

MINUTES OF 68th RESEARCH COUNCIL MEETING OF CMER&TI, LAHDOIGARH HELD ON 5th OCTOBER 2023

The 68th RC meeting was held in hybrid mode on 5th October 2023 under the Chairmanship of Dr. K.M. Vijaya Kumari, Director of CMER&TI Lahdoigarh. The list of participants is enclosed as Annexure-I. The meeting proceeded with discussions as per the agenda items.

AGENDA NO. 1: CONFIRMATION OF LAST RC MEETING MINUTES

The last (67th) RC meeting of CMERTI, Lahdoigarh was held on 25th July 2023 and the minutes were circulated among all the Members. Since no comments received from any of the members, the minutes of the meeting were confirmed.

AGENDA NO. 2: FOLLOW UP ACTION ON THE RECOMMENDATION/ DECISIONS OF THE LAST RC MEETING

The project wise action taken on the decisions/recommendations of the last meeting was presented by the respective scientists while presenting the progress of their projects.

AGENDA NO. 3: NEW CONCEPT NOTES FOR APPROVAL

Nil

AGENDA NO. 4: CONCLUDED PROJECTS

#	DETAILS	
5.	Project code and title:	AIB-05009-SI: Isolation of thermo-tolerant line(s) of Oak tasar silkworm <i>Antheraea proylei</i> J.
A	Investigators	Y. Debaraj (PI); S. Subharani Devi (CI); Arun Kumar (CI)
B	Project period:	October 2019- September 2022 (Extended upto Sept. 2023)
C	Objectives:	1. To isolate thermo-tolerant line of oak tasar silkworm, <i>Antheraea proylei</i> 2. Characterization of Heat shock protein gene in thermo-tolerant line.
D	Progress achieved:	During spring crop, 2022 reared <i>A. proylei</i> , RTRS-1 and C27 after inducing heat stress at different temperatures 32 °C to 38°C in 5th instar larvae and recorded decreased ERR % with increase in heat stress. Repeated protein profiling studies in heat treated larvae of <i>A. proylei</i> , RTRS-1 and C27. Cloning of PCR amplified random segments of genomic DNA is carried out in the Department of Biotechnology, Manipur University, however, the experimental work could not be completed due to closure of Manipur University since 3rd May 2023 due to large scale violence and riots that broke out on 3rd May 2023. Heat treated seed cocoons of <i>A. proylei</i> are under preservation for maintaining the generation.
E	Utility of Outcome/ future course of action	➤ <i>A. proylei</i> , RTRS-1 and C27 after inducing heat stress at different temperatures 32 °C to 38°C in 5th instar larvae and recorded decreased ERR % with increase in heat stress. ➤ Heat treated seed cocoons of <i>A. proylei</i> are under preservation for maintaining the generation for further studies.
F	Budget and expenditure:	Rs. 21.90 lakhs and 8.688 lakhs.
68th RC	Suggestions	The isolated thermo-tolerant line should be test verified through OST/OFT trials.

