

Minutes of the 39th RAC meeting, CMERTI Lahdoigarh

The 39th RAC meeting of CMERTI, Lahdoigarh was held on 6th November, 2021 under the Chairmanship of Prof. P.J. Handique, Chairman-RAC & Vice Chancellor, Gauhati University, Guwahati at the conference hall of the institute. The list of participants is appended as Annexure – I.

Welcome address by the Director, CMER&TI and felicitation

At the outset **Dr. Kasthala Mary Vijaya Kumari**, Director, CMER&TI welcomed **Prof. P. J. Handique**, Vice Chancellor, Gauhati University, Guwahati; **Prof. L. K. Hazarika**, Academic Registrar, AWU, Jorhat; **Dr. Bidyut Kumar Sarmah**, Director, DBT-AAU Centre, AAU, Jorhat; **Dr. B.K. Singh**, Rtd Director, CSB; **Mr. Robin Bharali**, Member (Rearer Representative), Sivasagar, Assam; **Sri Kaustav Borbora**, Member (Reeler Representative), Jorhat, Assam; Mr Aditya Gogoi, Representative for Commissioner, HT&S, Government of Assam; **Sri P. Borpuzari**, Scientist–D & Head, Muga Silkworm Seed Organization, CSB, Guwahati and all other invitees, scientists from the main Institute and its nested units. **Prof. Pradip K. Neog**, Director, Extn. Education Institute (NE Region), AAU, Jorhat, **Dr. Sivaprasad V.**, Director (Tech) and **Dr. Prashanth Sangannanavar**, Scientist-C (RCS) joined the meeting online through a Webex link. The meeting started as per the set agenda.

Inaugural address by the Chairman, RAC

Prof. P. J. Handique, Chairman, RAC, in his inaugural address, welcomed all the members of the RAC. He expressed happiness about the achievements of the Institute with the remarks that it is difficult to carry out the enormous work that is currently undertaken by the Institute merely by 11 scientists. He also noted that new project staff has been recruited and suggested to make use of them for running the projects smoothly. He further hoped that we can move forward in research with the cooperation of scientists and do well for the improvement of the vanya sericulture industry. He insisted on the coordination between state and CSB for better percolation of technologies in the field.

R&D highlights of the Institute by Director, CMERTI

Dr. K.M. Vijaya Kumari, Director, presented the major R&D achievements of the Institute that have been made since the last RAC meeting in January 2021. She gave an overall picture of the CMERTI main Institute, nested units and their mode of working. Major achievements from the concluded, new and ongoing projects were presented. Technologies taken for OST/OFT, research publications, recognitions to scientists were highlighted. She also pointed out that even though due to the current pandemic situation the work was hampered, we were able to achieve the set goals in the research and development.

AGENDA NO. 1: CONFIRMATION OF LAST RAC MEETING MINUTES

The minutes of the previous meeting was circulated to all the members and the committee confirmed the minutes of the previous RAC meeting.

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

Dr. Aftab A. Shabnam, Scientist-D, PMCE presented the follow up action on general recommendations / decisions of the last RAC meeting.

AGENDA NO. 3: FOLLOW UP ACTION TAKEN ON THE PROJECT SPECIFIC RECOMMENDATION/ DECISIONS OF THE LAST RAC MEETING

As decided in the 38th RAC, the project specific recommendations/decisions were presented by the respective scientists while presenting the progress of the projects.

