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OCCURRENCE OF LAC INSECT AND ITS HOST PLANTS IN ANDHRA PRADESH, INDIA

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ABSTRACT

This study reports a comprehensive survey of lac insect populations across 679 mandals in 26 districts of Andhra Pradesh, conducted between November 2019 and July 2024. The focus was on both natural and cultivated populations, emphasizing host plant diversity. Cultivation was documented on Kusum (*Schleichera oleosa*) in 20 acres at Salur Mandal, Parvathipuram Manyam, and on *Flemingia semialata* in 20 acres at Gontuvanipalem Village, Addateegala Mandal, East Godavari. Natural infestations were found on various hosts such as Rain tree (*Albizia saman*), Lance leaf (*Conocarpus lancifolius*), Custard apple (*Annona squamosa*), Ber (*Ziziphus mauritiana*), Peepal (*Ficus religiosa*), Manila tamarind (*Pithecellobium dulce*), Bargad (*Ficus benghalensis*), Kala siris (*Albizia lebbeck*), *Ficus amplissima* and *Flemingia semialata*. Lac encrustation was identified in 54 mandals across 23 districts, providing valuable insights into host plant associations and potential for lac cultivation in the diverse agro-ecological regions of Andhra Pradesh.

Keywords **:** Lac insect, host plants, *Albizia saman*, *Conocarpus lancifolius*, *Annona squamosa*, *Ziziphus mauritiana*, *Ficus religiosa*, *Manila tamarind Pithecellobium dulce*, *Ficus benghalensis*, *Albizia lebbeck*, *Ficus amplissima* and *Flemingia semialata.*

Introduction

Lac insects, belonging to the family Tachardiidae (Hemiptera), secrete a resinous material forming a hard protective covering (Gullan *et al.*, 2007; Rajgopal *et al.*, 2021). India, hosting two genera and 28 species, accounts for 27% of the global lac insect diversity (Sharma *et al.*, 2006). These insects are obligate phloem feeders and require specific host plants for survival (Shah *et al.*, 2015). Globally, over 400 host species have been recorded, with major preferences for *Butea monosperma*, *Ziziphus mauritiana*, *Schleichera oleosa*, and *Conocarpus lancifolius* (Sharma, 2017). India's lac cultivation involves two major strains, Rangeeni and Kusumi, named based on host plant preference. Raw lac yields three commercially significant products - resin, dye, and wax (Yogi *et al.*, 2021). During 2018 - 2019, India's estimated stick lac production stood at approximately 18,537 tons, with Kusumi contributing 12,846 tons and Rangeeni 5,691 tons. This study aimed to document the occurrence of lac insects both natural and cultivated and to identify potential new host plants across Andhra Pradesh.

Materials and Methods

A mandal-wise field survey was conducted between 2019 and 2024 across all districts of Andhra Pradesh. Each mandal was sampled at 2-3 sites,

totalling 679 mandals. Observations included altitude, latitude, host plant type, lac insect growth stage, colour variations, and presence of natural enemies. Data were recorded in passport datasheets with geotagged images.

Commonly recorded host plants were *Albizia saman, Conocarpus lancifolius, Ziziphus mauritiana, Annona squamosa, Albizia lebbeck, Ficus religiosa, Butea monosperma, Pithecellobium dulce,* and *Schleichera oleosa*. When present, branches bearing lac insects were collected, labelled, and transported using mesh nets for species identification at ICAR-NISA (Ranchi) and ICAR-NBAIR (Bengaluru).

Results and Discussion

Out of 26 districts surveyed, lac insects were reported in 54 mandals across 23 districts. Guntur, Bapatla, Kurnool, and Prakasam districts recorded the highest incidence of natural lac encrustation. In Guntur districts in Tenali, Tadikonda, and Ponnur mandals showed significant infestations on hosts like *Albizia saman* and *Conocarpus lancifolius*. In Bapatla, *Conocarpus lancifolius* was predominant. Kurnool recorded maximum occurrence on *Albizia saman* in all mandals. Prakasam's encrustation was largely associated with *Conocarpus lancifolius*. A notable discovery during this study was the first report of *Kerria thrissurensis* in Andhra Pradesh, observed on *Conocarpus lancifolius* (Rao *et al*., 2021).