AGENDA NO. 5: REVIEW OF THE PROGRESS OF ON-GOING PROJECTS

#	DETAILS	
1.	Project code and title:	AIB-05012-SI: Inter and intra-specific hybridization for improvement of eri silkworm, <i>Samia ricini</i> Donovan
A	Investigators involved	Aftab A. Shabnam (CI till June 2023 & PI from July 2023); Mahesh D. S (CI from July 2023); Reeta Luikham, (PI till June 2023)
B	Project period :	4 years (March, 2020 – February, 2024)
C	Objectives:	To develop improved cross breeds/hybrids of Eri silkworm with higher fecundity and silk yield for commercial exploitation.
D	Progress achieved:	<p>Selection of 08 fecundity lines was carried out from different cross combinations during preparation of F₂ generation seed. These lines were reared (cellular rearing) in F₂ generation and recurrent selection of fecundity lines was carried out during preparation of F₃ seed. The expression level of fecundity trait was calculated and only those lines were carried forward which showed fecundity above or on par with the selected fecundity lines. Hence, only C3FL1/11 (Fecundity: 465 Nos.), C2FL3/21 (Fecundity: 468 Nos.), C7FL1/29 (Fecundity: 484 Nos.) and C2FL3/31 (Fecundity: 478 Nos.) were selected and reared. After harvesting the cocoons, higher cocoon weight i.e. (C3FL1/11-CWA1=4.06 g), (C2FL3/21-CWB1=4.60 g), (C2FL3/21-CWB2=4.84 g), (C7FL1/29-CWC1=4.55 g) (C7FL1/29-CWC2=4.45 g), (C7FL1/29-CWC3=4.75 g), (C7FL1/29-CWC4=4.23 g), (C7FL1/29-CWC1=4.55 g) and (C2FL3/31-CWD1=4.16 g) were selected for cocoon lines (above 4 gram). Grainage activities of 04 fecundity lines (C3FL1/11, C2FL3/21, C7FL1/2 and C2FL3/31) to produce F₄ seed are in progress.</p> <p><u>Hybrid combination:</u> Rearing of 04 Parental strains (BYP, TGBP, GYP and C2) for preparing 03 hybrid combinations (BYP x TGBP, C2 x BYP and GYP x TGBP) was completed for their large scale trial at Institute level. Cocoons were harvested and kept for emergence at room temperature. Grainage activities of 04 parents are under progress</p> <p><u>Inter-specific hybridization</u> Larval mortality has been recorded during first and second instars of three lines crossed with wild eri. The effort for inter-specific hybridization will be made again based on the availability of wild eri.</p>
E	Specific outcome:	08 ‘fecundity’ and 09 ‘cocoon trait plus fecundity’ lines selected based on fecundity above 400 and cocoon weight above 4 g. Recurrent selection in F ₃ generation carried out. F ₄ generation rearing in progress.
F	Budget and expenditure :	Budget: Rs. 23.15 lakhs & Expenditure: 14.12 lakhs
68th RC Suggestions		<ol style="list-style-type: none"> 1. Continue the efforts for recurrent selection of fecundity and cocoon weight lines. 2. Re-check the performance of hybrid combinations before initiating station trials.
2.	Project code and title:	AIB 5013 SI: Impact of elevated CO₂ and temperature on muga silkworm and its primary host plant
A	Investigators involved	D. K. Jigyasu (PI, w.e.f. 01.08.2022), Amit Kumar (PI up to 31.07.2022 & Co-PI w.e.f. 01.08.2022); Aftab Ahmad Shabnam (CI); G. Subramanyam, (CI up to 26.07.2021)
B	Project period :	March 2020 to Feb 2023

