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Empowering Fragrant Crop Cultivation: CSIR-IHBT's Aroma Mission

CSIR-IHBT

05th May , 2024

CSIR-Himalayan Biopathy Technology Institute (CSIR-IHBT) in Palampur, Himachal Pradesh, embarked on a mission to distribute 10,000 plants and 10 kgs of contained ball seeds of lavender rosemary to the ethnic areas of Pangi in Kangra and aspiring district Chamba under CSIR Aroma Mission Phase-3. Dr. Sudesh Kumar Yadav, Director of CSIR-IHBT Palampur, highlighted the growing international demand for fragrant oils derived from aromatic plants. With India's oil market estimated to reach 239.85 million USD by 2028, fragrant crop farming becomes pivotal, especially in regions where conventional crops face challenges due to wildlife interference.

The Aroma Mission Project aims to bolster the cultivation of fragrant crops, thereby enhancing India's position in the production of essential oils and uplifting farmers' livelihoods. Lavender and rosemary plants were distributed to Pangi Ayrian Farmers Producer Society of District Chamba, alongside ball seeds distributed to Jan Kalyan Sabha Society of Baijnath, District Kangda, Himachal Pradesh.

Lavender oil, sweet knot, commands a price of Rs 8,000-10,000 per kg, while fragrant ball oil is valued at Rs 10,000-12,000 per kg, and Rosemary oil at Rs 4000-5000 per kg. Farmers stand to earn a net profit of 1.5 to 2 lakh per year from these crops, driven by the biological properties found in their oils, which are in high demand across fragrance and pharmaceutical industries.

During the distribution of plant materials, Dr. Rakesh Kumar, Nodal and Senior Chief Scientist of CSIR Aroma Mission Phase-3, enlightened farmers about extraction techniques, medicinal properties, crop processing, and value enrichment. This support is pivotal in enabling farmers to maximize their yields and improve the quality of extracted oils, thereby accessing profitable markets domestically and internationally.

Under CSIR Aroma Mission-3, CSIR-IHBT Palampur has established 62 processing units for various farmer groups nationwide, aiming to empower farmers to fetch better prices in the market and double their income. The institute aims to establish 3000 such units by March 2026, signaling a concerted effort towards sustainable agricultural practices and economic empowerment in the fragrant crop sector.

Meet on IPR exhorts scientists to document traditional knowledge

CSIR-NIIST

04th May , 2024

A workshop on Intellectual Property Rights (IPR) held at CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) here has called upon the scientific community to document traditional knowledge in a judicious manner to guard against their misuse by vested interests by various means including bio piracy.

The workshop was held at CSIR-NIIST campus here earlier this week in connection with World IPR Day, for which this year's theme was "IPR and Sustainable Development Goals - Building our common future with innovation and creativity."

In his inaugural address, Dr. G.M. Nair, President, Kerala Academy of Sciences and Director, Central Laboratory for Instrumentation and Facilitation (CLIF), University of Kerala, highlighted the importance of enhancing the awareness about IPR in general and patents in particular. He also cautioned against the misuse of traditional knowledge including bio-piracy and the need for documenting the traditional knowledge in a judicious manner.

Citing a case of effective scientific intervention, Dr Nair lauded the contribution of the Jawaharlal Nehru Tropical Botanical Garden and Research Institute (JNTBGRI) scientists in the development and commercialisation of 'JEEVANI' from 'Arogyapacha' and the subsequent sharing of revenue with Kani tribes. "This was the first world model of equitable benefit sharing based on Article 8(j) of Convention on Bio-Diversity (CBD)," he noted.

He cautioned the audience that patenting would not have any meaning unless the invented process or product is commercialized.

CSIR-NIIST Director Dr C. Anandharamakrishnan, who presided over the function, spoke on the importance of acquiring patents, copyright and trademarks by the scientific

establishments. Dr. R.S. Praveen Raj, convener of the workshop and Senior Principal Scientist, CSIR-NIIST, said the event was meant to build awareness among scientists, researchers and innovators on patent search and patent drafting along with exposure to various IPRs and rights of the inventors. The workshop was attended by about 125 participants.

