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136

RECORDED AND UNRECORDED LAC-HOSTS FROM MADHYA PRADESH

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SUMMARY

The authors record 30 lac-hosts from Madhya Pradesh from their personal observations. These include 8 new hosts, 8 first records from this State (one of them being a first record from India) and 14 lac-hosts which have already been recorded from this State. The previous authors have recorded 28 lac-hosts from this State. Thus a total of 44 (28+16) lac-hosts, so far recorded from this State, have been listed in this paper.

Introduction

The present paper deals with the recorded and unrecorded lac-hosts of Madhya Pradesh, which now consists of Central India (= Madhya Bharat+Vindhya Pradesh), Bhopal and Central Provinces (excluding Berar, Nagpur and Bhandara Districts).

Though many authors have referred to the major lac-hosts of Madhya Pradesh, very few have given a complete list of all the hosts recorded from this State. McKee (1876) (source Roonwal *et al.*, 1958) refers to two hosts, Imms and Chatterji (1915) five chief food plants from the principal Forest Divisions, Lindsay and Harlow (1921) four, Heutefeuille (Mehdi Hassan, 1924) five, Misra (1929) six and Srinvisan (1956) nine. Only Watt (1901), Stebbing (1910), Glover (1937) and Roonwal *et al.* (1958) have given fairly complete lists. From these various records it has been possible to count 28 lac-hosts from Madhya Pradesh. The present authors have recorded 16 more plant-species from this State. This paper, therefore, describes a total of 44 lac-hosts from Madhya Pradesh, embracing 24 genera belonging to 13 families, which contain 30 lac-hosts (including 8 altogether new hosts hitherto unrecorded and 8 first records from this State, one of them being a first record from India) observed by the present authors. These hosts belong to 16 genera (including 2 new and 5 first records from this State) and 10 families (including 1 new and 3 first records from this State) (Appendix).

Locality

Before discussing the plant species found carrying lac it is considered necessary to briefly describe some of the important localities from where most of them were collected.

(i) Forest Compartment No. 109—Situating about 10 kilometres from Damoh on Damoh-Jabalpur Road in the Reserve Forest of Damoh Range, Damoh Forest Division. It has a large concentration of *Zizyphus xylopyra* (*ghont*) trees, mixed with a variety of dry forest species of trees, and forms the experimental field area of our Regional Field Research Station At Damoh.

Abbreviation used in this paper "Compt. 109".

(ii) Forest Compartment No. 105—Situating about 2 kilometres from Damoh on the Damoh-Jabalpur Road. About 250 *ghont* trees stand intermingled with teak trees of various sizes. For sometime this formed part of our experimental field area.

Abbreviation used in this paper "Compt. 105".

(iii) Rajnagar—Located about 10 kilometres from Damoh in the Forest Compartment No. 107 of the Reserve Forest of Damoh Range, Damoh Forest Division. There is a good concentration of *ghont* and *palas* (*Butea monosperma*) on which lac cultivation was carried out by the Forest Department in the past. *Palas* trees are concentrated more on the lower reaches of a hillock and the banks of a pond. At present lac is being grown on *palas* trees by our Regional Station for feeding the experiments being conducted at Compt. 109 in times of need. The locality is frequented by monkeys (*Presbytis* sp.).

(iv) Katangi—Located 85 kilometres from Damoh on Damoh-Jabalpur Road in the Protected Forest of Sangrampur Range, Damoh Forest Division and contains *ghont* trees mixed with a variety of dry forest species of trees. The *ghont* trees were under lac cultivation by the Forest Department before World War II. The left-over lac must have multiplied by self-inoculation and spread to non-lac-bearing plant species by their branches coming in contact with the lac-bearing trees and through other agencies such as, wind, squirrels, birds, bats, monkeys (*Presbytis* sp.) man, etc. This forest had been the source of brood lac for our experiments at Compt. 109 before we started growing lac on *palas* at Rajnagar.

(v) Salebardi and Bamhani—Two villages in Katangi Range of Balaghat Forest Division. Lac is grown on *palas* by the local inhabitants.

(vi) Dalpatkhera—About 48 kilometres from Damoh in Tendukhera Range of Damoh Forest Division. *Palas* trees were leased out to a contractor sometime back who was utilising them for lac cultivation.

