

**Rain tree (*Albizia saman*): A potential lac host and gum producing tree**

Article id: 22895

Vaibhav D Lohot\*, Nandkishore Thombare, Jyotirmoy Ghosh, Thamilarasi K, A.

Mohanasundaram, V.V. Thakur and K.K. Sharma

ICAR-Indian Institute of Natural Resins and Gums, Namkum, Ranchi-834010 (Jharkhand) India

Rain tree (*Albizia saman*) is a host plant for lac insects (*Kerria* spp.) known for producing a resin called 'lac' which finds application in many industrial sectors. Lac cultivation is an important livelihood for the forest and sub-forest people of the country including Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Maharashtra and Odisha. Rain tree is an attractive, large, semi deciduous popular avenue tree with an umbrella-shaped crown. The tree also yields reddish-brown colored gum from its bark. The gum is of inferior quality and can be used as an adhesive. Recent surveys and past reports suggest that Rain tree may serve as an important host for lac cultivation thorough out India.

**INTRODUCTION**

The known beneficial insects like honeybees, silkworm and lac insect are nature's gift to mankind which provides additional income to the people engaged in agriculture. In agriculture, insects have many dimensions from harmful pests to beneficial nature. The economically important insects have influenced mankind's life in many ways since time immemorial. The products from these beneficial insects have provided livelihood to lakhs of farmers especially belonging to the down-trodden strata of the society. The best known beneficial insects like honeybees, silkworm and lac insect are nature's gift to mankind which provides additional income to the people engaged in agriculture. Indian lac insect (*Kerria lacca* Kerr.) known for producing a resin called 'lac' (Fig. 1) belong to the family Tachardiidae (=Kerridae), order Hemiptera and are phytosuccivorous and sessile (Fig. 2). Only female lac insects produce lac resin of commerce by ingesting phloem sap from their host plants (Fig 3). Lac cultivation is an important source of income for livelihood of the forest and sub-forest dwellers of Jharkhand, Chhattisgarh, Madhya Pradesh, West Bengal, Maharashtra, Odisha and parts of Uttar Pradesh, Andhra Pradesh, Gujarat and NEH region. It provides employment to both men and women dwelling in forest and sub-forest areas of these states. Lac finds application in many industrial sectors like food, cosmetic and jewelry, electrical and electronics, pharmaceutical, textile, adhesive, varnish, lacquer and paints etc (Fig 4). Common host plants of all India importance are Kusum [*Schleichera oleosa* (Lour.) Oken]; Palas [ *Butea monosperma* (L.) Taub.] and Ber [*Ziziphus mauritiana* (Lam)]. Based on the preference of host-plants by lac insect, host plants are classified into 3 categories (i) 'common' hosts or major hosts; (ii) the 'occasional' hosts; and (iii) the 'rare' hosts.



