



পশ্চিমবঙ্গ পশ্চিম বঙ্গাল WEST BENGAL

AR 4008

MEMORANDUM OF UNDERSTANDING

Between

ICAR-CENTRAL RESEARCH INSTITUTE FOR JUTE AND ALLIED FIBRES
(ICAR-CRIJAF), BARRACKPORE, KOLKATA

AND

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, KOLKATA
(IISER, KOLKATA)

FOR COLLABORATIVE RESEARCH

ON

“INTEGRATED CHEMICAL PROFILING OF BIOACTIVE COMPOUNDS AND
DEVELOPMENT OF HIGH-VALUE ACTIVATED CARBON FROM JUTE, KENAF,
RAMIE AND SISAL BIOMASS”

1. PREAMBLE

This Memorandum of Understanding (MoU) is entered into between **ICAR-Central Research Institute for Jute and Allied Fibres (ICAR-CRIJAF)**, Barrackpore, Kolkata, and **Indian Institute of Science Education and Research, Kolkata (IISER, Kolkata)**, hereinafter individually referred to as a “Party” and collectively as the “Parties”.

ICAR-CRIJAF has expertise in natural fibre crops, including jute, kenaf, ramie and sisal, and in their agronomy, biomass production and processing. IISER, Kolkata has expertise in analytical chemistry, metabolomics, pharmaceutical chemistry and advanced materials characterization. The proposed collaboration will integrate these complementary strengths for value addition and scientific utilization of fibre-crop biomass.



নম্বর 821 তারিখ 11/8/26
ক্রেতা DIRECTOR, ICAR-CRIJAF
গ্রাম Sahel Bagan gate, Barrackpore
মূল্য 56 টকা
ভেতাব শ্রী

বারাসাত কোর্ট 13 JUL 2026
উত্তর ২৪ পরগণা 13 JUL 2026
ক্রয়ের তারিখ 650000
মোট মূল্য

টেজারী অফিস বারাসাত
ভেতাব শ্রী সুব্রত চাটোপাধ্যায়

The Parties therefore agree to undertake the collaborative research programme entitled:

"Integrated Chemical Profiling of Bioactive Compounds and Development of High-Value Activated Carbon from Jute, Kenaf, Ramie and Sisal Biomass."

2. OBJECTIVE

The overall objective of the collaborative programme is:

To chemically profile bioactive compounds and characterize activated carbon derived from jute, kenaf, ramie and sisal biomass for identifying their medicinal, pharmaceutical and industrial value-added applications.

The collaboration will specifically focus on:

1. Chemical extraction, profiling and identification of bioactive compounds from different biomass fractions of jute, kenaf, ramie and sisal.
2. Metabolomic fingerprinting and comparative profiling of fibre-crop biomass.
3. Preliminary evaluation of antioxidant, antimicrobial and anti-inflammatory properties of selected extracts/compounds.
4. Development and optimization of activated carbon from selected fibre-crop residues.
5. Physicochemical and surface characterization of the developed activated carbon.
6. Evaluation of adsorption properties and potential environmental, pharmaceutical and industrial applications.
7. Development of protocols, scientific publications, patents, technology packages and other outputs arising from the collaborative research.

The proposed activities and analytical approaches are based on the attached project proposal.

3. SCOPE OF COLLABORATION

The collaborative programme shall comprise two major components:

Component I – Chemical Profiling of Fibre-Crop Biomass

Biomass fractions such as leaves, stems, roots, bark, sticks and processing residues of jute, kenaf, ramie and sisal will be collected and processed for phytochemical extraction.

The work may include:

- qualitative and quantitative estimation of phytochemicals;
- HPLC/UPLC, LC-MS/MS and GC-MS profiling;
- FTIR and NMR characterization, where required;
- metabolomic fingerprinting and comparative analysis;
- chemometric analysis such as PCA and PLS-DA; and
- preliminary antioxidant, antimicrobial and anti-inflammatory screening.

Component II – Activated Carbon Development and Characterization

Selected biomass residues, including jute sticks, ramie stem residues, sisal leaf waste and fibre-processing residues, will be utilized for preparation of activated carbon (biochar) using suitable physical and/or chemical activation methods.

Characterization may include:

- BET surface area and pore-size distribution;
- carbon yield, ash and moisture content;
- iodine number and methylene-blue adsorption;
- FTIR-based surface functional-group analysis;
- SEM/EDS;
- TGA; and
- XRD.

Potential applications such as water purification, heavy-metal adsorption, dye removal, pharmaceutical purification, catalyst support and energy-storage materials may be explored.



4. RESPONSIBILITIES OF ICAR-CRIJAF

ICAR-CRIJAF shall:

1. Provide authenticated biomass samples of jute, kenaf, ramie and sisal, as available.
2. Coordinate field sampling, biomass collection and documentation.
3. Undertake suitable biomass preparation, processing prior to analytical studies.
4. Contribute to biomass characterization and assessment of biomass availability.
5. Participate in characterization and application studies of activated carbon.
6. Coordinate integration of research activities and facilitate technology dissemination.
7. Participate in preparation of joint publications, patents, technology packages and reports.