C	Objectives:	<ol style="list-style-type: none"> 1. To assess the influence of elevated CO₂ and temperature on growth and yield attributes of primary host plant (Som). 2. To assess the impact of elevated CO₂ and temperature on muga seed crop production, cocoon characteristics and fecundity. 3. To design strategies for adoption in muga silk worm rearing under the changing environmental scenario in Assam.
D	Progress achieved:	<ul style="list-style-type: none"> • Imposing treatment of elevated CO₂ at 550 ppm concentration and elevated temperature (ambient +1.5 °C) are presently going on as per revised plan with constant monitoring and data recording. • The 1st seed crop rearing and grainage activities are completed after treatment for six months on som plants during January-February, 2023. • Biochemical analysis of six months treated Som plants was estimated and compared using paired t-test. • The average larval weight was recorded highest in OTC-4 (control) (13.24 gm) followed by OTC-1 (eCO₂) (11.87 gm), OTC-2 (eTemp) (10.61 gm) and OTC-3 (eCO₂+eTemp.) (10.52 gm). • The average cocoon weight was recorded highest in OTC-4 (6.86 gm) followed by OTC-1 (6.18 gm), OTC-3 (5.63 gm) and OTC-2 (5.20 gm). • Muga silkworm rearing was conducted in 2nd seed crop (July-August) under the OTCs.
E	Specific outcome:	Exposure of Som plants to eCO ₂ and varied temperature regimes to assess the impact on plant growth, biochemical attributes and feeding behavior of muga silkworm.
F	Budget and expenditure:	Budget: Rs. 44.72 lakh Expenditure till September, 2023: 35.4211 Lakh
68th RC Suggestions		<ol style="list-style-type: none"> 1. Study the impact of elevated CO₂ and temperature on moisture content of the leaves. 2. Continue the project as per revised milestones
3.	Project code and title:	ARP-05015-SI: Development of chemical based control measures for management of pebrine disease in Muga silkworm, <i>Antheraea assamensis</i> Helfer
A	Investigators involved	Arun Kumar K.P (PI)
B	Project period:	Jan 2021 – Dec 2023
C	Objectives:	<ul style="list-style-type: none"> • Effect of different chemical disinfectants and antifungal substances on survivability and infectivity of microsporidian spores • Efficacy analysis and field application of chemical disinfectants suitable for management of pebrine disease.
D	Progress achieved:	<ul style="list-style-type: none"> • Egg washing studies with different chemicals and optimization of protocol to avoid transovum infection. OST trails at research extension stations of CMER&TI and MSSO units. • The degree of capacity of controlling microsporidian infection of the disinfectants will be deduced.
E	Specific outcome:	<ul style="list-style-type: none"> • Protocols for field application of short-listed chemicals and egg washing technique are being optimized. • The Degree of capacity of controlling microsporidian infection of the disinfectants is being studied.
F	Budget and expenditure :	Budget: 19.92 lakhs Expenditure: 10.61 lakhs
68th RC Suggestions		<ol style="list-style-type: none"> 1. Plan for OST of shortlisted chemicals and egg washing technique in collaboration with the DoS & ASRs. 2. Continue the project work as per milestones
4.	Project code and title:	APR-05018-MI: Effect of various host plants separately and in combination on Rearing and grainage performance of Muga silkworm,

		<i>Antheraea assamensis</i> Helfer
A	Investigators involved	DK Jigyasu (PI w.e.f. 1 st July, 2022), Kh. Subadas Singh (PI up to 30 th June, 2022), S. A. S. Rahman (CI), Vikram Kumar (CI), D. Mech (CI, w.e.f. Nov., 2022)
B	Project period :	March 2021 – Feb 2024
C	Objectives:	1. To study the effect of various host plants separately and in combination on rearing performance of muga silkworm. 2. To study the effect of various host plants separately and in combination on grainage performance of muga silkworm.
D	Progress achieved:	<ul style="list-style-type: none"> • Muga silkworm rearing on primary (Som and Soalu) and secondary (Dighloti and Majenkari) host plants and its combinations is conducted during seed and commercial crops. • Data of rearing and grainage of muga silkworm were compilation. • Highest larval weight and highest larval mortality of muga silkworms was recorded on Soalu rearing and its combination. • Highest mortality was observed in Mejangkari solo and combinational rearing. The highest mortality was recorded due to continuous rainfall, high temperature and humidity lead to outbreaks of viral disease.
E	Specific outcome:	Assessment of Muga silkworm rearing on different host plants in seed and commercial crops.
F	Budget and expenditure:	Budget: Rs. 15.42 lakh (CMER&TI: 7.62 lakh), Total Expenditure till September, 2023: 6.51 Lakh
	68th RC Suggestions	Continue the project as per milestones
5.	Project code and title:	APS-05020-MI - Commercial egg production technology for ericulture
A	Investigators involved (PI & Co-I's)	Mahesh D S, (PI), Lalitha Natarajan, EBSF, Topatoli, (Co-PI), Arun Kumar K P, (CI)
B	Project period :	February 2022 to January 2024
C	Objectives:	a. Standardization and selection of suitable egg laying device for commercial loose egg production in eri. b. Synchronization of hatching and subsequent rearing. c. Popularization of loose egg production in Ericulture.
D	Progress achieved:	<ul style="list-style-type: none"> • Studies on black boxing schedules for synchronization of hatching by using different days laid eggs are being continued for the final confirmation. • Large scale trial on commercial loose egg production is being carried out at EBSF, Topatoli. The calculation of economics for commercial loose egg production of selected egg laying devices is being continued. • Standardization of mass mother examination, early emerged male moth and seed preservation techniques for commercial egg production are being carried out for conclusive results. • Development of standard package of practice for loose egg production is being carried out.
E	Specific outcome:	• New commercial loose egg production techniques in Ericulture
F	Budget and expenditure:	Budget: 14.65 Lakhs Expenditure: 7.95 Lakhs
	68th RC Suggestions	1. As requested by the PI, the duration of the project is recommended for extension upto March 2024 without any additional budget. The PI is advised to submit a formal request for the same well in advance for seeking approval from RCS. 2. Continue the project as per milestones
6.	Project code and title:	APS-05021-EF: Studies on population diversity and role of host plant volatile cues for enhancing egg laying in temperate tasar (<i>Vanya</i>) silk moths <i>Antheraea proylei</i>.
A	Investigators involved	S Subharani Devi (PI), Y. Debaraj (CI), K M Vijaya Kumari (PI)

