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NEWS BULLETIN

11 TO 15 AUGUST 2024



NIO celebrates Independence Day with patriotic enthusiasm

CSIR-NIO

15th August , 2024

CSIR-National Institute of Oceanography (CSIR-NIO), Goa, marked the 78th Independence Day with various activities organised with vibrant patriotic enthusiasm, on Thursday, August 15. The festivities began at the NIO campus at Dona Paula, Panaji, with the institute's Director Prof. Sunil Kumar Singh reviewing the parade and then ceremoniously hoisting the Tricolour. This was followed by the National Anthem and a patriotic song, setting an uplifting and inspiring tone for the occasion.



The highlight of the events was the parade, conducted by the security staff and children.

In his Independence Day address, Prof. Singh talked about the significance of the day and highlighted the NIO's notable achievements. He emphasized the institute's crucial role in addressing global warming and climate change and urged the scientists and researchers to intensify their research and development efforts to confront these pressing challenges.

Following the address, prizes were distributed to the NIO staff's children in acknowledgement of their achievements in academics, sports, and extracurricular activities.

In conjunction with Independence Day, the AcSIR Science Club at the NIO marked its first anniversary with a special celebration. The event began with an overview by AcSIR Coordinator Dr. Narsinh Thakur, followed by a presentation on the club's activities over the past year by Ms Shyamli.

A highlight of the celebration was an inspiring talk by Mr. Saieesh Gandhi, Agricultural officer at the Department of Agriculture and Nodal Officer at Samiksha Kendra, Education Department, Government of Goa. Mr Gandhi shared valuable insights on nurturing potential through effective parenting and balancing academics with extracurricular activities. Prof. Sunil Kumar Singh addressed the gathering and felicitated the guests.

The celebrations witnessed enthusiastic participation from staff, their families, and students.

India's trek through lesser-known eco-fibre terrain

CSIR-CLRI

15th August , 2024

The fashion industry has long faced criticism for its environmental footprint. However, many innovative fabrics are emerging, offering eco-friendly alternatives and challenging the very essence of what fashion fabrics can be made from. These promising materials, such as Apple Leather, Mango Fibre, Banana Fibre, Bamboo Fibre amongst others, also serve to repurpose various waste products and by-products that would otherwise pollute landfills or oceans. While these materials offer benefits such as waste management, water conservation, reduced carbon emissions and soil regeneration, it's important to note that no fabric can be deemed entirely sustainable.

According to a report by Boston Consulting Group (BCG), the sustainable fashion market in India is projected to reach US \$ 9 billion by 2025. The report also indicates a growing awareness amongst Indian consumers regarding sustainable products, along with an increased willingness to pay for them. While the journey towards an eco-friendly fashion industry is ongoing, significant strides have already been made.

Apple fibre

Sarjaa, a newly-launched homegrown brand founded by Anjana Arjun, turns apple skin into handcrafted bags. Sarjaa claims to not use polyvinyl chloride (PVC) which is a form of vegan leather, chemicals, phthalates, animal leather and other toxic ingredients. Given the niche appeal of the product, their handbags are created in small batches by a small team with a focus on zero wastage. Anjana stated that while she initially struggled with sourcing apple skin leather, the true challenge lay in working with the material itself. She stressed the importance of selecting the right thread and needle due to the fragility and unique properties of the material, making it tough to ensure strength and suitability for each design. Internationally, several brands have incorporated apple leather into their collections such as Good Guys Go Vegan, Ashoka Paris, Frida Rome and Oliver Co. London.

Algae-based fibre

Recently, Aditya Birla Group's Birla Cellulose partnered with Algaeing, a start-up from Berlin and Israel. Algaeing has harnessed algae as a source to produce fibres and dyes. Together, they have introduced an eco-friendly 'algae-powered' cellulosic fibre, aiming to 'detoxify the textile industry'. Birla Cellulose, a leader in Viscose Staple Fibre (VSF), operates 12 sites for pulp and fibre manufacturing. Algaeing's innovative processes significantly reduce water and energy usage compared to traditional methods, prioritising sustainability. The algae is grown in closed-loop vertical farming that requires only solar energy and salty or desalinated water. Its scalable and patented technology is compatible with existing production machinery. The algae-powered fibre provides a range of naturally occurring colours inspired by algae's vibrant hues while eliminating the need for traditional dyeing processes. Moreover, other international companies are also exploring the use of algae in textiles. For instance, Vollebak, a British clothing brand, has developed a biodegradable T-shirt incorporating eucalyptus and beech pulp, along with algae.