Hosts

The 30 lac-hosts recorded by the present authors have been treated under the following heads:

- I. New lac-hosts.
- II. First record of lac-hosts from Madhya Pradesh.
- III. Lac-hosts already recorded from Madhya Pradesh.

I. New lac-hosts

1. *Abrus precatorius* Linn. (*Gunj, Gunchi, Rati*) (Leguminosae : Papilionatae):

A pretty twining slender shrub. Distributed throughout India.

This shrub, twining on a inoculated *palas* tree at Rajnagar, was found carrying well developed sparse salls of *Katki* 1965 crop. Larval emergence took place on 12-11-1965 but was the progeny develops on the same host? Died before male emergence. Obviously initial inoculation must have taken place casually from the brood lac used for inoculating *palas* tree.

2. *Acacia donaldi* Haines (*Airma, Ramna*) (Leguminosae : Mimosoidae):

A small tree up to 0.75 metre girth; branches with usually five lines of minute prickles, twigs usually armed with short recurved prickles.

The first lac sample on this host with sparse and immature dead cells was collected from Compt. 109 in November, 1958. Later about 1.85 kg of brood lac from this host was purchased from a lac cultivator of Dalpatkhera in July, 1959 and 6.5 kg brood lac was collected from Katangi in October, 1959. Some brood lac from *Baisakhi* 1959-60, *Katki* 1960 and *Katki* 1962 crops was also collected from Katangi from this very host.

3. *Combretum ovalifolium* Roxb. (*Sande, Hathi-Sandan*) (Combretaceae):

A large scandent perennial shrub, common throughout the Deccan Peninsula.

This host resting on an inoculated *palas* tree at Rajnagar was found to carry *Katki* 1962 an encrustation of lac in the month of October, 1962, obviously some the lac insects settled

on this species from the brood lac used for inoculation of the *palas* tree. Settlement of lac insects was sparse to continuous. The latter was fairly thick and 30-40 cm long. It carried the subsequent progeny during *Baisakhi* 1962-63 crop as well and has ever since been carrying lac continuously.

4. *Hemidesmus indicus* Br. (*Kara Bichhua*) (Asclepiadaceae):

An evergreen slender twining shrub, distributed throughout India.

Few sparse mature lac cells during *Katki* 1963 season were found on this shrub while shrub was twining round and inoculated *ghont* tree, at Compt. 109, obviously harbouring the lac insects originating from the brood lac used on *ghont*.

5. *Vitis latifolia* Roxb. (*Imlaua*) (Ampelidaceae):

A climbing shrub, available during monsoon from the perennial root stock, with weak and hollow stem which easily breaks at the nodes; black succulent and sweet berries. Distributed throughout India.

This vine climbing on a *palas* tree at Rajnagar was seen carrying about 30-50 cm long mature encrustation during *Katki* 1962 season. Heavy mortality of lac insects was observed to have taken place in the early stage of the crop. It must have taken the inoculation from the brood lac used on *palas* tree.

6. *Vitis* sp. I (*Dokerbel*) (Ampelidaceae):

A climbing shrub found during monsoon, flowering and fruiting taking place in October.

This vine was seen carrying 30 cm long encrustation of mature cells at Bamhani, during *Katki* 1962 obviously taking the inoculation from the lac bearing *palas* tree on which it was climbing. Heavy mortality was seen to have taken place in the early stage of the crop.

7. *Vitis* sp. II (*Khatua*) (Ampelidaceae):

A vine of this climbing shrub was found carrying mature, well-developed, though patchy, encrustation during *Katki* 1963 season at Katangi. Even the thick bases of tendrils carried lac cells. It obviously took the inoculation from the lac-bearing *ghont* tree which it was climbing.

8. *Vitis* sp. III (*Dudhi*) (Ampelidaceae):

Mature sparse cells of *Katki* 1962 season were seen on the petioles of a vine of this climbing shrub at Katangi; obviously taking the inoculation from the lac-bearing *ghont* tree on which it was climbing.

II. First record of lac-hosts from Madhya Pradesh

1. *Acacia leucophloea* Willd. (*Reunja*) (Leguminosae: Mimosoidae):

A roadside tree in Comt. 109 in November, 1958 was seen to bear 4 branches with 15-20 cm long, thick, healthy and alround *Kusum*-like encrustation of *Katki* 1958. Source of inoculation is not known but since experimental lac cultivation is being carried out in this compartment brood lac might have been casually taken to the tree by some agency such as, monkeys (*Presbytis* sp.) which inhabit this place, squirrels, etc. The lac found on this tree was left for self-inoculation and the larvae did emerge and settle down but the subsequent *Baisakhi* 1958-59 crop died before male emergence.

