

**CENTRAL TASAR RESEARCH AND TRAINING INSTITUTE
RANCHI - 835 303, JHARKHAND**

**MINUTES OF THE 50TH MEETING OF RESEARCH ADVISORY
COMMITTEE (RAC) OF CTR&TI HELD ON 16th- 17th JUNE, 2022 AT
CTR&TI, RANCHI**

The 50th meeting of Research Advisory Committee (RAC) of CTR&TI, Ranchi was convened on 16th-17th June, 2022. Dr. K. Sathyanarayana, Director & Member Convener of RAC extended a warm welcome to the RAC Chairman, Dr. Onkar Nath Singh, Hon'ble Vice Chancellor, BAU, Ranchi, Dr. S. Manthira Moorthy, Scientist-D & Head-RCS and other RAC members, representatives from DOSs, and Scientists of the Institute. Expert Invitees, Dr. N.K. Krishna Kumar, RAC Chairman, SBRL, CSB, Dr. Mohd. Aslam, Consultant (DBT-ILS), NER-BPMC Cell of DBT, New Delhi & Dr. Arunava Pattanayak, Director, ICAR- Indian Institute of Agricultural Biotechnology were invited to the RAC in view of the Brainstorming Session on Tasar Seri Biotechnology conducted along with the RAC. The list of participants is appended at **Annexure-1**.

Director, CTR&TI, Ranchi presented the Research Highlights along with the achievements & activities of the institute since the last RAC. Director informed the Committee that Pebrine Visualization Solution (PVS), a product developed by the Institute has been commercialized and its efficacy in other sectors of sericulture was also proven as per feedback received from other institutes/ seed organizations. During the period, 5 research projects were approved, 10 Concept notes proposed, 4 project proposals were uploaded on e-proMIS portal of DBT and 5 Pilot projects were initiated by CTRTI.

The Chairman RAC congratulated CTR&TI, Ranchi on the occasion of conducting 50th meeting of RAC and observed that research in tasar sector is moving in a progressive direction. He welcomed the expert invitees, Dr. N.K. Krishna Kumar, Dr. Mohd. Aslam, Dr. Arunava Pattanayak and other RAC members and the scientists. After the introductory remarks Chairman requested the Members of RAC to offer opening remarks.

Dr. Mohd. Aslam acknowledged DBT's long association with CTR&TI and expressed that DBT has shifted its focus on technology development instead of basic/academic research. He suggested to focus on technologies leading to promotion of start-ups and to explore towards reducing the production costs of technologies.

Dr. N.K. Krishna Kumar expressed his happiness and thanked Director, CTR&TI for inviting him as expert on the occasion. He suggested that a study shall be conducted to do the factorial analysis of the fluctuations in tasar silk production during the past five years. Gaps in the transfer of technology shall

be addressed. The journey of research in tasar sericulture may be compiled into an article and get published in a renowned journal.

Dr. SubhashV. Naik, Director, CSTRI, Bengaluru stressed that for any industry, market is very much important and, in this regard, PCT is a very important sector for sericulture. He expressed the need to look for sustainability as well as the business in sericulture and creating market by focusing on product diversification for overall growth of the industry.

Dr. A. Pattanayak, Director, IIAB, Namkom, Ranchi informed that they have facility in Genomics & Nano-technology in agriculture and expressed hope that the two Institutes can have collaboration with each other and get benefited from each other expertise.

Dr. S. Manthira Moorthy thanked Dr. Aslam for his overall support to CSB. He appreciated Dr. K.Sathyanarayana, Director, CTR&TI, Ranchi for the progress and development of the Institute under his leadership.

Mr. Shekar Devangan observed that no. of power-looms is increasing and to cater their requirement, production of good quality tasar cocoons to be assured and post-cocoon sector shall be strengthened. Review of the technologies already in the field shall also be done.

Then with the Chairman's consent, Ms. Susmita Das, Scientist-D, PMCE Division initiated the proceedings as per the agenda.

Agenda No. 1: Confirmation of minutes of 49th meeting of RAC held 26th October 2021.

As no comments have been received from any of the members, minutes of 49th meeting of RAC held on 26th October 2021 at CTR&TI, Ranchi, were confirmed.

Agenda No.2: Follow up Action on the General Recommendation/ Decisions of the last RAC Meeting.

The follow-up actions on the general recommendation/ decisions of last RAC meeting were discussed. The committee reviewed the action taken on the decisions made during the last RAC and expressed its satisfaction on the follow-up. It was suggested to present the follow up in bulleted form.

Agenda No.3: Follow up Action Taken on the Project Specific Recommendation/Decisions of the Last RAC Meeting

The follow-up actions on the recommendation/decisions of last RAC with respect to projects were discussed along with the progress and findings of the projects.

