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CSIR-IICT demonstrates tech to turn dry leaves into soil conditioner

CSIR-IICT

31st March , 2024

CSIR-Indian Institute of Chemical Technology (IICT), which had indigenously developed high rate bio-methanation technology-based Anaerobic Gaslift Reactor (AGR) for the generation of biogas and bio-manure from organic waste, has now successfully demonstrated that it can be re-modelled to convert dry leaves into a 'soil conditioner'.

This method, called Accelerated Anaerobic Composting (ACC), ensure that only a bio-manure is generated, not the biogas. "This is a much simpler process, four times cheaper and does not require much expertise. It only needs RCC structure and pits without any big machinery," explained CSIR-IICT chief scientist A. Gangagni Rao on Sunday.

The ₹7.5-lakh 500-kg capacity ACC 'demonstration' reactor was established in a gated community, Maple Town Villas, at Sun City in Bandlaguda on request of the residents' association and is said to be working well for the past couple of months, generating about 10 tonnes of soil conditioner.

The organic manure thus generated out of the dry leaves from the trees on the 40 acre community land is being utilised by the residents of the 275 villas for various plants and trees on the premises, said Mr. Gangagni Rao, who heads the IICT's bioengineering and environmental sciences division.

"We have tried using dry leaves for the first time after testing it in our laboratory. The soil

conditioner parameters adhere to the standards prescribed by the fertiliser control order of the Union Agriculture Ministry about the content of nitrogen, carbon and others," he explained.

GHMC Commissioner Ronald Rose and his team had recently visited the facility to witness the operation of the AAC plant along with CSIR-IICT director D. Srinivasa Reddy, Maple Town Owner's Association's president Sudhakar Reddy and others. The plant was installed by KHAR Energy Optimisers.

The plant can produce about 6,000 kg of soil conditioner a month.

The team then visited the sewage treatment plant (STP) where sewage from the gated community was being treated to generate reusable water. The future plan now is to make use of the technology to tackle domestic waste as well. "We can convert everything into biomanure with a little bit of tweaking," said Mr. Gangagni Rao

The chief scientist had developed the AGR technology suitable for the Indian environment and has been successfully overseeing the plants being established across the country for converting kitchen waste, vegetable market waste and waste from the poultry industry into manure and gas for over a decade now.

There are about 30 AGR based plants across the country. Notably, Bowenpally vegetable market's 10-tonne biogas plant generating 500 units of power was mentioned by Prime Minister Narendra Modi during his radio talk 'Mann Ki Baat'.

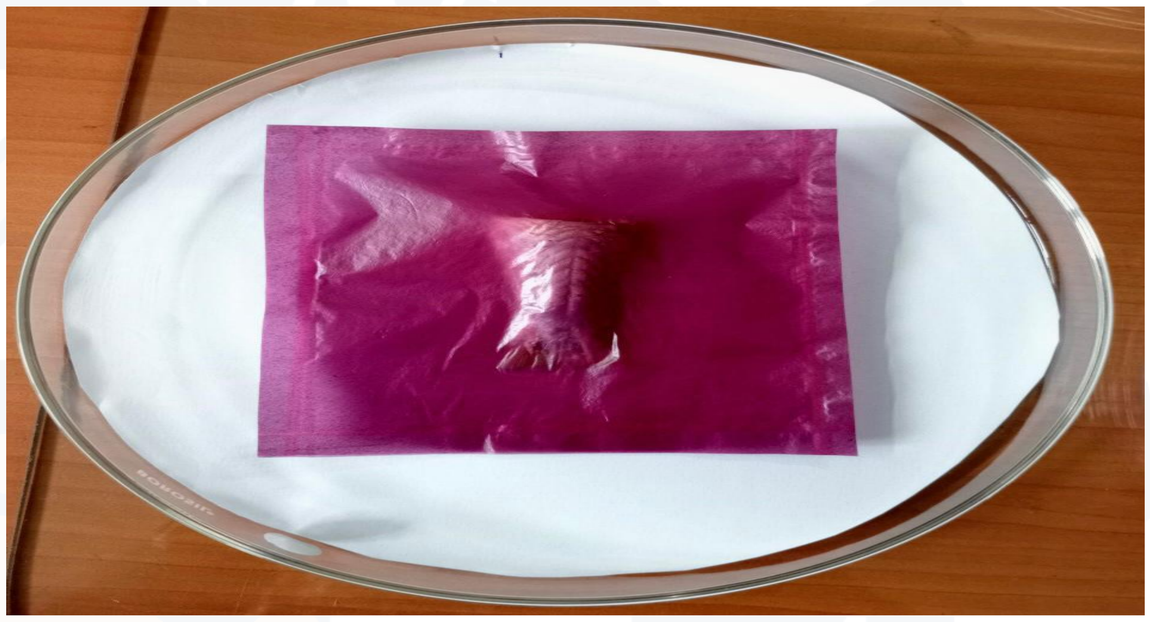
The chief scientist said the IICT is ready to take up projects for treating any kind of waste and certify the efficacy of the bio-manure.

