CSIR IN MEDIA

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The Innovation Engine of India

NEWS BULLETIN
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Kurao Pvt Ltd launches herbal tea

CSIR-NEIST

10th January , 2025

Kurao Herbal Tea manufactured by Kurao Herbals Pvt Ltd with the support from CSIR-North East Institute of Science and Technology (NEIST), Branch Laboratory, Imphal was launched at CSIR-NEIST office, Lamphelpat on Friday. The launch programme was attended by former union minister of state for education and external affairs Dr RK Ranjan as chief guest and CSIR-NEIST Branch Lab chief scientist Dr Huidrom Birkumar Singh as president, while College of Food and Technology CAU, Iroishemba dean professor Ng Iboyaima Singh, MSME Technology Centre Nilakuthi Food Park, Imphal deputy director Dr S Yoirentomba Meitei and Meira Paibi activist Moirangthem Ibemhal Devi were present as guests of honour.

Speaking on the occasion, Dr RK Ranjan praised the state entrepreneurs for venturing into tea production and producing national and international level quality product.

Dr H Birkumar said that Kurao Herbal Pvt Ltd, Moirangkhom has been partnering with CSIR-NEIST for a long time now and the tea launched today is fruit of this partnership.

He informed that the Kurao Herbal Tea has been made from a mixture of state grown black ginger, locally known as 'Yaingang Amuba' or 'Yaimu' and a protein-rich sacha inchi (sacha peanut) plant.

Published in:

E-pao

NIO discussed importance of oceans on its 60th annivarsary

CSIR-NIO

10th January , 2025

The National Institute of Oceanography (NIO) has insisted on sustainable use of marine resources stating oceans will play a key role in driving both the global and Indian economies through the blue economy. Speaking at the CSIR-NIO Foundation Day Diamond Jubilee program today, Chief Scientist Dr Sanil Kumar, emphasized the growing significance of oceans.

“The oceans will play an increasingly vital role in both the global and Indian economy, especially in terms of the blue economy. With climate change impacting ecosystems, it is essential that we continue to deepen our understanding of these shifts and their effects on biodiversity. Our work has never been more crucial, and we remain committed to advancing scientific research to address these pressing challenges," he said.

The NIO marked its 60th anniversary since its establishment on January 1, 1966. Reflecting on the institute’s progress over six decades, Kumar added, “Today, as we mark six decades of advancements in ocean sciences and technology, we pause to appreciate our achievements and look toward the challenges and opportunities ahead.“ The event also featured lectures on the future of ocean sciences, including ‘The Oceans: Opportunities and Challenges’ by Dr M Ravichandran, Secretary of the Ministry of Earth Sciences (MoES), New Delhi, and ‘Towards Sustainable Blue Economy’ by Dr Shailesh Nayak, Director of the National Institute of Advanced Studies, Bengaluru.

Published in:

Thegoan

‘Need to bridge gap between demand and supply of palm oil’

CSIR-IICT

10th January , 2025

CSIR-Indian Institute of Chemical Technology (CSIR-IICT) D. Srinivasa Reddy, on Friday, has highlighted the gap between the demand and supply of edible oils in the country and stressed the importance of addressing this issue.

He was speaking at the two-day 79th Annual Convention of the Oil Technologists’ Association of India (OTAI) and the National Conference on ‘Oil Palm: Recent Trends in Production, Processing, and Applications in the Food and Non-Food Sectors’ being held at the institute.

The director expressed hope that the conference would facilitate discussions on palm oil, address the myths surrounding it, and explore ways to reduce the nation’s dependence on oil imports. OTAI national president Rajiv Churi was concerned over the prevalence of unscientific claims on palm oil and hoped the conference would serve as a platform to address these issues.

OTAI-south zone secretary and convenor Sanjit Kanjilal said the conference’s goal is to bridge the gap between supply and demand and improving the perception of palm oil. Indian Vegetable Oil Producers Association (IVPA) vice president Bhavna Shah discussed the key drivers shaping the oil industry and the challenges. Former National Institute of Nutrition (ICMR) director Sesikeran discussed the harmful effects of negative marketing practices by some cooking oil companies. The opening session was followed by the presentation of the OTAI Annual Merit Awards, said a press release.

Published in:
The Hindu

CSIR-CCMB shows glimpse of science research to high school students

CSIR-CCMB

10th January , 2025

About 24 students studying in grades VIII-X selected from 24 different schools of the twin cities from among 326 applicants participated in the 12th Young Innovators Program conducted at the CSIR-Centre for Cellular and Molecular Biology (CCMB) recently.

The selected students spent a week in different labs and research facilities of the institute where they were exposed to how DNA is used to detect genetic diseases, how infectious diseases are studied through biology of pathogens, how cryo-electron microscope shows details of biomolecules even up to atomic levels and how such tools are used for understanding living systems and or making improved crop varieties as well as to conserve nature.

“It has been a wonderful experience as I got to see how scientists actually work. I discovered a whole new world of research,” said Oak Valley School’s S. Hitesh, one of the chosen students. IIT-Hyderabad’s Mudrika Khandelwal delivered the inaugural lecture.

“We connect to brilliant young people through this program though only a few among them may become scientists. The real value of the program is instilling in them the love for finding out more and solving challenges. We want them to become citizenry inspired by science,” said CSIR-CCMB director Vinay Kumar Nandicoori.

