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**MINUTES OF THE THIRTY EIGHTH MEETING OF
RESEARCH ADVISORY COMMITTEE HELD ON 30TH AUGUST 2019**

The thirty eighth meeting of the Research Advisory Committee [RAC] of CSGRC, CSB, Hosur was convened on 30th August 2019, chaired by Dr.Chandish R. Ballal, Director, National Bureau of Agricultural Insect Resources [NBAIR], Bangalore. The list of participants is appended at **Annex-1**.

At the outset, Dr.R.K.Mishra, Director, welcomed all the members and expressed his gratitude to the Chairperson, Dr.Chandish R. Ballal for her chairing the meeting. The Director briefed the Committee that as suggested by the RCC in its 62nd meeting, a Brainstorming meeting was organized on 30th April 2019 to formulate strategies for effective conservation and utilization of seri-genetic resources and the minutes of the said meeting were enclosed as Annexure 2 of the agenda. Further, he also informed that, the Centre has formulated projects aiming to take up molecular characterization of germplasm resources which will be presented and that from the upcoming recruitment schedule, more scientists could be posted for smooth running of the Centre. He also informed about the recommendations/ suggestions of the RCC during 63rd meeting held on 25th and 26th July 2019. With these opening remarks, the Director requested the Chairperson to address the participants.

The Chairperson, Dr.Chandish R. Ballal welcomed all the participants and advised scientists to take up work as per the mandate including research also as a priority area of the centre. She congratulated the centre for handling a large number of plant and animal (silkworm) resources and emphasized that work done should be projected focusing on clear presentations of inference of project results. She also advised to prepare both consolidated and detailed reports for presentation with emphasis on contributions of CSGRC, Hosur towards adding information on silkworm resources. She encouraged the scientists to publish atleast one research paper a year in peer-reviewed journals with proper statistical analysis. She further suggested convening of in-house pre-RCC meetings so that all scientists are aware of the requirement for RCC and other such meetings.

The Chairperson then requested the Members of RAC for their opinions. Dr.Sarat Babu agreed with the Chairperson regarding proper presentation of the work done by the centre and publications in impact factor journals. He also stated that mulberry fruits need to be popularized among stakeholders and informed that NBPGR New Delhi would like to associate with CSGRC, Hosur in survey and exploration especially with respect to fruit yielding mulberry germplasm. Dr.Modhumita Dasgupta, stressed on exposure of scientists to global platforms like conferences, symposia, seminars, etc. and suggested to apply for travel grants from DST (SERB), DBT for the same. Dr.Vijayan, Scientist-D, CSB requested the scientists of the centre to place the problems faced by them before the RAC for discussion and suggestions to guide them in the right direction. Subsequent to the introductory remarks by the Committee, the Director took up the meeting as per the agenda.

ITEM NO. I: CONFIRMATION OF MINUTES OF THE 37th MEETING OF RAC HELD ON 10th OCTOBER, 2018

The Director informed the Committee about the inclusion of comments received from Dr.Modhumita Ghosh in the minutes of 37th RAC meeting. The Committee confirmed the revised minutes.

ITEM NO. II: REVIEW OF FOLLOW-UP ACTION ON THE DECISIONS TAKEN IN THE 37th MEETING OF THE RAC HELD ON 10th OCTOBER, 2018

Follow-up action taken on the decisions/suggestions taken during 37th RAC meeting was presented by Dr.Geetha N. Murthy, Sc-D and following were the suggestions of the RAC:

- The formulation of project on testing of package of practices for fruit yielding mulberry genetic resources in collaboration with CSR&TI, Mysore should be based on equal credit sharing by scientists of both the institutes.
- Molecular characterization on the basis of chloroplast characterization instead of whole genome sequencing may be taken up after further discussion with Dr. Mahesh of UAS Bangalore and Dr.Vijayan.