**Fig.1. Lac resin**



**Fig.2. Lac insect encrustation**

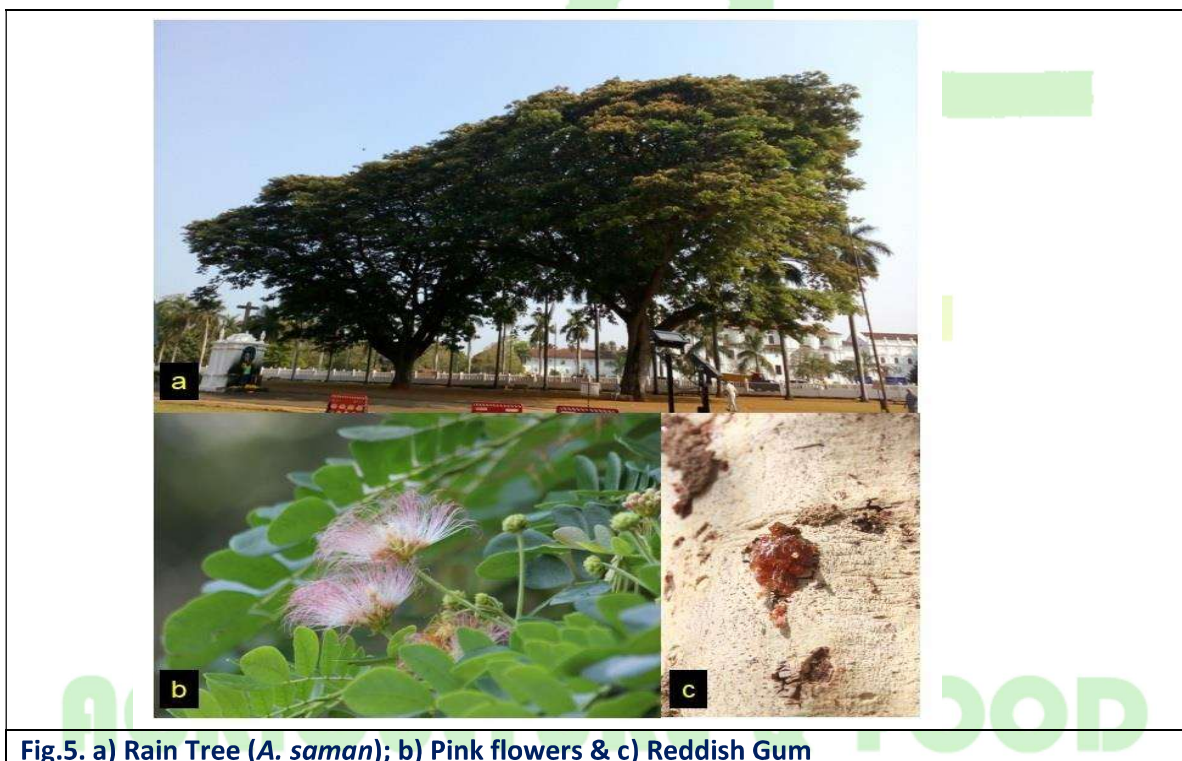


**Fig.3. Female lac insect cell**



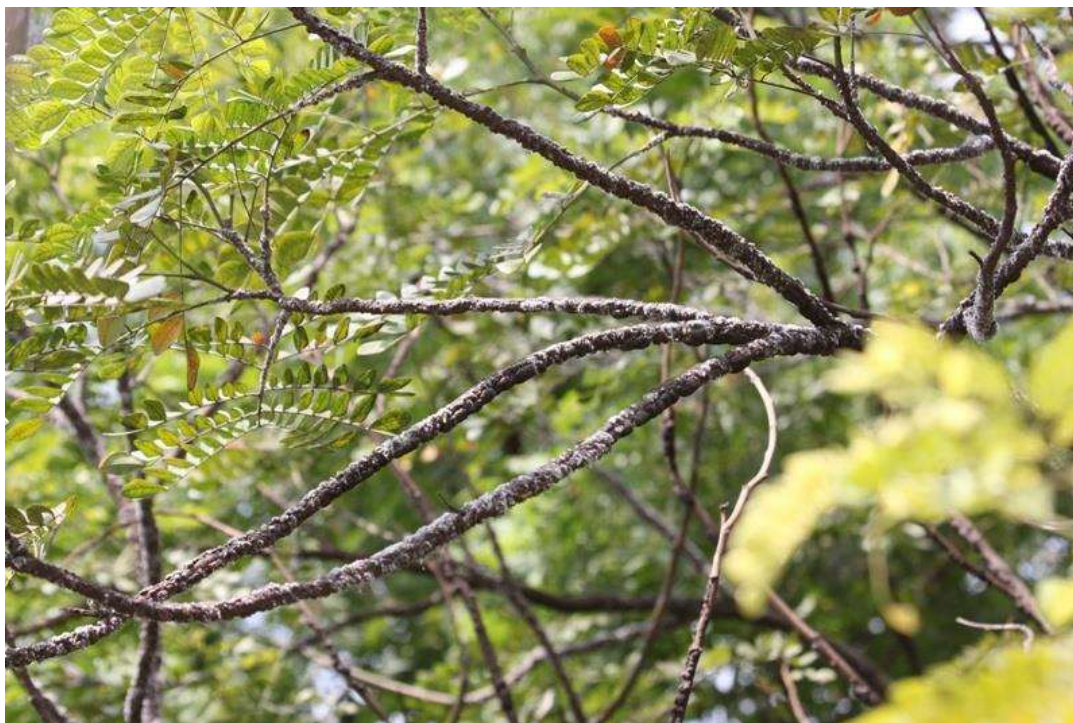
**Fig. 4. Crafts prepared from lac resin**