How Sugar and Growth Signals Trigger Flowering in Saffron Plants

CSIR-IHBT

04th May , 2024

Saffron, the world's most expensive spice, is harvested from the stigmas of the *Crocus sativus* flower, a plant that has fascinated scientists and farmers alike due to its complex biology and economic value. One of the challenges in saffron cultivation is the plant's inconsistent flowering, which is crucial for stigma production. Not all plants flower equally; smaller corms, the bulb-like storage organs of saffron, often fail to produce flowers, leading to variations in yield. To address this issue, researchers from the CSIR-Institute of Himalayan Bioresource Technology have delved into the genetic mechanisms that control the size-dependent flowering in saffron[1].

The study focused on apical buds, the part of the plant where flowering initiation takes place. By comparing gene expression profiles in buds from small and large corms, the researchers aimed to uncover the genetic factors that determine whether a plant will enter the flowering stage. They used RNA sequencing, a method that reads the genetic information being actively used by cells, to analyze the buds right after they emerged from dormancy.

Their findings highlighted the importance of starch and sucrose metabolism—processes involved in the plant's energy management—and the hormonal regulation by Auxin and Abscissic Acid (ABA), which are known to influence plant growth and stress responses. Genes associated with flowering development and circadian rhythm, such as Flowering locus T and Cryptochrome 1, were also found to be more active in the buds from larger corms. Additionally, the study marked the first comprehensive prediction of non-coding RNAs in *Crocus sativus*, which are molecules that can control when and how genes are turned on or off.

The research builds upon previous findings that have begun to unravel the complex genetic and epigenetic landscape of saffron. Earlier studies have shown that saffron is an autotriploid hybrid, which means it has three sets of chromosomes and is derived from one parent

species[2]. This genetic makeup contributes to saffron's sterility and clonal propagation. Furthermore, epigenetic variability among different saffron accessions has been linked to phenotypic differences such as flower pigmentation and yield[3]. The transcriptome analysis of saffron tissues has previously identified genes involved in apocarotenoid biosynthesis, which are compounds responsible for saffron's color and medicinal properties[4]. Moreover, the expression of these biosynthetic genes has been found to vary across different developmental stages of the plant[5].

The current study adds to this body of knowledge by pinpointing specific genes and pathways that are crucial for the plant's transition from vegetative growth to flowering. For instance, the identification of Enolase as a key protein in the interaction network suggests its potential as a target for enhancing flowering in saffron.

The significance of this research lies not only in its contribution to the basic understanding of saffron biology but also in its practical applications. By identifying the genetic determinants that control flowering based on corm size, the findings offer a potential pathway to improve saffron yields. Farmers and breeders could use this information to select for traits that promote flowering in smaller corms, potentially increasing the overall production of saffron.

In conclusion, the study advances our comprehension of the genetic factors influencing size-dependent flowering in *Crocus sativus*. This work not only integrates with previous research[2][3][4][5] but also opens new avenues for agricultural practices that could stabilize and enhance saffron production, ensuring the livelihood of rural communities that depend on this valuable crop.

IPC and CSIR-IMTECH forge strategic partnership to advance research in microbiology

CSIR-IMTECH

03rd May , 2024

Aimed at driving innovation and progress in the field of microbiology, the Indian Pharmacopoeia Commission (IPC) and the CSIR-Institute of Microbial Technology (IMTECH), Chandigarh, have joined forces towards advancing microbiological research and development for the betterment of public health. This partnership marks a significant milestone in the journey towards harnessing the potential of microbiology to address pressing healthcare challenges. By pooling their expertise and resources, IPC and IMTECH are poised to unlock new avenues of discovery and innovation in this critical field.