Published in:
The Hindu

Assam scientists make biodegradable packaging with freshness indicator

CSIR-NIEST

31st March , 2024



According to the World Health Organization (WHO), an estimated 600 million, or nearly one in ten people, cases of illness were caused by contaminated food supplies in 2023, and 420,000 people die each year as a result of contamination from food, which led to the loss of 33 million healthy life years. Food packaging retains product quality, reduces product damage, aids in transportation, allows safe storage, and acts as another type of product communication. Packaging plays a significant role in maintaining or monitoring food quality. Scientists from the North East Institute of Science and Technology, Jorhat, have developed a biodegradable packaging bag for meat and fish with freshness indicator. The work was led by Dr Swapnali Hazarika, Senior Principal Scientist at NEIST, and assisted by Krishnakamal Hazarika, Dr Achyut Konwar.

"We have developed a biodegradable packaging system and directly converted it into a bag by using heat sealing. The cellulose nanofiber used in the process was obtained from grass, a waste product which contains approximately 30-40% cellulose. The cellulose acetate and nanofiber composite film is converted into smart packaging materials by the addition of natural dyes obtained from vegetables," Swapnali told EastMojo.

Finally, the Cellulose acetate composite film was converted to an intelligent packaging material by coating its surface with natural anthocyanin. She said due to the colour-changing property of Anthocyanin present in dyes, it changes the colour of the packaging bag and indicates the spoilage of fish or meat inside the bag. In another sense, the bag will indicate the freshness of meat and fish inside the packaging bag. "The developed bag is biodegradable in

nature and there is no threat to the environment," she added. "Various factors, such as food safety, consumer expectations, nutritional information, uniformity, and other country-specific factors, impact the overall quality of food. Such a type of intelligent packaging can communicate with the food material inside it and the consumer without any direct contact" she said.

Cellulose acetate is a semisynthetic polymer and is important for various applications because of the increasing issue of plastic pollution. "Due to the thermoplastic nature of cellulose acetate, this bag can be sealed by applying heat and food packaging biodegradable bag can be prepared on a large scale," she added.

Cellulose acetate is one of the important candidates in this regard, having stability in aqueous medium along with inherent biodegradability due to being of natural origin. Cellulose acetate, being one of the oldest semisynthetic polymers, is now becoming relevant for various applications because of the increasing issue of plastic pollution.

In addition, cellulose acetate has very good film-forming ability and, being thermoplastic in nature, such films can be sealed by applying heat. "Food packaging on a large scale requires quick packing of the food item inside the packaging bag as well as availability of the packaging material," she said.

The thermoplastic nature of the polymeric materials providing heat sealability enables large production of packaging bags with quick packing facility. "Therefore, it is of utmost importance to concentrate on the development of smart packaging materials having thermoplastic nature with the additional benefit of biodegradability," she said.

The research work has been published in Carbohydrate Polymers, a research journal published by Elsevier.

Published in:
Eastmojo

Awaiting Rs 50k cr makeover, Musi now a deadly cocktail of antibiotics: Study

CSIR-IICT

30th March , 2024

At a time when the Telangana government is planning a Rs 50,000 crore Thames-like makeover for River Musi, new research shows that the water body is steeped in pharmaceutical contaminants. This includes a hazardous cocktail of commonly used antibiotics (Ciprofloxacin), antidepressants and anti-inflammatory (Naproxen and Diclofenac), antifungal medicines (Fluconazole) etc.