Mango leather

With a breakthrough in 2023, scientists at the Chennai-based Central Leather Research Institute (CLRI) harnessed the potential of 'King of Fruits' by successfully creating a leather-like material using mango pulp, suitable for making bags, belts and more. Beyond these products, mango leather can be further utilised in the apparel industry to create a variety of items. It holds promise for footwear, belts, jackets, skirts, pants and watch straps, offering innovative and sustainable options in fashion. This eco-friendly alternative to synthetic leather contains 50 per cent mango pulp and degrades faster than polyurethane leather. CLRI scientists, who have applied for a patent, transferred the technology to Mumbai-based start-up Aamati Green Private Limited, the sponsor of the research and development. According to CLRI Chief Scientist P. Thanikaivelan, the team combined mango pulp with a biopolymer in liquid and powder form, undergoing a straightforward process to produce a sheet-like material. They then applied a surface coating and added design patterns to enhance the material's aesthetics. Fruitleather in the Netherlands is the only company producing mango-based leather-like material. With India being the largest producer of mangoes, yielding

around 20 million tonnes annually, there's ample opportunity to utilise discarded mangoes – up to 40 per cent of the total – as a sustainable resource for producing this eco-friendly material. To foster more innovation, there should be increased collaboration between government research institutes and the private sector, according to Pratik Dadhania, Founder of Aamati Green Pvt. Ltd. However, he cautioned that government institutes are highly selective in their collaborations and partnerships. Therefore, any biotechnology company seeking to engage with them must support its research with substantial and verifiable data.

Pratik emphasised the importance of targeting the international market. “Currently, we're receiving significant interest from Northern Europe, particularly Denmark, Sweden and Norway, which are at the forefront of climate change initiatives and sustainability policies. When you engage with such forward-thinking consumers, you tap into a market driven by conscious buying. This level of consumer awareness is still evolving in India and may not fully materialise until around 2050.” In India, brands can target ultra-high-net-worth individuals. As per Pratik, “Nowadays, people seek items that aren't readily available in stores. Ultra-high-net-worth individuals, in particular, crave exclusivity; they're willing to pay a premium for something unique. Brands can also tap into the rising corporate gifting trend.”

The corporate gifting market is worth Rs. 12,000 crore and is growing rapidly every year by more than 200 per cent. Notably, there's an 80 per cent preference for eco-friendly gifts in this market, reflecting a strong emphasis on conscious consumption and positive messaging. In fact, there are now brands exclusively dedicated to provide sustainable gifting solutions.

Banana fibre

As a rich source of potassium, bananas are not only a staple in diets but are also increasingly catching the eye of emerging brands due to the fibre found in their peels and stems. Founded in 2022, Maleema, an eco-friendly unisex brand, specialises in collections made from bamboo and handloom weaves, including T-shirts, shorts and other apparel items. The brand also offers a unique line of accessories, such as bags and home decor items, crafted from banana fibre, comprising a blend of 90 per cent banana and 10 per cent cotton. Expansion plans

include introducing hemp collections and products made from recycled cork materials. “We source raw materials directly, particularly banana fibre, from local farmers and weavers. The brand actively collaborates with over 60 to 70 farmers, providing them with consistent work opportunities. We also conduct workshops to educate rural women about banana fibre production and assist in setting up small-scale units through government schemes,” said Srinithyaa, Founder, Maleema. The brand also has a small manufacturing unit in Salem, Tamil Nadu. In addition to the traditional audience, Maleema is also receiving substantial orders from corporate clients.

Anakaputhur, a weaver’s village in Chennai, has gained attention for innovatively using banana fibre to craft eco-friendly jeans and skirts. These garments, crafted by weavers affiliated with the Jute Weavers Association, boast enhanced water (sweat) absorption, ideal for the summer months. Utilising natural dyes and coconut shell buttons, they offer a sustainable alternative to traditional denim jeans, free from metal rivets and zips.

India is the world’s largest banana producer accounting for 26.45 per cent of the world’s banana production at 35.36 million metric tonnes. In 2022-23, India exported bananas worth US \$ 176 million, equivalent to 0.36 MMT. There’s a huge potential to cater to domestic as well as international markets.

For clothing brands, banana fibres show great promise, but the challenge lies in converting these fibres into usable yarns.

“When we extract fibres from the plant, there are often hidden fibres in the yarn, requiring a chemical solution to extract them. This process is costly and complex, making it difficult to achieve a cotton-like feel in the fabric. Currently, a significant amount of banana fibre is imported from the Philippines due to lower costs compared to India. However, advancements in technology suggest that banana fibre production may increase in the future,” said Jayendrasingh Rawal, Partner, Go Green Agri Solutions, a company based in Shirpur, Maharashtra that produces Banana Fibre Extraction Machines.

