

CSIR in Media



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CSIR-IIP

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Pine needles to help meet energy needs

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TRIBUNE NEWS SERVICE

CHANDIGARH, DECEMBER 26
Large swaths of pine forests covering the lower and middle Himalayas could help in meeting part of the country's ever increasing energy requirements. The Council of Scientific and Industrial Research (CSIR) has embarked upon a project to produce bio-fuel from fallen pine needles.

CSIR's Dehradun-based Indian Institute of Petroleum is undertaking a pilot project in association with the Uttarakhand Government. Turpentine oil will be extracted from dry pine leaves or needles, which are rich in resin and have a high calorific value and the resultant waste would be used for making bio-fuel.

CSIR'S PILOT PROJECT

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- Scientists linked with the project said the Himachal Pradesh Government had also evinced interest in the venture

Scientists associated with the project said the Himachal Pradesh Government had also evinced interest in the venture, both for economic as well as ecological reasons. Himachal has projected a potential to generate 418 MW of electricity through the use of various types of bio-mass.

A cement factory in Himachal is already using

pine needles in combination with other combustible elements as bio-fuel while a company in Uttarakhand is producing electricity using pine needles as raw material, which is also a revenue-generating opportunity for locals.

Scientists say dry pine needles are both beneficial and harmful. If these fall on bare soil and decompose, they pro-

vide valuable mulch and a source of organic matter as well as help in moisture retention, which improves soil quality. However, if these build up in large quantities, these become a fire hazard and susceptible to forest fires, especially during summers.

Moreover, a dense network of dry pine needles prevents growth of grass and shrubs that are vital for ecological balance and for checking soil erosion. Closer to built-up areas, pine needles clog gutters and drains. Being damp and slippery, these also make it difficult for humans to walk, if they cover tracks and mountain paths.

The Himalayan subtropical pine forests cover about 1.5 million hectares in Jam-

mu and Kashmir, Himachal Pradesh, Uttarakhand and Sikkim. The pine belt stretches almost 3,000 km across the lower elevations of the Himalayas, including Bhutan, Nepal, and parts of north-eastern Pakistan. In India, pine is the second largest planted tree species, though deforestation has severely affected it.

The CSIR, along with some other research intuitions and associated government departments, has been engaged in research on bio-fuels for the past few years. It has been exploring the use of other plants and organic matter for producing bio-fuel. The use of jatropha plant for making bio-diesel is one such example.

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Upgraded Saras PT1N all set for maiden flight in January

CSIR-NAL

26th December 2017



Bengaluru: National Aeronautics Laboratories (NAL), a frontline wing under Council of Scientific & Industrial Research (CSIR) here, is ready to put the upgraded prototype of Saras on its maiden flight. The Saras PT1N (New), a 14-seater passenger plane, is expected to have its first flight after completing one more high speed taxi trial (HSTT). Military sources confirm to Mathrubhumi that the first flight will be about 20-25 minutes. Two Test Pilots and one Flight Test Engineer, who are empanelled to the PT1N project from Indian Air Force's Aircraft and Systems Testing Establishment (ASTE), will be onboard the maiden mission.

The first flight could be any time during the first/second week of January 2018. What separates the PT1N now from the maiden flight are a SRB (Safety Review Board) and one final HSTT. A young team of around 40 scientists and engineers, with an average age of 40 years, have been toiling hard for the last nine months to ensure Saras does what it is meant to be doing -- flying. The project had virtually hit a dead end after the March 2009 crash of PT-2 martyring three ASTE crew onboard. The subsequent crash probe, lack of confidence among users, want of funds and political will further dented the project. The aircraft was grounded for close to three years (2013-2016) barring namesake EGRs to keep the power-plant in good shape. The resurgence of Saras project as PT1N has now given hope for India's foray into making 14/19-seater passenger turboprops, with China, Russia, Poland, Indonesia and United States have already gone some distance.

In the new avatar as PT1N, it boasts of many upgraded features, following a gap analysis undertaken last year.

A close look at what PT1N looks like:

- * The control forces have been significantly reduced
- * The nacelle design (for engine mount) has been made optimal.
- * Environmental control systems, cabin pressurization systems have been modified.
- * Automatic avionics stall warning system included.
- * Linear flap track and trim taps on elevator modified.
- * Rudder area enhanced for better controllability.
- * Flight test instrumentation modified.
- * Electrical systems modified to reduce voltage losses.
- * Air data system has been provided with the nose boom for redundancy.

Apart from above modification on the aircraft, the following additional safety measures have also been ensured by the team.

- * Complete boroscopic inspection of the aircraft to eliminate any doubts about corrosion.
- * Computer-based failure analysis of engine, elevator jamming and ailerons power adequacy.
- * Simulator upgraded to the high-fidelity.