“Our program intends to give high school students a glimpse of the excitements and opportunities that modern biology offers,” CSIR-CCMB’s science communication and public outreach head Somdatta Karak, said a press release.

Published in:

The Hindu

'Milestone In Biotechnology Research': PM Modi Unveils Genome Sequencing Data Of 10,000 Indians

CSIR

09th January , 2025

Prime Minister Narendra Modi on Thursday released the genome sequencing data of 10,000 Indian nationals and said it will be a milestone in the field of biotechnology research. The Genome India Data, that represents the genetic diversity in the country, will be available to researchers at the Indian Biological Data Centre (IBDC) through “managed access”.

"I am confident this will be a milestone in the field of biotechnology research," Modi said in a video-recorded statement played out at the Genomics Data Conclave organised by the Department of Biotechnology here. Modi said more than 20 renowned research institutions like IITs, Council of Scientific and Industrial Research (CSIR), and Biotechnology Research and Innovation Centre (BRIC) have played an important role in this research.

The prime minister said this national database encapsulated the extraordinary genetic landscape of the country and promised to serve as an invaluable scientific resource. "It will facilitate advancements in the treatment of genetic and infectious diseases, foster the development of new medications and precision medical techniques, and enable research into the lifestyles and habits of diverse communities," Modi said. Science and Technology Minister Jitendra Singh, Principal Scientific Adviser Prof. Ajay Kumar Sood, Indian Council of Medical Research (ICMR) Director General and Secretary, Department of Health Research Rajiv Bahl, and Secretary Department of Biotechnology Rajesh S Gokhale were present on the occasion.

Published in:

Outlookindia

Padmashri Prof. G.D. Yadav conferred prestigious Bhatnagar Fellowship

CSIR

09th January , 2025

Prof. Ganapati D. Yadav, an eminent engineering scientist and one of India's most prolific innovators, has been awarded the prestigious Bhatnagar Fellowship by the Council of Scientific and Industrial Research (CSIR). This recognition was conferred by the Selection Committee and approved by Dr. Jitendra Singh, Minister of State for Science & Technology, Atomic Energy, and PMO, who serves as the Vice President of the CSIR Society, chaired by the Prime Minister of India.

He currently serves as the National Science Chair (Government of India), Chairman of the Board of Governors, LIT University, and is the Former Vice Chancellor of the Institute of Chemical Technology (ICT), Mumbai. A transformative leader, he is celebrated globally for his groundbreaking contributions to science, technology, innovation, and policy, earning over 150 prestigious awards throughout his illustrious career. His pioneering work focuses on net-zero emissions, green hydrogen production, carbon dioxide refineries, and valorization of waste biomass and plastics, with several innovations now in pilot-scale production and nearing commercialization.

As Vice Chancellor of ICT Mumbai, Prof. Yadav spearheaded its transformation into a global institution, establishing two new campuses, 23 academic programs, five new departments, and multiple centres of excellence, securing unprecedented funding. He has mentored over 115 doctoral students, 153 master's students, and 48 postdoctoral fellows, and his research productivity is equally remarkable, with 570 original research papers, 136 patents, three books,

an h-index of 71, an i10-index of 370, and over 19,500 citations. A recipient of the Padma Shri (2016), Prof. Yadav is one of the few Indians to be elected to two prestigious U.S. academies: National Academy of Engineering (NAE) – among only 23 living Indians to receive this honor, and National Academy of Inventors (NAI) only the second Indian ever to achieve this distinction.

Prof. Yadav's numerous accolades include the Bharat Ratna Dr. A.P.J. Abdul Kalam Award for Science & Technology (2022), the SASTRA C.N.R. Rao Award (2024), and the Advantage India Chemical Conclave Award (2024) for his unmatched contributions to academic research and industrial innovation. He was named among Asia's Top 100 Scientists by Asian Scientist Magazine (2023) and honored with the Excellence in Catalysis Research Award (2023) by the Association of Catalysis Societies of Asia-Pacific.

In addition to his academic achievements, Prof. Yadav is a sought-after corporate advisor, serving as an Independent Director on the boards of seven leading companies, including Godrej Industries, Clean Science & Technology, Meghmani Organics, Bhageria Industries, Astech Lifesciences, and Dorf Ketal Chemicals India. He previously held board positions with Aarti Industries and Survival Technologies.

Prof. Yadav also plays an active role on the editorial boards of leading international journals and has received multiple lifetime achievement awards. Currently, he serves as the President of the Indian Chemical Society during its centennial jubilee year.

Published in:
Indianchemicalnews

Delhi-Dehradun Expressway: PM Modi likely to inaugurate 32-km section soon

CSIR-CRRI

09th January , 2025

Good news for the commuters as two sections of the Delhi-Dehradun Expressway are ready for inauguration. As per reports, the inauguration of the much-needed expressway was scheduled for Sunday, but it was later postponed. PM Modi is likely to inaugurate the expressway on a new date, expected to be announced soon.

NHAI Chairman Santosh Yadav inspected the expressway on November 27, after which he issued instructions to the project director and construction agency to complete the work of beautification, signage and painting.

A team from Central Road Research Institute (CRRI) also completed the on-site survey of the Delhi-Dehradun Expressway. According to Jagran.com, the technical flaws in the construction of the road and the design were thoroughly examined in the inspection. The Delhi-Dehradun expressway was made with a budget of Rs 2,324 crore and was scheduled to be completed by December 2024.