2. *Albizia procera* Benth. (*Gurar, Safed Siris*) (Leguminosae: Mimosoidae):

It is not only a first record from Madhya Pradesh but also from India as it has previously been recorded from Burma only (Norris, 1932).

This host at Rajnagar gave *Baisakhi* 1964-65 and *Katki* 1965 crops, when initially and artificially inoculated with *palas* brood, and is now carrying *Baisakhi* 1965-66 crop.

3. *Annona squamosa* Linn. (*Sitabhal, Sharifa*) (Annonaceae):

A group of trees have been observed to carry both *Baisakhi* and *Katki* crops at Silaundi (10 km from Karkeli Railway Station in District Sahdol, Umaria Forest Division) since February, 1961. They probably got casual inoculation from the surrounding *palas* trees, which are being used for lac cultivation by the local inhabitants. It has also been observed to carry *Baisakhi* 1960-61 crop at Salebardi.

4. *Putea parviflora* Roxb. (Syn. *Spatholobus roxburghii* Benth.) (*Nasbel, balia-patas, palas-lata*) (Leguminosae: Papilionatae):

This host was found carrying sparsely settled mature lac cells of *Katki* 1963 season in October, 1963 at Katangi.

5. *Dalbergia sissoo* Roxb. (*Sissoo, Sison*) (Leguminosae: Papilionatae):

About 500 g brood lac of *Katki* 1960 season was collected from this host at Katangi. This gave a successful *Baisakhi* 1960-61 crop though the succeeding *Katki* 1961 failed.

6. *Grewia tiliaefolia* Vahl (*Dhamin, Dhaman*) (Tiliaceae):

A sample of mature lac of *Katki* 1962 season was collected from Katangi.

7. *Pithecolobium dulce* Benth. (*Jangal-Jalehi*) (Syn. *Inga dulcis* Willd.) (Leguminosae: Mimosoidae):

30-40 cm long mature lac encrustation of *Katki* 1964 season was collected from a tree in Damoh town.

8. *Vitis cinifera* Linn. (*Angoar*) (Ampelidaceae):

A vine of this host in the private garden of a temple at Damoh has been observed to carry *Katki* 1963 and 1965 seasons by casual inoculation from a lac-bearing *pipal* tree in the neighbourhood, and continues to carry lac by repeated self-inoculation.

III. Lac-hosts already recorded from Madhya Pradesh

1. *Acacia catechu* Willd. (*Khair*) (Leguminosae: Mimosoidae):

Mature and healthy *Katki* 1963 lac was collected from this host at Compt. 109. Inoculation appears to have been casual as about 1500 *ghont* trees are under lac there.

2. *Albizzia odoratissima* Benth. (*Chichwa, Airma-bansa, Bansa*) (Leguminosae: Mimosoidae):

About 1 kg mature lac consisting of 15-20 cm long encrustation of *Katki* 1960 crop on this host was collected at Katangi in November, 1960.

3. *Butea monosperma* (Lamk) Taub. (Syn. *Butea frondosa* Koenig. ex Roxb.) (*Chheola, dhak, palas*) (Leguminosae: Papilionatae):

It is a common lac-host of all-India importance and one of the three main hosts of Madhya Pradesh (the other two being *kusum* and *ghont*). Lac on this host has been cultivated at Umaria by the Tribal Welfare Department; on trees round about Silaundi by the local population and at Padakar (Bilaspur Forest Division), Umaria (District Sahdol, Umaria Forest Division) and Chandarpur (Raigarh Forest Division) Nucleus Brood lac Farms by the Development Wing of the Indian Lac Cess Committee. Our Regional Station, besides experimenting on this host at Compt. 109 with a view to fortify cultivation of *ghont* lac, is using about 500 *palas* trees at Rajnagar for supplementing the brood lac requirement at Compt. 109.

4. *Dalbergia paniculata* Roxb. (*Dhobein*) (Leguminosae: Papilionatae):

2-3 kg brood lac was collected from this host from each of the *Katki* 1959, 1960 and 1962 crops from Katangi. A tree in Compt. 109 was observed to carry *Katki* 1963 crop and continues to carry some lac.

