

BIO-RESOURCES BULLETIN 2026

VOL 2, ISSUE 2,

A QUARTERLY NEWSLETTER

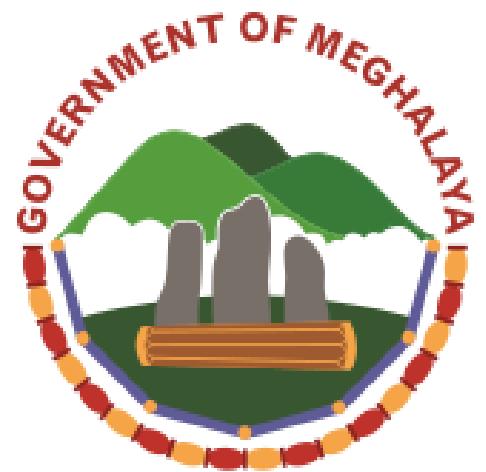
April-June 2026

**CONNECTING COMMUNITIES, CONSERVING BIODIVERSITY, INSPIRING
SUSTAINABLE FUTURES.**

Welcome to BIO-RESOURCES BULLETIN 2026 – Issue 2, Vol. 2 (April–June 2026)

This edition brings together the highlights, achievements, and activities of the quarter, showcasing our continued efforts in biodiversity conservation, sustainable bio-resource management, research, capacity building, and community engagement. From innovative initiatives to collaborative programmes, each story reflects our commitment to unlocking the potential of Meghalaya’s rich biological heritage while promoting sustainable development.

We invite you to explore the milestones, insights, and success stories featured in this issue and join us in celebrating the collective efforts that are shaping a greener and more resilient future.



**ROOTS OF RESILIENCE, SEEDS OF
INNOVATION**

"Discover the stories, innovations, and conservation efforts shaping the future of Meghalaya's bio-resources."

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MESSAGE FROM THE DIRECTOR



Mitali Chandra, IAS

It gives me immense pleasure to present Volume 2, Issue 2 of the Bio-Resources Bulletin, the newsletter of the Bio-Resources Development Centre (BRDC), Government of Meghalaya.

This issue showcases some of the Centre's ongoing initiatives and achievements in biodiversity conservation, biotechnology research, sustainable utilization of bio-resources, and documentation of indigenous knowledge systems. The activities highlighted in this edition reflect our continued commitment to advancing scientific research while preserving Meghalaya's rich biological and cultural heritage.

Among the notable developments featured in this issue are our efforts in tissue culture, seed conservation, carbon sequestration research, expansion of traditional knowledge documentation across Garo and Jaintia Hills, and various research and outreach activities undertaken by the Centre. These initiatives contribute towards addressing contemporary challenges related to climate change, biodiversity conservation, sustainable livelihoods, and resource management.

The successful implementation of these programmes would not have been possible without the dedication of our scientists, researchers, technical staff, collaborators, traditional knowledge holders, community stakeholders, and funding agencies. I extend my sincere appreciation to all who continue to support the Centre's vision and mission.

As we move forward, BRDC remains committed to fostering innovation, strengthening research partnerships, and promoting the sustainable use of Meghalaya's invaluable bio-resources for the benefit of present and future generations.

I hope this issue of the Bio-Resources Bulletin provides readers with valuable insights into our work and inspires greater engagement in the conservation and sustainable development of our natural and biological resources.

With best wishes,

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MICROPROPAGATION

Strengthening Sustainable Agriculture Through Tissue Culture Plantlet Distribution and Crop Propagation

Shillong, June, 2026: As part of its ongoing efforts to strengthen sustainable agriculture and enhance farmers' access to quality planting materials, the Centre undertook the distribution of healthy, hardened tissue culture plantlets and expanded tissue culture-based crop propagation activities across Meghalaya.

Healthy hardened tissue culture plantlets of the Grand Nain banana variety were distributed to banana growers in Mandalgre Village (East Garo Hills), Darechikgre Village (West Garo Hills), and Cham Cham Village (East Jaintia Hills) in collaboration with the Seed Bank Initiative of the Centre. The initiative aims to promote the cultivation of disease-free and quality planting materials, improve crop productivity, and enhance the livelihoods of banana growers in these regions.



In addition, approximately 140 well-hardened tissue culture plantlets of the Queen Spine pineapple variety were distributed to pineapple growers at Thadnongiaiw, Ri-Bhoi District. Implemented in collaboration with farmers under the Seed Bank Initiative, the programme seeks to encourage the adoption of superior planting materials, improve pineapple production, and create better income-generating opportunities for local farming communities.

