Edition: 1-5 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Saras Mk2 aircraft

CSIR to setup a Genome Sequencing Lab at NCL Pune

The Council for Scientific and Industrial Research (CSIR) has decided to set up one more genome sequencing laboratory at the Pune based National Chemical Laboratory (NCL) in addition to already existing two such setups at the National Institute of Virology and National Centre for Cell Science. This decision has come in the purview of the worsening COVID-19 situations in the country. This new venture is all set to get enough funding and resources as told by the CSIR Director-General Shekhar Mande on Sunday.

'Suraksha Box' for the under-privileged

The 15.1k mission by the Head Held High Foundation (HHH) envisages donation of 15,100 Suraksha Boxes to small vegetable vendors/kirana stores & government schools in India. The Suraksha box is a UVC Light sterilization box which can be used to keep fruits, vegetables, keys, wallets, goggles, etc. sanitized from all viruses including all strains of COVID-19 disinfected and clean. CSIR-CMERI (ICMR Approved lab) has tested, approved, and certified this product to safeguard against viruses, bacteria & fungi including COVID-19. Suraksha Box has a Govt. of India (MC&I) published patent. The Head Held High Foundation (HHH) has taken up the responsibility of providing Suraksha Boxes to underprivileged sections of society, front-line workers, schools and institutions, slum dwellers, etc. NextGenInnov8, a transformation focused venture, has partnered with the Bengaluru-based HHH for its Mission 15.1k.

Saras Mk2 aircraft development speeds up

The CSIR- National Aeronautics Laboratories (NAL) takes a step further in the development of its recently taken up highly advanced project - Saras Mk2 –which is an Indigenous Next-Gen Commuter Transport Aircraft, with the utility to be used as local aircraft for the Government's Udaan scheme. This scheme focuses on enhancing connectivity to remote and regional areas of the country. The 14-seater Saras Mk1 (PT1N) is presently undergoing modifications to its cockpit layout and its cabin configuration so that it will be used as a Test-bed aircraft for the development of Saras Mk2. NAL has been overseen for the same by the Council of Scientific & Industrial Research (CSIR), which has sought additional Rs 100 crore of funds for its development from the Central Government.

CSIR-NGRI develops first of its kind system to detect calamities

Recent landslides in the Himalayas caused due to ice melting are leading to frequent severe accidents. February of this year saw over 100 deaths because of the unexpected raging of floods in Uttarakhand. As a response to these frequent calamities in the area, the CSIR-NGRI has developed a system to detect this kind of threat early with the help of seismographs. The system is first of its kind developed in India and shall be helpful in giving early warnings with seismographs, as well as other information with high accuracy on calamities to help the areas be well-prepared and avoid destruction.

An Initiative by:

Reference:

CSIR matters

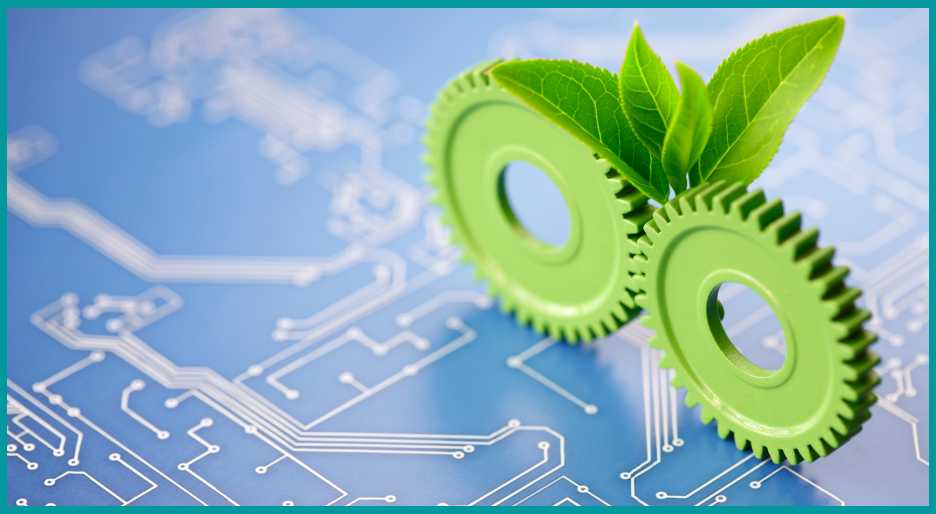
(Edition 1-5 April 2021)

Edition: 6-10 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



CSIR-IICT joins hands with VIT-AP to create research opportunities for students

The School of Advanced Sciences, VIT-AP University, and CSIR-IICT have signed a Memorandum of Understanding (MoU) under which the institutions will seek to bring forth project proposals in areas of mutual interest of faculty and students which could be submitted to various agencies/industries for funding. The collaboration will help faculty and students to get an opportunity to conduct research in advanced thrust areas in science and technology. VIT-AP along with IICT look forward to working on areas that would be beneficial to the academia which in turn would reflect on to the society.

Oxygen Enrichment Unit developed by CSIR-CMERI

With the oxygen supply being a major problem amid the pandemic, the CSIR-CMERI has indigenously developed Oxygen Enrichment Unit that works on the principle of Pressure Swing Adsorption (PSA) and utilizes Zeolite Columns to selectively remove nitrogen from air under certain pressure, thereby increasing the Oxygen Concentration. An Oxygen enrichment unit is a device, which concentrates the Oxygen from the air around us by selectively removing nitrogen to supply an oxygen-enriched air. The concentrated Oxygen is delivered to the patients, having respiratory diseases, through oxygen mask or nasal cannula. The device may be used in remote places, homes or hospital-like facilities for patients with chronic obstructive pulmonary diseases (COPD), chronic hypoxemia and pulmonary edema. It may be used as an adjunct treatment for severe sleep apnea (in conjunction with a continuous positive airway pressure unit).

Need for Green Technologies highlighted on 63rd NEERI Foundation Day

CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) celebrated its 63 rd NEERI foundation day on 8 April 2021. Speaking on the occasion of 63rd NEERI Foundation Day celebrations of CSIR- NEERI, the Hon'ble Minister and chief guest at the event Nitin Gadkari called for the deployment of green technologies to improve environment and economy. He praised the exceptional contributions of CSIR-NEERI made to the environment and society involving the Namami Gange Programme and Green National Highways Corridor Project. He urged CSIR to extend the outcome of research for betterment of the society through communication, coordination and cooperation.

CSIR-NGRI to monitor a construction on Malabar Hills

The Bombay High Court directed CSIR- National Geophysical Research Institute to conduct a tracer test to fully establish the possible impact of a nearby construction on the inlet water of the Banganga Tank at Walkeshwar, Malabar Hill. The direction followed after a preliminary report of an HC appointed committee of experts - including from NEERI, NGRI, Central Ground Water Board, IIT-Mumbai - said the construction is on an 100 metre upslope in the north-east of the tank and there are no cracks or seepages on the rocks due to the piling work. Additional solicitor general Anil Singh said it will require a three-month monitoring to submit a final report about the same. Singh informed that NGRI has nominated a senior scientist to provide inputs on observations made in the committee's report.

An Initiative by:

Reference:

CSIR matters

(Edition 6-10 April 2021)

Edition: 11-15 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR's indigenously developed solutions amid COVID-19 pandemic

Amid shortage of medical grade Oxygen for the rising number of Covid-19 patients in the country, two institutions of the public sector R&D body - Council of Scientific & Industrial Research (CSIR) – have come out with indigenously developed solutions. One of these solutions has come from the Dehradun-based Indian Institute of Petroleum for quickly setting up on-site oxygen enrichment units in hospitals itself, to save precious time during the pandemic.

The other one, developed by Durgapur-based Central Mechanical Engineering Research Institute (CMERI), can work quite effectively up to the altitude of 14,000ft, helping in treating Covid-19 patients in north-eastern states and other high-altitude terrain and battlefields in the Himalayan region.

CSIR-IIP's innovative Diamond Jubilee celebration

The Council of Scientific and Industrial Research (CSIR) director general Sekhar Mande flagged off a bus of the CSIR-Indian Institute of Petroleum (IIP) run on diesel obtained from the waste plastic conversion plant installed at CSIR-IIP. Additionally, he also drove a Tata Tiago car run on green diesel named DILSAAF (Drop In Liquid Sustainable Aviation and Automotive Fuel) from CSIR IIP's bio-jet plant. This was done during a function held in hybrid physical online mode as part of the institute's diamond jubilee celebration on April 14.

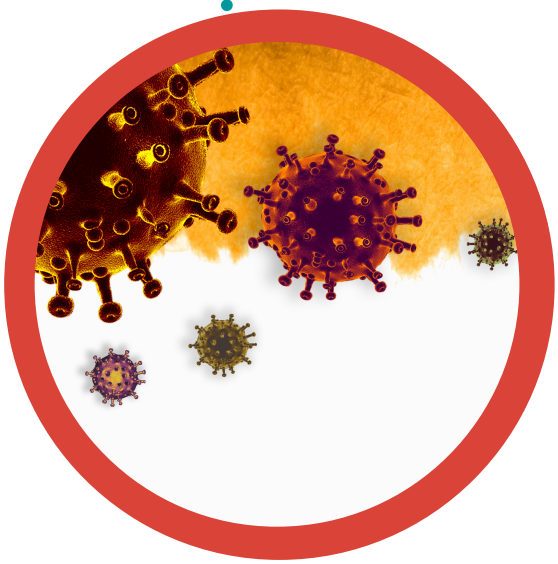
Speaking on the occasion, Mande highlighted the role of CSIR in bridging the gap between industry and academia, and shared his vision of presenting India on the global map through the achievements of CSIR. He highlighted major achievements of CSIR during Covid period while adding that the council has contributed considerably to Covid studies.

Italian Research Day celebration by CSIR-NEERI with the Italy Embassy

India and Italy have many commonalities. Both are ancient civilizations and water has played a very significant role in the growth of both the civilizations. It is appropriate that the Italy Embassy in New Delhi and the CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) jointly hosted a webinar on "Water Resources and Human Civilization" on The Italian Research Day - April 13. A distinguished panel of experts spoke on various topics including the Tiber River in Italy, Saraswati River and the Ganges. Eminent speakers graced the webinar with their presence including Dr Massimiliano Moscatelli, Institute of Environmental Geology and Geo engineering, Rome, as well as Prof SK Tandon, Indian Institute of Science Education and Research, Bhopal.

ITALIAN RESEARCH DAY

CSIR-IGIB's research answers vital questions about COVID-19



India is currently dealing with the second wave of COVID-19. As cases surge, people who had contracted the virus and recovered from it often ask a question - how long does natural immunity against coronavirus last?

According to research by the Institute of Genomics and Integrative Biology (IGIB), natural immunity against COVID-19 lasts for 6 to 7 months. It also states that between 20-30% of those infected with the virus shed this immunity after a 6-month period.

The findings of this research are particularly important for India as they could potentially explain the timing of the second wave of the COVID-19 pandemic in the country. The results also emphasise the importance of vaccination against virus infection. Research on the immunity period of COVID-19 vaccines is still ongoing, but most vaccines currently in use are expected to protect beneficiaries from severe coronavirus infection or death for at least a couple of years.

CSIR-NISCAIR and RSS' Vijnana Bharti launches Luni-Solar Calendar for food habits

The National Institute of Science Communication and Information Resources (NISCAIR) and Vijnana Bharati launched a thematic Luni-Solar Calendar that imparts information on the medicinal and nutritional values of food. This calendar was launched through a special session organised jointly by both the involved bodies.

The Luni-Solar calendar prominently displays the "Tithi"and"Paksha". It also displays the corresponding date as per the Indian National Calendar of Government of India and the Gregorian system, highlighting the scientific basis of Indian calendar system and scientific content on the seasonal fruits and vegetables.

Since 2019, the world is facing the acute challenge of COVID pandemic and it is linked with our food habits and resultant immunity, according to Vijnana Bharati, an RSS organisation. This effort was taken in the purview of the worsening situations of the COVID-19 pandemic.

An Initiative by:

Reference:

CSIR matters

(Edition 11-15 April 2021)

Edition: 16-20 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-CBRI at Infrastructural Rescue

The COVID-19 second wave has hit India quite badly in 2021, with lakhs of people testing positive for COVID each day. The medical infrastructure and resources are falling short even though frontline workers are working day and night to cope with the situation. The Council of Scientific and Industrial Research (CSIR) has done its fair part in providing relief to people in several ways within its capacities. The CSIR-Central Building Research Institute (CSIR-CBRI) is one such laboratory that has taken up the noble initiative of making durable but temporary hospital blocks available at the Safdarjung Hospital and Lady Hardinge Medical College. On the positive side, an improved capacity of 15 lakh tests per day in 2467 was noted along with development of hospital infrastructure including COVID Care Centres and more than 12,000 quarantine centres in April 2021, as told by Health Minister Dr. Harsh Vardhan.

CSIR-CCMB gives green signal to 'i2Cure'- a new, promising disinfectant

The CSIR-CCMB and Intertek (USA) have given certification to i2Cure, the new molecular iodine based detergent. Anil Kejriwal, a serial entrepreneur and venture capitalist has partnered with US-based molecular iodine specialist, Dr Jack Kessler to launch i2Cure, a healthcare brand that claims to safeguard against viral infections.

Even though iodine has been used by human beings for 200 years, the last research on iodine was done as Povidone Iodine 50 years ago.Active ingredient in Povidone Iodine is molecular iodine which is stabilised at only 5-8 PPM (parts per million). Dr Kessler managed to create a product at a few thousand PPM. This makes i2Cure molecular iodine a few hundred times more powerful than Povidone-Iodine. He has also removed the nasty color and smell of iodine.

An Initiative by:

Reference:

CSIR matters
(Edition 16-20 April 2021)

CSIR-IIP turns 60, with more Innovations to come

The CSIR-Indian Institute of Petroleum celebrated its Diamond Jubilee on April 14, 2021. The reputed institute celebrated the completion of 60 years of its existence with a hybrid physical-online event themed 'Atma Nirbhar Bharat: Utilization of Indigenous Carbon Resources and Reduction of Import Crude Dependency. This event had Dr Sanjay S Katty, DG, ONGC Energy Centre as the chief guest, while Dr Shekhar CMande, DG, CSIR, was the Guest of Honor.

Along with several successful innovations by CSIR-IIP, the achievements of CSIR during COVID and post COVID period were remembered during this event. These included the COVID studies like Paper Based Diagnostic based on CRISPR-Cas, FELUDA developed by CSIR IGIB and commercialised as TATA MD Check, ICMR approved Dry Swab based Diagnostic technique validated by CDFD Hyderabad and IISER Orissa, and Ciplenza (repurposed generic drug) developed by CSIR ICT in collaboration with CIPLA, etc.

CSIR-IIP also launched its bio-diesel run car and bus on this eve. This innovation developed in response to increasing pollution caused by stubble burning, is set to be introduced in Mohali, Punjab and Navrangpur in Orissa for its pilot introduction. The event also marked the 130th anniversary of Dr. Babasaheb Ambedkar, who was dearly remembered during the program.

CSIR-NEERI - A Prompt Testing Center

With COVID-19 testing centers attracting more people than ever, overcrowding has become a severe problem. Due to surge in Covid, the swab collection for RTPCR test in all centers of Nagpur Municipal Corporation (NMC) also resulted in overcrowding. Even after getting tested, the citizens had to wait for a day to get reports from all labs except the CSIR-NEERI. CSIR-NEERI has been duly serving the patients with their test results as soon as they are out. Even the samples from RTPS Centre are processed at the NEERI lab and the results of these tests are given the same day.

Edition: 21-25 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Photo Source: Business Insider India

CSIR-IIIM funds IAF for the medical equipment

The Indian Air Force (IAF) airlifted medical equipment weighing 1,700kg, including bio-safety cabinets and centrifuges to Ladakh, which will help augment COVID-19 testing facilities in the union territory. The Council of Scientific and Industrial Research – Indian Institute of Integrative Medicine (CSIR-IIIM) in Jammu provided the equipment for the same.
The IAF's Chinook and AN-32 helicopters airlifted a payload of 850 kgs each, comprising a total of four biosafety cabinets, two centrifuges and two stabilizers to Leh and Kargil. The items worth over One Crore INR were handed over by CSIR-IIIM Jammu for the UT of Ladakh.

Cost-Effective technology to recycle Aluminium

A team of Scientists from renowned institutes has developed a cost-effective technology to recycle Aluminium scraps efficiently, minimizing material losses in the process. These scrapes can be used by small and medium scale industries. Dr.C.Bhagyanathan, Associate Professor from Sri Ramakrishna Engineering College, Coimbatore along with Dr. P. Karuppuswamy, Professor Sri Ramakrishna Engineering College and Dr. M. Ravi, Sr. Principal Scientist, CSIR-NIIST Trivandrum developed a technology system that could combine value added/non-value added and hazardous/ non-hazardous wastes, Aluminium alloys and assorted scraps for industrial applications and recycle them efficiently. The technology was developed with support from the Advanced Manufacturing Technologies program of the Department of Science & Technology (DST), Government of India aligned with the 'Make in India' initiative. The developed technology can be used in tiny & cottage Industries, Small Scale Industries and MSME Aluminium foundries and recycling industries.

10 CSIR labs under INSACOG detect UK variant to be more prevalent

The UK variant of the Corona virus is distinctly more prevalent in several northern and central Indian States as compared to the southern ones, marked by increased infectivity. This has come forward through a perusal of genome sequencing data from the National Centre for Disease Control (NCDC). Two scientists from Central government labs that analyze national genome sample data alarmed that large gatherings in Punjab have significantly amplified transmission of the variant in Delhi, Uttar Pradesh and Haryana.
The NCDC is the coordinator of genome sequencing data from the Indian SarsCov2 Genome Consortium (INSACOG) – a group of 10 CSIR labs across India that is collecting a fraction of coronavirus positive samples from international travelers, their contacts as well from the local communities to check for patterns in mutations. The especially known variants of concern (VoC) include the UK variant, the South African variant (B.1.1.35) and the Brazil variant.

CSIR-CMERI's innovative step-up amid Oxygen Crisis

CSIR-CMERI has transferred its Oxygen Enrichment technology to the Hyderabad-based Apollo Computing Laboratories, to meet the oxygen supply chain problem of transportation and storage risks related to oxygen cylinders. Harish Hirani, Director, CSIR-CMERI, said the unit requires easily available oil-free reciprocating compressors, Oxygen grade zeolite sieves and pneumatic components. It is capable of delivering medical air in the range of upto 15 LPM with oxygen purity of more than 90 percent. If required, this unit can even deliver upto 70 LPM at a purity of around 30 percent and can safely be placed in the isolation ward of the hospital for patients who are in dire need of Oxygen.

An Initiative by:

Reference:

CSIR matters
(Edition 21-25 April 2021)

Edition 26-30 April 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

ICMR Telangana to test vaccine delivery through drones

Amid the COVID crisis, the Ministry of Civil Aviation has granted a conditional exemption for ICMR, Telangana to test vaccine delivery through drones. This permission will be valid for a year and has been given for drones which operate within the visual line of sight (VLOS) range. Each drone would carry a combination of dummy vials and regular vaccines over the course of the trials and the performance would be recorded in detail. The data shall be used to guide further policies regarding full-scale adoption. The ICMR has partnered with IIT Kanpur for this project.

Additionally, in February the office of the Principal Scientific Advisor proposed a pilot scheme to prove feasibility of distributing Covid-19 vaccine using unmanned aerial vehicles. The organizations responsible for this particular pilot are CSIR-Central Scientific Instruments Organization (CSIO), CSIR- National Aerospace Laboratory (CSIR-NAL), CSIR-Indian Institute of Petroleum (CSIR-IIP), CSIR-4PI and IIIT Bengaluru.

CSIR-CFTRI supports MMC-RI in its battle against COVID-19

India being a developing country with its healthcare facilities still in a primary stage, the COVID-19 outburst is proving to be difficult to tackle. Many places in India is coping with the situation step by step. For example in Mysuru, the Government Laboratories were not designed to handle testing of an invisible virus, but it worked swiftly in this direction by setting up two Labs to test the samples and give quick results. Now it has three COVID-19 Testing labs. The healthcare experts and students at the Mysore Medical College and Research Institute have been working without a leave for almost a year now, except for a brief period in February this year.

To help this medical taskforce to deal with RT-PCR test samples, the CSIR- CFTRI COVID-19 Testing Centre has also been set up at the Government Ayurveda Hi-Tech Panchakarma Hospital. It was done as per the directions from Dr. Shekhar C. Mande, DG-CSIR, Dr. KSMS Raghavrao, former CFTRI Director and Dr. Sridevi Annapurna Singh, the current CFTRI Director.

CSIR-IICT puts light on COVID-19 Appropriate Behavior and Vaccination

To propagate behavioral etiquettes amid COVID, a webinar on "Campaign for Covid-19 Appropriate Behavior and Vaccination" was organized by the CSIR-Indian Institute of Chemical Technology (IICT). It urged the citizens to get vaccinated, and take precautions to protect against the disease. Dr. S Chandrasekhar, Director CSIR- IICT, in his welcome address said that people should not hesitate to take vaccine as vaccination is one proven way to control the disease. He said the firms manufacturing vaccines worked under very difficult conditions to deliver and protect people against Covid-19 and that their efforts should be respected.

A similar kind of message has also come from CSIR-Centre for Cellular & Molecular Biology (CCMB) Director Rakesh Mishra.

CSIR-CMERI's solution to the Oxygen Crisis in India

The Oxygen Enrichment Unit (OEU) developed by CSIR-CMERI to the MSMEs and other entrepreneurs can provide a veritable solution to properly tackle and control the Oxygen crisis. CSIR- CMERI has been conducting series of webinars for dissemination of awareness on the Oxygen Enrichment Unit. Even in a Post-COVID scenario, the Oxygen Enrichment Units can be a game-changer for ailing aged persons as well as Therapeutic Usage of Oxygen, because it helps in detoxification. If innovatively used by the MSMEs, a Single Air Compressor strategically placed outside the room can help serve 4-6 patients at one go.
The CSIR-CMERI has already transferred the technology to M/s Jyoti CNC Automation Ltd, Rajkot and M/s GRID Engineers Pvt Ltd, Gurugram. Prof. (Dr.) Harish Hirani, Director, CSIR- CMERI also stated that CSIR-CMERI has transferred the license for production, marketing and service to four industries and he is confident that the all four parties are able to manufacture the product by the 2nd week of May 2021.

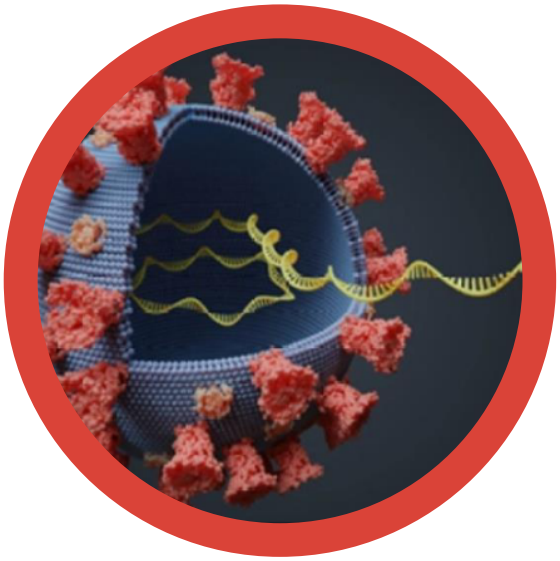
Pyrasol – an Indo-German Project to transform Urban Waste Management techniques

The CSIR- Central Leather Research Institute (CLRI), Chennai has developed the Integrated Solar Dryer and Pyrolysis pilotthat strives to offer an innovative approach for smart cities to transform their urban untreated organic waste into biochar and clean form of energy. With greater emphasis on Industrial participation, applied research and technology advancement, the project was rendered to CSIR-CLRI (Council of Scientific and Industrial Research) by the Indo-German Science & Technology Centre (IGSTC). The project has been named as Pyrasol which stands for Pyrolysis and Solar systems integrated in a single package. The mission focuses on managing and streamlining the collection, segregation, treatment, and disposal systems of urban wastes in Indian Smart Cities as well as other urban centers on their path to sustainability.

CSIR-IGIB to launch SARS-CoV-2 genome sequencing with support from Maharashtra Govt.

The Maharashtra Government has signed a memorandum of understanding (MoU) with the Council of Scientific and Industrial Research (CSIR)-Institute of Genomics and Integrative Biology (IGIB) for SARS-CoV- 2 genome sequencing. This move came after the Kerala Government, which had launched a genome sequencing program to better understand the mutation of the novel coronavirus and validate the policies implemented to contain its transmission.

AYUSH-64 – a ray of hope amid the deadly second wave



Amid the dark times of COVID-19, AYUSH-64 has emerged as a ray of hope for the patients of mild and moderate COVID-19 infection. The scientists of reputed research institutions of the country have found that AYUSH 64, a poly herbal formulation developed by the Central Council for Research in Ayurvedic Sciences (CCRAS), Ministry of Ayush is useful in the treatment of asymptomatic, mild and moderate COVID-19 infection as an adjunct to standard care. This drug was initially developed for Malaria in the year 1980 and now is repurposed for COVID-19.

