Minutes of the 68th meeting of Research Council of CSB-CSR&TI, Berhampore held on 10th June, 2024

The 68th RC meeting was convened on 10th June 2024, chaired by Dr. Jula S. Nair, Director, CSB-CSR&TI, Berhampore. Dr. Pooja Makwana, Scientist D welcomed all the scientists at the beginning of the session. The chairperson, Dr. Jula S. Nair, addressed the house, advising the scientists to submit new concepts aligned with the thrust areas communicated by CO. She also emphasized the importance of adhering to all activities as per the approved action plan.

As no comments were received, the minutes of the 67th RC meeting were confirmed.

List of participants is appended in *Annexure-I.*

Subsequently, agenda wise items were taken up for discussion.

New Concepts

A total of seven new concepts were comprehensively deliberated during the meeting.

New Concept 1: Development of an intelligent and automatic silkworm counting method using deep learning (DCNN) on smartphones for Sericulture

Objective

i. Development of DCNN based automatic and intelligent silkworm counting method

Expected Outcome and Utilisation

Coming out with an intelligent and automatic silkworm counting system for mulberry sericulture

Investigators: PI- Dr. Khasru Alam (Scientist-C, Mulberry Pathology); CI- Dr. Raviraj V.S. (Scientist-C, Biotechnology Division)

PA/JRF: 01

Duration: 2 years

Proposed Budget: 7.85 lakhs

RC comments

The concept was approved with minor modifications. RC recommended developing a mobile application that is more farmer-friendly, suggesting a possible revision of the budget accordingly. The council also proposed modifying the title to include "AI-based" instead of "intelligent and automatic". Additionally, the RC advised exploring potential collaborators to deliver high quality project outcome.

New Concept 2: Physio-biochemical and molecular analysis of drought mitigation by foliar application of Nano-Zinc in mulberry

Objectives

i. To standardize the treatment of Nano-Zn to mitigate drought stress in mulberry
ii. To study role of Nano-Zn in alleviating drought stress through physio-biochemical analysis
iii. To analyze the expression of drought responsive genes under Nano-Zn foliar application

Expected Outcome and Utilisation

i. Standardization of the concentration of Nano-Zinc to mitigate drought stress in mulberry
ii. Insights for understanding physio-biochemical and molecular mechanisms involved in drought alleviation through Nano-Zinc foliar application in mulberry

Investigators: PI- Mr. Pradeep S D (Scientist-B, Mulberry Physiology); CI's- Dr. Deepika Kumar Umesh (Scientist-C, Mulberry Physiology) & Ms. Harshitha B S (Scientist-B, MBG)
PA/JRF: 01
Duration: 3 years
Proposed Budget: 28.05 lakhs
RC comments
The PI was advised to revise the concept with a comprehensive methodology backed by a thorough literature review. Additionally, he is suggested to clearly establish the relationship between nano Zn application and drought mitigation mechanisms. The RC also recommended incorporating additional micronutrients and exploring various combinations. It was further suggested to include field-level studies with bioassay as part of the project. PI may include the above suggestions and present the concept in the upcoming monthly meeting for approval.

New Concept 3: Microbe-based nutrient concoction for sustainable mulberry growth and yield
Objectives

i. Survey, isolation, and characterization of microorganisms from rhizosphere
ii. Quantitative and qualitative analysis of the concoction
iii. To screen the performance of microbial nutrient concoction against popular mulberry varieties under pot culture conditions

Expected Outcome and Utilisation

i. Most sustainable and renewable way to produce an active/readily available ionic formulation for efficient plant growth and yield
ii. To understand the present status of soil health and to implement strategies for better management
iii. Identification of new isolates or strains of immense industrial and pharmaceutical importance

Investigators: PI- Dr. Y. Nagaraju (Scientist-B, Microbiology); CI- Mr. Pradeep S D (Scientist-B, Mulberry Physiology); **PA/JRF:** 01
Duration: 3 years
Proposed Budget: 45.14 lakhs (including Refrigerator, Air conditioner, BOD incubator with temperature, humidity and photo period control, Laminar airflow, Autoclave vertical, Steel racks, Microscope with dark field and Phase contrast, Bench top fermenter)
RC comments
The PI was advised to present the proposal with a detailed methodology for each of the outlined objectives, supported by a thorough literature review. The RC raised concerns about the cost-effectiveness of the proposed product and suggested to assess its feasibility at the field level. The suggestions may be incorporated in the concept and presented in the upcoming monthly meeting for approval.