Features Of 32-km section

The expressway is made up of several segments, including two recently completed sections spanning a total of 32 kilometers. The first segment, stretching 17 kilometers, runs through Delhi and includes a 6.5-kilometer elevated corridor. The second segment covers 15 kilometers and passes through the Ghaziabad and Baghpat districts of Uttar Pradesh.

The expressway will save a lot of travel time for commuters as it would take just 2.5 hours to 3 hours to complete the journey. The 32-km route will run from Akshardham to the EPE and it will pass through Laxminagar, Geeta Colony, Shastri Park, Khajuri Khas, and BihariPur, before entering Ghaziabad via Ankur Vihar. While in Ghaziabad, the expressway will pass through Pavi Pushta and Mandola, and then enter the Baghpat district.

More About The Expressway

The Delhi-Dehradun Expressway is 210 km long, and significantly reduces the travel time between the two cities. The journey that takes around six and a half hours will be reduced to two and a half hours.

This route will connect Delhi NCR to Uttarakhand and will increase the number of tourists visiting Dehradun.

The second phase will cover 118 kilometres, extending from EPE to the Saharanpur bypass. The third phase will cover 40 kilometres connecting Ganeshpur to the Saharanpur bypass and the final 20 kilometres will reach Dehradun.

Published in:
Business Standard

IIT Bhubaneswar signs pact with CRRI for research

CSIR-CRRI

08th January , 2025

IIT Bhubaneswar on Wednesday signed a memorandum of understanding with CSIR-Central Road Research Institute (CRRI) to promote collaborative research, facilitate exchange of ideas, develop new knowledge, and enhance high-quality research acumen. The MoU was signed by Dinakar Pasla, dean (sponsored research and industrial consultancy), IIT Bhubaneswar, and Manoranjan Parida, director, CSIR-CRRI. Shreepad Karmalkar, IIT director, was also present.

Major thrust areas of joint research will be traffic and transportation engineering, pavement engineering, road safety and other allied civil engineering areas such as geotechnical engineering and bridge engineering, official sources said.

"The modes of cooperation will include exchanges of faculty and students for the purposes of research and teaching. The two institutes will help each other in the development and implementation of collaborative research projects, professional development programmes, capacity-building efforts and dissemination of findings through scholarly publications and white papers," read an official statement from IIT.

Karmalkar said the collaboration with CSIR-CRRI will enhance the ecosystem for research in the field of road construction, thereby contributing towards strengthening the infrastructure for transportation and connectivity. "School of Infrastructure at IIT Bhubaneswar deals with academics and research in different areas of civil engineering through its eminent faculty

members. IIT Bhubaneswar, as a technical knowledge provider, is looking forward to this association to foster innovation in the field," he added. Parida said the MoU will bring transformation in research and development activities in the areas of roads and bridges, traffic and transportation, ground improvement and geotechnical engineering, rural roads, pavement design, pavement performance and its evaluation, instrumentation, environment, and road safety. "We hope this association will also help Odisha in creating a benchmark in this domain in the future," he added.

Published in:
Times of India

Bioplastics: Myth and reality - by Dr. K. Nagaiah, Chief Scientist, CSIR- IICT and Phaniraj G., IT Professional

CSIR-IICT

08th January , 2025

Bioplastics are being heralded as a panacea to the plastics problem. What are bioplastics, and are they safer alternatives to plastics? India according to a report in the journal Nature is the largest polluter of plastic waste. Will bioplastics solve our problem with plastics? The term “bioplastics” is often used to describe very different materials, and the terms “biobased”, “biodegradable” and “compostable” may be misleading. Bioplastics are polymers that are either sourced from biobased resources or if they are derived from fossil fuels but are biodegradable. Bioplastics have been in existence for a long time. Producing plastic from fossil fuels remains cheaper than producing bioplastics.

Several products are classified as bioplastics. The term "biobased" refers to materials partially or fully sourced from biomass, including polylactic acid (PLA), polybutylene succinate (PBS), thermoplastic starches (TPS), and polybutylene adipate terephthalate (PBAT). Drop-in plastics, such as Bio-PET from ethanol, which have a similar chemical structure to traditional plastics, are also considered bioplastics. Another category includes oxo-biodegradable plastics, which are conventional plastics with additives that promote biodegradability. This article focuses on biobased plastics marketed as biodegradable and/or compostable. It is important to note that not all biobased plastics are biodegradable, and even fewer are compostable.

Biodegradability refers to the physical or chemical breakdown of a material by biological activity, where microorganisms convert the polymer into carbon dioxide, water, methane, biomass, and residue. This degradation depends on whether the process is aerobic or anaerobic, as well as on the material’s molecular structure and environmental conditions. It is not dependent on whether the plastic is biobased or fossil-fuel-based.

There is a lot of confusion regarding the end of life of these bioplastics. Bioplastics companies claim that their products are easily biodegradable, and/or compostable. The

distinction should be made between biodegradable and compostable. Bioplastics are compostable under certain conditions but not biodegradable in nature. Biodegradation is a process that occurs without human intervention, while composting is with human intervention. Composting is a controlled aerobic decomposition of organic waste to release CO2, water and biomass in the presence of microorganisms. The composting is being used for food remains, agriculture waste, wood and grass from home yards. The compost is then used for agricultural uses especially in organic farms.