Agenda No.4: Review on Concluded projects

Findings of the 2 projects with main Institute and 1 from collaborative institute, concluded after 49th RAC meeting were reviewed in the light of their objectives and expected outcome and RAC decisions are mentioned as below.

A. With PI from Main Institute

1.[PIN04001SI]: Development of a package for optimum nutritional requirement of tasar host plants for producing quality Tasar cocoons (February 2019 – January 2022, Extended up to March, 2022) [PI: Dr. Jitendra Singh, Scientist- C,CTR&TI, Ranchi]

The objective shall have been more focused. Organic carbon in soil is important factor for soil health and it shall be correlated with nutrient availability.

[Action: Dr. Jitendra Singh Scientist- C]

2. [AIT04002SI]: Selection of Stable Thermo-tolerant Line(s) of Tropical Tasar Silkworm *Antheraea mylitta* Through Developed SCAR markers (February 2019 – January 2022, Extended up to March, 2022) [PI: Dr. I. G. Prabhu, Scientist- C, CTR&TI, Ranchi]

Results shall be defined for temperature in relation to humidity rather than temperature alone. Generation-wise data on both fecundity as well as hatching % shall be furnished in the final report. Statistical analysis of the data shall be done in consultation with a statistician. For variation in fecundity and hatching in generation S1 to S8, trend analysis shall be done. Survivability shall be the parameter for thermo-tolerance.

[Action: Dr. I. G. Prabhu, Scientist- C & PI]

B. Collaborative Projects with other institutes

1.[CFC07006MI]: Studies on tasar cocoon drying and cooking using CSTRI Conveyer Dryer and pressurized cooking technology(November 2018 – October 2021, [PI: Mr. D. Chattopadhyay, Scientist- D,CTR&TI, Ranchi]

Director, CSTRI informed that cooking the tasar cocoons first and then soaking in chemical overnight or for two nights makes the cocoons easily reelable just like mulberry and CSTRI is advocating multi-end reeling package for tasar also. The committee suggested that:

- One practical demonstration for 2 to 3 days needs to be arranged in Bhandara, Maharashtra where the required facilities are available so

that the developed technology can be demonstrated to the DOS, NGO, reelers, producer groups and stake holders since the improved cooking and wet reeling process shows significant reduction in no. of cocoons required for producing 1 kg of tasar silk yarn along with higher silk recovery, reelability and better yarn quality.

- Establishment of a reeling unit in any major tasar producing state i.e., Jharkhand or Chhattisgarh in which conveyor drying/stifling and wet reeling facility shall be available in association with DOS/NGO/Producer Groups. The modified cooking technique will be followed for softening of tasar cocoons. The techno- economic viability will be assessed for this unit so that more no. of units can be established in future. CSTR I may organise regular training through its field units at the said installed facility to replicate the model.

[Action: Mr. D. Chattopadhyay, Scientist- D&
CSTR I Bangalore]

Agenda No.5: Concept Notes of New Research Projects for approval

A. Project coded by CO for ratification of RAC:

Three projects with RAC recommendations submitted in RMIS-02 incorporating comments of referees and after complying to suggestions of RAC & RCS, to CO, CSB were approved and coded during 2021-22, are placed before RAC for its ratification.

1.[ARE04011MI]: Species diversity, assessment of potential loss and management of predatory wasps in tasar ecosystem (February 2022- January 2025) [PI: Dr. HanamantGadad, Scientist-C]

Committee suggested to take simultaneous estimation of parasitoid infestation and record other ecological parameters like alternate hosts, nesting sites, natural enemies etc. under species diversity studies.

Scientist may visit NCBS, Bangalore and discuss with Dr. Yashwant H.M. regarding the project and to get technical support in species diversity studies.

[Action: Dr. HanamantGadad, Scientist-C& PI]

2. [ARP 04012 SI] Developing ectomycorrhizal bio-inoculants for improving survival and leaf yield of *Terminalia arjuna* and *Terminalia tomentosa* (February 2022- January 2026) [PI: Dr. Aparna Koparappu, Scientist-C]

The word “PGP/ PGPR” shall be defined while reporting the progress. The number of treatments shall be increased for field evaluation, to statistically

analyse the data. Bio-hardening of saplings shall be done before transplantation into field. The word “Biofertilizer” in expected outcome may be replaced with “Bioinoculant”.

[**Action:** Dr. Aparna Koparappu, Scientist-C& PI]

3. [CYR 04013 MI] Studies on storage practices of tropical tasar cocoons for better cooking efficiency, reeling parameters and yarn quality(February 2022- January 2024) [PI: Mr. Debasis Chattopadhyay, Scientist -D]

The Committee suggested that modified cooking process developed by CSTRI can be attempted for softening of tasar cocoons along with wet reeling technique for assessment under this project, once the facility is installed in any of the tasar state.

For reelability (%) and raw silk recovery (%), chi- square test need to be carried out.

