

## Record of Host Trees, Predators and Parasitoids of Lac Insect *Kerria lacca* in Andhra Pradesh

S R Koteswara Rao, T Ramesh Babu and A K Jaiswal<sup>1</sup>

Department of Entomology, College of Agriculture, Acharya NG Ranga Agricultural University, Hyderabad - 500 030, Andhra Pradesh, India.

<sup>1</sup>Indian Institute of Natural Resins and Gums, Ranchi - 834 010, Jharkhand, India.

E mail: srkr23209@gmail.com

Lac is a natural resin secreted by an insect *Kerria lacca* (Kerr.) belongs to the Order, Hemiptera, family Tachardiidae, which thrives on the tender twigs of certain host trees. It feeds upon the phloem sap of the host plants. The first instar larva of lac insect that emerges from mother cell crawls and settles on tender shoots of host trees to feed upon phloem sap by inserting proboscis. After successful penetration of host tissue, the lac insect switches over to sedentary and gregarious habit for rest of its life cycle except crawling male adult. The insect produces three products of commercial importance, the lac resin, wax and dye. The lac is secreted by exocrine lac glands of female insect for protection of the fragile young insect and female insect itself. Lac derived products are biodegradable, non-toxic, and environment friendly and have tremendous export potential. In addition to this, the lac insect-host association contributes to the conservation of biodiversity viz, soil flora, fauna, and soil microorganisms (Sharma *et al.*, 2006). *Rangeeni* and *Kusmi* are the two strains of lac insect found in India (Glover, 1937). The host tree constitutes first trophic level, the lac insect itself second and insect-predators, parasitoids inflicting damage to lac insect constitute third level. There are hyper-parasitoids constituting fourth trophic level of lac ecosystem.

Indian lac insect, *K. lacca* thrives on more than 400 plant species prevailing mostly in forest areas. The lac ecosystem fauna includes 87 species of lac insect belonging to nine genera recorded from all over the world. *Kerria* and *Paratachardina* are two genera from India, having 19 recorded species. There are 22 species of insect-predators, 30 species of parasitoids (primary parasitoids) and 45 species of hyper-parasitoids (secondary parasitoids) associated with *K. lacca* (Varshney, 1976; Sharma *et al.*, 2006). A device to separate three groups of associated insects has been developed to retrieve hyper-parasitoids from used-up broodlac sticks for augmenting its population (Jaiswal *et al.*, 1998, 1999).

The objective of the present study is to record the presence of insect parasitoids and predator species in naturally

infested population of lac insect culture in Hyderabad (Andhra Pradesh). The rain trees, *Albiziasaman* (Mimosaceae) were severely infested by *rangeeni* lac insect *K. lacca* during August to November from 2010 to 2012 at College of Agriculture, Acharya N.G. Ranga Agricultural University, Rajendranagar, Hyderabad. These trees are also found throughout Hyderabad city and are regularly infested by lac insect. The same strain of lac insect also infests trees of *Butea monosperma*, *Ficus religiosa*, *Schleichera oleosa* and *Ziziphus mauritiana* species in different parts of the state and lot of scope for exploitation of these trees in the state for commercial production of the lac.

The living lac insect encrustation along with host twigs have been collected from host tree and kept in 60 mesh net bag. The mouth was tied with thread. The bag was hanged with sufficient aeration. The predators and parasitoids of lac insect emerging from lac encrustation were counted for five months (once in each month).

On a lacstick of rain tree (Weight of 50 g and length of 60 cm), eight *Eublemma amabilis* Moore (Lepidoptera: Noctuidae), three *Pseudohypato papulverea* (Meyr) Lepidoptera: Blastobasidae) insect-predators; 29 numbers of *Tachardiaephagus tachardiae* Howard (Hymenoptera: Encyrtidae), nine *Aprostocetus purpureus* Cameron (Hymenoptera: Eulophidae), 12 *Eupelmus tachardiae* Howard (Hymenoptera: Eupelmidae) parasitoids, and one *Bracon greeni* (Hymenoptera: Braconidae) hyper-parasitoid were recorded during 8<sup>th</sup> November 2012 to 4<sup>th</sup> March, 2013 at Department of Entomology, College of Agriculture, Rajendranagar, Hyderabad. The report showed conservation of lac insect under natural condition on *A. saman* and its associated insect fauna in Andhra Pradesh. This is the first report of lac associated insect-predator and parasitoids in Hyderabad.

The lac cultivation is being carried out commercially in northern and eastern India viz., Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Odisha, Uttar Pradesh, Assam etc. In these areas, the lac production is one of the

livelihood options for the forest and sub forest dwellers. The trees are intentionally inoculated with brood lac and cultivation is carried out systematically, harvesting lac after six or 12 months of inoculation depending on crop maturity period. However, in Hyderabad, the lac culture is natural and culture has many generation crops as no one is harvesting after the lac insect completes life cycle. These observed species of insect- predators and parasitoids have also been reported in conventional lac growing areas of north and eastern Indian (Srivastava *et. al.*, 1976; Jaiswal *et al.*, 2001 a, b).

## References

- Glover P M 1937.** Lac cultivation in India, Indian Lac Research Institute, Namkum, Ranchi. 147 pp.
- Jaiswal A K, Bhattacharya A, Sushil SN and Kumar P 2001a.** Incidence of lac associated insect fauna in a few lac growing area of Jharkhand. *Indian Journal of Applied Entomology* **15** : 55-57.
- Jaiswal A K, Bhattacharya A, Sushil SN and Kumar P 2001b.** Incidence of lac associated insect fauna in a few lac growing area of Orissa. *Journal of Applied Zoological Research* **12** : 75-77.
- Jaiswal A K, Sharma K Krishan and Agarwal S C 1998.** An efficient and indigenous device for lac insect pest management. *Tropical Science (UK)* **38** : 81-86.
- Jaiswal A K, Sharma K Krishan and Agarwal S C 1999.** A modified and upgraded device of insect- separation for managing the insect pests of lac. *National Academy of Sciences Letters* **22** : 106-110.
- Sharma K K, Jaiswal A K and Kumar K K 2006.** Role of lac culture in biodiversity conservation: Issue at stake and conservation strategy. *Current Science* **91** : 894-898.
- Srivastava D C, Mehara B P and Teotia T P S 1976.** On the related abundance of inimical and beneficial insets associated with the Indian lac insect, *Kerria lacca* (Kerr). *Indian Journal of Ecology* **3** : 194-196.
- Varshney R K 1976.** A check list of insect parasites associated with lac. *Oriental Insects* **10** : 55-78.

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