An Initiative by:

Reference:

CSIR matters
(Edition 26-30 April 2021)

Edition: 1-5 May 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Photo Source: India Today

Lions detected COVID-19 positive by CSIR-CCMB in Hyderabad

Amid the rapid COVID-19 surge in the country, eight Asiatic lions have tested positive for Covid-19 at a zoo in Hyderabad, registering the first such case reported in India. The analysis of the genomes of the coronavirus samples from these lions was carried out by the CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) in Hyderabad, which houses one of India's four designated Covid-19 testing centres for captive animals. The lab also confirmed that these felines were not infected by any variant of concern.

Veterinarians at the Nehru Zoological Park reportedly noticed the lions showing Covid-like symptoms in the last week of April. Of the 12 lions at the zoo, eight were found coughing with other symptoms including nasal discharge and loss of appetite, but the felines are reportedly "doing well" currently.

Improvised RT-PCR method of COVID-19 testing by CSIR-CCMB

The dry swab based direct RT-PCR method of COVID-19 testing, developed by CSIR-Centre for Cellular and Molecular Biology (CCMB) and approved by ICMR has been adopted in testing labs across the country. This method is easier to carry out than the current procedures, and can ramp up testing by 2-3 fold using the current infrastructure in the testing labs. The CCMB has offered to train ICMR-approved government as well as private COVID-19 testing centres to help them adopt this method. It aims to train staff at 500 testing centres across India, starting this week. Most of these sessions will be online. The willing centres can book their slots on --http://e-portal.ccmb.res.in/dst_slotbooking/

Mortality Prediction Model developed by IIITH and CSIR-IGIB

Researchers at the International Institute of Information Technology Hyderabad (IIITH) have come up with a Mortality Prediction Model to help in prioritizing healthcare based on risk and mortality prediction. As part of a joint project funded by IntelCorp, under its Pandemic Response Technology Initiative along with CSIR-IGIB (Institute of Genomics and Integrative Biology), researchers from IIITH have used machine learning models to categorize risk and predict mortality in Indian patients.

Using the same dataset of COVID positive patients from Wuhan, they have identified 5 biomarkers that can be used to predict mortality with 96% accuracy. A technology such as this can be highly effective as predictions can help accelerate the decision-making process of healthcare professionals for appropriate treatments.

Makeshift Hospitals in Punjab amid rising COVID cases

In order to further ramp up the existing health infrastructure and create more hospital beds for critical patients, the Punjab Government is to set up two makeshift hospitals equipped with the ICU facility for Covid patients in Mohali and Bathinda. Besides, nine smaller hospitals at various district hospitals would also come up in the state. For Bathinda, implementation partner CSIR-CBRI would work with HMEL to ensure equipment procurement.

The implementation partner for raising the Mohali hospital would be PSA-PM/IITM through CSR funding and Mohali medical college would ensure coordination and procurement of equipment.

An Initiative by:

Reference:

CSIR matters

(Edition 1-5 May 2021)

Edition: 6-10 May 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Photo Source: India Today

CSIR-NEERI's National Technology Day Celebrations emphasize on a clean and healthy environment

The CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) organized a webinar on 'Sustainable Technologies for Environment Management' as a part of the National Technology Day celebrated on May 11th. The chief aim of this webinar was to highlight sustainable technologies which are playing a significant role in betterment of the environment, economic growth and providing an alternative socio-economic model that will enable present and future generations to live in a clean and healthy environment, in harmony with nature.

CSIR granted INR 1 crore for COVID aid

The State Disaster Management Executive Committee, headed by Chief Secretary RK Tiwari, decided to give Rs 1 crore each to CSIR, NBRI, CDRI and Birbal Sahni Institute of Paleobotany for purchase of consumables and medicines for COVID relief. The use of state disaster relief funds for various Covid-related expenditures was thus cleared. A proposal to allocate Rs7.72 crore for operating quarantine centres in all 75 districts was also approved, along with Rs. 225 crore for purchase of medical consumables in the districts including testing kits, surveillance, screening, quarantine camps, renting vehicles for contact tracing.

CSIR-CMERI virtually transfers latest technologies to manufacturers

CSIR-Central Mechanical Engineering Research Institute transferred its Oxygen Concentrator Technology and High Flow Rate Iron Removal Plant Technology to various manufacturers. Oxygen Concentrator Technology was transferred to M/s. Candl Calibrations Pvt. Ltd, Kota, Rajasthan and M/s. SACORP, IMT Manesar, Gurgaon. Whereas the High Flow Rate Iron Removal Plant Technology was transferred to M/s Maa Durga Sales Agency, Guwahati.

Prof. (Dr.) Harish Hirani, Director, CSIR-CMERI expressed that CSIR-CMERI is trying to boost the MSMEs so that they can manufacture the product for its reach to the masses. The main motto of CSIR-CMERI is to help each and everyone to bring innovation to the common people for which we require cooperation MSMEs who have capabilities of low-cost manufacturing.

An Initiative by:

Reference:

CSIR matters
(Edition 6-10 May 2021)

Edition: 11-15 May 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

COVID-19 virus variant can still infect the vaccinated - study finds

A recent preliminary research shared by the Indian SARS-CoV-2 Genomic Consortia (INSACOG) shows that the Covid-19 variant known as B.1.617, first identified in India, may evade antibodies induced by the Pfizer mRNA and Covishield vaccines. However, while the B.1.617 does enough to cause breakthrough infections (infections in fully vaccinated people), it does not lead to severe or life-threatening versions of the disease. The World Health Organization (WHO) had classified B.1.617 as a variant of concern at the global level. In the study that is yet to be peer-reviewed, researchers from the INSACOG, along with the Covid-19 Genomics UK (COG-UK) Consortium, studied the effect of blood samples from vaccinated individuals against a pseudotyped virus system with HIV-1 particles that enveloped the SARS-CoV-2 spike.
Anurag Agrawal, who heads the CSIR Institute of Genomics and Integrative Biology (CSIR-IGIB), has been working as one of the chief authors of this survey.

CSIR-CMERI's technology transfer to MSMEs

One of the 38 CSIR laboratories spread pan-India, CSIR-CMERI has transferred 125 different technologies to the MSMEs for empowering the sector at large in the last five years. It has also played a vital role in setting up specialized manufacturing hubs to improve the technical capabilities of the National Industry Base and Human Resource Profile, said Prof. Harish Hirani, Director, CSIR-CMERI. He said this addressing a webinar which was organized by MSME-DI, Thrissur entitled 'Oxygen Enrichment Technology & Latest Credit Facilities from SIDBI to MSMEs' on the occasion of National Technology Day- 2021.

An Initiative by:

Reference:

CSIR matters
(Edition 11-15 May 2021)

Edition:16-20 May 2021

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Electrostatic disinfectant spray machines in NTPC Bongaigaon

CSIR-CSIO has designed and developed Electrostatic disinfectant spray machines of 12 lts capacity, which are functional at NTPC Bongaigaon since the month of May this year. These machines, manufactured and supplied by BHEL, aim at working towards fighting COVID 19 and also ensuring that the environment remains free from germs and other harmful microorganisms in NTPC Bongaigaon. This machine is developed based on the electrostatic principle, by producing a uniform and fine spray droplet of disinfectants in the size range of 10-20 micrometre to kill microorganisms and viruses. Due to the small size of droplets, the surface area of spray droplets increases thereby enhancing the interaction with harmful microorganisms and coronavirus. The machine uses very less disinfection material as compared to conventional methods, which helps to save natural resources with a negligible increase of chemical waste in the environment.

CSIR-NEERI's COVID testing technique: A game changer in the pandemic

At a time when experts across India are trying to find ways to fight the inevitable third wave of the novel coronavirus effectively, a newly approved technique can transform the way people are tested for the novel coronavirus. This process, which has been greenlighted by the CSIR- ICMR has not been introduced for the general public yet. Developed by the CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), the new testing technique will completely remove the need for taking the nasal and throat swabs for Covid detection.

It is a sterile saline gargle technique , which has also been approved by CSIR-ICMR. This process uses gargle samples, which are used for detecting the person for the Covid-19 infection. There is no need for collecting an individual's nasal or throat swabs. Unlike the RT-PCR testing tool kits, there is no need to transport the samples in a specific medium also. The technique is completely non-invasive, doesn't require any special training and can be used at home for collecting samples. Unlike the usual RT-PCR, this technique can give results at a faster rate, while also minimizing waste and is very economical. With no need for RNA extraction, simple room temperature incubation can be done with this method.

Human blood parameters change with Altitudes - says new CSIR-CCMB study

A study done on Tibetans by the CSIR-Centre for Cellular and Molecular Biology (CCMB) shows that the blood parameters of people alter when they change their altitude. Tibetans are one of the oldest high-altitude inhabitants in the world. There are known genetic and physiological factors that help them endure low-oxygen conditions. However, their population has now moved to low-altitude regions such as Karnataka. Dr K. Thangaraj and his team from CSIR-CCMB studied changes in physiological factors of Tibetans who now inhabit low-altitude regions. Physiological factors of the people of the Tibetan ethnicity from various regions of the high altitudes of Ladakh were recorded and observed to conclude a major difference in blood parameters.

An Initiative by:

Reference:

CSIR matters
(Edition 16-20 May 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Meril to produce the low cost RT-PCR kits developed by CCMB

A simple and fast method of dry swab-based direct RT-PCR has been developed by Centre for Cellular and Molecular Biology (CCMB), Hyderabad. The method, has been approved by ICMR based on their independent validation and has the potential of bringing the costs and time of testing by 40-50 percent in all kinds of settings. CSIR-CCMB has tied up with Meril Diagnostics, for commercially scaling up the dry swab-based tests across diagnostic labs in the country. Meril is currently equipped to manufacture 2 crore kits a month. Each kit suffices for 100 tests. Using these kits, each test will cost between Rs 45-60.

CFTRI to introduce immunity booster food supplements for children

Due to the probable threat for children in the third wave, Mysuru-based Central Food Technological Research Institute (CFTRI), a Council of Scientific and Industrial Research (CSIR) institute, has come up with a couple of immune-boosting food supplements for COVID-19 patients, especially children. CFTRI had earlier supplied nutritious food like Spirulina-based chikkies containing micro-nutrients and protein during the first wave. A couple of immunity boosting food products for children are in the pipeline at CFTRI waiting for approval from the CSIR.

Post vaccine infections at Delhi caused mostly due to Delta variant: CSIR study

A study which is yet to be peer-reviewed and authored by scientists at the CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) and the National Centre of Disease Control have characterized the variant Delta (B.1.617.2) by high transmissibility and an accelerated surge in infections. Breakthrough infections are instances of people testing positive for the virus after getting vaccinated. In 27 instances of break through infections analyzed, the scientists found that two line ages dominated. B.1.617.1 (Kappa) comprised 8%, Delta was 76% and the remaining linked to variants that belonged to broader “B.1lineages”.

CSIR-CMERI OEU Technology fascinates Jammu & Kashmir industries

Micro, Small & Medium Enterprises Development Institute (MSME DI) Jammu along with Federation Chamber of Industries Kashmir (FCIK) has now shown its interest in the Oxygen Enrichment Unit (OEU) technology indigenously developed by CSIR-CMERI, Durgapur. The representatives of MSME DI Jammu, FCIK, SIDBI, several MSME stakeholders and several start-ups had earlier joined a webinar on the Oxygen Enrichment Unit technology. The technology is capable of serving as a ready means of solution to the oxygen supply crisis in the rugged mountainous region and comparisons shows significant results on several parameters against the standard concentrators available in the market in terms of Higher Flow Rate, FiO2 level, consistent performance for a longer period, ability to work on High Altitude.

Initiative to promote cultivation and production of medicinal plants

A memorandum of understanding (MoU) have been signed by the National Medicinal Plant Board (NMPB) and the National Botanical Research Institute (CSIR-NBRI) to facilitate the development of Quality Planting Material (QPM) of medicinal plants and herbs identified by NMPB, and establishment of their nurseries for QPM. MoU will also facilitate development, promotion, conservation, and cultivation of the appropriate medicinal plants indifferent agro-climatic zones, including the threatened medicinal plant species and plants for the high-altitude regions. The collaboration will support CSIR-NBRI in carrying out potential medicinal plant species with high commercial value for the Germplasm collection/conservation and the establishment of nursery and seedbanks/genebanks. According to the Ministry of Ayush, under which NMPB works, the NBRI while undertaking the survey of medicinal plants, will work in coherence with NMPB in the desired direction.

CSIR –NCL introduces Ayurveda based drinking water disinfecting technology

With water-borne diseases majorly contributing to India's disease burden, the CSIR-National Chemical Laboratory (CSIR-NCL) at Pune has come up with a new technique for disinfecting water by using natural oils. Scientist Dr V.M. Bhandari and his group at CSIR-NCL Pune, with support from the Water Technology Initiative of the department of science and technology (DST), government of India, has developed the novel hybrid technology called "SWASTIIK", which involves boiling of a liquid as a result of pressure reduction (cavitation) and also uses natural oils having antimicrobial properties. This technology can eliminate harmful bacteria, including antibiotic-resistant strains, economically. It not only integrates Indian traditional knowledge of Ayurveda for complete disinfection of water but also may offer possible health benefits of natural oils.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Consortium of eight national labs for COVID surveillance

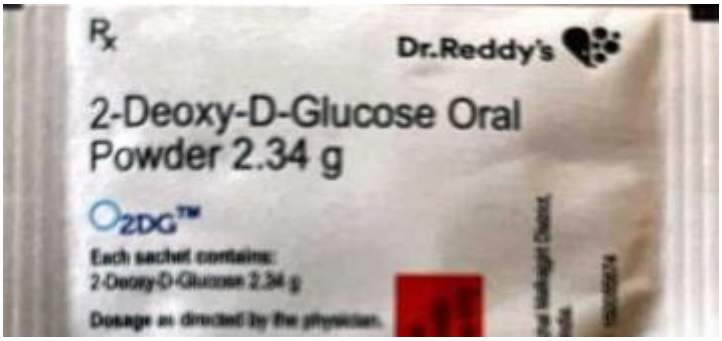
A consortium of four city clusters – Bangalore, Hyderabad, New Delhi and Pune – has been established with eight national labs to upscale SARS-CoV-2 coronavirus genomic surveillance and to complement the national efforts led by INSACOG - Indian SARS-CoV-2 Genomics Consortium. Led by Centre for Cellular and Molecular Biology (CCMB) in Hyderabad, the consortium currently includes different partners in three other cities: National Centre for Biological Sciences (NCBS) in Bengaluru; Tata Institute of Fundamental Research (TIFR) in Mumbai; Institute for Stem Cell Science and Regenerative Medicine (InStem-Department of Biotechnology (DBT); National Institute of Mental Health and Neurosciences (NIMHANS) in Bengaluru; CSIR-Institute of Genomics and Integrative Biology - IGIB in New Delhi; Pune Knowledge Cluster, Indian Institute of Science Education and Research (IISER), Pune and CSIR-National Chemical Laboratory in Pune. The new effort will track the emergence of viral variants correlated to epidemiological dynamics and clinical outcomes. The consortium aims to develop targeted sampling strategies based on granular epidemiological and clinical data

Traces of SARS-CoV2 found in Pune's wastewater

Scientists of the National Chemical Laboratory (NCL) along with officials of the Pune Municipal Corporation (PMC) have found traces of the SARS-CoV2 virus, which causes Covid-19, in sewage samples collected from different areas in the city since December 2020. The samples are being collected since December 2020 as part of a pilot project. Experts have the opinion that testing wastewater could serve as a cost-effective early warning system which could help officials keep track of coronavirus at an early stage, even among asymptomatic persons.

Lee Pharma signs agreement for production of Covid drug (2-DG)

Hyderabad-based Lee Pharma has entered into an agreement with the Indian Institute of Chemical Technology (IICT) to manufacture and commercialize 2-Deoxy-D-Glucose (2-DG). 2-DG is a drug used to treat Covid patients, which was recently developed by DRDO and Dr Reddy's Laboratories. The drug has received approval for use in COVID-19 patients. It has been found to help speed up recovery and reduce oxygen dependence. It has been launched in the form of sachets by Dr. Reddy's Laboratories. The CSIR has been engaged in development of drugs for treatment of COVID-19 and has undertaken many clinical trials for repurposed drugs. The agreement is aimed towards increasing affordable therapeutic options for treatment of COVID-19.



Probiotic food from CFTRI to protect children during COVID-19 third wave

The Central Food Technological Research Institute (CFTRI), a CSIR lab in Mysuru, is currently working on developing food that can boost immunity and prevent diseases. The institute is also working on probiotic food that will protect children prone to the third wave of Covid infection. The probiotic is rich in vitamin A,C,D and E with micro-nutrients necessary to combat infections. The food will keep harmful bacteria and viruses in check. The institute had distributed spirulina chikki, high protein wrap, mango energy bar, banana cereal bar and spiced water with bio-active and antioxidant ingredients to the migrant workers, frontline workers and Covid patients during the first wave of the COVID-19 pandemic.

Repurposed Drug Niclosamide to go through clinical trials

CSIR in collaboration with Laxai Life Sciences Pvt Ltd, has initiated the phase-II clinical trial with anti-helminitic drug Niclosamide for treatment of the Covid-19. The trial is a multicentric, phase-II, randomised, open label clinical study to evaluate efficacy, safety and tolerability of NIclosamide for the treatment of hospitalized the Covid-19 patients. Niclosamide has been extensively used in past for treatment of tapeworm's infection in adults as well as children. The safety profile of this drug has been tested over time and has been found safe for human consumption at different dose levels.

CSIR study reports that air is equally toxic in industrial and residential Lucknow

The 'Assessment of ambient air quality of Lucknow city', PreMonsoon 2021 report, was released by the CSIR-Indian Institute of Toxicology Research (IITR) on the eve of World Environment Day. The report stated that two gaseous pollutants– sulphur dioxide and nitrogen dioxide–have been found below the permissible limits in the city's air but the worrisome fact is that both the gases are showing an increasing trend as compared to the levels recorded in April and May (pre-monsoon period) last year. Also, the level of both the pollutants in a residential area is almost equal to industrial and commercial areas. The ultrafine PM10 and PM2.5 pollants were found to be 10-40% high than permissible limits in various parts of the city by the study.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aroma mission extended to Udhampur District

In an effort to kick start the scientific cultivation of Aromatic crops viz lemongrass & lavender in the Udhampur district, a farmer scientists interaction was organized in collaboration with CSIR- IIIM Jammu under ATMA-SMAE 2021-22. As many as 50 farmers from different blocks of the district participated in the farmers-scientists interaction. Scientists talked about the scientific cultivation of aromatic crops viz lavender & lemongrass in the sub-tropical & temperate region of the district. They presented the cultivation technology & economics of both the crops viz-a-viz traditional agriculture and the scope & importance of aromatic crops in the district. He informed the farmers & officers that because of varied agro climatic conditions in the district there is huge potential of aromatic crops & directed the officers to identify the progressive farmers on cluster basis to harness this potential.

SuvenPharma and CISR-IICT ties up for new anti-Coviddrug (Molnupiravir)

In what comes as a boost to India's pharmaceutical industry amid the coronavirus disease (Covid-19) pandemic, the Council of Scientific and Industrial Research-Indian Institute of Chemical Technology (CSIR-IICT), and the Council of Scientific and Industrial Research-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) have signed an MoU with Suven Pharmaceuticals Ltd. (SPL) for the process technology transfer and manufacture of the anti-Covid drug Molnupiravir. Citing a study published in 'Nature Microbiology', CSIR-IICT said that Molnupiravir can completely suppress Covid-19 virus transmission within 24 hours.

DCGI approves for the clinical trials of Colchicine in Covid patients

Council of Scientific and Industrial Research (CSIR) and Hyderabad-based Laxai Life Sciences will now undertake a two-arm phase-II clinical trial to ascertain safety and efficacy of the drug in improving clinical outcomes during the treatment of Covid-19 patients. India being one of the largest producers of Colchicine, and can provide it to the patients at an affordable cost if the clinical trials are successful. The trials are expected to be completed in 8-10 weeks Drug Controller General of India (DCGI) has given its approval to clinical trials for antiinflammatory drug Colchicine in treating Covid-19 patients. CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad and CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu will be the partner institutes in this trial.

Honeywell collaborates with DRDO to speed up Oxygen production

Industrial technology firm Honeywell will be partnering with Defense Research Development Organization and Council of Scientific and Industrial Research–Indian Institute of Petroleum to supply molecular sieve adsorbents to accelerate setting up of medical oxygen plants (MOP) in the country amid the COVID-19 pandemic. The company has freed up an entire manufacturing line in Italy to prioritize supply to India. Excellent cooperation is extended by Honeywell in application and supply of zeolite, an important constituent of Medical Oxygen Plants (MOP). This is helping industries to fabricate MOPs. Scientists from Honeywell UOP, DRDO and CSIR-IIP are collaborating to establish the suitability of absorbents for oxygen production in India.

Lucknow to become a natural O2 hub

The Lucknow Municipal Corporation (LMC) has joined hands with the scientists at the National Botanical Research Institute (NBRI) to plant oxygen rich trees, across the city parks in a bid to upgrade Lucknow as a natural oxygen hub. This initiative will also propel the municipal body's green vision to develop and modify about 900 parks in the city. All these trees have advantageous resistance over earthquakes, the banyan's capability to hold water is an added blessing.

Under-representation of Northeast Covid-19 data to be solved by scientists

As per the Indian SARSCoV-2 Genomics Consortium (INSACOG) database, out of the total SARS-CoV-2 genomes sequenced from samples all over India, only 0.71 per cent of genomes have been sequenced from samples originating from Northeast India. This indicates under-representation and the critical dearth of genome surveillance in the region. Though sequencing efforts in a sporadic manner have been carried out on Covid-19 samples originating from Northeast India, a concerted effort under the aegis of INSACOG is yet to be undertaken. Three research institutes have come together to sequence genomes of the SARS Cov-2 virus variants prevalent/evolving in Northeast India. Senior officials of the Council of Scientific and Industrial Research-North East Institute of Science and Technology (CSIR-NEIST), Jorhat along with the Institute of Bio-resources and Sustainable Development (IBSD), Imphal, which is an autonomous institute under Department of Biotechnology (DBT), Government of India and ICMR-Regional Medical Research Centre, NE, Dibrugarh recently met to discuss collaborative strategies and planning for a concerted genome sequencing of SARS-CoV-2.

Presented by:

Extract from 'CSIR Matters' (Edition 11-15 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR and Tata MD partners to make COVID-19 detection more accessible across India

The Council of Scientific and Industrial Research (CSIR), India's apex scientific research organization and Tata MD, the new healthcare venture from the Tata Group have announced a significant partnership to ramp up the COVID-19 testing capacity across Tier II and III towns as well as rural areas across India. CSIR and Tata MD are developing this capacity to manage any future surge in the COVID-19 testing requirements. The initiative will utilize CSIR's network of labs across India and help increase India's testing capacity in smaller locations in the country. CSIR and Tata MD will jointly develop the testing capacity and the RT-PCR CRISPR test will be done using the Tata MD CHECK SARS-CoV-2 test kits that are powered by FELUDA technology from CSIR-IGIB.

Private labs adopts gargling sample method of NEERI

National Environmental Engineering Research Institute (NEERI) had developed a method for RT-PCR sample collection by gargling. The test was earlier adopted by government agencies, and now several private laboratories have shown interest in the new method. With private laboratories bringing it into use, the technology is expected to bring about a big change in detecting Covid-19, making the process simpler, faster and cost-effective.

Colchicine (Covid-19 drug) to go for phase-II trials

The Drugs Controller General of India has given approval to Hyderabad-based Laxai Life Sciences Pvt Ltd to undertake two-arm phase-II clinical trials —to assess the safety and efficacy of the drug colchicine in the improvement of clinical outcomes during the treatment of Covid-19 patients. Laxai is partnering with the Indian Institute of Chemical Technology, Hyderabad, and the Indian Institute of Integrative Medicine, Jammu, both of which are units of the government-owned Council of Scientific and Industrial Research (CSIR). Since India is one of the largest producers of this key drug, if the clinical trial is successful, it will be made available to patients at an affordable cost.

Himachal to be fragrant by saffron now

For the first Himachal Pradesh is introducing saffron cultivation at the commercial level. The state is aiming to surpass the saffron production of Jammu and Kashmir Union Territory (JKUT) and also make India self- reliant in saffron production. The production of good quality, disease-free flowering size saffron corms (seed) was the main bottleneck of saffron production which they had overcome with continuous research and scientific procedure. To overcome this problem, new tissue culture facility is under construction at CSIR- Institute of Himalayan Bio resource Technology (IHBT), Palampur which will be capable of producing 3.5 lakh disease-free corms per annum.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

NEERI to solve the pollution problem at Vaikunth crematorium

The Pune Municipal Corporation (PMC) have requested the Council of Scientific and Industrial Research (CSIR)-linked National Environmental Engineering Research Institute (NEERI), to inspect and perform assessment of the air pollution control system at Vaikunth crematorium and suggest if any modification is needed to improve the air quality. The PMC Standing Committee approved a proposal to conduct a study and audit of the crematorium and give recommendations to minimize the pollution. The committee has approved ₹17 lakh for the project involving NEERI.