Similarly, Jalpa Patel, Founder, JcraftEco, a GOAT-certified organisation producing various eco-friendly fibres like Hemp, Bamboo, Organic Cotton, Aloe Vera, Honey, Viscose, Modal, and Tencel, also highlighted the challenges posed. “For instance, bamboo fabrics pose a challenge due to stitching issues. The fibres require extensive processing to ensure comfort, which takes time and effort. Similarly, Aloe Vera fibres face stitching challenges that demand significant processing for optimal comfort.” Based in Ahmedabad, JcraftEco operates as a fully integrated garment manufacturing company with a monthly capacity of 300,000 pieces.

Despite facing challenges, Jalpa Patel and other stakeholders are optimistic about the future of lesser-known sustainable fabrics. “With the fashion industry increasingly embracing sustainable practices, there is a growing demand for eco-friendly fibres.”

Independence Day celebrations at Cheluvamba Mansion in CFTRI

CSIR-CFTRI

15th August , 2024

On the occasion of the 78th Independence Day celebrations at the CSIR-CFTRI here on Thursday, Sridevi Annapurna Singh, director, CSIR-CFTRI hoisted the national flag in front of the Cheluvamba Mansion in the campus. After unfurling the tricolour, the CFTRI school students took part in a march past and rendered a guard of honour.

Addressing the gathering of students, staff, and retirees, Dr. Singh spoke on the role of people in the freedom movement, especially freedom fighters, and also the importance of science and technology in building the nation after independence.

She also spoke about the achievements of CFTRI in the years 2023-2024 and they included R&D projects, collaboration with industries, MoU agreements, corporate social responsibility (CSR), and also societal role in serving the nation. She commended the entire staff of CFTRI for extending a helping hand, preparing and supplying relief supplies like food materials and sanitizers to the people in landslide-hit Wayanad.

Earlier, some of the staff and research scholars rendered patriotic songs which were coordinated by the Food Research Institute Gymkhana (FRIG) of CFTRI.

CSIR-NGRI and NRSC-ISRO sign pact to study Himalayan range for quakes

CSIR-NGRI

15th August , 2024

CSIR-National Institute of Geophysical Research Institute (NGRI) and the National Remote Sensing Centre (NRSC) of the Indian Space Research Organisation (ISRO) have signed a memorandum of understanding to conduct a detailed investigation of the tectonic strain build up for the earthquakes in the Himalayan ranges on Tuesday.

NGRI director Prakash Kumar and NRSC deputy director K. Sreenivas were the signatories for the partnership. Both the organisations will collaborate for the next three years using the information on the crustal deformation measured at the ground through continuous GPS and satellite-based observations to calculate high resolution images of crustal deformation in the western Himalayas for the seismic hazard assessment, said a press release

Develop tech that reduces human intervention in agri: Brajesh Pathak

CSIR-CIMAP, IITR

15th August , 2024

Scientists and students associated with Central Institute of Medicinal and Aromatic Plants (CIMAP) were felicitated for conducting research in six fields, at the 46th Annual Day celebrations of the institute on Wednesday. The research activities were carried out in the fields of phytochemistry, bioprospection and product development, plant biotechnology, crop production and protection, plant breeding and genetic resource conservation, and technology dissemination and computational biology. CIMAP is a multidisciplinary research institute of Council of Scientific and Industrial Research (CSIR).

Deputy chief minister Brajesh Pathak was the chief guest on the occasion. He spoke about the improved varieties of medicinal and aromatic plants developed by CSIR-CIMAP, which not just provides a better yield but also benefits farmers. He also spoke about his visit to Brazil where he saw how technology was being used in agriculture. “Scientists should work towards developing technologies that can reduce human intervention in agriculture,” said Pathak. CSIR-CIMAP director Prabodh Kumar Trivedi, CSIR-IITR director Bhaskar Narayan and CSIR-NBRI director Ajit Kumar Shasany were present on the occasion.

On the occasion, CIMAP signed memorandums of understanding (MoU) with Bromhan Solution of Bhubaneswar for expansion of lemongrass cultivation among tribal farmers of Odisha. The technology of lutein production from marigold flowers was transferred to Sunfed Farm of Varanasi. Among the research activities acknowledged at the event was one led by scientist Puja Khare, which is about the effect of biochar on soil microbial community, dissipation and uptake of pesticide and herbicide. It found that biochar helps in absorbing pollutants from soil that helps plants grow well.

