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E Arockia LeninNational Institute of Plant
Health Management,
Hyderabad, Telangana, India**S Jesu Rajan**National Institute of Plant
Health Management,
Hyderabad, Telangana, India

Biology of predatory bug *Eocanthecona furcellata* Wolff (Hemiptera: Pentatomidae) on *Corcyra cephalonica* Stainton

E Arockia Lenin and S Jesu Rajan

Abstract

Eocanthecona furcellata (Wolff.) (Hemiptera: Pentatomidae) is an important predator for several agriculturally important pests. The biology of *E. furcellata* has been done with several insect pests but there is no report on the laboratory host, *Corcyra cephalonica* (Stainton). Hence, this study is aimed to understand the biology of *E. furcellata* Wolff. and its role in mass rearing on laboratory reared pest *C. cephalonica* Stainton. The analyses showed that the total number of eggs of the predatory stink bug was 44 ± 8 days, incubation period 6 ± 1.05 days and the life cycle passed through five nymphal instars with a total nymphal period of about 16 ± 0.64 days. Male and female longevity were 12 ± 1.05 days and 14 ± 1.09 days, respectively, and total longevity period for male and female lasted 32 ± 0.19 and 36 ± 1.90 days, respectively. Moreover, this study revealed that *C. cephalonica* could be used as alternative host to mass rear *E. furcellata* when the main host is not available.

Keywords: Biology, predatory sting bug, *Eocanthecona furcellata*, *Corcyra cephalonica*

1. Introduction

Sustainable agriculture gaining momentum, more emphasis is laid on Integrated Pest Management which includes other components like biological control of the pests of crops by natural enemies. Such types of natural enemies include predators, parasitoids and pathogens. Arthropod predators and parasitoids are the most important naturally occurring biological control agents of insect and mite pests in most of the crop ecosystems [2]. Among the heteropteran predators, *Eocanthecona furcellata* (Wolff.) (Hemiptera: Pentatomidae) has received much attention in biological control due to its potential to control lepidopteran, coleopteran and heteropteran insects [3]. In India, *E. furcellata* had been considered as an important predator on several important lepidopteran pests [6, 8]. This predator can be used as an important biological control agent in integrated pest management programme. Here, the biology and the utility of *Corcyra cephalonica* as an alternative pest were studied.

2. Materials and Methods

This experiment was conducted at National Institute of Plant Health Management (NIPHM), Hyderabad during the period from January to February, 2016. The adult male and female bugs of *E. furcellata* Wolff were collected from brinjal field of NIPHM, Rajendra Nagar (latitude $78^{\circ}41'E$ and $17^{\circ}33'N$), Hyderabad, India. They were maintained in plastic containers (15 x 8 cm) on the head crused larvae of *C. cephalonica* under the laboratory conditions (temperature 32 ± 2 °C, $75 \pm 5\%$ relative humidity and 12 ± 1 hrs photoperiod) and containers were covered with muslin cloth for aeration. The adults were kept in a container for mating. The eggs were separated and kept in separate petri dishes for hatching with wet cotton swabs for maintaining optimum humidity (85%). The cotton swabs were changed periodically in order to prevent fungal attack. Mated females were maintained individually in order to count the number of batches of eggs and number of eggs in each batch laid by them. The bugs were reared in the laboratory for two generations to find out the incubation period, stadia period, nymphal mortality, fecundity, longevity and sex ratio.

3. Results and Discussion

3.1 Biology of *Eocanthecona furcellata* on larvae of *Corcyra cephalonica*

The life history of *Eocanthecona furcellata* was analysed previously using different insect pests [1, 4, 7, 8]. But observations on the biology of *E. furcellata* on the laboratory reared larvae of *C. cephalonica* has not yet been analysed.