Covid testing rules for animals issued by CCMB lab

CSIR-Centre for Cellular and Molecular Biology (CCMB)'s Laboratory for the Conservation of Endangered Species (LaCONES), one of the four designated centers for testing animal samples for possible coronavirus infection, have released guidelines for the frontline zoo personnel on COVID-19 investigation in captive animals. LaCONES started testing animal samples for possible SARS-CoV-2 infection in August last year and scientists found the first positive samples from Asiatic lions in the Nehru Zoological Park in April this year. LaCONES team has tried testing for coronavirus using different kinds of nasal, oropharyngeal, rectal and fecal samples from the animals. Various species of animals can be infected with SARS-COV-2 however current studies do not indicate that animals spread infection back to humans.

Ayurvedic formulations helps manage post-Covid hyperglycemia: Study

Hyperglycemia is the medical term for a high blood sugar level and it is a common problem for people with diabetes. At least 14.4% of patients reported onset of diabetes as they were hospitalized for Covid-19, causing dysfunctional glucose metabolism, leading to hyperglycemia after recovery. Research conducted by the Council Scientific and Industrial Research-National Botanical Research Institute (CSIR-NBRI) and CIMAP (Central Institute for Medicinal and Aromatic Plants) found out that BGR-34 formulation could help these patients as it has natural bioactive compounds of Daruharidra with DPP-4 inhibitory effect.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-IGIB to help Maharashtra in COVID surveillance

Maharashtra will seek assistance from CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) in New Delhi to ramp up its genome sequencing capacity. The collaboration will continue for another three months to sequence more samples sent from the state. Currently 100 samples per district are send in a month. That number may be scaled up if there is a rise in cases reporting Delta-plus. Twenty-one samples from the state have tested positive for Delta-plus so far. The collaboration is expected to go beyond sequencing and should be towards supporting the state in building genomics capacity at key medical institutions.

NEERI genome sequencing prompt

It is reported that the National Institute of Virology (NIV), Pune, haven't been able to speedily process and deliver results of the samples of Covid patients send from the Umred family for genomic sequencing. The response has been ordinary with the 10 samples yet to be sent to the NIV by the Indira Gandhi government medical college and hospital (IGGMCH) and the government medical college and hospital (GMCH). On the other hand, CSIR-NEERI has already sent the sequencing quality RNA of eight Umred family samples while those of two more family members found Covid positive later haven't been shared with it. NEERI, carrying out genomic sequencing in association with the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, is set to declare the results through the collector in a day or two.

Presented by:

Extract from 'CSIR Matters' (Edition 26-30 June 2021)

SCIENCE AND SOCIETY NEWSLETTER

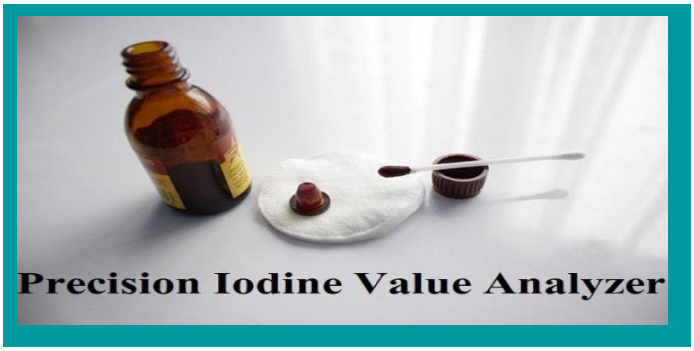
Innovations and Contributions by CSIR labs

In this issue:

DRDO gives license for manufacturing and marketing of Covid-19 drug (2-DG)

Hyderabad-based pharma company Laurus Labs was granted license from the Defense Research & Development Organization (DRDO) for manufacturing and marketing the Covid-19 drug 2 Deoxy-D-Glucose (2-DG) in India. The company have also applied to the Central Drugs Standard Control Organization (CDSCO) for emergency use authorization for the drug. Dr Reddy's Laboratories, which was the first to tie up with DRDO, has already received a EUA from the Drugs Controller General of India (DCGI) for use of the drug to treat moderate to severe hospitalized Covid-19 patients. Meanwhile, Council of Scientific & Industrial Research institution Indian Institute of Chemical Technology (CSIR-IICT) has been licensing the knowhow for 2-DG synthesis to other companies, including Lee Pharma, Suven Pharma, Anthem Biosciences and Nosch Labs.

New technology to measure degree of unsaturation in vegetable oil



The Council of Scientific and Industrial Research-Central Scientific Instruments Organization (CSIR-CSIO) has developed and transferred the technology of Precision Iodine Value Analyzer (PIVA), an instrument for the measurement of the degree of unsaturation (iodine value) in vegetable oils. The indigenous food testing equipment was recognized by the Food Safety and Standards Authority of India (FSSAI) on the occasion of World Food Safety Day (7 June 2021). The technology has been transferred to a Chandigarh based start-up, M/s Comfax Systems. With the rapid analysis technique developed by CSIR-CSIO, Iodine Value can be determined in just three minutes. Also, the cost of analysis per sample has reduced drastically.

BHEL to solve the oxygen shortage of India

In response to the shortages of medical oxygen, caused by the coronavirus pandemic (Covid-19), Bharat Heavy Electricals Limited (BHEL) has started to manufacture medical oxygen plants in India. The company has developed its first medical oxygen plant using CSIR-IIP technology for SLG Hospitals in Hyderabad. The plant was delivered in less than 35 days from receipt of order. BHEL has now signed an agreement with CSIR-IIP for the transfer of technology for medical oxygen plants of 500LPM and higher using pressure vacuum swing adsorption technology.

NMC sends samples for genomic sequencing to NEERI

The Nagpur Municipal Corporation (NMC) has decided to place samples of patients under genomic study if they belong to the same chain of infection and have tested positive at the same time. Impressed with the CSIR-NEERI's speedy delivery of genomic sequencing results of 8 Umred family samples, the NMC requested the institution's environment virology cell to do the genetic study. Neeri, in association with CCMB Hyderabad under the aegis of INSACOG, has been performing genome sequencing of samples collected from NMC's RPTS swab collection center since October last year. It was the first institute to detect Delta variant (B1.617.2) or the double mutant in January this year.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Pan-CSIR sero-survey ends

The Phase 3 pan-CSIR (Council of Scientific and Industrial Research) Phenome India sero-survey was concluded at CSIR-Central Food Technological Research Institute (CFTRI). The three-day camp was open to all students, staff, retirees and their family members. The survey had aimed at the estimation of both qualitative and quantitative antibody levels to SARS CoV2 (coronavirus) in the blood, breakthrough coronavirus infections, vaccination efficacy and its correlation with other lifestyle changes, including smoking, food habits, age and so on. The survey also looked into the presence of underlying co-morbidities in vaccinated (first or both doses) persons or in those naturally infected individuals, including children from 5-18 years of age.

.

Efficiency of masks decrease after detergent wash: Study

A study conducted by the Institute of Minerals and Materials Technology (CSIR), Bhubaneswar, has found that the efficiency of the six-layered N95 mask reduced more than the simple N95 mask after being washed with detergents. Surgical masks saw the most reduction in filtration capacity after a wash.

The findings revealed that the efficiency of the six-layered N95 mask reduced by 3% after washing while that of the surgical masks dropped by 11%. The filtration efficiency of the N95 mask without valve reduced by 2% after a detergent wash, while it reduced by 4% in a KN95 mask, 3% in an N95 mask, with valve and 4% in a heavily –knitted cotton mask. It came down by 11% in a two layered cotton mask, by 6% in a double –layered nylon fabric mask, a double –layered T-shirt fabric each by 8% in a single-layered T-shirt fabric mask.

IICT collaborates with PI Industries to manufacture Covid drug

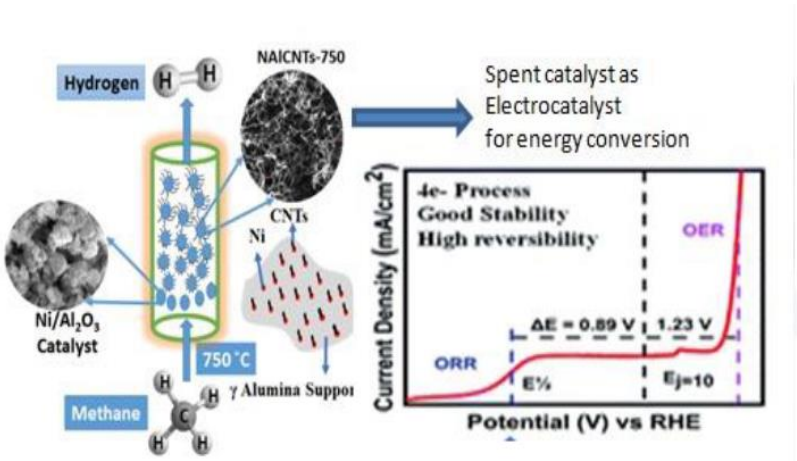
CSIR-Indian Institute of Chemical Technology (IICT) is collaborating with PI Industries Limited and have signed an agreement for technology transfer and manufacture of the anti-Covid drug 2-DG. In the last few months, especially after Drugs Controller General of India (DCGI) granted emergency use authorization for the anti-Covid drug, the institute has entered into similar collaborations with Anthem Biosciences, a Bengaluru-based integrated biopharmaceutical company, and Lee Pharma for synthesis of 2-DG. Under the terms of the license agreement, PI Industries Limited gets license for the process knowhow for synthesis of 2-DG (2-Deoxy- D-Glucose).

Today's wastage as tomorrow's energy

Scientists have demonstrated that spent catalysts from the energy industry can function as an efficient bifunctional oxygen electro-catalyst and can catalyze the core reactions that facilitate the operation of metal-air batteries.

The Centre for Nano and Soft Matter Sciences (CeNS), an institute under the Department of Science & Technology (DST), in collaboration with Hindustan Petroleum Corporation Ltd (HPCL) R&D Green Centre, Bengaluru, have demonstrated that these spent catalysts worked as an efficient bifunctional oxygen electro-catalyst. This work is supported by the Centre for High Technology (CHT)-Oil and Industry Development Board (OIDB), Hydrogen Corpus Fund that helped in efficient utilization of industrial waste for energy storage applications resulting in the production of green energy in a sustainable manner.

Earlier, the CSIR-CMERI developed a Municipal Solid Waste Processing Facility that helped in achieving the decentralized decimation of solid wastes and also helped in creating value-added end-products from abundantly available redundant material such as dry leaves and dry grass, etc.



CSIR to seek emergency use approval for Sepsivac as anti-covid drug

The Council of Scientific and Industrial Research (CSIR) is all set to apply for emergency use authorization for its repurposed Covid-19 drug Sepsivac. The drug, which was originally licensed for use in 2012 in sepsis patients, was tried as a drug against Covid-19 in moderate and serious patients in association with the manufacturer Cadila Pharmaceuticals and has so far given good results. The phase 2 trial on moderate patients had also been completed last week. The drug is also being tested as a vaccine in 4,000 healthcare workers in an ongoing phase 3 trial.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CLRI promotes leather industry in Ladakh

Industries and Commerce Department, Union Territory of Ladakh and CSIR-Central Leather Research Institute (CLRI), Chennai organizes a day-long workshop on 'Entrepreneurship Opportunities in leather and allied products' at Leh. After Ladakh was constituted as Union Territory (UT) in 2019, the Industries and Commerce Department here had inked a MoU with the Council of Scientific and Industrial Research (CSIR), under which a number of initiatives are planned for the UT.

The idea is to create employment locally and share the potential of the leather industry in the region. The UT administration is very supportive and wants to undertake planned development. A similar workshop is scheduled in Kargil for which more than 70 participants have enrolled. Later this month, a month-long training programme was held for Ladakh's Self Help Groups to enhance their skills in this field. During the course, experts will impart training required for making leather products, besides engaging with traditional designers, helping retain the local flavor.

AI powered COVID-19 kits for self-testing at home

Scientists at the Indian Institute of Technology Hyderabad (IITH) have developed COVIHOME, an artificial intelligence-powered COVID-19 test that allows self-testing at home. On obtaining ICMR approvals, and after commercialization, the kit will be available in the market at an affordable price. This test kit can produce results within 30 minutes. The major benefit of this testing kit is that it does not require RT-PCR, an expert human resource, and a BSL 2 lab facility for the extraction of RNA. CSIR-CCMB has performed the validation of the rapid RNA electronic diagnostic device for detection of SARS-Cov-2 virus in the swab samples independently with the in-house samples and hospital samples as advised by ICMR. These samples were confirmed for their positivity or negativity by the RT-PCR method..

Nagpur reports pocket outbreaks of Delta variant

After the Delta variant (B1.617.2) was found in samples of two Kolhapur returnees and nine more Covid positive patients through genome sequencing by CSIR-NEERI, experts are calling this outbreak as 'pocket outbreaks'. The study was done by CSIR-NEERI in association with CCMB Hyderabad. Amid the Delta Plus (AY.1 variant) warnings, Nagpur Municipal Corporation (NMC) had started tracing and placing suspected cases in institutional quarantine since last month. So far, it has quarantined around 18 persons who had tested Covid positive, along with their family members. Only saline gargle RT-PCR samples are being used for the study. CSIR-Neeri environmental virology lab, led by Krishna Khairnar, has developed the saline gargle RT-PCR method.

CSIO developed UV-C technology to be installed at Parliment

The Ultraviolet-C or UV-C Disinfection Technology developed by CSIR-CSIO (Central Scientific Instruments Organization) will soon be installed in Parliament for the "mitigation of airborne transmission of SARS-COV-2". The system is designed to fit into any existing air-ducts and the veridical dosages using UV-C intensity and residence time can be optimized according to the existing space. The virus is deactivated in any aerosol particles by the calibrated levels of UV-C light. It can be used in auditoriums, malls, educational Institutions, AC buses, and in railways.

Presented by:

Extract from 'CSIR Matters' (Edition 11-15 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-CFTRI to transfer pickle making technology to SHGs

The State government has decided to tap the potential of women entrepreneurship through Mission Shakti SHGs by encouraging them to manage the semi-mechanised pickle manufacturing units. Maa Durga SHG at Baripada, Bighneswar-II SHG at Berhampur and Mahasangam Mission Shakti Area Level Federation (ALF) at Dhenkanal have been selected to run the fully mechanised pickle centers and fulfil the required demand of 300 tonnes of pickle every year for Aahaar centres.

As per the decision, the units will supply pickles to the Aahaar centers of 10 districts. All the three Mission Shakti SHGs have signed a MoU with Central Food Technological Research Institute (CFTRI-CSIR), Mysuru on technology transfer of pickle making process. The president and secretary from the groups had already undergone an exposure trip to CFTRI in March to have first-hand experience on pickle making.

North east regions to get proper representation in COVID data now

The Centre for Infectious Diseases have been newly-established at the CSIR-North East Institute of Science and Technology, Jorhat (NEIST), Assam, equipped with state-of-the art genome sequencing facility to lead the genome surveillance of SARS-CoV-2 for the country's north east region. INSACOG or Indian SARS-CoV-2 Genomics Consortium database had only 0.71% samples sequenced from this region indicating under- representation and critical dearth of genome surveillance. The centre has just started genome sequencing of 600 samples this month, and this will be increased to 1,000 next month. They have the capacity to take up 1,500 samples a month for real-time surveillance to understand the spread, transmission, and fatality dynamics of COVID, response to vaccines and for identifying mutations.

Municipal Solid Waste Technology developed by CSIR-CMERI

A Webinar on "CSIR-CMERI Developed Municipal Solid Waste Technolog" for Municipal Corporations, District Administrations, MIDCs, ZillaParishads, Grampanchayat, and MSMEs & Prospective Entrepreneurs was organised by MSME-DI, Nagpur in association with HVPM"s College of Engineering & Technology, Amravati and CSIR-CMER. Management of Solid Wastes is a big challenge for the Nation. Improper management of Solid Wastes is responsible for both Surface and Underground Water Pollution. The CSIR- CMERI developed Decentralised Solid Waste Management Technology (DSWMT) has a design consisting of a number of modules, which tries and provides solutions for management of every aspect of Solid Wastes.

Scientists introduce China's monkfruit in HP

The cultivation of monk fruit (Siraitia grosvenorii) from China has been taken up for the first time in India by the Palampur- based CSIR-IHBT. The monk fruit is known for its properties as non-caloric natural sweetener. Its sweet taste is attributed to cucurbitane-type triterpene glycosides known as mogrosides, which is about 300 times sweeter than sucrose or cane sugar. In spite of its high demand, this crop is only cultivated in China. However, suitable agro climatic conditions are also available in India, particularly in Himachal. Keeping in mind the importance and essentiality of non-nutritive natural sweetener and diverse agro-climatic conditions in India, Dr Sanjay Kumar, Director, CSIR-IHBT, Palampur, brought monk fruit seeds for the first time in the country from China through ICAR-NBPGR, New Delhi, in March 2018.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

NEERI recommends wet scrubbers to control air pollution at Vaikunth crematorium

National Environmental Engineering Research Institute (NEERI) has recommended installing wet scrubber to control air pollution at the city's Vaikunth crematorium. The Pune Municipal Corporation (PMC) had earlier appointed CSIR-NEERI to inspect the problem and suggest possible solutions. Padma Rao, senior principal scientist, air pollution control division, Neeri, and her team visited Vaikunth crematorium. Neeri is to inspect and assess the air pollution control system at the Vaikunth crematorium and then submit a report within six months.

Coronavirus could be detected up to 10 ft in air around infected person: Study

A study by the CSIR found out that the coronavirus could be detected up to 10 feet or 3.048 meters in the air around an infected individual. The Science and Technology Minister, Jitendra Singh indicated this study in a written response to a question in the parliament. The study also tells that with directional air flow, the possibility of virus riding on aerosols to long distance cannot be denied. As a precautionary measure, wearing mask can help in significantly reducing the risk of catching the infection through air. Talking about the activities of INSACOG he told that, "Since the inception of INSACOG till now the INSACOG has sequenced 57,476 SARS-CoV-2 genomes. Out of these, 44,334 samples have been analyzed and assigned Pangolin lineage classification and submitted to the National Centre for Disease Control (NCDC) for public health correlation".

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Himachal Pradesh to get in to saffron revolution

A saffron-cultivation training programme was recently organised in Himachal Pradesh by the CSIR-Institute of Himalayan Bioresource Technology (IHBT) in Palampur. Many farmers in the state have replaced their regular crop produce with saffron. Saffron seeds, from IHBT, were distributed through the agriculture department of the state to farmers in Kinnaur, Chamba, Kullu, Mandi, and Kangra districts, who had undergone the training. As a pilot project, saffron seeds were planted on 2.5 acres (a little more than one hectare) of land in different parts of the state.

CCMB scientists finds new drug targets on cells

Cells communicate with each other via "receptor proteins" on the cell membranes which are targets for drugs to alter functioning and physiology. However, the latest study from Amitabha Chattopadhyay's lab at CSIR-Centre for Cellular and Molecular Biology (CCMB) makes a case for designing new drugs to focus on the lipid environment surrounding these receptor proteins. In the new study published in "Science Advances", they report a sensor region on "human serotonin1A" receptor can detect cholesterol, specifically a region called "CRAC motifs", which is believed to interact with cholesterol. The lab had earlier found that the serotonin receptors are sensitive to cholesterol surrounding them.

Study finds that new Covid -19 variants take shape inside bodies of hosts

Scientists from different research institutions, including the CSIR-Centre for Cellular and Molecular Biology (CCMB) have claimed to have decoded the mystery behind the emergence of new variants of novel coronavirus. In a research study published on July 27 on the preprint server MedRxiv, the scientists said that the virus undergo changes in the body of an infected person and once it's done, it infects new people carrying the changes with it. The team found that about 80 per cent of the genomes sequenced in individuals have later emerged as new variants or strains. Scientists said that tracking over time within-host variability of the virus in individuals and populations might provide important leads to the sites that are favourable or harmful.

Tractor operated spading machine

CSIR- Central Mechanical Engineering Research Institute (CMERI) developed a tractor operated spading machine for seed bed preparation. First activity in any crop cultivation practice is the tilling of soil to make a desirable seed bed for germination of seeds or seedlings. A major part of tractor energy is utilized in seed bed operation leading to high operating cost for farmers. This Spading Machine reduces the cost of tillage operation and improves the effectiveness of tillage operations. The design of CSIR-CMERI spading mechanism is advantageous in reducing vibration and enhancing the comfort of tractor operator. As compared to other tillage implements, the machine forms no compaction of subsurface soil and improves the aerobic quality and drainage of soil. The machine can also incorporate large organic material due to its homogeneous working and uniform turning of soil. The spading machine is powered by tractor PTO which rotates at standard speed of 540 rpm, power is transmitted to the crank through the speed reduction gear. This machine has a working width of 1800 mm and it can be operated with any tractor having power greater than 45 HP. The main advantage is less compaction in subsurface soil layers thereby eliminating the need for sub-soiling. This is due to the fact that soil breakup during spading is similar to manual hoeing as it imitates the manual soil cutting action.

CSIR-IHBT get applauds for apple cultivation in Manipur

Prime Minister Narendra Modi applauded the efforts of the CSIR-IHBT, Palampur, for helping farmers to cultivate apple in northeastern states, particularly in Ukhrul district of Manipur, in the —Mann ki Baatl programme. Dr Sanjay Kumar, Director, CSIR-IHBT, while talking to The Tribune, thanked the Prime Minister for appreciating the role of the institution. He said it was an ambitious project for which his institution had signed a memorandum of understanding with an NGO. He said the CSIR-IHBT, Palampur, had supplied 40,000 plants for cultivation in Manipur, Meghalaya, Mizoram and Arunachal Pradesh.

NIIST to present their products at RINK Demo Day

The Research Innovation Network Kerala (RINK) under Kerala Startup Mission (KSUM) is conducting a Demo Day on July 29, facilitating online presentation of ten products before an expert panel. Being organized to boost the commercial prospects of research-based ideas and product, the event in association with the startup-promoting TiE Kerala will see select items from National Institute for Interdisciplinary Science and Technology (NIIST) which is a constituent lab of CSIR.

Presented by:

Extract from 'CSIR Matters' (Edition 26-31 July 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Percolation tanks caused water level to rise up

A group of villagers from neighboring areas gathered as CSIR Director- General Shekhar C. Mande surveyed the five acre percolation tank inside the sprawling 100 acre campus of the CSIR-National Geophysical Research Institute (NGRI) housing the geomagnetic observatory at Choutuppal. The percolation tanks made the water rise up to surface in this area. Groundwater has reached the surface this year so much so that the scientists had to raise foundations of the structures housing the geomagnetic instruments. Nearby villages of Chinnakoduru, Kuntlagudem and Nelapetla too received fluoride-free water as minor tanks of Yerragunta, Beerappakunta and others in the vicinity got filled to the brim through gravity flow. The sub-surface area and the rocky formation below should be studied for better water management during dredging of tanks and other projects, as precise percolation points was identified.

New temperature and flow control ultrasonic spray system

The delivery of herbal therapeutic ingredients as drugs in conventional forms shows variable and non-uniform absorption. To overcome such limitations, herbal drugs can be encapsulated with suitable biopolymers as nanocarriers. Keeping this in mind, Dr S. Prabhakaran, Sr. Scientist at CSIR-Central Scientific Instruments Organisation (CSIO) Chennai Centre, has developed a new prototype of temperature and flow control ultrasonic spray (tFOCUS) system with support from the Advanced Manufacturing Technologies programme of the Department of Science & Technology (DST), Government of India, and aligned with the 'Make in India' initiative to enhance colloidal stability of poorly water-soluble herbal extracts. The prototype has been validated using a commercial AYURSULIN capsule used to treat type-II diabetic as a model drug.

NGRI to detect solar storms

Dr Shekar C Mande, Director-General of Council for Scientific and Industrial Research (CSIR) inaugurated the National Geophysical Research Institute's (NGRI) electromagnetic observatory at Choutuppal in Nalgonda. The observatory identifies the shifts in the Earth's electromagnetic fields and solar storms from the Sun. The readings are connected to a global repository online. Dr Shekar inaugurated the Variometer Facility constituting '3 Component Fluxgate Magnetometer' and 'Overhauser total field magnetometer' at the Choutuppal campus NGRI. The system continuously measures the Earth's magnetic field at an interval of 1 sec and sends it to the Intermagnet, the global data repository of geomagnetic observatories. This is the only facility of its kind in the country delivering one sec data. He visited a declination inclination magnetometer meant for manual absolute measurements of the geomagnetic field twice a week.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

"Purple revolution" in Kashmir

Lavender is ready for harvest in the hilly slopes of Jammu and Kashmir. It was in 2010 that Council of Scientific and Industrial Research (CSIR) and the Indian Institute of Integrative Medicine, Jammu (IIIM-Jammu) organized a programme in which farmers were encouraged to move to lavender cultivation. CSIR-IIIM Jammu wanted to popularise aromatic crops such as lavender, which is native to European countries, among agriculturists across India to increase the income of small and marginal farmers. In 2016, the Indian Government launched Aroma Mission to boost the cultivation of plants such as lavender which have aromatic medicinal properties.