Bioplastics cannot be composted in the home yard or municipal composting; they need industrial composting. The composting in industrial units can happen from 60 to 120 days under stipulated pressure and temperature criteria. Industrial composting units are not available widely in India. Even in the US there are only a few composting units that accept compostable bioplastics. With the heightened awareness of plastic pollution, consumer and business attitudes are shifting towards using these bioplastics even if they are at a higher cost. The average consumer does not understand the intricacies involved with biodegradability and compostability. The consumers are being greenwashed in believing bioplastics are the solution to plastic problems.

There is no central authority to regulate bioplastics production or its end of life. However, there is an effort to push bioplastics to be an alternative to plastics making them look identical and for the same functions. The bioplastics that are not accepted in the compostable units end up in our landfills. Under the anaerobic conditions in landfills, they emit methane which is 30% more potent as a greenhouse gas than CO2. Also, there is a cross-contamination risk to the recyclable conventional plastics if they end up in recycling channels and could damage the equipment.

Bioplastics can clog our waterways and can cause damage to our oceans if they are littered assuming they are eco-friendly. They do not degrade on their own. The marine environment presents a unique challenge for biodegradability because of the cold temperature and different microorganism profile. Bioplastics would not biodegrade in oceans left to the elements.

Bioplastics such as PLA, PBS, TPS, PBAT are produced from feedstocks such as cornstarch, potato starch etc. These feedstocks are first generation. The technology for bio-based plastics production from second generation feedstock such agro waste, algae is still evolving. There is an ethical question of using food crops diverting the land, resources to the production of bioplastics that is mostly for packaging and single use when global food insecurity is a problem. Further growing these crops for bio-based plastics may lead to using more GMOs, pesticides, fertilizers indiscriminately leading to biodiversity loss, genetic pollution, erosion, nutrient loss and pesticide resistance that may affect agriculture landscape. These practices can introduce pesticide residues and heavy metals into bioplastic products and compost, which can harm both the environment and human health, and in organic farming settings. The fertilizers in the runoff may cause algal bloom in aquatic environments causing harm to agriculture.

Plastics, both conventional and biobased, use similar additives that include stabilizers, plasticizers, flame retardants, antioxidants. A typical plastic product can contain over 20 additives as per a study, overall, there are about 4,000 additives used. Many are known to be toxic. Information on additives is rarely disclosed. The manufacturers use the existing machinery to make the end products using the same additives as conventional plastics. There could be differences in additives from product to product and from one manufacturer to another, creating further confusion.

Most additives do not chemically bind to the polymers and can leach out. Also, they undergo bioaccumulation and biomagnification and climb up the food chain. Several additives include PFAS (per- and polyfluoroalkyl substances) and BPA (Bisphenol- A) are known toxins causing a risk to humans and marine organisms even at a low concentration. PFAS are ‘forever’ chemicals that remain in the environment without biodegrading. They are used in plastics to repel moisture and water and used in bowls and packing for food. In the US Chipotle and Sweetgreen chains had to phase out compostable bowls since they contained PFAS. PFAS are known carcinogens that are also found in soils, rainwater and in the marine environment. There is a risk of chemicals penetrating through bioplastics via agriculture. BPA is used as a

flame retardant and is an endocrine disrupter posing a risk to humans and wildlife. While bioplastics are often promoted as environmentally friendly, it is essential to consider the full environmental impact, including the carbon footprint of producing feedstocks, the energy required for industrial composting, and the emissions from transportation of produce and fertilizer use.

The recycling of bioplastics remains a challenge, and more research is needed through Life Cycle Assessment to understand the upstream and downstream impacts of bioplastics. A study by the UK's University of Plymouth pointed out that compostable bioplastic bags have remained in the soil even after 27 months with some deterioration. Bioplastics can also produce microplastics with toxins that may accumulate in the soil, impacting the soil health and into livestock and marine organisms.

Consumers need clear, easily understandable information about the use and end-of-life disposal of bioplastics. Biodegradable and compostable bioplastics should be properly labeled in local languages, and governments should regulate them, including additives, including a unique color coding to distinguish them from conventional plastics. Currently several Indian companies import the bioplastic PLA/PBAT pellets and additives to produce the final product. We need to assess the toxicity of these materials. Bioplastics are significantly more expensive than conventional plastics and not safe as they are claimed.

Another risk to the environment that is often overlooked is with the nurdles- tiny plastic resin pellets used as an input in manufacturing the products. They pollute the environment causing immense harm to our lakes, rivers, oceans. Marine organisms, including fish may mistake them for eggs and ingest them leading to harmful consequences. Bioplastic nurdles are also at risk of spilling into the environment during transportation and production compounding the issue. More research is needed on eco-friendly additives, second-generation feed stocks such as agro waste, industrial composting, microorganisms and enzymes that break down bioplastics. The newly announced BioE3 (Biotechnology for Economy, Environment and Employment) initiative should drive this research.

Ultimately, bioplastics are not necessarily safer than conventional plastics. As consumers we must focus on reducing plastic consumption overall—by recycling, upcycling, and reusing. We need to use plastics sustainably in our retail sector.

We need to find solutions to reduce single use plastics, packaging waste generated by our food delivery and e-commerce sectors, which is rapidly contributing to the plastic problem. Currently, conventional plastic recycling rates are low, at 9%. To address this, we need to advance recycling technologies, raise more awareness and expand recycling infrastructure.