AGENDA NO. 4: REVIEW ON CONCLUDED PROJECTS

#		DETAILS
1.	Project code and title	APS-05001EF: Development of technology for enhancing egg laying in Vanya Silk moths by application of host plant volatiles.
A	Investigators	Dr. Kartik Neog (Up to June 2019) Dr. Dip Kr. Gogoi (Up to Aug. 2021) Dr. T. James Keisa (w.e.f. Sept. 2021). Dr. Vijaya Kumari K M (Up to Aug. 2021) Dr. Kamala Jayanthi P D, Principal Scientist, IIHR CI: Dr. Prashanth Sanganavvar (Up to June 2019)
B	Project period	March, 2018 – Feb., 2021 Extended upto September 2021 by DBT
C	Objectives	1. To survey and establish population diversity of Muga and Eri silkmoth across India. 2. To establish potent Food plants (oviposition hosts) for Muga and Eri silk moth for egg production. 3. To isolate and evaluate highly suitable host plant volatiles to instigate egg laying in Muga and Eri silk moth 4. To standardize the synthetic oviposition stimulant blends to enhance egg production in Muga and Eri silk moth and establishing the efficacy of developed technology
D	Suggestion of RAC	1. Since the objectives of the project are yet to be fully achieved. It is suggested to seek extension of the project by six months. 2. Follow up with DBT for release of second year funds. 3. Complete testing of volatile blends on muga by March 2022. 4. Take up large scale trials in future for commercial exploitation. 5. Increase the lot size and carryout next trials by involving ESSPC and MESSO units.
2.	Project code and title	MOE 05003EF: Socio-economic uplifting of farmers through adoption of improved technologies & skill development in ericulture
A	Investigators	Dr. Himangshu Barman (PI), SAS Rahman (CI)
B	Project period	September 2018 to August 2021

C	Objectives	<ul style="list-style-type: none"> •To adopt improved technologies (both pre and post cocoon sectors)at farmers’ level. •To improve the economies of scale through group approach
D	Suggestion of RAC	<ol style="list-style-type: none"> 1. Any procedural problems for release of funds from the main Institute to meet project expenses should be clarified by the PI immediately for smooth conclusion of the project. 2. Statistically analyzed data for drawing meaningful conclusions from the project is missing. 3. Outcome of the project is not provided clearly. 4. Only recommended technologies should be included in such type of projects. 5. Compare the adopted farmers’ data with the traditional farmers and include the same in the concluded report.
3.	Project code and title	AIB-5894: <i>In-situ</i> conservation of muga and other wild silkmoths in Natural Habitat
A	Investigators	Dr. R. Kumar (PI-April 2016 to May 2018); Dr. P. Sangannavar (PI- June 2018 to June 2019); Dr. G. Subrahmanyam (PI, July 2019 to June 2021); Dr. Kh. Subadas Singh (CI- June 2018 onwards)
B	Project period	April 2016 to March 2021.
C	Objectives	<ol style="list-style-type: none"> 1. Development of <i>in-situ</i> conservation site for muga silkworm and other wild silk moths species. 2. Utilization of muga silkworm germplasm for breeding and seed production.
D	Suggestion of RAC	<ol style="list-style-type: none"> 1. Monitor the conservation sites regularly. 2. Explore the possibility of using advanced technologies such as drones to carryout muga silkworm population dynamics studies at conservation sites. 3. Continue in the project in 2nd phase and ensure the completion of the remaining work. Propose JRF/RA for 2nd phase of the project. 4. Utilize the conserved muga silkworm at conservation sites for breeding programmes.
4.	Project code and title	PPA 5879: Assessment of phytochemical diversity in Som (<i>Persea bombycina</i> Kost), the primary host plant of <i>Antheraea assamensis</i> Helfer from Northeast India
A	Investigators	Dr. Amit Kumar (12-07-2019 to 28-02-2021), Dr. Prashanth Sangannavar (upto 12-07-2019), Dr. Ranjini M. S. (upto 31-05-2017), Dr. D. K. Gogoi, Dr. Ranjana Das (upto 28-02-2020)
B	Project period	01.09.2016 to 28.02.2021
C	Objectives	<ol style="list-style-type: none"> 1. Assessment of phyto-chemical constitutes of Som during different rearing seasons under agro-climatic zones of northeast region 2. To develop a comprehensive nutrient management package for muga host plant

D	Suggestion of RAC	<ol style="list-style-type: none"> 1. Specific comments of the previous RAC have not been addressed. 2. Specify variations of the most important phytochemicals in the host plant from different agro-climatic zones as suggested in the last RAC. 3. Conclude the project with precise outcomes.
5.	Project code and title	ARP-5887: Isolation and characterization of lytic Bacteriophages infecting bacterial pathogens of Muga silkworm <i>Antheraea assamensis</i>
A	Investigators involved	Dr. M. Chutia (PI); Dr. G. Subrahmanyam (CI)
B	Project period	Project period: April, 2017 - March, 2020 (Extended upto March 2021)
C	Objectives	<ol style="list-style-type: none"> 1. Isolation and characterization of bacteriophages against muga silkworm bacterial pathogens. 2. Study of the phage biology and genome organization. 3. Evaluation of the potential phages cocktail against muga silkworm pathogens
D	Suggestion of RAC	<ol style="list-style-type: none"> 1. Infect the muga silkworm larvae with most common bacterial disease and then spray the phage cocktail to ascertain the effectiveness of phages. 2. Complete the 2nd objective by studying the phage biology and genome organization. 3. Plan for large scale trials.

