केन्द्रीय रेशम जननद्रव्य संसाधन केन्द्र, केन्द्रीय रेशम बोर्ड ,होसूर-635 109

Central Sericultural Germplasm Resources Centre
Central Silk Board, Hosur – 635 109

MINUTES OF THE 41ST MEETING OF RESEARCH ADVISORY COMMITTEE HELD ON 23RD AUGUST, 2021

The 41st meeting of the Research Advisory Committee [RAC] of CSGRC, CSB, Hosur was convened on 23rd August, 2021 and the meeting was chaired by Dr. Chandish R. Ballal, Director (Retd.), National Bureau of Agricultural Insect Resources [ICAR-NBAIR], Bengaluru. The list of participants is appended at **Annexure-1**.

At the outset, Dr. B.T.Sreenivasa, Director, CSGRC, Hosur, welcomed all the participants on behalf of the centre. He welcomed all members of the Research Advisory Committee and invitees to the meeting. The Director informed the Committee that the review period of the meeting is from October, 2020 to June, 2021. With this, the Director requested the Chairperson for her opening remarks.

The Chairperson welcomed all participants to the RAC meeting. She expressed happiness to see the newly recruited research fellows and project assistants. She opined that it is extremely important to have threadbare discussions in the RAC meeting before the RCC meeting to have updated information about the research programmes. This will ultimately help in achieving the deserved support for the projects taken up at CSGRC. She congratulated the Director and scientists of the centre for upkeeping of the campus and research publications made during the period under report. All the RAC members appreciated the overall improvement of the centre. They opined that germplasm is of high importance in order to carry out genomic studies and expressed their willingness to extend wholehearted support in shaping up of the ongoing projects and in formulation of future projects and other activities of the centre.

Director, CSGRC, Hosur, presented an overview of the activities being carried out at CSGRC during the period under report. The committee appreciated the overall progress and upkeep of the centre with other developmental activities. The following were suggested by the committee:

a) Staff sanctioned and vacancies at CSGRC should be projected so that RAC can recommend for staff requirement.
b) Publications should focus on sericultural germplasm.
c) Data on fruit-yielding accessions can be presented.

d) Cocoon photos in the overview slides can be changed as per voltinism.
e) CSGRC should affiliate with universities that charge reasonably for undertaking PhD students.

ITEM NO. I: CONFIRMATION OF MINUTES OF THE 40thMEETING OF RAC HELD ON 15TH JANUARY, 2021

As no comments were received, the House confirmed the minutes of 40th RAC meeting.

ITEM NO. II: REVIEW OF FOLLOW-UP ACTION ON THE DECISIONS TAKEN IN THE 40TH MEETING OF THE RAC HELD ON 15TH JANUARY, 2021

Follow-up action on the decisions/suggestions taken during 40th RAC meeting was presented by Dr. M. Maheswari, Sc-D and following were the suggestions of the RAC:

1. The action taken report should be crisp, clear and quantified.
2. Review of the work carried out at sister CSB institutes should be reviewed properly before taking up projects.
3. Instead of waiting for deployment of technical personnel, the services of the Project Assistants can be utilized as and when required.
4. At least one research publication in a reputed / NAAS rated journal to be published by each scientist per year within their domain.
5. Director, CSGRC can assess the training needs of the Scientists and to deploy them suitably for training at the Institutes of national repute.

[Action: All concerned scientists]

ITEM NO. III REVIEW ON THE PROGRESS OF THE ON-GOING RESEARCH PROJECTS

The ongoing research projects of CSGRC, Hosur were reviewed and the following decisions were taken.