New Concept 4: Establishing a sustainable organic mulberry cultivation practice model for plains and hilly areas of East and North Eastern India

Objectives

i. To survey and identify the organic farming practices suitable for mulberry in Northeast India
ii. To formulate the organic farming practices in mulberry
iii. To estimate the microbial and biochemical quality parameters of the fortified products
iv. To establish an organic mulberry garden for evaluation of organic farming practices

Expected Outcome and Utilisation

i. Identification of a suitable organic farming practice for mulberry in West Bengal
ii. Establishment of the quality parameters for organic mulberry practices
iii. Development of an organic farming package for the mulberry in West Bengal

Investigators: PI- Dr. Yalavarthi Nagaraju (Scientist-B, Microbiology); CI- Mr. Ravi Saini (Sci-B, Soil Science & Chemistry)
PA/JRF:1 JRF and 1 PA
Duration: 3 years
Proposed Budget: 51.11 lakhs (including pH meter, EC meter, Shaker, Vortex, Double distillation unit, Refrigerator- 680 L, Colony counter, Water bath, PCR)

RC comments

RC recommended to proactively initiate the work using existing standard practices for organic mulberry production from various regions. It was advised to revise the title for clarity. The use of "Eastern and North-Eastern region" was discouraged as the proposed work specifically targets the Eastern Himalayan zone. The RC also advised including detailed methodology for each objective and revising the proposed budget.
In addition to incorporating the above suggestions, the PI is advised to reallocate the work assigned to Mr. Ravi Saini, the proposed CI who has resigned. Any changes in the work plan due to his resignation, especially given his specialization in soil science and chemistry, should be incorporated in the concept and presented in the upcoming monthly meeting for approval.

New Concept 5: Optimization of levels of genetic inheritance in multivoltine and bivoltine silkworm crosses for identifying hybrids with low disease incidences and improved silk quality

Objectives

i. To measure incidence of diseases in relation to varying levels of multivoltine and bivoltine inheritance in Multi x Bivoltine hybrids
ii. To evaluate the influence of different levels of multivoltine and bivoltine inheritance on various silk quality traits in Multi x Bivoltine hybrids

Expected Outcome and Utilisation

i. Optimal levels of bivoltine and multivoltine inheritance in Multi x Bivoltine hybrids with the least incidence of disease & improved silk quality
ii. Further research across various regions and environmental conditions to assess optimal inheritance levels in hybrids specific to those conditions
iii. Contribute towards formulation of region specific breeding policy or revamping existing breeding policy

Investigators: PI- Dr. Javid Ur Rahman (Scientist-B, SBG Section); CI's- Dr. Oshin (Scientist-B, SBG Section); Dr. Th. Ranjita Devi (Scientist-C, SBG Section) & Mr. Arun Kumar (Scientist-B, Reeling and Spinning section)
PA/JRF: 02 (1 PA and 1 JRF)
Duration: 2.5 years
Proposed Budget: 20.00 lakhs
RC comments
The PI was advised to refine the concept in consultation with senior/retired scientists having expertise in silkworm breeding and genetics. He may present the concept in the upcoming monthly meeting for approval.

New Concept 6: Genome-wide mapping of silk productivity markers of mulberry silkworm (*Bombyx mori* L.)
Objectives

i. To identify, annotate and associate the variants and genomic regions linked to silk productivity traits
ii. Identification of potential silk productive breeds for North-Eastern region

Expected Outcome and Utilisation

i. Basic understanding of the genetic architecture of economically significant silk productivity traits will be an asset for the institute (Initiation of the genome repository of the institute)
ii. Identification of the genetic markers for silk productivity traits
iii. MAS- Introgression of traits in a single new strain
iv. Development of an ultra-low trait specific SNP chip

Investigators: PI- Dr. Oshin (Scientist-B, SBG); CI's- Dr. Javid Ur Rahman (Scientist-B, SBG), Dr. Raviraj V. S. (Scientist-C, Biotechnology) & Mr. Arun Kumar (Scientist-B, Reeling and Spinning Section)
PA/JRF: 01
Duration: 4 years
Proposed Budget: 40.69 lakhs (including major instruments: Desktop computer with high storage- Rs. 3.00 lakhs, Whole genome sequencing- 15.5 lakhs)
RC comments
The concept was approved with minor modifications. The PI was advised to modify the title to include "quality traits". The RC also suggested using a smaller number of samples with higher quality sequencing through hybrid genome sequencing on two platforms (one for long reads and one for short reads). Accordingly, the budget should be revised.

New Concept 7: A study on native parasitoid community associated with major sucking pests in mulberry in Eastern and North Eastern India

Objectives

i. Survey of sucking pest complex attacking mulberry, their population dynamics and relative abundance in Eastern and North Eastern India

ii. To explore native parasitoid community associated with sucking pests in mulberry and their potential in managing the pests

Expected Outcome and Utilisation

i. A comprehensive understanding of different sucking pest species attacking mulberry, their population dynamics and relative abundance in Eastern and North Eastern India in the present scenario

ii. Identification of native parasitoid community associated with sucking pest complex in mulberry, their parasitization efficiency, population dynamics and relative abundance. Correlation between population trends of the pests and parasitoids. This information will lead us to select the most potential parasitoid for further studies to use it as a biocontrol agent

Investigators: PI- Ms. Reshma R; CI's: I/c of CSB-RSRS, Jorhat and CSB-RSRS, Koraput

Duration: 2 years

Proposed Budget: Rs. 24.92 lakhs (including major instruments: Leica microscope with PC Display-Rs.10 L; Computer and printer- Rs. 1 L)

RC comments

The concept was approved with minor modifications. The PI was advised to focus on areas with similar climatic conditions in Assam and West Bengal. The RC also recommended that the PI may conduct preliminary investigations personally rather than relying solely on data from nested units. Additionally, the PI was encouraged to gather comprehensive information on previous work done in this line.