AGENDA NO. 5: CONCEPT NOTES OF NEW RESEARCH PROJECTS FOR APPROVAL

# NEW RESEARCH PROPOSAL		
1.	Project title	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 (PI & Co-I's)	NER Institute -1 (RSRS, CSB, Imphal): Dr Sinam Subharani Devi (PI), Dr. Y. Debaraj (Co-PI) NER Institute -2 (Manipur University): Dr. Lisam ShanjuKumar Singh (PI) Non NER Institute -1 (IIHR, Bangalore): Dr. Pagadala Damodaram Kamala Jayanthi (PI) Non NER Institute -2 (SSTL, CSB, Bangalore): Dr. Kasthala Mary VijayaKumari (PI)
B	Objectives	<ol style="list-style-type: none"> 1. To survey and establish population diversity of oak tasar silk moths across NER. 2. To establish potent food plants (Host) for oak tasar silk moths, <i>A. proylei</i> for egg production. 3. To isolate and evaluate highly suitable host plant volatiles to activate/increase egg laying in oak tasar silk moth. 4. To standardize the synthetic oviposition stimulant blends to enhance egg production in oak tasar silk moths and establishing the efficacy of developed technology. 5. To evaluate the synthetic volatile blend in large scale at oak tasar

		seed production centers.
C	Suggestion of RAC	1. Specify whether population diversity will be established according to host plant availability or agro-climatic conditions. Recommendation: Project is approved with suggestions. PI to submit the updated proposal within 15 days.
2	Project title	Commercial egg production technology in Ericulture for synchronization of hatching and subsequent rearing.
A	Investigators (PI & Co-I's)	Dr. Mahesh D S, CMER&TI, Lahdoigarh (PI). Dr. Lalitha Natarajan, Eri basic seed farm, Tapatoli (Co-PI) Dr. Arun Kumar K P, CMER&TI, Lahdoigarh (CI)
B	Objectives	1. Standardization and selection of suitable egg laying device for commercial loose egg production in eri. 2. Synchronization of hatching and subsequent rearing. 3. Popularization of loose egg production in Ericulture.
C	Suggestion of RAC	Recommendations: Project is approved. PI to submit the full project proposal within 15 days.
3	Project title	Advanced level Biotech-Hub for upper Assam area
A	Investigators	Dr.Arun Kumar KP (PI); Dr. Mahesh D S (CI); Dr.Reeta Luikham (CI); Dr.Amit Kumar (CI)
B	Objectives	1. Collection and maintenance of different ecoraces and strains of eri silkworms 2. Genotyping by Sequencing of selected ecoraces and strains of eri silkworms 3. Analysis of SNP data for use in different downstream applications for the improvement of eri silkworm
C	Suggestion of RAC	1. Include all the available eri ecoraces and strains in the study. 2. Develop genetic markers for marker assisted breeding. Recommendation: Project is approved with suggestions. PI to submit the updated proposal within 15 days.

AGENDA NO. 6: REVIEW OF THE PROGRESS OF ON-GOING PROJECTS

1.	Project code and title	MOE05004-EF : Adoption of improved sustainable technologies of Muga culture for elevation of cocoon production in the tribal belt of Assam
A	Investigators	Dr. Vijay N, (PI), Dr. DK Gogoi, (CI, upto July 2021), Dr. D. Mech, (CI), Dr. SAS Rahaman, (CI), Dr K.Sathyanarayana, (CI)
B	Project period	Aug 2019-July 2022
C	Objectives	1. To promote adoption of improved Muga rearing technologies among tribal rearers through sustainable NGO-rearer linkages facilitated by CMER&TI, Lahdoigarh. 2. To improve the socio-economic status of tribal population by