1. PIE06001SI: Collection, Characterization, Evaluation, Conservation and Supply of Mulberry Genetic Resources (IX phase - 2018-2021)

i. Biochemical studies under the project can be taken up irrespective of the IX phase of project period by utilizing the facilities at SBRL, Kodathi, since it is a mandated programme of the centre.
ii. The scientists are advised to submit the proposal for the X phase of the project to CO at the earliest.
iii. Survey and collection of new mulberry germplasm can be carried out in unexplored areas of the country, subject to availability and without fixing target for collection.

iv. IC number should be taken for all mulberry accessions from NBPGR after completion of characterization and evaluation. Focus may be given to unique germplasm that can be published in newsletter.
v. The data of V1 mulberry variety can be taken as cut off value/benchmark in order to identify accessions that are performing better than V1.
vi. Score the germplasm (in terms of per cent infestation or severity of infestation) for all pests (including mites) encountered during different seasons and provide information on how the pests were managed in the presentation. If biocontrol is considered an option, NBAIR may be contacted for advice or to obtain bio-control agents for pest management.
vii. Focus should be given on identifying accessions showing tolerance to biotic stress.
viii. Scientific names of the causal organisms and percent of infestation to be indicated. Details of exotic accessions (i.e., country and year of collection) should be presented.

[*Action: Dr. G. Thanavendan, Sc-C*]

2. PIG 06004 SI: Studies on cytological status of mulberry genetic resources.

The committee appreciated the scientist for carrying out karyotyping work successfully and following observations/suggestions were made:

i. The work already carried out on flow-cytometry and ploidy level at CSR&TI, Mysore to be ascertained and the remaining accessions can be taken up for the study to avoid duplication. The *Morus* database and annual reports of CSRTI, Mysuru to be checked/ verified and a brief report to be submitted on the status of the same latest by 30th Sept, 2021.
ii. Fund utilization should be improved and the project can be taken up in two phases, if required.

[Action: Shri. Raju Mondal, Sc-B]

3. PIG 06005SI- Molecular characterization of mulberry genetic resources for the identification of duplicates and effective utilization

i. The objectives should be modified by removing the first objective of doing WGS of *Morus indica* as it has already been done at CSR&TI, Mysuru under the CSB-DBT network project PIC01003CN at CSRTI, Mysuru. The milestones should be revised for the second objective.
ii. As suggested by the Director (Tech.), the PI of the project PIC01003CN, CSRTI, Mysuru should be contacted to obtain the 50 validated SSR primers along with the PCR optimization protocol within two months to screen the germplasm.
iii. The list of genotypes screened by CSRTI, Mysuru under the project PIC01003CN for SSR markers can be collected and the remaining genotypes can be screened using the validated SSR primers generated from the WGS of *Morus indica.*

iv. PAGE electrophoresis unit along with gel documentation to be purchased for SSR genotyping as early as possible.
v. Revise the project as suggested above and submit the same to CO before 30th Sept, 2021.

[Action: Dr. M.C. Thriveni, Sc-B]

4. PIT08004: Study on epigenetic and autophagy modifiers on induction of haploid microspore embryogenesis in mulberry

i. The committee noted the progress and advised to discuss protocol standardization with Dr. Tanmoy Sarkar, Scientist-C, CSR&TI, Mysore.

[Action: Shri. Raju Mondal, Sc-B]

5. AIE06002MI-Evaluation of bivoltine silkworm genetic resources for tolerance to abiotic stress in selected hotspots

i. As rearing is to be conducted under thermal stress conditions, the trial rearing should be taken up during unfavourable season at CSR&TI, Berhampore (July-Sep).
ii. One more trial rearing should be taken up at RSRS, Jammu during June-July, 2022, REC, Chitradurga during April-May, 2022 and at CSR&TI, Berhampore during Feb-Mar, 2022.
iii. ANOVA/ t-test should be carried out and statistical data should be presented in future. Evaluation Index should be computed with minimum 3 rearing data and at the end of the project, stability analysis can be taken up for each location and season.
iv. Meteorological data of the test centres should be verified before presentation.

[Action: Dr. M. Maheswari, Sc-D]

6. AIE-06003SI: Evaluation of silkworm genetic resources of *Bombyx mori* with reference to inbreeding depression and their conservation [IX-phase of Collection, Conservation, Characterisation, Evaluation and Utilization of silkworm genetic resources]

i. Eight main breeding parameters (refer Bivoltine Technical committee meeting minutes) to be considered for evaluation of inbreeding depression and tolerance percentage of each parameter should be determined.
ii. Last 5 generations data should be considered for IBD analysis and quantitative geneticist/biometrician should be consulted for analysis.
iii. The analysis of inbreeding depression should be considered as a sub project of the regular ongoing project.

