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PREY OF THE CRIBELLATE SPIDER, *DICTYNA ANNULIPES* (ARANEAE, DICTYNIDAE), ON APPLE TREE FOLIAGE

Cribellate spiders belonging to the genus *Dictyna* are often abundant on the foliage of fruit trees and other plants where they spin their webs on the upper surface of partially rolled leaves, in the axils of twigs and on the bark (Chant 1956; Putman 1967; McCaffrey and Horsburgh 1980; Temerak 1981; Nuessly and Golden 1983; Bostanian et al. 1984). Putman (1967) reported that *D. annulipes* (Blackwall) was a common spider on peach bark, and also recovered *D. foliacea* (Hentz) and *D. sublata* (Hentz) by limb jarring.

In 1988, *D. annulipes* was the predominant spider (76.2%, N = 235 spiders) on the foliage of dwarf apple trees, cultivars McIntosh and Empire, at Jordan Station, Ontario. To assess the importance of this spider as a general predator in apple orchards, determination of its prey was undertaken by analysis of carcasses in its web and by assays of gut contents by immunoelectroosmophoresis as described by Allen and Hagley (1982). Webs ($\bar{x}$ no. per tree = 32, N = 7 trees) were examined at two- to three-day intervals and prey carcasses identified *in situ*, or the webs removed and examined microscopically in the laboratory. Spiders removed from the webs were placed individually in No. 000 gelatin capsules and frozen (−15° C) immediately. Serological tests were subsequently performed on individual spiders to determine if they had fed on insects in the orders Diptera, Hemiptera/Homoptera, Hymenoptera and Lepidoptera using antisera prepared to the apple maggot, *Rhagoletis pomonella* (Walsh), the green apple aphid, *Aphis pomi* DeGeer, the braconid, *Pholetesor ornigis* (Weed) and the leafminer, *Phyllonorycter blancardella* (Fabr.), respectively.

Chironomids (Diptera), (species undetermined), were the major prey (70.7%, N = 222 prey cadavers) of *D. annulipes* as determined by web analysis. Putman (1967) also suggested that chironomids were the major prey of web-spinning spiders, including *Dictyna* spp., on peach trees. The second largest group of prey were Hemiptera/Homoptera (15.3%) of which the leafhopper, *Typhlocyba pomaria* McAtee (5.88%) and the mirid, *Campylomma verbasci* (Meyer) (5.0%) were the most frequently recovered species. Chant (1956) reported that *D. arundinacea* L. fed on the mirid, *Plagiognathus arbustorum* Fab., but the anthocorid, *Anthocoris nemorum* L., was rejected. Chant (1956) also stated that aphids and coccids were not particularly favored by *D. arundinacea*. *Dictyna annulipes* apparently did not favor the green apple aphid, *A. pomi*, which comprised only 2.7% of the prey in the webs. Although McCaffrey and Horsburgh (1980) did not analyse the contents of the webs of *D. foliacea* and *D. sublata*, they suggested that the webs would be most effective for the capture of small, weak-flying insects, such as leafhoppers and aphids.

Other groups of prey in the webs of *D. annulipes* included Araneae (4.5%), Hymenoptera (2.7%), Lepidoptera (1.8%), Neuroptera (0.9%) and other Diptera (4.5%).

The proportion of *D. annulipes* giving positive serological reactions for various prey groups is shown in Table 1. The greatest proportion of spiders tested positive for the Hemiptera/Homoptera group. The number of spiders that were serologically positive to the antisera for Diptera decreased from May through

Table 1.—The proportion (N = 177) of *D. annulipes* that were serologically-positive for four prey groups.

Month	No. *D. annulipes* tested	Diptera	Hemiptera/ Homoptera	Hymenoptera	Lepidoptera
May	24	12.5	41.7	8.3	8.3
June	89	9.0	36.0	16.9	19.1
July	33	6.1	39.4	30.3	15.2
August	31	1.2	14.3	13.0	31.2

August, probably due to the fact that chironomids were most abundant in late April and May (unpublished data). Chironomid carcasses accumulated in the webs over time, as they were not removed by *D. annulipes*. Feeding on Hymenoptera and Lepidoptera increased as the season progressed and probably reflects an increase in the density and activity of both predator and prey (unpublished data). Of 177 *D. annulipes* that had fed, 75.7% consumed individuals of one prey group, 20.9% of two prey groups and 3.4% of three prey groups.

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