Through close collaboration, IPC and IMTECH aim to explore cutting-edge technologies and methodologies that hold the promise of transforming healthcare and pharmaceutical industries. By fostering an environment of cooperation and knowledge exchange, this partnership seeks to accelerate the pace of microbiological research and propel India to the forefront of global innovation.

According to Dr. Rajeev Singh Raghuvanshi, secretary-cum-scientific director, IPC, “This significant partnership underscores the mutual recognition of the critical role played by both institutions in the realm of microbiology and public health. By formalizing their commitment to cooperation, IPC and IMTECH pave the way for an unprecedented synergy in research, development, and innovation.”

He further added that the MoU signifies a strategic alliance aimed at leveraging collective

expertise and resources to drive advancements in the field of microbiology. Through collaborative efforts, IPC and IMTECH aim to spearhead the development of future technologies that hold the potential to revolutionize healthcare and pharmaceutical industries.

Central to this partnership is the exchange of technical and scientific knowledge, fostering an environment conducive to innovation and progress. By pooling their respective strengths and resources, IPC and IMTECH seek to address pressing challenges and seize emerging opportunities in microbiological research and development.

Moreover, this collaboration is poised to facilitate the exchange of skills and best practices, nurturing talent and expertise in the field of microbiology. By investing in human capital development, IPC and IMTECH aim to empower future generations of researchers and professionals, driving sustained growth and excellence in the domain.

“As both institutions embark on this collaborative journey, they reaffirm their shared commitment to advancing public health and well-being. Through concerted efforts and collective endeavors, IPC and IMTECH aspire to make meaningful contributions towards addressing healthcare challenges and improving the quality of life for communities across the nation,” said Dr. Sanjeev Khosla, director, CSIR-IMTECH, Chandigarh.

He further added that the signing of this MoU heralds a new era of partnership and innovation in microbiology, setting the stage for transformative advancements and breakthroughs. With a shared vision and a commitment to excellence, IPC and IMTECH are poised to redefine the boundaries of microbiological research and shape the future of healthcare in India and beyond.

Botanical breakthrough: Lucknow NBRI grows 1,000-petal lotus!

CSIR-NBRI

03rd May , 2024

The CSIR-National Botanical Research Institute (NBRI) which made headlines for cultivating a 108-petal lotus called 'Namoh-108,' has now successfully grown a lotus with around 1,000 petals at its Lucknow campus. According to the research institute, this is the first time a lotus with so many petals has been grown, not only at NBRI but also in the entire state of Uttar Pradesh.



“There are about 1,000 petals in this lotus, which makes it unique,” said Ajit Kumar Shasany, Director of CSIR-NBRI. “Sometimes the number of petals can vary, ranging from 800 to 1,100,” he added. This lotus is known as “Sahasrara Padma,” the lotus of a thousand petals, which is a symbol of supreme consciousness and spiritual enlightenment.

This lotus variety is a new addition to the over 50 types of lotus grown at the botanical garden campus. The flower’s blooming is the result of four to five years of hard work by senior scientist KJ Singh. “We have been trying for the past four to five years but were unsuccessful due to various climatic conditions, with the flowers often dying within four to five days. However, over time, we refined our methods,” said Singh.

“This time, it took us 15 to 20 days to achieve full bloom. The process was manual, with petals carefully opened by hand,” he explained adding that the petals of this lotus are usually smaller, allowing up to 1,000 petals to fit in a single flower.

According to scientists, unlike other flowers, extreme heat and intense sunlight create ideal

conditions for the Sahasrara Padma to bloom. “The more sunlight, the better it blooms,” Singh noted.

Origin

The history of lotus also known as ‘ZhinZun Qianban,’ dates back to ancient times. It was rediscovered in 2009 by Chinese horticulturist Diake Tian, a professor at the Shanghai Institute of Botanical Science. The lotus has a pink color and emits a fragrance. The first 1,000-petal lotus was brought to India by Ganesh Anand Krishna, a lotus hybridizer from Kochi, Kerala. He received it from a friend in China.