[**Action:** Mr. Debasis Chattopadhyay, Scientist -D & PI]

With above suggestions, the three coded projects were ratified by the Committee.

B. Project proposals based on RAC recommendation/AAP meetings:

Four project concepts recommended by RAC in its 49th meeting (Phase III of the concluded project) and suggested by CSB during Annual Action Plan meeting in view of the field relevance were formulated and placed before the RAC.

4. Stabilization and Multiplication of Thermo-Tolerant Line(s) of Tropical Tasar Silkworm *Antheraea mylitta* [Continuation Phase III](July,2022- June,2025) [PI: Dr. I.G. Prabhu, Scientist-C]

Differentiation of thermo-response from thermo-tolerant in the genetic studies shall be ensured and the methodology shall be modified accordingly. Effects shall be recorded for multiple parameters including sex ratio in next generation. To check the effect of heat, viability of the sperms extracted from the heat treated pupae shall be checked. It was suggested to drop the 3rd objective i.e. to decipher the molecular mechanism behind the heat stress response and the thermos-tolerance. Instead of pupa, adults may be considered for molecular studies.

For Multi Location Trials, areas with similar temperature and humidity range shall be chosen for consistency in the results.

The proposal was recommended for submission to C.O. in RMIS-02 for coding. RAC felt that referee comments are not required as it is continuation of the earlier project.

[Action:Dr. I.G. Prabhu, Scientist-C & PI]

5. Tasar silkworm disease monitoring and management (July, 2022-June, 2027) [PI: Mr. M.M. Baig, Scientist C]

Committee observed that this is need of the hour and suggested to categorise the diseases on the basis of crop loss by them. Weather data shall also be recorded to find out the factors triggering the disease incidence. Remedial measures developed by the Institute shall be validated. Possibilities of involving KVKs may also be explored.

The proposal was recommended for submission to C.O. in RMIS-02 for coding. As it is a programme work in project format, RAC felt that referee comments are not required.

[Action:Mr. M.M. Baig, Scientist C & PI]

6. In-situ Conservation of Modal Eco-race of Tasar Silkworm in Odisha(July, 2022- June, 2025) [PI: Dr. I.G. Prabhu, Scientist-C]

In case of Modal, factors contributing to decline of the eco-race shall be analysed. In objectives, usage of “phenotypic and genotypic variations” may be reconsidered. The objectives shall be clear and focussed. Both phenotypic and allelic parameters shall be mentioned in the expected outcome. Instead of spatial distribution, the term geographic distribution pattern shall be used. It was also suggested to involve one statistician in the project, till posting of statistician, provision for expert consultations may be included in the project. It was suggested to share the outcome of the proposed workshop on conservation of eco-races with the RCC also.

[Action: Dr. I.G. Prabhu, Scientist-C & PI]

7. In-situ Conservation of Raily Eco-race of Tasar Silkworm in Chhattisgarh(July, 2022- June, 2025) [PI: Dr. I.G. Prabhu, Scientist-C]

Committee suggested to modify the proposal on similar lines as suggested for project on Conservation of Modal Eco-race and submit in RMIS-02 to C.O., Bengaluru.

[Action: Dr. I.G. Prabhu, Scientist-C& PI]

Committee observed as these two projects on eco-race conservation are of field relevance and hence comments of referees are not required. RAC recommended the above two projects for submission in RMIS-02 format to C.O., Bengaluru for approval and coding.

C. Project proposals recommended by R.C. and submitted to C.O, CSB/Working Group on By-product Utilization:

8. Medicinal Mushrooms Production on Vanya tree waste for Tribal Empowerment (July, 2022- June, 2025) [PI: Mr. M.M. Baig, Scientist C]

The Committee recommended the proposal with the following suggestions:

- The word medicinal mushrooms may be replaced with the names of specific mushrooms under study.
- Publications of international bodies (societies) of Mushrooms shall be referred.
- Ganoderma can also be taken but with absolute containment measures. Before Inclusion of Ganoderma, ICAR- DMRO, Solan need to be consulted.
- Other wood loving mushrooms of commercial importance may be explored in consultation with DMRO.

[Action: Mr. M.M. Baig, Scientist C& PI]

9. Documentation and Validation of Indigenous Technical Knowledge (ITKs) in Tropical tasar Zone (July,2022 – June, 2025) [PI: Dr. Jagadajyoti Binkadakatti, Scientist-C]

The Committee recommended the proposal with the following suggestions:

- Parameters like environment soundness, cost effectiveness, efficacy, complexity, cultural appropriateness etc., need to be considered while validating the ITKs.
- Proforma to be prepared and circulated to RAC members & other concerned experts for assessment of parameters by giving weightage.
- Include TDF official as Co-Investigator for better coordination in R&D and allocate separate budget.
- List out harmful and useful birds residing in the area where ITKs to be documented.
- Environment and sustainability shall also be taken into consideration.