The NAL-ASTE combines primary objective with PT-1N is to evaluate all systems, including design and performance parameters. The inputs collected from PT1N's initial flights (expected to be around 20-30 in the next six months), will be then used to freeze the design, paving way for the production version

India's 19-seater dream will be Saras Mk-2

PT-IN flight data will inspire NAL to prepare the DPR (detail project report) for India's much-awaited 19-seater passenger plane – Saras Mk2

The Saras Mk2 will have additional five more seats and a toilet as compared to the PT1N. It will also have gen-next avionics and glass cockpit, autopilot and other features any modern passenger turboprop could boast off.



The Saras Mk2 with reduced weight (around 700 kg compared to PT1N) will have an AUW (all up-weight) of roughly around 7.4 to 7.5 ton and will likely to run on MRF tyres

Both military and passenger platforms:

Sources confirm that NAL plans to have both military and passenger version for the 19-seater. They hope to encash on the CEMILAC-DGCA's certification model used in ALH, to save time. As of now, two production variants are planned while the third one will be a fatigue test specimen (FTS) – all estimated to costing around Rs 700 crore. In the last one year, NAL put some of its best workforce behind the Saras project with many slogging it out day and night. Insiders say only less than Rs 5 core has been spent in the last one year for Saras PT-IN, thanks to lean management philosophy, optimum usage of resources and constant monitoring. With CSIR backing the project after some hiccups, Saras is sure to be India's star in 2018 with IAF offering all support to the desi mission once again. CSIR DG Dr Girish Sahni's push for the Saras PT1N/19-seater, and the Udan mantra of Govt of India also have come as a blessing for team NAL. Subject to the Cabinet Committee on Security approval, the detail design of the first limited series production (LSP) variant of Saras-Mk-2 should begin in 2019 followed by certification and demonstration flights by 2021. In short, in three years NAL will have its handful with Saras once again back on the radar. (The writer is a Content Consultant with Mathrubhumi (English Online) and tweets @writetake.)

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India's First Medical Cannabis Company Receives "Significant" Support

CSIR

26th December 2017

As 2017 comes to a close, a country that's home to nearly 18 percent of the world's population is talking about cannabis, thanks largely to the wealthy and charitable Ratan Tata. On Dec. 17, the massive South Asian nation of India had its first ever marijuana march to bring attention to the idea of legalization. Less than a week later, it was reported one of the country's biggest business tycoons, Ratan Tata, funded India's first medical cannabis research organization, the Bombay Hemp Company (BHC).

Tata was joined by Rajan Anandan, the managing director for Google India, who also invested capital in the startup. The Bombay Hemp Company was created to explore various applications of cannabis as medicine. In order to bypass any legal hurdles, the organization partnered with India's Council of Scientific and Industrial Research (CSIR). Based in Mumbai, BHC is cultivating cannabis in the state of Jammu and Kashmir with the intent of researching the crops for the treatment of epilepsy, breast cancer, and palliative care.

"We already have our first batch of cannabis plants cultivated in Jammu," said Avnish Pandya, co-founder of BHC. "[It is] within the CSIR framework." The company added the investment from Tata and Anandan will be used to hire scientists from India and the international scientific community, with BHC already looking for scientists in the Netherlands. Announcements regarding product development will happen next year, with the first products expected for palliative care.

BHC is not just riding the coattails of medical marijuana. This year, the company created a nanocarbon, which is a form of renewable energy made from hemp. Recreational cannabis was available and sold legally in India until 1985. It was then the country finally succumbed to pressure from the United States and created the Narcotics Drugs and

Psychotropic Substances Act. The legislation effectively banned the possession and consumption of all narcotic substances, including marijuana. Cannabis use has been well documented in India for thousands of years and had great cultural significance until a crackdown of widespread use under the British Empire.

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[Marijuana](#)

CSIR-NIO, Greenle Life Sciences partner for tech transfer

CSIR-NIO

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Officials of NIO and Greenle Life Sciences after signing the technology transfer agreement at CSIR-NIO office, Dona Paula on Monday

PANAJI: The CSIR-NIO, Dona Paula, recently signed a transfer of technology agreement with Greenle Life Sciences Pvt Ltd, a Kochi based company for the extraction of non-cytotoxic melanin from sponge associated bacteria for biomedical applications. The agreement was signed on Monday, at CSIR-NIO office in Goa. Greenle is a registered company working to translate technologies and products from laboratory to market in the fields of healthcare and life sciences. The transfer includes the know-how for a melanin producing bacteria, medium for the cultivation of bacteria and know-how for the extraction of melanin.

The bacterial melanin is non-cytotoxic and has high antioxidant and broad photo-absorption properties. It has commercial value and can be incorporated in lotions for topical application as a UV protectant. This melanin has the advantage of being biological in origin and was developed at NIO RC Kochi as part of an FTT project supported by CSIR. The application of sunscreens is widespread in Europe, America and Canada where the incidence of skin cancer is relatively higher. The recent reports indicate that the bacterial melanin has good market potential in India's skin care industry too. Being a natural UV protectant, the bacterial melanin would be an attractive and preferred option for the health-conscious markets in India and abroad.