[Action: Dr. M. Maheswari, Sc-D]

7. AIT-06006MI: Marker-assisted screening to identify silkworm genetic resources tolerant to BmNPV and BmBDV

i. The markers linked to BmNPV tolerance should be reviewed. The scientist was advised to discuss with Dr. Satheesh, Scientist-C, CSR&TI, Mysore and obtain information regarding markers linked to BmNPV tolerance utilized for the project on multi-viral disease resistance.

[Action: Dr. Ritwika Sur Chaudhuri, Sc-C]

8. **AIG-06007MI: Molecular characterization and assessment of genetic diversity in silkworm (*Bombyx mori*) germplasm**

i. To discuss with Dr. Mohan, NBAIR, regarding the need and if required the methodology for choosing the isogenic lines/population for this work.

ii. Whole Genome Sequencing of four silkworm breeds with 100x depth may not be required since reference genome sequences of silkworm are available. However, one indigenous silkworm breed may be taken up with 100x and other three may be considered for sequencing at lower depth.

[Action: Dr. G. Lokesh, Sc-D]

New research concepts:

Concept 1: Standardization of protocol of cryopreservation of mulberry genetic resources using pollen and vegetative tissues

The concept note was proposed in collaboration with ICAR-IIHR (Dr. P.E. Rajasekharan). The house suggested the PI to utilize cryo-tanks instead of establishing a large cold storage facility. Discussions to be taken up with Dr. Anuradha Agarwal, Scientist, NBPGR, New Delhi and required training can also be undertaken at IIHR. It was suggested to submit the concept note to C.O. before 30th Sept, 2021 for approval.

[Action: Shri. Raju Mondal, Sc-B]

Concept 2: Screening of fruit yielding mulberry germplasm and development of package of practices for fruit tree plantation

The committee suggested to consider few already identified fruit yielding accessions for development of Package of Practices (POP) with a project period of 5 years. A sub-project may be included to study the phytochemical profiles of fruit yielding accessions. It was suggested to submit the concept note to C.O. latest by 30th Sept, 2021 for approval.

[Action: Dr. G. Thanavendan, Sc-C]

Concept 3: Digitization of phenotypic and biological characteristics of silkworm genetic resources

The house suggested to refer the data presentation on similar lines in Japanese institute website. Book on sericigenous insects published by CSB should be reviewed.

The work was suggested to be included in the X phase of the regular project of silkworm germplasm conservation.

[Action: Smt. G. Punithavathy, Sc-D]

Concept 5: Screening of silkworm genetic resources for tolerance to microsporidian (*Nosema bombycis*) causing pebrine disease

It was suggested to take up the work as a pilot study using productive silkworm breeds after discussion with Director (Technical). The revised concept note to be submitted to RCS latest by 30th Sept, 2021.

[Action: Dr. G. Ravikumar, Sc-D]

ITEM NO. VIII: ANY OTHER POINTS WITH THE PERMISSION OF THE CHAIR

1. The scientists should publish research papers based on their specific allotted research work at CSGRC. The scientists should avoid predatory journals with fake impact factors while publishing research articles.
2. Germplasm of fruit yielding mulberry accessions supplied to stakeholders for commercial purpose would be useful for utilisation / diversification of germplasm. Requisite guidelines / procedures should be institutionalized as per biodiversity and other related regulations.
3. The members suggested that the scientists should concentrate on trait-specific germplasm. Labelling of trait-specific germplasm and organising awareness programmes for stakeholders should be encouraged.
4. Articles can be prepared on vegetatively propagated mulberry accessions, and submitted to the *Indian Journal of Plant Genetic Resources*.
5. Success stories in the form of popular articles can be published from CSGRC and submitted to Indian Silk and also put up on CSGRC / CSB websites.
6. Draft documents eg. SOPs, Catalogues, etc. should be circulated for review by experts.
7. While purchasing through GeM portal, the procurement team (SPC) along with the indentor should verify the specifications before placing orders.
8. Network based projects should be taken up at CSGRC.
9. Dr. P.E. Rajasekharan expressed that this centre is maintaining precious germplasm material and is a national treasure for Indian sericulture that warrants for enhanced utilization.
10. Scientists of this centre should have more interactions with fellow scientists of sister institutes which will be helpful in identifying the research gaps and formulating need-based projects.
11. Proper guidance and inputs should be obtained from the Senior/Retired scientists and subject experts to take up new need-based research projects in future.
12. Care should be taken to retain the original characters of the accessions based on the passport data.