		enhancing cocoon production through improved muga culture
D	Suggestion of RAC	1. The progress made in the project is satisfactory. 2. Continue the project as per milestones.
2.	Project code and title	PIB-05005-SI: Genetic enhancement of Castor (<i>Ricinus Communis</i> L.) germplasm as a source material for development of productive perennial varieties
A	Investigators	Dr. Aftab A Shabnam (PI) Dr. Amit Kumar (CI); Dr. DK Jigysu (CI), Dr. Somen Singh (CI)
B	Project period	Oct., 2019 – Sept., 2022
C	Objectives	1. Genetic enhancement of castor germplasm. 2. Development of pre-bred intermediate castor with perennial characteristics.
D	Suggestion of RAC	1. Include disease tolerance data in characterization. 2. Continue the project as per milestones.
3.	Project code and title	AIB 05006 SI: Breeding of muga silkworms for improved silk quality and disease tolerance
A	Investigators	Dr. Arun Kumar K.P. (PI), Dr. Mahesh D.S. (CI) and Dr. Manjunath R.N. (CI)
B	Project period	October, 2019 to September, 2022
C	Objectives:	1. Selection of better parents by field collection of muga silkworm samples. 2. Classical breeding studies to select better lines for muga silkworms. 3. Mass production for limited trials.
D	Suggestion of RAC	1. The progress made in the project is satisfactory. 2. Continue the project as per milestones.
4.	Project code and title	APR 05007 SI: Standardization of chawki rearing practices for Eri silkworm, <i>Samia ricini</i> (Donovan)
A	Investigators	Dr. Mahesh D S (PI); Dr. Arun Kumar K P (CI); Dr. Kh. Subadas Singh (CI)
B	Project period	3 years (October, 2019 – September, 2022)
C	Objectives	1. Establishment and management of eri host plant garden for eri chawki rearing. 2. Design and fabrication of Eri silkworm chawki rearing equipment. 3. Development of new rearing method and ideal environment for eri chawki rearing.
D	Suggestion of RAC	1. Proper care should be taken throughout the chawki rearing for maintaining feed, breed and seed along with disease occurrence and preventive measures. 2. Identify and train some entrepreneurs for establishing micro chawki centers to commercialize the technology. 3. Continue the project as per milestones.
5.	Project code and title	APR 05008 SI: Standardization of Rearing and Grainage Technologies of <i>Antheraea frithi</i> Moore
A	Investigators	Dr. L. Somen Singh (PI); Dr. S. Subharani Devi (CI)
B	Project period	October 2019- September 2022

C	Objectives	To standardize the rearing and grainage technologies to suit for commercial adoption
D	Suggestion of RAC	1. Specify the cost benefit associated with the bamboo baskets besides identifying economic viability of any other materials. 2. Continue the project as per milestones
6.	Project code and title:	AIB 05009 SI: Isolation of thermo-tolerant line(s) of Oak tasar silkworm <i>Antheraea proylei</i> J.
A	Investigators	Dr. Y. Debaraj (PI); Dr. S. Subharani Devi (CI); Dr. R. Debnath (CI)
B	Project period	October 2019- September 2022
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	Suggestion of RAC	1. The progress made in the project is satisfactory. 2. Continue the project as per milestones.
7.	Project code and title	APR 05010 SI: Evaluation of Eri Silkworm Races suitable for different agro-climatic conditions of Manipur.
A	Investigators	Dr.Y. Debaraj (PI); Dr. L. Somen Singh (CI)
B	Project period	October 2019- September 2022
C	Objectives	To identify the best performing eri silkworm race in different agro-climatic conditions of Manipur.
D	Suggestion of RAC	1. PI to justify why all the ecoraces are not included in the study as proposed in the project document. 2. Continue the project as per milestones.
8.	Project code and title:	AIT 05011 EF: Molecular investigation into the lingo-cellulolytic system of a few wild silkmths of North East India
A	Investigators	Dr. R. Debnath (PI upto July 2021), Dr. D.K Gogoi (CI, upto Aug. 2021), Dr. Arun Kumar (CI, upto July 2021 and PI from August 2021)
B	Project period	Sep 2019-Sep 2022
C	Objectives	1. Impact of host plant range on the <i>Antheraea assamensis</i> Helfer and <i>Samia ricini</i> Donovan associated microbial community 2. Lignocellulose degradation by the gut microbes associated with <i>Antheraea assamensis</i> Helfer and <i>Samia ricini</i> Donovan 3. Molecular characterization of the lignocellulolytic biomass degrading enzyme 4. Developing microbial pathogen resistance through induction of immunity in silkworms through gut microbiome manipulation (Additional objective from CSB included)
D	Suggestion of RAC	1. Pacify the effective utilization of sanctioned fund. 2. Involve Dr. Rajal Debnath, Sc-C from SBRL as CI as he was the PI of the project and has the requisite expertise. 3. Continue the project as per milestone
9.	Project code and title	AIB 05012 SI: Inter and intra-specific hybridization for improvement of eri silkworm, <i>Samia ricini</i> Donovan
A	Investigators	Dr. Reeta Luikham (PI), Dr. Aftab A. Shabnam (CI).