[Action: Dr. Jagadajyoti Binkadakatti, Scientist-C& PI]

D. Concept notes recommended by R.C.

10. Effect of different spacing on chawki leaf productivity of tasar host plats (*Terminalia arjuna*, *T. tomentosa* and *Lagerstroemia speciosa*) and its influence on chawki silkworm rearing [PI: Dr. Harendra Yadav, Scientist-C]

- It was suggested that both productivity and sustainability shall be addressed in the proposal.
- 1st and 2nd objective shall be merged.
- Light interception shall be measured to understand the impact of the spacing and pruning height. Methodology shall be modified accordingly.
- Ease of mechanization in wider spacing shall also be considered.
- Velvet bean is a very good nitrogen fixing Plant and can be used in between the rows.
- Literature pertaining to the nutritional requirements of chawki worms shall be referred.

With the above suggestions the project was recommended.

[**Action:** Dr.Harendra Yadav, Scientist-C& PI]

11. Isolation and characterization of fibroin from tasar silk fiber waste: its application in wound healing [PI: Dr. Karmabeer Jena, Scientist-D]

The project was recommended with the following suggestions:

- Possible applications other than biomedical shall be explored during the course of research like utilization of fibroin for surgical suture, packing material for some delicate item etc.
- Propose some partners to make the project more feasible for extramural funding.

[**Action:** Dr. Karmabeer Jena, Scientist-D& PI]

12. Impact of climate change on tasar food plants and silkworm [PI: Dr. Jitendra Singh, Scientist-C]

Effects of gradual changes and effects of sudden changes in weather during the project period shall be reported separately. The meteorological data from NICRA database can be used if required. Intensity of rainfall shall also be considered along with the number of rainy days as it is a deciding factor for disease infestation.

[**Action:** Dr. Jitendra Singh, Scientist-C& PI]

E. Status of Concept Notes under pipeline recommended by RCC/RCS/RAC:

- i) Development of KASP Based SNP Barcoding System for the Molecular Identification of Tropical Tasar Silkworm Ecoraces.

- ii) Unravelling of genes responsible for productive traits of tasar silkworm *Antheraea mylitta* using functional genomics approach.
- iii) Inhibition of multiplication of pebrine spores in tasar silkworm through specific inhibitors.
- iv) Pheromone/ kairomone based traps for vanya silkworm pest management.
- v) Establishment and Characterization of Novel Stable Cell Lines from Tropical Tasar Silkworm, *Antheraea mylitta*.
- vi) Enterprise of Tasar Silkworm Genomics Centre of Excellence Biotechnology at CTR&TI Ranchi
- vii) Establishment of Biotech-KISAN programme/ developmental projects in 9 districts of Bihar, Odisha and Chhattisgarh.

Consequent to positive recommendations of Brainstorming Session on Seri-biotechnology held on 25.09.2022 and subsequent recommendations of 49th meeting of RAC, four project proposals, proposal no.(i), (ii), (iii) & (iv) were uploaded on e-proMIS portal of DBT, recommended by Internal Screening Committee which has allotted temporary Registration Number (including two follow-on projects approved by RCC). CO, CSB will be requested for allotment of code on approval of the projects by DBT.

Also, it was suggested to speed up the uploading of proposal (v) in view of its practical and academic relevance on e-proMIS. It was also suggested to upload the proposals (vi) & (vii) on the relevant portals which are open at present on DBT website.

Agenda No.6: Review of the progress of ongoing research projects

Total 15 research projects (including 3 collaborative) were discussed and RAC recommended/suggested as mentioned below:

A. Main Institute:

1. [PIB 04009 SI] Evaluation of identified hybrids of *Terminalia arjuna* × *T. tomentosa* and drought tolerant accessions of *T. arjuna* for their suitability in different tropical tasar silkworm rearing regions (Oct. 2021 – Sept. 2027) [PI: Dr. S. Gandhi Doss, Scientist-D, CTR&TI, Ranchi]

The committee suggested to raise sufficient no. of saplings for every test entry.

[Action:Dr. S. Gandhi Doss, Scientist-D& PI]

2. [PPA04010CN] Region and season specific selection of pruning and brushing schedule for tasar food plants and silkworm protection(Feb 2022 – January 2025)[PI: Dr. Jitendra Singh, Scientist- C, CTR&TI, Ranchi]

As the project has been initiated in February 2022, the committee was appraised about the progress made in the project, for which the committee expressed its satisfaction.

[Action:Dr. Jitendra Singh, Scientist- C& PI]

3. [ARP04012SI] Developing ectomycorrhizal bio-inoculants for improving survival and leaf yield of *Terminalia arjuna* and *Terminalia tomentosa* (Feb 2022 – January 2025) [PI: Dr. Aparna Kopparapu, Scientist-C, CTR&TI, Ranchi]

The PI was asked to follow the suggestions given during the discussion on ratification of the project.