Table 1 : Natural occurrence of lac insect in Andhra Pradesh

S.No.	District	Mandal	Place/site	Host plants observed
1	Alluri Sitharama Raju	Munchingaputtu	Munchingaputtu	*Schleichera oleosa*
2	Alluri Sitharama Raju	Munchingaputtu	Munchingaputtu	*Zizyphus mauritiana*
3	Alluri Sitharama Raju	Pedhabayalu	Pedhabavalu	*Albizia saman*
4	Anakapalli	Anakapalli	Anakapalli	*Conocarpus lancifolius*
5	Anakapalli	Kasimkota	Kasimkota	*Conocarpus lancifolius*
6	Anantapur	Kalyanadurg	Kalyanadurg	*Conocarpus lancifolius*
7	Annamayya	Pullampet	Pullampet	*Annona squamosa*
8	Bapatla	Bapatla	Karlapalem	*Conocarpus lancifolius*
9	Bapatla	Bapatla	Maddiboinavaripalem	*Conocarpus lancifolius*
10	Bapatla	Bapatla	Maddiboinavaripalem	*Albizia saman*
11	Bapatla	Chirala	Chirala	*Conocarpus lancifolius*
12	Chittoor	Ramakuppam	Peruru	*Conocarpus lancifolius*
13	Guntur	Guntur	Guntur	*Albizia saman*
14	Guntur	Guntur	Guntur	*Conocarpus lancifolius*
15	Guntur	Guntur	Guntur	*Pithecellobium dulce*
16	Guntur	Guntur	Guntur	*Annona squamosa*
17	Guntur	Guntur	Guntur	*Ficus religiosa*
18	Guntur	Guntur	Guntur	*Albizia lebbeck*
19	Guntur	Chebrolu	Chebrolu	*Ficus religiosa*
20	Guntur	Mangalgiri	Mangalgiri	*Albizia saman*
21	Guntur	Pedakakani	Pedakakani	*Albizia saman*
22	Guntur	Ponnur	Ponnur	*Albizia saman*
23	Guntur	Prathipadu	Koyavaripalem	*Conocarpus lancifolius*
24	Guntur	Tadikonda	Lam	*Conocarpus lancifolius*
25	Guntur	Tadikonda	Lam	*Albizia saman*
26	Guntur	Tadikonda	Lam	*Zizyphus mauritiana*
27	Guntur	Tadikonda	Lam	*Albizia lebbeck*
28	Guntur	Tadepalli	Tadepalli	*Conocarpus lancifolius*
29	Guntur	Tenali	Tenali	*Conocarpus lancifolius*
30	Guntur	Tenali	Angallakudhuru	*Albizia saman*
31	Guntur	Tenali	Angallakudhuru	*Annona squamosa*
32	Guntur	Tenali	Angallakudhuru	*Albizia lebbeck*
33	Guntur	Tenali	Angallakudhuru	*Ficus bhengalensis*
34	Guntur	Chebrolu	Vadlamudi	*Ficus amplissima*
35	Guntur	Vatticherukuru	Pulladigunta	*Conocarpus lancifolius*
36	Dr. B.R. Ambedkar Konaseema	Ravulapalem	Ravulapalem	*Conocarpus lancifolius*
37	Krishna	Avanigadda,	Avanigadda	*Annona squamosa*