As demand and profits continue to rise, local entrepreneurs are also jumping in and helping the farmers in their cultivation and oil processing by providing technical support and quality planting material. Moreover, other than providing technical support, CSIR and IIIM have given free essential oil distillation facilities to the farmers of Bhadarwah and it has led to the production of more than 800 litres of lavender oil worth more than $107,500 from 2018 to 2020. Statistically, the world's total production of essential oils is estimated at between 100,000 and 110,000 tonnes, and India stands third with a share of around 16 to 17 percent.

Polyhouses with retractable roofs

Scientists from CSIR- Central Mechanical Engineering Research Institute (CMERI), Durgapur in West Bengal have developed a retractable-roof polyhouse that will enable farmers to open or shut the roof of the polyhouse as per the requirement. A model of the polyhouse with a retractable centre will be set up in Ludhiana, Punjab at CMERI extension centre. CSIR-Institute of Himalayan Bioresource Technology (IHBT) based in Palampur, Himachal Pradesh is also associated with the development of the retractable-roof polyhouse. The roofs can be opened both automatically and manually. Sensors to gauge rain, carbon dioxide, humidity and temperature can be installed within the polyhouse so that roofs can work automatically. These retractable-roof polyhouses will do away with the need of extra blowers, ventilation vents, etc.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aroma mission in Ladakh

The CSIR-Institute of Himalyan Bioresource Technology (IHBT) in Palampur, Himachal Pradesh, has initiated a new project for cultivation and promotion of high-value aromatic and floriculture crops in Ladakh, which is a cold desert region of the country. IHBT signed a memorandum of understanding (MoU) with the industries and commerce department of Ladakh in May for cultivation and promotion of clary sage, wild marigold, damask rose, lavender, mint, dracocephalum and artemisia spp. Floriculture crops lilium, tulip and gladiolus, which are suitable for the climatic conditions of Ladakh, would also be grown there. CSIR-IHBT has provided quality planting material of these crops to the farmers of Ladakh in association with industries and commerce department, under the Aroma Mission Phase II project.

NIO scientists to study hydro-thermal activity in Indian Ocean

A team of 20 scientists from the CSIR-National Institute of Oceanography (NIO), Dona Paula, will be launching an expedition to the Indian Ocean to study the hydro-thermal activity and the rates of plate movement. Prof. Sunil Kumar Singh, the director of the NIO, said that huge mountain chains are created within the Indian Ocean due to tectonic activity and the NIO team will be studying things like how the new crust is being formed; from where exactly are the materials coming; how exactly are they moving; speed of the movement and how all these impact the overall plates movement.

Mobile Covid Testing Lab Launched In Manipur

In order to increase the COVID-19 inoculation drive in Manipur, the state government has now commissioned a mobile testing unit van at the Modern College premises, Porompat. The facility is powered by RTPCR, CRISPR, and FELUDA platform from the Council of Scientific & Industrial Research-Institute of Genomics and Integrative Biology (CSIR-IGIB), a leading Indian biosciences research Institute. First-of-its-kind initiative undertaken in Manipur, the lab is based on CRISPR technology; the lab has a capacity to test up to 3,300 tests per day and will be able to give results in just 3 hours. Residents of the state will be able to avail the service at a much cheaper rate, worth of Rs 450.

Alternatives for antibiotics in food industry

A new study conducted by the scientists at Council Of Scientific And Industrial Research–Central Food Technological Research Institute (CSIR–CFTRI) has sounded an alarm on the indiscriminate and rampant use of conventional antibiotics in the food industry. The study revealed that new protein-based antimicrobials from beneficial microbes could be a better replacement for conventional antibiotics in the food industry. CSIR–CFTRI researchers have identified one from beneficial microbes, to demonstrate how it is better than antibiotics. It is highly suitable for the food industry because it works in the presence of metal salts, detergents and enzymes. It does not cause any harm after consumption, instead, it cleans up the harmful pathogens in the stomach, without harming the beneficial microbes.

NIO finds presence of microplastics in tap water in Goa

A recent research by the CSIR-National Institute of Oceanography (NIO) has found the presence of microplastics in tap water supplied to households in Goa. The research by the CSIR-NIO and Delhi-based NGO Toxics Link was conducted on pre-treatment raw water and treated tap water, sourced from reservoirs at Selaulim, Opa, Assonora and Canacona in the coastal state. The major characteristics of microplastics found in tap water were similar to those found in pre and post-treated water samples, with black and blue colour ones, made of polyisoprene (used in rubber, footwear etc), ethylene vinyl alcohol (used in packaging, drugs and cosmetics) and polyvinyl chloride (pipes) polymer. The increased presence of microplastics in tap water can be attributed to abrasion of plastic particles.

IICT develops 'SaanS' face mask

CSIR-Indian Institute of Chemical Technology (IICT) have developed an effective and comfortable membrane-based 'SaanS' face mask. The four-layered cotton cloth mask has a lot of scientific input gone into making of it. The mask has a 'hydrophobic polyethylene terephthalate' layer extracted from used membrane modules as the second layer to repel respiratory droplets carrying the virus with the first layer being 100% cotton. Next critical layer is the non-woven hydrophobic polypropylene barrier with a high contact angle of 120 degrees to create minimum critical pressure as a barrier and prevent aqueous aerosols from entering the human respiratory system. First and last textile layers provide tight porosity and comfort to the wearer. 'SaanS' masks can withstand up to 30 washes for reuse.

Presented by:

Extract from 'CSIR Matters' (Edition 11-15 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

NIIST develops system for safe medical waste disposal

The CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), a constituent laboratory of the Council of Scientific and Industrial Research (CSIR), has developed a know-how for safely disposing of biomedical waste. The technology involves a solidifying agent, which reduces the risk of spillage and aerosolization, and a disinfectant which helps to dispose the waste as non-regulated medical waste. The CSIR facility said that the technology, 'Disinfection-Solidification System for Pathogenic Biomedical Waste Disposal,' has been transferred to M/s Bio Vastum Solutions Pvt. Ltd. (CML Group), Thrissur. NIIST has come out with the technology at a time when the generation of biomedical wastes has witnessed a sharp increase due to the COVID-19 pandemic.

"The technology enables the disinfection of both liquid and solid biomedical waste samples, and results in gelation or solidification instantaneously upon mixing. The complete microbial disinfection followed by immobilization reduces the risk of spillage and occupational exposure. Transportation and disposal of such disinfected pathogenic waste are easier and safer for a healthcare facility," NIIST said.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-CDRI and Marc Labs to develop drug for stroke

CSIR-Central Drug Research Institute (CDRI) has teamed up with domestic drugmaker Marc Laboratories to develop a compound for treating heart attack and stroke. The CSIR-CDRI recently obtained permission to initiate Phase I clinical trials for the drug. The drug company is looking at the development of a synthetic compound S-007-867 as a modulator of the blood coagulation cascade, in particular as an inhibitor of collagen-induced platelet aggregation. The drug will be developed for coronary and cerebral artery diseases.

Prophylactic use of this compound also could be useful for COVID-19 induced complications. In COVID-19, critical patients with acute respiratory distress syndrome (ARDS) have high D-dimer and reduced prothrombin time, suggesting a pro-thrombotic state. In addition, these patients have high numbers of circulating neutrophils, inflammatory mediators/cytokine, CRP and lymphocytopenia. Therefore, drugs reducing platelet reactivity and neutrophil activation could be beneficial, the official said.

How green is my lake! That sparkle hides a secret

The first phase of reviving Sanjay Van Lake in south Delhi has been completed. The so-called floating rafters holding hormonally treated plants to extract excess pollutants from the water have done their work. A grid-based aeration system to enable bubble diffusion is now being installed to boost the level of dissolved oxygen in the water levels to catalyze the water purification process.

The floating rafter technology, developed by CSIR-NEERI, employs hormone-treated species such as cyperus and canna to soak up pollutants. Each square rafter is made from PVC pipes and each is lined with geo-netting to support the plants. A blend of different plants is used on each float to increase the nutrient uptake from the water. These small floating islands in the lake are also being used by ducks for nesting.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Manathakkali holds hope for liver cancer patients

A research team led by Ruby John Anto, senior scientist at the Division of Cancer Research at the Rajiv Gandhi Centre for Biotechnology (RGCB), Thiruvananthapuram, have found out the unassuming effects of manathakkali in treating liver cancer. Manathakkali (Black nightshade), also called sukkuti keerai is a plant seen abundantly on the backyards, growing underestimated. The work has been published in the nature group journal Scientific Reports and has received many international patents, including those from the US, Canada, Japan and South Korea. Dr. Anto and her team, including her student Lekshmi R. Nath, identified a natural compound, uttroside B, present in the leaves of manathakkali (Solanum nigrum Linn) that has liver-protective properties.

Genetic study on Roman Catholics population of West Coast

The CSIR-Centre for Cellular and Molecular Biology (CCMB) and BSIP, Lucknow, have conducted a genetic study on Roman Catholic population of the West Coast India to infer their origin and genetic history. DNA of 110 individuals from the Roman Catholic community of Goa, Kumta and Mangalore were analysed and compared with the available genetic information of the Roman Catholic group from India and West Eurasia which was earlier published. They concluded that the Roman Catholics of Goa, Kumta and Mangalore regions were the remnants of very early lineages of Brahmin community, a majority with Indo-European-specific genetic composition. This study have found out the consequences of Portuguese inquisition in Goa on the population history of the Roman Catholics. They also found some indication of Jewish component.

Mechanized Scavenging System by CSIR-CMERI

CSIR-CMERI is developing a Mechanized Scavenging System, which was initiated after intensive studies of the diverse nature of Indian Sewerage Systems and the manner of its chokages. The technology is Modular in design so as to ensure customised deployment strategies as per situational requirements.

The System also focuses upon Sustainable Usage of resources i.e. Water as the System sucks in Slurry Water from the choked Sewerage Systems and after adequate filtration of the same redirects the same for Clearing of Chokages using a Self-Propelling Nozzle.

This, CSIR-CMERI technology provides an in-situ option for Mechanized Scavenging as well as purification of Water. The design of the Technology is such that the Water Filtration Mechanism may be changed/modified as per the customised needs/requirements with the ability to change/redesign the Filter Media. The Vehicle-mounted Filtration Units will be able to augment and use Water from Surface Drain and Flooded Areas and purify it into Water suitable for Agricultural, Household and Drinking Water usage.

Scientists discover new pathogenic bacterial species

Prof. Vikas Gautam, Department of Medical Microbiology, Post-Graduate Institute of Medical Education and Research (PGIMER) and Dr Prabhu Patil, principal scientist at the CSIR-Institute of Microbial Technology (CSIR-IMTECH), have announced a new species of a bacterium that causes serious infections especially in ICU patients. The species was detected in a patient admitted at PGIMER a few years ago, prior to the COVID-19 pandemic. The species has been named "sepilia" as it was isolated from blood infection leading to sepsis. A high death rate ranging from 20-60 per cent has been found associated with various kinds of infections caused by this bacterium that includes pneumonia and blood infections due to
lack of appropriate antibiotic therapy.
.

Biomedical waste to plastic

The CSIR-National Chemical Laboratory (NCL) has announced a new project which will recycle the biomedical waste into various plastic products. The pandemic had created a situation in which the country was creating biomedical waste at an alarming rate of 200 tonnes per day, mainly including the face masks and PPE suits used by health workers and hospital staffs. This situation demanded the scientist to come up with a solution. Face masks and PPE suits were burnt earlier. The new research is based on a system in which the biomedical waste is first autoclaved, then quarantined and later small particles of plastic are made after a recycling process and then converted into various products.

Presented by:

Extract from 'CSIR Matters' (Edition 26-31 August 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Anionic clay to aid cancer therapy

Scientists at Cusat have developed a novel method for the synthesis of in situ exfoliated magnetic anionic clay that exhibits high magnetic hyperthermic properties. It can help target cancer treatment and provide localized intervention. The compound was developed and biological evaluations were performed in Cusat. The magnetic measurements were carried out at CSIR-NIIST. Magnetic hyperthermia is an advanced strategy for the treatment of cancer with minimum side effects to normal tissues. Unless certain intercalation or post-synthesis strategies are performed, the exfoliation of layers is very difficult for normal anionic clay due to the strong electrostatic interaction between the layers.

NAL's aircraft(Hansa-NG) had a successful maiden flight

The two-seater Hansa New Generation (Hansa-NG) aircraft had a successful maiden flight when it took off from the HAL airport and flew for about 20 minutes. It is a revamped version of the original Hansa developed three decades ago. The aircraft was designed and developed by the CSIR-National Aerospace Laboratories (NAL) in Bengaluru and was flown by test pilot Captain Amit Dahiya to an altitude of 4,000 feet and gained a speed of 80 knots before landing.

The unique features of the two-seater include a glass cockpit with cabin comfort, digitally controlled engine, electrically operated flaps, long endurance, low acquisition and low operating cost. The defense sector can use Hansa-NG for cadet training and coastal surveillance. It will help create job training opportunities for ITI and diploma holders in various aircraft building and training disciplines.

Integrated treatment of sewage, organic solid waste

A Gangagni Rao, chief scientist, and S Sridhar, senior principal scientist at the CSIR-Indian Institute of Chemical Technology (IICT), have jointly developed this high-rate bio methanation tech based on Anaerobic Gas lift Reactor (AGR) technology for the treatment of organic solid waste and concomitant generation of biogas and bio manure along with nanofiltration (NF) setup. This integrated and sustainable sewage and organic solid waste treatment system can be used for treating groundwater and wastewater and generating potable and reusable water respectively. Instead of sending the organic solid waste and liquid waste to common bigger facilities in the city, those can be treated at source in a decentralized manner. Urban and local bodies and gated communities comprising around 50,000 to 1,00,000 population can benefit from this technology.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aromatic crop cultivation in Kalimpong

The CSIR- Institute of Himalayan Bio-resource Technology (IHBT), Palampur has inked a pact with Mani Trust, Kalimpong for promotion of aromatic crops. The IHBT has recognised Kalimpong, the north-eastern hill town in West Bengal, ideal for cultivation of aromatic and floriculture crops. Situated at a height of 1,250m above mean sea level, Kalimpong has a diverse climatology and temperature varies between 15-25 °C in summer and 7-15°C in winter and average rainfall of 2,030 mm.

CSIR started Aroma Mission during 2017 and Floriculture Mission 2020 programmes to promote aromatic and floriculture crops aimed at socio-economic upliftment and employment generation for the farming community and rural masses throughout the country.

No trace of coronavirus in Ganga waters: study

As per the recent study conducted by the National Mission for Clean Ganga under the Union jal shakti ministry in collaboration with the CSIR-Indian Institute of Toxicology Research (IITR), Lucknow, the Central Pollution Control Board (CPCB) and Bihar State Pollution Control Board (BSPCB), no trace of coronavirus was found in the Ganga after bodies of Covid-19 victims were recovered from Buxar, Katihar and some districts in neighbouring Uttar Pradesh.

RT-PCR test was done to determine the viral load on the water body after the extraction of the ribonucleic acid (RNA) of the viruses from the collected samples of water. The study also checked the biological characteristics of the river.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Heli-borne survey to map acquifer in north west

CSIR-National Geophysical Research Institute (NGRI) will be using heli-borne geophysical mapping technique to cover about 4 lakh sq km of arid regions north western India to take up high resolution aquifer mapping and management to augment the groundwater resources. The institute has been contracted by the Union Water Resources Ministry to take up the project in in two phases — from the foothills of the Himalayas to Punjab, Rajasthan and Gujarat till the Rann of Kutch, to provide a high resolution 3D image of the sub-surface up to a depth of 500 meters below the ground.

It is also developing a new drone in association with other CSIR labs for taking up drone based electro-magnetic system for conducting aeriel geo-mapping with the first prototype instrument ready for testing.

Saline Gargle to be transferred RT-PCR Technique to be transferred to MSME Ministry

The Nagpur-based National Environmental Engineering Research Institute (NEERI) has transferred the knowhow of an indigenous saline gargle RT-PCR technique to the Ministry of Micro, Small and Medium Enterprises (MSME) for commercialising it. The saline gargle RT- PCR technology is simple, fast, cost-effective, patient-friendly and comfortable. The test also provides instant results and is well-suited for rural and tribal areas, given minimal infrastructure requirements. The transfer of knowhow "on a non-exclusive basis" is expected to "enable the innovation to be commercialised and licensed to all capable parties, including private, government and various rural development schemes and departments".

Air sanitization product to 'inactivate' COVID-19

A path-breaking air sanitization product that can be integrated with any kind and capacity of air-conditioning systems, right from Split AC, Cassette AC to AHUs and FHUs and inactivate 99.9% of coronavirus in an affordable manner has been launched by the start-up India tech with the approval of CSIR.

It's a unique UVGI-based solution for covid-protection which has been certified and validated by CSIR-CSIO. Although UVGI technology has been traditionally considered harmful to human skin thereby remaining limited in use for many years, the company has sought to mitigate those safety concerns by developing a thoroughly non-contact, non-chemical product. Keeping pace with time and the changing nature of the demand, with this product, the company has also brought mobility to the centre stage enabling the new-age air sanitization systems to be fitted in moving vehicles and transportation, thereby adding a new dimension to their traditional usage limited to buildings.

Mobile vans for eco-friendly Ganesh visarjan

The CSIR -National Chemical Laboratory (NCL) has launched a mobile van service that will offer door-to-door Ganesh visarjan. The efforts are part of promoting an environment-friendly immersion among residents. The Pune-based institute has joined hands with Ujjivan Bank for the initiative. The 13 mobile vans have an eco-friendly pond installed. The van will ferry the pond across the city during the main immersion days of the 10-day festival.

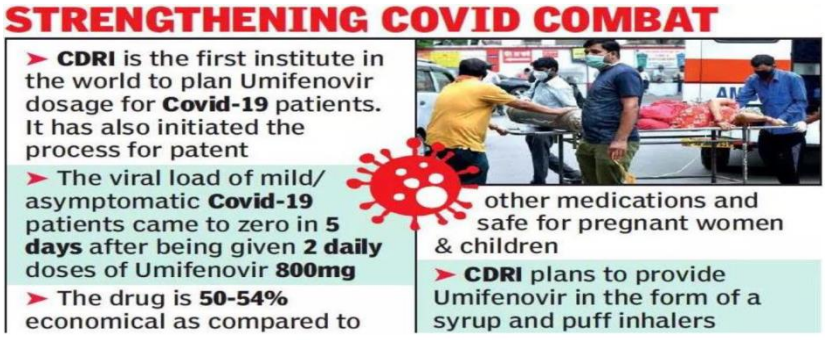
The institute has been distributing ammonium bicarbonate since 2016 for eco-friendly immersions. When put in water, ammonium bicarbonate helps dissolve Ganesh idols made from Plaster of Paris.

Sakkardara lake exploited by anthropogenic activities: Experts

The Environment Status Report (ESR) of Nagpur prepared by CSIR-NEERI stated that city lakes, including Sakkardara, were mainly used for recreational activities besides being exploited by unprecedented anthropogenic activities. Desilting, identifying traditional tributaries, removal of water hyacinth, stopping sewage are needed to conserve this 200-year-old lake. Rapid urbanisation has posed a serious threat to wetlands in the city. The prime example of this is the Sakkardara lake. Even the existing lakes have become unfit as sources of drinking water due to the growth of water hyacinth and other aquatic weeds and encroachments.

CDRI achieves breakthrough in trial of Umifenovir in Covid-19 treatment

The CSIR-Central Drug Research Institute (CDRI) claimed that the clinical trials of antiviral drug, Umifenovir, in treatment of Covid-19 have been successful. The trial of Umifenovir on 132 Covid-19 patients showed that, if proper dose is given twice daily for five days, the drug can effectively reduce viral load to zero in mild or moderate symptomatic and asymptomatic patients by checking multiplication of the virus. Umifenovir is a broad spectrum antiviral and is being used as a safe over-the-counter drug for influenza and pneumonia for over 20 years in Russia, China and other countries. Umifenovir will be economical for treating Covid-19 patients as it is around 50-54% cheaper as compared to current medication.



Presented by:

Extract from 'CSIR Matters' (Edition 11-15 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Y chromosome plays vital role in evolution, finds CCMB

A study conducted by the CSIR-CCMB has given fresh insights into the role played by the Y chromosome in the DNA. The study done by a team of researchers headed by Professor Rachel Jesudasan, Advisor (Research) at the Department Genetics of Osmania University, throws light on novel regulatory functions of the Y chromosome. Published in BMC Biology, the research suggests that beyond determining the gender of a person, the Y chromosome also regulates genes on other chromosomes involved in male reproduction. “Our previous studies had shown that sex and species-specific repeats on the Y chromosome egulate a reproductively important protein-coding RNA transcribed from chromosome number 1. Along with this study, there are reports of interaction between the Y chromosome and other chromosomes. Thus, consolidating the two studies, we see more pervasive regulation of genes associated with reproduction by the Y chromosome,” said Prof Jesudasan.

Indian scientists discovered dengue medicine

Experts researching medicine for dengue treatment have achieved great success. Experts from The Central Drug Research Institute (CSIR-CDRI) in Lucknow have conducted two drug searches. In the first phase, the trial on rats has been found to be successful. Soon it will be tested on human beings also.

The same dengue crisis begins to looming every year by September. Initially, the fever seems normal, but due to lack of proper treatment and delay, it becomes fatal. Experts from the Central Institute of Drug and Research, CSIR-CDRI, Lucknow have conducted two drug searches for dengue treatment, which has been successfully tested on mice. However, the drug has so far been used for the treatment of thrombosis. The test has just been conducted on mice, soon after conducting a trial on human beings, the drug will be available to humans.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR turns 80

On its 80th birthday, the Council of Scientific and Industrial Research casts its gaze towards the sky as its plans to make pseudo-satellites or very high altitude UAVs that can do a variety of things at a fraction of cost than conventional satellite. Bengaluru-based CSIR-National Aerospace Laboratories, one of the 37 constituent laboratories of CSIR, will manufacture the prototypes of such a high altitude UAV that has never been realized.

The CSIR was formed on September 26, 1942 through a Department of Commerce Resolution of the British government succeeding the Board of Scientific and Industrial Research created in 1940. While its initial budget was Rs 10 lakh, the council received a grant of Rs one crore two years later to establish its first five laboratories – National Metallurgical Laboratory at Jamshedpur, National Physical Laboratory in Delhi, National Chemical Laboratory in Pune, Central Glass and Ceramics Research Institute in Kolkata and Central Fuel Research Institute at Dhanbad. One fifth of that grant came from the Tata group.

Solar DC Cooking System

Taking a small step in realizing the dream of a 'Pollution-Free India', the CSIR-CMERI has developed a Solar DC Cooking System. The Solar DC Cooking Technology developed by the CSIR- CMERI has been transferred to two companies: Asansol Solar & LED House, and Meeco Solar & Infrastructure Associates, Durgapur.

The Solar DC Cooking System is a solar energy-based cooking system that includes a solar PV panel, charge controller, battery bank, and cooking oven. The technology offers a clean cooking environment, invertor-free direct operation, fast and uniform heating, and the ability to reduce 1 tonne of CO2 (Carbon Dioxide) per year /household.

In comparison to conventional solar-based cooking systems, which lose efficiency due to AC-DC conversion, the CSIR-CMERI designed Solar DC Cooking System has a 20-25 % higher efficiency and is more cost effective.

National R&D labs bring livelihoods to Odisha's poorest district

In 2019, a consortium of 12 national research and development laboratories joined hands in a rare effort to transform livelihoods in Odisha's Nabarangpur, one of India's poorest districts. Two years later, the interventions appear to be creating quite a stir. With 56% tribal and 15% Dalit population, Nabarangpur has the lowest per capita income of ₹14,700 per annum in Odisha (at 2004-05 prices), and 50% of its working population does not have any work. At the bottom in almost all social indicators, it has been identified as an aspirational district by the Centre. The collaboration involved 5 CSIR laboratories and 5 Indian Council of Agricultural Research centres.

Nabarangpur, where little happened till a couple of years ago, now has 5,000 farmers, artisans and women self-help groups involved in livelihood generation with 12 government departments and 15 entrepreneurs.

Moulded plastic components from COVID-19 PPE waste

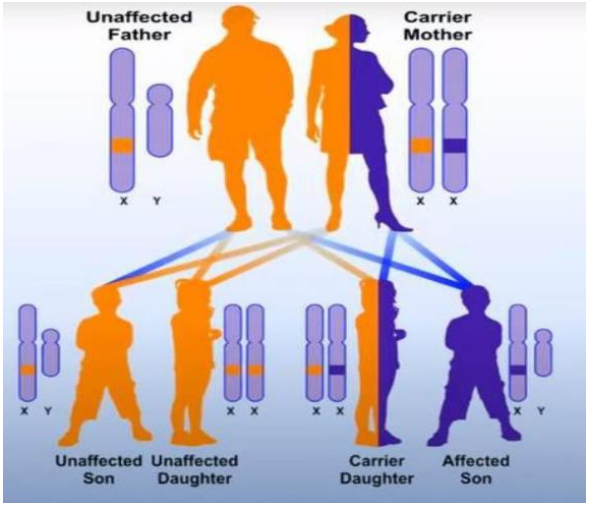
CSIR- National Chemical Laboratory (CSIR-NCL), Pune, jointly with Reliance Industries Ltd. (RIL) and several other companies from Pune have managed to manufacture useful moulded plastic components from COVID-19 PPE waste. The pilot project has the potential to be implemented throughout the country to recycle PPE waste into useful and safe products. The technical journey of CSIR-NCL, aided by Reliance and CSIR-Indian Institute of Petroleum (CSIR-IIP) Dehradun, with funding from the Council of Scientific and Industrial Research, mainly involved converting the decontaminated PPE waste (mainly comprising PPE suits/overalls) into an easily processable and upcycled agglomerated form (pellets or granules).