Rain tree [*Albizia saman* (Jacq.) Merr.] [Family: Fabaceae] is a natural host plant for lac insects (*Kerria* spp.). It is an attractive, large-spreading deciduous tree. It has a low, dense, umbrella-shaped crown, feathery foliage, puffs of pink flowers with a short, usually crooked bole (Fig.5 a-c). Due to its rapid growth habit, it was spread to other parts of the world from Central America for railway fuel. The name rain tree has been attributed to many theories like closing of leaflets from dusk to dawn allowing rain to fall through the canopy to the ground below and a steady drizzle of honeydew from sap-sucking insects etc. (Staples and Elevitch 2006). Tree was introduced in India in 1880 principally as a shade or ornamental tree in streets, parks and in coffee plantations. It is a popular avenue tree and has many other uses like preparation of fruit drink from the pulp of pod, use of decoction of inner bark and fresh leaves to treat diarrhea, stomach-ache, skin problems, eczema and pruritus, fruit decoction as a sedative, seeds for treating a sore throat etc. The tree yields a gum of inferior quality which could be used as a poor man's substitute for gum Arabic and can be used as an adhesive.



**Fig.5. a) Rain Tree (*A. saman*); b) Pink flowers & c) Reddish Gum**





**Fig. 6. Natural population of lac insect on rain tree branches**

Apart from this, tree was accepted by lac insect and soon tree was colonized by lac insect to produced lac resin (Fig.6.). Glover (1937) reported rain tree as a host of lac insect from Visakhapatnam (Andhra Pradesh, now Telangana) and Thailand. Now in Thailand rain tree is a popular lac host plant (Takeda 1990). Thangam (1961) utilized rain tree as a minor host for *kusmi* lac in Cumbam range, Madurai district (Tamil Nadu). Mishra *et al.*, in 2000 reported occurrence of trivoltine lac insects (identified as *Kerria sharda*) on *Albizia saman* (Jacq.) Merr. from coastal West Bengal and Rairangpur, Odisha. In recent surveys, natural population of lac insect was found on rain tree in most of the regions of Jharkhand, Tamil Nadu and West Bengal (Mohanasundaram *et al.*, 2018). Now reports from others researches suggest that rain tree supports natural population of lac insect in Andhra Pradesh, Telangana, Odisha, Madhya Pradesh, Maharashtra, Kerala, Tamil Nadu and Karnataka (Table 1). The lac insect species found on rain tree in Madurai (Tamil Nadu) is identified as *Kerria maduraiensis* a new species of *Kerria* genus (Ahmad & Ramamurthy, 2014).

**Table 1.: Details of lac insects found on Rain Tree during survey**

Year	States	Districts/ villages/ places	Lac insect presence	Host Plant	Scientist conducted Survey from ICAR-IINRG, Ranchi
2011-12	Tamil Na du	Madurai	Yes	<i>Rain tree</i>	Dr. A Mohanasundaram
2013-14	West Bengal	Kolkata	Yes	<i>Rain tree</i>	Dr. J. Ghosh & Dr. A Mohanasundaram
2014-15	Tamil Na du	Salem Krishnagiri Dh armapuriDind igul Madurai	Yes	<i>Rain tree</i>	Dr. Vaibhav D Lohot Dr. A Mohanasundaram
2015-16	Tamil Na du	Vellore Tirivanna- malai Kanchipuram Tiruvalluar	Yes	<i>Rain tree</i>	Dr. Vaibhav D Lohot Dr. A Mohanasundaram
2017-19	Other states	Andhra Pradesh Telangana Odisha Madhya Pradesh Maharashtra Kerala Tamil Nadu Karnataka	Yes	<i>Rain tree</i>	Other Researchers