5. *Ficus bengalensis* Linn. (*Barh, bargad, bargat*) (Urticaceae):

A tree on the bank of a pond in Damoh has been observed to carry *Rangeeni* lac since 1961.

6. *Ficus lacor* Buch.-Ham. (Syn. *F. infectoria* Roxb. non-Willd.) (*Pakar*) (Urticaceae):

Well-developed lac samples of mature *Katki* 1963 crop were collected from a tree at Bamhani.

7. *Ficus religiosa* Linn. (Syn. *F. glomerata* Roxb.) (*Umar, gular*) (Urticaceae):

Well-developed and 15-45 cm long lac samples of mature *Katki* 1965 crop were collected at Rajnagar.

8. *Ficus religiosa* Linn. (*Pipal*) (Urticaceae):

About a dozen avenue trees in Damoh have been observed to carry *Rangeeni* lac since *Katki* 1962 crop. Probably it existed earlier.

9. *Pterocarpus marsupium* Roxb. (*Bija, Bija-sal*) (Leguminosae: Papilionatae):

A tree at Katangi was observed to bear sparse but living cells of *Katki* 1962 crop.

10. *Schleichera oleosa* (Lour.) Oken (Syn. *S. trijuga* Willd.) (*Kusum, kusam*) (Sapindaceae):

It is a common lac-host of all-India importance and one of the three main hosts in Madhya Pradesh (the other two being *palas* and *ghont*). Lac on this host has been grown by the lac Development Wing of the Indian Lac Cess Committee at Bagratawa (Hoshangabad Forest Division), Barukatuiyamura (Raipur Forest Division) and Bhainsamura-korba (Bilaspur Forest Division) and on trees at Khadgaon (Protected Forest of Chhal Range in Raigarh Forest Division) by the Forest Department. It is also under experiment by our Regional Station at Umariya with a view to stabilize and augment *Kusum* lac production in the State.

11. *Tectona grandis* Linn. (*Sagon*) (Verbenaceae):

In 1959 the mid-ribs of a few leaves of this host were found carrying *Katki* 1959 lac at Compt. 105, where experimental lac cultivation was being carried out by our Regional Station on *ghont* growing in the inter-spaces of teak trees. Later about 500 g brood lac of *Katki* 1960 was obtained from Katangi and sparse cells of *Katki* 1962 were observed on the petioles, mid-rib and branches of this host at Rajnagar.

12. *Zizyphus mauritiana* Lamk. (Syn. *Z. jujuba* Lamk. non Mill.) (*Ber*) (Rhamnaceae):

It is a common lac-host of all-India importance. It is under experimental lac cultivation at Compt. 109. As observed elsewhere, it does give a successful *Katki* crop but fails to produce a *Baisakhi* crop on its nearly bare branches exposed to the summer sun.

13. *Zizyphus oenoplia* Mill. (*Makor, Makoi*) (Rhamnaceae):

A small quantity of *Katki* 1960 and 1962 brood laces were collected from Katangi and a climber at Compt. 109 was seen to carry well-developed lac encrustation of *Katki* 1963 crop. Inevitably it got the inoculation from the inoculated *ghont* tree on which its branches were resting.

14. *Zizyphus xylopyra* Willd. (*Ghont, ghonti, ghat-ber, kat-ber*) (Rhamnaceae):

It is a common host of regional importance in Madhya Pradesh, Uttar Pradesh and Punjab and one of the three main lac-hosts in Madhya Pradesh (the other two being *palas* and *kusum*). Continuous lac crops are found on this host at Katangi. It is also under experiment for systematic lac cultivation by our Regional Station at Compt. 109.

Possibilities of augmenting lac cultivation in Madhya Pradesh

Next to Bihar, Madhya Pradesh is the second most important lac producing State with *palas*, *ghont* and *kusum* as the main hosts. The lac-hosts studied in this paper show that the State holds great potential for augmenting lac production through some of the hosts such as, *Acacia catechu*, *A. donaldi*, *A. leucophloea*, *Albizia odoratissima*, *Combretum ovalifolium*, *Dalbergia paniculata*, *D. sissoo*, *Ficus bengalensis*, *F. lacor*, *F. racemosa* and *F. religiosa*. All these hosts except *Ficus* spp. have been observed to grow *Katki* crop better than *Baisakhi* crop, which is not unexpected as they are devoid of leaves or carry leaves which are unable to provide any shade to the lac insects during summer. They may, therefore, be used for growing *Katki* crops. *Ficus* species may be used for lac cultivation especially with a view to preserving broodlac from *Baisakhi* crop.