Sensors for cars to alert possible collisions

An indigenous Artificial Intelligence (AI) based system developed jointly by multiple public and private agencies, including the International Institute of Information Technology (IIIT-Hyderabad), is currently being pilot tested and will also be seen in Mahindra's latest SUV. iRASTE – Intelligent Solutions for Road Safety through Technology and Engineering project is a combined effort of the government, Applied AI Research Institute (INAI), Intel, IIIT-Hyderabad, CSIR-CRRI - Central Road Research Institute, Mahindra and Mahindra and the Nagpur Municipal Corporation.

While Intel-India brought onboard systems based on Advanced Driver Assist System (ADAS) technology, CSIR-CRRI domain expertise was in road engineering and Mahindra and Mahindra helped in conducting road safety public awareness programs and driver training.

Genetic testing for married couple



India with a huge population and known for endogamous and consanguineous marriages — within the same community or family — it is necessary for every married couple to undergo genetic testing for thalassemia since there is a chance of one in 30 to pass on the gene to the off-spring, said scientists of the CSIR-Centre for Cellular and Molecular Biology (CCMB) on Thursday. CCMB has a full-fledged Genetic Diagnostic Centre within its premises where several options are there for families to get tested for various genetic diseases caused by mutations, which could manifest in the subsequent generations from silent carriers. These could be neurological diseases, cancers, sickle cell anaemia, spinal muscular atrophy and several others.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Lahaul farmers trained in 'Heeng' cultivation

To strengthen the economy of farmers in the tribal district of Lahaul-Spiti, the CSIR-Institute of Himalayan Bioresource Technology (IHBT), Palampur, is encouraging them to cultivate 'heeng'. As many as 186 farmers have been trained so far. To improve the livelihood of farmers and utilise the land, the CSIR-IHBT is making an endeavour to introduce heeng, which is suitable for cultivation in cold desert conditions. Lahaul and Spiti is the first district in India to start 'heeng' cultivation.

The institute has the Centre for High Altitude Biology, Ribling at Lahaul, where farmers grow potato and peas on mainly barren land. To improve the livelihood of farmers and utilise the land, the institute is making an endeavour to introduce 'heeng', which is suitable for cultivation in cold desert conditions.

NIIST lauded for security printing technology

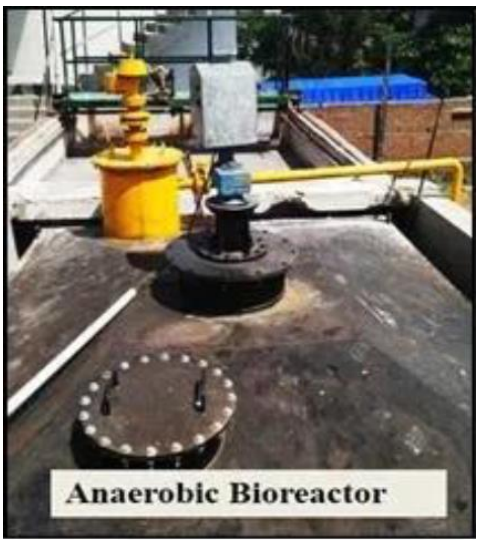
Scientists at the CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) here have won recognition for developing the know-how for indigenously manufacturing fluorescent pigments used to incorporate security features in currency notes and official documents. Images made using these fluorescent inks are invisible under normal light. They turn visible only when viewed under UV light. Such fluorescent materials find anti-counterfeiting applications in bank notes, passports, and other high-security documents. What the NIIST team did was to identify molecules that can absorb UV light and emit different colours, and enhanced their stability. A normal organic molecule will decompose over time under harsh conditions such as sunlight. But a currency note has to last for a certain period of time. A passport had to last longer.

Sero testing for corona antibodies in Uttar Pradesh

CSIR-Central Drug Research Institute is likely to expand its serological testing for antibodies against coronavirus (SARSCoV-2) to the state level. The institute will request the government to provide more Covid-19 samples so that the study can be conducted at the state level. The institute had conducted a sero survey of its employees last year in which it was found that around 6% had contracted novel coronavirus infection at some point in time but recovered without even knowing that they were carrying the virus. The institute has also developed an indigenous RT-PCR kit where the fluorophores have been developed at the institute. The institute is also carrying out whole-genome analysis of virus strains from several hundred patients as requested by the state government. These studies are helping analyse the spread of various SARS-Cov2 strains in the state.

Biogas Production Of Fat-Rich Sludge From Dairy Industry

Indian Scientists have developed a novel high-performance bioreactor system integrated with sustainable pre-treatment process for enabling anaerobic digestion of complex fat-rich sludge from dairy industry. It has been further integrated with membrane bioreactor based wastewater treatment to enable zero liquid discharge in the dairy industry.
This technology has been developed by Dr. Sandeep N. Mudliar at CSIR-CFTRI Mysore with support from the Waste Management Technology program of the Department of Science & Technology (DST), Government of India, with in- kind support from M/s Sun Enviro Technologies Pvt. Ltd. for the pilot-scale trials at a model dairy plant. They had developed a bench-scale system, which has been tested on pilot scale and will be filing for a patent soon.


Anaerobic Bioreactor

Himachal Pradesh becomes first state to organise cultivation of true dalchini

Realizing that people in India have been consuming inferior quality cinnamon (dalchini) having serious ill effects on health, the Council of Scientific and Industrial Research (CSIR) -Institute of Himalayan Bioresource Technology (IHBT) has, for the first time, begun organized cultivation of 'true' variety of cinnamon plant in the country. The true cinnamon is derived from Cinnamomum verum whereas the majority of cinnamon being sold in the market is derived from Cinnamomum cassia which is yet another species whose bark is used in place of Cinnamomum verum and it has a high content of courmarin which is not good for health and is known as kidney destroyer due to which it is banned in the US and other countries.

Reason for loss of taste and sense of smell in COVID-19 patients

At the height of both waves of the COVID-19 pandemic, health care workers and scientists were keenly looking at two key clinical symptoms: a loss of the olfactory (smell) and gustation (taste) receptors. The loss of both receptors, and their associated pathways, were a major correlate of the COVID-19 infection.
Geneticists at the Centre for Cellular and Molecular Biology (CCMB) in Hyderabad have now published a study on the reasons why some people infected with the SARS-CoV-2 virus tend to lose their sense of smell and taste. The researchers have indicated that genes associated with the olfactory and gustation functions become suppressed, causing COVID-19 positive patients to lose their ability to smell and taste. The study found that genes associated with crucial body functions, including those of the respiratory system, the heart, the endocrine system and the nervous system, were also suppressed or lowered.

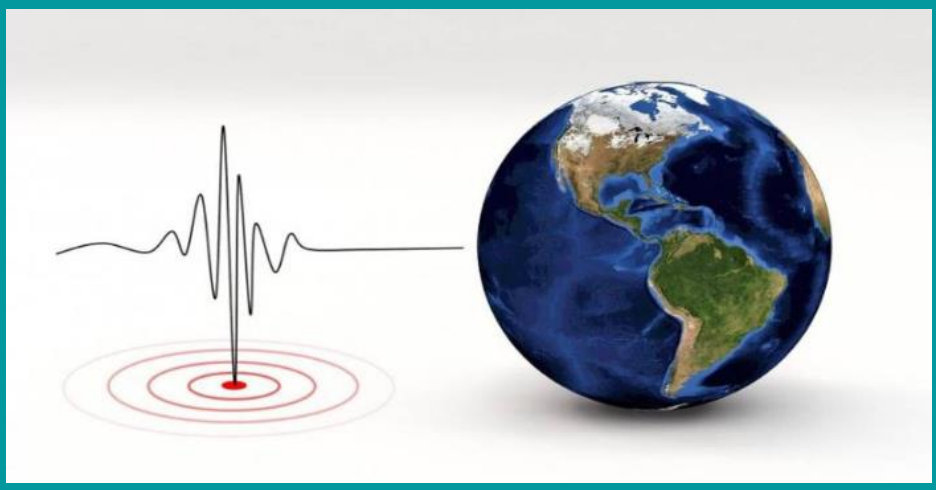
Presented by:

Extract from 'CSIR Matters' (Edition 26-30 September 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



Landslide, flood warning system for Himalayas

Hyderabad-based CSIR- National Geophysical Research Institute (CSIR- NGRI) has launched an Environmental Seismology (ES) group to develop a landslide and early flood warning system for the Himalayan region based on real- time monitoring. CSIR - NGRI said this would enable crucial warning several hours prior, which will save precious human lives and property in the future. This also has important implications for the planning of infrastructural development of dams, power plants, and other projects by governments that are of great strategic and societal importance to the country, the NGRI statement added.

CSIR – NGRI said landslides, rockslides, and flooding events are a cause of major concern. They have claimed thousands of lives. Ironically there still does not exist a clear mechanism for early warning and mitigation of these hazards.

Mineral separator at IREL commissioned

A group of scientists of CSIR- Institute of minerals and materials technology, Bhubaneswar led by Dr. S Angadi have identified the process to recover valuables from plant tailings for which IREL Ltd has signed an agreement to develop the technology.

A number of heavy minerals, such as, ilmenite, rutile, garnet, monazite, zircon, and sillimanite are found in different placer deposits along the coastline of India. IREL Limited (Formerly Indian Rare Earth Limited) is engaged in mining and processing of beach sand minerals in the Eastern and Southern coast of India. Presently, IREL has the capacity to process about 6 lakhs tons of beach sand per annum.

NIIST looking to develop 'vegan leather'

After showing that agro-residues can be used to make chic tableware, the CSIR – National Institute for Interdisciplinary Science and Technology (NIIST) here is looking to develop 'vegan leather' from agro-wastes such as mango peels and pineapple leaves. The research on 'vegan leather' and food packaging material from farm waste is the next step in a research programme which used rice husk, sugarcane bagasse, fruit peel and wheat bran for making durable plates and cups, a success story which won the NIIST accolades at the national level in September.

'Vegan leather' is considered an eco-friendly and ethical substitute to leather from animal skin. The NIIST is working on technologies for its cost-effective development for use in consumer goods such as bags, footwear, wallets and belt.

State-of-art Helicopter-borne Survey technology

Union Minister Dr Jitendra Singh launched state-of-the-art Helicopter-borne or Heli-borne survey technology for groundwater management, developed by CSIR-NGRI Hyderabad. To start with, the States of Rajasthan, Gujarat, Punjab and Haryana are being taken up for this latest heli-borne survey for groundwater and the beginning was made today from Jodhpur in Rajasthan. CSIR is employing the latest state-of-the-art technology for mapping groundwater sources in arid regions and thus help utilize groundwater for drinking purposes. CSIR, along with National Geophysical Research Institute NGRI, have undertaken High Resolution Aquifer Mapping & Management in Arid Regions of North Western India to augment the groundwater resources. The Heli-borne geophysical mapping technique of CSIR-NGRI provides a high resolution 3D image of the sub-surface up to a depth of 500 meters below the ground.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 October 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Novel formulation for thermo-stable, cost-effective Insulin

Researchers from Bose Institute, CSIR-Indian Institute of Chemical Biology (CSIR-IICB), Kolkata, in collaboration with CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, have shown that a small peptide molecule consists of four amino acids, named as Insulock prevents both heat and storage induced insulin fibrillation and thereby loss of effective quantum of insulin. The researchers have found that the Insulock is non-toxic, non-immunogenic and heat-stable and can maintain insulin in the active form at room temperature, without any loss for months. The Insulock has been tested in mice models. This research work has been published in iScience, an international reputed journal of Cell press.

The Kolkata-Hyderabad scientists team hopes that, upon successful completion of trials in humans, the novel Insulock formulation can give a rich scope for producing cost-effective insulin injection, and will be extremely useful in delivering it to the patients even in resource-limited areas.

.

CSIR's tech to replace costly imported electronic items in satellites

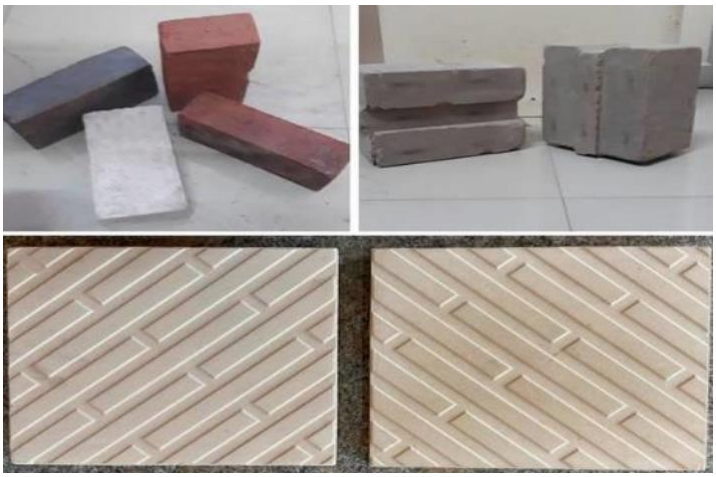
Indian scientists have indigenously developed toxic-free and superior multilayer technology that packages together electronic components to produce multilayer circuits. The technology has immense application in the strategic sector such as satellite communication and defence industry, which at present depends upon costly imports. Referred to as Low-Temperature Cofired Ceramic (LTCC) tapes and High-Temperature Cofired Ceramic (HTCC) substrates the technology is in the fifth stage of 'Technology Readiness' and is being supplied by the Council of Scientific and Industrial Research (CSIR) to the Indian Space Research Organisation (ISRO) for tests. If the testing is successful, the technology can be employed in several microwave components like 'S' and 'C' band receivers in satellite transponders. ISRO requires thousands of tapes and substrates every year. Defense research laboratories and some defense public sector undertakings also require them.

CSIR Institute Plans to Seek Emergency Approval for Horse- based Antibody Therapy for Covid

The Hyderabad-based CSIR- Centre for Cellular and Molecular Biology (CCMB) is planning to seek emergency-use approval for its horse-based antibody therapy for Covid treatment within the next two months. Known as fragment-based therapeutic antibody treatment, these antibodies are raised in horses using inactivated coronavirus, which are fractionated and purified to produce antibody fragments for neutralising the virus in the patients for recovery. The therapy — on which CCMB is working in collaboration with VINS Bioproducts, which manufactures equine-based immunoglobulins — is in the advanced stages of phase I/II trials.

According to experts, therapeutic antibody treatment could prove more effective and feasible than plasma therapy. While plasma therapy has now been proven ineffective against the treatment of Covid-19, therapies using horses or other animals to generate antibodies against the SARS-CoV-2 viral antigens are expected to show efficacy.

The objective, the CCMB chief says, is to manufacture cheaper priced mRNA technology that can help reduce vaccine inequality across the globe. The Pfizer-BioNTech coronavirus vaccine, for instance, was priced $19.5 (Rs 1,423) per dose in the United States, and around $21 (Rs 1,532) a dose in the United Kingdom.



Now, bricks from 'waste' sand

Tons of waste foundry mould sand generated at the State Government undertaking Autokast Ltd will now be turned into bricks for the construction sector, courtesy a technique developed by the CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) at Pappanamcode. Cherthala-based Autokast, which manufactures ferrous castings components, generates 600 to

700 tonnes of foundry waste sand every month.NIIST developed the technology to make bricks from the silica sand through a simple, cement-bonded compression moulding technique. NIIST will transfer the know-how to Autokast whereboth the institutions will set up a brick manufacturing plant, designed to produce 4,000 bricks per day. The cement bonding and compression moulding technique can produce high-strength bricks that meet the IS 1077 standards.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 October 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Anti-viral drug to treat dengue by CDRI

Scientists at Lucknow-based Central Drug Research Institute (CSIR-CDRI) claim to have developed a medicine to treat dengue and a Mumbai-based pharmaceutical major has received permission from the Drug Controller General of India (DCGI) to conduct human testing of the drug.

The anti-viral drug AQCH, derived from plants has been tested successfully in labs on mice. Trials will be conducted at one medical college in each of the following cities: Kanpur, Lucknow, Agra, Mumbai, Thane, Pune, Aurangabad, Ahmedabad, Kolkata, Bengaluru, Mangalore, Belgaum, Chennai, Jaipur, Chandigarh, Visakahapatnam, Cuttack, Khurda and Nathdwara. A dengue patient should be at least 18 years of age to be eligible for trials. Additionally, infection in the patient should have been confirmed 48 hours before the testing. The patient will be kept in hospital for eight days, during which he will be administered the drug for seven days. He will be kept under observation for 17 days after being given the medicine.

.

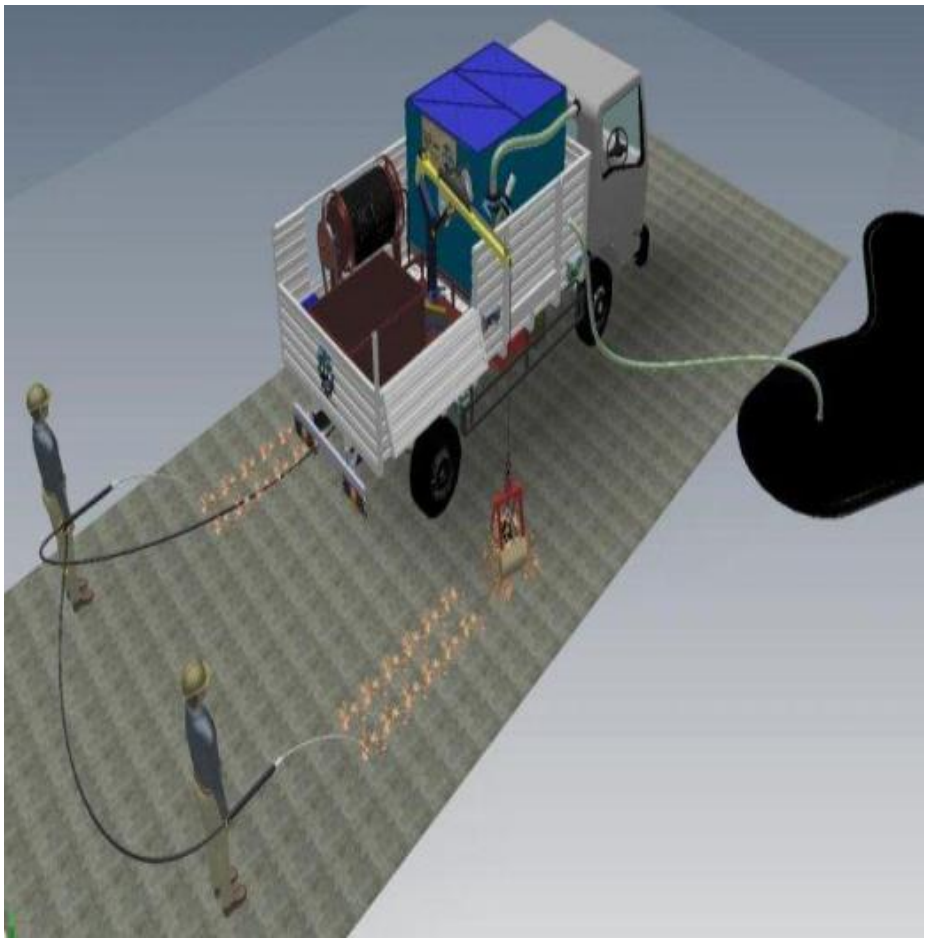
Presented by:

Extract from 'CSIR Matters' (Edition 16-20 October 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



CMERI develops machine for cleaning roads

Researchers at the CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur, have developed a machine to clean roads using treated water from manholes. This machine sucks out the wastewater from drain/manhole using slurry pump. The drain water passes through multiple chambers and screened by different mesh size sieves, before it is finally treated with chemical disinfectant. The treated water is stored in a separate chamber that is used in jetting operation. The water intake capacity of the machine from one manhole is more than 1000 litres. The machine can utilize the water to clean the road up to next available manhole within 50-70 meters..

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 October 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Herbal plants planted at CSIR-NEIST

Plantations of medicinal, aromatic and economically important plants were carried out at Herbal Garden of CSIR-North East Institute of Science and Technology, Branch Laboratory, Lamphelpat by Botanical Survey of India. A press release of CSIR-NEIST informed that more than 60 species of medicinal, aromatic and traditional or religiously associated plants are already planted in the Herbal Garden of the institute..

CSIO transfers tech for LED aircraft lights to BEL

The CSIR- Central Scientific Instruments Organization (CSIO) signed a Technology Transfer Agreement with Bharat Electronics Limited (BEL) and the CSIO for LED-based night vision goggles, compatible wing and fin navigation lights for aircraft, LED-based taxi and landing lights and LED-based drogue lights along with associated test rigs.

Prof S Anantha Ramakrishna, Director, CSIO said the new technology developed by the CSIO would lead to more rugged lights for the aircraft since these would be LED based and would replace the thin filament lamps used in earlier versions, which made it more prone to breakdowns. He said it would lead to less power consumption and less heat dissipation, making the lights compatible for night vision capability.

Hyderabad goes green this Diwali

The green crackers have been making headlines every Diwali for the last few years. Unlike earlier years which saw only limited availability of green crackers in the market, this time, the firecracker dealers' association is confident that most crackers available in Hyderabad will be eco-friendly. The National Environmental Engineering Research Institute (NEERI) has prepared the chemical formula for the green crackers that all the manufactures were asked to adopt. Green crackers are developed using a chemical formula that makes them less harmful for the environment than the conventional ones. In the green crackers, the usual polluting chemicals such as Aluminium, Barium, Potassium, Nitrate and Carbon are either cut down to reduce emissions by about 30 percent or completely removed.

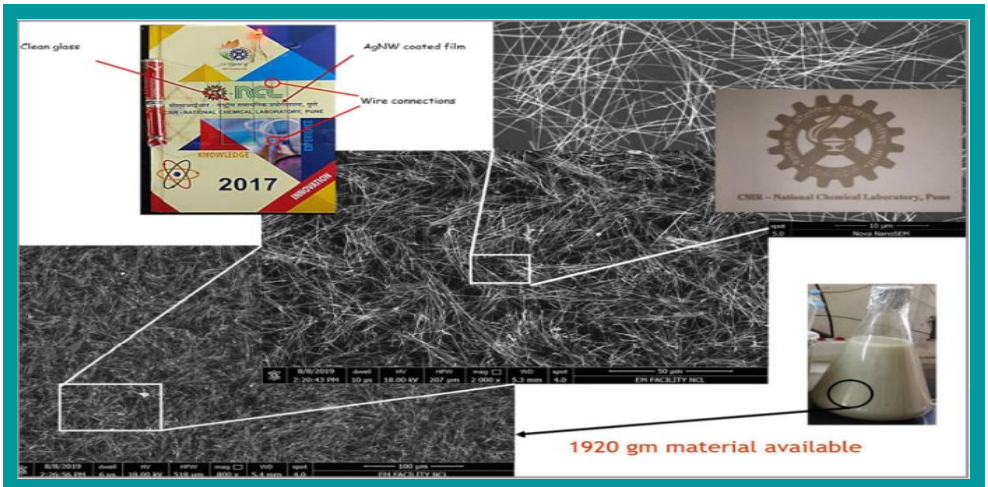
Presented by:

Extract from 'CSIR Matters' (Edition 26-30 October 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



CFTRI to help set up workable food processing units

The Mysuru-based CSIR- Central Food Technological Research Institute (CFTRI) has drawn up a plan to support SHGs and rural entrepreneurs who are interested in taking up food processing, and establish enterprises in their villages. Thanks to Sustainable Rural Food Processing Enterprises for Livelihood Generation, CSIR-CFTRI, under the CSIR Integrated Skill Initiative, aims to enable poor households in rural areas access gainful self-employment opportunities, thus improving their livelihoods. The National Rural Livelihoods Mission (NRLM) was launched by the Ministry of Rural Development (MoRD) which aims at building strong grassroots institutions of the poor.

A low-cost synthesis method for silver nanowires

Synthesizing nanomaterials like nanowires and nanotubes in large quantities is quite tricky. It is essential to synthesize the materials to get a uniform nanowire diameter range with a variation. A new process developed by Indian scientists could bring down the costs for large-scale manufacturing of nanomaterial (Silver nanowires). This low-cost synthesis method can produce silver nanowires at the scale of 500 grams per day at the expense of 20$/gm compared to 250$/gm to 400$/gm of the market price. The process produces silver nanowires with excellent conductivity. This process can also be used to make conducting inks and coatings for display technologies and flexible electronics. The developed process has been tested at CSIR-NCL's characterization facility and is in stage 8 of the Technology Readiness Level.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 November 2021)

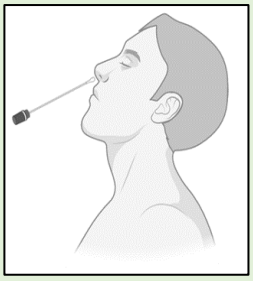
SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-CCMB's dry swab RT-PCR test method gets more validation

CSIR-CCMB's novel 'Dry Swab', extraction-free direct RT-PCR testing method, which has reduced the time taken for the COVID test result to be declared, got further validation with another study highlighting the 'immense' value of the method in the detection of any kind of variant, better sensitivity and illuminating more 'scientific dimensions'. Challenges like reagent shortage, limited human resources and high transmission rate can be handled in a better manner to contain the infection and better allocation of medical resources, as it can quickly diagnose and control the spread. The study on temporal stability of two strains of SARS-CoV-2 at two different temperatures indicates that for shorter distance transportation, cold chain can be avoided and the dry swab samples with low viral load also is stable at RT for 24 hours.



