

Proceedings of the Ninth Annual review / Co-ordination Committee Meeting of Network Project on Conservation of Lac Insect Genetic Resources (NP-CLIGR)

A. Inaugural Session

The Ninth Annual Review / Co-ordination Committee Meeting of Network Project on Conservation of Lac Insects Genetic Resources (NP-CLIGR) was organized by ICAR- Indian Institute of Natural Resins and Gums, Namkum, Ranchi (Online mode) on 20th January 2022. Dr. S. N. Jha, DDG (Agricultural Engineering) graced the inaugural session as Chief Guest and Dr. K. K. Singh, ADG (Farm Engineering) as Guest of Honour, Dr. Panna Lal, PS from ICAR; Heads of the Divisions and scientists from ICAR-IINRG, PIs & Co-PIs, RAs & SRFs of Network Cooperating Centres and Voluntary Centres took part in the deliberations (*Kindly see Annexure – I for list of participants*).

The inaugural session began with the welcome address by Dr. Thamilarasi K, Co-PI, ICAR-IINRG. Dr. K. K. Sharma, PC, NP-CLIGR and Director, ICAR-IINRG presented the quantified achievements and the major highlights of this project. In his inaugural presentation he mentioned about presence of 100 species of lac insects all around the world; out of them one new species was described by ICAR-IINRG, Ranchi this year. Among all available lac insect species, 27 species (27%) are found in our country. Now-a-days integration of lac cultivation with agriculture becoming popular and the farmers are showing inclination towards lac cultivation. Lac insect genetic resources are under threat due to deforestation and developmental activities, leading to either extinction or verge of extinction of some of the lac insect species. To keep this biodiversity intact, work is being carried out since past eight years to record and document the lac insect biodiversity in our country under this network project.

Dr. K. K. Singh, ADG (Farm Engineering), Guest of Honour appreciated the progress under NP-CLIGR. He has asked all the centres to highlight the success stories, patents, staff position, deliverables and future plan of this project. He suggested interpreting the relevance/justification of this project under current scenarios like changing climate, COVID-19, changing institute's name along with its changed mandate. He emphasized that the project activities must align with the other ICAR-schemes, government priorities, national and global trends during the next plan period. He also suggested planning for celebration of institute's centenary and International Year for Natural Resins and Gums.

Dr. S. N. Jha, DDG (Agricultural Engineering), the Chief Guest while addressing the participants, expressed the importance of conserving the indigenous natural resources like lac insects of the country. He advised to explore the possibility of associating this project with government policies especially in zero- budget farming. He also emphasized on revealing the role of lac insect host plant in environmental cleaning in terms of CO₂ sequestration. He stressed on accelerating the survey for natural lac insect populations so as to complete the lac map of the country. He also said the finding of entomo-pathogenic fungi under this project was a good lead; and all the DNA sequences generated must be submitted to NCBI. He also asked the scientists to explore the ways of production of lac resin by lac insects without host plants.

The following publications from different Network Cooperating Centres were released during the inaugural function: (i) Web-portal on 'Lac Insect and Host Plants' by the lead centre, ICAR-IINRG, Ranchi; (ii) Handbook on 'Lac Host Plants in Kerala' by KFRI, Thrissur; (iii)

Manual on ‘Lac Insect and associated Hosts’; (iv) Bulletin on ‘Scientific Lac Cultivation on *Semialata*’ in Assamese by AAU, Jorhat; (v) Booklet on ‘Lac Cultivation’ by PAU, Ludhiana; (vi) Folder on ‘Lac Cultivation on *Ber*’ by MPUAT, Udaipur; (vii) Folder on ‘Lac Cultivation on *Flemingia*’ in Telegu by ANGRAU, Guntur; (viii) Folder on ‘Lac Cultivation on *Kusum*’ in Telegu by ANGRAU, Guntur and (ix) Folder on ‘Lac Cultivation’ in Kannada by KVK- Sirsi