Published in:

[Hindustantimes](https://www.hindustantimes.com/)

कानपुर में जाजमऊ पुराना पुल कितना सुरक्षित? CSIR की टीम ने की जांच, 15 दिन बाद आएगा फैसला

CSIR

14th August , 2024

कानपुर-उन्नाव को सड़क मार्ग से जोड़ने के लिए गंगा पर बने जाजमऊ पुराने पुल की स्थिति खस्ताहाल है। दिल्ली से आई केंद्रीय सड़क अनुसंधान संस्थान (सीएसआईआर) की टीम को प्राथमिक जांच में पुल की बेयरिंग के बाद 70 प्रतिशत पीयर क्षतिग्रस्त मिले हैं। मंगलवार को टीम ने पुल की क्षमता का जायजा लेने के लिए फाउंडर हिस्से से कंक्रीट के नमूने लिए। आधा दर्जन बिंदुओं पर जांच के बाद टीम दिल्ली रवाना हो गई। अब 15 दिन बाद रिपोर्ट आने पर पुल का भविष्य तय किया जाएगा।

कानपुर-उन्नाव-लखनऊ को जोड़ने के लिए वर्ष 1974 में जाजमऊ पुल तैयार किया गया था। यह पुल अब बूढ़ा हो गया है। भारी वाहनों के आवागमन से पुल पर बड़े-बड़े गड्ढे हो गए हैं। जगह-जगह सरिया का जाल झांक रहा है। किनारों पर मौजूद गड्ढों से पुल के नीचे बहती गंगा की धारा को देखा जा सकता है। इस पुल से रोज हजारों छोटे-बड़े वाहनों का आवागमन होता है। पुल की जांच का जिम्मा भारतीय राष्ट्रीय राजमार्ग प्राधिकरण (एनएचएआई) ने सीएसआईआर को सौंपा था। दो दिन पूर्व टीम ने शहर आकर पुल का निरीक्षण शुरू किया।

टीम ने पुल के हर कंपोनेंट की बारीकी से जांच की है। पुल की सुरक्षा पड़ताल में मोबाइल ब्रिज इंस्पेक्शन यूनिट शामिल रही। मंगलवार को सीएसआईआर की टीम ने नॉन डिस्ट्रक्टिव टेस्ट (गैर विनाशकारी परीक्षण) किया। टीम को प्राथमिक जांच में 70 प्रतिशत पीयर और कछ गड्ढों में क्रैक मिला। कंक्रीट की क्षमता परखने के लिए पुल के फाउंडर हिस्से से टीम ने कंक्रीट का नमूना जुटाया। टीम ने अल्ट्रासोनिक टेस्ट, रिवाइंड व हैमर टेस्ट के साथ विजुअल इंस्पेक्शन व ट्रैक मैपिंग भी की। पुल की वर्तमान स्थिति की जांच के लिए सीएसआईआर की टीम को बुलाया गया था। प्राधिकरण समय-समय पर अपने पुलों की जांच कराता रहता है। टीम ने सभी प्रकार की जांचें कर नमूने एकत्र किए हैं। पुल पर भारी वाहनों के आवागमन पर रोक या पुल बंद करने की अभी कोई स्थिति नहीं है। 15 दिन बाद संस्था पुल की रिपोर्ट सौंपेगी, इसके बाद ही इस संबंध में कोई निर्णय लिया जाएगा।

Published in:

[Amritvichar](https://www.amritvichar.com)

KBC 16: Contestant fumbles on Rs 12.5 lakh question about climate clock

CSIR

14th August , 2024

The second episode of Kaun Banega Crorepati 16 began with the host Amitabh Bachchan imparting a life lesson to the audience. He then moved on to the rollover contestant, Dipali Soni, who took the hot seat in the Monday, August 12, episode. Dipali played well until the 11th question and won Rs 6.40 lakh. However, she couldn't answer the 12th question, worth Rs 12.50 lakh.

The question about India's largest climate clock left Dipali in jitters the moment Amitabh Bachchan read it out to her. He asked her, "India's largest climate clock is installed at Anusandhan Bhawan, the headquarters of which organisation, to raise awareness about climate change?" The four options were: DRDO, CSIR, BARC, and ISRO.

Confused between DRDO and ISRO, Dipali, without wasting time, decided to quit the game and take home Rs 6.40 lakh. After she quit, Amitabh asked her to guess the answer. She chose DRDO, which was indeed incorrect. The correct answer was CSIR (Council of Scientific & Industrial Research).

Sharing more details, Amitabh added, "This clock is at the headquarters of CSIR, and it reminds us that we need to protect our planet Earth and time is an important element in it."

After taking leave from Dipali, the actor played another round of 'Fastest Finger First' on KBC 16. The next contestant to take the hot seat was Vaishnavi Bharti from Jharkhand, who was nervous to sit opposite the Bollywood superstar. She won Rs 5,000 on Tuesday's episode and will continue playing in Wednesday's episode of Kaun Banega Crorepati 16.