Swab collection

No risk of leakage

No RNA isolation

Dry-Swab Method

Transport dry swab

Unpacking and cataloguing

Elution of RNA using **TE-P buffer**

Direct RT-PCR and reporting

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 November 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

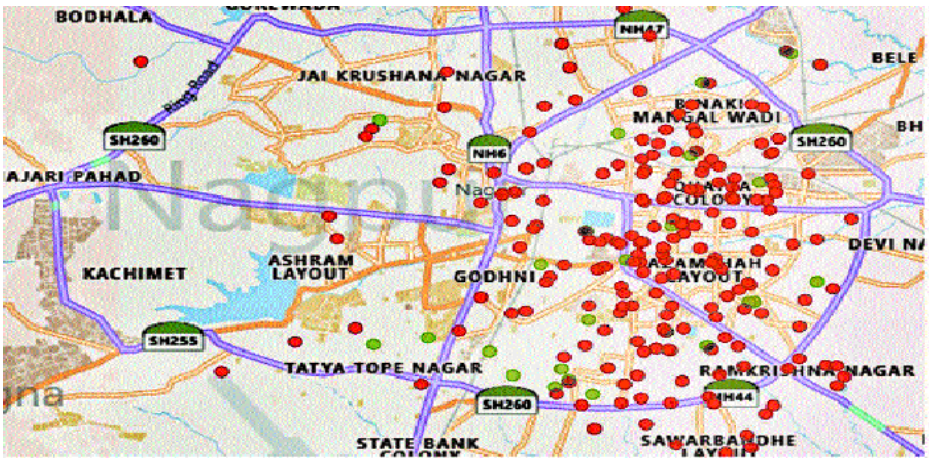
In this issue:

Drones Successfully Deliver COVID-19 Vaccine Doses

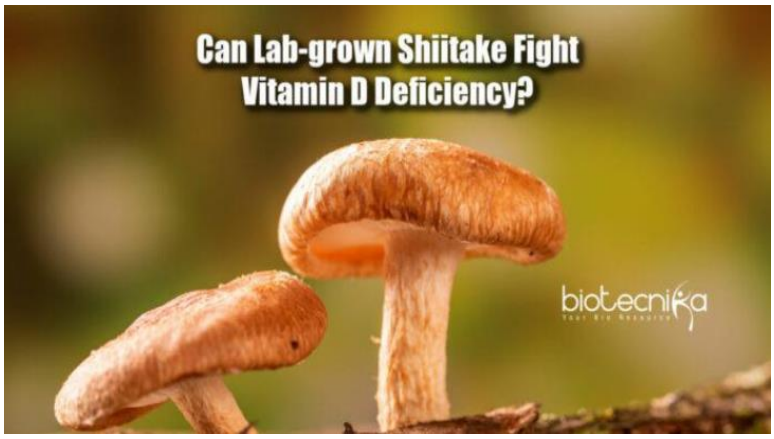
An indigenous, medium class octacopter developed by the state-run CSIR- National Aerospace Laboratories (NAL) successfully delivered COVID-19 vaccine doses in a remote village in Karnataka, covering an aerial distance of 7 km in about 10 minutes. The CSIR-NAL's octacopter successfully delivered 50 vials of the COVID-19 vaccine along with syringes in a special container from the Chandapura Primary Health Centre (PHC) to the Haragadde PHC. The octacopter took off at 9.43 a.m. from Chandapura PHC carrying COVID vaccine doses which they delivered to the Haragadde PHC at 9.53 a.m. The octacopter flew at an altitude of 300m AGL at 10 metres/sec and covered an aerial distance of about 7 km in about 10 minutes.

This Diwali: Noise pollution in city was higher compared to last 2 years

Noise monitoring by CSIR-National Environmental Engineering Research Institute (NEERI) during this Diwali, by sourcing the data from citizens, has revealed that noise pollution in Nagpur city was higher than that in last two years. Satish Lokhande, CSIR-NEERI Noise Expert and Senior Technical Officer, launched a campaign for noise monitoring across Nagpur city. An appeal was made to the citizens of Nagpur to volunteer and record noise levels with the help of the Android app 'Noise Tracker' developed by Lokhande to report noise pollution status of the city. NEERI received an overwhelming response to this call. A careful analysis and evaluation of the data received revealed that this Diwali, the overall noise pollution of Nagpur city was much higher than that in the last two years.



Lab-grown Mushrooms to Fight Vitamin D Deficiency?



Scientists at CSIR-IHBT intend to conduct a human clinical trial to evaluate the benefit of lab-grown shiitake mushrooms in Vitamin D deficient people. Researchers from CSIR-IHBT headed by Rakshak Kumar had developed a low-priced approach for growing shiitake mushrooms in the lab, allowing regional farmers to supplement their earnings.
Shiitake mushrooms are costly as they grow in particular conditions on fallen tree logs. Although shiitake is currently produced in northeastern India, the team at CSIR-IHBT has developed a new technology that enables these mushrooms to grow much quicker in controlled lab settings. Furthermore, the type grown by CSIR has higher levels of Vitamin D.

To determine whether the mushrooms can be used as a nutraceutical — a food or component of food that gives medical or health benefits — to boost vitamin D levels in people with vitamin D deficiency, the team headed by Rakshak Kumar is planning human trials to assess the benefit of a standardized (the preparation must be such that each lot of the final nutraceutical product has the equal level of Vitamin D) shiitake mushroom soup on vitamin D levels.

Beverage mix from coffee leaves

Mysuru-based CSIR-Central Food Technological Research Institute (CFTRI) has developed a technology that will allow them to produce a beverage mix out of the leaves and create a value-added product from coffee leaves that also offers health benefits. This technique is the result of a CFTRI initiative in 2019 to generate value-added products from coffee leaves. Due to the nature of the coffee bean's growing cycle, over 70% of the coffee industry is unemployed or underemployed for nine months of the year. The project's goal was to give coffee farmers a year-round sustainable procedure.

The making of a beverage from coffee leaves is called in Ethiopia as “kuti tea” and in West Sumatra and Indonesia as “Kahwa daun”. However, the preparation in these areas differs from the one developed by CFTRI. Water can be used to make the brew, which can then be steeped for a few minutes before being filtered and drunk. The institute has started the process of transferring this technology to the coffee business, and a few industry partners have already given their assent. In terms of the beverage's nutritional content, she claims that coffee leaves are high in phenolic acids, which may have health benefits. A coffee leaf contains around 17 percent more antioxidants than green tea.

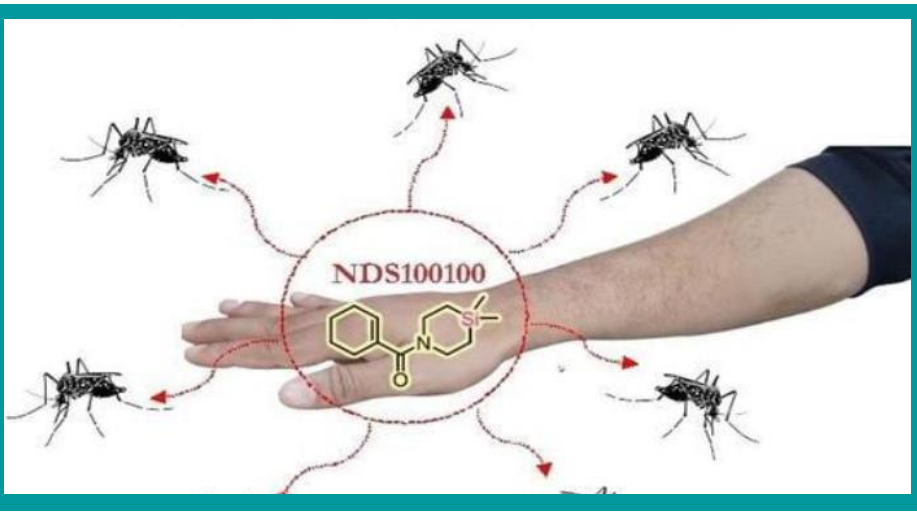
Presented by:

Extract from 'CSIR Matters' (Edition 11-15 November 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



Patent for Hydrazine Hydrate production

Gujarat Alkalies and Chemicals Limited (GACL), Vadodara and CSIR-Indian Institute of Chemical Technology, (CSIR-IICT), Hyderabad have achieved success in developing indigenous environment friendly technology to manufacture super speciality chemical Hydrazine Hydrate (H6N2O). Patent Office, Government of India has awarded a joint patent for 20 years to CSIR and GACL for invention entitled 'An improved process for production of Hydrazine Hydrate'. Hydrazine Hydrate finds its applications in various industries such as Agrochemicals, Polymers, Water treatment, Fuel cells, Space applications etc. At present, Hydrazine Hydrate is 100% imported product in India and there was a need for import substitution of this high value super speciality chemical product.

Novel mosquito repelling molecule by CSIR-NCL

A team of researchers from the CSIR- National Chemical Laboratory (CSIR-NCL), Pune, has synthesised a potent molecule that helps repel adult female Aedes Aegypti mosquitoes which are vectors of debilitating and often fatal diseases such as dengue and chikungunya and also vectors of the Zika virus. A research team led by Dr D S Reddy, currently the director of the CSIR-Indian Institute of Integrative Medicine, Jammu, used the "silicon switch" approach to synthesise a library of compounds based on the DEET scaffold, which is the present-day's gold-standard insect repellent. Out of the 25 compounds synthesised, one of the molecules offered longer duration of protection than DEET (N,N-Diethyl-meta-toluamide), suggesting that the incorporation of silicon improves efficacy. Results of this exciting study have been published in the journal ACS Omega.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 November 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aerial survey for Thalassery-Wayanad line

The Konkan Railway Corporation Limited (KRCL) launched the survey for the proposed Thalassery-Wayanad-Mysuru rail line in Wayanad by using the heli-borne geophysical mapping technique of the CSIR-National Geophysical Research Institute (NGRI), Hyderabad. The 10-day survey will assess the structure of the soil, rock formations, underground water sources, and marshy lands through which the proposed rail line will pass, sources said. The base of the survey has been set up on the helipad near St. Mary's College ground at Sulthan Bathery. The main advantage of the heli-borne geophysical survey was that it was fast, highly data dense, precise and economical, the sources said.

India's first virtual science lab launched for students

India's Union Minister of State for Science & Technology, Jitendra Singh inaugurated the country's first virtual science lab for children under the CSIR Jigyasa programme. The virtual lab was launched to help students connect with scientists across the country. The lab is also in tune with the National Education Policy (NEP), where students are allowed to choose any subject and the concept of streams has been disbanded. With the facility students will be provided with quality research exposure and innovative pedagogy to help them drive their scientific curiosity with the help of an online interactive medium. The platform will consist of simulated experiments; pedagogy based content, videos, chat forums, animations, gaming, quiz, facility sharing, webinars and more.

Delta variant can infect fully vaccinated individuals: Study

The study conducted by the Indian SARS-CoV-2 Genomics Consortium (INSACOG), Council Of Scientific And Industrial Research (CSIR) and the National Centre for Disease Control in two Delhi hospitals revealed that the highly transmissible Covid Delta variant can infect individuals who have been fully vaccinated against the virus. It has revealed that vaccination protects against hospitalization and the severity of infection but there is also a possible risk of transmission in very vulnerable people. The researchers from INSACOG and CSIR analysed data on 113 breakthrough infections among health workers by constructing a probable transmission network from epidemiological and virus genome sequence data using computational approach.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 November 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aerial delivery of Covid-19 vaccines using drones in Jammu

Union Minister for Science and Technology Jitendra Singh has launched a drone-driven aerial delivery facility to transport Covid-19 vaccines and emergency medicines to inaccessible and difficult areas in a short span of time in Jammu. CSIR-National Aerospace Laboratories (CSIR-NAL) and CSIR-IIIM have teamed up with the Department of Health and Family Welfare of the Government of Jammu for aerial delivery of Covid-19 vaccines in remote areas. The Octacopter drone can carry a payload of 10 kg with range of 20 kilometers and it can fly at an operational altitude of 500 meters AGL at a maximum flying speed of 36 kmph, as per the minister.

HP: First pilot project for cinnamon cultivation

In its first to grow high value herbs mission, HP has launched a pilot project for Cinnamon in state's Una district. The project is aimed to empower the farmers to cultivate herbs for the commercial use in the state's lower areas bordering Punjab. At present some species of Cinnamomum genus are naturally grown wild in forests. First sapling of Cinnamomum Verum, which is also called sweet wood, was successfully planted in Una by minister for agriculture and rural development Virender Kanwar. State's agriculture department has also been joined by the CSIR's institute of Himalayan Bioresource Technology (IHBT), Palampur to make the state a hub for cultivation of spices in different districts depending on climatic conditions.

CSIR-CMERI Durgapur develops world's largest solar tree

The CSIR – Central Mechanical Engineering Research Institute (CMERI) has developed the world's largest solar tree, which has been installed at the CSIR- CMERI Residential Colony, Durgapur. The tree has been designed to ensure each solar panel's maximum exposure to sunlight and also create the least shadow area beneath. There are a total of 35 solar PV panels in each tree with a capacity of 330 wp each. The inclination of the arms holding the panels can be adjusted, a feature that is not available in roof-mounted solar facilities. The energy generation data can be monitored either real-time or on a daily basis.

Indian Bio-Jet Fuel Technology Receives Formal Military Certification

CSIR-IIP Dehradun's home- grown technology to produce bio-jet fuel has been formally approved for use on military aircraft of the Indian Air Force (IAF). The provisional clearance (PC) certificate was handed over by Shri R.Kamalakannan, Group Director (AT&FOL), Centre for Military Airworthiness and Certification (CEMILAC) to Mr Saleem Akhtar Farooqui, Principal Scientist from CSIR-IIP in the presence of Group Captain Asheesh Shrivastava and Wing Commander A Sachan of the IAF and Mr R Shanumgavel of CEMILAC. This certification represents India's growing confidence in aviation biofuel sector and another step towards Atmanirbhar Bharat'.

Presented by:

Extract from 'CSIR Matters' (Edition 26-30 November 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CIMFR initiates a jewelry-making project with CSIR

In an initiative to provide sustainable income source to people living near the colliery areas, the Dhanbad based CSIR- Central institute of Mining and Fuel Research (CIMFR) is working on a project to make jewelry items from coal. Initial training of a group of local residents has already been conducted in this regard by the Renewable Energy and Biotechnology section of the institute. The two-year project is funded by Central Institute of Mining and Fuel Research. People in hinterland of Jharkhand are very skilled in tribal art which is quite unique, so under the project they will be utilizing their artistic skills on waste coal by polishing and refining it to make beautiful jewelry which will have ethnic look.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 December 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

India's Bio-jet Fuel Technology Receives Military Recognition

India's Ministry of Science and Technology has awarded provisional clearance to a domestically developed technology, which can produce bio-based jet fuel for use on military aircraft. The technology was developed by the laboratory of the Indian Institute of Petroleum (IIP), along with the Council of Scientific and Industrial Research (CSIR). The fuel has undergone inspection and evaluation testing, along with trials over the last three years. This technology of producing Indian bio-jet fuel can be developed using cooking oil, tree-borne oils, short gestation oilseed crops, etc., typically grown off-season by farmers, and waste extracts from edible oil processing units. This technology will also reduce air pollution by virtue of its ultra-low sulphur content compared with conventional jet fuel and contribute to India's Net-Zero greenhouse gas emissions targets. Additionally, one of the biggest governing factors is it will aid in enhancing the livelihood of farmers and indigenous tribes engaged in extracting, collecting, and maintaining non-edible oils.

IndiGo Partners With CSIR-IIP For Sustainable Aviation Fuel

IndiGo has signed an agreement with CSIR-Indian Institute of Petroleum (CSIR-IIP), Dehradun to become partners in leading the deployment of sustainable aviation fuel (SAF) in India and globally. Under this partnership, IndiGo and CSIR-IIP will enter into specific arrangements for projects for SAF based on techno-commercial feasibility and Environment, Social, and Governance (ESG) value creation. IndiGo desires to be an anchor partner to such Institutes and oil refining companies in the future to address the core issue of Carbon Emissions and take a lead in demonstrating its commitment towards sustainable and responsible growth.

Weekly Nutrition Packs Distributed To Severely Acute Malnourished Children

CSIR-CFTRI launched a nutrition intervention initiative aimed at improving the nutritional status of the Severely Acute Malnourished (SAM) children in Mysuru with the participation of Women and Child Development Department, Government of Karnataka. About 140 SAM children identified by the District Administration will be provided with Weekly Packs consisting of selected nutrition supplements such as Spirulina Chikki, High Protein Biscuits, High Protein Rusks, Energy Food along with Sesame Paste (burfi), Fortified Mango bar etc. for a period of 6 months. The children will be served with one of these supplements every day to enhance their macro and micro-nutrient status.

Seaweed cultivation empowers rural population of Rameswaram

The Council Of Scientific And Industrial Research-Central Salt And Marine Chemicals Research Institute (CSIR-CSMCRI) located at Mandapam in Tamil Nadu provided training to local farmers in the skills necessary for harnessing its full potential of sea weeds. Seaweeds are macroscopic algae, also termed as the 'Medical Food of the 21st Century' due to their usage as laxatives. They are also used for making pharmaceutical capsules for the treatment of goiter, cancer, bone-replacement therapy, and cardiovascular surgeries. Locals have been cultivating it for a long time but lacked the skills necessary for harnessing its full potential. This is where CSIR-CSMCRI stepped in and took up the initiative to impart necessary skills. CSIR-CSMCRI's efforts have helped develop skills in cultivating seaweed, employing appropriate technology, enhancing biomass productivity of seaweeds for industrial requirements, and encouraging entrepreneurship development on seaweed-based activities among community-based organisations and Self Help Groups in Mandapam, Tamil Nadu, and Gujarat.

Genome Sequencing Lab In Vijayawada

A genome sequencing lab, to help in identifying the genomic sequence of the COVID variant will soon be available in the State of Andhra Pradesh. The State Medical Health Department has entered into an agreement with the CSIR-Center for Cellular and Molecular Biology (CCMB) for the establishment of this lab. The facility will be set up at the Government Medical College in Vijayawada. About 15% of the positive cases registered in the State so far are being sent to the Hyderabad lab for genome sequencing. With the threat of the Omicron variant looming and many people coming from different countries landing in AP, the samples of those who have tested COVID positive are being sent to CCMB in Hyderabad for genomic sequencing to identify the Omicron variant. This leads to a delay in the release of results.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 December 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CDRI probes mitochondrion of malaria parasite for alternative drug Targets

Dr Niti Kumar, Scientist, CSIR-Central Drug Research Institute (CDRI), Lucknow, along with her research group, is trying to identify proteins which influence the shape-function of the single mitochondrion that the malaria parasite harbors as well as how it undergoes repair. Understanding these processes will help decipher how the parasite adapts to environmental perturbations, mitigate drug-induced toxicity (phenotypic drug resistance), drive recurrence of infection after completion of treatment, and relapse from dormant stages.

Dr Niti's research group is using multi-pronged approaches to understand how the structurally-functionally diverged components of genome and proteome maintenance pathways give a survival advantage to the malaria parasite. It is very intriguing that despite the vulnerability to genotoxic and proteotoxic stress, the parasite maintains cellular homeostasis even under hostile conditions and can withstand immune surveillance mounted by mosquito vector and human host.

A bus that uses hydrogen and air as fuel

The Sentient labs demonstrated India's first indigenously developed Hydrogen fuel cell bus. The Hydrogen fuel cell technology has been developed in collaboration with CSIR (Council of Scientific and Industrial Research)-NCL (National Chemical Laboratory) and CSIR-CECRI (Central Electrochemical Research Institute).

Recently Sentient had announced the world's first technology that generates hydrogen directly from agricultural residue for use in fuel cell-powered vehicles. In addition to the hydrogen fuel cell technology, Sentient Labs also designed and developed other key components like balance of plant, powertrain, and battery pack. All of these components have been deployed on a 9-meter, 32-seater, air-conditioned bus. This is designed to provide a range of 450 kms while utilizing 30 kgs of Hydrogen. A modular architecture allows for changes in the design to suit requirements of range and operating conditions.

The fuel cell utilizes hydrogen and air to generate electricity to power the bus. The only effluent from the bus is water, therefore making it possibly the most environmentally friendly mode of transportation. While hydrogen generation technology can provide an alternative source of revenue to farmers, replacing diesel buses with Hydrogen fuel cell buses will improve air quality drastically and also reduce oil import costs.

CSIR-NEERI to install STP at Butibori MIDC

CSIR- National Environmental Engineering Research Institute (CSIR-NEERI) will be installing a sewage treatment plant (STP) at Maharashtra Industrial Development Corporation (MIDC) Butibori, Nagpur. The STP with a capacity to treat 50 m3 of sewage per day will consist of a compact improved moving bed bio-film reactor (MBBR) and Submerged Aerobic Fixed Film (SAFF). The waste water treated through MBBR and SAFF will be reused for other purposes like gardening at MIDC Butibori, Nagpur.

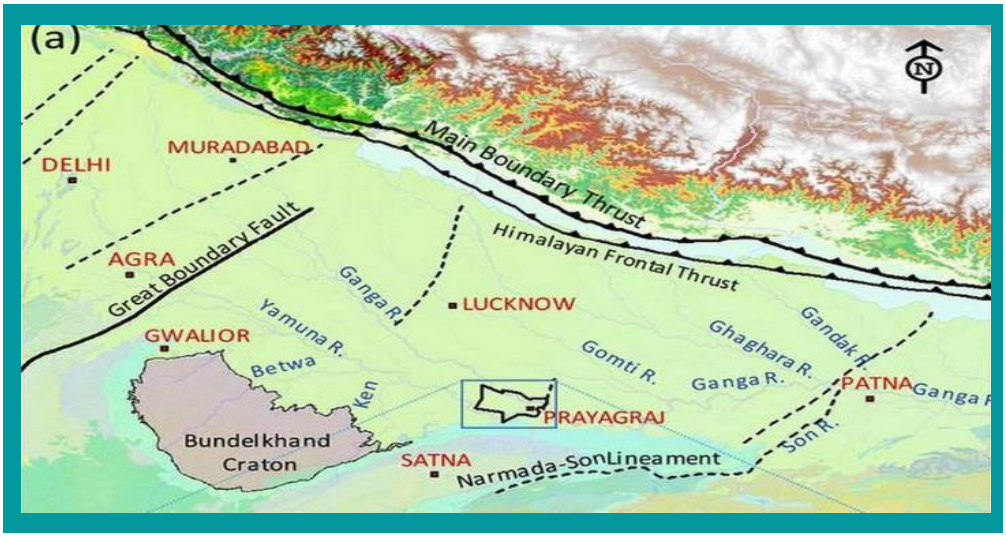
Presented by:

Extract from 'CSIR Matters' (Edition 11-15 December 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



CSIR study unravels buried river in Ganga-Yamuna Region

A high resolution airborne electromagnetic study in the Ganga-Yamuna region, supplemented with drilling and logging data to address the groundwater crisis, by scientists of the CSIR National Geophysical Research Institute (NGRI), has unraveled exhaustive aquifer information with discovery of a 45-km long buried river equal to these two rivers. This ancient river, likely to be extending towards the Himalayas, is characterized by porous and permeable structures and is hydro-geologically linked with Ganga and Yamuna through an underlying principal aquifer, which could help in replenishing groundwater resources in the region. The river falls within a region where a lost mythological river 'Saraswati' was believed to be flowing in the past, says the CSIR-NGRI study.

Transporter protein in brain identified

Runa Hamid of the CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad and colleagues have identified a transporter protein in the brain that plays a vital role in habituation. They have reported the new findings in the journal PLOS Genetics.

Habituation is common in humans and other organisms because it enables them to pay attention to the most essential features in their surroundings — food, mates, and danger — while safely ignoring extraneous information. Hamid's team investigated these mechanisms by studying the ability of fruit flies to tune out a specific scent. They discovered that the choline transporter, a protein that takes up choline into neurons so that the cells can produce the neurotransmitter acetylcholine, regulates habituation to smells.

'Indian Footwear Sizing system' to be developed

The Department for Promotion of Industry and Internal Trade (DPIIT) in consultation with the Central Leather Research Institute (CLRI), Chennai has initiated the first ever exercise to develop an 'Indian Footwear Sizing system' to identify the footwear size ranges required for the local population. This project will lead to accurate measurement of foot sizes, taking into consideration all the variations due to region, gender, age, health condition towards indigenisation of key products essential for realisation of an AatmaNirbhar Bharat.