It also has a high dosage of caffeine - present in several over-the-counter medicines for headaches and pains - shows the study, which was led by researchers from four premiere institutes, including the Indian Institute of Chemical Technology (CSIR-IICT) and Australia-based Commonwealth Scientific and Industrial Research Organisation (CSIRO).

The impact: Fear of serious health concerns, especially anti-microbial resistance (AMR) given that these drugs are found in concentrations ranging from 0.013 micrograms per litre (approx.) to 19.295 micrograms per litre (approx.) in the Musi.

Researchers note the prolonged exposure to these drugs can make the microbes in the watershed areas resistant to the various antibiotic drugs. Concerns are also being raised that fungi may also be becoming resistant to antifungals in such concentrations measured in the study.

Our environment is full of microbes and when these microbial communities are exposed to high enough concentrations of antimicrobial pharmaceuticals for a long time, they can become resistant to the specific drugs. When humans are exposed to microbes carrying these AMR genes then microbial infections can also too become resistant to the antibiotic drug. Eventually antibiotics may become ineffective in humans," explained Dr Mike Williams, senior research scientist in Industry Environments Program, CSIRO.

Specifically, Enrofloxacin and Ciprofloxacin, used as antibiotics were found in concentrated quantities enough to cause antimicrobial resistance. Similarly, the drug - Fluconazole, was found in high quantities and researchers note it is still not known if they too can develop resistance to antifungal drugs. These resistant microbes can then enter humans through contaminated food (e.g. irrigated by polluted water) and other sources

The study has been published in the Journal of Hazardous Materials.
As part of the research, the team led by four authors -- Satyanand Konda, Narendra Kumar Nagendla, Mike Williams, and Mohana Krishna Reddy Mudiam -- collected water samples from 11 sites across the Musi watershed area (inlet of Osmansagar, Kukatpally, Hussainagar outlet, Old City, Dilsukhnagar etc) and tested them for 46 common pharmaceutical and personal care products.

Of them, the water tested positive for 16 chemicals -- most common being anti-inflammatory drugs (Naproxen and Diclofenac), a stimulant (caffeine), an anticonvulsant (Carbamazepine), and an antifungal (Fluconazole), indicating their widespread occurrence.

Catchment area above
Hussainsagar polluted

Among the different sites that were studied, highest pollution levels were recorded around the Kukatpally region (which flows into the Hussainsagar). In sharp contrast, water samples collected at the inlet of Osmansagar pollution levels were practically negligible. The research notes level of chemicals was possibly higher around the Kukatpally region due to its proximity to both pharmaceutical companies as well as a high density of medical centres.

How did drugs land in Musi?
Researchers of the study also attribute the pollution in the Musi river to the widespread consumption of scheduled drugs and to pharma companies releasing untreated waste into the water body.

"Our study suggested higher population density did not always correspond to higher concentration of pharma chemicals, indicating wastewater from industrial discharges may have contributed to higher loads in less densely populated areas," said Williams.

The study also measured environmental hazards of these drugs in the water on three species- invertebrates, algae and fishes, and found that each of these pharma pollutants had moderate to high toxicity for the species.

Published in:
Times of India

Identifying Genes for Stress Management in Licorice Plants

CSIR-IIIM 28th March, 2024

Understanding the complex network of proteins that transport various substances across cellular membranes is crucial for advancing our knowledge of plant biology and improving agricultural practices. Among these proteins, ATP-binding cassette (ABC) transporters play a pivotal role. They are a large family of proteins that use energy from ATP hydrolysis to transport a wide range of substrates across biological membranes, affecting processes from growth and development to stress responses[2].

Researchers at CSIR-IIIM Jammu have conducted a groundbreaking study[1] focusing on a particular plant, Glycyrrhiza glabra, commonly known as licorice. The study has expanded our understanding of ABC transporters by identifying a total of 181 members of this protein family in G. glabra, which they have classified into six subfamilies. This discovery is significant as it provides a more comprehensive view of the diversity and potential functions of these transporters in a species not previously studied in this context.