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*Not seen by the authors.

(For Appendix, see page 701)

APPENDIX

Analysis of the host-plants of the lac insect, *Kerria lacca* (Kerr)
(Syn. *Laccifer lacca* (Kerr) from Madhya Pradesh

Abbreviations used : C.I. = Central India; C.P. = Central Provinces; M.B. = Madhya Bharat;
M.P. = Madhya Pradesh and Vindhya Pradesh.

+, observed; —, not observed, as lac-hosts in Madhya Pradesh.

Family	Genus	Species	Previous authors	Present authors	Remarks
1. Ampelidaceae**	1. <i>Vitis</i> **	1. <i>latifolia</i> Roxb.	—	+	Rajnagar. New lac-host.
		2. <i>vinifera</i> Linn.**	—	+	Damoh. First record from M.P. Previous records Ranchi (Mehra, 1955), locality not mentioned (Kapur, 1958).
		3. sp. I*	—	+	Bamhani. New lac-host.
		4. sp. II*	—	+	Katangi. New lac-host.
		5. sp. III*	—	+	Katangi. New lac-host.
		6. <i>Squamosa</i> Linn.**	—	+	Silaundi and Salebardi. First record from M.P. Previous records—Punjab (Watt, 1901; Malhotra (1964), Punjab and Lower Burma (Stebbing, 1910), locality not mentioned (Mehdi Hassan, 1924; Misra, 1929), Burma (Glover, 1937), Coimbatore (Joseph, 1955), Northern Burma (Srinivasan, 1956) and Northern Burma and Coimbatore (Roonwal <i>et al.</i> , 1958).
3. Asclepiadaceae*	3. <i>Hemidesmus</i> *	7. <i>Indicus</i> Br.*	—	+	Compt. 109. New lac-host.
	4. Combretaceae***	4. <i>Combretum</i> **	—	+	Rajnagar. New lac-host.
		5. <i>Terminalia</i> ***	8. <i>ovalifolium</i> Roxb.* 9. <i>Chebula</i> Retz.***	— +	—

(Contd.)

APPENDIX—(Contd.)

Family	Genus	Species	Previous authors	Present authors	Remarks
5. Dipterocarpaceae		10. <i>tomentosa</i> W. & A.***	+	—	C.P. (Watt, 1901; Stebbing, 1910) and M.P. (C.P.) (Roonwal <i>et al.</i> , 1958).
6. Dipterocarpaceae	<i>Shorea</i>	11. <i>robusta</i> Gaertn. f.	+	—	C.P. (Stebbing, 1910).
6. Leguminosae (i) Caesalinioidae	<i>Caesalpinia</i>	12. <i>coriaria</i> (Jacq.) Willd.	+	—	C.P. (Glover, 1937), M.P. (Srinivasan, 1956) and M.P. and M.B. (Roonwal <i>et al.</i> , 1958).
(ii) Mimosoidae	<i>Acacia</i>	13. <i>arabica</i> Willd.	+	—	C.P. (Glover, 1937).
		14. <i>canescens</i> R. Grah. (= <i>A. pennata</i> Willd. var. <i>canescens</i> Baker non Martin)	+	—	C.P. (Glover, 1937), M.P. (Srinivasan, 1956; Roonwal <i>et al.</i> , 1958).
		15. <i>catechu</i> Willd.	+	+	Compt. 109. Previous records—C.P. (Stebbing, 1910; Imms & Chatterji, 1915; Misra, 1929; Glover, 1937).
		16. <i>donaldi</i> Haines*	—	+	Compt. 109. Dalpathkhera and Katangi. New lac-host.
		17. <i>leucophloea</i> Willd.**	—	+	Compt. 109. First record from M.P. Previous records—U.P. (Glover, 1937; Srinivasan, 1956; Roonwal <i>et al.</i> , 1958).
	<i>Albizzia</i>	18. <i>odoratissima</i> Benth.	+	+	Katangi. Previous records—C.P. (Glover, 1937; Roonwal <i>et al.</i> , 1958).
		19. <i>procera</i> Benth.**	—	+	Rajnagar. First record from M.P. and India. Previous record—Burma (Norris, 1932).