[Action: Dr. Aparna Kopparapu, Scientist-C& PI]

4. [APS04003SI] Studies on the Reproductive Potential of Tasar Silkworm, *Antheraea mylitta* D with Special Reference to Nutritional and Mechanical Indices (March 2020-February 2023) [PI: Dr. K. Jena, Scientist- D, CTR&TI, Ranchi]

During the 49thRAC of the Institute, It was suggested to try some ovulation stimulating substance as well as cold shock treatment. *To execute this additional work six months extension was requested, which was recommended by the Committee.*

[Action: Dr. K. Jena, Scientist- D& PI]

5.[AIE 04004 CN] Study on existence of tropical tasar silkworm ecoraces and their subsist places with the help of geospatial technology (March 2020-February 2023) [PI: Dr. I. G. Prabhu, Scientist- C, CTR&TI, Ranchi]

Changes in ecological parameters like species of host plants, health of host plants, altitude, etc., shall be correlated with the data of the eco-races. *In view of the travel restrictions during COVID-19 and revision of the methodology, an extension for a period of two years was suggested/recommended by the Committee.*

[Action: Dr. I.G.Prabhu, Scientist- C & PI]

6. [BPC 04005SI] Tasar Waste to wealth by *Cordyceps* (March 2020-February 2023)[PI: Mr. M.M. Baig, Scientist- C, CTR&TI, Ranchi]

Committee suggested to indicate molecular wt. of the proteins like Cordycepin, Adenosine and Ergosterol and to make a graphic presentation of the Cordycepin, Adenosine and Ergosterol. In view of the commercial importance of the project, Committee suggested the PI to expedite patent filing and commercialization process.

[Action: Mr. M.M. Baig, Scientist- C & PI]

7. [ARE 04006CN] Management of Important Pests of Tasar Silkworm *Antheraea mylitta* (D) Through Botanical Repellents (April 2021- March 2024)[PI: Dr. H. S. Gadad, Scientist- B, CTR&TI, Ranchi]

- Suggested to include pongamia oil as a treatment to study its repellent potential against tasar silkworm pests.
- Blend the chemicals to make new treatments which can repel both uzifly and yellow fly.
- Due to severe winter during ETL experiments for uzifly, rearing got affected. Also, the incidence of target pests (uzifly) was very less in previous season. To repeat the experiment, extension of project period for six months within the allocated budget was requested which was recommended by the RAC.

[Action: Dr. H.S. Gadad, Scientist- C& PI]

8. [BPC 04008EF] Mass level extraction of sericin from tasar cocoon cooking waste water for its prospective utilization (March 2021-Feb 2024)[PI: Dr. K. Jena, Scientist- D, CTR&TI, Ranchi]

It was suggested to add Chromium & Arsenic to the list of heavy metals to be assessed. Some novel utilization of the sericin purified from the developed extraction plant shall be explored.

[Action: Dr. K. Jena, Scientist- D & PI]

9. [AIB-4717] Improvement of tropical tasar silkworm *Antheraeamylytta* D for high silk yield through recurrent Selection (Sep 2020 - Aug 2022) [PI: Dr. N. Kumar, Scientist- D, CTR&TI, Ranchi]

The PI was asked to complete the project on time and submit the Final report of the project.

[Action: Dr. N. Kumar, Scientist- D & PI]

10. [ARE04011MI] Species diversity, assessment of potential loss and management of predatory wasps in tasar ecosystem (February 2022- January 2025) [PI: Dr. HanamantGadad, Scientist-C& PI]

Dr. HanamantGadad, Scientist-C presented the proposal. The PI was asked to follow the suggestions given during the discussion on ratification of the project.

[**Action:** Dr. HanamantGadad, Scientist C & PI]

11. [CYR 04013 MI] Studies on storage practices of tropical tasar cocoons for better cooking efficiency, reeling parameters and yarn quality (February 2022- January 2024)[PI: Mr. Debasis Chattopadhyay, Scientist -D]

The PI was asked to follow the suggestions given during the discussion on ratification of the project.

[**Action:** Mr. Debasis Chattopadhyay, Scientist –D& PI]

12. [MOE 0414 MI] Evaluation and popularization of improved technologies developed in the field of tasar sector for central and north India (On Station/Farm Trials of CTRTI)(February 2022- January 2024)[PI: Dr. Jagadajyoti Binkadakatti, Scientist-C]

The committee made the following suggestions regarding validation of the developed technologies/packages

- Cocoonase variant trial may be taken up with scientists of CSRTI during the year 2022-23.
- Although the developed chemical traps were not found effective for control of Ichneumon wasp, in view of infestation/severity of Ichneumon wasp in tasar growing states, trial shall continued during the year with 03 chemicals i.e., Octen-3-ol, Pentadecanoic acid, 2-Methylphenol
- IPM for control of stem borer was also found effective for control of bark eater. It was suggested to continue trial on both stem borer and bark eater under OST.
- A suitable location to be taken for implementation of the OFT trial, management of abiotic factor using light reflector paints to reduce erratic emergence.
- Enhancement of budget from Rs.27.25 lakhs to 38.59 lakhs was requested in view of addition of Egg washing cum dis-infection machine technology under OST and addition of 16 locations of Producer Institutions under the project. The committee recommended for enhancement of the budget and asked to submit the revised proposal along with revised budget.