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	Suggestion of RAC	1. Progress made in the project is satisfactory. 2. Continue the project as per milestones.
10.	Project code and title:	AIB 5013 SI: Impact of elevated CO₂ and temperature on muga silkworm and its primary host plant
A	Investigators	Dr. Amit. Kumar (PI); Dr. Aftab A. Shabnam (CI); Dr. D.K. Jigyasu (CI)
B	Project period	March 2020 to Feb 2023
C	Objectives	1. To assess the influence of elevated CO ₂ and temperature on growth and yield attributes of primary host plant (Som). 2. To assess the impact of elevated CO ₂ 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	Suggestion of RAC	Expedite the process for procurement of OTCs and carry out the project as per milestone.
11.	Project code and title:	BPP 05014 CN: Standardization of Processing and Production of a Consumable Beverage from Mulberry Leaves and Blending with Green Tea
A	Investigators	Dr. K. Sathyanarayana (PI), Dr. M. Chutia (CI), Sri P. Kumersen (CI), Dr. P. Sangannavar (CI),
B	Project period	March, 2020 – June, 2021 (Ext. Dec. 2021)
C	Objectives	1. Standardization of protocol for preparation of mulberry leaf for production of mulberry tea and mulberry green tea (blending of green tea with mulberry leaves). 2. Standardization of protocol for blending of processed mulberry leaf with green tea for value addition. 3. Evaluation of biochemical and organoleptic properties and customer's acceptance of the products.
D	Suggestion of RAC	1. Conduct a meeting of project working group to suggest future course of action on the outcome of the project. 2. Extend the project till June 2022 to complete the left over work including customer feedback and patenting process.
12.	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	Dr. Arun Kumar K.P (PI)
B	Project period	Jan 2021 – Dec 2023
C	Objectives	1. Effect of different chemical disinfectants and antifungal substances on survivability and infectivity of microsporidian spores 2. Efficacy analysis and field application of chemical disinfectants suitable for management of pebrine disease.
D	Suggestion of RAC	Continue the project as per milestones.