B. Technical session

1. Assam Agricultural University (AAU), Jorhat

Dr. Purnima Das, PI presented the progress of the project. Three districts (Dhemaji, Kokrajhar and West Karbi Anglong) of Assam comprising fourteen villages and five blocks were surveyed during 2021 by the centre. She reported that *Kerria chinensis* is the most dominant lac insect species in Assam. Karbi Anglong district comprising of 12 villages produced and sold approximately 15 tons of lac this year. She found *Kerria lacca* collected from Howrah, West Bengal strain as tri-voltine in nature under Assam conditions. The centre made an attempt to intercrop King chilli with lac cultivation under net house condition. A new native entomopathogenic fungus collected from *Archips* sp., a major pest of *Flemingia semialata* was characterized and identified as *Cordyceps javanica* which was effective against different groups of pests. Bio-safety test and bio-efficacy study of two strains of entomopathogenic fungi (EPF), identified as *Isaria fumosorosea* and *Isaria javanica* against lac insects (*K. lacca* and *K. chinensis*) and predators of lac is going on in both the field and the laboratory conditions. *Biston suppressaria* (Guen.) and *Hyposidra talaca* (Walk.) were recorded as insect pests of *F. semialata* and *Flemingia macrophylla* which could be major pests of lac ecosystem in the near future.

The PI was suggested to: (i) Organise a stakeholder’s meet with the participation of farmers, traders and researchers together and (ii) Calculate the economics of integrating apiculture with lac culture and compare it with sole lac crop.

2. Central Agricultural University, Imphal

Dr. KI Singh, PI presented the progress. Centre surveyed 42 villages under 9 districts during the year and reported the presence of lac insect on the white hibiscus (*Hibiscus rosa sinensis*). A study on the effect of mordanting on lac dyeing of silk fabric was conducted by using different methods of mordanting. The centre also studied the biology and host preference of lac insect species found in Manipur. A new research field with the area of 252 sq ft. has been established at the college campus.

The PI was suggested to: (i) Focus on collection of lac insect and host plant in new areas since there is a huge potential of finding new lac insect species and host plants, (ii) Mention the specific name of lac insect species in the study on biology and host preference of lac insect, (iii) Increase the multiplication of lac insect by increasing the number of host plants in use and (iv) Record the ITKs on dyeing instead of doing research on dyeing.

3. Kerala Forest Research Institute (KFRI), Thrissur

Dr. TV Sajeev, PI presented the progress. Five blocks of Lakshadweep were extensively surveyed, and new live lac was reported from six locations in Tamil Nadu by the centre. *Hyblaea puera*, the teak defoliator, has been found as a pest of *F. semialata* at Regional Field Gene Bank, Thrissur. Scanning Electron Microscopy of six lac insect samples (collected from Srirangam, Trichy, Madurai, Dindigul, Thenkasi and Krishnarayapuram areas of Tamilnadu)

was done for the identification. Museum has been elaborated with all the necessary details. An initial mutual communication has been established between KFRI and Coimbatore *Aaryavaidyasala* and Kottakal *Aaryavaidyasala* industries in the Palakkad district of Kerala for lac consumption.

The PI was suggested to: (i) Strengthen the Regional Field Gene Banks (RFGB) of the lac insects and the host plants, (ii) Find where and how much lac is used in *Ayurvedic* formulations and (iii) Increase the number of research publications.

Since, KFRI Thrissur has a provision for maintaining the RFGB of lac insect and host plants under establishment project, proposal of the PI to maintain and strengthen the already established RFGB of lac insect and host plants under this establishment project was accepted.

4. ICAR- KVK, Sirsi, Uttara Kannada (UAS, Dharwad) – Voluntary Centre

PI of the project, Dr. Roopa S. Patil presented the progress. Among 30 districts of Karnataka surveyed, lac encrustation was recorded in 11 districts *viz.*, Ballari, Bidar, Yadgir, Raichur, Vijayapur, Chitradurga, Chamarajnagar, Ramanagar, Davanagere, Chikkamagalur and Mysuru. Exhibition was arranged at KVK, Sirsi to showcase different forms of lac, lac products and miniature plants of lac hosts. PI also provided technical guidance to farmers of Mysuru and Chikkaballapura areas involved in *Kusmi* lac cultivation on *Flemingia* and *ber*.

The PI was informed to: (i) Conduct capacity building training programmes for the farmers and (ii) Explore the utilization of lac dye in printing ink in Karnataka

5. Maharana Pratap University of Agriculture & Technology (MPUAT), Udaipur

Dr. Hemant Swami, PI presented the progress. Six districts of Rajasthan were surveyed during 2021 by the centre and reported live lac insect population from 29 different locations. Twenty-six live mature samples were collected from different locations and are maintained at the Regional Field Gene Bank on different host plants. *Ber*, *Babool*, *Palas*, *Peepal*, *Gular*, *bargad* and *Sitafal* were identified as major lac insect host plants in the various agro climatic zones of Rajasthan. Total 554.30 kg broodlac was collected from natural hosts in the region and was inoculated at RFGB and farmer's field during *Katki* and *Baisakhi*, 2021. Herbarium has been developed where lac host plant samples were preserved for identification and display.