Published in:

[Indiatoday](https://www.indiatoday.in)

Tribals of East India hold on to traditions despite external influences

CSIR-CCMB

13th August , 2024

Tribal populations living in the interior parts of eastern India have largely managed to retain their cultural heritage despite the influence of modernisation but face threat to their language. According to a study done by a consortia of Indian institutes, the ancient tribal populations of Odisha, Jharkhand and Chhattisgarh have retained their languages for the last 4000 years. These tribal groups have preserved their cultural and linguistic identity withstanding both industrialisation and demographic changes, the study mainly done by the CSIR-Centre for Cellular and Molecular Biology and the DST-Birbal Sahni Institute of Palaeosciences, Lucknow has suggested.

However, recently some of these populations have started adopting Indo-European languages. The study led by Dr Kumarasamy Thangaraj at CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad, and Dr Niraj Rai at the Lucknow Institute has shed light on understanding these changes in the ancient tribes of East India. “Using genetic and linguistic data, for the first time, we established that the language of Austroasiatic-speaking tribal groups is altered by the recent demographic changes. This linguistic shift largely has socio-cultural effects and presents a threat to the Austroasiatic languages, if this trend continues given a small number of people speak these languages,” said Dr. Thangaraj. However, the risk is still rather small at present. The findings are published in an international journal, Heliyon, by Cell Press.

The Key Findings & Likely Threat are:

This is the first high-throughput genetic study on the East Indian tribal populations. The researchers studied four major tribal populations (Bathudi, Bhumij, Ho, and Mahali) from Odisha. Bhumij is an ancient, Austroasiatic language belonging to the Munda ethnic group and related to the Ho, Mundari, and Santalis and primarily spoken by the Bhumij people residing in the states of Odisha, Jharkhand, Assam, West Bengal, and partly in Bihar. As per

the 2011 census data available around 27,506 of the estimated 911,349 Bhumij (which means “one who is born from the soil”), tribals spoke the language as their mother tongue. Many have moved to one of the dominant languages of the respective states, thus putting the mother tongue language under the endangered list. In January 2019, Bhumij was accorded the status of second official language in Jharkhand.

The researchers examined the genetic affinities of the tribal populations and a few Indo-European speakers from nearby areas. Their findings suggest that the two groups do not mix genetically. The researchers further suggest that the linguistic mixing between the Austroasiatic and Indo-European speakers happened likely due to industrialisation (movement of Indo-European speakers may be from neighbouring states) and modernisation (cultural exchange, may be due to marriage/ trade/ education) that brought them into close cultural contact with the Austroasiatic speakers, and some of them have adapted Indo-European as a primary language.

The study did not find any Indo-European-speaking population who have adopted the Austroasiatic language. About 5 % of Indians speak Austroasiatic languages, largely by the ancient tribal populations of Odisha, Chhattisgarh, and Jharkhand. “This study is a crucial add-on to the existing genetic database of Austroasiatic speakers. Because India is one of the most diverse assemblages of people in the world, this research work is significant in demonstrating the origin of Austroasiatic speakers and demographic changes that happened in the deep past and those ongoing, explained Dr. Vinay Kumar Nandicoori, Director, CCMB.

Overall, the Austroasiatic speakers have retained their languages firmly for the last 4000 years.

The other institutes and agencies involved in this study are the Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, Shreyanshi Health Care Private Limited, Raipur, Chhattisgarh, and Punjab University, Chandigarh.

Published in:

[Siasat](https://www.siasat.in/)

India Unveils Lethal 'Swadeshi' Kamikaze Drones With 1,000 Km Range

CSIR-NAL

13th August , 2024

As India prepares to celebrate the 78th Independence Day, the National Aerospace Laboratories (NAL) unveiled that it is making potent swadeshi (indigenous) Kamikaze Drones, do-and-die unmanned aerial vehicles with home-built engines that can power them to fly up to 1,000 kilometres. Loitering munitions are do-and-die machines. They have been widely used in the ongoing Russia-