13.	Project code and title	AIT 05016 MI: Integrating genomic and transcriptomics resources for functional insight into the biology of muga silkworm <i>Antheraea assamensis</i>.
A	Investigators	Dr. Arun Kumar K.P. (PI)
B	Project period	January, 2021 to December, 2023
C	Objectives	<ol style="list-style-type: none"> 1. Development of web accessible database 'Mugabase' to host the muga sequence data, initially within CSB and later for public access. 2. Refining of assembly and annotation of the whole genome and transcriptome sequence data. 3. Identification and validation of functional genes associated with insect behavior, silk quality and immunity.
D	Suggestion of RAC	<ol style="list-style-type: none"> 1. Present the brief outcome of Phase-I of the project in next meeting. 2. Continue the project as per milestone
14.	Project code and title	CFC 5017 MI: Exploration and adoption of novel solvent based muga cocoon cooking technology for increasing its reelability and raw silk quality
A	Investigators	Dr. Manjunath R. N (PI), Dr. Dip Kumar Gogoi, CI (transferred) Dr. Rajiv Munshi, RSTRS Khanapara (CI)
B	Project period	March 2021 – Feb 2023
C	Objectives	<ol style="list-style-type: none"> 1. To study the efficacy of enzymatic and non-enzymatic (chemical) approaches in muga cocoon cooking/softening. 2. To develop a new solvent based cocoon cooking technique to improve the reelability & raw silk quality in muga cocoons dried under different techniques 3. To carry out large scale Multi-location trials at CSB and DoS reeling units for validating the efficacy of the newly developed cooking method. 4. To create awareness among the reeling beneficiaries to adopt/popularize the new solvent based muga cocoon cooking technique for efficient reeling and quality raw silk production.
D	Suggestion of RAC	<ol style="list-style-type: none"> 1. For achieving the target of enzymatic approach in muga cocoon cooking, expertise with other CSB Institutes may be explored for collaboration. 2. Continue the project as per milestone
15.	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	Dr. Kh. Subadas Singh (PI), SA.S. Rahman, RSRS Boko (Co-PI), Dr. M. Deka, RSRS Boko (CI), Dr. Vikram Kumar, MSSO Rompara (CI)
B	Project period	March 2021 – Feb 2024
C	Objectives:	<ol style="list-style-type: none"> 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	Suggestion of RAC	<ol style="list-style-type: none"> 1. Conduct experiments in proper statistical design and present statistically analyzed rearing data.

		2. Continue the project as per milestone
16.	Project code and title	MFM 5019MI Development of Honeycomb Mountages and Harvesting Technology for Muga Cocoon Production with Improved Uniformity and Raw Silk Recovery.
A	Investigators	Dr. Manjunath R. N (PI), Dr. Mahesh D.S (CI) Dr. Urmimala Hazarika, MSSO (CI)
B	Project period	March 2021 – Feb 2023
C	Objectives	1. Fabrication of honeycomb mountages and suitable harvesting technology for uniform Muga cocoon production. 2. Impact assessment of honeycomb mountages on cocoon production, cocoon characteristics and reeling performances. 3. To conduct on-station feasibility trials of the mountages at CSB/DoS units for prototype test verification.
D	Suggestion of RAC	1. Continue the project as per milestone
17.	Project code and title	CYF 07010 MI: Grading of Muga silk yarn- Development of methods and procedure – (CSB funded)
A	Investigators	Manjunath R.N, CMERTI, Prakash Bhat, PI, Ravi Kumar, CI, CSTR
B	Project period	June, 2019 to May, 2021 (Extended upto November 2021)
C	Objectives	1. To study the required quality parameters of muga silk yarns for consideration of test method. 2. To develop standard test procedures for assessment of muga silkyarn quality. 3. To develop standard photographs for evaluation of defects. 4. To develop suitable grading / classification norms for quality assessment.
D	Suggestion of RAC	1. Progress was discussed. It was suggested to present the progress of all the collaborative projects of other Institutes from next RAC meeting. 2. Continue the project as per milestone
18.	Project code and title:	CYF 07014 MI: Development of 3D Woven Silk Fabrics and their Applications
A	Investigators (PI & Co-I's)	H Shambulingappa, PI, CSTR, CI: Manjunath R.N, CMERTI,
B	Project period	June, 2020 to May, 2022
C	Objectives:	1. To modify the existing 2D weaving loom suitably for producing industrial scale 3D woven fabrics. 2. To produce 3D woven silk fabrics with various fiber architecture and fabric parameters. 3. To characterize the properties of 3D fabrics made from different varieties of silk yarns to suit them for various textile and technical applications.
D	Suggestion of RAC	1. Progress was discussed. It was suggested to present the progress of all the collaborative projects of other Institutes from next RAC meeting. 2. Continue the project as per milestone

19.	Project code and title	BPS 01013CN- Utilization and diversification of silkworm pupae products for human & animal consumption and composting.
A	Investigators (PI & Co-I's)	PI: Dr. Mahesh DS, CI: Dr. James Kiesa,
B	Project period	2 years (September 2020 – August 2022)
C	Objectives	1. To evaluate nutrients and bioactive compounds in silkworm pupae of Eri and Muga. 2. To characterize proteome of Eri and Muga silkworm pupae.
D	Suggestion of RAC	1. Progress was discussed. It was suggested to present the progress of all the collaborative projects of other Institutes from next RAC meeting. 2. Continue the project as per milestone

AGENDA NO. 7: R&D HIGHLIGHTS OF THE INSTITUTE UPTO DECEMBER 2020.