The study revealed that nine of these transporters, referred to as GgABCBs, showed a significant increase in their transcript levels in response to the plant hormone auxin. Auxin is known to be a key regulator of plant growth and development, and these findings suggest that these nine ABC transporters could be important for auxin transport within the plant. The use of an auxin transport inhibitor further demonstrated that these ABC transporters are indeed responsive to auxin, as their expression was downregulated in shoots but upregulated in roots when the inhibitor was applied at higher concentrations.

In an effort to understand the broader roles of these transporters, the researchers also examined their expression under various growth conditions and in response to different abiotic stresses, such as drought. They found that seven of the nine transporters were involved in the plant's response to stress, with some being induced by multiple stress factors, while others

were specifically triggered by drought conditions. This study's insights into the auxin transport system are particularly valuable, as auxin not only influences plant architecture but also plays a role in how plants respond to their environment. By identifying and characterizing these transporters in G. glabra, the study lays the groundwork for future research into manipulating these transporters to develop plants that can better withstand environmental stresses.

The findings of CSIR-IIIM Jammu's research build upon previous studies that have explored the structure and function of ABC transporters in other species, such as rice[3] and Arabidopsis thaliana[4]. The research in rice highlighted the dynamic nature of the ABCI subfamily and their potential roles in salt stress response[3]. Similarly, the comprehensive inventory of ABC proteins in Arabidopsis provided a foundational understanding of the diversity within this protein family[4]. Together, these studies have helped to map out the evolutionary patterns of ABC transporters and their functional roles across different plant lineages.

The current study by CSIR-IIIM Jammu not only adds to the existing body of knowledge but also provides a new perspective by focusing on a species that has not been extensively studied in the context of ABC transporters. This research underscores the importance of studying a wide range of plant species to gain a more complete understanding of the complex roles that ABC transporters play in plant biology.

In conclusion, the work of CSIR-IIIM Jammu represents an important step forward in our understanding of plant ABC transporters. By identifying and characterizing a large number of these proteins in licorice and demonstrating their involvement in auxin transport and stress responses, this study opens up new possibilities for improving plant resilience and productivity through biotechnological interventions.

Published in:
Naturalsciencenews

HAL conducts successful first flight of LCA Tejas Mk1A in Bengaluru

CSIR-NAL

28th March , 2024

The first aircraft LA5033 of the Tejas Mk1A series successfully soared in the sky after taking off from the Hindustan Aeronautics Limited (HAL) facility in Bengaluru on Thursday, the public sector aerospace and defence company said. According to HAL, the Tejas Mk1A aircraft did a successful sortie with a flying time of 18 minutes. The plane was piloted by Chief Test Pilot Group Captain K K Venugopal (Retired).

HAL achieved this significant production milestone with concurrent design and development amid major supply chain challenges in the global geopolitical environment, subsequent to the contract signature in February 2021, HAL Chief Managing Director C B Ananthakrishnan said.

Extending its gratitude to the Ministry of Defence, Indian Air Force, Defence Research and Development Organisation (DRDO) and associated private firms for contributing to the success of this programme, HAL said the country can look forward to early induction of the Tejas Mk1A by the IAF, and more numbers through the three lines of production established at HAL.

The Tejas Mk1A will have an advanced electronic RADAR, warfare and communication systems, additional combat capability and improved maintenance features, HAL said.

HAL had signed a Transfer of Technology (ToT) agreement with CSIR-National Aerospace

Laboratories (CSIR-NAL) on November 8, 2023. The agreement was aimed at manufacturing BMI Engine Bay Door for the series production of Light Combat Aircraft (LCA) Tejas Mk1A an indigenous 4.5 generation, all-weather and multi-role fighter aircraft for the Indian Air Force.

Published in:
Business Standard

Ashish Lele – Director, National Chemical Laboratory (NCL), India

CSIR-NCL

28th March , 2024

Could you start by introducing yourself and the laboratory, and by explaining your current focus, and top priorities?