We must be cautious in embracing bioplastics until further research is conducted to avoid creating bigger environmental challenges. Responsible plastic use is essential for protecting our planet's future.

Published in:
Indianchemicalnews

Two rare Neuroptera species found for the first time from Kerala

CSIR

08th January , 2025

Researchers have found two rare Order Neuroptera species, Glenochrysa zeylanica and Indophanes barbara from Kerala.

Indophanes barbara is an antlion belonging to Myrmeleontidae family and Glenochrysa zeylanica is a green lacewing of Chrysopidae family in Order Neuroptera. The research team of the Shadpada Entomology Research Lab (SERL), Christ College (Autonomous), Irinjalakuda, Thrissur, is behind the findings.

The green lacewing species Glenochrysa zeylanica was rediscovered after 111 years from Mananthavady and Thirunelly in Wayanad district. This species, previously thought to be endemic to Sri Lanka, has been rediscovered from the State and reported for the first time from India, according to the researchers.

The antlion species Indophanes barbara is found in Kerala in Irinjalakuda, Manakkody in Thrissur district; Pudunagaram, Chittur, Kulikkiliyad in Palakkad district; Chaliyam, Devagiri in Kozhikode district; Kuthuparamba in Kannur district; Aroor in Malappuram district; and Ponmudi in Thiruvananthapuram district.

Doctoral Scholar Suryanarayanan T. B. and research supervisor Bijoy C., Assistant Professor of Christ College, are behind this discovery. The findings are published in the recent issue of the international scientific journals viz, Journal of the Entomological Research Society and Natura Somogyiensis.

"Indophanes barbara and Glenochrysa zeylanica have been reported only from Sri Lanka, validating the similarity between faunal elements in Sri Lanka and Kerala. The larva of Indophanes barbara does not build pits like common antlion species. They live under the surface in loose soils where they are protected from direct sunlight, wind and rain. Adults of Indophanes barbara are misidentified as damselflies by non-taxonomists because of their morphological resemblance. Indophanes barbara, an antlion can be easily distinguished by their long distinct antennae. They come under Order Neuroptera, which includes holometabolous insects while the damselflies come under Order Odonata, which includes hemimetabolous insects" says Mr. Suryanarayanan.

This is the 12th green lacewing species and eighth antlion species reported from Kerala, says Dr. Bijoy. The research was conducted with financial assistance from the Council of Scientific and Industrial Research (CSIR), New Delhi.

The Shadpada Entomology Research Lab at Christ College has a special emphasis on researching such organisms.

Published in:
The Hindu

Genome sequencing key to check HMPV spread: AIIMS, NEERI

CSIR-NEERI

08th January , 2025

National Environmental Engineering Research Institute (NEERI) and AIIMS-Nagpur, spearheading fight against human metapneumovirus (HMPV), said that whole genome sequencing (WGS) holds the key to check any surge in cases. HMPV, a respiratory illness, has sparked concern and curiosity in equal measure among healthcare professionals and the people.

Dr Prashant Joshi, executive director, AIIMS-Nagpur, said they have received samples of the two suspected city patients and an RT-PCR will be done once test kits arrive by Wednesday. AIIMS-Nagpur has begun procurement of genome sequencing kits to determine the new variant of HMPV, if any. The institute has also earmarked 10 beds for isolating HMPV patients.

"We are also procuring kits for WGS from NIV, Pune. These are expensive investigations. Unlike China and Hong Kong there is no surge in respiratory infections in India at this point. We don't know if the virus in China is old or a mutated one. This can only be ascertained through WGS. If it is an old virus, there is nothing to worry about," Dr Joshi said.

Dr Krishna Khairnar, NEERI'S principal scientist and head of environmental epidemiology and pandemic management, said, "China has not provided clarity on the HMPV variant circulating there. Hence, it is not clear whether the same variant exists in India too. As of now, those found positive here had no foreign travel history. We are keeping a close eye on developments.“

Dr Khairnar emphasised importance of WGS, particularly amid the current surge in HMPV cases in China. "HMPV was detected in samples of Covid-19 patients who reported influenza-like illness (ILI), and severe acute respiratory infection (SARI) in 2022 and also September last

year," Dr Khairnar added. HMPV is known to have two genotypes, A and B, with sub-lineages A1, A2, B1, and B2. NEERI scientists are closely monitoring developments following suspected cases reported in India.

Dr Khairnar said that there is no need to panic as the situation is under control in India. During Covid-19 pandemic, Dr Khairnar's lab conducted WGS on over 5,000 SARS-CoV-2-positive samples, demonstrating their capability in genome analysis and surveillance.

Published in:
Times of India

Tata Elxsi and National Aerospace Laboratories join hands for advanced air mobility

CSIR-NAL

07th January , 2025

Tata Elxsi, a global leader in design and technology services, and the CSIR-National Aerospace Laboratories (CSIR-NAL) have signed a Memorandum of Understanding (MoU) to establish a Strategic Partnership for Advanced Air Mobility. This collaboration is focused on driving innovation in emerging areas such as Unmanned Aerial Vehicles (UAVs), Urban Air Mobility (UAM), and electric vertical take-off and landing (eVTOL) aircraft. The partnership combines NAL's deep aeronautical expertise and Tata Elxsi's technological capabilities in electrification, AI/ML, sensor fusion, and certification processes to support global and Indian markets, the company said in a media release.