Besides above a reddish brown to pale yellow colored gummy discharge comes out from stem of rain tree, generally through wounds (Fig. 5c). The gum is considered of inferior quality but could be used as paper adhesives and adhesive for other domestic uses. The gum contains tannin and believed to have medicinal properties descended from bark. The gum is edible and also popular as a poor man's substitute for gum Arabic.

**CONCLUSION**

Lac cultivation once carried out in 1960s by Thangam in Tamil Nadu has no traces at present. So far around 400 host plants of lac insect are reported and majority of them do not fall under the category of host plants of all India importance (Sharma 1997). Only three host plants Kusum, Palas and ber are commercially exploited for lac resin. Recently *Flemingia semialata*, a bushy host is gaining importance amongst the lac growers. Occurrence of lac insect

species on rain tree in several parts of southern states of India and its distribution throughout India, makes rain tree a potential lac host. Based on the above reports we can conclude that rain tree can be a potential host for lac cultivation in humid warmer parts of India. Thus, this host can find a place in the category of major hosts of all India importance. Most of the time, heavy natural settlement of lac insect on rain tree causes death in some of the plants. Tree also yields gum which can be substitute for gum Arabica. Therefore, scientific lac cultivation and gum tapping from rain tree may be initiated and promoted throughout India.

#### REFERENCES

1. Ahmad, A., Sharma, K. K., Ramamurthy, V.V., Vidyarthi, A. S. and Ramani, R. (2013). Three new species of *Kerria* (Hemiptera: Sternorrhyncha: Coccoidea: Tachardiidae), a redescription of *K. yunnanensis* Ou & Hong, and a revised key to species of *Kerria*. *Zootaxa*, 3620 (4): 518-532.
2. George W. Staples and Craig R. Elevitch. (2006). *Samanea saman* (rain tree) [www.traditionaltree.org](http://www.traditionaltree.org)
3. Glover, P.M. (1937). Lac cultivation in India (2<sup>nd</sup> revised edition). Indian Lac Research Institute, Namkum, Ranchi. pp 8.
4. Mishra YD and Sushil SN (2000). A new trivoltine species of genus *Kerria* Targioni-Tozzeti (Homoptera: Tachardidae) thriving on *Schleichera oleosa* (Lour.) oken from eastern India. *Orient. Insects*, 2000, 34, 215-220
5. Mohanasundaram A., Sharma K. K., Lohot V. D., Thamilarasi K., J. Ghosh, R. Ramani, Gulsaz Shamim, Neelanjana Choudhury and Saijiya Eqbal (2018). Occurrence Of Lac Insects And Their Host Plants In Tamil Nadu And Kerala. *Indian Journal of Entomology*, 80(4): 1351-1358
6. Sharma, K. K., Jaiswal, A. K. and Kumar, K. K. (2006). Role of lac culture in biodiversity conservation: issues at stake and conservation strategy. *Current Science*, 91 (7): 894-898.
7. Sharma, K. K., Ramani, R. and Mishra, Y. D. (1997). An additional list of the host plants of lac insects, *Kerria* spp. (Tachardidae: Homoptera). *Journal of Non-Timber Forest Product*, 4:151-155.
8. Takeda, S. (1990). Lac cultivation and host tree plantation in northern Thailand. *Southeast Asian Studies*, 28 (2): 182-205.
9. Thangam, E. S. (1961). Rain tree as *kusumi* lac host-an interim report. *The Indian Forester*, 87 (4): 266-269.