I am the current director of the National Chemical Laboratory (NCL) and a trained chemical engineer. I completed my bachelor's in chemical engineering at Mumbai University and my PhD at the University of Delaware in the US. I joined the National Chemical Laboratory as a scientist in 1993.

The National Chemical Laboratory is a vital component of the Council of Scientific and Industrial Research (CSIR). We operate under the Ministry of Science and Technology as a central government laboratory falling under the domain of science and technology. CSIR encompasses 37 laboratories throughout India, spanning diverse fields such as aeronautics, the chemical industry, biotechnology, advanced materials, and agriculture. Out of these 37 labs, the National Chemical Laboratory is one of the first, having been established in 1942 and predating India's independence in 1947. The lab has been actively contributing to scientific advancements since it opened in 1950. With a focus on the chemical and allied industries, the laboratory interfaces with chemistry, biology and chemical engineering.

The mission of the laboratory is to support the Indian chemical industry in achieving global competitiveness and the use of world-class technologies. The laboratory engages in the complete research and development life cycle, including demonstration and deployment. We also collaborate closely with industry stakeholders to bring innovations from the lab to the market. As the laboratory approaches its Platinum Jubilee after 75 years of dedicated service, it remains committed to ensuring that the highest quality research translates into tangible advancements within the chemical industry and beyond.

What are the most significant opportunities and challenges facing the field of chemical research in India, and how is the CSIR-National Chemical Laboratory addressing them?

The laboratory's roadmap spans seven decades, marked by notable contributions, such as playing a pivotal role in India's emergence as a global leader in generic drug manufacturing. In the 1970s, a significant policy change regarding product patents for pharmaceuticals was put in place. This was a necessary step because income levels were low and healthcare was becoming unattainable. This change catalysed the laboratory's development of new processes, positioning India as a major contributor to the global pharmaceutical supply chain. For this reason, India has become the pharmacy of the world, with 25 percent of North American and European generic drugs coming from India.

The lab has made major contributions to producing the best processes with more than 140 technologies being developed for manufacturing pharmaceutical intermediates and APIs in the country. Eminent figures from within the industry such as Yousef Hamid, the founder of Cipla, publicly expressed that if it was not for the NCL, the Indian market would have not grown so quickly.

In the 1990s, a pivotal policy shift opened India's markets. It allowed big industry players to come to India and sell their products across categories such as chemicals, materials, polymers and more. The opening of markets in India presented both challenges and opportunities for laboratories like ours. The challenge emerged as a shift in funding dynamics, transitioning from government dependency to self-sustainability. While the government continued partial funding, the laboratories were urged to manage themselves independently. However, this challenge brought with it an opportunity—the ability to offer R&D services globally rather than just in India. With the markets now open to the world, laboratories, including ours, were able to extend their services to major multinational companies. This led to the filing of the first US patents in the early 90s, marking the beginning of substantial collaborations with prominent global entities, particularly in the pharmaceutical sector.

Simultaneously, the second challenge arose as Indian companies faced increased competition, particularly in the local market. Responding to this, they began substantial investments in R&D. Our laboratory played a crucial role by providing strategic guidance, manpower through our students, and technological support to these companies.

As we move into the current decade, climate change and regulatory pressures for decarbonization are the biggest challenges. The focus lies on addressing pollution, achieving decarbonization, and navigating the complexities of sustainability aligning with the global push for environmental responsibility. Our laboratory recognizes its responsibility to contribute meaningfully to addressing these critical challenges defining this decade.

What are some of the current research initiatives and challenges that the laboratory is actively working on?

One of the prominent challenges the country is facing is the over-dependency on China for APIs. As a country we want to avoid this dependency and rely on our own manufacturing abilities and to be self-sufficient. In that sense, our laboratory has outlined a roadmap with seven focal themes, particularly emphasizing clean energy and decarbonization-related chemistry. The themes include process chemistry, finance, and specialty chemicals, especially in the pharmaceutical sector. One notable concept we are exploring is continuous flow chemistry, a departure from traditional batch processes. To illustrate this, batch processes are like cooking in a pot, yielding a mixture of desired and undesired chemicals. 20 percent of energy goes into downstream purification to extract the desired chemicals. Continuous flow chemistry, conducted in a pipe, offers clarity in the resulting mixture, with significantly reduced downstream costs and enhances safety.