PC appreciated the publication record, RFGB and Museum of the centre as praiseworthy. Besides that, the following comments were made: (i) Centre must conduct awareness program to replace the synthetic lac (*Thandi* lac) with natural lac in lac industries of Rajasthan state especially in Jaipur, (ii) Explore the potential of consumption of lac produce through benchmark surveys of lac industries, (iii) Identify and train farmers for *in situ* conservation and lac cultivation and (iv) Centre was advised to conduct location specific study to identify the most preferred host plant.

6. Punjab Agricultural University (PAU), Ludhiana

Dr. R. Kaur, Co-PI presented the progress. Centre has surveyed five districts of Punjab and six districts of Delhi during 2021. Natural infestation of lac insect on *Calliandra haematocephala* has been reported for the first time in Punjab. Fifty-two lac insect samples were collected from seven host plants including *Ziziphus mauritiana*, *Ficus religiosa*, *Ficus benjamina*, *Ficus bengalensis*, *Ficus retusa*, *Ficus virens* and kikar (*Acacia* sp.) from the

surveyed areas of Delhi. The collected samples are maintained at Regional Field Gene Bank, Ludhiana. The centre has multiplied 246.95 kg broodlac from different host plants at RFGB during 2021. The life cycle and productivity-linked parameters of lac insects (*Rangeeni* strain; *Baisakhi* and *Katki* crops) were studied on *F. semialata*, *F. macrophylla* and *Z. mauritiana* under Punjab conditions. The duration of *baisakhi* and *katki* crops varied from 210-245 and 98-118 days, respectively. She reported that *Kinnow* mandarin fruits coated with Citrasol, Formesa, Citrashine and Lac based wax formulations prior to storage under ambient conditions can retain their post-harvest quality up to 15 days which may help in extending the marketing period for better economic returns as compared to un-coated fruits.

The PI was suggested to: (i) Conduct a comparative study on lac-based fruit coating with synthetic formulation in terms of storage and quality, (ii) Improve the expenditure of the funds and (iii) Try to integrate lac cultivation with agriculture on hosts like *Cajanus cajan*.

7. ICAR Research Complex for Eastern Region, (ICAR-RCER), Patna (Voluntary Centre)

Dr. Md. Monobrullah, PI presented the progress. The centre has completed surveys in all 38 districts of Bihar. Out of 38 districts, 22 districts showed naturally occurring lac insect in varied proportion mostly on *Ficus religiosa*, *Ficus benghalensis* and rarely on *Ziziphus mauritiana* and *Butea monosperma*. The centre explored the commercial utilization of shellac in Muzzafarpur and Sitamadhi districts. PC appreciated the work of the centre.

The PI was suggested to: (i) Identify the potential lac growers and initiate lac cultivation in Bihar, (ii) Explore the scope of consumption of lac in Bihar and (iii) Identify and organize training programmes for entrepreneurs on processing of lac and establishment of small processing unit.

8. Acharya N. G. Ranga Agricultural University (ANGRAU), Guntur (Voluntary Centre)

Dr. SR Koteswara Rao, PI presented the progress. *Conocarpus lancifolius* Engl. was first time reported as a host plant for the lac insect from Andhra Pradesh. He also added that *Kerria thrissurensis* was found on *C. lancifolius* and *Kerria rangoonensis* on *C. lancifolius* and *Albizia saman* plants.

The PI was suggested to: (i) Identify an area / location for infrastructure development such as RFGB and the Lac Museum, (ii) Try to develop a team with proper involvement of Co-PIs for smooth running of the project and (iii) More focus should be given to *A. saman* as a host plant.

9. Sher-e- Kashmir University of Agricultural Sciences and Technology (SKUAST), Jammu

Dr. R.K. Gupta, PI presented the progress. He informed that thirteen lac insect collections are being maintained *in situ* and at the Regional Field Gene Bank at SKUAST, Jammu. Adding momentum to ongoing lac conservation campaign, this year 1016 plants were inoculated for *in situ* conservation and 154 people were involved in the campaign. 1018 Kg of broodlac was produced for small scale demonstrations from *in situ* conserved trees. In general, crimson strains outperformed yellow one. Success for lac conservation was observed on *khair*, *Acacia catechu* in the RFGB for the first time. Summer mortality remained the most serious concern and was minimally observed on *kikar (in situ)* whereas maximum on *ber* in the RFGB. A lac

conservation campaign was conducted in all the potential areas and people participation was ensured to restore lac on host trees. As a result of *in situ* conservation activities, natural lac insect occurrence was increased from 2.3% to 13.5%.