Further strengthening tissue culture-based crop development efforts, micropropagated potato plantlets representing seven potato varieties were successfully transplanted from the laboratory to polyhouse facilities at Laitumiong in collaboration with MBMA and at the BRDC Experimental Farm. These activities were undertaken to facilitate ARC sapling production for the upcoming August–September planting season. A total of 1,204 culture bottles containing 16,162 healthy potato plantlets were transplanted, marking a significant step toward the production and dissemination of quality seed potato planting materials.

These initiatives reflect the Centre's continued commitment to promoting sustainable agricultural development through advanced propagation technologies, quality planting material production, and farmer-centric interventions aimed at improving crop productivity and rural livelihoods.



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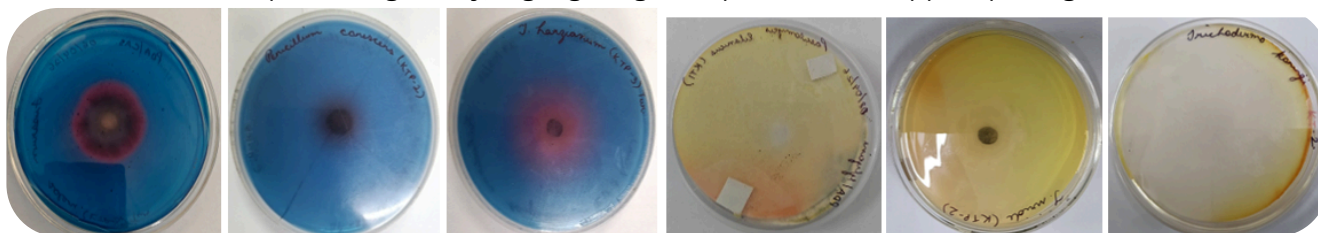
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BIO-INOCULANT LABORATORY

Shillong, June, 2026: Strengthening the foundation of evidence-based agriculture, the activities combined laboratory research, field trials, molecular analyses, and stakeholder engagement to support crop improvement initiatives.

Fungal isolates were screened for key plant growth-promoting traits, including siderophore and HCN production. Of the 11 isolates tested, 4 showed positive siderophore production, while 6 demonstrated HCN-producing ability, highlighting their potential to support plant growth and health.



As part of our ongoing research and characterization activities, a total of 15 isolates were sent for molecular identification 10 fungal isolates and 5 bacterial isolates. These samples included potential Plant Growth Promoting & antagonist isolates. This initiative represents an important step in validating laboratory findings.

Field Trial at Cham Cham Village: The Mahima variety of ginger was evaluated using *Trichoderma* sp. (1) and *Trichoderma* sp. (2) treatments to assess their potential in enhancing crop growth and performance.



Our team conducted monthly field visits to designated villages as part of ongoing research activities. The visits focused on site assessment, evaluation of crop health and identification of locations suitable for microbial sampling.

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QUALITY CONTROL AND ANALYTICAL LABORATORY

Quality Control and Analytical Laboratory Conducts Extensive Testing of Soil and Food Samples

Shillong, June, 2026: The Quality Control and Analytical Laboratory of the Bio-Resources Development Centre (BRDC) continued to provide analytical support to researcher, institutions, and stakeholders through comprehensive testing and quality assessment services. During the reporting period, the laboratory successfully analyzed 41 soil samples and 22 food samples received from various institutions, organizations and individuals.



A wide range of physicochemical and quality parameters were evaluated to ensure product quality, standardization, and compliance with established specifications. The laboratory carried out analyses of several fruit-based products, including carambola, strawberry, and pineapple juices and squashes, where parameters such as curcumin content, acidity, and Total Soluble Solids (TSS) were assessed to determine product quality and composition.

The laboratory also undertook detailed quality evaluation of spice and herbal products. Testing of turmeric flakes included estimation of curcumin content, moisture content, total ash content, and acid-insoluble ash, providing important indicators of quality, purity, and processing standards. Similarly, bay leaf whole samples were analyzed for extraneous vegetable matter, foreign matter, moisture content, volatile oil content, and acid-insoluble ash, while bay leaf powder samples were evaluated for moisture content, total ash content, acid-insoluble ash, crude fibre, and volatile oil content.