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CSIR-SERC to launch short-term courses for engineers

CSIR-SERC

23rd December 2017

CSIR-Structural Engineering Research Centre (CSIR-SERC), a national laboratory involved in analysis, design and testing of structures and structural components, will launch courses for engineering graduates and diploma holders in January 2018. Launched as part of the Pradhan Mantri Kaushal Vikas Yojana, there will be both short-term certificate courses and advanced training programmes and workshops. Online certificate courses will be launched soon by the CSIR laboratory. The courses will be related to structures, concrete technology and durability of concrete structures. It is aimed at addressing the growing demand for the skilled workforce in the industry and to providing employment and entrepreneurship opportunities for the youth of the country. The one-month certificate courses are aimed at imparting training to the engineering graduates and diploma holders who are seeking employment immediately after graduation. Duration of advanced training programmes/workshops will vary from three to five days. The courses are designed to give equal importance to both theory and hands-on practical experience. Case studies will be presented for better understanding of the subjects along with group practice. Participants will also be briefed about alternate career options.

The laboratory will put up more details on the courses/programmes, eligibility criteria and the schedule on its website <http://serc.res.in>.

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CSIR covers a wide spectrum of science and technology

CSIR

23rd December 2017

Kolkata, Dec 23 (UNI) The contemporary research and development organisation -- Council of Scientific & Industrial Research (CSIR) -- known for its cutting edge R&D knowledge base on diverse science and technology areas, has been strengthening its patent portfolio to carve out global niches for the country in select technology domains.

Having pan-India presence, CSIR has a dynamic network of 38 national laboratories, 39 Outreach Centres, 3 Innovation Complexes and 5 units. CSIR's R&D expertise and experience is embodied in about 4600 active scientists supported by about 8000 scientific and technical personnel.

CSIR covers a wide spectrum of science and technology – from radio and space physics, oceanography, geophysics, chemicals, drugs, genomics, biotechnology and nanotechnology to mining, aeronautics, instrumentation, environmental engineering and information technology.

It provides significant technological intervention in many areas with regard to societal efforts which include environment, health, drinking water, food, housing, energy, farm and non-farm sectors. Further, CSIR's role in S&T human resource development is noteworthy.

Pioneer of India's intellectual property movement, CSIR today is strengthening its patent portfolio to carve out global niches for the country in select technology domains. CSIR is granted 90 per cent of US patents granted to any Indian publicly funded R&D organisation.

On an average CSIR files about 200 Indian patents and 250 foreign patents per year. About 13.86 per cent of CSIR patents are licensed - a number which is above the global average. Amongst its peers in publicly funded research organisations in the world, CSIR is a leader in terms of filing and securing patents worldwide.

CSIR has pursued cutting edge science and advanced knowledge frontiers. The scientific staff of CSIR only constitute about 3-4 per cent of India's scientific manpower but they contribute to 10 per cent of India's scientific outputs.

In 2012, CSIR published 5007 papers in SCI Journals with an average impact factor per paper as 2.673. In 2013, CSIR published 5086 papers in SCI journals with an average impact factor per paper as 2.868.

CSIR has operationalised desired mechanisms to boost entrepreneurship, which could lead to enhanced creation and commercialisation of radical and disruptive innovations, underpinning the development of new economic sectors.

CSIR has put in place CSIR@80: Vision & Strategy 2022 – New CSIR for New India. CSIR's mission is “to build a new CSIR for a new India” and CSIR's vision is to “Pursue science which strives for global impact, technology that enables innovation-driven industry and nurture trans-disciplinary leadership thereby catalysing inclusive economic development for the people of India”.

CSIR is ranked at 84th among 4851 institutions worldwide and is the only Indian organization among the top 100 global institutions, according to the Scimago Institutions Ranking World Report 2014. CSIR holds the 17th rank in Asia and leads the country at the first position.

This has been a year of great significance for CSIR. Some of the major achievements during 2017 are as follows: CSIR has been ranked 9th in the world amongst the 1207 government institutions, with an overall global ranking of 75 in the world, covering 5250 institutions.

In the Asiatic region, it ranks at 14 overall out of 1431 entities, and at No 3 among 284 Government-funded research bodies, with only Chinese Academy of Sciences and Japan Science and Technology Agency ahead of the Council. CSIR is the only Indian Organization among the Top 100 global institutions. A total of 252 Indian organisations are covered in the evaluation.

According to the Nature Innovation Index 2017, CSIR is ranked at 162 and IITs at 185 in the Top 200 institutions world-wide. Among Top 50 global institutions by normalized WIPO patent families, CSIR is at 16, and is the only Indian organization in this top 50 list.

CSIR has contributed significantly in the development, nurturing and positioning of essential oil-based aroma industry in the country. This has led to creation of an ecosystem benefitting the industry, farmers and next generation entrepreneurs.

The effort has had been aimed at socio-economic development on one hand and creation of desired capability and capacity on the other. In doing so, several CSIR laboratories have developed and deployed desired technologies in the domain.

