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POTENTIAL VORACITY OF THE APHIDOPHAGOUS SYRPHID LARVAE, *METASYRPHUS COROLLAE Fabr. SPHAEROPHORIA SCRIPTA* L. And *LASIOPHTHICUS PYRASTRI* L. (SYRPHIDAE-DIPTERA)*

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ABSTRACT

The present paper deals with the potential voracity of the aphidophagous syrphid larvae, *Metasyrphus corollae* Fabr., *Sphaerophoria scripta* L. and *Lasiophthicus pyrastri* L. In case of the first syrphid species, two types of aphid preys (i.e. *Brachycaudus amygdalinus* Schout. and *Hyalopterus pruni* Geoffr.) were used for larval feeding under two different thermal conditions, while with the other latter two syrphid species, *H. pruni* was only used. In association with *M. corollae* neither prey nor thermal conditions showed a significant effect on the total amount of aphids consumed during the larval period. On the

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other hand, when being under quite trophic and thermal conditions, the voracity of the larva of *S. scripta* was significantly lower than that of *M. corollae* larva, despite of its insignificant longer duration. However, the larva of *L. pyrastri* occupied an insignificant shorter period than that of *M. corollae* and showed an insignificant higher voracity during this period.

INTRODUCTION

Syrphid flies, commonly called the flower hovers or sweat flies constitute one of the largest, most sharply defined and best known group of all the families of Diptera. The larvae of this family vary in their feeding habits. The present work was based only on the aphidophagous syrphids that was found associating with aphids attacking peach and apricot leaves in Mosul Region. The efficiency of the three syrphid larvae, *Metasyrphus corollae* Fabr., *Sphaerophoria scripta* L. and *Lasiophthicus pyrastri* L. were herein investigated by using different preys and under different thermal conditions.

Few data concerning the voracity of the aforementioned larvae were previously recorded (Bombosch, 1962; and Tawfik et *al.*, 1974).

Due to the difference in the preys taxonomy of the present work as well as thermal experimental conditons compared with those of the previous authors, no comparative studies were under taken.

MATERIALS AND METHODS

The newly hatched larvae of the investigated syrphids were reared individually in small plastic pots (of 2.5 cm height and 3.5 cm diameter) in which where they were supplied daily with alive aphids. The consumed individuals of the prey were determined in each pot at the corresponding time on the following

day. The individuals of the prey were always chosen in the mature nymphal stage and relatively of the same size to allow comparisons of the consumption rates for different larval stages of the studied syrphid species. On the other hand preys were always introduced *ad lib.* to avoid all risks of food shortage.

RESULTS

The investigated syrphid larvae showed no particular preference for aphids; the phenomenon that was also recorded by Mitchell (1962) and Tawfik *et al.* (1974).

Efficieny of the larvae of *M. corollae*:

In case of *M. corollae*, the feeding capacity of the larvae was determined under two different thermal conditions (18.3 °C and 54.0% R.H. and 27.1 °C and 77.3% R.H.) and by using two types of preys (i.e., *Brachycaudus amygdalinus* Schout and *Hyalopterus pruni* Geoffr.).

Data (Table I) show that the first instar larva consumed the respective averages of 10.14±1.96 and 13.90±0.54 individuals of *B. amygdalinus* and *H. pruni*, at 18.2 °C and 54.0% R.H. Associating with these two types of preys, the first stadium lasted 2.21±0.18 and 3.26±0.13 days, respectively. Under the aforementioned conditions, the daily consumption rates averaged 5.09 (4–12) and 4.61 (4–8) individuals of *B. amygdalinus*. and *H. pruni*, respectively. Accordingly, it could be stated that the relative increase of the consumed individuals of *H. pruni* may be due to the longer stadium associated with this prey and not