B	Project period :	Jan., 2022- Dec. 2024
C	Objectives:	<ul style="list-style-type: none"> • To survey and establish population diversity of oak tasar silk moths across NER. • To establish potent food plants (Host) for oak tasar silk moths, <i>A. proylei</i> for egg production. • To isolate and evaluate highly suitable host plant volatiles to activate/increase egg laying in oak tasar silk moth. • To standardize the synthetic oviposition stimulant blends to enhance egg production in oak tasar silk moths and establishing the efficacy of developed technology. • To evaluate the synthetic volatile blend in large scale at oak tasar seed production centers.
D	Progress achieved:	Surveyed and collected live <i>Antheraea frithi</i> cocoons from Imphl east and Kangpokpi district of Manipur. Cocoons of <i>A. proylei</i> and other <i>Antheraea</i> sp. supplied to other collaborating Institutes viz. Manipur University for molecular characterization and IIHR for GC-EAD studies from different host plant leaf as well as stem volatiles. Conducted grainage of <i>Antheraea proylei</i> cocoons reared on different food plants and observed maximum average realized eggs in <i>Q. serrata</i> (174 eggs) followed by <i>Q. griffithii</i> (157 eggs) and <i>L.dealbata</i> (101 eggs) fed plants. Rearing performance of <i>A. proylei</i> fed on <i>Quercus serrata</i> showed highest ERR (26.90 %). The elemental composition of <i>A. proylei</i> cocoons collected from different NE states by EDX technique showed the character spectrum of different elements. It was found that carbon (C) showed the highest percentage (53.13 to 60.70) % of all the elements.
E	Specific outcome:	Surveyed and collected live <i>Antheraea frithi</i> cocoons from Imphal East and Kangpokpi district of Manipur. Grainage performance of <i>A. proylei</i> fed on different food plants showed maximum average realized eggs in <i>Q. serrata</i> (174 eggs). Rearing performance of <i>A. proylei</i> fed on <i>Quercus serrata</i> showed highest ERR (26.90 %). EDX analysis of elemental composition of <i>A. proylei</i> cocoons collected from different states showed the highest percentage of carbon (53.13 to 60.70) % of all the elements.
F	Budget and expenditure:	Budget: Rs.122.49 lakhs (Total) & Rs. 12.72 lakhs (RSRS, Imphal)
	68th RC Suggestions	<ol style="list-style-type: none"> 1. Present details regarding the physical and financial progress of the collaborating institutes. 2. Continue the project as per the milestones.
7.	Project code and title:	MOE-05022-MI: Evaluation and popularization of improved technologies developed in the field of Muga, Eri and Oak sector for Northeastern India (OST/OFT of CMER&TI)
A	Investigators involved (PI & Co-I's)	D K Jigyasu, CMERTI (PI), Sri Suraj Pal, REC-Fatehpur (CI), James T Keisa, CMERTI (CI), Y Debaraj, RSRS-Imphal (CI), L Somen Singh, RSRS-Imphal (CI), Sri. B N Choudhury, RSRS-Boko (CI), Sri SAS Rahman, RSRS-Boko (CI), Dr D. Mech, REC-Lakhimpur (CI), Aftab A Shabnam, CMERTI (CI), S. Subharani Devi, RSRS-Imphal (CI), Arun Kumar KP, CMERTI (CI), Amit Kumar, CMERTI (CI), Kh. Subadas Singh, CMERTI (CI), Dr Vijay. N, CMERTI (CI), Mahesh D S, CMERTI (CI), Manjunath R N, CMERTI (CI), Mr. Abhishek Singh, MESSO (CI)
B	Project period:	February 2022 to January 2024
C	Objectives:	<ul style="list-style-type: none"> • To popularize various technologies in different stages developed by the Institute • To further create awareness for technological intervention among the farmers and beneficiaries • To increase the overall cocoon production.
D	Progress achieved:	• 10 kg of Castor (NBR) seeds were supplied to DoS, Pathankot, Punjab for