13. Subject experts can be consulted throughout the project period. Scientists are advised to utilize the opportunities provided by CO to get the required guidance / training / consultation visits from relevant experts.
14. Data should be presented with proper statistical analysis.
15. Budget utilization of all the projects should be improved.
16. Pattern of presentation, especially for characterization projects should be improved.
17. Collaborations with national and international Institutes are encouraged.
18. Outsourcing work should be awarded to genuine firms to achieve the objectives of projects.
19. Impact of different hibernation schedules in multivoltine silkworm accessions was discussed as a follow up of previous RAC meeting. The study cannot be taken up since it is not feasible for multivoltine silkworm accessions.

[Action: All concerned scientists]

Director, B.T. Sreenivasa thanked all the RAC members for critical comments and providing valuable guidance to the scientists in formulation of the projects and scientific activities. He advised all the scientists to work with full co-ordination with each other and improve their presentations with accurate scientific information.

The Chairperson, Dr. Chandish Ballal, appreciated all RAC members for the threadbare discussion held during the meeting and specifically for offering help and support to the scientists of CSGRC. The suggestions given by the RAC for different projects should be systematically incorporated and analysed data should be presented in future. She opined that the translational value of germplasm centre will differ from that of R&D institutes. Hence, the rating system should be made separate for this centre. She encouraged the scientists to be more vocal about their requirements and problems faced, if any, in carrying out project related activities. She applauded the Director and scientists of the centre for their efforts to uphold the significance of sericultural germplasm resources.

The meeting ended with thanks to the chair and RAC members.

16.09.2021
Dr. Chandish R. Ballal
Chairperson- RAC
CSGRC, Hosur

Annexure-1

List of participants for the 41st Meeting of Research Advisory Committee held on 23/08/2021 at CSGRC, Hosur

1. **Dr. Chandish R. Ballal,** Former Director, NBAIR, Bengaluru, Chairperson, RAC.
2. Dr. Anitha Kodaru, Principal Scientist, NBPGR, Hyderabad, Member RAC (virtual mode).
3. Dr. P.E. Rajasekharan, Principal Scientist, ICAR-IIHR, Bengaluru, Member RAC.
4. Dr. Manjunatha Gowda,Professor, UAS, GKVK, Bengaluru, Member RAC.
5. Dr. Ravindra Singh, Scientist-D (Rtd.), Central Silk Board, Member RAC.
6. Dr. Modhumita Dasgupta, Scientist-G, IFGTB, Coimbatore, Member RAC (virtual mode)
7. Dr. V. Sivaprasad (Tech), CSB, Bengaluru, Member RAC
8. Dr. B.T. Sreenivasa, Director, CSGRC, Hosur, Member Convener RAC
9. Dr. M. Maheswari, Scientist-D & Head, Silkworm Division & PMCE, CSGRC
10. Dr. G. Ravikumar, Scientist-D & Head, Mulberry Division, CSGRC, Hosur
11. Dr. Jameela Khatoon, Scientist-D (R&S), CSGRC, Hosur
12. Smt. G.Punithavathy, Scientist-D, CSGRC, Hosur
13. Dr. G. Lokesh, Scientist-D, CSGRC, Hosur
14. Dr. K.M. Ponnuvel, Scientist-D, SBRL, Kodathi
15. Sh. S. Nazeer Ahmed Sahab, Scientist-D, RCS, Central Silk Board
16. Dr. Ritwika Sur Chaudhuri, Scientist-C, CSGRC, Hosur
17. Dr. G. Thanavendan, Scientist-C, CSGRC, Hosur
18. Dr. M.C. Thriveni, Scientist-B, CSGRC, Hosur
19. Shri. Raju Mondal, Scientist-B, CSGRC, Hosur
20. Shri. S. Sekar A.D (Comp), CSGRC, Hosur
21. Smt. K. Gayathri, A.D. (A&A), CSGRC, Hosur
22. Shri. R. Gopinathan, Steno (Gr-I), CSGRC, Hosur