Journal of Biological Control, 29(1): 43-46, 2015

Research Article

Studies on biology of *Amphibolus venator* (Klug) on *Corcyra cephalonica Stainton*

ANAND KATTI*, J. S. AWAKNAVAR, D. N. KAMBREKAR[1], M. B. PATIL[2] and S. B. PATIL[3]
Department of Agricultural Entomology College of Agriculture, Bijapur UAS Dharwad
[1]Agricultural Entomology Regional Agricultural Research Station, Bijapur
[2]Department of Agronomy, College of Agriculture, Bijapur
[3]Department of Agricultural Extension Education, College of Agriculture, Bijapur
**Corresponding author E-mail*: anand.katti33@gmail.com

ABSTRACT: The biology of *Amphibolus venator* was studied on *Corcyra cephalonica* under laboratory conditions. The egg period was 16.33±1.24 days, with the range of 15-18 days. There were five nymphal instars in *Amphibolus venator*. The nymphal period for I, II, II, IV and V instar lasted for 23.33±3.14, 30.83±6.06, 38.33±9.70, 40.16±3.67 and 40.00±4.63 days, respectively. The total developmental period was 172.65±15.50 days. The longevity of female was 65.83 ± 2.4 days with range of 63 to 68 days and male was 59.33 ± 2.49 with range of 57 to 62 days; the fecundity per female was 210 with range of 200 to 220 eggs.

KEY WORDS: *Amphibolus venator*, biology, *Corcyra cephlonica*, reduviid bug.

(Article chronicle: Received: 27-02-2015; Revised: 04-03-2015; Accepted: 11-03-2015)

INTRODUCTION

It is well established fact that lot of efforts should be put for the production of "every single grain" but this is of no use if the produced grains seeds are not saved, which recalls the proverb "A grain saved is a grain produced". This adage depends mainly on how best we protect the quality of grains during storage. Loss of grains stored as seed and future food of our country is to the tune of 7-8 per cent accounting to major share of economic loss worth Rs. 600-700 crores. Farmers retain 60 to 70 per cent of their agricultural produce for seed purpose, home consumption and for sale (Reddy and Pushpamma, 1980).

The reduviid bug predator (*Amphibolus venator*) play a major role in suppressing stored insects pests like *Corcyra cephlonica, Tribolium* spp., *Cadra cautella* and *Trogoderma granarium*.

MATERIALS AND METHODS

Rearing of *Corcyra cephalonica*

C. cephalonica eggs culture were purchased from the Bio-control laboratory of UAS Dharwad. Each 0.5 cc of eggs were reared on a newly formulated medium consisting of jowar flour (1 kg), groundnut (200 gm), (20 mg) and Wesson's salt mixture (15 gm) in plastic trough (22 cm lower diameter, 28 cm upper diameter and 10 cm height) and the troughs were covered with a muslin cloth. Each such trough with culture medium was enough to rear 3 generations of *C. cephalonica*. The cost of production including labour for rearing 5000 reduviid predator was determined (Sahayaraj K, 2002).

To study the biology of predatory reduviid bug, observations were made under laboratory conditions Department of Agricultural Entomology, College of Agriculture, Bijapur, Biology of reduviid bug predator of 10 in different glass vials on the respective larval host stage of rice moth were carried out in the laboratory by providing five larvae per day per glass vial. The food was provided till the death of predatory reduviid bug and observation on the egg period, nymphal period, Adult longevity and the feeding potential of adults were recorded for 10 pairs of predatory reduviid bug.

To know the adult longevity of both male and female, 10 reduviid bugs were transferred to glass vials (1cm diameter, 5cm height with plastic tops with fine metal mesh for ventilation). They were placed in the laboratory conditions under which they developed. Eggs and larvae were provided. The numbers of surviving reduviid bug were counted every day till the death of insects. Similarly longevity of reduviid adult male and female was recorded separately by providing food.

RESULTS AND DISCUSSION

Egg

The female bug usually laid eggs individually on the side of the glass jars and on tissue paper at the base of ovipositional container. The freshly laid egg was creamy white and opaque with polygonal reticulation on the chorion which was more or less elongated pitcher or pot shaped. A day before hatching, the egg turned to dark red color. The embryo was visible through the egg shell, with two dark clear red eye spots. At the time of hatching, the nymph pushed out the operculum and emerged with its head first followed by thorax and abdomen. Though hatching was seen throughout the day, majority of eggs hatched during late evening and early morning hours. The incubation period was 16.33±1.24 days which ranged from 15-18 days (Fig. 1).

Fig. 1. Egg of *Amphibolus venator*

Nymph

The data pertaining to duration of different nymphal instars, adult and fecundity are presented in Table 1.