Review of concluded projects

PIB02007SI: Improvement of mulberry leaf longevity in E & NE states of India

The PI was suggested to include stability statistics for 'Hariyali'. The RC opined that OST and OFT should be conducted simultaneously. The PI was further advised to present the data season-wise with proper analyses. Additionally, the PI was directed to provide the budget utilization details for the project.

[Action: Dr. Deepika Kumar Umesh, Sci-C]

AIB02006MI: Improvement of Nistari lines for survival and silk productivity

The PI was advised to comprehensively present the results according to the project objectives. It has been noted that the budget utilization is very poor.

[Action: Dr. Th. Ranjita Devi, Sci-C]

AIT02008SI: Identification of high humidity tolerant silkworm breeds/hybrids for Eastern & North-Eastern India

The PI was suggested to include appropriate statistical analyses for a better interpretation of the results presented. RC advised the PI to establish relationship between Pyrexia gene (a well-known temperature related gene) and relative humidity.

[Action: Dr. Raviraj V.S., Sci-C]

Further, all PIs of the concluded projects were advised to submit their final project reports for onward transmission to the Central Office (CO).

The progress of the ongoing projects and programs is as per the set targets. However, it has been noted that fund utilization in many of these projects is very low. The PIs were advised to take appropriate action to address the same. The progress in the activities of SEEM & Training Division were found to be satisfactory.

Additionally, it has been observed that concluded project reports, new project proposals, and progress of the ongoing projects are not being updated in the E-submis portal. All scientists were requested to ensure that this information is promptly and accurately updated in the E-submis portal.

Furthermore, a few of the concept notes approved in the previous RC meeting have not been submitted. The PIs were advised to adhere to the timeline and submit these concept notes immediately.

In view of the retirement of scientists involved in ongoing projects and the joining of new scientists, the Research Council recommended the following changes to the investigator team of the various ongoing projects/programs of the Institute. This is to ensure smooth running of the projects and timely achievement of the set targets. However, the same is subjected to approval from CO.

#	Scientist	Project Code/Role	Duration (From)
1.	Dr. K. Rahul, PMCE/Silkworm Pathology	MOE02014SI- **Coordinator** MOE02015MI (C-IV)- **CI**	January, 2024
2.	Ms. Harshitha B S, Sci-B, MBG	PIB02010SI- **CI** PIE13001MI- **Facilitator**	April, 2024
3.	Ms. Sanghmitra Aditya, Sci-B, Mulberry Pathology	MOE02015MI (C-I)- **CI** PIE13001MI- **Facilitator**	April, 2024
4.	Dr. Y. Nagaraju, Sci-B, Microbiology	MOE02014SI (C-I)- **CI** PIE13001MI- **Facilitator**	April, 2024
5.	Mr. Pradeep SD, Sci-B, Mulberry Physiology	MOE02015MI (C-II)- **CI** PIE13001MI- **Facilitator**	April, 2024
6.	Ms. Reshma R, Sci-B, Entomology	MOE02014SI (C-II)- **CI** ARE01028MI- **CI**	April, 2024
7.	Dr. Ranjith Kumar S, Sci-B, CSB-RSRS, Koraput	PIB02010SI- **CI** AIE02018SI- **CI** MOE02014SI- **CI** MOE02015MI- **CI** PIE13001MI- **CI**	April, 2024

Meeting ended with vote of thanks

Minutes approved

(Dr. Jula S. Nair)
Director

Annexure-I

List of participants in the 68th Meeting of Research Council (RC) held on 10.06.2024 at CSRTI-Berhampore, West Bengal

#	Name	Designation
1	Dr. Jula S. Nair	Director
2	Dr. G. Srinivasa	Scientist-D, SEEM
3	Dr. Satadal Chakrabarty	Scientist-D, Sericulture Division, Farm Management
4	Dr. K. Suresh	Scientist-D, MBG
5	Dr. Pooja Makwana	Scientist-D, Biotechnology
6	Dr. Parameshwara Naik J.	Scientist-C, Training
7	Dr. Deepika Kumar Umesh	Scientist-C, MBG
8	Dr. Thangjam Ranjita Devi	Scientist-C, SBG
9	Dr. Mihir Rabha	Scientist-C, Silkworm Protection
10	Dr. Raviraj V.S.	Scientist-C, Biotechnology
11	Dr. Yallappa Harijan	Scientist-C, MBG
12	Dr. Khasru Alam	Scientist-C, Mulberry Pathology
13	Dr. Oshin	Scientist-B, SBG
14	Dr. Y. Nagaraju	Scientist-B, Microbiology
15	Mr. Pradeep S.D.	Scientist-B, Mulberry Physiology
16	Ms. Sanghmitra Aditya	Scientist-B, Mulberry Pathology
17	Ms. Reshma R.	Scientist-B, Entomology
18	Mr. Ravi Saini	Scientist-B, Soil Science & Chemistry
19	Dr. Javid Ur Rahman	Scientist-B, SBG