The global market for UAVs and UAM is rapidly evolving, with applications spanning industries such as logistics, agriculture, defence and urban transportation. This partnership will accelerate product development cycles for these sectors by providing access to advanced testing infrastructure, methodologies, and expertise. Tata Elxsi and CSIR-NAL will jointly focus on technologies such as aerodynamic design, autonomous systems, and secure communications to address the unique needs of both manned and unmanned air mobility systems, the company said.

India presents significant opportunities through initiatives like Make in India, indigenisation, and the growing demand for advanced air mobility solutions. The partnership will contribute to building a robust ecosystem of precision manufacturing, component suppliers, and tool vendors. It will also help shape industry regulations and standards, fostering a sustainable

framework for innovation and commercialisation in India, the company added. Manoj Raghavan, MD & CEO at Tata Elxsi, said, "We believe the future of aerospace innovation lies in technologies like UAVs and Urban Air Mobility. This strategic partnership with NAL combines our strengths to push the boundaries of innovation and accelerate the development of next-generation air mobility solutions for our customers globally."

Dr Abhay A Pashilkar, Director at CSIR-NAL, said, "Partnering with Tata Elxsi marks a crucial development in our mission to innovate within the aerospace sector. CSIR-NAL's deep expertise in aerospace research and testing, along with Tata Elxsi's advanced technology and design expertise, will help us to develop innovative, scalable, and sustainable solutions that will shape the future of urban transportation."

As part of this collaboration, Tata Elxsi and CSIR-NAL also envision creating a robust ecosystem that integrates precision manufacturing, tools, components, and vendor partnerships. This ecosystem aims to bring together key stakeholders to foster innovation, enhance scalability, and address the unique requirements of advanced air mobility systems, the company said.

Published in:
Manufacturing

CSIR-NML hosts Corporate Training for SAIL Executives

CSIR-NML

07th January , 2025

The CSIR-National Metallurgical Laboratory (NML) in Jamshedpur commenced a four-day corporate training programme on Mineral Characterization, Beneficiation, and Agglomeration (MCBA 2025) for officials from Steel Authority of India Ltd. (SAIL). The programme began with an inauguration ceremony featuring a lamp-lighting ritual performed by dignitaries including Dr. Sandip Ghosh Chowdhury, Director of CSIR-NML, Dr. Devabrata Mishra, Head of the Mineral Processing Division, and Dr. S. Sivaprasad, Chief Scientist and Head of the Human Resource Group.

Inaugural Session and Welcome Remarks

Dr. Sandip Ghosh Chowdhury welcomed the SAIL executives and shared insights about NML's history, its legacy, and its close proximity to India's steel and mineral-rich industries. He highlighted the crucial role of mineral processing, especially in light of the projected rise in domestic steel production from 140 million tons to 300 million tons by 2030. He also introduced the state-of-the-art facilities available at NML's Mineral Processing Division, emphasizing their potential benefits to industry professionals.

Dr. Devabrata Mishra explained the objectives of the MCBA 2025 training, focusing on the division's specialized expertise and facilities in mineral processing. He expressed that this training would not only broaden the participants' knowledge base but also provide valuable insights into industry-related challenges, which would aid NML scientists in solving real-world problems.

Objective of the MCBA 2025 Training Programme

The training programme aims to:
Enhance participants' technical knowledge in mineral characterization, beneficiation, and agglomeration.
Provide hands-on experience with cutting-edge equipment.
Foster collaboration and interaction between research laboratories, industry executives, and academic institutions.

Importance of Beneficiation and Agglomeration in Metallurgical Industries

Dr. S. Sivaprasad underscored the significance of beneficiation, particularly for low-grade ores and minerals, which are vital for meeting the growing demand for high-quality raw materials. Beneficiation processes include ore comminution, mineral liberation, and separation through techniques such as gravity separation, magnetic separation, froth flotation, and dewatering. In cases where fine-grained concentrates are produced, agglomeration methods like briquetting, sintering, and pelletization come into play.

CSIR-NML's Expertise in Mineral Processing and Training Initiatives

CSIR-NML has been a pioneer in the beneficiation of ferrous, non-ferrous, and non-metallic minerals, as well as coal, from both domestic and international sources. The laboratory has extensive experience in agglomeration processes and regularly conducts training programs aimed at skill development for industry professionals, researchers, and academic personnel. The MCBA 2025 programme is one such initiative, providing a comprehensive mix of lectures, laboratory visits, and hands-on training with advanced equipment, ensuring that SAIL officials gain a deeper understanding of mineral processing techniques. This training programme reflects CSIR-NML's ongoing commitment to advancing the technical capabilities of the mineral processing industry and fostering mutually beneficial relationships between research institutions and industry leaders.

Published in:
Uditvani

‘Evolution of agri-India independent of Iranian roots’

CSIR-CCMB

07th January , 2025

In a seminal revelation that promises to redefine the contours of India’s rich cultural heritage, a recent study conducted by esteemed scientist K Thangaraj, from the CSIR-Centre for Cellular and Molecular Biology, Hyderabad, has posited that the genesis of agriculture in India may have been an independent phenomenon, unshackled from the erstwhile perceived Iranian roots. This paradigm-shifting discovery, born out of an exhaustive analysis of ancient DNA samples, has sent ripples of excitement through the academic community, inviting a nuanced reassessment of the nation’s storied past.