(Contd.)

APPENDIX—(Contd.)

Family	Genus	Species	Previous authors	Present authors	Remarks	
(iii) Papilionatae	10. <i>Dichrostachys</i> (= <i>Cailliea</i>)	20. <i>cinerea</i> W. & A. <i>cinerea</i> Macb.)	+	—	C.I. (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1924).	
		21. <i>dulce</i> Benth.** <i>dulcis</i> Willd.)	—	+	Compt. 109. First record from M.P. Previous records—locality not mentioned (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1924; O'Connor, 1874, quoted by Roonwal <i>et al.</i> , 1958), Jamshedpur and Ranchi (Kapur, 1954) and Punjab (Malhotra, 1964).	
	12. <i>Abrus</i> *	22. <i>precatorius</i> Linn.*	—	+	Rajnagar. New lac-host.	
	13. <i>Butea</i>	23. <i>monosperma</i> (Lamk.) Taub. (= <i>B. frondosa</i> Koenig ex Roxb.)	+	+	Compt. 109, Rajnagar, Chanderpur, Padakar, Umania and Silaundi. Previous records—C.P. (Watt, 1901; Imms & Chatterji, 1915; Lindsay & Harlow, 1921), C.P. and C.I. (Stebbing, 1910; Misra, 1929), C.P. and Bhopal (Glover, 1937), India wide spread (Srinivasan, 1956) and of "all-India" importance (Roonwal <i>et al.</i> , 1958.)	
			24. <i>parviflora</i> Roxb.** <i>roxburghii</i> Benth.)	—	+	Katangi. First record from M.P. Previous records—Bengal and Travancore (Stebbing, 1910), locality not mentioned (Lindsay & Harlow, 1921), Travancore (Misra, 1929; Roonwal <i>et al.</i> , 1958).
			25. <i>superba</i> Roxb. 26. <i>latifolia</i> Roxb. 27. <i>paniculata</i> Roxb.	+	—	C.P. (Watt, 1901; Stebbing, 1910). C.P. (Glover, 1937).
		14. <i>Dalbergia</i>		+	+	Katangi and Compt. 109. Previous records—C.P. (Watt, 1901; Stebbing, 1910). Saugar Forest Division C.P. (Glover, 1937), Saugar District M.P. (Srinivasan, 1956) and M.P. and M.B. (Roonwal <i>et al.</i> , 1958).

(Contd.)

APPENDIX—(Contd.)

Family	Genus	Species	Previous authors	Present authors	Remarks
		28. <i>sissoo</i> Roxb.**	—	+	Katangi and Bamhani. First record from M.P. Previous records—Punjab (Anand <i>et al.</i> , 1936; Malhotra, 1964).
	15. <i>Ougeinia</i>	29. <i>ojeinensis</i> (Roxb.) Hoch. (= <i>O. dalbergioides</i> Benth.)	+	—	C.P. (Watt, 1901; Stebbing, 1910; Glover, 1937) and M.P. (Roonwal <i>et al.</i> , 1958).
	16. <i>Pterocarpus</i> ***	30. <i>marcupium</i> Roxb.***	+	+	Katangi. Previous records—C.I. (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1923) and M.B. (C.I.) (Roonwal <i>et al.</i> , 1958).
7. Malvaceae	17. <i>Kydia</i>	31. <i>Calycina</i> Roxb.	+	—	C.P. (Watt, 1901; Stebbing, 1910).
8. Rhamnaceae	18. <i>Zizyphus</i>	32. <i>mauritiana</i> Lamk. (= <i>Z. jujuba</i> Lamk. non Mill.)	+	+	Compt. 109. Previous records—C.P. and C.I. (Watt, 1901; Stebbing, 1910; Misra, 1929), C.P. (Imms and Chatterji, 1925), C.P. and Bhopal (Glover, 1937), most parts of India (Srinivasan, 1956) and of "all-India importance" (Roonwal <i>et al.</i> , 1958).
		33. <i>oenoplia</i> Mill.	+	+	Katangi and Compt. 109. Previous records—C.I. (Srinivasan, 1956) and M.B. (Roonwal <i>et al.</i> , 1958).
		34. <i>xylopyra</i> Willd.	+	+	Katangi, Compts. 109 and 105. Previous records—C.P. (Watt, 1901; Stebbing, 1910; Imms and Chatterji, 1915; Misra, 1929; Glover, 1937), C.I. (Lindsay and Harlow, 1921), M.P. and Bhopal M.B. (Roonwal <i>et al.</i> , 1958).