The present Indian Standard IS 1638:1969 specification for sizing and fitting of footwear is based on the European and French standards. This standard requires a revision to accommodate demographic, anthropometric features of the Indian feet, leading to a more comfortable footwear and health of the individual. The project includes anthropometric survey, statistical analysis and development of an Indian foot sizing system and involves foot biomechanics and gait study, materials identification, lasts fabrication, development of design patterns and comfort parameters, wear trials, generation of specification.

CSIR-CDRI to transfer technology to develop a new safer drug (S-007-867) for heart attack and stroke

CSIR-CDRI, Lucknow has tied up with UP-based Marc Laboratories Pvt. Ltd., India for the development of a synthetic compound S-007-867 as modulator of blood coagulation cascade, in particular as inhibitor of collagen induced platelet aggregation. This may be helpful in treating patient population of coronary and cerebral artery diseases. Arterial thrombosis is an acute complication that develops on the chronic lesions of atherosclerosis leading to heart attack and stroke. Therefore, inhibition of platelet collagen interaction is anticipated to be a promising therapeutic strategy to treat intravascular thrombosis. The compound S-007-867 significantly inhibits collagen mediated platelet activation and subsequently reduces the release of ATP from dense granules and thromboxane A2 via COX1 activation.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 December 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Aerospace incubation centre launched at NAL

A new technology accelerator and incubation centre was launched at the CSIR-NAL campus in the city to nurture aerospace start-ups. The announcement was made by Social Alpha, a venture development platform for science and technology start-ups. Dubbed mach33.aero, the centre was described as the first public-private partnership in India. The centre is housed on the CSIR-NAL campus and will focus on aviation, defense, space exploration, agriculture and climate action. Mach33.aero will leverage innovations to build solutions for some of our toughest challenges with the help of advanced systems and frontier technologies like Robotics, AI/ML/Data Science, Nanotech, Material Science, Advanced Manufacturing, Cryogenics etc.

DCGI approves hydroxyurea for treatment of sickle cell anemia

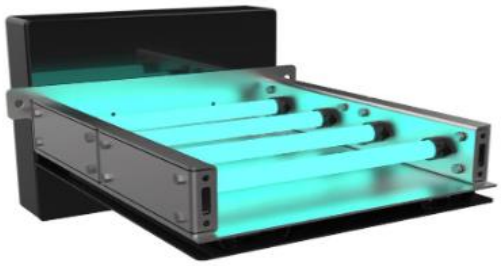
The Drugs Controller General of India (DCGI) has approved the use of hydroxyurea to treat Sickle Cell Anemia. The CSIR-Sickle Cell Anemia (CSIR-SCA) Mission has sought the DCGI for clearance, organized by the CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB) with the help of Cipla, a hydroxyurea manufacturer, and with active support from CSIR-IIIM. A committee of specialists appointed by the Central Drug Standard Control Organization (CDSCO) critically assessed the proposal and approved the marketing of hydroxyurea for the treatment of SCA, subject to post-marketing surveillance. The medicine can now be used to treat SCA at regular doses, thanks to the authorization. It also paves the way for the development of smaller-dose formulations that promise higher compliance rates in SCA youngsters, and could potentially lead to syrup-based formulations.

Silica nanoparticles for better systems of drug Delivery

Researchers have developed silica nanoparticles that can improve drug-delivery systems (DDS). These nanoparticles with pores are tuned to absorb hydrophobic drugs with more stable surfaces and effective absorption properties. In a recently published paper, researchers from Centre for Nano and Soft Matter Sciences, Bengaluru, an autonomous institute of the department of science & technology, and National Chemical Laboratory (CSIR-NCL), Pune showed how they have transformed material widely used to design DDS to make it more stable. Their work also has an impact on the total amount of drugs that can be loaded and released. DST said the researchers used a technique called selective chemical functionalization strategies to bring about the modification.

UV-C based disinfection solutions for the transportation systems

To restrict the spread of the virus and to provide safer outdoor air, UVHeal in collaboration with CSIR-CSIO has introduced the Clean Air UV-C Induct System to disinfect the air inside Railways, Metros, and Buses. The UV-C-based air disinfectant is CE-certified and NABL approved. This comes along with the fire/smoke sensors which is a necessary safety feature. The technology has been developed according to the requirements for deactivation of SARS COV-2 virus contained in an aerosol with necessary ventilation measures, necessary safety, and user guidelines, and tested Bio-safety standards. The UV-C is an energy-efficient system, improves airflow through coils, enhances indoor air quality, requires less maintenance, is easy to retrofit with any existing system having AHU, Casset AC, CSUs ducts or suitable fitouts and has a low initial setup cost. The system comes with commercialized standards and certifications.



Seaweed cultivation in Indian coastal areas

With the help of certain technical proficiency, the maritime rural population living along the coastline of Gujarat (1600 km) and Tamil Nadu (1076 km) have made seaweed farming a successful venture and earn a decent earning.

Experimentation on seaweed cultivation began about fifty-eight years ago by the scientists of Council of Scientific and Industrial Research–Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI) in Bhavnagar, Gujarat. They have provided technical proficiency including the ambient parameters required for cultivation with salinity between 25-30 ppt (grams per kilogram), surface seawater temperature between 28-32 degrees Celsius, good mixing of water during high/low tide cycle for sufficient availability of nutrients and dissolved oxygen. Farming is recommended in intertidal areas where water is always present during low tide so that plants do not get exposed to direct sunlight and desiccation. Notably, the cultivation also creates natural habitat, which provides shelter, diet and breeding grounds to several marine taxa and thus is responsible for structuring marine habitats and providing ecosystem services.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 December 2021)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

First Immunity Booster Alkaline Ionized Water of India

ICPURE (India) have created India's first alkaline water ionizer in technical collaboration with the Council of Scientific and Industrial Research's Indian Institute of Chemical Technology (CSIR-IICT). The CSIR has certificated that the ICPURE alkaline ionized water is an immunity booster, which helps in the prevention of various infections and diseases. The ionizer produces healthy drinking water with different pH values above 8 with negative Oxidation Reduction Potential (ORP) to boost the health of the heart, liver, kidney and bone structure.

The machine gives five different types of pHs ranging from 5.0 to 10.5. Neutral water of 7.0 pH can be used for intake of medicines and consumption by children up to 10 years of age, 8.5 pH gives regular alkaline drinking water by normal persons to regulate pH level in the blood to boost the health of heart, liver, kidney and bone structure with extra minerals and antioxidants, 9.5 pH water can be used for making of tea and coffee making and for cooking purposes, while 10.5 pH water can be used for cleaning of fruits and vegetables to remove pesticides and harmful chemicals.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 January 2022)

SCIENCE AND SOCIETY NEWSLETTER

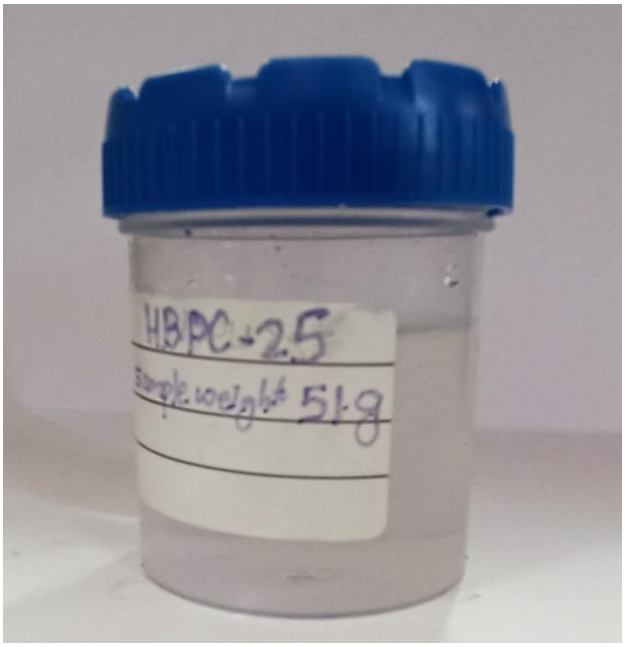
Innovations and Contributions by CSIR labs

In this issue:

Novel technique to indigenously produce polymer used in packaging industry

A polymer that is widely used in the packaging industry, and is presently imported, will soon be made indigenously using a novel technique developed by scientists of CSIR-National Chemical Laboratory (NCL). It is for the first time that this polymer has been successfully developed in India. Scientists say that the polymer, as an additive, can better mould, strengthen and allow high-performance plastics to be shaped into desired forms. The polymer development technique was Thursday licensed out to SKYi Innovations LLP that manufactures Long Fiber Thermoplastics (LFT).

Two or three specific commercially available raw materials are used to obtain the polymer, which is hyperbranched. The side products, too, after the chemical process, are later used in the making of other chemicals and can be recycled.



Presented by:

Extract from 'CSIR Matters' (Edition 11-15 January 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Tech to address perchlorate contamination of water

A team of researchers at the CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) here has developed a process (patent filed) to address the issue of perchlorate contamination of water sources in the country. The project oversees purging of the perchlorate contaminated water from one of the abandoned wells to be treated to a potable quality level.

Led by Krishnakumar B, Senior Principal Scientist in the Environmental Technology Division at the CSIR-NIIST, Thiruvananthapuram, the team has set up a demonstration plant at a contaminated site in Keezhmad panchayat in Aluva in Ernakulam district. The demonstration plant can generate around 2,000 litres of potable water and will be operated at the site initially for a period of three months. The capital cost is ₹3 lakh, and the cost of production of pure water at 20 paise per litre (including operator charge).

Novel genetic risk factors cause heart failures in India: CCMB

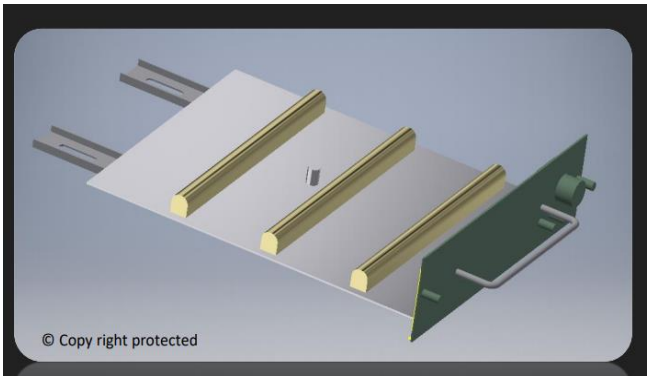
Scientists at the Centre for Cellular and Molecular Biology (CCMB) have found that novel genetic mutations are responsible for this condition. A team of CCMB scientists, led by K Thangaraj, have found novel genetic mutations in the beta myosin heavy chain gene (β-MYH7) gene are responsible for causing dilated cardiomyopathy among Indians. This gene is one of the major genes that are found to be causing cardiac diseases globally. β-MYH7 gene of 137 dilated cardiomyopathy patients along with 167 ethnically matched healthy controls were sequenced to identify the mutation(s), if any, that are associated with dilated cardiomyopathy in Indian patients.

Bio-drug derived from turmeric to treat cancer

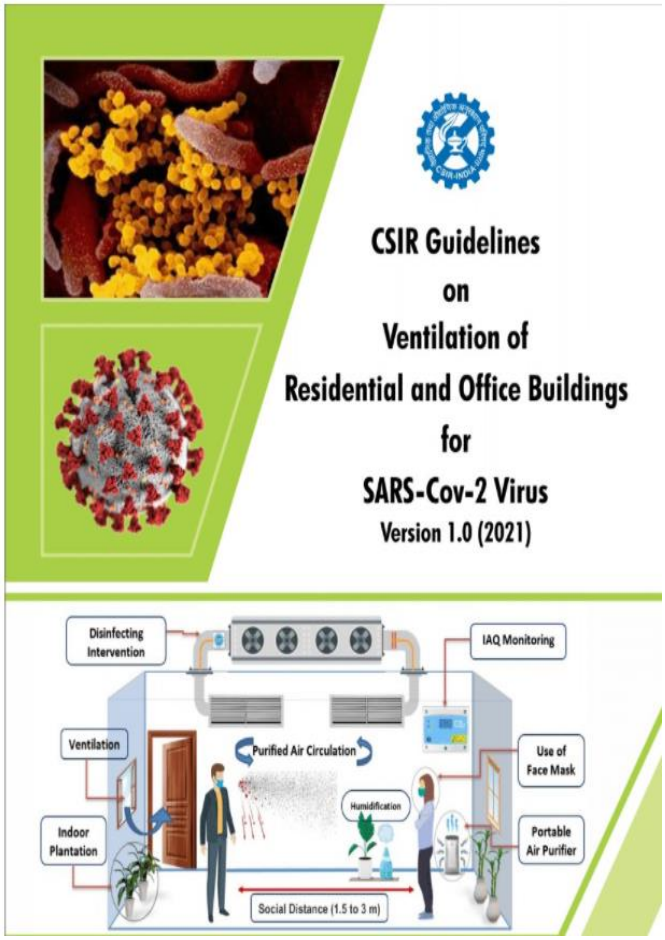
CSIR-Centre for Cellular & Molecular Biology (CCMB) scientists in collaboration with CSIR-National Chemical Laboratory (NCL) announced on Thursday that they have made progress towards developing a non-toxic bio-drug derived from turmeric through a 'gene silencing approach' to treat cancer. 'RNA interference (RNAi)' is a gene silencing approach and a promising tool for targeted and focused therapy for chronic diseases like cancer. The lack of safe and effective delivery methods for RNAi molecules is one of the key challenges against using RNAi-based therapy in biological systems. CCMB's Dr. Lekha Dinesh Kumar and her group in collaboration with NCL's polymer science and engineering division have developed nano-curcumin structures (derived from turmeric) to encapsulate the RNAi and other molecules that aid in targeting specific tissues. The proposed bio-drug is bio-compatible with a higher uptake efficiency, and shows effective site-specific delivery with regression of tumors in two different mouse models of colon and breast cancer.

Covid-19 disinfectant technology developed by CSIO

Technology developed recently by the CSIR-Central Scientific Instruments Organisation (CSIO), Chandigarh, is being installed to combat the Covid-19 pandemic in railway coaches, air conditioned buses and other indoor spaces, including Parliamnt and election campaign-related meetings. The Ultraviolet (UV-C) based technology developed by CSIO under the aegis of the Council of Scientific and Industrial research (CSIR) is said to be effective for mitigation of airborne transmission of SARS-COV-2 and will also remain relevant in post-Covid era. The technology has been successfully tried in railways, buses and even in the Parliament House, and is now open for general roll-out for use by the common masses. The technology has been developed according to the requirements for deactivation of SARS COV-2 virus contained in an aerosol with necessary ventilation measures, necessary safety and user guidelines and tested bio-safety standards. UV-C deactivates viruses, bacteria, fungus and other bio-aerosols with appropriate dosages of 254nm UV light, the statement added.



Deployed at Parliament of India
Pilot on Indian Railway Coaches and Ac Buses



Recommended Air Changes per Hour are provided

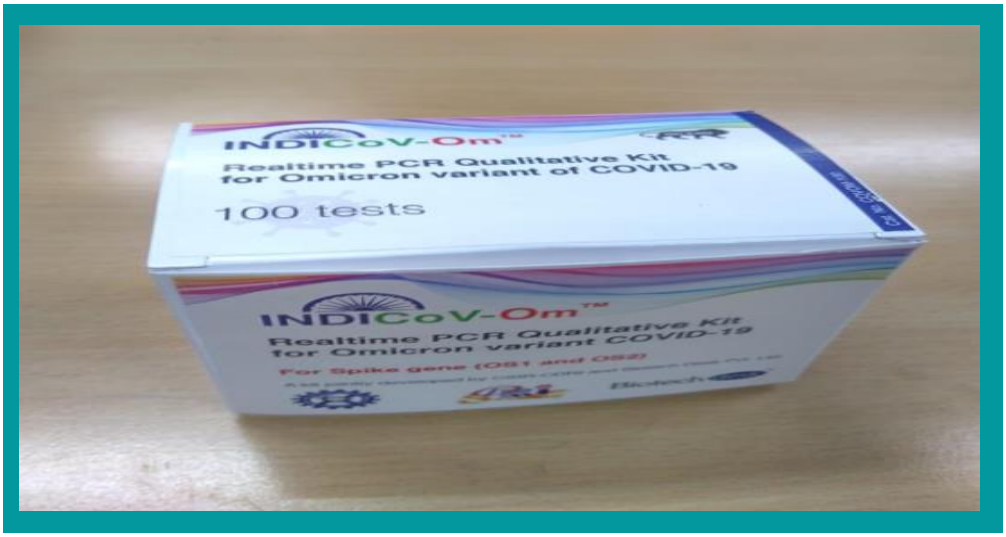
Presented by:

Extract from 'CSIR Matters' (Edition 16-20 January 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:



CDRI scientists working on two combinations of Covid-19 drugs

After successful clinical trials of the antiviral drug, Umifenovir, for Covid treatment, scientists of the Central Drug Research Institute (CDRI) in the city are trying to develop another drug without any side-effects. A team of scientists led by chief scientist Ravishankar is working on two combinations to provide the safest medication to coronavirus patients. Experts say that a combination of antivirals with different mechanisms can be more effective to counter the viral pandemic. We are working on two combinations — Umifenovir with Molnupiravir (an antiviral) and Umifenovir with Niclosamide (anti-parasitic). The other combination is Umifenovir with Niclosamide. Niclosamide is known for its efficacy for Covid treatment but the biggest challenge is that its high dosage is required for treatment and that leads to side-effects. A safe and efficacious combination of Umifenovir with Niclosamide is being researched on and exact dosage in the combination that can give positive results.

OM - the RT-PCR kit for Omicron

The CSIR – Central Drug Research Institute's scientists have developed an indigenous RT-PCR kit called 'Om' for testing the omicron variant. The kit, a first by any government institution for the omicron variant, will also make India self-reliant in RT-PCR diagnostics. Om enables quick and cost-effective detection of omicron variant over genome sequencing for a large population. It was made within two months and will cost around Rs 150. Further, it will give the test results in around two hours. According to the scientists, it can also be aligned for the detection of other emerging variants of Covid infection and other respiratory infections. Once the kit gets approval from the Indian Council of Medical Research (ICMR), it will be launched by mid-February. The kit has been referred to the ICMR-National Institute of Virology (NIV) and is yet to be validated..

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 January 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Development and Commercialization of First-in-Class Bone Health Drugs

CSIR-Central Drug Research Institute (CDRI), Lucknow, one of the premier drug research institutions in the world and Aveta Biomics, USA, a leader in developing the next generation of botanical drugs based on its evolutionary biology platform joined their hands and announced today the exclusive licensing to Aveta Biomics of CDRI's patented technology of Caviunin-based drug compositions for further clinical development and commercialization.

Worldwide, one in three women and one in five men over the age of 50 years will suffer an osteoporotic fracture. Osteoporosis is a chronic condition requiring a life-long treatment. Approved treatment duration of currently available drugs ranges from 1 to 5 years (depending on the drug) due to waning efficacy and increasing risk of adverse events. Caviunin-based therapeutic has a huge potential to change the standard of care for osteoporosis. The potential benefit risk profile is expected to be second to none with desirable efficacy and safety for long-term use.

Presented by:

Extract from 'CSIR Matters' (Edition 26-31 January 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CDRI and Biotech Desk develops Omicron testing kit

CSIR-Central Drug Research Institute (CDRI), Lucknow and Hyderabad-based Biotech Desk Pvt have developed one of the few testing kits to detect Omicron variant. According to the Government, this testing kit can identify Omicron variant in a quick and cost-effective manner. Currently, detection of the Omicron variant depends on tests such as "S-gene drop out" or "NextGen sequencing" of the entire viral genome. This kit developed by CDRI can identify Omicron in a quick, cost-effective manner. Omicron is a highly transmissible variant but with moderate symptoms. According to the Health Ministry, currently the third wave is majorly driven by the Omicron variant. However, Delta variant, which causes more severe symptoms, has not completely faded away from various places in the country.

Self-Disinfecting, Biodegradable Face Masks

Scientists at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of Department of Science and Technology (DST), Govt. of India, in collaboration with the Centre for Cellular & Molecular Biology (CSIR-CCMB) and Resil Chemicals, a Bengaluru based company have developed the self-disinfecting "Copper-based Nanoparticle-coated Antiviral Face Masks" under the DST sponsored Nano-Mission project, to fight against the COVID-19 pandemic.

ARCI developed copper-based nanoparticles of around 20 nanometers by a Flame Spray Pyrolysis (FSP) processing facility. Stable nanoparticle suspension was obtained by optimizing the solid loading and pH. A uniform layer of this nano-coating on the cotton fabric with good adhesion was achieved using a suitable binder. CSIR-CCMB tested the efficacy of this fabric against SARS-CoV-2 for their disinfection properties and reported 99.9% disinfection, as evident from the standard results. Prototype masks having different designs such as single layer and triple layers with nanoparticle coated fabric as outer layer have been demonstrated. A single layer mask is especially useful as a protective antiviral outer mask over a regular mask.

Twin towers demolition plan

The Chennai-based Structural Engineering Research Centre (SERC), a laboratory of the Council for Scientific and Industrial Research, will go through the plan to bring down the Supertech twin towers in Noida and measures to keep an underground gas pipeline just 15 metres away from site safe from the impact of the explosion. Scientists and experts of the government institute will conduct several tests of the structures and other components that could be affected by the explosion to demolish the Apex and Ceyane towers. SERC, which conducts instrumentation and response measurements of railway overbridges and vibration testing, has been helping GAIL to withstand stress on underground gas pipelines.

IGIB develops future-proof primers, kits for RT-PCR test

Using its expertise in genome sequencing and analysis pipeline of genome sequence data, the Delhi-based CSIR lab Institute of Genomics and Integrative Biology (IGIB) has successfully developed a unique pool of primers and kits to be used in RT-PCR testing of SARS-CoV-2 virus. The most distinguishing aspect of the work carried by a team led by Dr. Sridhar Sivasubbu and Dr. Vinod Scaria at IGIB that was developing primers that will not be affected by mutations seen in SARS-CoV-2 variants. This may allow the primers to detect any new SARS-CoV-2 variants that might emerge immaterial of the novel mutations that the variants might have. The primers developed in a way future-proofs the ability to detect without fail any new SARS-CoV-2 variants that may emerge. The pool of primers has been developed to target regions of the virus which are unlikely to undergo mutations

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 February 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Self-Disinfecting Face Mask found to be 99.9% Effective On COVID-19

A team of Indian scientists have developed special face masks that come with a copper-based nanoparticle coating that researchers claim performs better than a regular fabric mask. The present-day face masks only retain the viruses by filtering and do not kill them and hence, are prone to transmission if the masks are not properly worn or disposed of.

The mask has been developed by researchers at the International Advanced Research Centre for Powder Metallurgy and New Materials in collaboration with the CSIR-Centre for Cellular and Molecular Biology as well as Resil Chemicals under the Nano Mission project funded by the Department of Science. The newly developed fabric was found to be 99.9 percent effective against the bacteria. Moreover, CSIR-CCMB tested its effectiveness against SARS CoV-2 and found the germicidal ability to be at 99.9 percent.

Hydrogen Fuel Cell Tech

Clean Vision Corporation (OTCQB:CLNV), a global holding company that acquires and operates sustainable clean tech and green energy businesses, today announced that it has optioned a state-of-the-art hydrogen fuel cell technology as a pivotal next step toward demonstrating its ability to store its clean hydrogen — AquaHTM produced from its pilot pyrolysis plant – anticipated to lead to full scale commercialization.

The Company plans to customize this advanced fuel cell (technically, a —low temperature PEM pure hydrogen fuel cell electric power generator‖) for installation with its Hyderabad pyrolysis pilot plant which is being developed in accordance with its agreement with the Indian Institute of Chemical Technology (IICT).

Genome sequencing of entire Vidarbha samples to NEERI lab

Impressed by six rapid back-to-back whole genome sequencing (WGS) series within a month in the city, the state public health department has now requested the environmental virology cell of National Environmental Engineering Research Institute (NEERI) to study Covid samples from all 11 districts of Vidarbha.

The lab has also been designated as INSACOG (Indian SARS-CoV2 Genomics Consortium) Genome Sequencing Laboratory/Regional Genome Sequencing Laboratory and sentinel centre for SarsCov2 northeastern region (Vidarbha) of Maharashtra.

Success story of 7CFTRI's infant food from buffalo's milk

CFTRI, Mysore

The story behind the formulation of infant food (Amul) from buffalo's milk using the technology developed by the scientists from CSIR-Central Food Technological Research Institute (CFTRI) was retold during a webinar organised in commemoration of 80 years of Council of Scientific and Industrial Research (CSIR).

Scientists recalled how an unthinkable task was achieved when the scientists from CSIR-CFTRI successfully formulated the infant food using buffalo's milk at a time when only cow's milk was considered for making such foods. The innovation made the country self-reliant in infant foods as India at that point of time (in 1957) was importing infant foods worth ₹6 crore, he explained

The infant food innovation was key as it gave rise to other foods for children like bala ahaar which was fed to over one crore children a year in Nigeria. The midday meal programme was also inspired by the CFTRI's innovation as today 14.8 crore children are fed meals daily across the country.

Researchers identifies COVID-19 RNA variations

Researchers from the Indian Institute of Technology (IIT) Jodhpur identifies variations in the RNA of the COVID-19 virus by using genomic sequencing methods which can help in adopting precautionary methods and treatment protocols against emerging variants.