The segment is maturing and there is global connect in a significant manner, providing newer opportunities which are associated however with several challenges. Industry thus needs to reposition itself in this important segment. CSIR has committed itself to contribute for the purpose in a mission mode. CSIR Aroma Mission has been conceptualised for the purpose and is being made operational.

The objectives of the Mission have been divided into eight verticals. These include: Development of superior varieties and their agro-technologies and assessment of their suitability for specific agro-climatic regions; Promotion of cultivation and processing of aromatic crops, enhancing area under selected aromatic crops along with enabling interventions including setting up of distillation units and catalysing setting up of cooperatives for marketing of the produce; Value-addition of aromatic crops (High-end aroma chemicals and products); Skill development activities; Intellectual property generation, valuation and management; Entrepreneurship development/Spin-offs; Business development; and Making public aware of Mission activities and achievements using appropriate interface.

Medicinal plants have played a key role in human health since time immemorial. Plants and their parts have been in use since ancient times as medicines for the treatment of a range of diseases. In spite of the great advances observed in modern medicine in recent decades, plants still make an important contribution to global healthcare.

As per World Health Organisation (WHO), because of poverty and lack of access to modern medicine, about 65-80% of the world's population living in developing countries depends essentially on plants for primary healthcare.

The CSIR Mission on phytopharmaceuticals aims to improve the availability (through cultivation) of such medicinal plants which are in high demand by global and domestic industry involved in the preparation of medicines of Indian traditional systems.

Under this mission it is proposed to prevent exhaustion of medicinal plants from their native locations by identifying the elite germplasm and conserving it by cultivation and in gene banks. Improved varieties along with their agrotechnologies will be developed to increase productivity and profitability per unit land area, and to make use of such areas which are affected by abiotic stresses such as drought, salinity, flood, shade, etc.

Chemical processes will be developed for the preparation of standardized extracts and enriched fractions of selected medicinal plants to transfer the value-addition technologies to the entrepreneurs to promote use and export of value-added material instead of the raw plant material. Efforts would be made to translate the potential clinical leads in different CSIR laboratories to develop them into phyto-pharmaceutical drugs which would be affordable and acceptable at global standards.

The verticals are: Captive cultivation of medicinal plants; Conservation and revival of engendered and threatened medicinal plant species; Technology Packages for production of GMP grade medicinal plant extracts; Phytopharmaceutical development from important medicinal plants; Intellectual Property generation, valuation and management; Design & Development of Digital Library of Indian Medicinal Plants & Natural Products; and Showcasing CSIR technologies / products / services with appropriate interface.

Sickle Cell Anemia (SCA) is the most common blood related disorder in India with a high prevalence among ethnic groups that have a socio-economic disadvantage, such as tribal populations. Every year approximately 5,00,000 children are born with SCA worldwide with India accounting for nearly 50% of the cases.

SCA is a genetic disease caused by a point mutation in the sixth codon of the β -globin expressing gene resulting in the replacement of glutamic acid by valine, which under deoxygenation state oligomerises with α -globin and gives rise to a type of haemoglobin named as HbS (Haemoglobin sickle).

The mutated valine favours the hydrophobic interactions between the β subunits of the hemoglobin tetramers leading to the HbS polymerization and formation of long hemoglobin fibers. These fibers deform the disc shaped RBCs to sickle shaped cells.

The sickle shaped cells lose flexibility with reduced oxygen carrying capacity and induce dehydration in the cells. Due to irregular shape of these cells, they are prone to physical stress leading to hemolysis and capillary occlusion. Individuals suffering from sickle cell disease show symptoms such as body pain, clotting, dyspnea, anaemia, jaundice, pneumonia, repeated infection, etc.

Their lifespan is usually reduced to 5-25 years with 50% of children with SCA dying before the age of 5. Hence early and affordable detection, treatment as well as preventive measures are important in managing this disease.

CSIR has developed a Mission Mode Project on Sickle Cell Anaemia through brainstorming and domain expert group discussions. The CSIR Mission on Sickle Cell Anaemia aims at: Managing Genetic Burden of Sickle Cell Anaemia and Understanding Genetic Basis of Differential Response to Hydroxyurea Therapy; Drug discovery and development for management of SCA; Genome editing and stem cell research approach for the treatment of SCA; and Development and on-ground implementation of an affordable, accurate and accelerated diagnostic kit.

The project will be implemented by CSIR-IIIM, Jammu; CSIR-CCMB, Hyderabad; CSIR-IICB, Kolkata; CSIR-IMT, Chandigarh; CSIR-IGIB, Delhi; CSIR-NCL, Pune and CSIR-URDIP, Pune.

CSIR constituent laboratory, CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad has been identified as one of the ten organisations in the country to host a Atal Incubation Centre to be supported by NITI Aayog.

The initiative is part of the Atal Innovation Mission set up by Union government to promote innovation and entrepreneurship in the country. CSIR-CCMB would offer its scientific expertise, infrastructure and business management to the start-ups.

