hatched from two

of the remaining oothecae. Apparently they had been unparasitized, and the young mantids had issued at some time prior to the time that we collected them. From the last remaining ootheca 151 mantids hatched March 18 to 21, and no parasites issued.

On March 15, a freshly-mated female *Podagrion* was placed with what appeared to be an unhatched ootheca. From this ootheca numerous mantids hatched on April 12 and five more on April 15; also 32 female and two male *Podagrion* issued between April 12 and 16. Thus the progeny of this one female was 34, and the development took about four weeks.

Also on March 15, a freshly-mated female *Podagrion* was placed with an unhatched ootheca collected that day from a wooden fence post at the Experiment Station, H.S.P.A. Numerous mantids hatched on April 2, and 45 females and four males of *Podagrion* issued between April 12 and 23, the total of this progeny being 49 parasites, and the time of development being about the same.

From an ootheca collected July 3, 1944 on a post at Experiment Station, H.S.P.A., 33 mantids hatched July 24, and between July 20 and 26, 151 females and 14 males of *Podagrion* issued, a total of 165 parasites, the largest number so far obtained from a single ootheca.

From four oothecae collected by Mr. Bianchi in Woodlawn, Manoa Valley, November 23, 1944, parasites issued respectively: 53 females and six males; 84 females and 23 males; 21 females and two males; 55 females and eight males. From two of these oothecae mantids also hatched, respectively: 28 and 42.

The mantis has been noticeably scarcer on Oahu of late years, and the finding of this parasite so thoroughly established explains the scarcity of the mantis. From the present observations there are always some eggs in each ootheca which escape being parasitized. This indicates that the mantis may not become entirely exterminated, but will no doubt exist at a very low ebb.

At the January 1944 meeting of the Hawaiian Entomological Society Mr. Krauss reported having found mantis oothecae on Kauai having exit holes of the parasite; and at the July meeting, Mr. Bianchi reported finding on the island of Hawaii, above Hilo, mantis oothecae with exit holes of the parasite. Thus, *Podagrion mantis* is known to occur on four of the main islands of the Hawaiian group: Molokai, Oahu, Kauai and Hawaii.