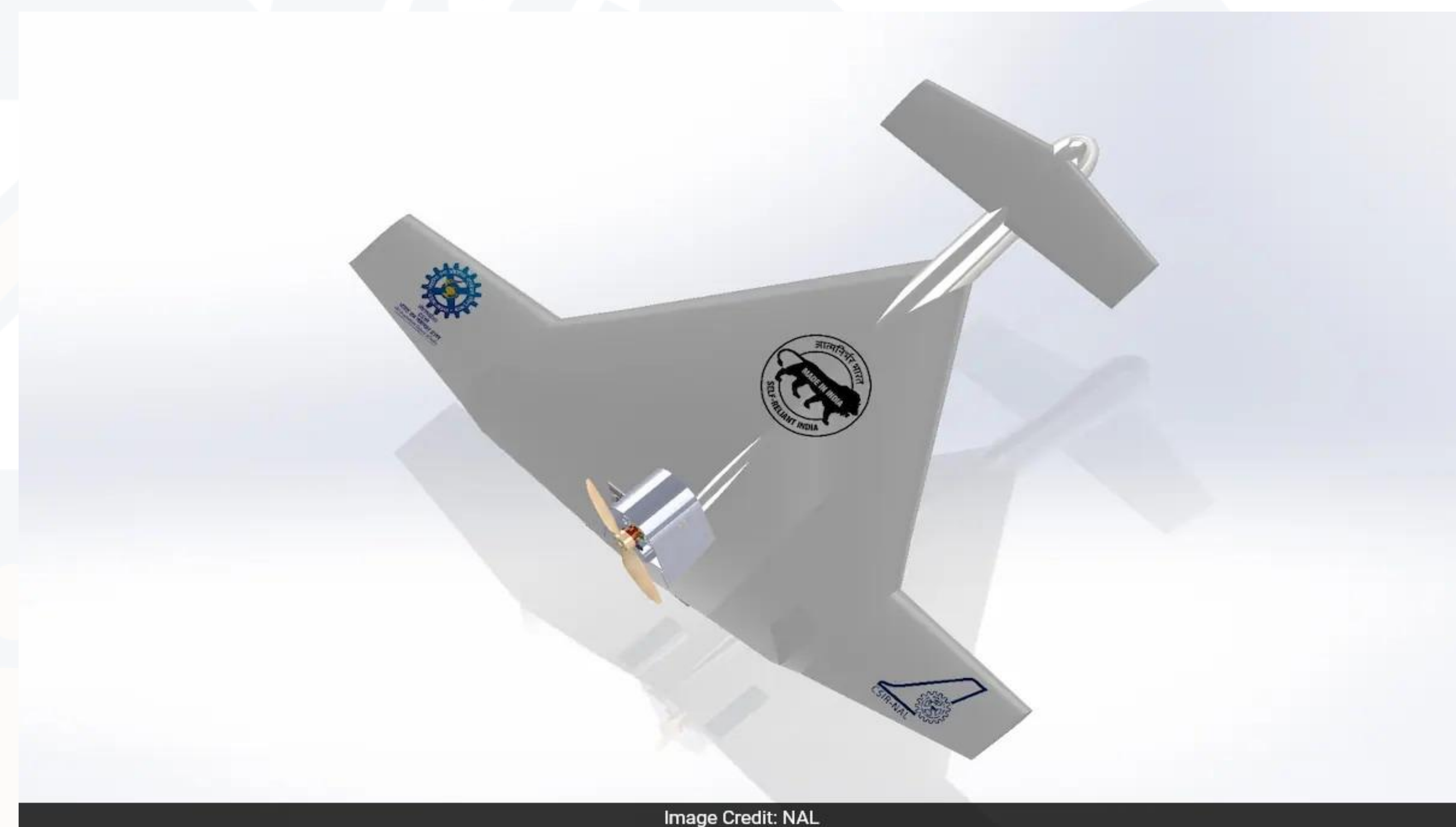


Image Credit: NAL

Ukraine war and the Israel-Hamas conflict in Gaza. These unmanned aerial vehicles have been used extensively by the Ukrainians to target Russian infantry and armoured vehicles.

They loiter in the general area of interest for an extended period, carry explosives and ram the target when commanded by a human controller sitting far away. They can be sent in swarms, i.e. multiple drones and attack enemy installations by overwhelming the radars and enemy defences.

Dr Abhay Pashilkar, Director of the National Aerospace Laboratories, who is spearheading the research says, "India is developing these fully indigenous kamikaze drones, they are a game-changing 21st century new age war machine". The Indian kamikaze drone will be around 2.8 meters long with a wingspan of 3.5 meters, weigh about 120 kg and carry an explosive charge of 25 kilograms.

Dr Pashilkar told NDTV, that the Indian loitering munition will have an endurance of about nine hours meaning, that once launched, it can continuously hover in the area of interest. After the target is identified, the controller after authorization can send the do-and-die drone

on its suicide mission. The Council of Scientific and Industrial Research (CSIR) has given in-principle approval for launching a project on Loitering Munitions or kamikaze drones with CSIR-NAL as the nodal laboratory and participation from all the major engineering laboratories of CSIR. This capability will address our national security needs.

The Indian kamikaze drone will use a 30-horsepower Wankel Engine designed and developed by the National Aerospace Laboratories and can fly continuously for 1,000 kilometres with a maximum speed of 180 kilometres per hour.