These analyses form part of the laboratory's ongoing efforts to support quality assurance, value addition, product development, and scientific research related to bio-resources and agro-based products. Through its analytical services, the laboratory continues to play a vital role in promoting quality standards and enhancing the market potential of agricultural and natural products from Meghalaya.



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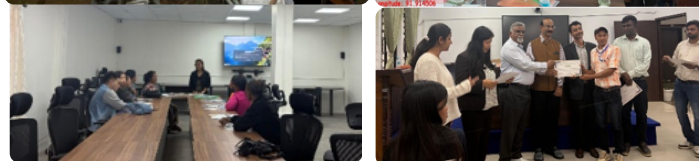
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SEED CONSERVATION

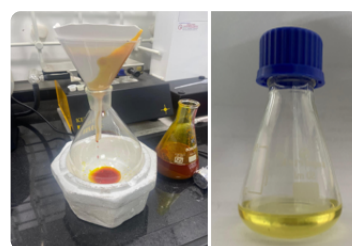
Shillong, June, 2026: Promoting sustainable agriculture through seed security initiatives, farmer capacity development, crop production activities, and research on plant diversity, health, and nutrition.

The team strengthened community seed systems through training on seed conservation and seed-saving units in East Garo Hills, alongside capacity building on cole crop (cabbage and cauliflower) seed production practices at the BRDC Experimental Farm in collaboration with NESFAS.

To enhance technical expertise in community seed bank management, the team also attended a training programme for CSB Managers and Master Trainers under the PM-DevINE Project, conducted by NECTAR in collaboration with ICAR-NBPGR, New Delhi.



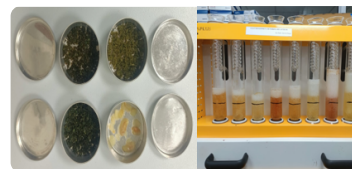
An NOC was signed at Darechikgre Village, Rongram Block, West Garo Hills, to facilitate the efforts establishment of a Seed Saving Unit and strengthen local seed conservation



Research activities focused on evaluating the in-vitro antioxidant and antifungal properties of Lakadong turmeric (*Curcuma longa* L.) essential oil and rhizome extracts against common soil pathogens of Meghalaya, alongside assessing the nutritional and proximate composition of unconventional wild and local edible resources.



Comparative studies on bean morphological characterization from Jaintia Hills are underway, while nursery raising and maintenance of key vegetable crops such as chilli, brinjal, cabbage, and cauliflower continue to support crop development activities.



Post-harvest activities were undertaken at the Experimental Farm, Laitmysaw, including the drying, weighing, and packaging of seeds harvested during 2025-2026 to ensure quality and storage readiness.



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BIOTECHNOLOGY IGNITION GRANT SCHEME (BIG)

Shillong, June, 2026: From Tissue Culture to Field Success: Advancing Potato Improvement



Sub-culturing activities were carried out to maintain and multiply tissue culture (TC) plantlets of the potato varieties Phan Imdiang, Phan Saw, Phan Shidieng, and Phan Syntiew, ensuring the availability of healthy and disease-free planting materials for further propagation and research.

Tissue culture (TC) plantlets were successfully transplanted from the laboratory to the polyhouse for acclimatization and ARC plug production, facilitating the development of healthy planting materials for subsequent multiplication and field cultivation.



Field evaluation of the potato variety Phan Saw was undertaken using G0 tubers to assess its agronomic performance and suitability for quality seed potato production.

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CARBON SEQUESTRATION

Meghalaya Advances Carbon Sequestration Research Through Bamboo Afforestation and Bioengineered Plant Systems

Shillong, June, 2026: In a significant step towards climate change mitigation and sustainable ecosystem restoration, researchers under the project "**Carbon Sequestration of *Bambusa tulda* through Afforestation and Bioengineered Plant Systems**" have initiated key activities aimed at assessing the carbon capture potential of bamboo and selected native tree species of Meghalaya.

The project focuses on evaluating the role of *Bambusa tulda*, one of the most economically and ecologically important bamboo species of Northeast India, in sequestering atmospheric carbon dioxide through afforestation and advanced plant propagation technologies. The initiative seeks to generate scientific evidence on the carbon storage capacity of bamboo-based ecosystems while contributing to landscape restoration and sustainable resource management.

As part of the preliminary phase of the project, researchers have successfully established tissue culture protocols for the mass propagation of *Bambusa tulda*. The development of healthy, disease-free planting material through tissue culture is expected to facilitate large-scale plantation programmes and ensure the availability of uniform planting stock for future field trials.