5. RESPONSIBILITIES OF IISER, KOLKATA

IISER Kolkata shall:

1. Develop/standardize analytical protocols for extraction and chemical profiling.
2. Undertake extraction, purification and chemical profiling of selected biomass samples.
3. Conduct HPLC/UPLC, LC-MS/MS, GC-MS, FTIR and NMR analyses, as appropriate.
4. Undertake metabolomic and chemometric analysis including identification/structural elucidation of bioactive compounds.
5. Conduct preliminary bioactivity evaluation, including antioxidant, antimicrobial and anti-inflammatory assays, as appropriate.
6. Undertake advanced characterization and interpretation of activated-carbon materials.
7. Contribute to data integration, comparative analysis and identification of potential biomarkers and value-added compounds.
8. Participate in joint publications, patents and technology development.

6. JOINT ACTIVITIES AND DELIVERABLES

Both Parties shall jointly:

- finalize research protocols and analytical methodologies;
- exchange relevant samples, experimental information and research data;
- interpret and integrate the analytical results;
- identify potential high-value compounds and applications;
- validate promising biomass-valorization approaches;
- prepare joint reports and technical documents; and
- explore opportunities for technology transfer and further research funding.

Major expected deliverables

1. Comparative phytochemical/metabolomic database for fibre-crop biomass.
2. Identification of potential bioactive compounds/biomarkers.
3. Standardized extraction and analytical protocols.
4. Optimized activated-carbon preparation process.
5. Characterized activated-carbon materials with identified application potential.
6. Integrated biomass-valorization/biorefinery technology package.
7. Joint scientific publications and patent applications, wherever appropriate.
8. Technology dossier for future validation and commercialization.

The proposal specifically envisages a comparative metabolomic database, novel phytochemical biomarkers, green extraction protocols, integrated biorefinery technology, high-performance activated carbon and scientific/patent outputs.



7. FINANCIAL AND ADMINISTRATIVE ARRANGEMENTS

The research activities shall be carried out within the approved provisions of the concerned project/programme and/or resources mutually agreed upon by the Parties.

Both Parties shall follow their respective applicable **Government of India, ICAR and institutional rules and procedures** for financial, administrative, procurement, research and other matters.

This MoU shall not, by itself, create any additional financial liability on either Party.

8. DATA, INTELLECTUAL PROPERTY AND PUBLICATIONS

Data generated through the collaborative research shall be shared between the Parties for scientific interpretation and reporting. Intellectual property, patents, technology transfer and commercialization arising from the collaboration shall be governed by the **applicable rules and guidelines of the respective institutions and Government of India/ICAR**, as applicable.

Joint publications shall appropriately acknowledge the contributions of both Parties.

9. REVIEW AND AMENDMENT

The progress of the collaborative programme shall be reviewed periodically by the designated investigators. Any modification or amendment to this MoU shall be made in writing with the approval of the competent authorities of both Parties.

10. DURATION

This MoU shall remain valid for the duration of the relevant activities/sub-project under the ongoing ICAR project, unless extended or modified by mutual consent of the Parties. Any amendment or extension shall be made with the approval of the competent authorities of both institutions.

11. REVIEW AND TERMINATION

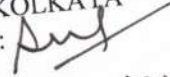
The progress of the collaborative research shall be reviewed periodically by the designated scientists of both institutes. Either Party may discontinue the collaboration by providing written notice to the other Party. Any ongoing research activity shall be suitably completed or closed in consultation with the concerned project authorities and in accordance with applicable ICAR rules.

12. EFFECTIVE DATE

This MoU shall become effective from the date of signing by the authorized representatives of both Parties.

SIGNATURES

FOR INDIAN INSTITUTE OF SCIENCE
EDUCATION AND RESEARCH
(IISER), KOLKATA

Signature: 

Name: Prof. Sunil Kumar Khare

Designation: Director/Head

Date: 30.09.2026

Official Seal

Witness:

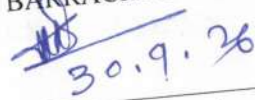
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Alakesh Bisai
30.09.26

2.

G K Datta
30.09.26

FOR ICAR-CENTRAL RESEARCH
INSTITUTE FOR JUTE AND ALLIED FIBRES
(ICAR-CRIJAF), BARRACKPORE

Signature: 

Name: Dr. Gouranga Kar

Designation: Director

Date: 30.09.26

Official Seal



डॉ. गौरांग कर / Dr. Gouranga Kar
निदेशक / Director

भारतीय-केन्द्रीय पटसन एवं सम्बन्धीय रेशा अनुसंधान संस्थान
ICAR-Central Research Institute for Jute & Allied Fibres
भारतीय कृषि अनुसंधान परिषद् / Indian Council of Agricultural Research
मोहनपुर, बरकपुर, कोलकाता-700 121

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(R.K. Naik)
30/09/26