		<p>popularization of NBR-Castor for eri silkworm.</p> <ul style="list-style-type: none"> • 200 Kesseru seedlings were supplied to 2 farmers at Golaghat district. • 2 kg NBR castor seeds have been supplied to eri farmers at Mariani area. • 100 kg of Castor (NBR) seeds were supplied to DoS, Mizoram for popularization of NBR-Castor for eri silkworm. • 18 kg Borpat seeds for raising of seedling for the popularization of perennial host plant of eri silkworm have been collected. • Single leaf bud cuttings and bud grafting of Som morphotypes of S3 and S6 have been prepared for the raising of saplings. • Transferring of seedlings of superior variety of Kesseru (HF-008 and HF-005) in poly bags for supply. • 400 seedlings of Kesseru plant are supplied to two farmers in Sivasagar.
E	Specific outcome:	Awareness and popularization of technologies in muga, eri and oak tasar.
F	Budget and expenditure:	Budget: Rs. 8.84 lakh Expenditure till September, 2023: 0.61 Lakh
68th RC Suggestions		<ol style="list-style-type: none"> 1. Progress in the project is not satisfactory. 2. All the CI should compare the outcome of OST/OFT data with the actual outcome/results reported in the respective research projects. 3. Henceforth, the results of OST/OFT to be presented by respective Cis. 4. Continue the project and achieve yearly targets as fixed in Annual Action Plan (2023-24)
8.		
	Project code and title:	ARP05023CN: Muga and Eri silkworm disease monitoring in north eastern states of India
A	Investigators involved	Bitupon Das (PI), Lopamudra Guha (Co-PI) and all Scientists of CMER&TI & MESSO units (CIs).
B	Project period:	March 2023 to February 2028
C	Objectives:	1. To monitor silkworm diseases during grainage and rearing and its management with respective DoS in North Eastern states
D	Progress achieved:	<ul style="list-style-type: none"> • Region wise committee for monitoring prepared with nominated team leader. • Review meeting with all in-charges/technical personnel of MESSO was conducted in the month of August 9th for carryout monitoring works. • Monitoring of diseases and suggestions of remedial measures for bhodia crop in MESSO and ASRs field undertaken.
E	Specific outcome:	Will be appraised by the PI during the meeting
F	Budget and expenditure:	Budget: 11.88 Lakhs Expenditure: 0.295 Lakhs
68th RC Suggestions		<ol style="list-style-type: none"> 1. Pacify the procurement process of microscopes. 2. Continue the project as per the milestones.
9.		
	Project Code & Title	AIT05024EF - Advanced-Level Institutional Biotech Hubs at CMERTI-Jorhat Assam (Phase-II)
A	Investigator	Dr. Arun Kumar K P (P.I), Sh. Bitupan Das (C.I), Dr. Mahesh DS (C.I),
B	Project period:	3 Years, February 2023 – February 2026
C	Objectives:	<ol style="list-style-type: none"> 1. Collection and maintenance of different eco-races and strains of eri silkworms. 2. Genotyping by Sequencing of selected eco-races and strains of eri silkworms. 3. Analysis of SNP data for use in different downstream applications for the improvement of eri silkworm
D	Progress achieved:	<ul style="list-style-type: none"> • Collected ecoraces from Lakhimpur (SR012), Kokrajhar (SR014) and Borduar (SR001) were characterised according to their morphological traits and are maintained at the institute. • Cocoons from Dhansiripar (SR020) ecoraces were collected and grainage is

