

Study on the abundance of various insect associated with the lac insect (*Kerria lacca* Kerr.) in Allahabad region

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Abstract

A study was carried out for the assessment of abundance of various insects associated with lac insect *Kerria lacca* (Kerr.) in Allahabad growing region of Uttar Pradesh. For this purpose Rangeeni lac growing host plants i.e. *Zizyphus mauritiana* (Lam.) and *Butea monosperma* (Lam.) were selected. The data were recorded on both these host plants with same ecological situations. This study indicated that the abundance of various insects is more in Katki crop than baisakhi. Lac insect predators like *Eublema amabilis* Moore and *Pseudohypatopa pulvereae* Mayrick. were found in all the selected area. Similarly lac insect parasitoids *Tachardiaephagus tachardiae* (How), *T. somervilli* (Mahd.), *Aprostocetus purpureus* (Cam.), were found in nominal amount in Allahabad and Mirzapur district. It was seen that the abundance of the parasites and predator varied considerably with the crops. This study shows that abundance of lac insect fauna is very low even below the consideration level in most of the areas.

Key words: Lac insect, *Eublema amabilis*, predators.

Introduction:

Lac is the scarlet resinous secretion of the insect *Kerria lacca*. This important insect is also known by numerous synonyms such as *Laccifer lacca*, *Carteria lacca* and *Tachardia lacca*. The uses of the secretions of the insect was known to man from the prehistoric time. Lac cultivation is a seasonal, part-time agroforestry activity which may be based on cultivated or wild host trees. In order to obtain maximum yields of sticklac, the insects are cultured, the host trees are managed and attention is given to control of parasites. Lac production in some traditional lac production catchment is decreasing due to effects of various parasites, predators and pathogens. Attack of enemy insect and diseases are the important reasons of reduction in lac production. On an average 30-40% lac crops are damaged due to attack of enemy insect (Malhotra and Katiyar, 1979). There are several parasites and predators of lac insects and another set of parasites of lac predators which are intimately associated with each other in the biotic complex (Teotia, 1964; Varshney, 1976; Srivastava, 1980; Jaiswal, 2001).

Area under Allahabad and around is in its initial stage of lac culturing. It will be better to take precautions for controlling the lac insect fauna. The study was conducted to prepare the profile of insects present in lac growing regions.

Materials and Methods:

Lac insect bearing twigs of various host trees as *Butea monosperma* (Lamh.) Taub., *Zizyphus marutiana* (Lam.), *Ficus racemosa* Linn. and *Flemingia semialata* were collected for the study. The twigs selected for the study had the length

from 40-70 cms. Samples were collected from the different regions in and around Allahabad. The samples used for the study contains different growth stage of rangini crop of lac insect preferably with full lac encrustation samples collected from different region were kept into different containers. These containers were specially designed with insect separation device (Jaiswal, 1999) emergence of the predators and parasitoids were recorded emery day upto two months from the date of caging. It is so that as if there would be egg stage of any species will also emerge out by this period. The data were recorded on the basis of everyday study and given in the Table-1.

Result and Discussion

Out of samples of lac encrustation collected from 13 different areas of Allahabad and Mirzapur region. *Eublema amabilis* Moore was found maximum in Lohgara(18) followed by Matwar (17), Bhagipur (16), Katai (15), Tulsi (13), Haliya (12) Salaiyakala and Mohiddinpur (8each) similarly *Pseudohypatopa pulvereae* Meyr is abundant in summer katai (19), followed by Matwar(13), Lohagara (13), Salaiyakalan (12), Mohiddinpur (11), Khajuri and Bhagipur (8) each. Both the predators were greater in number in Katai, Matwar and Lohgara area, but their numbers vary according to the season. Both the strain showed their abundance in winter season in Matwar and Katai village while in Lohagara *Eublema amabilis* Moore has shown its fondness toward winter while *Pseudohypatopa pulvereae* was abundant in summer. It is to be noted that incase of both the season *P. pulvereae* was abundant in summer season as compared to *E. amabilis*. As Allahabad region has higher degree of temperature in summer it influence the availability of lac insects thus lac predators also.

Among the parasitoids of lac insect *Tachardiaephagus tachardiae* found in highest number i.e. 15 in Matwar village followed by Katai (11), Haliya (10), Mewadi (8), Salaiy kalan (8) and other areas. The incidence of *Tachardiaephagus somervilli* was highest in Khajuri (8) followed by Salaiyakalan (7) and Mohiddinpur (6) and other areas. Other Parasitoids which appeared during the study but in limited number are *Erencyrtus dewitz* and the parasitoid *P. clavicornis* was noticed only in Sipaua village. Parasitoids of predators studied are *Bracon greeni*, *Apanteles tachardiae*, *Goniozus pulveriae* and *Pristomerus sulci*. All of them are seen in a very limited number and in most of the villages they were absent or in a very low amount.