Table I. Number of aphids consumed by the larva of *M. corollae*

Larval instar	Consumption :at 18. 3 °C and 54.0% R.H.				at 27.1 °C and 77.3% R.H.	
	B. amygdelinus		*H. pruni*		*H. pruni*	
	No. Consumed	A⁺	No. Consumed	A⁺	No. Consumed	A⁺
I	10.14±1.96 (3–21)	2.21±0.18	13.90±0.54 (6–21)	3.26±0.13	11.04±0.52 (5–21)	2.42±0.16
II	38.0±3.02 (16–88)	3.00±0.19	32.84±2.69 (20–82)	3.01±0.16	42.56±3.84 (20–79)	2.96±0.18
III	94.48±4.48 (48–142)	5.52±0.18	94.0±4.70 (44–169)	5.68±0.25	137.48±19.66 (76–213)	6.96±0.39
Total	142.62±3.85 (72–174)	10.72±0.31	140.74±5.55 (79–222)	11.71±0.08	191.08±8.01 (126–252)	12.32±0.41

A⁺ = *Average larval duration in days.*

Total	142.62±3.85		10.72±0.31		140.74±5.55		11.71±0.08	
	(72–174)				(79–222)			
		191.08±8.01		12.32±0.41				
		(126–252)						

A' = Average larval duration in days.

to the daily consumption rate that was relatively lower than in case of *B. amygdalinus*. Statistically, the difference between the consumed number of these two preys during the first stadium was significant ($t_{0.01} = 3.162$). On the other hand, when using *H. pruni* for feeding at 27.1 °C and 77.3% R.H., the first instar larva devoured 11.04±0.52 individuals during an average period of 2.42±0.16 days (Table I). Under such conditions, the daily consumption rate ranged from 2 to 5 with an average of 4.88 individuals per day. Comparing data recorded for the voracity of the first instar larva of *M. corollae* when using *H. pruni* for feeding under two different thermal conditions, it could be concluded that the significant decrease ($t_{0.01} = 2.744$) in the consumption rate at 27.1 °C and 77.3% R.H. was due to the shorter larval duration and not to the daily consumption rate that was more or less equal under both laboratory conditions; being 4.88 and 4.61 individuals, respectively.

During the second stadium, the total number of *B. amygdalinus* consumed at 18.3 °C and 54.0% R.H. was 38.00 ± 3.02 individuals; being insignificantly greater than that found to be 32.84±2 .69 individuals when feeding larvae on *H. pruni* under the same laboratory conditions (Table I). Under such conditions the second stadia were equal, being 3.00±0.19 and 3.01±0.16 days, respectively. However, the daily consumption rates were 13.34 (10—25) and 11.94 (10—22) individuals of *B. amygdalinus* and *H. pruni*, respectively. Thus, the insignificant increase in the preyed individuals of *B. amygdalinus* may be due to the relatively higher daily consumption rate of this prey. At 27.1 °C and 77.3% R.H. and in association with *H. pruni*, the total consumption rate increased to 42.56±3.84 individuals (Table I). The average of the daily consumption rate increased to (14.59

(6-16) during an average stadium of 2.96±0.18 days; a more or less equal period to that (3.01±0.16 days) was reported for the corresponding stadium when using the same prey but at 18.3 °C and 54.0% R.H. Accordingly, it could be mentioned that the insignificant increase in the potential voracity at 27.1 °C and 77.3% R.H., is probably due to the relatively higher daily consumption rate under such laboratory conditions.

Similar results were also obtained during the third instar larva of *M. corollae*, but with higher consumption rates. At 18.3 °C and 54.0 R.H., this instar consumed 94.48± 4.48 and 94.00±4.70 individuals of *B. amygdalimus* and *H. pruni*, respectively; being equal in voracity (Table 1). This relative equality existed also in the duration of this instar that occupied the respective averages of 5.52± 0.18 and 5.68±0.25 days, and in the averages of the daily consumption rates that were in respective 20.49 (14–33) and 20.94 (12–35) individuals of *B. amygdalinus* and *H. pruni*. However, at 27.1 °C and 77.3% R.H. and by using the prey, *H. pruni*, the third instar larva consumed 137. 48±19.66 individuals during an average period of 6. 96±0.39 days (Table 1) and with a daily consumption rate of 23.56 (10–24) aphids. Comparing these findings with those reported for the same instar larva when using the same prey (*H. pruni*), but at 18.3 °C and 54.0% R.H., it appeared that the total amount of the consumed aphids, even insignificant, was relatively higher at 27.1 °C and 77.3% R.H. This increase was also coincident with an increase in the duration of this instar and in its daily consumption rate.