The PI was suggested: (i) To carry out the study on the pest incidence of agricultural fields neighboring lac plots systematically to verify the data presented on this aspect and (ii) Carbon dioxide emission study was found to be interesting. However, it needs to be validated with the live lac insect population.

10. State Forest Research Institute, Jabalpur (Madhya Pradesh)

Dr. Anirudha Majumdar, PI presented the progress. He informed that all the districts of Madhya Pradesh have been surveyed. Survey of lac insect and host plants was done in 23 blocks of 11 districts, but lac occurrence was found only in 12 blocks of 11 districts in Madhya Pradesh. RFGB has been established at SFRI campus, in which 13 species of host plants are conserved. Eighty-five host plants including the host plants *viz.*, *kusum*, *palas*, *ber*, *gular*, *sitaphal*, *jangal jalebi*, *safed siris*, *black siris*, *khair*, *akashmoni*, rain tree, *pipal*, *shisham* are maintained. Trainings were conducted at Saisaipura, Sheopur (M.P.) for farmer's awareness about lac insect and lac cultivation techniques in which 61 farmers, *van samiti* and forest staff participated. One day interaction meeting was conducted among scientific team, lac traders, farmers and *van samiti* members on 26 November 2021 in lac processing unit Jairamtola, Waraseoni, Balaghat. Socio-economic survey was conducted in Gondia district of Maharashtra, and Katni, Dindori and Balaghat districts of MP. PC appreciated the work done by this centre.

The PI was suggested: (i) To carry out socio-economic survey in other districts and give a consolidated survey report for the states of Maharashtra and Madhya Pradesh, (ii) To train the farmers for scientific *kusmi* lac cultivation techniques as a measure for increasing *kusmi* lac cultivation in the given area, (iii) To study income generated from lac cultivation in different areas and (iv) To report the results of the study on integration of paddy with lac.

11. ICAR-Indian Institute of Natural Resins and Gums (IINRG) Ranchi

Dr. Thamilarasi, K., Co-PI presented the progress. Evaluation of lac insect (*kusmi*) on pruned plants of *Calliandra calothyrsus* during *aghani* (winter) crop 2020-2021 was done. January and February pruning recorded longest shoot with more diameter as compared to other months of pruning in *C. calothyrsus*. February and March month of pruning recorded more broodlac ratio during *aghani* crop 2020-2021. A facility was created to rear lac associated parasitoids and predators by maintaining lac populations throughout the year and keep more populations for executing further study. Barcoding of new lac insect lines and lac host pests have been carried out. Isolation and identification of endophytes from *F. semialata* phloem sap have been done. Identification of endosymbiotic fungi in lac insects has been carried out. Web portal of major lac host plants was designed.

The PI was suggested to: (i) Coordinate with the centres to complete the surveys and lac map of the country within this plan period and (ii) To add 50 minor host plant in the existing web portal.

C. Business session

Following points emerged out of the discussion in the concluding session:

1. Centers should prepare year-wise and block-wise plan to conduct surveys so as complete the lac map of the country within this plan period.
2. Centres should strengthen their RFGBs of lac insects and host plants.
3. Each Centre must identify two dominant lac-host plants of their region and develop separate plots for these having at least 30 plants each to evaluate and multiply local lac insect strains
4. Centers must maintain the passport data and GPS location of each collection (insects and host plants) during survey.
5. Plan of research for the coming year must be presented in the form of either sub-project or technical activities.
6. Centers are advised to send the samples of pests of lac insects / host plants to the Lead Centre, ICAR-IINRG for maintaining them in the repository.
7. Centers should sent their manuscripts to Lead Center for evaluation / improvement before submitting for publication.
8. All the Centers were advised to send the requirement of funds for this financial year under different heads such as salary, operational and capital.
9. Funds under Travel may be utilized for research and operational purposes.
10. Centers must make plans for the expenditure of the budget meticulously and ensure the salary be paid for the contractual staff on time.
11. Expenditure on surveys must be covered under operational expenses not under TA.
12. Co-PIs of some of the Centers have neither attended any Annual Workshops nor is their role clear in the project. Such Centers were advised to actively involve the Co-PIs or drop them from the project.
13. Centers need not take consent of the Lead Centre to conduct the already approved technical programs in the Annual Workshops of NP-CLIGR.