Simultaneously, extensive soil sampling has been undertaken from selected project sites across Meghalaya to establish baseline carbon levels. These samples will be analysed to quantify soil organic carbon stocks and monitor changes in carbon accumulation over the course of the project. The findings will provide valuable insights into both above-ground and below-ground carbon sequestration dynamics.

Recognizing the importance of native biodiversity in climate resilience, the project has also identified four additional indigenous plant species for comparative evaluation alongside *Bambusa tulda* viz., *B. pallida*, *Bambusa balcooa*, *Dendrocalamus hamiltonii* and *Dendrocalamus hookeri*.

The selected species will be assessed for their growth performance, biomass accumulation, and carbon sequestration potential under Meghalaya's unique agro-climatic conditions. Comparative analyses are expected to help identify the most effective species combinations for afforestation and ecosystem restoration programmes in the region.

According to the project team, the integration of plant tissue culture with afforestation strategies offers a promising approach to enhancing carbon capture efficiency while supporting biodiversity conservation and sustainable livelihoods. The project is expected to generate critical scientific data that can guide future climate action initiatives, afforestation programmes, and carbon credit opportunities in Meghalaya and beyond.

As global efforts intensify to combat climate change, innovative research initiatives such as this demonstrate the growing role of biotechnology and ecosystem-based solutions in achieving long-term environmental sustainability. The outcomes of the project are anticipated to contribute to national and international goals for carbon neutrality, ecological restoration, and sustainable development.

The project continues to progress with field establishment, carbon stock assessments, and long-term monitoring activities planned in the coming months.



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HIMALAYAN BIO-RESOURCES MISSION

Documentation Initiative Revisited and Expanded Across Garo and Jaintia Hills

Shillong, June, 2026: The ongoing Documentation Initiative continues to make significant progress across Meghalaya, with recent field visits conducted in the Garo and Jaintia Hills to document indigenous medicinal knowledge and collect ethnobotanical specimens flowering during the May-June season. The exercise also aimed to identify previously collected plant specimens and validate existing records through direct engagement with traditional healers.

During the reporting period, a total of 11 revisits and three detailed documentation sessions were conducted with traditional healers. These interactions provided valuable insights into local medicinal practices that have been preserved and transmitted orally across generations.

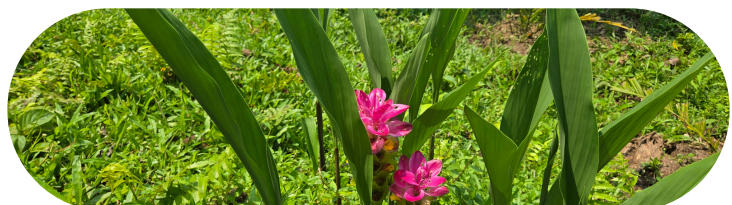
Among the notable findings was the documentation of a rhizome locally known as Dikge Siljriong, which traditional healers describe as possessing unique properties and medicinal applications. Another plant, Dikge Nojol, was reported to be used in traditional healing

practices for ailments believed to arise from supernatural causes. Such accounts reflect the rich cultural heritage and belief systems associated with indigenous healthcare traditions.



The field study also recorded a fascinating account of how medicinal plants were discovered through close observation of nature. According to a traditional healer from Garo Hills, the medicinal value of a plant used for treating fractures and dislocations was first recognized after observing a bird repeatedly bringing the plant to its injured young, which subsequently recovered. Stories such as these illustrate the deep connection between local communities and their natural environment.

The continued expansion of documentation efforts highlights the importance of preserving Meghalaya's traditional knowledge systems. These initiatives contribute to safeguarding valuable cultural heritage while creating opportunities for future scientific research, biodiversity conservation, and the sustainable utilization of indigenous knowledge.



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BRDC BIONEST

BRDC BioNEST to Launch “Idea to Creation” Call for Proposals Challenge

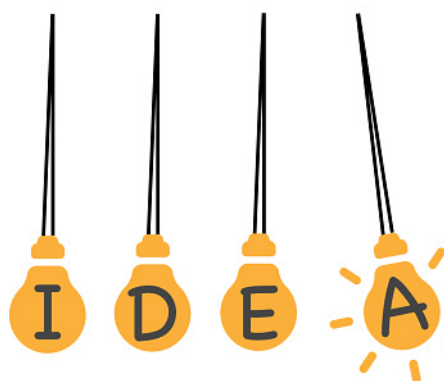
Shillong, June, 2026: The BRDC BioNEST Incubation Centre is set to launch its flagship “Idea to Creation” Call for Proposals Challenge, an initiative aimed at identifying, nurturing, and supporting innovative biotechnology and bioresource-based ideas from aspiring entrepreneurs, researchers, students, and start-ups across Meghalaya and the Northeast region. The challenge is designed to provide a platform for innovators to transform promising concepts into viable products, technologies, and enterprises. Selected participants will receive mentorship, technical guidance, incubation support, access to laboratory facilities, and

opportunities to connect with industry experts and potential investors.

