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GREGARIOUS BEHAVIOUR AS CLIMATIC ADAPTATIONS IN A FOREST DWELLING BUG, *LOHITA GRANDIS* GRAY (HETEROPTERA-PYRRHOCOROIDEA - LARGIDAE)

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ABSTRACT : *Lohita grandis* Gray is a red-coloured larger forest dwelling bug infesting *Trewia nudifflora* in sub-Himalayan region. In this bug gregarious behaviour as climatic adaptation occurs for food, eggs and first instar nymphs, copulation, for protection from enemies, for getting warmness and suitable temperature and R.H., for caring young ones etc. These adaptations for climatic changes developed during the long course of evolution. These are discussed in relation to other researches carried out in heteropteran bugs.

Key words : *L. grandis*, *Trewia nudiflora*, climatic adaptations, gregariousness.

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INTRODUCTION

Lohita grandis Gray is a larger red and black Largid bug found in association of *Iphita limbata* and *Physopelta scholanbuschii* in forest area of sub-Himalayan region form east (Assam) to west (Kashmir) mainly infesting *Trewia nudiflora* (Euphorbiaceae). Various studies are made from time to time on this Largid bug by Dhiman (1990), Dhiman and Chatterjee (1981), Dhiman and Dhiman (1985), Dhiman and Garg (1985) and Dhiman and Dhiman (1989 and 1990). In *L. grandis* in field area gregarious behaviour is found. This gregarious behaviour of an insect is a tendency to form a group with other insects of the same species. This aggregation is found in many social and sub social insects such as honey bees, ants, termites, locusts, may flies and monarch butterflies etc. Further, this aggregation occurs for various purposes of life and it stimulates changes in their physiology, behaviour and morphology. These changes mainly interpreted as an adaptation for high population density and migration. In heteropteran bugs gregarious behaviour has been rarely described by Sword (2008), Dhiman and Gulati (1986), Svadova *et al* (2014) and Shikha *et al* (2020). *L. grandis* is a forest pest and by its desapping habit, it causes good damage to it host plants mentioned by Dhiman and Dhiman (1989).

Considering its pest status, gregarious behaviour of this graceful bug is studied in relation to climatic adaptation which makes the bug population enable to survive and continue its generation.

MATERIALS AND METHODS

Study site area

Field studies are carried out in Satyanarayan and Haridwar forest area with are part of Rajaji National Park. At these sites main food plants of *L. grandis* are in good number. Studies are made for two consecutive years 2020 and 2021 by making weekly visits. Extensive surveys and keen observations are made and data are recorded.

Rearing

For rearing two wooden wire gauze cages were taken and in each five pairs of male and female *L. grandis* were released. Crushed seeds of *Trewia nudiflora* were placed and food and water-soaked cotton swab was placed in a water filled watch glass to maintain necessary R.H. The cages were kept in a room at 20-25^{0}C and R.H. was maintained 70 to 80%. Several generations to

care the younger ones from enemies, keep warms during winter and maintain R.H. in summer. Younger ones are more vulnerable to heat and cold. If nymphs and adults both (sensitive) are kept in direct sun light in summer and open in cold winter, then nymphs are died earlier than adults, Though, both are very sensitive to temp. and R.H.

Researchers reported some specific adaptive functions of aggregation. Gumberale and Tullberg (1996) reported a more effective signal in aggregated aposematic prey for seed bug *Spilostethus pandurus*, while Svadova *et al* (2014) pointed out gregariousness as a defence strategy in *Pyrrhocoris apterus*. The population of *L. grandis* flourishes during hot season on abundant ripe fruits and seeds of *Trewia* and in winter on the decayed fruits and seeds as well as on bark and tender leaves of the main food plant as well as on sheltered plants as mentioned by Dhiman and Dhiman (1986). Chemoreceptors located in distal antennal segment are responsible for perceiving pheromone and odour of food in agreement with the results of the investigation on the milk weed bug, *Onchopeltus fasciatus* (Harbach and Larsen (1976a) and the bed bug *Cimex lectularius* (Levinson *et al*, 1974b) as well as Dhiman and Gulati (1986) in *Serinetha augur*. In *Lohita grandis*, like *Dysdercus* (Calam and Yondeowei, 1968) and bed bugs (Levinson *et al*, 1974a), the defensive secretion acts as alarm phenomenon to alert and disperse threatened aggregations. All these changes are climatic adaptations, behavioural or physiological, developed gradually during the course of evolution.

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