Correspondence**E Arockia Lenin**National Institute of Plant
Health Management,
Hyderabad, Telangana, India

In the present investigation, the biology of *E. furcellata* on *C. cephalonica* shows that, the number eggs of 44 ± 8 , incubation period of 6 ± 1.05 , hatchability rate of 90% and the duration of the first instar nymph was observed to vary from 3-4 days. The duration of second, third, fourth and fifth instar nymphs lasted for 3.7, 4.4, 3.3 and 3.7 days. In addition, Male and female longevity were 12 ± 1.05 and 14 ± 1.09 days, respectively. Hence, the total life cycle of the female and male lasted for 32 ± 0.19 and 36 ± 1.90 days, respectively (Table 1). Notably, the variations were observed when compared earlier studies of the biology of *E. furcellata* on lepidopteran larvae *Podenia litura* F^[5] and *Spilarctia obliqua* Walk^[1, 8]. This

may be possibly due to the variation in atmospheric temperatures and geographical differences.

Intrestingly, the nymphal instars are good predators than adults. Of which third, fourth, fifth nymphal instars wer feeding more larvae. It is important to note that head crushed larvae should be given to the first and second nymphal instars to avoid webbing of *C. cephalonica*. Moreover, adults predators have not preferred more larvae than nymphal instars. Hence, *C. cephalonica* could be used as an alternative host to rear the first, second, third, fourth and fifth nymphal instars than adults of *E. furcellata* when the main host is not available.

Table 1: Biological parameters of *Eocanthocona furcellata* on *Corcyra cephalonica* under laboratory conditions (n = 12; X \pm SD)

Parameters	Number in days
Incubation period	6 ± 1.05
I instar	3 ± 0.85
II instar	3 ± 0.76
III instar	4 ± 0.48
IV instar	3 ± 0.35
V instar	3 ± 0.79
Total nymphal period	16 ± 0.64
Total number of eggs	44 ± 8
Hatchability	90%
Male	12 ± 1.05
Female	14 ± 1.09
Preoviposition period	4 ± 0.96
Oviposition period	9 ± 0.57
Post Oviposition period	5 ± 0.36
Total longevity	
Male	32 ± 0.19
Female	36 ± 1.90



Fig 1: Egg mass of *Eocanthocona furcellata*



Fig 3: Second nymphal instars feeding on *Corcyra* larvae



Fig 2: First nymphal instars feeding on *Corcyra* larvae



Fig 4: Third nymphal instars feeding on *Corcyra* larvae



Fig 5: Fourth nymphal instars feeding on *Corcyra* larvae



Fig 6: Fifth nymphal instars feeding on *Corcyra* larvae



Fig 7: Adult female feeding on *Corcyra* larva

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5. References

1. Bhadauria VKS, Jakhmola SS, Bhadauria NS. Biology of *Canthecona furcellata* Wolf. on the larvae of *Spilarctia obliqua* Wlk. Indian J. Entomology. 1999; 61:196-198.
2. Carson R. *Silent spring*. Houghton Mifflin, Massachusetts, 1962.
3. De clerq P. Prdaceous stink bugs (Pentatomidae: Asopinae). In *Heteroptera of Economic Importance*, ed. C.W. Shaefer and A. Panizzi, Boca Raton, FL: CRC Press. 2000, 737-86.
4. Gallego VC. Biology and mass production of castor semilooper, *Achaea janata* W. for use as rearing host of *Eocanthecona furcellata* (Wolff), a predator slug caterpillar. Phillipine Journal of Crop Science. 1998; 23:29.

5. Kapoor KN, Gujarathi JP, Gangrade GA. *Canthecona furcellata* as a predator of *Prodenia litura* F. larva. Indian J Entomology. 1973; 35:275
6. Pant CP. Some aspects of the bionomics of *Earias* spp. at Kanpur. Agra. Univ. J Res Sci. 1960; 9(1):31-40.
7. Tabasa MA. Life history and funtional response of the predatory bug, *Eocanthecona furcellata* (Wolff) (Heteroptera: Pentatomidae) in relation to its prey *Spodoptera litura* F. Leguna (Philippines), 1991, 96.
8. Vineet kumar MN, Morrison S, Rajadurai AM, Babu V, Thiyagarajan Datta RK. Studies on the biology and predatory behaviour of *Eocanthecona furcellata* (Wolff.) predating on *Spilarctica obliqua* (Walk.) in mulberry plantation. Int. J Indust Entomol. 2001; 2(2):173-180.