The programme seeks innovative solutions in areas such as biotechnology, sustainable agriculture, bio-based products, natural resource management, traditional knowledge-based innovations, food processing, waste valorization, environmental sustainability, and other emerging bioeconomy sectors. Through this initiative, BRDC BioNEST aims to foster a culture of innovation and entrepreneurship while addressing local and regional challenges through science and technology.

The “Idea to Creation” Challenge represents an important step in strengthening Meghalaya's innovation ecosystem and empowering young innovators to translate their ideas into impactful ventures. By supporting early-stage innovations, the programme seeks to create new opportunities for employment, enterprise development, and sustainable economic growth in the region.

The official call for proposals is expected to be announced shortly, inviting innovators with transformative ideas to participate in this exciting journey from concept to creation.



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PGS-INDIA ORGANIC AND NATURAL FARMING CERTIFICATION

Strengthening Organic and Natural Farming Certification Across Meghalaya



Shillong, June, 2026: During April-June 2026, BRDC-RC successfully implemented a series of activities under the PM-DevINE, KfW, and NMNF projects to strengthen PGS-India Organic and Natural Farming Certification across Meghalaya. These initiatives focused on enhancing farmer participation, strengthening certification processes, and promoting sustainable agricultural practices. In April, Document Signing

Programmes, Scope Certificate Distribution, and Annual Field Inspections were conducted in Muplieng and Nongspung villages, facilitating the continued certification and compliance of farmer groups under the PGS-India framework. The momentum continued in May with activities across Namdong, Dienglieng, Nongkrong, Nonjrong, and Thangsning villages. Key interventions included Document Signing Programmes, Peer Appraisal Training, distribution of PGS manuals, farm visits, Annual Field Inspections, and Scope Certificate Distribution. These efforts enhanced farmers' understanding of certification requirements while strengthening internal quality assurance mechanisms within the groups.

In June, BRDC-RC organized Natural Farming Awareness Programmes, Peer Appraisal Training, Document Signing Programmes, and Field Inspections at Soba Jambal in North Garo Hills. The Centre also facilitated market linkage discussions between pineapple growers and Vista Naturals, creating opportunities for improved market access and value realization for farmers. Additionally, SGT Training, Field Inspections, and Scope Certificate Distribution were carried out in Pyndengdiwah, Laitnong, and Shngimawlein villages to further support certification and capacity-building efforts.

Through these activities, BRDC-RC continues to promote sustainable agriculture, strengthen farmer institutions, and expand certification and market opportunities, contributing to the growth of organic and natural farming across the state.

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MEGHALAYA STATE ORGANIC CERTIFICATION BODY (MSOCB)

Strengthening Organic Certification and Compliance Systems under NPOP



Shillong, June, 2026: During April-June 2026, the Meghalaya State Organic Certification Body (MSOCB) undertook a series of capacity-building, compliance, audit, and governance activities to strengthen the implementation of the National Programme for Organic Production (NPOP) and enhance the effectiveness of organic certification services.

To strengthen staff competency and ensure compliance with NPOP requirements, MSOCB personnel participated in an online training programme on Input Approval conducted by Parthavi Organic Vision Pvt. Ltd. The training focused on the evaluation and approval of inputs used in organic agriculture, in accordance with the provisions outlined under the NPOP framework.

In line with directives issued by APEDA, MSOCB carried out extensive farmer verification activities across registered grower groups from April to June 2026. The exercise covered several certified farmer groups, including the Dhansiripar Organic Grower Association in Nagaland and the Iatreilang Organic Producers Cooperative Society Ltd. (ICS-I and ICS-II), among others. The verification process was undertaken to assess the authenticity of organic farming practices and strengthen the integrity of the certification system. MSOCB also conducted external audits and field inspections to verify compliance with NPOP standards. These included inspections of individual organic farms as well as grower group production systems, ensuring adherence to certification requirements and promoting transparency within the organic value chain.