Among the parasitoids of predators *Bracon greeni* was found maximum in Haliya (5) followed by Sipaua (3) and Khajuri (2). During the study it is noticeable that all the

Table1. Lac associated insect fauna in various lac growing areas of Jharkhand

Place/ village	Stra in (1)	Cro p (2)	Host tree (3)	Period of Sample Collection	Lac Predators (4)		Parasitoids of lac insect (5)						Parasitoids of lac predators (6)			
					E.a.	P.p	T.t.	T.s.	A.p.	E.d.	P.c.	E.t.	B.g.	A.t.	G.p.	P.s.
Allahabad																
Salaiyakalan	R	S	B.m.	April '06	1	3	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Sept. '06	8	12	8	7	6	4	-	-	1	1	-	-
			Z.m.	Sept. '06	2	5	-	-	-	-	-	-	-	-	-	-
Khajuri	R	S	B.m.	April '06	-	2	5	8	-	5	-	-	2	-	-	-
		W	B.m.	Sept. '06	3	8	-	5	-	-	-	-	-	1	-	-
			Z.m.	Sept. '06	-	2	-	1	-	-	-	-	-	-	-	-
Pandua	R	S	B.m.	April '06	-	4	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Oct. '06	11	3	2	-	2	7	-	-	1	-	1	-
Lohagara	R	S	B.m.	Jan '06	4	13	1	-	-	-	-	-	-	-	-	-
		W	B.m.	Oct. '06	18	6	4	2	7	2	-	-	-	1	-	-
Mohiddinpur	R	S	B.m.	Feb '06	3	11	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Oct. '06	8	12	4	6	-	-	-	-	-	-	-	-
Bhagipur	R	S	B.m.	April '06	2	8	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Nov. '06	11	7	3	2	1	1	-	1	-	-1	-	-
Sipaua	R	S	B.m.	March '06	-	6	-	1	2	-	-	-	-	-	-	-
		W	B.m.	Oct '06	5	4	1	3	-	2	1	1	2	-	-	-
			Z.m.	Oct '06	-	5	2	-	2	-	-	-	3	-	-	1
Sringverpur	R	W	F.s.	Nov. '06	1	3	-	-	-	-	-	-	-	-	-	-
			Z.m.	Nov. '06	2	-	-	-	-	-	-	-	-	-	-	-
			F.r.	Oct '06	3	1	-	-	-	-	-	-	-	-	-	-
Mirzapur																
Matwar	R	S	B.m.	April '06	5	11	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Sept. '06	17	13	15	-	7	-	-	-	-	-	-	-
Katai	R	S	B.m.	March '06	1	6	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Sept. '06	15	19	11	2	1	-	-	-	-	-	1	-
Mewadi	R	S	B.m.	April '06	1	3	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Sept. '06	6	4	8	-	5	-	1	-	-	-	-	-
Tulsi	R	S	B.m.	April '06	4	7	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Nov '06	13	2	-	-	-	1	-	-	-	-	-	-
Haliya	R	S	B.m.	April '06	3	5	-	-	-	-	-	-	-	-	-	-
		W	B.m.	Sept. '06	12	6	10	-	3	1	-	-	5	2	-	1

1. Strain; R- Rangeeni, 2. Crop; S-Summer, W- Winter; 3. Host: B.m.- *Butea monosperma*, Z.m.-*Ziziphus mauritiana*, F.s.-*Flemingia Semialata* F.r.- *Ficus recemosa*; 4. Lac Predators: E.a.- *Eublemma amabilis*, P.p. *Pseudohyptopa pulvere*, 5. Lac Parasitoids: T.t.-*Tachardiaephagus tachardiae*, T.s.- *T. somervilli*, A.p. *Aprostocetus purpureus*, E.d.- *Erencyrtus dewitzi*, P.c.-*Parechthrodryinus clavicorni*, E.t.- *Eupelmus tachardiae* 6. Parasitoids of lac predators: B.g- *Bracon greeni*, A.t.- *Apanteles tachardiae*, G.p. *Goniozus pulveriae*, P.s. *Pristomeruis sulci*, B.t. -*Brachymeria tachardiae*.

predators parasitoids of lac insect and parasitoids of lac predators have shown their abundance in winter season only but during summer season due to excess heat there is lack of lac insects. The abundance of lac associated fauna differs from crop to crop, place to place and during different month (Srivastava and Mehra, 1980; Srivastava *et al.*, 1976, 1984; Malhotra, 1984; Sharma *et al.* 1997; Jaiswal *et al.* 2001). Based on the above study lac growing areas can be categorized as (a) where lac predators are available in a medium numbers but its parasitoids are present only in a limited number as in areas like Salaiyakalan, Khajuri, Matwar and Katai. In these areas insecticidal control (Malhotra and Katiyar, 1979) for the enemy insects can be adopted. (b) where degree of parasitisation of lac predators are relatively high and environment is conducive for breeding of beneficial parasitoid, the lac growers should preferably adopt cultural control of lac predators. *Z. mauritiana* has shown a very interesting feature that it has the lowest number of predators and parasites and no parasitoids. Thus as the parasites and predators are in their low number, the present situation is the best one for cultural practices.

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