[Action: Dr.G.Thanavendan, Scientist-B, Shri Raju Mondal, Scientist-B]

ITEM NO.III: REVIEW OF DECISIONS TAKEN IN THE BRAINSTORMING MEETING TO FORMULATE STRATEGIES FOR EFFECTIVE CONSERVATION AND UTILIZATION OF SERI-GENETIC RESOURCES HELD ON 30TH APRIL 2019 AT CSGRC HOSUR

The recommendations that emanated from the meeting along with proposed plan of action were presented by Dr.Geetha N. Murthy, SC-D. The suggestions of the RAC are as hereunder:

- Screening of silkworm germplasm resources for disease resistance should be taken up on priority basis.
- Since all multivoltine silkworm based projects are on the verge of conclusion, more projects must be taken up on MV silkworm genetic resources.

[Action: Smt.G.Punitavathy, Scientist-D]

ITEM NO. IV: REVIEW OF THE RESEARCH PROJECTS CONCLUDED DURING THE PERIOD UNDER REVIEW

Three projects were concluded during the period under report. Based on the presentations by the respective PIs/CIs, the following were suggested.

1. PIE - 3356:Evaluation of coresets of mulberry germplasm for physiological efficiency and leaf quality (Mar.16 – Feb.19)

Dr. G. Thanavendan, Scientist-B, presented the details of work done and which was appreciated by the Committee. The RAC suggested the following:

- Re-analyze the correlation data indicating the level of significance so as to confirm reproducibility of the work. Take guidance of Statistician at Central Office, Bengaluru and also discuss with Dr.Modhumita.
- Identify the parameter-wise top performers against performance of the check varieties and the range
- Prepare publication with proper statistical information, quantification and practical inference and submit within 3 months.

[Action: Dr.G.Thanavendan, Scientist B]

2. PI-3575:Evaluation of mulberry genetic resources for functional traits associated with resilience to climate change (Collaboration with CSR&TI Mysore) (May.16 – Apr.19)

Shri.Raju Mondal, Scientist-B, presented the findings of the project which was also appreciated by the Committee and following are the suggestions:

- Identify genetic resources that indicate 15% increase in performance compared to the check varieties.
- Conduct functional trait-wise repeatability analysis and correlation analysis between the traits and abiotic factors
- Analyse the GxE interaction in ANOVA to understand the environmental impact.
- Initiate recording of soil moisture content data at CSGRC, Hosur at fortnightly intervals which will be helpful in all future works.
- Find out region-specific mulberry accessions for functional traits.

[Action: Shri Raju Mondal, Scientist B]

3. AIB-3577:Evaluation of multivoltine germplasm to identify potential parents for developing cross breeds suitable for Southern and Eastern India (Collaboration with CSR&TI, Mysore & CSR&TI, Berhampore) (Jun.16 – May'19)

Smt.G.Punithavathy, Scientist-D presented the findings of the project and the Committee suggested the following::

- Impact assessment to be carried out based on per cent improvement over control and the data to be included in the final report.
- Include Mano Index and statistical data for shortlisting the germplasm.
- Recommend suitable region-specific hybrids as the outcome of the project.

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

ITEM NO.V: CONSIDERATION OF NEW RESEARCH PROJECTS FOR APPROVAL

A total of four new projects were presented along with the referee comments. Project-wise observations of the Committee are given below.

1. Evaluation of silkworm genetic resources of *Bombyx mori* L. with reference to inbreeding depression and their conservation (3 years)

Dr.D.S.Somaprakash, Scientist-D presented the project proposal and the Committee recommended the project for approval with a suggestion to update the catalogue data for all silkworm accessions in the CSGRC Hosur and NBAIR databases.