To further enhance operational efficiency, a team from MSOCB attended the TraceNet 2.0 Training Programme organized by APEDA in New Delhi. The programme provided hands-on training on the upgraded digital platform, covering the complete certification workflow from registration and farm verification to the issuance of Scope Certificates.

Institutional strengthening remained a key focus during the quarter. MSOCB hosted a visit from the Manipur Organic Mission Agency (MOMA), during which certification procedures and compliance mechanisms were shared. The organization also convened its Technical Committee, Advisory Committee, and

review meetings to discuss updates to operational manuals, certification procedures, organizational development, and policy matters related to organic certification.

Further supporting quality assurance efforts, experts from Parthavi Organic Vision Pvt. Ltd. reviewed certification work instructions, assessed corrective actions related to previous non-conformities, and conducted training sessions on organic logo usage, traceability, and mass balance systems. In addition, the Quality Council of India (QCI), authorized by APEDA, carried out an on-site assessment of MSOCB to evaluate its continued compliance with accreditation standards and NPOP requirements.

Through these initiatives, MSOCB continues to strengthen certification systems, enhance stakeholder capacity, ensure regulatory compliance, and promote the credibility and growth of organic agriculture in the regio



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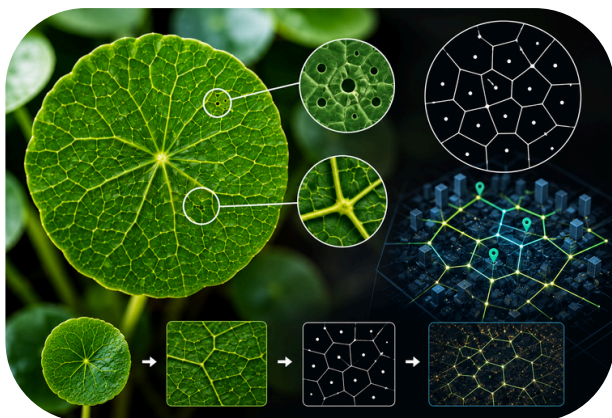
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SCIENCE BEYOND BORDERS

Chinese Money Plant Reveals Hidden Mathematical Pattern



Date: May 14, 2026

Source: Cold Spring Harbor Laboratory

Scientists found that the Chinese money plant arranges its leaf veins and tiny pores in a very organized way, following a pattern called a Voronoi diagram a design often used by engineers and city planners to divide space efficiently.

The plant naturally creates the most efficient layout for moving water,

nutrients, and gases throughout its leaves. It does this without any planning or calculation, simply through its natural growth process.

Hidden Therapeutic Potential Discovered in Cannabis Leaves

Date: May 1, 2026

Source: Stellenbosch University

Recent scientific research has revealed a previously unexplored chemical diversity in Cannabis leaves, leading to the identification of numerous novel compounds, including the first reported occurrence of rare flavoalkaloids in the plant. These discoveries highlight the strategic importance of Cannabis bio-resources as a source of novel compounds with potential applications in therapeutic and pharmaceutical sciences.



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SCIENCE BEYOND BORDERS

Amino Acid Found to Support Gut Healing



Date: May 21, 2026

Source: Massachusetts Institute of Technology

Researchers at MIT have discovered that cysteine, an amino acid commonly found in protein-rich foods such as meat, dairy products, beans, and nuts, may help the intestine repair itself after damage.

In laboratory studies, a diet rich in cysteine activated certain immune cells, which released

signals that encouraged intestinal stem cells to regenerate damaged tissue. This natural repair process was particularly effective in helping the gut recover from radiation-related injury.

Beetroot juice may help lower blood pressure in older adults within two weeks

Date: May 25, 2026

Source: University of Exeter

A recent study suggests that drinking beetroot juice regularly for just two weeks can help reduce blood pressure in older adults. Beetroot is rich in natural compounds called nitrates. When consumed, beneficial bacteria in the mouth convert these nitrates into substances that help relax and widen blood vessels, improving blood flow throughout the body.

Researchers found that this simple dietary habit not only supported healthier blood pressure levels but also promoted a more beneficial balance of bacteria in the mouth. These findings indicate that beetroot juice could be a natural and easy addition to a heart-healthy lifestyle for older adults.



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please contact:**



0364-2561530



brdc_shillong



brdcshillong@gmail.com



www.megbrdc.nic.in