Data in Table (1) show that at 18.3 °C and 54.0% R.H. the total number of aphids consumed during the whole larval period of *M. corollae* was 142.62±3.85 and 140.74±5.55 individ-

uals of *B. amygdalinus* and *H. pruni*, respcctively; being insignificantly varied. The respective total larval durations under this varied trophic condition were 10.72 ± 0.31 and 11.71 ± 0.08 days. However, at the higher temperature and relative humidity (27.1 °C and 77.3% R.H.)the feeding capacity increased to 191.08 ± 8.01 individuals of *H. pruni* devoured in 12. 32±0.41 days. This amount, even insignificant was relatively higher than the corresponding one (140.74±5.55 individuals) by using the same prey (*H. pruni*) at 18.3 °C and 54.0% R.H.

Efficiency of the larva of *S. scripta*:

The feeding capacity of the larva of *S. scripta* was estimated by using *H. pruni* as a prey at 27.1 °C and 77.3% R.H.

Data (Table 2) show that the first instar larva consumed 10.62±0.94 individuals in 3.19±0.22 days with a daily consumption rate of 3.5 (1—6) individuals.

Table 2. Number of aphids (of *H. pruni*) consumed by the larva of *S. scripta* at 27.1 °C and 77.3% R.H.

Instar	No. of aphids consumed			Average larval duration (in days)
	Min.	Max.	Average	
I	4	21	10.62±0.94	3.19±0.22
II	18	66	34.67±2.53	3.86±0.23
III	54	178	116.62±7.84	6.95±0.38
Total	96	226	161.90±8.14	14.00±0.34

During the second stadium that averaged 3.86±0.23 days, the total number of consumed aphids averaged 34.67±2.53 individuals, while during the third stadium (6.95±0.38 days), this amount increased to 116.62±7.84 individuals. During the last two stadia, the daily consumption rates were 9.1 (3–11) and 19.8 (8–21) individuals, respectively. Accordingly, the total amount of the devoured aphids was 161.90±8.14 (96–226) individuals during an average larval period of 14.00±0.34 days at 27.1 °C and 77.3% R.H.

Efficiency of the larva of *L. pyrastri*:

With the species, *H. pruni* which was used for larval feeding at 18.3 °C and 54.0% R.H.

Data obtained (Table 3) show that the number of aphids consumed by the first instar larva was 11.54±1.57 individuals devoured in 1.64±0.20 days with a daily consumption rate of 4.40(5–12) aphids. During the second stadium that occupied 2.82±0.23 days, the number of consumed aphids averaged42. 45±3.89 individuals, where the daily consumption rate was 15.18 (14–29) individuals on the average. During the third stadium, the average of 131.18±14.68 aphids was devoured during 6.82±0.72 days at 18.3 °C and 54.0¼ R.H. The daily consumption rate of this instar ranged between 24 and 43 individuals with an average of 23.22 aphids/ day. Accordingly, the total amount of *H. pruni* consumed by the larva of *L. pyrastri* averaged 185.18± 12.96 individuals during an average period of 11.27±0.66 days at 18.3 °C and 54.0% R.H.

Table 3. Number of aphids (of *H. pruni*) consumed by the larva of *L. pyrastri* at 18.3°C and 54.0% R.H.

Instar	No. of aphids consumed			Average larval duration (in days)
	Min.	Max.	Average	
I	5	26	11.54±1.57	1.64±0.20
II	25	73	42.45±3.89	2.82±0.23
III	68	243	131.18±14.68	6.82±0.72
Total	125	281	185.18±12.96	11.27±0.66

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