[**Action:** Dr. Jagadajyoti Binkadakatti, Scientist-C& PI]

B. Collaborative projects:

13. [BPS01013CN] Utilization and diversification of silkworm pupae products for human & animal consumption and composting(Collaborative project of CSRTI, Mysore)(October 2020-September 2022) [Co-PI: Dr. K. Jena, Scientist- D, CTR&TI, Ranchi]

The committee suggested the following:

- The fish species used for the study shall be defined.
- Use cage fishes like Rohu, Katla, Mrigal, Grass carp and Silver carp.
- The feed may also be tested on prawns to diversify the utilization.
- The feed may be tested for calcium content and antibiotics.
- Some of the extreme climatic abrasion can be addressed by supplementation of Vitamin/micronutrients.
- Follow-on project to explore use of pupae as fish feed in cold water fisheries and also utilizing pupae oil, which is other-wise is going waste as of now.

[Action: Dr. K. Jena, Scientist- D &PI]

14. [MOE 04007EF] Establishment of Biotech-KISAN Hub at Professional Assistance for Development Action (PRADAN), Deoghar, Jharkhand for three Aspirational Districts of Jharkhand (Godda, Dumka and Pakur) (September 2020 – August 2022) [PI: Dr. J. P. Pandey, Scientist- D, CTR&TI, Ranchi]

House agreed with the progress made and suggested to take up the projects on similar lines for other states.

[Action: Dr. J. P. Pandey, Scientist- D &PI]

15. [AIT 08006 EF] Development of lateral flow assay (LFA) kit for diagnosis of pebrine disease in silkworms (DBT funded project of SBRL) in Collaboration with Bhat Biotech Pvt Ltd, Bangalore B Project period: A) [Co-PI: Mr. Mohammed Muzeruddin Baig, Scientist-C CTR&TI, Ranchi]

PI informed that after getting the LFA kit from SBRL, validation will be done to detect the microsporidian infection in silkworm. RAC suggested CTR&TI to be involved in the periodical review meetings by SBRL for adding further value, instead of only in field trials.

[Action: Mr. M. M. Baig, Scientist - C&PI, CTR&TI, Ranchi]

Agenda No.7: R&D Highlights of the Institute from last RAC to till date

R&D Highlights of the Institute from last RAC to till date was presented by Dr. K. Sathyanarayana, Director, CTR&TI, Ranchibefore the RAC. The salient points of the research highlights of the Institute are as below:

1. During the period, 5 Research projects were approved, 10 new concept notes proposed including projects on Eco-race conservation and Disease monitoring, 4 project proposals uploaded on e-proMIS portal of DBT, which were cleared by Internal Screening Committee of DBT besides submitting 5 concept notes for CSB funding.
2. Initiated 5 pilot studies on pebrine identification system using image processing technique, treatment on pebrine contaminated eggs, carbon sequestration potential of tasar host plants, induction of parthenogenesis in tasar silkworm and studies on heavy metal and pesticide content in tasar pupae to explore possibilities for further research.
3. Fertilizer recommendation chart has been developed for tasar food plants.
4. TasarGeoTag mobile application has been developed and linked with both mobile and GAGAN dongle.
5. Coordinated with CIFRI, Barrackpore in field trials on use of Tasar pupae as fish feed (RESHMEEN) in West Bengal, Chhattisgarh and Jharkhand. Patenting and commercialization of RESHMEEN initiated.
6. Coordinated with CFTRI, Mysuru on use of Tasar pupae as poultry feed
7. Isolation and characterization of chitin and chitosan from tasar spent pupae besides utility of chitosan in enhancement of shelf life of fruits (Banana)
8. Joint surveys conducted to assess the present status of different tasar eco-races for developing / updating operational/ functional conservation models.
9. Refined technology process documents of nine effective technologies considering field feedback.
10. Patenting of technologies:
 - i. Mass production protocol of *Cordycepsmilitaris* over tasar silkworm refuses such as egg, pupa and adult moth tissues standardized and patenting process initiated.
 - ii. Cocoonase variant trypsin and papain effective in cocoon softening under OST, is being patented.

- iii. Mass level extraction of sericin from tasar cocoon cooking waste water prototype unit.