[Action: Dr.D.S.Somaprakash, Scientist-D; Shri.S.Sekar, Asst. Director (Comp)]

2. Molecular characterization and assessment of genetic diversity in silkworm (*Bombyx mori* L.) Germplasm (3 years)

Dr.G.Lokesh, Scientist-D presented the project proposal and the Committee recommended submission of the project to CO, CSB for approval subject to following suggestions:

- Ascertain the number of SNPs available for silkworm and feasibility of ddRAD sequencing technology for the proposed work.
- Re-check the feasibility of ddRAD sequencing for identification of duplicates as it has only limited coverage.
- The methodology and the use of the proposed sequencing technology needs to be discussed involving Dr.Modhumita Dasgupta, experts from NBAIR, Dr.Vijayan, Sc-D from CSB and Dr.Mahesh before finalizing the proposal.
- The PI and CI should associate with PI of the collaborating institute during analysis of sequence data.

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

3. Studies on Cytological status of Mulberry Genetic Resources (3 years)

Shri Raju Mondal, Scientist-B presented the project proposal. The Committee recommended submission of the revised project to CO, CSB for approval with following suggestions:

- Include flow cytometry studies for each group based on ploidy level and revise the methodology of the project.
- Karyotyping of each accession may be taken up.
- The time schedule of activities to be revised and budget allocation for flow cytometry studies to be indicated.

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

4. Molecular characterization of Mulberry Genetic Resources for the identification of duplicates and effective utilization (3 years)

Shri Raju Mondal, Scientist-B presented the project proposal. The Committee suggested revision of the project as follows after which the same can be submitted to CO, CSB for approval:

- Plan of work and budget to be revised after discussion with experts and CO, CSB on the said lines.
- Budget provision may be provided for procurement of capillary system for SSR related work to save time and for better accuracy.

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

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

The progress of the on-going projects was presented as per milestones by the respective PIs.

1. **PIE-06001 SI: Collection, Characterization, Evaluation, Conservation and supply of mulberry genetic resources - Phase IX**

Dr. G. Thanavendan, Scientist-B presented the progress of the project. The following were the suggestions of the Committee

- The PI to immediately initiate action for planning and taking up surveys
- The PI may conduct joint surveys by involving NBPGR for survey & collection of germplasm for fruit production
- A detailed survey plan should be submitted to Director, CSGRC, Hosur by 15th September, 2019.

[Action: Dr.G.Thanavendan, Scientist-B, Shri Raju Mondal, Scientist-B]

2. **PIB-3505: Development of Drought Tolerant Mulberry Variety for Rainfed Sericulture** (Coll. project of CSR&TI, Berhampore with CSGRC, Hosur)

3. **PIB-3586: Development of superior mulberry varieties through controlled hybridization for North-West Indian states** (Coll. project of CSRTI, Pampore with CSGRC, Hosur)

4. **PIB-3629: Development of Mulberry Genotypes Suitable for Rainfed Hill Farming in North - West India** (Coll. project of RSRS, Jammu with CSGRC, Hosur)

Dr. G. Thanavendan, Scientist-B presented progress of the aforesaid collaborative projects and the Committee noted that the Centre has achieved the targeted milestones and suggested the following:

- Obtain up to date reports on the project status from the respective institutes and progress to be informed to the RAC.
- Present the projects' progresses indicating the characters of the crosses and status of progress.

[Action: Dr.G.Thanavendan, Scientist-B]

5. **PIC01003CN: Genetic Enhancement of Mulberry by Genomics Approaches: A Multicomponent Network Project: NW4b: Mimic Alkaloids in Mulberry and their Role in Modulating Host Plant – Insect Interactions** (*Coll. project of CSR&TI, Mysore with UAS-GKVK, Bangalore, CSIR-NCL, Pune and CSGRC, Hosur*)

Dr. G. Thanavendan, Sc-B presented the progress of the project which is as per milestone and the Committee suggested the following:

- Collect feedback of all the supplies made by the Centre for the project.
- Address letter to Director, CSR&TI, Mysore, Co-ordinator of the project requesting for the reports/progress of the collaborative project.

[Action: Dr.G.Thanavendan, Scientist-B]

6. **AIB-3578: Evaluation of exotic bivoltine silkworm breeds to identify parental genetic resources**

Dr. M. Maheswari, Sc-D presented the progress of the project which is scheduled to conclude in September 2019 and has completed the milestones targeted. The Committee suggested the following:

- Include data on control combination during analysis of the trial data.
- Discuss the inclusion of post cocoon parameters to evaluate performance of the breeds with other CSB institutes.
- Present quantified data in the final presentation.

