SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:


Scientists concerned after finding high levels of B12 in Bay of Bengal

Image Source: Times of India, January 3, 2026

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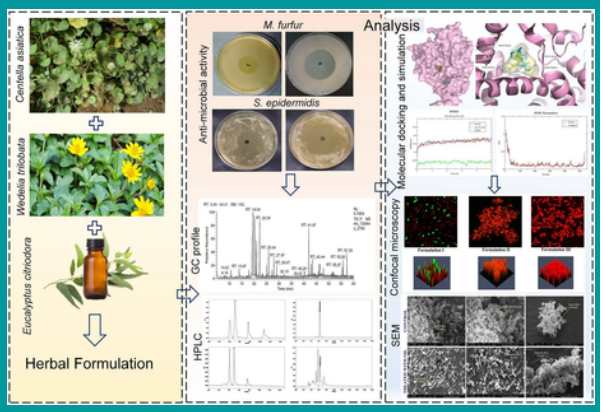
Scientists concerned after finding high levels of B12 in Bay of Bengal

- A recent study by the National Institute of Oceanography (NIO), Goa, and the Academy of Scientific and Innovative Research (AcSIR), Ghaziabad has found elevated levels of vitamin B12 in the Bay of Bengal.
- The research, which examined dissolved cobalt in the Indian Ocean, highlights that cobalt , a key component of vitamin B12 — plays an important role in maintaining ocean health and supporting marine food chains.
- The study reports that cobalt levels in the Bay of Bengal are higher than in other parts of the Indian Ocean, especially in the northern region. Coastal waters recorded concentrations of about 0.11 nmol L^{-1}, with levels decreasing towards the south.
- Scientists note that climate change and ocean deoxygenation may significantly influence cobalt distribution in marine waters.

NBRI develops eucalyptus-based herbal oil to treat dandruff

- CSIR-National Botanical Research Institute (NBRI) has developed a scientifically validated herbal anti-dandruff oil based on eucalyptus for effective scalp care.
- The formulation targets Malassezia furfur, a common scalp yeast that causes dandruff when it overgrows and disrupts natural oils.
- The oil works by stopping the scalp's natural oils from breaking down into irritating substances, helping reduce itching, flaking, and excessive shedding of skin cells.
- The innovation was developed by a six-member NBRI research team after years of study and formulation work.



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India plans to make own air-pollution monitoring devices

- India has established the world's second National Environmental Standard Laboratory (NESL) at CSIR–National Physical Laboratory (NPL), marking a significant step towards strengthening environmental governance and reducing dependence on foreign certification systems.
- The laboratory will develop India-specific testing and calibration facilities for air pollution monitoring equipment used across the country.
- At present, most air pollution monitoring instruments used in India are imported and certified based on environmental conditions in Europe or the United States.
- Since environmental conditions in those regions differ from those in India, the new facility will help improve the accuracy, reliability, and long-term performance of monitoring instruments under Indian conditions.

Silk goes beyond fabric, shows promise in healing chronic wounds

- Indian scientists have developed a photo-activated silk–collagen hydrogel that accelerates tissue regeneration, offering strong potential for treating diabetic ulcers, burns, and other chronic wounds requiring long-term care.
- The next-generation wound-healing material is stable, patient-friendly, and highly effective, with the potential to redefine wound management for chronic and fragile skin, according to CSIR.
- The hydrogel has been developed by researchers at the Central Leather Research Institute (CLRI), a CSIR laboratory, by blending natural silk fibroin with a synthetic collagen-like protein to enhance healing performance.
- Silk fibroin, known for its biocompatibility and strength, is widely used in biomedical applications; however, combining it with a collagen-like protein helps create a more supportive environment for cell growth, multiplication, and migration, improving overall wound healing outcomes.

