

Review on ecology and host plant interaction of *Lohita grandis* Gray and *Dolycoris indicus* Stal

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Abstract

Insects are the largest group of arthropods prevailing in different habitats and niches in the varied ecological conditions. This paper reviews the comparative ecology, host-plant interactions of *Lohita grandis* Gray (commonly known as the giant red bug) and *Dolycoris indicus* Stål (the Indian stink bug). Despite belonging to distinct hemipteran families, both phytophagous species cause substantial sap-sucking damage to diverse agricultural and forest plants across South and Southeast Asia. The food plant play a vital role in the survival and growth potential of insects. In polyphagous insects, different host plant and ecological condition influence the physiology and development of insects.

Keywords: *Lohita grandis* Gray, *Dolycoris indicus* Stål, Phytophagous, Polyphagous, Ecological condition

Introduction

The gaint red bug *Lohita grandis* Gray is a terrestrial bug. In one species of *Lohita grandis*, the male is marked by the great length of the abdomen (Lefroy, 1909) [6]. The oriental *Lohita grandis* attains a length of over 5 cm and is sexually dimorphic, the male having the antennae and abdomen greatly elongated (Imms, 1957) [4]. *Dolycoris indicus* Stal, is a bug belonging to order Hemiptera, family Pentatomidae. *Dolycoris indicus* Stal, was recorded in 1872 and 1876 (Distant, 1904) [3]. *Dolycoris indicus*, strongly sclerotized bdy, antennae usually with 5 segments, pronotum usually 6-sided, mesoscutellum large, reaching at least to middle of abdomen and sometimes covering entire abdomen, legs with tarsal segments, claws with pulvilli, membrane always with veins (Imms, 1957) [4]. *Dolycoris indicus* Stal, is an allied form of *Dolicoris baccarum* but according to Distant (1904) [3], *Dolycoris indicus* Stal, differ from *Dolicoris baccarum* due to narrower form, head, pronotum and scutellum less densely punctuate, membrane longer, anterior lateral margins of the pronotum more broadly pallid sparingly punctured with black at base.

Materials and Methods

A standard material and methods framework for reviewing the ecology and host plant interactions of *Lohita grandis* Gray and *Dolycoris indicus* Stal. involves a combination of multi-seasonal field surveys, controlled laboratory rearing, and behavioral or morphological assays.

Field surveys and sample collection

Selection of specific agro-climatic zones or forest ranges (e.g., the Tarai belt of the Shivalik hills near Saharanpur, Uttar Pradesh) for the collection of data and adult bug.

- **Sampling:** Conduct routine collections during pre- and post-monsoon seasons.
- **Data recording:** Record exact geographic coordinates, weather conditions (temperature, relative humidity and rainfall), and specific plant parts being attacked (leaves, barks, milky stage fruits, or seeds).

Laboratory rearing

- **Housing:** Maintain collected adults and nymphs in standardized wooden or mesh rearing cages (e.g., (50 cm x 35 cm) in a controlled environment.
- **Feeding setup:** Provide fresh plant material (leaves, seeds) and a continuous water source in small petri-dishes.
- **Observation:** Monitor life-cycle stages (egg to adult) to study mating, pre-oviposition periods, and survival rates.

Host Plant Interaction Assays

- **Choice & No-choice tests:** Conduct multiple-choice feeding assays by placing the bugs in arenas with various plant species (e.g., *Trewia nudiflora* for *L. grandis*; *Trifolium alexandrium* or *Oryza sativa* for *D. indicus*) to assess feeding preferences.
- **Damage index:** Use standardized scales to quantify damage (e.g., seed shriveling, discoloration, or yield reduction).

Result and Discussion

Lohita grandis Gray is a bright colored bug. It has been reported as a pest of cotton by Atkinson (1891) [1]. In Uttar Pradesh its occurrence has been recorded from Hardwar (Now in Uttarakhand). Distant (1904) [3] gave some information regarding its distribution in oriental region. Later on, Lefroy (1909) [6] recorded it from Bengal and Assam and as pest on

Bhindi, while Dhiman and Chatterjee (1981) ^[2] mentioned its presence from Haridwar and Raiwala.

Table 1: Host plant interaction of *Lohita grandis* Gray

S. No.	Host Plant	Edible Plant Part
1.	<i>Trewia nudiflora</i>	Leaf, Seed, steam
2.	<i>Bombex ceiba</i>	Leaf, Seed
3.	<i>Gossypium herbaceum</i>	Steam, Leaf, Fruit

Table 2: Host plant interaction of *Dolycoris indicus*

S. No.	Host Plant	Edible Plant Part
1.	<i>Sorghum vulgare</i>	Leaf, Seed, steam
2.	<i>Pennisetum typhoides</i>	Leaf, Seed, steam
3.	<i>Triticum aestivum</i>	Leaf, Seed
4.	<i>Halianthus annus</i>	Steam, Leaf, Fruit

Lohita grandis Gray is a pest of Gutel (*Trewia nudiflora*), Semul (*Bombex ceiba*), Cotton (*Gossypium herbaceum*) and Bhindi (*Hibiscus esculantus*), which are the economic value. *Trewia nudiflora*, the main host plant is large deciduous tree. Another host plant, Adhatoda vasica a wild host plant, is small, gregarious and evergreen shrub. *Lohita grandis* Gray mainly desaps the sedds, decayed fruits, barks and leaves of the host plant. In *Lohita grandis* Gray Pre-oviposition and oviposition pattern depends upon environmental factors (Kumar & Shoeb, 2024) ^[8].

Both bugs feed upon the important part of host plant. *Lohita grandis* Gray mainly feed upon stem, leaf, seed and fruit of host plant. Similarly in case of *Dolycoris indicus* feed upon steem, leaf, seed and fruit of host plant.

Dolycoris indicus has been recorded from Naga Hills, Darjeeling, Bombay Dekhan, Banglore and Calcutta (Ind. Mus.), Distant (1904) ^[3]. Stal (1876) ^[9] enumerated known genera and species from various parts continents Asia and Australia.

Table 3: Ecological conditions for *Lohita grandis* Gray

Temperature		Humidity (%)		Rainfall (mm)
Max. °C	Min. °C	Max.	Min.	
38.3	8.8	98	17	000.00-128.2

Table 4: Ecological conditions for *Dolycoris indicus* Stal

Temperature		Humidity (%)		Rainfall (mm)
Max. °C	Min. °C	Max.	Min.	
38.6	11.8	97	21	000.00-064.2

Lohita grandis Gray survive in various ecological conditions. Temperature range varies from 38.3 °C to 8.8°C range of humidity varies from 98% to 17% and conditions of rainfall varies from 000.00 mm to 128.2 mm. Similarly, *Dolycoris indicus* survive in Temperature range varies from 38.6 °C to 11.8°C range of humidity varies from 97% to 21% and rainfall varies from 000.00 mm to 064.2 mm.

Dolycoris indicus appears to be the most universal of the Pentatomids in the cultivated plains. It is a minor pest of *Sorghum vulgare*, *Pennisetum typhoides*, *Triticum aestivum*

Halianthus annus, maize and on Paddy. *Dolycoris indicus* occasionally attacks at milky stage of heads of JOWAR, millets and another host plants. It is plant feeding, but no instance of serious destruction caused by, it has yet been recorded. Kumar (1999) ^[5] has reported 60% damage to BERSIME. Priti Saxena (2026) investigates the feeding behavior and host plant preference of *Lohita grandis* across diverse agroclimatic zones of India.

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