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APPENDIX—(Contd.)

Family	Genus	Species	Previous authors	Present authors	Remarks
9. Sapindaceae	19. <i>Schleichera</i>	35. <i>oleosa</i> (Lour.) Oken (= <i>S. trijuga</i> Willd.)	+	+	Umaria, Bagratawa and Khadgaon. Previous records—C.I. (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1924), C.P. (Imms and Chatterji, 1915; Lindsay and Harlow, 1921; Glover, 1937), C.P. and C.I. (Misra, 1929), most parts of India (Srinivasan, 1956) and of "all-India importance" (Roonwal <i>et al.</i> , 1958).
10. Sterculiaceae***	20. <i>Eriolaena</i> ***	36. <i>hookeriana</i> W. & A.***	+	—	C.P. (Watt, 1901; Stebbing, 1910) and C.P. (M.P.) (Roonwal <i>et al.</i> , 1958).
11. Tiliaceae**	21. <i>Grewia</i> **	37. <i>tiliaefolia</i> Vahl**	—	+	Katangi. First record from M.P. Previous records—Berar (Watt, 1901; Stebbing, 1910; Roonwal <i>et al.</i> , 1958).
12. Urticaceae	22. <i>Veltis</i> ***	38. <i>tetranda</i> Roxb*** (= <i>C. roxburghii</i> Planch.)	+	—	C.I. (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1924) and M.B. (C.I.) (Roonwal <i>et al.</i> , 1958).
	23. <i>Ficus</i>	39. <i>bengalensis</i> Linn. = <i>F. indica</i> (Roxb. non Linn.)	+	+	Damoh. Previous records—C.P. (Stebbing, 1910; Glover, 1937) and M.B. and M.P. (Roonwal <i>et al.</i> , 1958).
		40. <i>lacor</i> Buch.- Ham. (= <i>F. infectoria</i> Roxb. non Willd.)	+	+	Bamhani. Previous records—C.P. (Stebbing, 1910; Glover, 1937) and M.B. (Roonwal <i>et al.</i> , 1958).
		41. <i>racemosa</i> Linn. (= <i>F. glomerata</i> Roxb.)	+	+	Rajnagar. Previous records—C.P. (McKee, 1876; Watt, 1901; Stebbing, 1910), M.P. (C.P.) (Kapur, 1955) and M.P. (Roonwal <i>et al.</i> , 1958).

(Contd.)

APPENDIX—(Contd.)

Family	Genus	Species	Previous authors	Present authors	Remarks
		42. <i>religiosa</i> Linn.	+	+	Damoh. Previous records—Many provinces (Watt, 1901; Stebbing, 1910), C.P. (Lindsay and Harlow, 1921; Glover, 1937), C.I. (Misra, 1929), M.P. (Kapur, 1955) and M.B. and M.P. (Roonwal <i>et al.</i> , 1958).
		43. <i>tsjhela</i> Burm. f. (= <i>F. tsjakela</i> Burm.)	+	-	C.P. (Watt, 1901; Stebbing, 1910), M.P. (C.P.) (Kapur, 1955) and M.P. (Roonwal <i>et al.</i> , 1958).
13. Verbenaceae***	24. <i>Tectona</i> ***	44. <i>grandis</i> Linn.***	+	+	Compt. 105, Rajnagar and Katangi. Previous records—C.I. (Watt, 1901; Stebbing, 1910; Mehdi Hassan, 1924) and M.B. (C.I.) (Roonwal <i>et al.</i> , 1958).

N.B.—(a) *New family (1), genera (2) and species (8).

**First record of families (3), genera (5) and species (8) from Madhya Pradesh.

***Families (3), genera (5) and species (6) not included by Roonwal *et al.* (1958) in the main list of families and host-plants discussed by them; but included in the Appendix (Supplementary list of lac-hosts) by Roonwal and Balwant Singh.