Director of the Institute presented the R&D highlights of the institute in the beginning of the meeting. Chairman and members appreciated the progress made by the institute.

AGENDA NO. 8: TRANSFER OF TECHNOLOGY (TOTS) PROGRAMMES

1. It was observed that the target achievement in OSTs/OFTs is poor due to Covid-19 situation.
2. It was suggested to complete the left over target on time.

AGENDA NO. 9: EXTENSION COMMUNICATION PROGRAMMES

RAC suggestions:

1. It was observed that the target achievement is poor due to Covid-19 situation.
2. Complete the remaining ECPs on time.

AGENDA NO. 10: CAPACITY BUILDING & TRAINING PROGRAMMES

RAC suggestions:

1. It was observed that the target achievement is poor due to Covid-19 situation.
2. Make necessary efforts to achieve the set annual target for the year 2021-22.

AGENDA NO. 11: CONCLUDING REMARKS/GENERAL RECOMMENDATIONS FROM RAC CHAIRMAN & MEMBERS:

1. **Prof. L. K. Hazarika** congratulated the scientists for publishing their work in high Impact factor journals. He insisted that more work needs to be done at the *In-situ* and *Ex-situ* muga conservation sites such as population buildup of muga silkworm and other wild silk moths needs to be ascertained. He noted that the technology transfer to the field is poor and suggested to work for better percolation of technologies so that the end users are getting benefitted. He commended the new proposal on loose egg production with the remarks that it has the potential and will be path breaking in eri culture. He also appreciated the work being carried out in the ongoing project on chawki rearing techniques in eri culture and suggested to develop some entrepreneurs for supplying eri chawki

worms in North East India.

2. **Dr. Bidyut Kumar Sarmah** suggested updating Institute website regularly. Upload status paper on the website reflecting strategies to enhance the silk production in Northeast India during next 10 years. He further suggested prioritizing projects on development of climate smart silkworms, undertaking impact analysis of technologies to get the real assessment of adoption level by farmers and increasing fund utilization in the projects as presently fund utilization in the projects is poor. He stressed to give serious thought on the projects being handled by the scientist while making transfers. An alternative and appropriate measure has to be arranged to run the projects smoothly.
3. **Dr. B.K. Singh** advised the scientists to work hard for achieving Sustainability Development Goal (SDG). He suggested to speedup research work on race improvement in eri and muga silkworm; work towards mitigating the adverse effects of climate change; strengthen post cocoon sector by carrying out more focused research and constantly monitor and supervise the conservation sites of muga silkworm. He further suggested exploiting agroforestry for increasing the vanya silk production.
4. **Dr. V. Siva Prasad** insisted on collaboration with other Institutes for timely achieving the project objectives. He suggested carrying out more focused research for breed development in muga and eri. He also suggested to enhance muga seed production.
5. **Sri P. Borpuzari** insisted that focused research needs to be carried out to address the issue of muga silkworm summer crop failure (pre-seed & seed crops).
6. **Dr. Prashanth Sangannanavar** opined that the outcome of concluded projects should be validated at field level and taken forward. He suggested investigators to regularly visit and release muga DFLs at muga conservation sites and monitor their populations; speeding up procurement process of instruments proposed in the projects; maintain CMR-1 and CMR-2 and submit the data to CO. He further suggested that CMER&TI and MESSO should come up with a plan to increase the availability of muga silkworm seeds. Mandate of the Institute should include research on Oak tasar as well and website should be updated accordingly.
7. **DoS representative (Sh. Aditya Gogoi)** informed that farmers are looking for disease resistant muga silkworm breeds. Therefore, research in this direction should be carried out to develop a muga breed that that can withstand the adverse conditions. Further, eri pupae preservation technology should be worked out so that pupae can be preserved for longer duration.
8. **Sh. Robin Bharali** informed that there is a serious problem of muga disease especially during the 4th and 5th Instars which should be addressed through R&D.
9. **Prof. P.J. Handique** advised the scientists to carry out extensive review of literature before formulating the new research projects and follow up the outcome of research projects to ensure farmers are getting benefited.