(KK Sharma)
PC and PI, NP-CLIGR
IINRG, Ranchi



(Thamilarasi K)
Co-PI, NP-CLIGR
IINRG, Ranchi

List of Participants

Sl. No.	Name	Designation	Address
1	Dr. SN Jha	DDG (Agricultural Engineering)	ICAR, New Delhi
2	Dr. KK Singh	ADG (Farm Engineering)	ICAR, New Delhi
3	Dr. Panna Lal	Principal Scientist	ICAR, New Delhi
4	Dr. KK Sharma	PC and Director	IINRG, Ranchi
5	Dr. VD Lohot	Sr. Scientist	IINRG, Ranchi
6	Dr. Thamilarasi K	Sr. Scientist	IINRG, Ranchi
7	Dr. Achintya pramanik	Scientist	IINRG, Ranchi
8	Mr. Rajgopal NN	Scientist	IINRG, Ranchi
9	Dr. Kanchan Kumari	RA	IINRG, Ranchi
10	Dr. Vishwa V Thakur	RA	IINRG, Ranchi
11	Dr. Rashmi Mishra	SRF	IINRG, Ranchi
12	Dr. Amrita Sinha	SRF	IINRG, Ranchi
13	Mrs. Sajiya Ekbal	SRF	IINRG, Ranchi
14	Dr. A. Mohanasundaram	Scientist	NRC Banana, Trichy
15	Dr. Purnima Das	Assistant Professor	AAU, Jorhat
16	Dr. Surjit Kalita	Junior Scientist	AAU, Jorhat
17	Miss. Priyanka Saikia	SRF	AAU, Jorhat
18	Dr. SR Koteswara Rao	Professor	ANGRAU, Guntur
19	Dr. Rabinder Kaur	Senior Entomologist	PAU, Ludhiana
20	Dr. Sudhendu Sharma	Senior Entomologist	PAU, Ludhiana
21	Dr. Ankita Thakur	SRF	PAU, Ludhiana
22	Dr. Md. Monobrullah	Principal Scientist	ICAR RCER, Patna
23	Mr. Deepak R Kishor	SRF	ICAR RCER, Patna
24	Dr. RK Gupta	Prof.and Head, Entomology	SKUAST, Jammu
25	Dr. Kamlesh Bali	Associate Professor	SKUAST, Jammu
26	Dr. Suhail Ahmad Ganai	SRF	SKUAST, Jammu
27	Dr. Roopa S Patil	Scientist	KVK, Sirsi, Karnataka

28	Dr. Javaregouda	Professor	KVK, Sirsi, Karnataka
29	Dr. TV Sajeev	Scientist F and Head	KFRI, Thrissur
30	Dr. S Muthu Kumar	SRF	KFRI, Thrissur
31	Miss. Anuja Joseph	Project fellow	KFRI, Thrissur
32	Dr. KI Singh	Head, Entomology	CAU, Imphal
33	Miss. K Linda Devi	SRF	CAU, Imphal
34	Th. Rishi	SRF	CAU, Imphal
35	Mr. L Bobby Singh	L.C.A	CAU, Imphal
36	Mr. L Luhenba Singh	L.C.A	CAU, Imphal
37	Dr. Hemant Swami	Scientist	MPUAT, Udaipur
38	Dr. Lekha	Scientist	MPUAT, Udaipur
39	Dr. Gaurang Channgani	Scientist	MPUAT, Udaipur
40	Dr. Virendra Singh	Scientist	MPUAT, Udaipur
41	Dr. SK Sharma	Scientist	MPUAT, Udaipur
42	Dr. Aniruddha Majumder	Scientist	SFRI, Jabalpur
43	Mr. Balram Lodhi	SRF	SFRI, Jabalpur