CSIR has launched an Integrated Skill Development Initiative for gainful utilisation of its state-of-the-art infrastructure and human resources through specific industry oriented skilling programmes. The plan is for expanding the present 30 programmes to 75 in diverse areas with varying duration (8 weeks to 52 weeks) by end of the year. The skill development programmes include the following areas: Leather process Technology; Leather Footwear & Garments; Paints & coatings for corrosion protection; Electroplating & Metal Finishing; Lead Acid Battery maintenance; Glass Beaded Jewellery / Blue Pottery; Industrial Maintenance Engineering; Internet of Things (IoT); and Regulatory – Preclinical Toxicology.

Recently CSIR and Andhra Pradesh Scheduled Caste Co-operative Finance Corporation Ltd. (APSCCFC) have signed an Agreement for Skill training and Entrepreneurship in Leather Sector. The initiative is set to benefit 10,000 Scheduled Caste Candidates from Andhra Pradesh, creating income generation assets to the households and thus enabling social and economic development. An investment of Rs 30-crore is being made by APSCCFC in next 2-3 years. CSIR has launched a program named JIGYASA in collaboration with the Ministry of Human Resource Development. The focus is on connecting school students and scientists so as to extend the classroom learning of students with experiential education based on a very well planned research laboratory environment.

“JIGYASA” aims to inculcate the culture of inquisitiveness on one hand and scientific temper on the other amongst the school students and their teachers. The Programme is expected to connect 1151 Kendriya Vidyalayas with 38 National Laboratories of CSIR targeting 100,000 students and nearly 1000 teachers annually.

CSIR has achieved multiple breakthroughs in developing medicinal and aromatic plants (MAPs) that grow in different kinds of soils e.g. water logged soils, saline lands, desert prone and semi-arid soils, drought hit regions, snow bound areas or waste lands.

CSIR developed varieties not only harness all available cultivable land but enhance incomes to farmers. Returns are much higher than conventional agriculture. The estimated area under cultivation over the years from such interventions by CSIR is more than 3.5 lakh hectares with an estimated value of Rs 4000 crores and generated employment of more than 7.00 crore man-days.

CSIR's 'Jammu Kashmir Arogya Gram Yojana' was launched in July 2015 as an effort for handholding of farmers to enable value added agriculture of aromatic and medicinal plants. 10 Districts (Kathua, Udhampur, Reasi, Doda, Ramban, Kishtwar, Samba, Poonch, Jammu and Rajouri) comprising kandi land/rainfed/ wasteland/unutilized land/snow bound areas are covered under this initiative.

Through this initiative 107.82 ha of land has been brought under cultivation, which has resulted in employment generation of 26,959 mandays, and benefitted 399 farmers. The efforts that targeted at rural skill set enhancement through farm based activities and technology support, provided training to 1760 personnel on specific agro-technologies.

CSIR has also developed agri-implements such as Krishi-Shakti (tractor for small land holdings), Air-Assisted Electrostatic Sprayer for Crops, Inter-row rotary cultivator for wide-row crops, Digital Grain Moisture Analyser, etc. for enhancing productivity and reducing drudgery of farmers.

Recently, CSIR has launched two Mission programmes – Aroma and Phytopharmaceuticals - with significant stakeholder focus, targeting niche yet cost effective agri- and value-add technologies for high national impact.

Samba Mahsuri (SM) is one of India's most popular and highly prized rice varieties because of its high yield and excellent cooking quality. It is cultivated in more than 2 million hectares of land in the country.

However, SM is highly susceptible to many pests and diseases including the serious bacterial blight (BB) disease. BB is one of the serious production constraints of rice in India, limiting rice yields by upto 30 % in many of the states in which SM is cultivated. This disease is a particular problem because effective chemicals for managing the disease are not available.

Recognising the seriousness of the problem of BB, CSIR-CCMB and ICAR-IIRR jointly developed BB resistant derivatives of SM and one of the breeding lines was released as a new variety under the name, Improved Samba Mahsuri (ISM) in the year 2008.

The BB resistant lines of SM, when evaluated across the country through multi-location trials, exhibited high yield and grain quality similar to the original parent, SM and also showed excellent resistance to BB in disease in locations prone to BB infection.

After its release of ISM, its cultivation area has been steadily increasing and upto 2016 it is estimated to have been cultivated in an area of 130,000 hectares across the country. ISM matures 7-10 days earlier than Samba Mahsuri and farmers in East Godavari attested that it is more tolerant to lodging than other popular varieties.

ISM has another unique feature of low glycemic index (i.e. a value of 50.99), which is amongst the lowest value for several rice varieties tested. Foods with glycemic index (GI) value below 55, like ISM, are considered highly suitable for consumption by patients suffering from diabetes as consumption of foods with low GI results in slow release of glucose into the bloodstream, thus reducing the ill effects of the diabetes.

Therefore, ISM, in addition to possessing desirable attributes like high yield, fine-grain type, bacterial blight resistance, premium market price etc., also has a unique advantage of low GI, thus enhancing its market potential and profit earned by the farmers.