(b) (i) *Vitis vinifera* Linn. (Ampelidaceae) though not included by Roonwal *et al.* (1958) has been recorded as a lac-host for *Kerria lacca* (Kerr) (Syn. *Laccifer lacca* (Kerr) (Mehra, 1955) and for *K. communis* (Mahd.) (Syn. *Lakshadia communis* Mahd. and *Laccifer communis* (Mahd.) Chamberlain, ? form or subspecies of *K. lacca*) (Kapur, 1958).

(ii) *Dalbergia sissoo* Roxb. (Leguminosae : Papilionatae) : Roonwal *et al.* (1958) quoting Glover (1931, p. 49) and Malhotra (1964) quoting Glover (1937) state that "lac is sometimes produced on it." However, a reference to these records shows that Glover (1931, p. 49) says that "*D. sissoo*, *D. latifolia* and *D. laccolaria* have all so far been failures at Namkum as regards lac infection. This, however, does not necessarily mean that they will be failures in other districts". And he has included *D. sissoo* as a lac-host tree in the Appendix. In the other reference (1937) Glover says that "*D. sissoo* in spite of constant infections has never given a satisfactory result, and may be classified as a non-lac host" and has excluded it from Appendix I (List of host trees.....). The statements of Roonwal *et al.* and Malhotra have, therefore, not been accepted.

- (c) The following plant-species have been excluded from the 28 lac-hosts, accepted by the present authors from Madhya Pradesh (Para. 2) for the reasons mentioned against each.
- (i) *Ficus lucescens* Blume (Urticaceae)—Kapur (1955) regards *F. infectoria* Roxb. as its synonym, Roonwal *et al.* (1958) and Raizada (1958) have both considered *F. infectoria* Roxb non Willd. as a synonym of *F. lacor* Buch.-Ham. and Hooker (1885) considers both, *F. lacor* Ham. and *F. lucescens* Blume as synonyms of *F. infectoria* Roxb. Hence, *F. lucescens* Blume and *F. infectoria* Roxb. non Willd. are both treated as synonyms of *F. lacor* Buch.-Ham., which is the latest accepted nomenclature. This synonymy has later been accepted by Kapur (1958).
 - (ii) *Ficus tjakela* Miq (Urticaceae)—Kapur (1955) regards it as a distinct species and does not mention *F. tsjajela* Burm. f. at all. Watt (1901) uses the name *F. tjakela* Burm., while Stebbing (1910) used the same spelling but does not mention the author's name. It is likely that *F. tjakela* is a mis-spelling for *F. tsjajela* Burm. f. (Roonwal *et al.*, 1958).
 - (iii) *Ficus venosa* (Urticaceae)—Roonwal *et al.* (1958) quote McKee (1876) and Coldstream (1881) (both the authors do not state the author's name of the host) as their source for considering this species as a lac-host in Central Provinces, i.e., Madhya Pradesh. According to Hooker (1885) *F. venosa* Ait. is a synonym of *F. tsjajela* Burm. f. (Roonwal *et al.*, 1958) and *F. venosa* Wall is a synonym of *F. infectoria* Roxb. which is a synonym of *F. lacor* Buch.-Ham. (Raizada, 1958) and (Roonwal *et al.*, 1958). Since both *F. tsjajela* and *F. lacor* are lac-hosts it hardly matters in this context whether *F. venosa* is a synonym of the former or the latter.
 - (iv) *Grewia tiliacifolia* Vahl (Tiliaceae)—Watt (1901) and Stebbing (1910) both state it to be a lac-host in Berar, which does not form part of Madhya Pradesh, though Roonwal *et al.* (1958) state it to be "a reported host in Madhya Pradesh" on the basis of information of Watt and Stebbing.
 - (v) *Hamelia patens* (Rubiaceae) (Spelt by Misra, 1929 as *Hemelia*), *Loranthus* sp. (Loranthaceae), *Montanoa bipinnatifida* (Compositae) (Spelt by Misra, 1929 as *Montana*), *Prantij roxburghii* (Euphorbiaceae) (Probably *Putranjiva roxburghii* Wall; Roonwal *et al.*, 1958) and *Rosa* spp. (Rosaceae).
Roonwal *et al.* (1958) quote Misra (1923 and 1929) as their source for recording these species as lac-hosts in Central India (Madhya Bharat) but on a reference to Misra (1929) it is observed that these species are not stated as lac-hosts from that State. The authors of this paper, however, could not find the other reference of Misra.