S.No.	District	Mandal	Place/site	Host plants observed
38	Krishna	Kankipadu	Kankipadu	*Albizia saman*
39	Krishna	Mopidevi	Mopidevi	*Annona squamosa*
40	Kurnool	Kurnool	Kurnool	*Albizia saman*
41	Kurnool	Kallur	Chinnatekur	*Conocarpus lancifolius*
42	Kurnool	Kondumur	Kondumur	*Albizia saman*
43	Kurnool	Veldurthy	Veldurthy	*Albizia saman*
44	Kurnool	Nandavarm	Nandavarm	*Albizia saman*
45	Nandyal	Nandikotkur	Nandikotkur	*Albizia saman*
46	Nandyal	Mahanandi	Mahanandi	*Albizia saman*
47	Sri Potti Sriramulu Nellore	Nellore Urban	Nellore Urban	*Conocarpus lancifolius*
48	Sri Potti Sriramulu Nellore	Kovuru	Kovuru	*Conocarpus lancifolius*
49	NTR	Ibrahimpatnam	Ibrahimpatnam	*Albizia lebbeck*
50	Palnadu	Sattenpalli	Sattenpalli	*Albizia saman*
51	Prakasam	Giddalur	Giddalur	*Conocarpus lancifolius*
52	Prakasam	Kanigiri	Kanigiri	*Ziziphus mauritiana*
53	Prakasam	Markapur	Markapur	*Conocarpus lancifolius*
54	Prakasam	S. Konda	Markapur	*Conocarpus lancifolius*
55	Prakasam	Yerragondapalem	Yerragongapalem	*Albizia saman*
56	Prakasam	Yerragondapalem	Yerragongapalem	*Conocarpus lancifolius*
57	Parvathi Puram Manyam	Salur	Salur	*Schleichera oleosa*
58	Parvathi Puram Manyam	Pachipenta	Panasalapadu	*Schleichera oleosa*
59	Parvathi Puram Manyam	Parvathi Puram Manyam	Parvathipuram Manyam	*Albizia saman*
60	Parvathi Puram Manyam	Gummalaxmipuram	Rastakuntabai	*Butea monosperma*
61	Sri Satya Sai	Ramagiri	Peruru	*Conocarpus lancifolius*
62	Srikakulam	Burja	Kollivalasa	*Flemingia semialata*
63	Tirupathi	Tirupathi rural	Tirumala	*Albizia saman*
64	Tirupathi	Tirupathi rural	Tirumala	*Conocarpus lancifolius*
65	Tirupathi	Tirupathi	Tirupathi	*Albizia lebbeck*
66	Tirupathi	Chandragiri	Chandragiri	*Conocarpus lancifolius*
67	Visakhapatnam	Visakapatnam	Visakapatnam	*Albizia saman*
68	Vizianagaram	Vizianagaram	Vizianagaram	*Albizia saman*
69	Vizianagaram	Ramabhadrapuram	Narsapuram	*Albizia saman*
70	Vizianagaram	Santhakaviti	Santhakaviti	*Albizia saman*
71	East Godavari	Rajahmundy	Rajahmundy	*Albizia Saman*
72	West Godavari	Bhimavaram	Bhimavaram	*Albizia Saman*

Cultivation of lac was recorded in Salur (on *Schleichera oleosa*) and Addateegala (on *Flemingia semialata*), highlighting the underutilized potential for expansion. Natural populations were detected on several host species. Among them, *Albizia saman* and *Conocarpus lancifolius* were most widespread. In contrast, typical Indian hosts like Butea monosperma and Schleichera oleosa were underrepresented. The pest Eublemma amabilis was commonly observed affecting lac encrustations.