Popularisation of ISM amongst rice farmers was supported by CSIR through its CSIR-800 program. The ongoing research in this collaborative program of CSIR-CCMB and ICAR-IIRR is aimed at developing derivatives of Samba Mahsuri that have higher yield, mature early and possess tolerance to other biotic stresses.

In order to address the grave problem of adulteration in milk, CSIR has developed an electronic system, named 'Ksheer-Scanner', a low cost portable system with user friendly features, which detects contaminants in just 40-45 seconds.

The system is useful for on-the-spot milk testing by food inspectors. Over 55 Ksheer-Scanner systems have been deployed at dairies in Goa, Gujarat, Jammu & Kashmir, Kerala, Maharashtra, Punjab, Rajasthan, Uttar Pradesh and West Bengal.

Recently, a new handheld GPS-enabled 'Ksheer Tester', a variant of the benchtop system, Ksheer-Scanner, has been developed by CSIR for checking adulteration in milk. The device would enable any person to track the location of the tested sample of milk and receive the test results through SMS on the device.

The handheld milk adulteration tester, with system capabilities comparable to those of Ksheer Scanner which was meant for dairy-level inspection, is aimed for domestic usage. User friendly salient features include single button operation, fast measurement time (less than 60 Seconds) and the ability to detect contaminants like urea, salt, detergent, soap, boric acid and hydrogen peroxide down to low levels ranging from fractions of a percent to parts per million depending on the adulterant. A cost of below Rs. 10,000 per piece enables small communities and dairy-processing businesses to adopt this cost-effectively.

The CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI), Pilani has developed mercury-free plasma (MFP) UV-lamp for water disinfection systems which would provide water free of environmentally and health hazardous mercury.

The developed MFP-UV-lamp is a better alternative for mercury-based UV lamps and has been well-tested in the household water purifier systems. This is a first of its kind worldwide. The technology can also be used for sterilization of food, medical equipment, surfaces, ill-skin conditions, air-conditioners and air fresheners for hospitals, etc. The technology has been transferred to two companies for its mass production. The device is based on the principle of anodic oxidation. The device is particularly useful for the treatment of drinking water supplies that have microbial contamination to disinfect pathogenic microorganisms and to provide safe drinking water to communities as per National and International standards [World Health Organization (WHO) and Environmental Protection Agency (EPA) USA] prescribed for potable water.

This has high disinfection efficiency of >8 Log reduction of bacteria (E coli) and is maintenance-free. It is a low-cost water disinfection device that can even treat brackish or turbid water unlike UV technology. Cost of treated water is less than 1 paisa per litre. Domestic device can supply 10 litres of water for homes and small establishments while the online version can supply 450 litres of safe water for communities. CSIR has developed a cost-effective toilet that weighs less than 500kg and has a life of 25-30 years suitable for areas where toilet coverage is still incomplete. It can be made in-situ and even assembled in less than five hours.

A Memorandum of Understanding was signed with M/s. Smart Built Prefab Pvt. Ltd., Hyderabad, for technology transfer for manufacturing textile reinforced concrete (TRC) panels for the construction of such toilets. The TRC panels are manufactured using textile reinforced concrete prototyping technology (TRCPT), an innovative all-in-one technology developed by the CSIR laboratory. Chromium, a toxic element with significant adverse environmental and public health impact, is widely used as part of tanning agents with about 2.0 billion sq. ft. of leather being made in India. About 20 thousand tons of chrome tanning agent is discharged in the consequent wastewater.

CSIR has developed a “Waterless tanning technology” that a) completely eliminates two processes before and after tanning, b) eliminates the use of water in tanning, c) reduces the total dissolved solids in wastewater from this process by 20 per cent and d) brings down the usage of chromium by 15-20 per cent, resulting in material saving. The technology has been widely accepted in the country, with over 100 tanners in all clusters enrolling for its adoption. Several countries including Ethiopia, South Africa, the Netherlands, New Zealand, Vietnam and Brazil have evinced interest in this CSIR technology.

A technology that separates sodium chloride and sodium sulphate found in waste in common effluent treatment plants (CETP) has been developed by CSIR-Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar. Once separated, the salts can be reused in preserving hides and in tanning process.

The technology will drastically cut down the cost of treating effluents from tanneries. The CSIR constituent laboratories, CSIR-Central Leather Research Institute (CSIR-CLRI), Chennai and CSIR-CSMCRI have signed an MoU with All India Skins and Hides Merchants Association to initiate the trials of the technology in Gujarat.

Portable Reading Machine (PRM) is an assistive device for visually impaired that helps them reading printed documents, e-books, or recorded speech. It is based on the principle of contact scanning of a printed document and converting it into speech. The device is stand-alone, portable, wireless and uses open source hardware and software.

The device can analyse a multi-column document and provide seamless reading. It is capable of page, sentence and word level navigation while reading. It helps visually impaired to read print media as well as electronic files such as eBooks. It has support for speaking Hindi, English and is further compatible for other Indian languages such as Bengali, Kannada, Malayalam, Marathi, Punjabi, Tamil, Telugu, etc.