Table 1. Studies on biology of reduviid bug, (*Amphibolus venator*)

Parameters	Mean ± SD	Range
Incubation period (days)	16.33 ± 1.24	15 - 18
1st instar (days)	23.33 ± 3.14	20 - 26
2nd instar (days)	30.83 ± 6.06	24 - 36
3rd instar (days)	38.33 ± 9.70	28 - 48
4th instar (days)	40.16 ± 3.67	36 - 44
5th instar (days)	40.00 ± 4.63	36 - 45
Total developmental period (days)	172.65 ± 15.50	144 - 199
Longevity of Female (days)	65.83 ± 2.4	63 - 68
Longevity of adults Male (days)	59.33 ± 2.49	57 - 62
Fecundity/female	210 (3-6 eggs/ female)	200 - 220

First instar nymph

Freshly hatched nymph was non-transparent, dark brown with dark red eyes. The abdomen was red in color. It started actively feeding on larvae of *C. cephalonica.* The nymphal duration was 23.33±3.14 days with the range of 20-26days. As nymph developed it turned to dark brown (Fig. 2).

Fig. 2. First instar nymph of *Amphibolus venator*

Second instar nymph

The second instar nymph was slightly larger than the first and having transparent head, antennae, thorax and legs, abdomen and eyes are dark brown in color. Second instar occupied 30.83±6.06 days with a range of 24-36 days (Fig. 3).

Fig. 3. Second instar nymph of *Amphibolus venator*

Third instar nymph

The third instar nymph was slightly larger than the second and it was dark brown in color and having slightly transparent head, antennae, thorax and legs. Abdomen and eyes are black in color. Third instar lasted for 38.33±9.70 days with the range of 28-48 days (Fig. 4).

Fig. 4. Third instar nymph of *Amphibolus venator*

Fourth instar

The fourth instar nymphs looked similar to third instar having non-transparent head, thorax and legs, transparent antennae and abdomen and eyes are black in color. Wing pads were observed from fourth instar onwards. The duration was 40.16±3.67 days with the range of 36-44 days (Fig. 5).

Fig. 5. Fourth instar nymph of *Amphibolus venator*

Fifth instar

The fifth instar nymph looked similar to fourth instar. The duration was 40.00±4.63 days with a range of 36-45days (Fig. 6).

Fig. 6. Fifth instar nymph of *Amphibolus venator*

Adults

The sex of *Amphibolus venator* was differentiated based on their size. Females are larger than males. Longevity of adult female was 65.83±2.4 days with a range of 63-68 days, while male survived for 59.33±2.49 days with a range of 57-62 days. The present findings are similar to the reports of Sebaey (2001) who reported of female longevity was 66.6 days and male longevity was 59.8 days of *A. venator* in Egypt. The slight variation might be due to change in the location of study (Fig. 7).

Male

Female

Fig. 7. Adult of *Amphibolus venator*

Ovipositional behavior

The female *Amphibolus venator* was restless, briskly moved its antennae to locate a suitable place preferably side walls of the glass jars and on the papers kept inside the bottles to lay eggs and oviposited where sufficient host insects were available.

The fecundity of *A. venator* was 210 with an average of 200-220 eggs per female. The present findings are strongly supported by the reports of Sebaey (2001) who recorded fecundity of *A. venator* to the extent of 217 eggs. The mean ovipositional period of *Amphibolus venator* was 55 days. The present finding is in line with the results of Sebaey (2001) who recorded a mean oviposition period of 60 days. The variation might be due to change in the location and host *Anagasta kuehniella*.

No much work has been carried out on the biology of *Amphibolus venator* in the world in general and India in particular. However there is only one (Sebaey, 2001) which encloses the results of present study.

ACKNOWLEDGEMENT

We are thanks full to Dr. J. Poorani Pr. Scientist of NBAII Bangalore for identifying the natural enemies which are collected during survey made in Bijapur district. We are also grateful to acknowledge the department of Entomology College of Agriculture, Bijapur UAS Dharwad for providing necessary facilities during present study.

REFERENCES

Reddy, Pushpamma P. 1980. Effect of insect infestation and storage on nutritional quality of different varieties of pigeonpea. *Proceedings of international workshop on pigeonpea,* ICRISAT. 433–451.

Sahayaraj K. 2002. Small scale laboratory rearing of a reduviid predator, rhynocoris marginatus fab. (hemiptera: reduviidae) on corcyra cephalonica stainton larvae by larval card method. J *Central European Agric*. **3**(2): 137–147.

Sebaey IIA. 2001. Biology and predation rates of certain adult reduviids (Hemiptera: Heteroptera). *Plant Protection Research Institute, Agricultural Research Centre, Dokki, Cairo, Egypt*. **11**: 15–16.