The Indian version will be able to work in GPS-denied scenarios and can use the Indian NAViC for navigating and homing on to the target.

Post a comment

"Such drones deployed by other nations have shown great potential in the modern ongoing wars elsewhere," asserts Dr Pashilkar.

Big win! CSIR-NPL launches comprehensive certification for Continuous Emission Monitoring Systems across India

CSIR-NPL, NEERI

12th August , 2024

Continuous Emission Monitoring System (CEMS) is a critical tool for accurate pollution monitoring and reporting, essential for industries across India. In 2014, Central Pollution Control Board (CPCB) mandated the installation of CEMS in 17 categories of highly polluting industries and common pollution control facilities. However, despite this mandate, CEMS data has yet to be fully utilised for regulatory and compliance purposes due to concerns about its reliability. To address this, a robust certification and quality assurance system is required.

In August 2019, the Union ministry of environment, forest and climate change designated the Council of Scientific & Industrial Research-National Physical Laboratory (CSIR-NPL) as the national verification agency responsible for certifying instruments and equipment used for monitoring emissions and ambient air.

After five years of dedicated effort, CSIR-NPL has developed a certification scheme, NPLI CS and associated testing facilities for CEMS. As of now, CSIR-NPL has begun accepting applications for the certification of gaseous CEMS, with certification for particulate matter (PM) CEMS expected to follow shortly.

Nivit Kumar Yadav, director of industrial pollution team at Delhi-based think tank Centre for Science and Environment (CSE) said the certification was a big win. “CSE has been working on CEMS for the past 9-10 years and advocating for a CEMS certification system in India. Certification is crucial step in ensuring the quality of CEMS data and in facilitating its use for regulatory and compliance purposes,” he said.

Rupesh M Das, senior principal scientist, environmental sciences and biomedical metrology division, CSIR-NPL said, “After five years of extensive effort, CSIR-NPL has initiated CEMS

certification in India. Applications for gaseous CEMS are now open. The laboratory is also developing the conformity test facility for PM-CEMS certification and expected to begin soon.” Once an application is received from manufacturer for certification, the manufacturer must submit two identical sets of CEMS to CSIR-NPL, an official informed.

The certification committee, which includes representatives from testing and calibration facilities, regulatory bodies and independent external experts, will then develop the required test programme and direct the testing facility to perform the required tests accordingly. The entire certification process will be overseen by this committee, which is constituted by the member secretary of NPLI CS. Based on the results, certification committee submits its recommendation to apex body, NPL India Certification Body (NICB) for grant/refusal of certificate. =

The NICB has members from CSIR- NPL, CPCB and CSIR-NEERI. The CEMS certified by TUV/MECERT and United States Environmental Protection Agency, needs to be verified by CSIR- NPL certification agency as well.

The CSIR-NPL has also developed a testing facility for PM 2.5 in Continuous Ambient Air Quality Monitoring Systems (CAAQMS) and has started accepting applications for the certification of Indian-made low-volume PM 2.5 monitoring systems.

CEMS certification is crucial for ensuring that the products manufactured in India meet both national and international standards, providing reliable data for legal and compliance purposes. This certification process also prevents the installation of outdated, non-compliant CEMS that fail to meet CPCB directives.

In 2022, CSE published a report titled CEMS certification system in India-CSE Proposal, emphasising the need for a robust CEMS certification system and proposing a process similar to that used in Europe. The report highlighted the importance of product certification as the first and vital step, particularly in India, where some local vendors mislead industries by

selling substandard products that generate poor-quality data. The NPL India Certification process mirrors the European approach. CSE has also been advocating the similar CEMS certification process, as suggested in its 2022 report. In the first part of the process, manufacturers submit their applications for certification. The certification agency, NPL, has established a certification committee to oversee all certification processes. This committee reviews the applications and directs the testing facility to conduct the necessary tests.

The CSIR-NPL testing facility will perform the performance test (laboratory and field tests), ensuring compliance with EN ISO 17025, which outlines the general requirements for the competence of testing and calibration laboratories. In addition, NPL conducts an audit of the manufacturer and prepares a comprehensive report.

After reviewing the test results and audit reports, the certification committee makes a recommendation to either issue or reject the certificate.

For a robust quality framework, a four-stage quality assurance process is required. This includes Quality Assurance Level 1 (QAL-1), Quality Assurance Level 2 (QAL-2), Quality Assurance Level 3 (QAL-3) and the Annual Surveillance Test (AST). Product certification is the first level, known as QAL-1. The QAL-1 procedure assesses the potential suitability of CEMS equipment through a series of laboratory tests, field tests and an audit of the manufacturer's quality management system.