At the heart of this path-breaking research lies the Indus Valley Civilization (IVC), a Bronze Age marvel that has long fascinated both historians and archaeologists. By isolating and examining DNA samples from this bygone era, Thangaraj and his team, in collaboration with the renowned archaeologist Vasanth Shinde, have unearthed a fascinating narrative that underscores the complexity and diversity of India’s demographic tapestry.

The study’s findings, distilled from a painstaking analysis of 200-300 distinct populations, suggested that the IVC was, in fact, a confluence of two distinct populations: ancestral North Indians and ancestral South Indians. This dichotomy, hitherto unknown, has significant implications for our understanding of the subcontinent’s cultural and genetic evolution. Furthermore, researchers’ discovery of a unique genetic admixture in the IVC sample, comprising elements of both Iranian hunter-gatherers and Andaman hunter-gatherers, has raised intriguing questions about the dynamics of population migration and exchange in ancient India. The prevailing wisdom, which posits that agriculture originated in the Fertile Crescent of Iran and subsequently spread to other parts of the world, including India, has been challenged by the study’s findings.

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Dtnext

Twigstats: New tool reveals hi-res genetic view of people's ancestors

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Prehistoric human ceremonial burials, mass grave mounts, and war graves scattered around the world are a treasure trove of ancient genetic material that scientists consider key to unlocking secrets from our past. The ancient DNA (aDNA) at these sites opens windows into population dynamics, including the expansion and replacement of populations using peaceful, natural or violent means, admixture events involving two or more sub-populations, cultural transitions, migrations for hunting, and wealth at individual, local, and global scales.

This said, tracing genetic ancestry in particular across populations still remains a challenging task. This is because populations across geographical regions often tend to be very similar, statistically speaking.

Different sample sizes

For example, studies in the past have documented genetic differences between ancient groups such as the hunter-gatherers, early farmers, and the steppe-pastoralists of the Stone and Bronze Ages. Similarly, numerous studies in recent years have provided insights into the genetic diversity of mediaeval populations across the world. But comparing the genetic ancestry of ancient and medieval populations has been hampered by differences in sample sizes. There are fewer samples bearing aDNA, resulting in lower sequencing quality compared to that of medieval or modern genomes, which come from larger cohorts.

The incorporation of genetic material in the form of gene flows laterally, from an ancient line into a modern one after ancient times, adds an additional layer of complexity. Traditionally, researchers' studies of aDNA have involved analysing single nucleotide polymorphisms (SNPs), which are natural genetic variations in the genomes. The method has been extensively used to reconstruct genetic histories and ancestry models using aDNA derived from Indo-European and Native American populations.

In a 2009 study, researchers from the Broad Institute in the US and the CSIR-Centre for Cellular and Molecular Biology, Hyderabad, reconstructed India's population history as well. They analysed 25 diverse groups and identified two ancient populations in the country that were ancestral to most Indians. Ancestral North Indians were found to be genetically closer to Central Asian, European, and Middle Eastern populations while Ancestral South Indians were a distinct group. The analysis of SNPs is a powerful technique when the task is to understand populations, but it's restricted by the need for high quality DNA samples and its inability to resolve the histories of groups with closely related ancestors.

Combining various techniques

Alternatively, analytical methods that use haplotypes, or shared segments of DNA, and rare variants instead of only SNPs have been found to be more powerful. Researchers have applied the genealogical tree inference method to modern and ancient genomes to understand their population structure, demographics, locations of ancestors, etc. This method captures information from haplotype-sharing or identity-by-descent and rare variants simultaneously, includes time-resolved information about genetic ancestry, and provides comprehensive insights into how individuals 'share' their ancestors. For example, in a study published on January 1 in Nature, a collaboration led by the Francis Crick Institute in the UK and including multiple research groups across the UK, Japan, and Sweden developed a new way to infer genome-wide genealogies. The team has called it Twigstats. It uses time-stratified ancestry analysis that boosts the statistical power of existing methods by a magnitude and reduces statistical errors. A particularly unique aspect of Twigstats is its ability to take into account the coalescence of populations in recent times.

The moving Viking

The authors first tested Twigstats on multiple simulated genetic conditions, including to verify using previously published work, to ascertain its robustness. Then they applied it to the task of reconstructing the genetic history of 1,556 aDNA samples belonging to individuals who lived in northern and central Europe from 500 BC to 1000 AD, spanning the Iron, Roman, and Viking ages on the European continent. This fresh analysis using Twigstats has

determined more precisely than ever individual-level ancestry at a very high resolution. The researchers were even able to revisit the ancestry of population groups in the far-flung western frontiers of the Roman Empire in the first millennium AD. Twigstats models also provided direct evidence and high-resolution maps of the migration of individuals who spoke Germanic languages and had Scandinavian-like ancestry across Europe in the first century AD.

In the region represented by present-day Poland, the analysis of ancient genomes using Twigstats suggested a unique shift in ancestry over historical timelines. For example, the team found signs of a shift away from the corded ware cultures in the middle to late Bronze Age (1500 BC to 1000 BC). For another, in the first to the fifth centuries AD, populations associated with the Wielbark culture peeled away from Bronze Age groups.