This shift to continuous manufacturing is particularly pertinent for various industries dealing with complex reactions involving toxic materials and exothermic processes. If not done right it can lead to explosions and the risk of spreading harmful chemicals. By running such reactions in a continuous loop, we achieve efficiency, safety, and economic advantages.

The driving force behind the implementation of this change is decarbonization. For example, batch plants entail distillation. Distillation relies on steam, and the traditional methods of generating steam involve burning coal or gas contributing to carbon emissions. The imperative to decarbonize compels companies to seek alternatives. By transitioning from batch to continuous processes, they can significantly reduce distillation and their carbon footprint. This shift represents a strategic move to align with environmental sustainability goals and decrease emissions, both gaseous and liquid.

Large pharmaceutical companies are embracing this approach and heavily investing in research and development of continuous flow chemistry. However, the challenge in achieving this transformation relates to current assets. There are current assets, such as batch plants with depreciated values that still generate profits. Company management faces the dilemma of investing in a new plant that utilizes continuous flow chemistry, or depending on old processes.

China is already ahead in implementing this change to continuous flow chemistry whereas India is still in the transitional phase, navigating this shift. China's government is taking a decisive stance to only permit new pharmaceutical plants if they adhere to continuous batch processes.

The NCL is collaborating with numerous companies, including prominent players in the pharmaceutical industry showing them how the adoption of continuous processes can be implemented and that it can be advantageous. Companies are accustomed to traditional methodologies and are often sceptical about executing a continuous flow system. To address this scepticism, we have established a "living lab" featuring various platform chemistries such as continuous flow setups for hydrogenation, sulfonation, ozonolysis, and chlorination. We invite industry players to witness first-hand how these processes can be seamlessly integrated. This shift demands a change in mindset, and our role is to catalyse this transformation.

Notably, we have engaged in a substantial partnership with a UK laboratory, the CPI (Centre

for Process Innovation), which is part of the renowned catapult network. This collaboration aims to establish a cutting-edge living lab, and their dedicated team has visited us recently to interact with major pharmaceutical companies in Hyderabad and Bangalore. Can you share more about how biology is advancing in India and the contributions of the lab to this advancement?

The implementation of biology is a relatively new field for India. During the COVID-19 pandemic, India confronted its heavy reliance on China for imports, particularly strategic materials known as Key Starting Materials (KSM). Recognizing the urgency to incentivize domestic manufacturing of these critical components, the government introduced the Production Linked Incentives (PLI) scheme. This initiative, spanning PLI one, PLI two, and now extending into PLI three, is focused on encouraging Indian industries to produce materials through organic chemistry. In the initial phase, PLI one concentrated on identifying 53 key strategic materials, that are 100 percent imported from China, urging companies to manufacture them domestically. Within this, 26 molecules were allocated to be manufactured through conventional organic chemistry production. The remaining 27 molecules ventured into the realm of bio-based production. This shift brought forward the realization that India lacked essential competencies in large-scale fermentation, a critical aspect of bio-based manufacturing.

With respect to biotechnology, India is emerging but faces challenges in scaling up from lab-level fermentations to industrial-scale operations. Smaller companies lack the financial means to independently acquire cutting-edge biotech solutions. While larger enterprises may seek technology licenses globally, smaller players face constraints. The government is actively acknowledging and supporting the need to bridge these gaps, fostering an ecosystem for large-scale fermentation, downstream purification, and other essential components of bioprocessing. Despite the hurdles, some companies demonstrated resilience and invested in perfecting these technologies, paving the way for pre-clinical and clinical trials.

Within the Ministry of Science and Technology, specifically the Department of

Biotechnology, there is a concerted effort to propel advancements in biotechnology. The Secretary of this department, Mr Rajesh Gokhale has initiated a ground-breaking policy known as the Bio-entry Policy. This policy is a significant stride toward utilizing biology to manufacture materials, chemicals, and various products traditionally not associated with biological processes. Its primary objective is to catalyse research and innovation in the field of biotechnology within India.