A. Details of ongoing and envisaged projects of the Lead Centre

1. Name of the Lead Centre ICAR-Indian	Indian Institute of Natural Resins and Gums (IINRG), Ranchi
Name of the Project Co-ordinator	Dr. KK Sharma
Name of the PI	Dr. KK Sharma
Name of Co-PIs	Dr. Vaibhav D Lohot Dr. Thamilarasi K Dr. A Mohanasundaram (up to March, 2021) Mr. NN Rajgopal (on study leave) Mr. Md. Ali (on study leave)
Approved allocation as per RE 2020-2021	Rs 199.78 lakhs
Total remittance under 2020-2021	Rs 199.78 lakhs
Expenditure during 2020-2021	Rs.199.51 lakhs

List of new Sub-projects:

Sl. No.	Project title	Date of start	Date of completion
1.	Coordination and monitoring of Network Project on Conservation of Lac Insect Genetic Resources	August, 2014	March, 2026
2.	Identification of endosymbionts of lac insects	April, 2021	March, 2026
3.	Analysis of phloem sap from different lac host plants	April, 2021	March, 2026
4.	Wood anatomy of different lac host plants	April, 2021	March, 2026

List of ongoing sub-projects:

Sl. No.	Project title	Date of start	Date of completion
1.	Diversity analysis of aleuritic acid content in major lac insect species/strains and its use for better isolation strategies	April, 2017	March, 2021
2.	Taxonomic studies of lac insects (Hemiptera: Coccoidea: Tachardiidae) from different Agro climatic zones of India	April, 2020	March, 2026

B. Details of ongoing and envisaged projects of Coordinating Centres

1. Name of the Centre	Assam Agricultural University (AAU), Jorhat
Name of the PI	Dr. Purnima Das
Name of the Co-PI	Dr. Surajit Kalita
Opening balance 01-04-2020	0.57678
Budget released for 2020-21	13.0 lakhs
Budget utilized in 2020-21	13.19325 lakhs
Closing balance in 31-03-2021	0.38535 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources of Humid Bengal, Assam Basin of India	August, 2014	March, 2026
2.	Study on pathogenicity of naturally occurring indigenous isolate of entomopathogenic fungi (EPF) against <i>Eublemma amabilis</i> and lac insect	August, 2018	August, 2021 (Still continuing)
3.	Chemical characterization of lac resin produced by <i>Kerria chinensis</i> and value addition	March, 2020	August, 2024
4.	Pests and diseases of lac host plants and their management	February, 2021	August, 2023

2. Name of the Centre	Central Agricultural University (CAU), Imphal
Name of the PI	Dr. KI Singh
Name of the Co-PI	Dr. Shravan Manbhar Haldar
Opening balance 01-04-2020	5.77905 lakhs
Budget released for 2020-21	16.28000 lakhs
Budget utilized in 2020-21	22.05070 lakhs
Closing balance in 31-03-2021	835 .00 Rupees

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources of the Humid Eastern Himalayan Region and Bay Islands of India.	August, 2014	March, 2026

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Study on biology of lac insects found on different host plants	April, 2022	March, 2026
2.	To study the insect pest complex on host plant, <i>Malvaviscus penduliflorous</i>	April, 2022	March, 2026

3. Name of the Centre**Kerala Forest Research Institute (KFRI), Thrissur**

Name of the PI

Dr. TV Sajeev

Name of the Co-PI

Dr. M Amruth

Opening balance 01-04-2020

1.65413 lakhs

Budget released for 2020-21

14.70000 lakhs

Budget utilized in 2020-21

14.65413 lakhs

Closing balance in 31-03-2021

1.70000 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources of Humid to Semi-arid Western Ghats and Karnataka Plateau of India	August 2014	March 2026

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Mapping of Natural Population of lac in Humid to Semi-arid Western Ghats and Karnataka Plateau	April, 2022	March, 2023

3a. Name of the Centre (Voluntary Centre)	ICAR- KVK Sirsi, Uttara Kannada (UAS, Dharwad)
Name of the PI	Dr. Roopa S Patil
Name of the Co-PI	Dr. Javaregowda
Opening balance 01-04-2020	0.26726 lakhs
Budget released for 2020-21	5.50000 lakhs
Budget utilized in 2020-21	5.15238 lakhs
Closing balance in 31-03-2021	0.61488 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources from different parts of Karnataka and popularization of lac insect cultivation in Karnataka	April, 2018	March, 2026

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Systematic studies on lac cultivation on <i>Ber</i> under northern dry zone conditions	April, 2022	March, 2024
2.	Documentation of insect pests of <i>Flemingia semialata</i>	April, 2022	March, 2023
3.	Collection and documentation of predators and parasitoids under Karnataka conditions	April, 2022	March, 2024