In the appropriate historical and anthropological contexts, these insights are significant — and Twigstats should be credited for uncovering them. By analysing a large dataset of ancient genomes, the researchers could reconstruct fine population movements and admixture events that coincided with key cultural transitions, offering new insights into the genetic legacy of groups like the Vikings and the impact of migrations on the genetic makeup of modern Europeans.

The study also uncovered evidence of Scandinavian-like ancestry present in the British and the Baltic regions before the traditional commencement of the Viking Age. This suggests interactions with and migrations from Scandinavia began sooner than researchers believed was the case. The presence of Scandinavian ancestry in Britain was also linked to the Anglo-Saxon migrations, while its presence in the Baltic region indicated early contact with Scandinavian groups.

While Scandinavian ancestry expanded significantly across Europe, the study also revealed gene flows into Scandinavia before the Viking Age. Specifically, the researchers reported evidence of ancestry related to continental Europe and the British Isles in pre-Viking Age

Scandinavian individuals. The implication is that the flow of genes was bidirectional. Evidence of the movements of Vikings are recorded in the genetic makeup of the populations of Britain, Ireland, and Iceland.

Cultures and genes

In the historical context, the study seems to confirm the widespread impact of Viking activity as well as highlights the complex and dynamic nature of population movements during the Viking Age.

Taken together, the new study is a good example of how the use of innovative methods for genomic analysis can refine our understanding of the dynamics of early mediaeval populations. By combining genetic data with archaeological and historical evidence, and adding the fact that cultural shifts are often associated with genetic changes as well, researchers can now offer a more nuanced and detailed picture of the complex processes that shaped the cultural histories of our ancestors.

As the researchers wrote in their paper, "our approach can be used for the reconstruction of new high-resolution genetic histories around the world."

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The Hindu

Nadi Tarangini, first ayurvedic diagnostic device, gets CDSCO nod

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Nadi Tarangini, an indigenously developed pulse diagnostic tool, has become India's first ayurvedic medical device to receive approval from the Central Drugs Standard Control Organization (CDSCO), the national regulator for cosmetics, pharmaceuticals, and medical devices in the country. The device is the brainchild of Padma Bhushan awardee Prof. J.B. Joshi, Chancellor of the Institute of Chemical Technology (formerly UDCT) and President of Marathi Vidnyan Parishad. It has been developed by Dr Aniruddha Joshi following over six years of research at IIT Bombay.

The duo shared details about the device at a press conference held in Pune on Monday. The price of Nadi Tarangini is ₹55,000 and its manufacturing company, Atreya Innovations, is based in Hinjewadi, Pune. At present, the company has the capacity to manufacture 5,000 Nadi Tarangini devices per year. The company has recently received seed funding of ₹5 crore, which the company will use for further research, setting up a distribution network, and increasing its production capacity.

During the process for the CDSCO certification, over 25,000 individuals were examined and a report was submitted. When the pulse is tested through the Nadi Tarangini, a 10-page report that involves 22 ayurvedic parameters is obtained. This device has the facility to make this report available in 10 Indian languages. D. Joshi also highlighted the fact that the accuracy of Nadi Tarangini is about 85 per cent.

Speaking on the occasion, Joshi said, "I am indeed happy to see the idea conceptualized about two decades ago coming into reality by getting the Government's approval for its use. It will not only give a new direction to Ayurvedic treatment. Still, it will also mark the beginning of the standardisation process of Ayurvedic practices with the use of technology so that it can be taken across the globe for the benefit of people."

"Nadi Tarangini is an advanced AI-powered pulse diagnostic device designed to speed up traditional Ayurvedic practices. It combines ultra-sensitive sensors with cutting-edge algorithms. It delivers precise pulse readings to provide detailed health insights. This patented device helps practitioners analyse 22 Ayurvedic parameters, including Tridosha balance (Vata, Pitta, Kapha), stress levels, digestive health, and overall well-being of a person," said Dr Aniruddha Joshi. Speaking about the research process of this device, Dr Joshi said, "My father Prof. J. B. Joshi had some health problems about 20 years ago, and Vaidya Ashok Shripad Bhat from Pune treated him successfully. That time he realised that pulse examination played a very important role in diagnosis. Thus, he came with an idea to develop a medical device suitable for pulse examination, which is an important part of the diagnostic process in Ayurveda. During my intense research work at IIT Bombay, I worked on 7 to 10 different sensors before I could successfully develop a device that came very close to the tactile sensation of a finger based on piezoelectric pressure sensors. It was my PhD topic too."

research project

"Since it is a device that picks up the pulse wave, it was named 'Nadi Tarangini'. Now we are able to carry forward the legacy of ancient Indian knowledge tradition like pulse examination through a modern device. A research grant was received from the Council of Scientific and Industrial Research (CSIR) for this research project. After this, when renowned entrepreneur Anand Deshpande suggested that research should not be limited to the laboratory only but should be brought to the market for the use of people at large So, I founded the company Atreya Innovations and worked to make this device suitable for the use of Ayurvedic doctors," said Dr Joshi. Last year, the sensing technology and process of Nadi Tarangini device received a US patent. Apart from the US patent, the device has also received patents for Europe, Indonesia and India. Currently, Nadi Tarangini is being used in more than 1250 Ayurvedic clinics across the country and so far, more than 5 lakh individuals have been tested with this device. Prime Minister Narendra Modi had mentioned this device in his 'Mann Ki Baat' program and praised this device.

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