		going on.
E	Specific outcome:	<ul style="list-style-type: none"> • 2nd Generation grainage of selected strains of Lakhimpur (SR012) and Kokrajhar (SR014) ecoraces completed. 3rd generation rearing of both ecoraces started. • 2nd Generation grainage and rearing of selected strains of Borduar ecorace (SR001) completed. 3rd generation grainage is going on. • 4 eco-races of eri have been collected.
F	Budget and expenditure:	Budget – 57.81 Lakhs, Expenditure – 1.80 Lakhs
	68th RC Suggestions	<ol style="list-style-type: none"> 1. Efforts should be made to collect all the eco-races and maintain at Institute farms. 2. Initiate the proposed trainings under the project. 3. Continue the project as per the milestones.

AGENDA NO. 6: TRANSFER OF TECHNOLOGY (TOTs) PROGRAMMES

The progress of ToTs was presented & discussed in the ongoing project MOE05022MI.

AGENDA NO. 7: EXTENSION COMMUNICATION PROGRAMMES

Progress of extension activities was presented by Dr. D. Mech, Scientist-D. It was suggested to complete the left-over target as per annual action plan 2023-24.

AGENDA NO. 10: CAPACITY BUILDING & TRAINING PROGRAMMES

Progress under capacity building and trainings was presented by Sh. Bitopan Das, Scientist-D. It was advised to make necessary efforts to achieve the leftover annual target for the year 2023-24.

AGENDA NO. 11: ANY OTHER POINTS

The PIs were advised to effectively utilize the budget under the R&D projects.

(Dr. K M Vijaya Kumari)
Director & Chairman-RC

**LIST OF PARTICIPANTS IN THE 68th RESEACH COUNCIL MEETING OF
CMER&TI, LAHDOIGARH HELD ON 5th OCTOBER 2023**

1. Dr. K. M. Vijaya Kumari; Director, CMER&TI, Lahdoigarh
2. Dr. Y. Debraj, Scientist-D, RSRS, Imphal (*Attended online*)
3. Dr. Reeta Luikham, Scientist–D, Scientist-D, RSRS, Imphal (*Attended online*)
4. Dr. D. Mech, Scientist-D, CMER&TI, Lahdoigarh
5. Sh. S A S Rahman, Scientist–D, RSRS, Boko (*Attended online*)
6. Dr. Laishram Somen Singh, Scientist-D, RSRS, Imphal (*Attended online*)
7. Dr. Aftab A. Shabnam, Scientist-D, CMER&TI, Lahdoigarh
8. Sh. Bitupan Das, Scientist-D, CMER&TI, Lahdoigarh
9. Dr. Sinam Subharani Devi, Scientist-D, RSRS, Imphal (*Attended online*)
10. Dr. Arun Kumar K.P., Scientist-D, CMER&TI, Lahdoigarh
11. Dr. D.K. Jigyasu, Scientist-C, CMER&TI, Lahdoigarh
12. Dr. K. Subadas Singh, Scientist-C, RSRS, Imphal (*Attended online*)
13. Dr. Vijay N., Scientist-C, CMER&TI, Lahdoigarh
14. Dr. Mahesh D.S., Scientist-C, CMER&TI, Lahdoigarh
15. Dr. Manjunath R.N., Scientist-C (R&S), CMER&TI, Lahdoigarh
16. Dr. Om Prakash Patidar, Scientist-C, CMER&TI, Lahdoigarh
17. Sh. Roshan Lal Meena, Scientist-B, CMER&TI, Lahdoigarh

Technical staff/Research Fellows

18. Sh. Simanta Saikia, SFA
19. Sh. Kalpajyoti Gogoi, JRF
20. Sh. Akib Hussain, JRF
21. Sh. Suraj K Shah, JRF
22. Ms. Wahengam Sapana Devi, PA
23. Ms. Raisa Begum, PA
24. Sh. Debajani Nath, JRF