In line with this vision, we are discussing plans to establish specialized centres dedicated to translational research. These centres will be equipped to handle volumes ranging from 1,000 to 10,000 litres, providing an open facility accessible to all. The idea is to foster a beneficial environment for start-up companies with limited resources. The proposed centres aim to limit constraints by offering rental services for larger fermenters. The start-up can rent the necessary facilities for a week, conduct their trials, generate sufficient material, and return to their laboratory. This innovative approach fosters a collaborative ecosystem, facilitating the growth and success of emerging companies on the biotechnology landscape.

What are some contributions the lab has made to the field of biosimilars?
Our laboratory is actively assisting various companies, both major players and others entering the field. Two noteworthy examples highlight our contributions in this area. Firstly, we have licensed technology for a biosimilar designed to address diabetic retinopathy. Given the absence of competition in small molecules for treating highly diabetic retinal disorders, biosimilars become the sole viable route. The appeal lies in the fact that larger companies with no alternative, are eager to tap into this lucrative market.

The second contribution pertains to snakebite-related fatalities. This is a significant issue in rural India, causing between 60,000 to 70,000 deaths annually. With regulatory pressures intensifying with respect to the purity of anti-snake venom treatments, traditional production methods faced challenges. We guided companies on transitioning to newer technologies, ensuring compliance with stringent regulatory standards. By demonstrating how to navigate regulatory pressures we facilitate the adoption of advanced technologies. This approach is

particularly relevant for biomolecules with practical significance for India. As we embark on this journey, we acknowledge the importance of building confidence gradually. Initiatives involve identifying suitable candidates, launching investments, and then expanding operations.

How does the laboratory support the professional development of its researchers and scientists, and what opportunities are available for students and early-career researchers?

The laboratory engages in extensive training programmes. Although we are not an established university, we provide training through the CSIR's Virtual University which encompasses virtual campuses across all CSIR labs. This initiative involves mentoring 400 PhD students, acting as catalysts for innovation. Additionally, postdoctoral fellows, with varying experience levels, contribute to the laboratory's endeavours.

The focus lies not only on high-quality scientific research but also on preparing students for industrial roles, emphasizing the translation of scientific knowledge into practical applications. The laboratory operates on three key fronts: research, services, and developing skilled human resources. Our approach involves combining curiosity-driven science with focused, application-oriented programmes. This strategic alignment enables the creation of intellectual property based on fundamental science.

Do you have any final message to share with PharmaBoardroom's international audience?

Bio manufacturing is key for India, urging a timely implementation of transformative measures. The transition has gained momentum with the support of the policies in place by the Department of Biotechnology. The strategic alignment with these policies allows us to catalyse bio manufacturing and continuous flow synthesis both of which are pivotal areas of focus.

Published in:
Pharmaboardroom

KU's initiative on promoting entrepreneurship, building start-ups reaches North Kashmir

CSIR-IIIM

27th March , 2024

To unlock the potential of medicinal and aromatic plants in North Kashmir, the Department of Botany, North Campus, Kashmir University (KU), organised a two-day capacity building programme here. Titled, "Cultivation, Processing and Marketing of High Value Medicinal and Aromatic Plants concluded on March 23 at the Campus in Delina, Baramulla, an official statement issued here read.

The programme is part of a mega initiative of Kashmir University for promoting entrepreneurship and building star-ups. "The initiative reflects KU's attempt to provide service to local communities and engage people in meaningful collaboration with the institution," an official spokesperson said, adding that.

As part of the initiative, an array of programmes have already been conducted across different departments and campuses of the varsity, he added. Unemployed youth, farmers, entrepreneurs and researchers of North Kashmir, attended the programme at North Campus witnessing an overwhelming participation of the local women as well.

Director, North Campus, Dr Sheikh Ghulam Mohammad, highlighted the significance of tapping the vast natural resources available locally to develop entrepreneurship and start-up ventures within the valley. "To orient our future enterprises, these programmes pave the way towards building a culture of entrepreneurship and start-ups," he said.