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

7. **AIE06002MI: Evaluation of bivoltine silkworm genetic resources for tolerance to abiotic stress in selected hotspots** (Collaboration with CSR&TI, Mysuru, Berhampore&Pampore)

Dr. M. Maheswari, Sc-D presented the progress of the project and the Committee noted that the same is a newly initiated project and is progressing as per milestone.

8. **Collection, Characterization, Evaluation, Conservation and supply of silkworm genetic resources Phase IX** (Routine program)

Dr. G. Lokesh, Scientist-D presented the progress of the program and the Committee noted that the same is progressing as per milestone.

ITEM NO. VII: LIST OF PUBLICATIONS

The list of publications of the Centre was reviewed by the Committee and the scientists were advised to publish the outcome of the concluded projects in peer-reviewed journals for better focus on the activities of the Centre.

Observation by the Members

- Dr.Sarat Babu, Member RAC, advised the young scientists to commit more to the Institute to improve its global visibility and advised to apply for external funding from DBT and other agencies.
- Dr.Modhumita Dasgupta, Member RAC appreciated the enthusiasm among the scientists and their whole-hearted participation in the meeting. She advised all scientists to reach out internationally to improve their scientific profile. She also suggested in-depth statistical analysis for all data generated from the project work and to take up studies on epigenetics of stress-tolerance in mulberry.
- Dr.Vijayan, Scientist-D RCS, CO, CSB suggested the scientists to thoroughly review and identify the research gaps based on earlier work before formulating new projects.
- Dr.R.K.Mishra, Member RAC & Director CSGRC Hosur appreciated the scientists for the work carried out and advised them to also apply for travel grants to participate in international conferences, as also suggested by other members.

Dr.ChandishBallal, Chairperson RAC concluding the meeting advised scientists to incorporate newer ideas on germplasm research from the National Bureaus that are involved in similar research in the country and publish atleast one research paper based on final report of each concluded project. She suggested RCS section of CSB that in the RCC presentations, the Institutes utilizing genetic resources of CSGRC Hosur may mandatorily present the list, source and utilization of the resources as a separate slide.

The meeting ended with vote of thanks by Dr.Jameela Khatoon, Scientist-D.


Dr.Chandish R. Ballal
CHAIRPERSON

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Annex-1

List of participants for the 38th Meeting of Research Advisory Committee held on 30/08/2019

1. Dr.Chandish R. Ballal, Director, NBAIR, Bengaluru, Chairperson RAC.
2. Dr. Sarat Babu, Principal Scientist, NBPGR, Hyderabad, Member RAC.
3. Dr. Modhumita Dasgupta, Scientist-F, ICFRE, Coimbatore, Member RAC.
4. Dr. R.K. Mishra, Director (Tech), Central Silk Board, Bengaluru, Member RAC and Director, CSGRC, Hosur, Member Convener RAC
5. Dr. K.Vijayan, Scientist-D, Central Silk Board, Bengaluru
6. Dr. D.S.Somaprakash, Head, Silkworm Division, CSGRC, Hosur
7. Dr. Geetha N. Murthy, Scientist-D, CSGRC, Hosur
8. Dr. M. Maheshwari, Scientist-D, CSGRC, Hosur
9. Dr. Jameela Khatoon, Scientist-D (R&S), CSGRC, Hosur
10. Smt. G.Punitavathy, Scientist-D, CSGRC, Hosur
11. Dr. G. Lokesh, Scientist-D, CSGRC, Hosur
12. Dr. Ritwika Sur Choudhury, Scientist-C, CSGRC, Hosur
13. Dr. G. Thanavendan Scientist-B, CSGRC, Hosur
14. Shri S. Sekar A.D (Comp), CSGRC, Hosur
15. Shri Raju Mondal, Scientist-B, CSGRC, Hosur