4. Name of the Centre	Maharana Pratap University of Agriculture and Technology (MPUAT), Udaipur
Name of the PI	Dr. Hemant Swami
Name of Co -PI	Dr. Lekha
	Dr. Virendra Singh
	Dr. SK Sharma
Opening balance 01-04-2020	406.00 Rupees
Budget released for 2020-21	12.50000 lakhs
Budget utilized in 2020-21	12.49998 lakhs
Closing balance in 31-03-2021	408.00 Rupees

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources of Arid Western Plains of India	August 2014	March 2026
2.	Evaluation of bio-diversity of lac insect, <i>Kerria lacca</i> (Kerr) and management of its natural enemies in western plain of India.	January, 2018	December, 2021
3.	Host preference studies in <i>Rangeeni</i> strain of lac insect, <i>Kerria lacca</i> (Kerr).	July, 2018	June, 2021
4.	Studies on the Effect of Lac Cultivation on Yield of Pigeonpea (<i>Cajanus cajan</i> Linn.).	July , 2019	June, 2021
5.	Comparative studies of productivity linked parameters of Lac insect, <i>Kerria lacca</i> on different lac hosts prevailing in Southern Rajasthan.	July, 2021	June, 2022
6.	Study on biology and productivity linked parameters of lac insect <i>Kerria lacca</i> (Kerr) on Custard apple (<i>Annona squamosa</i> Linn.).	July, 2021	June, 2022

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Tritrophic interaction of lac insect with its natural enemies	July, 2021	June, 2023
2.	To study molecular diversity in lac insect genetic resources in Arid Western plan zone	July, 2021	June, 2023
3.	Bio chemical analysis of major host plants for the lac insect in Southern Rajasthan	July, 2021	June, 2023
4.	Effect of different hosts on the settlement of lac insect	July, 2021	June, 2023
5.	Bio-efficacy of organic treatments against major lepidopteran predators of lac insect	July, 2021	June, 2023
6.	Biology of major lepidopteran predators of lac insect	July, 2021	June, 2023

5. Name of the Centre

Prof. Jayshankar Telangana State Agricultural University (PJTSAU) Hyderabad

Centre dropped out due to poor performance

5a. Name of the Centre (Voluntary Centre) Acharya N. G. Ranga Agricultural University (ANGRAU), Guntur

Name of the PI Dr. SR Koteswara Rao
 Opening balance 01-04-2020 2.07224 lakhs
 Budget released for 2020-21 5.50000 lakhs
 Budget utilized in 2020-21 4.08888 lakhs
 Closing balance in 31-03-2021 3.48336 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of biological diversity of the lac insect of the country (Andhra Pradesh)	April, 2021	March, 2022

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of biological diversity of the lac insect of the country (Andhra Pradesh)	April, 2022	March, 2026

6. Name of the Centre Punjab Agricultural University (PAU), Ludhiana

Name of the PI Dr. PS Shera
 Name of Co-PI Dr.Rabinder Kaur and
 Dr.Sudhendu Sharma
 Opening balance 01-04-2020 0.72786 lakhs
 Budget released for 2020-21 14.00 lakhs
 Budget utilized in 2020-21 14.72337 lakhs
 Closing balance in 31-03-2021 449.00 Rupees

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of lac insect genetic resources of Sub-humid Sutlej-Ganga Alluvial Plains of India	August, 2014	March, 2026

2.	Evaluation of lac-based formulation for fruit coating (<i>Kinnow</i>) for longer shelf life through eco-friendly measures	April, 2020	March, 2023
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List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Integrated management of Lac natural enemies	April, 2022	March, 2023

6a. Name of the Centre (Voluntary Centre)

ICAR Research Complex for Eastern Region, (ICAR RCER), Patna

Name of the PI

Dr. Md. Monobrullah

Opening balance 01-04-2020

90.00 Rupees

Budget released for 2020-21

5.60000 lakhs

Budget utilized in 2020-21

6.14317 lakhs

Closing balance in 31-03-2021

-0.54227 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Survey for availability of natural occurrence of lac insect and their host plants Bihar and Eastern Uttar Pradesh.	January 2019	March 2022

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Establishment of lac host plants viz., <i>Flemingia semialata</i> and <i>F. macrophylla</i> for conservation and studies on biological attributes	April, 2022	October, 2024

7. Name of the Centre

Sher-e- Kashmir University of Agricultural Sciences and Technology (SKUAST), Jammu