11. Commercialization of technologies:

- i. Commercialized Pebrine visualization Solution (PVS) through NRDC, New Delhi.
- ii. Application filed for commercialization of Egg Washing cum Disinfection Machine through NRDC, New Delhi.
- iii. Products developed by CTR&TI viz., “JeevanSudha” to control virosis and “Depuratex” for egg washing and disinfection are listed by the authorized vendor in the GeM portal.

12. Capacity Building and Convergence Initiatives:

- i. Hands-on training programme on “Statistics and its application in Tasar” (5-7 January 2022) for the scientists of CTR&TI, Ranchi and BTSSO, Bilaspur.
- ii. “Competency Enhancement Training Programme” (11-13 April, 2022) for imparting functional knowledge on administrative, accounts, establishment and stores related works for Scientists/Technical staff/ Administrative staff of CTRTI, Ranchi and its nested units.
- iii. “Experience sharing workshop & Exposure visit” organized on 17-18 November, 2021 at B. Deoghar covering 113 scientists, officers and officials of CSB, DOSs, NGOs etc.
- iv. “Trainers Training Programme for KVK Personnel” (22-26 November 2021) covering 21 scientists/ SMSs of KVKs was organized.
- v. Meeting with PRADAN/TDF organized on 9th February 2022 to discuss various issues related to Trail of Technologies and technical convergence in tasar sector.
- vi. Meeting with Mr. S. K. Guru, Head, Sustainability, Mines & Mineral division, HINDALCO, Ranchi and his team on 6th December, 2021 & 13th June 2022 to explore the possibilities of sustainable Tasar Value Chain promotion in mining areas and to provide livelihood to the tribal populace.
- vii. Signing of MOU/MOA with Birsa Agricultural University, Banaras Hindu University, Dept of Forests, Environment and Climate Change, Govt. of Jharkhand Tasar Development Foundation is in pipeline

13. Fund utilization: Over 80% of the allocated budget was utilized during the period under report with respect to the ongoing and concluding projects. As suggested during Annual Action Plan meeting, procurement

process is front loaded during the first quarter of 2022-23 for effective and proper utilization of Budget under R&D Head.

Agenda No.8: Trial of Technologies (OSTs/OFTs)

Total 8 technologies (6 OSTs and 2 OFTs) were discussed during the RAC meeting. The committee took note of the progress. The list of OSTs and OFTs are given below.

On Station Trials

- i) Evaluation of cocoonase variant for cocoon softening/ degumming and silk surface modification.
- ii) Evaluation of PSB for qualitative and quantitative improvement in tasar food plant leaf.
- iii) Validation of chemical trap for Ichneumon wasp.
- iv) Evaluation of IPM for control of gall fly.
- v) Evaluation of IPM for control of Stem borer in tasar food plants.
- vi) Establishment and popularization of New Improved accession nos. 102 and 123 of *Terminalia Arjuna* and *Lagerstroemia speciosa*.

On Farm Trials

- i) Validation and popularization of cooking package developed for three eco- races.
- ii) Management of abiotic factors using light reflector paints to reduce erratic and delayed emergence.

Agenda No.9: Extension Communication Programmes (ECP) and other programmes

Progress of the Extension Communication Programmes (ECP) conducted by the nested units was presented to the Committee. The committee took note of the progress.

Agenda No.10: Training Capacity Building (CBT) and other programmes

Progress of the Capacity Building Training conducted at the Institute and nested units was presented to the committee. The committee took note of the progress.

Agenda No.11: Any other points for discussion

The Chairman asked the representatives of Reelers & Weavers and visiting scientists to share their problems/views.

Mr. Shekar Devangan informed that after 3-4 years there is a boom in Raily production and stifling of that volume of cocoons is not possible. It is easier to store them in cold storage because improper drying results into fungal growth which affects the reelability. Due to variations in shell wt. /cocoon wt. of tasar cocoons, to what extent conveyor type drying will be useful, has to be ascertained.

Dr. N.K. Krishna Kumar asked to make an analysis that during the last 5 years in tasar as well as mulberry why the production is not increasing.

Agenda No.12: Concluding remarks from RAC members

Dr. Aslam appreciated the scientists for their hard work despite many limitations and requested all the scientists to go through the work going on in other Institute also. He also suggested for lots of reading and partnership with Institutes other than CSB.

Dr. N.Kulkarni expressed that the PI shall keep questioning them to improve the projects /proposals right from title and objective itself.

Dr. N.K. Krishna Kumar suggested that a “Tasar or Vanya Symposium” shall be organized at CTR&TI, Ranchi involving those Industrial partners who are dealing with marketing of tasar or Vanya silks at national and international level.

He also suggested that-

- When scientists visit the field, every observation shall be noted whether directly related to their projects or not.
- While dealing with environment, our work has some positive or negative impact on the environment which should be taken care of.
- Scientists shall be more techno-savvy and always try to improve their communication skills.