Table 2 : Host plant wise occurrence of lac insect in Andhra Pradesh

	Botanical Name	Family	Lac insect occurrence sites	Relative abundance %
1	Zizyphus mauritiana	Rhamnacea	3	4.17
2	Conocarpus lancifolius	Combretaceae	24	33.33
3	Annona squamosa	Annonaceae	5	6.94
4	Schleichera oleosa	Sapindaceae	3	4.17
5	Albizia lebbeck	Fabaceae	5	6.94
6	Butea monosperma	Fabaceae	1	1.39
7	Ficus amplissima	Moraceae	1	1.39
8	Albizia saman	Fabaceae	25	34.72
9	Flemingia semialata	Leguminosea	1	1.39
10	Ficus religiosa	Moraceae	2	2.78
11	Pithecellobium dulce	Fabaceae	1	1.39
12	Ficus benghalensis	Moraceae	1	1.39
			72	100.00

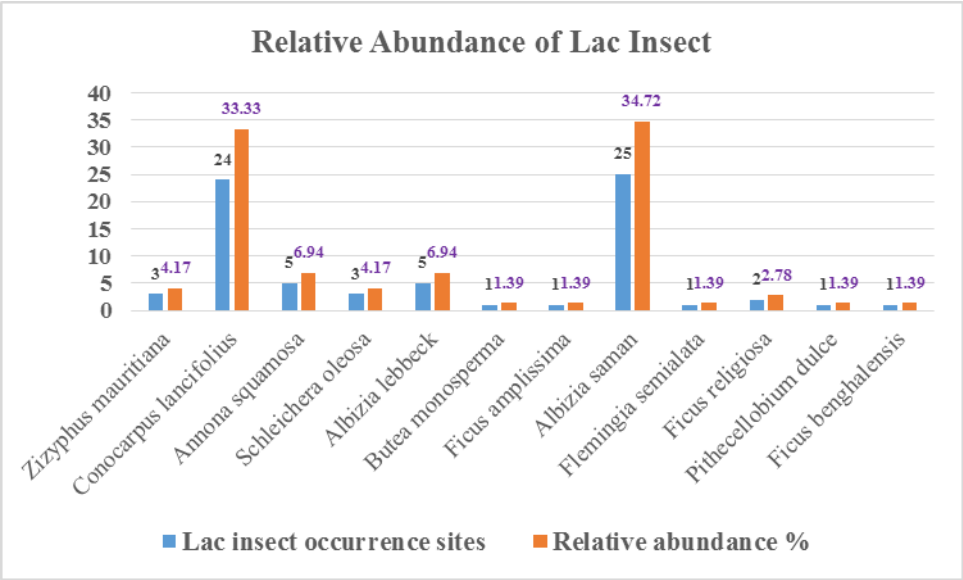

Fig. 1 : Relative abundance percentage of Natural occurrence in lac insect host plants in Andhra Pradesh.

Conclusion

This study documents the occurrence of lac insects across Andhra Pradesh, providing crucial baseline data for their in-situ conservation and potential cultivation. While natural encrustation was observed in only 7.5% of the surveyed mandals, the findings suggest ample scope for promoting lac culture. Emphasis should be placed on conserving host plant diversity, expanding cultivated areas, and encouraging on-farm demonstrations in non-traditional lac-growing regions.

Plate 1: Lac insect on *Flemingia semialata* at Gontivani palem of East Godavari District

Plate 2: Lac insect on *Ficus benghalensis* at Angalakuduru of Guntur District

Plate 3: Lac insect on *Ficus amplissima* at Vadlamudi of Guntur District

Plate 4: Lac insect on *Pithecellobium dulce* at Vadlamudi of Guntur District

Plate 5: Lac insect on *Conocorpus lancifolius* at Bapatla of Bapatla District

Plate 6 : Lac insect on *Conocorpus lancifolius* at Tirupati of Tirupati District

Plate 7: Lac insect on *Conocorpus lancifolius* at Kovvuru of Nellore District

Plate 8: Different growth stages of Lac insect on *Conocorpus lancifolius* at Guntur of Guntur District

Plate 9: Different growth stages of Lac insect on *Albizia saman* at Guntur of Guntur District

Plate 10: Lac insect on *Albizia saman* at Nandikotkuru of Nandyal District

Plate 11: Incidence of *Eublemma amabilis* on Lac insect at Guntur of Guntur district

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