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Turning Farm Waste into Future Highways

- **Scientists from the CSIR – Central Road Research Institute (CSIR-CRRI) and the CSIR – Indian Institute of Petroleum (CSIR-IIP) have developed an innovative technology that converts crop stubble into material for road construction.**
- **The technology offers a sustainable solution to stubble burning, helping reduce air pollution in Delhi-NCR.**
- **Farmers can now derive economic value from crop residue that was previously treated as waste.**
- **Roads built using bio-bitumen derived from crop stubble are more durable, cost-effective, and environmentally friendly, thereby improving air quality and road safety.**

CSIR-SERC Chennai develops nation's 1st power emergency response technology

- **CSIR-Structural Engineering Research Centre (CSIR-SERC), Chennai, has developed India's first fully indigenous Emergency Power Restoration System (EPRS) for rapid restoration of power transmission.**
- **The system has been designed, tested, and patented in India, marking a major step toward self-reliance in power infrastructure and disaster management.**
- **It helps to quickly restore electricity when high-voltage transmission towers collapse or suffer severe damage during floods, cyclones, landslides, earthquakes, or other extreme weather events.**
- **Until now, India has largely depended on imported emergency restoration systems from countries like the United States and Canada.**

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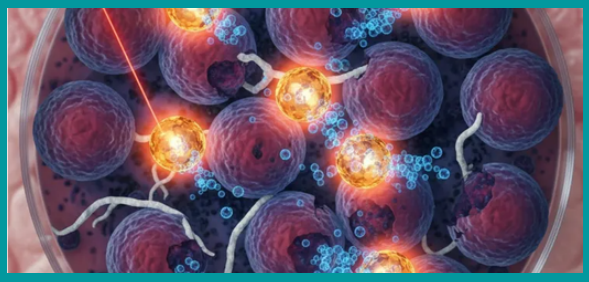

Image Source: neosciencehub.com

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CSIR-IICT & IIT H develop gold-coated nanoparticles that offer dual strike on skin cancer

- **Scientists from the Indian Institute of Technology Hyderabad (IIT Hyderabad) and the CSIR – Indian Institute of Chemical Technology (CSIR–IICT) developed gold-coated calcium peroxide nanoparticles (CPAu-NPs) to enhance photothermal therapy for melanoma and address secondary fungal infections in immunocompromised cancer patients.**
- **The nanoparticles improve treatment by converting light into localized heat and intrinsically generating reactive oxygen species (ROS), offering a dual therapeutic advantage.**
- **Gold was chosen for its strong photothermal properties, biocompatibility, and ease of surface modification, making the system effective and adaptable.**
- **The study, led by Aravind Kumar Rengan of IIT Hyderabad in collaboration with CSIR–IICT scientists, was published in Communications Chemistry, a Nature group journal.**

New species of rare white-flowered ginger discovered in Northeast India

- **Researchers discovered a new ginger species, Parakaempferia alba, in the remote Siang Valley of Arunachal Pradesh, identified by scientists from CSIR–North East Institute of Science and Technology along with local colleges.**
- **The discovery, published in the Nordic Journal of Botany, marks a significant milestone for the region's biodiversity, as it is only the second species recorded in its genus.**
- **The journey began in 2015 when researcher Tatum Mibang first collected the specimen, which remained unstudied in a local herbarium for several years.**
- **A recent follow-up expedition rediscovered the plant, and after detailed comparison with historical records and digital databases, researchers confirmed it as an entirely new species.**

Image Source: csir.res.in

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Banana Peels & Cauliflower Stems Power Sustainable Biogas Innovation

- Researchers at CSIR–Central Leather Research Institute (CSIR-CLRI) developed a low-cost biogas technology using banana peels and cauliflower stems to stabilise food-waste digesters and enhance clean energy production.
- The method is based on anaerobic co-digestion, where food waste is broken down by microbes without oxygen to produce biogas.
- Since food waste alone turns acidic and reduces methane output, naturally alkaline banana peels and cauliflower stems were added as biological buffering agents to improve gas yield.
- The system was tested in 30-day laboratory batch experiments, mixing restaurant and university mess food waste with banana peel or cauliflower stem waste in a 70:30 ratio, showing improved biogas production and reduced CO_2 emissions.

CSIR-IICT transfers natural fibre reinforced plastic technology

- CSIR–Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, has transferred its Natural Fibre Reinforced Plastic (FRP) formulation and compounding technology to J. Rettenmaier & Söhne (JRS) Fibres for Life (India), a leading provider of sustainable fibre based solutions.
- The technology supports the manufacture of lightweight and durable automotive components, particularly for electric vehicles (EVs), promoting sustainable mobility solutions.
- The technical knowledge to produce compostable plastic items, such as pheromone traps and cutlery, was also shared, helping expand environmentally friendly applications.
- The formulations will be supplied to automotive manufacturers for interior and semi-structural components, helping partially replace virgin polymers and offering cost and sustainability benefits.