

NOTES ON ALLOGRAPTA FRACTA O. S. (DIPTERA: SYRPHIDAE).

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During the spring and early summer of 1918 the writer was stationed in the Imperial Valley of southern California, and was afforded good opportunity to observe the habits of the predaceous fly, *Allograpta fracta* O.S.

Previous to the first settlement and cultivation, some twenty years ago, the Imperial Valley was a flat, almost treeless, dry plain and, therefore, was not a habitat congenial to Syrphidæ, a family most of whose members prefer moist forested localities. In 1918 with several hundred thousand acres under cultivation to grains, corn, alfalfa, cotton and grapes and with canals everywhere a fairly rich syrphid fauna might have been expected. This was not the case, and with three exceptions the writer failed to observe during five months' time other than aphidophagous types and some of these, the species of *Melanostoma*, abundant elsewhere in California were conspicuous by their absence. The three exceptions above mentioned consisted of the species *Mesograpta geminata* Say, *M. marginata* Say, and *Ceria* sp., the last-named breeding in wounds in the trunks and limbs of cottonwood (*Populus fremontii*). From February to July *Allograpta fracta* was without doubt the most abundant species present, and the larvæ were very beneficial, acting as an undoubted check upon the barley and corn aphids (*Aphis maidis* Fitch). So mild was the winter that numbers of adults were observed January 3rd, on the occasion of a visit to the valley. After the middle of February, when the writer took up his duties, until the end of June, when he left the valley, the adult flies were seen nearly every day, often in abundance, about barley and corn fields infested with aphids. The first larva was observed February 19th, and thereafter larvæ and pupæ were to be found at any time first on barley and later on corn. The larvæ were especially beneficial to barley from March 15th to April 30th, at which date most of the grain had ripened, and to corn during May and June. In some fields they were more abundant than in others, and in those in which they especially abounded it was found that about 25% of the infested heads had larvæ working on the aphids. Experiments on the number of aphids a larva could destroy indicated that one could in its life-time eat all the aphids on from three to four heads of grain of average infestation. It therefore appeared that if at any one time larvæ were found to be working in a quarter of the infested heads in a field they might be expected to wipe out in due course between 75% and 100% of the infestation of aphids. In one field of 20 acres examined on a number of occasions, it appeared that *A. fracta* was responsible for an almost total destruction of barley aphids.

Larvæ of *Eupodes volucris* O.S., *Syrphus americanus* Wied., *Allograpta obliqua* Say, and *Catabomba pyrastri* L. were present in the barley and corn fields, but in much smaller numbers than those of *Allograpta fracta*.

In the Los Angeles district of southern California *Allograpta obliqua* is very abundant and *A. fracta* comparatively scarce, whereas in the Imperial Valley the reverse evidently holds true. *Fracta* is common in the San Diego mountains.

In 1918 *fracta* was not bred from any other host than *Aphis maidis*, except that a single larva was taken attacking *Aphis pseudobrassicæ* Davis. *Aphis*

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