The meeting was ended with vote of thanks by Dr. Manjunath R.N., Scientist-B, PMCE Division, CMER&TI, Lahdoigarh.

Date: 29.12.2021

Place: Guwahati



(Prof. P.J. Handique)
Chairman-RAC

Annexure-I
LIST OF PARTICIPANTS OF 39th RAC MEETING OF CMER&TI, LAHDOIGARH
HELD ON 6th NOVEMBER, 2021

Name & Designation	
1.	Prof. P.J. Handique, <i>Chairman</i> Vice Chancellor, Gauhati University, Guwahati-781014 (Assam)
Members	
2.	Prof. L.K. Hazarika, Retd. Professor & Head of Entomology, AAU & Academic Registrar, Assam Women University, Jorhat (Assam)
3.	Dr. Bidyut Kumar Sarmah, Director, DBT-AAU Centre & ICAR-National Professor Assam Agricultural University, Jorhat - 785 103 (Assam)
4.	Prof. Pradip K. Neog, Director, Extension Education Institute (NE Region) Assam Agricultural University, Jorhat (Assam) (<i>Attended through virtual mode</i>)
5.	Dr. V Sivaprasad, Director (Tech), Central Silk Board, Bangalore (<i>Attended through virtual mode</i>)
6.	Dr. B.K. Singh, Rtd. Director (CMER&TI, Lahdoigarh) Tarun Nagar, Bye lane-5, House No. 8, Dispur, Guwahati-781005 (Assam)
7.	Sri Aditya Gogoi, Deputy Director of Sericulture, Govt. of Assam Representative of Commissioner, Handloom, Textiles & Sericulture, Govt, of Assam, Guwahati
8.	Sri Robin Bharali, Rearer, Representative Sericulture Farmer, Sivasagar-785640 (Assam)
9.	Dr. P. Borpuzari, Scientist-D & Head, MESSO, CSB, Guwahati - 781 002 (Assam)
10.	Dr. Prashanth Sangannavar, Scientist-C, RCS Section, Central Silk Board, Bangalore (<i>Attended through virtual mode</i>)
11.	Dr. K. M. Vijaya Kumari; Director, CMER&TI, Lahdoigarh
Scientists	
12.	Dr. Yumnam Debaraj, Scientist-D, RSRS, Imphal
13.	Dr. Reeta Luikham, Scientist-D, CMER&TI, Lahdoigarh
14.	Dr. D. Mech, Scientist-D, REC, Lakhimpur
15.	Shri S A S Rahman, Scientist-D, RSRS, Boko
16.	Shri. Bidyut Nath Choudhury, Scientist-D, RSRS, Boko
17.	Dr. Laishram Somen Singh, Scientist-D, RSRS, Imphal
18.	Dr.T. James Keisa, Scientist-D, CMER&TI, Lahdoigarh
19.	Dr. Aftab A. Shabnam, Scientist-D, CMER&TI, Lahdoigarh
20.	Dr. Sinam Subharani Devi, Scientist-D, RSRS, Imphal
21.	Dr. H Barman, Scientist-C, RSRS, Boko
22.	Dr. Amit Kumar, Scientist-C, CMER&TI, Lahdoigarh
23.	Dr. Arun Kumar K.P., Scientist-C, CMER&TI, Lahdoigarh
24.	Dr. D.K. Jigyasu, Scientist-C, CMER&TI, Lahdoigarh
25.	Dr. K. Subadas Singh, Scientist-C, CMER&TI, Lahdoigarh
26.	Dr. Vijay N., Scientist-C, CMER&TI, Lahdoigarh
27.	Dr. Mahesh D.S., Scientist-B, CMER&TI, Lahdoigarh
28.	Dr. Manjunath R.N., Scientist-B(R&S), CMER&TI, Lahdoigarh
29.	Dr. Om Prakash Patidar, Scientist-B, REC, Coochbehar
Invitees	
30.	Dr. K. Sathyanarayana, Director, CTR&TI, Ranchi (<i>Attended through virtual mode</i>)
31.	Dr. Mahananda Chutia, Scientist-D, CMER&TI, Lahdoigarh
32.	Dr. S. Sanyal, TTRI, Jorhat