Name of the PI

Dr. RK Gupta

Name of the Co-PI

Dr. Kamlesh Bali

Opening balance 01-04-2020

100.00 Rupees

Budget released for 2020-21

11.80000 lakhs

Budget utilized in 2020-21 11.79966 lakhs
 Closing balance in 31-03-2021 134.00 Rupees

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of Lac Insect Genetic Resources of Humid Western Himalayan Region of India	April, 2014	March, 2022

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of Lac Insect Genetic Resources of Humid Western Himalayan Region of India	April, 2022	March, 2026

8. Name of the Centre

State Forest Research Institute (SFRI), Jabalpur

Name of the PI

Dr. Anirudhwa Majumdar

Opening balance 01-04-2020

4.31086 lakhs

Budget released for 2020-21

13.50000 lakhs

Budget utilized in 2020-21

17.69498 lakhs

Closing balance in 31-03-2021











0.11588 lakhs

List of ongoing Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of Lac Insect Genetic Resources of Semi-arid Lava Plateau and Central Highlands of India	August, 2014	March, 2022

List of new Sub-projects

Sl. No.	Project title	Date of start	Date of completion
1.	Collection and conservation of Lac Insect Genetic Resources of Semi-arid Lava Plateau and Central Highlands of India	April, 2022	March, 2026

Rating of AINP-CLIGR Centres											
Performance of different Network Centres of the AINP-CLIGR during 2020											
Sl. No.	Name of Centres	A	B	C	D	E	F	G	Total	Rank 2020	Rank 2019
1	AAU, Jorhat	20	18	15	6	8	5	5	77	4 	1
2	CAU, Imphal	20	20	9	12	8	2	5	76	5 	6
3	KFRI, Thrissur	20	15	15	6	8	1	5	70	7 	7
3a	KVK, SIRSI	20	15	9	12	3	0.5	5	64.5	8 	5
4	MPUAT, Udaipur	25	20	15	9	8	5	5	87	2 	2
5	PAU, Ludhiana	25	20	15	12	8	3	5	88	1 	3
5a	ICAR-RCER, Patna	25	20	9	12	6	0	5	77	4 	4
6	ANGRAU, Guntur	20	5	9	9	3	4.5	5	55.5	9 	8
7	SKUAST, Jammu	20	20	9	9	8	3.5	5	74.5	6 	2
8	SFRI, Jabalpur	25	20	9	6	8	5	5	78	3 	3

Performance criteria and assigned weightage

<p>A = Research Progress (35)</p> <ol style="list-style-type: none"> 1. Submission of survey report in given format : 5 2. Establishment of lac insect/host plant field Gene Bank and Museum: 10 3. Survey and maintenance of collections <ol style="list-style-type: none"> a. 50 blocks/25 districts = 20 b. 40 blocks/15 districts = 15 c. 30 blocks/10 districts = 10 d. 20 blocks/5 districts = 5 	<p>D = Submission of AUC & SOE (12)</p> <ol style="list-style-type: none"> 1. AUC <ol style="list-style-type: none"> a. By 30^t June = 12 b. By 16th July= 06 c. By 31st July = 03
<p>B = Budget utilization (20)</p> <ol style="list-style-type: none"> a. > 98 per cent= 20 b. > 95 per cent=18 c. > 90 per cent=15 d. > 85 per cent= 10 e. > 80 per cent= 5 	<p>E= Hiring of approved Manpower (8)</p> <ol style="list-style-type: none"> a. Research Associate/ Senior Research Fellow = 6 b. Lac culture attendants through contractor = 2
<p>C = Submission of Report (15)</p> <ol style="list-style-type: none"> 1. Soft copy of annual report (January to December) <ol style="list-style-type: none"> a. By 31st January= 9 b. By 14th February= 6 c. By 25th February= 3 d. After February= 0 2. One page Quarterly report by April 30, July 31 and October 31= 2 marks each 	<p>F = Publications (5)</p> <ol style="list-style-type: none"> 1. Research paper/ popular article/bulletin and others <ol style="list-style-type: none"> a. Research paper = 2 b. Technical bulletin = 1 c. Popular article = 0.5 d. TV talk/Radio talk = 1 e. Newspaper clippings = 0.5
	<p>G = ATR on recommendation of Annual Review Meeting (5)</p> <p>Satisfactory and timely action communicated to the Lead Centre</p>