The device may also be readily configured for major foreign languages, and find application extensions in low-literacy populations for improved understanding of written documents.

The first Indigenous Aviation automatic Weather Monitoring System has become functional at the Mangalore International Airport w.e.f. June 25, 2017. This integrated Weather Monitoring system has been developed and deployed jointly by CSIR-National Aerospace Laboratories (CSIR-NAL) and India Meteorological Department.

The main feature of this system is that it measures Wind Speed, Wind Direction, Pressure, Temperature and Relative Humidity along with Visibility which are critical for aviation safety. A mandatory system required for Airport operations has been developed, as per the International Civil Aviation Organization (ICAO) requirements. In view of indigenous efforts, saving of foreign exchange to the country also accomplished.

A symposium on Indian Strategy on Quality Infrastructure was held on 29th November, 2017 to highlight the role of accurate and precise measurements for building the quality infrastructure of the country. The symposium highlighted the importance of measurements and the ways through which it facilitates international trade, and enhances the quality of life and the environment. The symposium was attended by more than 400 foreign delegates from 31 countries.

The symposium witnessed a landmark occasion, as the Timescale of Indian GPS (NavIC - NAVigation with Indian Constellation) developed by Indian Space Research Organization (ISRO) was synchronized to the Indian Standard Time (IST) generated by the “Primary Atomic Clocks” of CSIR-NPL. The link was dedicated to the Nation.

CSIR-NPL is the custodian of Indian Standard Time (IST) and has the national responsibility for realization, establishment, maintenance and its dissemination. As a 'National Metrology Institute', CSIR-NPL has the mandate to maintain 'Indian Standard Time' (IST) using the most up-to-date technologies. The National Time Scale is contributing to the Universal Coordinated Time (UTC) maintained by International Bureau of Weights and Measures (BIPM) and has uncertainty of 20 nano-second.

A MoU was signed between CSIR and ISRO on August 04, 2017 under which CSIR will provide time and frequency traceability to ISRO. Under the MoU, CSIR-NPL will provide the UTC traceability to the Time Scale of the Indian Regional Navigational Satellite System (IRNSS), an independent navigation satellite system, being developed by ISRO. The all in view GPS P3 technique will be used by CSIR-NPL for providing traceability to ISRO's time scale. Due to the criticality of precise time signals for satellite navigation, Two Way Satellite Time and Frequency Transfer (TWSTFT) system between CSIR-NPL's Laboratory in New Delhi and ISRO's Laboratories in Bangalore and Lucknow has been setup to provide few nanoseconds uncertainty to the ISRO's time scale.

In satellite based navigation systems, the spatial resolution is decided by precise synchronisation of the clocks embedded in the end user's device with clocks in the satellites. The accuracy of satellite navigation systems depends on the proper synchronization of on-board clocks.

For navigation purpose atleast four satellites are needed to know someone's position accurately. The time have to be incredibly accurate as light travels 30 centimetres in one nanosecond (or 300 million metres in one second) so that any tiny error in the time signal could put a defined activity by a very long way.

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Govt Mint launches first home-grown high purity gold reference standard

CSIR-NPL

23rd December 2017

India's first home-grown high purity gold reference standard - the Bharatiya Nirdeshak Dravya (BND-4201) - was launched on Saturday at the India Government Mint, Mumbai. BND-4201, which is the reference material for gold of '9999' fineness (gold that is 99.99 per cent pure), will be beneficial to the consumers and public at large to ensure purity of gold, said IGM, Mumbai, in a statement. IGM said once the BND's of other purity gold are made available in the market, jewellers will move towards more instrumental methods rather than the conventional fire assay methods for testing, which are not only time consuming but also not environment friendly as poisonous gases are released. Gold reference standard is indispensable in gold and jewellery hall marking. This will also be useful for Collection and Purity Testing Centres to certify the purity of gold deposits under the gold monetisation scheme.

The high purity gold reference standard has been developed through a collaboration between IGM, Bhabha Atomic Research Centre -- National Centre for Compositional Characterisation of Materials (Hyderabad), and Council of Scientific & Industrial Research-National Physical Laboratory (New Delhi). "The measurement of the high purity BND-4201 is traceable to SI units (International System of Units)...Therefore, the possibilities of exporting to other economies are very high," said DK Aswal, Director, CSIR-NPL. R Haripanth, General Manager, IGM-Mumbai, said alongwith CSIR-NPL, IGM will soon take up the production of other morphologies of the gold BND's as well as other precious materials. IGM, Mumbai, is a unit of the Security Printing and Minting Corporation of India Ltd.