The research team also studied the variations that occur in the virus while it is inside a host cell and its persistence to outside. The study has been published in the journal Nucleic Acid Research. According to a statement from IIT Jodhpur, frequent RNA variations occur at a minor scale in the COVID-19 virus when inside a host cell. These are called intra-host variations. Many such variations occur due to the immunity response from the host cell and hence are mostly harmless or destructive to the virus. But some variations in the RNA structure of the Covid virus lead to its increased survivability and become variants of concern.

The study was conducted at the Council of Scientific and Industrial Research-Institute of Genomics and Integrative Biology (CSIR – IGIB) in Delhi. The research was led by IIT Jodhpur and Institute of Life Sciences (Bhubaneswar) and was accompanied by researchers from Academy of Scientific and Innovative Research (Ghaziabad), Council of Scientific and Industrial Research – Center for Cellular and Molecular Biology (CSIR-CCMB) located in Hyderabad, and National Center for Disease Control (NCDC) in New Delhi.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 February 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

'Iron fertilization' to tackle global warming

The Council of Scientific and Industrial Research (CSIR) laboratory NIO, Goa has proposed a simpler Geo-engineering method of iron fertilisation to reduce carbon dioxide in the atmosphere. They came to this conclusion after conducting a study on lack of productivity in the ocean. It was observed that 30-40 percent of the southern ocean near Antarctica and even Arabian Sea, despite having enough macronutrients was not productive enough. The researchers came to the conclusion that it was happening due to lack of iron, as, for photosynthesis the presence of iron is a must. The GEOTRACES programme worked on the measurements of micronutrients in the global ocean. The Physical Research Laboratory, National Institute of Oceanography and a few other labs started work on the Indian Ocean with the help of the Ministry of Earth Sciences. It was confirmed with this studies that there are iron deficient areas in the southern and north west Arabian Sea. The NIO scientists suggest artificial iron seeding; by which the productivity can increase as it will enhance the photosynthesis process in which plants draw atmospheric carbon dioxide. Simultaneously, it will remove CO2 from the atmosphere and tackle the problem of global warming.

Biodrug holds promise in cancer cure

Dr Lekha Dinesh Kumar has blended two research technologies — RNA interference (RNAi) and nanotechnology — thereby developing a bio-drug that is non-toxic and bio-compatible and ensuring site-specific delivery of the same to targeted colon and breast cancerous cells.
Dr Lekha works as the project leader, cancer biology, at CSIR-Centre for Cellular & Molecular Biology (CCMB) in Hyderabad. The research which got published in the peer-reviewed scientific journal 'Nanoscale' involved a collaboration of CSIR-Centre for Cellular & Molecular Biology (CCMB) and CSIR-National Chemical Laboratory (NCL). The 'gene-silencing approach' or RNAi method is used here. The RNAi is a promising tool for targeted and focused therapy for chronic diseases like cancer.

Pearls cultivation in Himachal

Besides cultivating heeng, saffron, monk fruit and cinnamon, the CSIR-Institute of Himalayan Bioresource Technology (IHBT) has initiated the cultivation of pearls integrated with aquaculture in Himachal Pradesh. IHBT had initiated research and development activity on pearl culture utilizing fresh water mussels with an aim promote its cultivation through trainings and skill development, and facilitate farmers, entrepreneurs and start-ups in this high income generating venture.
CSIR-IHBT was closely working with North-East states by developing clusters for the production of vitamin D2 enriched shiitake mushroom and vermicomposting under Scheme of Fund for Regeneration of Traditional Industries (SFURTI), anaerobic Biogas plant installation through the Department of Science & Technology (DST) – Waste Management Technologies (WMT) and establishment of essential oil processing unit under the CSIR Aroma mission.

Foot sizing survey in Longleng

As a part of project to develop the 'Indian National Footwear Sizing System,' the CSIR-Central Leather Research Institute (CSIR-CLRI) carried out foot sizing measurements in Longleng from February 8 to 10 for 4-55 years age group. A CSIR-CLRI team successfully took the measurement from Phom Lemphong School, Bautung Government Higher Secondary School, Yingli College and Phom Baptist Christian Association (PBCA), Longleng, Nagaland, informed a press release. There is a need for an Indian foot size because any footwear adapted from other sizing systems cannot produce comfortable footwear for
India's population owing to differences in foot characteristics necessitating for development of a own sizing system. To achieve this, it is necessary to conduct an anthropometric foot measurement survey across India to capture the foot dimensions and then statistically arrive at the footwear sizing system.

CSIR-CDRI Nucleic Acid Staining Dye technology licensed

Lucknow based national laboratory CSIR-Central Drug Research Institute (CDRI), has licensed the technology of Nucleic Acid Staining Dye GreenR™ to GenetoProtein Pvt. Ltd., a start-up company registered in Uttar Pradesh in the year 2020. This start up is involved in developing an array of enzymes, kits and biochemical used in Lifesciences research, particularly molecular biology. The dye GreenR™ has been developed by CDRI Senior Principal Scientist Dr. Atul Goel in a joint collaborative project with an industry partner Biotech Desk Pvt. Ltd., Hyderabad. The product GreenR™ may be used to stint DNA and RNA for research and diagnostics to detect and quantify them. It binds to nucleic acids like genomic DNA, PCR products, plasmids and RNA under blue light or UV exposure.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 February 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

IICT-GACL get patent for making Hydrazine Hydrate indigenously

The CSIR-Indian Institute of Chemical Technology (IICT) and Gujarat Alkalies and Chemicals Limited (GACL) have been awarded a patent for developing an indigenous environment friendly technology to manufacture super speciality chemical Hydrazine Hydrate (H6N2O) used in agrochemicals, polymers, water treatment, fuel cells, and space applications. At present, Hydrazine Hydrate is a 100% imported product and the Hyderabad based institute has played a major role in indigenising the manufacturing process of this "high value super speciality chemical product". GACL has set up ₹450 crore manufacturing plant to reduce import dependence and this is expected to go on stream soon.

CDRI's plant-based drug for fatty liver get nod for clinical trials

The Council of Scientific and Industrial Research- Central Drug Research Institute (CSIR-CDRI), along with the ICMR (Indian Council of Medical Research) will begin phase-III clinical trials for Picroliv drug for treatment of fatty liver. Picroliv is a phytopharmaceutical product, developed by the CDRI, and has got the nod for phase-III clinical trial for the treatment of fatty liver disease. Picroliv has been developed from the plant picrorhiza kurroa, also known as Kutki. Non-alcoholic fatty liver disease (NAFLD) refers to accumulation of excess fat in the liver of people who consume little or no alcohol. NAFLD is the most prevalent liver disease in human history, with prevalence estimates indicating it affects almost two billion people globally.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 February 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

India's first indigenous flying trainer HANSA-NG completes sea-level trials

India's first indigenous flying trainer 'HANSA-NG' designed and developed by CSIR-National Aerospace Laboratories has successfully completed the sea-level trials at Puducherry from February 19 to March 5. The aircraft was flown to Puducherry covering a distance of 140 nautical miles in 1.5 hours at a cruising speed of 155 km/hr on February 19. The objective of these trials were to evaluate handling qualities, climb/cruise performance, balked landing, structural performance including positive and negative G, power plant and other systems performance at sea level etc. All the objectives of the sea-level trials were met and the aircraft was ferried back to Bengaluru on March 5, after completing 18 hours flying in Puducherry.

According to NAL, HANSA-NG is one of the most advanced flying trainers powered by Rotax Digital Control Engine with unique features like Just-In-Time Prepreg (JIPREG) Composite Lightweight Airframe, glass cockpit, bubble canopy with wide panoramic view, electrically operated flaps, etc. It is designed to meet the Indian flying club needs and it is an ideal aircraft or Commercial Pilot Licensing (CPL) due to its low cost and low fuel consumption.

Recyclib inks MoU with NML for e-waste recycling tech transfer

Recyclib Private Limited, New Delhi signed an MoU with CSIR-NML for recycling technology of electronic waste. The MoU will facilitate technology transfer of recycling of lithium ion batteries (LIBs) to recover metal or salts of Li, Co, Mn, Ni, Cu, Al, graphite and saleable plastics.

Technological know-how is a closed-loop design to recover Li, Co, Mn, Ni, Cu, Al, plastics and graphite from black cathodic material of spent LIBs. Developed hydrometallurgical process flow-sheet to recover Li, Co, Mn, Cu, Ni as metals/salts and graphite from spent LIBs will be fine-tuned by the samples supplied by the PARTY. The party will commercialize the technology as per the transferred Know-How of CSIR-NML.

Presented by:

Extract from 'CSIR Matters' (Edition 01-05 March 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Doda: The Lavender District

Considered as the birthplace of India's purple revolution, Jammu and Kashmir's Doda district is likely to witness a major boom in Lavender farming under the 'one district, one product' scheme with the government, army and various other institutions coming forward in a big way to boost its production. The central government has designated Lavender as 'Doda brand product' to promote the exotic aromatic plant, bringing cheers to agri startups, entrepreneurs and farmers associated with its cultivation under the Aroma mission. CSIR-IIIM (Council of Scientific and Industrial Research- Indian Institute of Integrative Medicine) Jammu has distributed eight lakh saplings among the farmers after “one district, one product” initiative and has set a target to grow another 50 lakh saplings in Bhaderwah by September, for distribution among the farmers under the Aroma Mission two, not only in Doda but also in Reasi, Udhampur, Kathua and Rajouri districts of the Jammu province.

CRRI studies about accident prone roads of Nagpur

A study conducted by the CSIR-Central Road Research Institute (CRRI) revealed that the roads prone to highest number of accidents are owned by National Highways Authority of India (NHAI), followed by Nagpur Municipal Corporation (NMC) and Maharashtra state’s public works department. The study also suggested that about 39 of the 49 accident-prone spots across the city will require geometric solutions including engineering intervention and black spot rectification. CSIR-CRRI chief scientist S Velumurgan also added that most of the stretches require closure of road cuttings, pedestrian facilities and strengthening of traffic signals etc. According to the data compiled by traffic police, NHAI’s 27 different stretches crisscrossing the city have earned the dubious distinction of witnessing frequent accidents in the last three calendar years (2019, 2020 and 2021), followed by 14 on roads owned by Nagpur Municipal Corporation. State public works department-owned roads have eight such spots.

Presented by:

Extract from 'CSIR Matters' (Edition 06-10 March 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

CSIR-CMERI's solar tree breaks Guinness World Record

The Council of Scientific and Industrial Research's Central Mechanical Engineering Research Institute (CSIR-CMERI) have broken the Guinness World Record for the world's largest solar panel. The solar tree, which has been installed at the CSIR-CMERI Centre of Excellence for Farm machinery in Ludhiana, has a solar photovoltaics panel surface area of 309.83 square meters.
Illustrating the viability of the solar tree in the agriculture sector, Prof. Harish Hirani, Director of CSIR-CMERI, Durgapur said that "Farmers don't need a roof to install the solar tree. It can be setup in the fields itself, and will not even obstruct wind." "The solar tree will power integrated farming activities such as charging e-tractors, e-tillers and electric vehicle charging stations, running agriculture pumps and solar-based cooking systems and powering cold storages," he said. "Drones will spray pesticides and water on the crops. The battery of the drones can be charged by the solar tree," he said.

First indigenous COVID drug to be made available soon

The first indigenous drug to treat COVID-19 is likely to be made available to the public soon with the completion of clinical trials, which showed "excellent results", informed Tata Institute for Genetics and Society (TIGS) director Rakesh Mishra on Friday. The product 'Vincov-19' is a collaborative effort of CSIR-Centre for Cellular & Molecular Biology (CCMB), University of Hyderabad (UoH) and city-based VINS Bioproducts. In this, the SARS-CoV-2 virus is inactivated and injected into horses. The anti-bodies generated through the blood serum is synthesised and purified to be turned into a drug, which would then be injected into humans for neutralising the COVID virus.

"It is a kind of sophisticated and scientific plasma therapy similar to a snake-bite antidote," said the top scientist, also the former-director of CCMB, while delivering a lecture on 'Lessons learnt from the pandemic and the way forward' organised by CSIR-IICT.

Presented by:

Extract from 'CSIR Matters' (Edition 11-15 March 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Unique synergism of planar optics with functional optical materials

Solar optics and materials development group led by Dr. Adersh Asok, a DST-INSPIRE Faculty fellow, has facilitated the development of experimental and computational optics at CSIR-NIIST for the past 5 years.
Focusing on optical materials and optical engineering for smart solar energy management, Dr. Asok and his group have recently identified a unique synergism of planar optics with functional optical materials. Further, using the fundamental understanding generated from these findings, the group has devised new approaches for enhancing light-matter interactions, and tailored light propagation. This can help meet the unmet developments in the energy, environment, and healthcare arena. Two technologies developed by him include Dynamic Power Windows, a technology innovation that can offer adaptable transparency (solar heat gain control) and clean electricity generation in a single platform.

LFI collaborates with CSIR-JIGYASA Program

Livingstone Foundation International (LFI) became "one of the few schools in Nagaland to collaborate" with the Central Government's CSIR (Council of Scientific & Industrial Research)-JIGYASA Program. A team of experts and officials from CSIR-NEIST (North East Institute of Science and Technology), Jorhat, Assam visited the school on March 17 , LFI stated in a press note. The team interacted with students, faculty members and School Management. During the interactive session, Anshuman Goswami from Team JIGYASA explained the various aspects of the program whereby the students would be aided in communicating with Scientists from across the country through online platforms. The team from CSIR-NEIST, Jorhat also presented some lab equipment's to the Chairman of LFI.

Improved Brass Melting Furnace Inaugurated At CSIR-IMMT

CSIR-Institute of Minerals and Materials Technology (IMMT) Bhubaneswar, being a premier research organization in metals and minerals is committed to establish S&T intervention for the benefit of artisans of metal craft sectors. One-day demonstration-cum-training programme on improved brass/ bell metal melting furnace for the metalcraft artisans was held today at the CSIR-IMMT campus. The programme was being organized in collaboration with CSIR-National Metallurgical Laboratory, Jamshedpur.

Presented by:

Extract from 'CSIR Matters' (Edition 16-20 March 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

SpiceJet, Boeing, CSIR-Indian Institute of Petroleum forge ties for eco-friendly aviation fuel

SpiceJet, Boeing and CSIR-Indian Institute of Petroleum (IIP) announced that they are working together to explore opportunities for the use of sustainable aviation fuel (SAF) in the Indian aviation industry. The coordination is part of their commitment to help reduce carbon emissions to achieve environmental goals, a press release from the three firms said.

They would work to leverage SAF supply from CSIR-IIP and its production partners and licenses to help SpiceJet decarbonise its fleet. SAF can reduce CO2 emissions by as much as 65 per cent over the life-cycle of fuel with the potential to reach 100 per cent in the future. It is recognised as offering the most immediate and greatest potential to decarbonise aviation over the next 20 to 30 years, the release said.

Wings India 2022 off to a flying start in Hyderabad

Asia's largest civil aviation event, Wings Indiawitnessed overwhelming activity with the participation of over 125 international and domestic exhibitors and delegations from 15 nations and various Indian states and union territories. It has exhibits from the governments of Telangana, Andhra Pradesh, Haryana and Madhya Pradesh, besides CSIR – National Aerospace Laboratories, Airbus, Embraer, GMR Infrastructure, Pawan Hans, Pratt & Whitney, Rolls Royce and Turbo Aviation.

Marking the occasion, CSIR-NAL and Scientech Technologies signed an agreement for technology transfer on multi-copter drones for societal applications like medicine delivery, agriculture, earth surveillance using Octacopters, Hexacopters, and Quadcopters. NAL conducted a demo flight of NAL-Hansa NG, its two-seater flying trainer aircraft, and a drone formation show of its NAL-Octocopter.

Higher learning modules for hearing-impaired students

The scientists of CSIR- Institute of Microbial Technology (IMTech) have started working on pilot project to prepare content for the hearing-impaired students to pursue higher education in science, technology and engineering. Principal scientist of CSIR-IMTECH, Alka Rao, who is leading the initiative, said, "We have planned to provide the content on a website in the form of images and logos for science, technology and engineering students from April itself."

The science and engineering jargon were proving to be a hurdle for hearing-impaired students, resulting in only a small fraction of them opting for science. In 2021, Prime Minister Narendra Modi announced that Indian Sign Language will become a language subject. This helped in bringing the challenges of deaf and mute students on center stage.

Indigenous octocopter for relief work by NAL

The CSIR-National Aerospace Laboratory (NAL) have indigenously developed unmanned aerial vehicles (UAV), which can be handy for relief missions during emergencies in hostile terrain. The octocopters are designed to carry a weight of up to 20 kilograms over 10 kilometers distance. The UAVs have a feature where the landing spot can be geo-tagged and it will deliver there, thus food drop or medicine drop can be performed if we know the location of the victims. The UAVs were earlier used successfully for the delivery of COVID vaccines in Jammu and Karnataka regions.

The Ministry of Civil Aviation, Government of India, had granted conditional permission to CSIR-NAL for conducting Beyond Visible Line of Sight (BVLOS) flight trials in September. The algorithm and design of the UAV were developed at NAL, while few parts like the brushless motors that power the vehicles were imported.

India's first 'steel slag road' laid in Surat

India's first 'steel slag road' was constructed in Surat, promising a huge potential to reduce the demand for aggregates in road construction. The successful implementation of the 1.2 km six-lane connectivity stretch of the Hazira Port will also pave the way for utilization of huge mounds of steel slag lying as waste across the country.

The research project under the steel ministry was sponsored by ArcelorMittal Nippon Steel with the technical guidance from CSIR-Central Road Research Institute (CSIR-CRRI). This stretch has been built by substituting natural aggregates with 100% processed steel slag aggregates in all layers of bituminous pavement. Considering its higher strength, the thickness of the road has also been reduced by 30%.

Annually, nearly 18.5 million tonnes (MT) of steel slag is generated from various integrated steel plants. Only in Vizag, around 60 MT of steel slag is lying unused. Utilisation of steel slag aggregates as a substitute of natural aggregate in road construction will reduce the unsustainable quarrying and mining of natural aggregates.

Fragrance of marigold, lemon grass to pervade Palampur under Aroma mission

Lemon grass and marigold will soon be cultivated in gram panchayats and societies around Palampur under the Council of Scientific and Industrial Research's (CSIR) aroma mission. The Institute of Himalayan Bio resource Technology (CSIR-IHBT) Palampur, has signed a pact with Dev Surya Himalayan Organic Private Limited to promote the cultivation of aromatic crops. Under the aroma mission, 10 lakh lemon grass slips and 75kg seeds of aromatic marigold will be sown on around 336 acres. The project will benefit 1,209 farmers of the region.

Aroma mission had been initiated in 2017 to promote the cultivation of high-value aromatic crops for socio-economic upliftment and employment generation for the farming community and rural masses.

Presented by:

Extract from 'CSIR Matters' (Edition 21-25 March 2022)

SCIENCE AND SOCIETY NEWSLETTER

Innovations and Contributions by CSIR labs

In this issue:

Student, Teacher and Scientist interaction programme under 'Jigyasa' organized for first time after the pandemic

CSIR-IMMT Bhubaneswar organized a demonstration program for students and teachers under the CSIR-"Jigyasa" program. It was for the first time after the pandemic that such a demonstration program was organized.Three school of Bhubaneswar namely, Nayapalli Govt. School, DM School and Sainik School participated in this programe. There were 14 groups of 10 students each for visiting the scientific experiments. 5 experiments of physics, 1 of ore Materials, 2 of Sophisticated Instruments, XRF, SEM(Electron Microscope), RAMAN, XRD and many more showcased during the demonstration.

Manufacturer's Meet Cum Demonstration On Fly Ash Bricks Technology

The CSIR-Institute of Minerals and Materials Technology(IMMT), Bhubaneswar is actively engaged in development of innovative, energy efficient green processes for utilization of various industrial and mining solid wastes in manufacture of building materials such as brick, block, concrete, aggregate etc. The institute has recently organized a Skill Development Program on "Manufacturers' Meet cum Demonstration on Fly Ash Bricks Technology" under the CSIR Integrated Skill initiative and part of Azadi Ka Amrit Mahotsav celebration. The program was useful for bricks manufacturers, Entrepreneurs aspiring to work on fly ash bricks manufacturing and persons who are already working in relevant industries. Bricks manufacturers, MSMEs, Entrepreneurs, Startup companies in Bricks manufacturing, Industrial waste utilization sectors etc. participated in the meet.

‘Unscientific’ disposal of waste might have led to the massive fire at Ghazipur landfill: Experts

Expert studies suggest that the recent massive fire at the Ghazipur landfill was due to the mismanagement of waste at the dumpsite. As per media reports, the East Delhi Municipal Corporation (EDMC) had earlier attributed the fire to very high temperatures.
According to studies by National Environmental Engineering Research Institute (CSIR-NEERI), the share of methane entrapped at dumpsites ranges from 5.3–13.9 per cent. Methane gas is an explosive gas, formed due to the anaerobic decomposition of untreated organic waste. Nearly 74 per cent of the 2,700 tonnes of municipal solid waste generated per day from the EDMC area is dumped there unsegregated. Merely 26 per cent of waste is processed or treated scientifically by EDMC, the corporation reported to the National GreenTribunal in 2020.

Flying clubs show keen interest in NAL’s HANSA-NG

CSIR-National Aerospace Laboratories (CSIR-NAL) received commitments, from prospective customers, for the indigenous two-seat flying trainer aircraft HANSA-NG, at the ongoingWings India 2022 civil aviation event in Hyderabad. HANSA-NG has been developed by incorporating state-of-the-art technologies and new generation design features. It offers advanced digital display systems using certified instruments, two primary flight displays with built in redundant power supply. The aircraft is capable of flying upto an altitude of 10,000 feet with a maximum speed of 200 kmph with more than five hours endurance. Overall, NAL has received more than 80 Letter of Intents (LoI) from various flying clubs across the country.

Cryo-electron microscopy facility opens at Hyderabad

Hyderabad becomes the second city in India to host the modern cryo-electron microscopy facility after Dr Shekhar Mande, Director-General of CSIR inaugurated the cryo-electron microscopy facility at the Centre for Cellular and Molecular Biology (CCMB), Hyderabad. The modern cryo-electron microscopy facility is expected to help us view the functioning of several molecular machines that operate in the cell that were earlier not amenable to conventional structure determination methods such as X-ray crystallography or Nuclear Magnetic Resonance (NMR). This facility will allow working with samples at cryogenic temperatures, around -173 0C, and photographing individual molecules using the electron microscope. This, in addition to the confocal microscopy, NMR spectroscopy and X-ray diffraction facilities at CCMB, makes it a formidable facility for researchers to look into details of living cells like never before.

Chamba and Kangra identify buildings to be strengthened in wake of earthquakes

Since the Chamba and Kangra districts of Himachal Pradesh are prone to be sensitive in the seismicity point of view, the administrations of both the districts have identified buildings for retrofitting to make them earthquake resistant. They have also done various earthquake awareness campaigns on April 4, to mark the 117th anniversary of the massive earthquake that claimed over twenty thousand lives.
The Council Of Scientific And Industrial Research–Central Building Research Institute (CSIR–CBRI), Roorkee is giving training to engineers from different departments of Chamba for the retrofitting of the buildings.

Sabarmati river pollution: Effluents from 4 CETPs don't meet parameters: Report

The two draft reports of Council of Scientific And Industrial Research–National Environmental Engineering Research Institute (CSIR–NEERI) states that the untreated influent as well treated effluent from four Common Effluent Treatment Plants (CETPs) under the Ahmedabad Municipal Corporation jurisdiction do not adhere to prescribed parameters. The two draft reports submitted to the Gujarat Pollution Control Board on March 24 with respect to functioning of four of the total seven CETPs under AMC jurisdiction – Naroda Enviro Project Ltd (NEPL), Gujarat Vepari Maha Mandal Odhav (GVMM), CETP Green Environment Services Co-op Society Ltd (GESCL) Vatva and CETP Narol Textile Infrastructure & Enviro Management (NTIEM) Narol.

Omicron variant BA.2 of Clade 21L still dominant in Vidarbha and TN

The latest genome sequencing by CSIR-NEERI has found Omicron sub-variant BA.2 (Clade 21L) as the dominant variant in Covid positive samples collected from Vidarbha and Tamil Nadu. Clade is a genotypic term and used in scientific diaspora to understand the characteristics of a variant. Currently, the BA.2 belonging to Clade 21L is seen as dominant in most parts of the world. Omicron belongs to clade 21M, thus its sub-variants are further classified as BA.2 (21L) and BA.1 (21K).
Until recently, Omicron lineages belonging to Clade 21M were majorly seen in samples processed at the NEERI lab. Between January and February, BA.1 belonging to Clade 21K was reported to some extent, but it is not found now in the available samples. The NEERI study showed the percentage share of BA.2 (Clade 21L) at 77.58% and B.1.1.529 (Clade 21L) at 22.41%.
This was the 15th series of genome sequencing undertaken at Neeri since early January. The lab has now processed 1,195 Covid positive samples of symptomatic and asymptomatic patients. The turnaround time for whole genome sequencing at the lab is 1.5 days, which is the shortest among all premier facilities in the country.

Presented by:

Extract from 'CSIR Matters' (Edition 26-31 March 2022)