

## On the biology of agriculturally important pentatomid pests *Dolycoris indicus* Stal and *Eurydema pulchrum* Westwood (Hemiptera: Pentatomidae)

Nafisa Akhter, S. Tariq Ahmad\* & M. Nayyar Azim

Entomology Research Division, Department of Zoology, University of Kashmir, Srinagar, Jammu & Kashmir-190006, India

\*Corresponding Author: [drtariqento@kashmiruniversity.ac.in](mailto:drtariqento@kashmiruniversity.ac.in); [drtariqiari@yahoo.co.in](mailto:drtariqiari@yahoo.co.in)

**Abstract:** The present paper highlights the role of biological studies in two important pests attacking agricultural crops in Kashmir. It discusses some ex situ observations on the life history strategies of *Dolycoris indicus* Stal and *Eurydema pulchrum* Westwood, the two pentatomid pests infesting cruciferous crops in Kashmir Valley. In *Dolycoris indicus*, copulation takes place in 8-10 days. Preoviposition varies from 1 to 2 days. A single female usually lays 5-6 batches of eggs which vary from female to female. The colour of eggs remains same upto hatching. The egg burster is well developed and T-shaped, present beneath pseudopericulum. The incubation period varies from 2-3 Days while in case of *Eurydema pulchrum* almost similar observations were found like in *D. indicus* except that freshly laid eggs are creamy white in colour with black bands which appear after few hours. The incubation period varies from 3 to 4 days.

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### 1. Introduction

Since the two above cited pests attack different crops of importance in Kashmir valley and causing economic losses, they are urgently needed to be studied in Kashmir valley as the existing literature reveals that no work has been carried in India as well as in our Kashmir valley. A considerable amount of work has been done outside India on the biology of various pentatomid species (MacGill, 1947, 1950; Mayne and Breny, 1948; Woodward, 1948; Ishihara, 1950; Balcelis, 1951; Hoffmann, 1954; McDonald, 1968, 1971; Mcpherson, 1974, 1975 and McDonald & Grigg, 1988).

The studies in this field in India are scanty and contributions of those of Ayyar (1929), Rakshpal (1949), Joseph (1953), Pant & Kalode (1971), Rajendra & Patil (1972) and Nath (1974) are the handy few available. Altogether neglected biological studies on the Indian Pentatomid pests have encouraged the authors to undertake the present work which contains observations on the life cycle of two species viz., *Dolycoris indicus* Stal and *Eurydema pulchrum* Westwood under similar laboratory conditions of temperature, humidity and light. Four generations of each species were examined for the study of nymphal stages as well as their agricultural importance.

### 2. Material and Methods

The adults of the two species were collected from various fields and were kept separately in 21 cm high x 14 cm diameter glass jars. The insects were fed on the cabbage leaves which were placed in jar. The open end of the jar was covered with a piece of muslin cloth and held in a position with the rubber band. The feed was changed every day. Copulation and preoviposition periods were recorded. Leaves containing eggs were removed and placed in separate jar. Records were also maintained about the number of egg masses laid by a single female and the number of eggs in a single egg mass. The eggs were examined daily. After hatching, hatching period was recorded. Different nymphal stages and duration of each nymphal period were observed by searching cast skins in each jar.

### 3. Results and Discussion

The biological observation on *Dolycoris indicus* Stal and *Eurydema pulchrum* (Westwood) under laboratory conditions revealed that the life cycle of these species are basically similar with other pentatomid species:

#### (i) *Dolycoris indicus* Stal

##### Plants attacked:

Cruciferous vegetables such as Cabbage, Cauliflower, Mustard.

**Copulation and egg laying:**

Copulation takes place 8-10 days after the last moult. The process lasts for about 4-5 hours. A single female may copulate at several times. Pre-oviposition varies from 1 to 2 days. Eggs are laid in batches and arranged regularly in rows and glued vertically to the undersurface of the leaves. A single female usually lays 5-6 batches of eggs but this number varies from female to female. Each batch consists of 10-14 eggs.

Freshly laid eggs are creamy white in colour. They are barrel shaped and reticulately sculptured with a lid or pseudopericulum apically. Each egg is 1.04mm long and 0.76mm wide. The colour of eggs remains same upto hatching. The egg burster is well developed and T-shaped, present beneath pseudopericulum. The incubation period varies from 2-3 Days.

**(ii) *Eurydema pulchrum* Westwood****Crops attacked:**

Cruciferous crops such as cabbage, cauliflower and mustard.

**Copulation and egg laying:**

Similar to *D.indicus* Stal except that freshly laid eggs are creamy white in colour but black bands appear after few hours. The incubation period varies from 3 to 4 days.

Both males and females attain sexual maturity at about the same age. Adults of *D. indicus* and *E. pulchrum* were found to copulate 8-10 days and 10-12 days respectively after the last moult. Although one mating is sufficient to ensure egg laying, adults of both the species were found to mate several times. Pre-oviposition period varies to 1-2 days for both the species. Eggs laid on an average were 65 and 95, respectively.

There were five nymphal instars, differentiated on the basis of normal or deflexed condition of head; distinct or indistinct condition of meso and metathoracic wing pads; length of antennal and rostral segment. The first instar of nymphs were gregarious in nature and never feed. This condition gradually disappears from second instar onwards. Head is strongly deflexed in first instar, slightly deflexed in second instar and normal in 3<sup>rd</sup> to 5<sup>th</sup> instar. Rostral segment second is shorter than fourth in 1<sup>st</sup> instar, longer in remaining instars. Antennal segment second and third are together shorter than fourth in 1<sup>st</sup> instar, longer in remaining instars. meso and metathoracic wing pads are indistinct in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> instars; metathoracic wing pads developed in 4<sup>th</sup> instar, while in 5<sup>th</sup> instar both meso and metathoracic wing pads developed. Antenna had 4-segmented and tarsi 2-segmented in all nymphal instars while in adults

antennae were found to be 5-segmented and tarsi 3-segmented.

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**Corresponding Author:**

Dr. S. Tariq Ahmad  
Sr. Assistant Professor  
Entomology Research Division  
P.G. Department of Zoology  
University of Kashmir, Srinagar,  
J & K – 190006, India  
E-Mail: [drtariqento@kashmiruniversity.ac.in](mailto:drtariqento@kashmiruniversity.ac.in)  
[drtariqiari@gmail.com](mailto:drtariqiari@gmail.com)

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