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जैविक खेती आय का मजबूत जरिया

संवाद सूत्र, ऋषिकेश: प्रदेश के मुख्यमंत्री त्रिवेन्द्र सिंह रावत ने भारतीय पेट्रोलियम संस्थान मौहकमपुर की तकनीक से स्थापित की गई आधुनिक प्रदूषण रहित जैविक उन्नत गुड़ भट्टी का उद्घाटन किया। उन्होंने कहा कि जैविक खेती आय का मजबूत जरिया बन चुकी है। इससे कुटीर उद्योग को बढ़ावा दिया जा सकता है। डोईवाला विधानसभा क्षेत्र के सर्वांगीण विकास की दिशा में तेजी से कार्य किया जा रहा है। सूर्यधार में 60 करोड़ रुपये की लागत से बनने वाले बहुउद्देशीय बांध की आधारशिला 25 दिसंबर को अटल बिहारी वाजपेयी के जन्मदिन पर रखी जाएगी। नए वर्ष में सौंग नदी देहरादून में भी 900 करोड़ रुपये की लागत से बनने वाले बांध का प्रोजेक्ट तैयार किया जा रहा है। इससे देहरादून जिले में पीने व सिंचाई के पानी की कमी को दूर करने के साथ बिजली का उत्पादन भी किया जा सकेगा।

खैरी रोड डोईवाला में भारतीय पेट्रोलियम संस्थान की मदद से किसान अशोक पाल व मोहित तोमर द्वारा लगाई गई प्रदूषण रहित उन्नत गुड़ भट्टी का उद्घाटन करते हुए प्रदेश के मुख्यमंत्री त्रिवेन्द्र सिंह रावत ने कहा कि बाहरी प्रदेशों में जैविक उत्पादों की खासकर उत्तराखंड में उत्पादित खाद्य पदार्थों की भारी मांग है। आइआइपी के साथ एक अनुबंध किया गया है। जिसमें चीड़ की पत्तियों से तारपीन व



प्रदूषण रहित गुड़ भट्टी का बटन दबाकर शुभारंभ करते मुख्यमंत्री त्रिवेन्द्र सिंह रावत • जागरण

डीजल आदि बनाए जाने की शीघ्र शुरुआत होगी। आइआइपी के निदेशक अंजन रे ने कहा कि संस्थान विभिन्न क्षेत्रों में आगे बढ़कर कार्य कर रहा है। मुख्य वैज्ञानिक अमर कुमार जैन ने प्रदूषण रहित उन्नत गुड़ भट्टी की विशेषताओं की जानकारी दी। जैविक खेती करने वाले दीपक उपाध्याय ने जैविक खेती के साथ पशुपालन को भी खेती से जोड़ने की बात कही। इस मौके पर गन्ना समिति के चेयरमैन ईश्वर चंद पाल, सहकारी समिति के अध्यक्ष अशोक

पाल, वैज्ञानिक पंकज कुमार, डॉ. डीसी पांडे, कॉर्पोरेटिव बैंक के चेयरमैन डॉ. केएस राणा, डोईवाला पालिका चेयरमैन कोमल कन्नौजिया, नगीना रानी, परमिंदर सिंह बाबू, मोहित पाल, करण वोहरा, डबल सिंह भंडारी, राजेंद्र तडियाल, रामेश्वर लोधी, रणजोध सिंह, गौरव चौधरी, शेर सिंह पाल, त्रिलोक सिंह, बलवंत सिंह, तिलोक बोरा, अरुण सूद, दरपान सिंह बोरा, चीनी मिल के अधिशासी निदेशक मनमोहन सिंह रावत आदि उपस्थित रहे।

Focus on application-oriented research

CSIR

22nd December 2017

The workshop was inaugurated by PK Mehta, DS & Director General-Armament and Combat Engineering (ACE), Prof Appa Rao Podile, Vice-Chancellor, UoH and Director-HEMRL, K P S Murthy.



Hyderabad: A one-day workshop titled 'Development of Binders and Plasticisers for Energetic Applications' was organised at the Advanced Centre of Research in High Energy Materials (ACRHEM), a Defence Research and Development Organisation (DRDO) Centre of Excellence at the University of Hyderabad (UoH) in collaboration with the High Energy Materials Research Laboratory (HEMRL)-DRDO, Pune. The workshop was inaugurated by PK Mehta, DS & Director General-Armament and Combat Engineering (ACE), Prof Appa Rao Podile, Vice-Chancellor, UoH and Director-HEMRL, K P S Murthy.

Speaking on the occasion, Mehta elaborated the need for developing indigenous molecules that can be used for defence and space applications. Prof Appa Rao underscored the computational facilities available at UoH which is need of the hour in the 'Design & Synthesis of Novel High Energy Molecules'.

The HEMRL Director, KPS Murthy discussed importance of application-oriented research and the role of ACRHEM to focus on product driven R&D activities.

Speakers from VSSC-ISRO, IIT Bombay, CSIR-IICT, CSIR-NCL, HEMRL-DRDO and UoH delivered lectures on Development of Binders and Plasticizers for Energetic Applications. The present scenario of energetic binders and plasticizers at Isro and DRDO were explored in depth.

The two lecture sessions, each followed by engaging panel discussions, were chaired by eminent scientists from DRDO, Dr. S N Asthana and Dr Manoj Gupta. About 100 delegates participated in the workshop.

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