Dr. P.K. Mishra expressed that the RAC was like a brain storming and requested the scientists to take benefit from the suggestions given by Dr. N.K. Krishna Kumar.

Director, CSTRI informed that there is lot of potential to usage of sericin in various field. Research institutes have successfully developed technologies and machineries for extraction and purification of sericin both in case of mulberry and tasar. Now focused research work on development of products from sericin is under progress in CSB.

Dr. Manthira Moorthy, Scientist-D & Head-RCS informed that CTR&TI, Ranchi is doing great in meeting the targets and utilization of Research and Development Budget.

Dr. Niva Bara expressed that low cost or no cost technologies shall be made available to the farmers. Traditional wisdom/Indigenous Technical Knowledge System shall be tapped for Research/Extension. ICT shall be used in technology assessment and technology transfer.

Mr. Shamshad Alam expressed that this RAC meeting was quite different. Issues have been discussed in detail and so many aspects have been touched. He informed that scientists are regularly visiting the field and all field issues/ problems discussed with the Director after his joining have been proposed in project form. He requested for further technological interventions to improve the farmers' income.

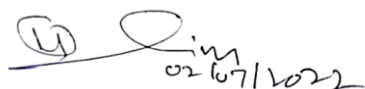
Mr. Shekar Devangan observed that this RAC of CTR&TI, Ranchi was an eye opener. He expressed hope that when the outcome of the project on sericin will reach the farmers, surely their income will grow which is very much required for advocating tasar culture as business. We are already having cooking and reeling units and with the development of machine for extraction of sericin, a full package can be worked out and translated to some commercial unit.

The Chairman opined that a letter shall be written to the National Biodiversity Authority, Ministry of Environment, Forest and Climate Change, Government of India mentioning that (i) The Vanya silk is our biodiversity/copyright and no unauthorized person shall be allowed to take any link/material outside the country.

(ii) Nowhere, in the world, one shall start any business based on Vanya silk without legal permission of Govt. of India.

Dr. K. Sathyanarayana thanked the Chairman, all the Members, Invitees, Scientists from RCS and his team of scientists from CTR&TI, Ranchi and BTSSO, Bilaspur for a thorough and meaningful discussion.

The meeting ended with a vote of thanks to the chair.



(Dr. Onkar Nath Singh)
Chairman, RAC

**LIST OF PARTICIPANTS IN THE 50TH MEETING OF RAC OF CTR&TI
RANCHI HELD ON 16TH-17TH June 2022**

CHAIRMAN:

1. Dr. OnkarNath Singh, Vice Chancellor, Birsa Agricultural University, Ranchi.

MEMBERS & INVITEES:

2. Dr. N.K. Krishna Kumar, RAC Chairman, SBRL, CSB, Expert Invitee.
3. Dr. Mohd. Aslam, Consultant (DBT-ILS),NER-BPMC Cell of DBT, New Delhi, Expert Invitee.
4. Dr. ArunavaPattanayak, Director, ICAR- Indian Institute of Agricultural Biotechnology, Expert Invitee.
5. Dr. S. ManthiraMoorthy, Director [Tech.] (I/C), Central Silk Board, Bengaluru.
6. Dr. NitinKulkarni, Director, IFP, LalGutwa, Ranchi.
7. Dr. Niva Bara, Associate Professor, BAU, Ranchi.
8. Dr. P. K. Mishra, member &Director (Rtd.), CSB.
9. Mr. Niranjan Tirkey, Dy. Director (Representative), DoS, Jharkhand.
10. Mr. ShamshadAlam, Integrator-PRADAN, Ranchi
11. Mr. Chandra ShekharDevangan, Entrepreneur, Sitaram HathkarghaUdhyog, Champa- Chhattisgarh
12. Dr. M.S. Rathore, Scientist - D, BTSSO, Bilaspur, Chhattisgarh.
13. Dr. PrashanthSangannavar, Scientist-C, RCS, CSB Bengaluru
14. Dr. K. Sathyanarayana, Director, CTRT&TI, Ranchi- Member Convener

SCIENTISTS – CTR&TI, Ranchi

1. Dr. Niranjan Kumar, Scientist-D
2. Dr. A.H. Naqvi, Scientist-D
3. Mr. M.D. Tiwari, Scientist-D
4. Ms. Susmita Das, Scientist-D

5. Dr. J.P. Pandey, Scientist-D
6. Dr. K. Jena, Scientist-D
7. Dr. Vishal Mittal, Scientist-D
8. Mr. DebasishChattopadhyay, Scientist-D
9. Dr. HarendraYadav, Scientist-C
10. Md. MuzeruddinBaig, Scientist- C
11. Dr. Jitendra Singh, Scientist-C
12. Dr. D.I.G. Prabhu, Scientist-C
13. Dr. J. Binkadakatti, Scientist-C
14. Dr. HanmantGadad, Scientist-B
15. Dr. Aparna, K, Scientist-B