The CSIR-NPL certification procedure aligns with the European standard EN-15267 (Parts 1, 2 and 3). EN-15267-3 specifically defines performance standards and test procedures for CEMS that measure gases and particulate matter from stationary sources.

CSIR-NPL is also collaborating with the CPCB to develop procedures for QAL-2 and AST, aiming to complete the quality assurance framework for CEMS.

Ten years after CEMS was introduced in India, CSIR-NPL is taking crucial steps to improve

CEMS data quality. The certification process involves several stages, including field tests, laboratory tests and audits of CEMS manufacturing units. While challenges and limitations may arise during the implementation of CEMS certification, they need to be addressed by the certification agency. Given the urgency of the situation, it is essential to expedite the certification process and it is the responsibility of the certification agency to do so.

First fully indigenous vaccine shows 'near-complete protection' from Covid

CSIR-IMTECH

11th August , 2024

Bengaluru: In what could be a major boost to fight future SARS-COV-2 infections, researchers from CSIR-Institute of Microbial Technology (IMTECH), Chandigarh, have developed a "safe and highly effective" protein subunit-based vaccine candidate offering "near-complete protection" in preclinical studies.

Newer variants of SARS-CoV-2 capable of evading the human immune response continue to emerge, although not of pandemic-proportions such as those detected in 2020 and 2021. Most existing Covid vaccines currently in human use are based on messenger ribonucleic acid (mRNA), inactivated Covid virus or non-replicating virus vectors.

Recently published in the international journal Vaccine (Elsevier), CSIR-IMTECH's paper reported the development and pre-clinical assessment of an engineered antigen IMT-CVAX, which is a recombinant prefusion-stabilised trimeric spike protein, to tackle Severe Acute Respiratory Syndrome-related Coronavirus 2 (SARS-CoV-2) infections.

The project was funded by the Council of Scientific and Industrial Research (CSIR), New Delhi, and the team was headed by principal scientist Dr Ravi P N Mishra. Dr Mishra told DH that this was a "first-of-its-kind study", completely based on indigenous resources for antigen designing and production, characterisation, and preclinical assessment of efficacy.

Dr Sanjeev Khosla, Director, CSIR-IMTECH, said that the idea was to generate scientific know-how and set up an indigenous technology platform for the development of vaccine proof of the concept, either for Covid variants or similar pathogens, so that we have readiness for any exigencies or pandemic-like situations in the future.

How is IMT-CVAX different?

Protein subunit-based vaccines have a documented ease of large-scale production and transportation, efficient storage in standard refrigerators, compatibility with approved adjuvants, and safe administration to individuals across age groups, making them well-suited for mass immunisation programmes.

The IMTECH team used the SARS-CoV-2 spike protein — one of four structural proteins encoded in the virus that is the major virulence factor enabling pathogens to infect the host (human) and stabilised it to use as the antigen IMT-CVAX.

It elicited robust anti-spike IgG antibodies in mice, effectively neutralising various virus variants, including Delta, one of the most common variants during the Covid second wave in 2021.

Vaccine testing

Vaccine efficacy was tested at the viral biosafety level 3 laboratory at CIDR, IISc, where it was found that it provided hamsters "excellent protection" against the SARS-CoV-2 infection, compared to control groups that did not receive the vaccine.

Dr Shashank Tripathi, Assistant Professor, CIDR, said: "We tested seven SARS-CoV-2 vaccine candidates in our lab using the Hamster model during Covid-19 pandemic. IMT-CVAX emerged as the best performing vaccine."

The NII's vaccine immunologist, Dr Nimesh Gupta, and his team evaluated the immunological effectiveness of the adjuvanted IMT-CVAX and found that the vaccine generates potent humoral immunity by inducing a robust T-cell-mediated germinal centre response. Germinal centres, located in lymphoid organs, are critical for developing protective immunity.

Efficacious vaccine candidate

The study's authors concluded that the adjuvanted IMT-CVAX is an "efficacious vaccine candidate" to offer broad and long-lasting immunity against any future SARS-COV-2

infections, showing no visible adverse side-effects in mice and hamsters. "It is imperative to have a robust expression system and bioprocess for generating high quality and quantity antigen that meets the prerequisites of clinical development to ensure a rapid response to any potential pandemics," noted Dr Mishra.

The CSIR-IMTECH team has also filed international patents in the effort to protect the innovation and secure the intellectual property.

About the vaccine

Funded by: Council of Scientific and Industrial Research (CSIR), New Delhi.

Team lead: Dr Ravi P N Mishra, Principal Scientist, CSIR-IMTECH, Chandigarh.

Collaborators: The Centre for Infectious Disease Research (CIDR), IISc, Bengaluru and National Institute of Immunology (NII), New Delhi.

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