Programme Convener/Organising Secretary and Coordinator, Department of Botany, Dr Bilal Ahmad Mir, emphasised on the significance of such events in forging ties of the institution with local populace.

"These plants not only offer solutions for various health ailments but also contribute to economic prosperity, environmental conservation and cultural heritage preservation," he said.

A series of indoor theoretical and outdoor practical sessions were held in the campus emphasising on the diversity, cultivation, conservation and marketing phase of medicinal plants and mushrooms.

Led by expert agronomists and botanists, the sessions delved into the intricacies of soil health, agro technique developments, government policies and conservation and cultivation practices, it read further.

Prof Yash Pal Sharma, Department of Botany, Jammu University, highlighted the importance of conservation, development and sustainable management of medicinal plants.

Dr Irfan Hussain Banday, National Medicinal Plant Board, Department of AYUSH, reflected on cultivation and economics of some high altitude medicinal plants.

Dr Aijaz Hassan Ganie, Department of Botany, North Campus, introduced the participants to different agro-techniques for cultivation and commercialisation of medicinal plants.

The participants also visited the field station of CSIR-IIIM situated at Boonera where they learned how to transform raw plant materials into value-added products. The final session focused on marketing strategies, providing valuable insights into market demand, consumer preferences and branding techniques, the statement added.

Published in:
Brighterkashmir

CSIR-NIIST unveils innovative solution for biomedical waste management

CSIR-NIIST

27th March , 2024

An innovative technology for the safe, sustainable and cost-effective management of biomedical waste, developed by a team of scientists at the the CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), was unveiled at a one-day Biomedical Waste Management Conclave held at CSIR-NIIST campus here on Tuesday.

Management of biomedical waste, which contains potentially infectious pathogenic substances is a perpetual challenge as improper segregation or inadequate incineration of these wastes can release many harmful toxins, ash and particulate matter into the environment.

The search for alternatives, which are innovative and environment-friendly, has led CSIR-NIIST to develop a dual disinfection-solidification system that can spontaneously disinfect and immobilise pathogenic biomedical waste from operation theatres and laboratories and convert it into value-added soil additives.

Using this advanced technology, hazardous biomedical waste can be disinfected and disposed of at its source, at a very low cost, eliminating all risks of spills and occupational exposure. For large and small hospitals, clinics, laboratories and the healthcare sector in general, this technology can be a life-saver, for it makes risk-free and cost-effective disposal of biomedical waste a reality.

Director of NIIST, C. Anandharamakrishnan, said that the technology that CSIR-NIIST has developed for converting pathogenic biomedical waste into value added soil additives is a perfect example of the 'Waste to Wealth' concept. Using this technology, one kg of medical waste can be converted into soil additives in three minutes and it can be used safely for agriculture purposes, he added. The other advantages of the technology are that any quantity of both fluid and solid biomedical wastes can be handled, incineration can be avoided totally,

the equipment handling the wastes is fully automated and that the processing is odour-free.

CSIR-NIIST has transferred the technology to its industry partner, the Angamaly-based firm Bio Vastum Solutions.

The one-day biomedical waste management conclave was inaugurated by M. Srinivas, Director of All India Institute of Medical Sciences, who spoke about the imminent need for innovative technologies in biomedical waste management.

N. Kalaiselvi, Secretary and Director General of CSIR, who presided over the conclave via video conferencing, appreciated that the new technology of CSIR-NIIST will have much impact on the global biomedical waste management scenario, as it addresses the limitations of conventional technologies, including that of energy-intense incineration.

Over 250 delegates participated in the conclave, which discussed various aspects of biomedical waste management and the need for innovative solutions.

Those who spoke at the inaugural event included Pragya Yadav, Director-in-Charge, ICMR-National Institute of Occupational Health, Sanjay Behari, Director, SCTIMST; J. Chandrababu, Regional Director, Central Pollution Control Board; Joshy Varkey, the Managing Director of BioVastum Solutions, S. Sreekala, chairperson, Kerala State Pollution Control Board; M.S. Faisal Khan, MD, NIMS Medicity; Joseph Benavan, State President, IMA and P. Nishy, Head, Business Development Division, CSIR-NIIST.

Published in:
The Hindu

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