Teachers inspired by the innovative training to teach Science

CSIR-IIIM

03rd May , 2024

A two days training workshop for the capacity building of Science teachers concluded today at Army Goodwill School, Wyne Kupwara. CSIR – Indian Institute of Integrated Medicine organized this training workshop in collaboration with the Royal Society of Chemistry (RSC), UK with the support of Army Goodwill School (AGS) on 2nd and 3rd May, 2024. Total 49 Science teachers from various government schools of Kupwara / Tangdhar participated along with the teachers from AGS, Kupwara. The program was organized under the patronage of Dr. Zabeer Ahmed, Director IIIM and guidance of Er. Abdul Rahim, Head IIIM (Br.) Srinagar under the flagship of IIIM Jigyasa program.

Mr Hemant Lagvankar, a key resource person of this training programme said, “The aim of this teacher development programme was to give teachers the new techniques for delivering and engaging concepts in Science effectively. Teachers were introduced to proven active learning techniques that can be applied easily in a science context, helping students to develop their conceptual understanding. Teachers got the opportunity to learn some practical science experiments that could be adapted to be used in any setting, including those with no traditional laboratory facilities”.

Participating teachers thoroughly enjoyed the proceedings when they actively learned the techniques like Dart, Tarsia, Dominoes, etc. Deputy Chief Education Officer of Kupwara – Mr Manzoor Ahmed was present on this occasion. Mr Ahmed urged teachers to take these innovative techniques into the classroom and make Science teaching effective and joyful for the students.

Senior Principal Scientist Dr Khursheed Ahmad Bhat from IIIM briefed the teachers about the objectives and various educational activities which are being conducted by IIIM through Jigyasa programme. The Jigyasa programme is a regular activity of CSIR for student-

scientist interaction. Under this programme, scientists visit schools for outreach, students visit CSIR labs for hands-on training, live demonstrations of various scientific experiments / facilities, and student residential programme, etc. Dr Asha Chaubey, Senior Principal Scientist, IIIM and Lt. Col. Rajiv from AGS, Kupwara played a key role in coordinating this two days workshop.

CSIR-CLRI's Strategic Meeting & Workshop Paves the Way for Innovation & Sustainability in Zimbabwe Leather Industry

CSIR-CLRI

03rd May , 2024

In a bid to foster enduring collaborations aimed at a sustainable future, a strategic meeting took place at Lupane State University, Zimbabwe, on April 30, 2024. The meeting brought together esteemed representatives from the Council of Scientific and Industrial Research – Central Leather Research Institute (CSIR-CLRI), Dr. B. Madhan, Chief Scientist, and Dr. S. Sundarapandiyan, Senior Scientist, alongside the Vice Chancellor and faculty members of Lupane State University.



The gathering served as a platform to deliberate on the impactful interventions of CSIR-CLRI across various African countries, with a particular emphasis on charting a course for mutual success in the leather sector. Dr. Fortune Jomane, from Lupane State University, played a pivotal role in orchestrating the visit, which included engagements with key institutions such as the Leather Institute of Zimbabwe and a tannery in Bulawayo.

Central to the discussions was the exploration of strategic collaborations aimed at fostering the growth of the leather manufacturing industry in Zimbabwe. The CSIR-CLRI team emphasized the importance of leveraging expertise and resources to drive innovation and sustainability within the sector, thereby contributing to economic development and job creation.

As part of their engagement, Dr. B. Madhan and Dr. S. Sundarapandiyan delivered presentations on cleaner and sustainable technological options in leather manufacture. The

presentations took place during a workshop organized by Lupane State University and the Zimbabwe Leather Development Council on April 29, 2024, in Bulawayo. The workshop served as a platform for knowledge exchange and capacity-building, further cementing the commitment to collaborative progress.

In conclusion, the strategic meeting at Lupane State University marks a significant step towards fostering partnerships that hold the promise of a vibrant and sustainable future for the leather sector in Zimbabwe. Through shared expertise, innovation, and collaboration, stakeholders are set to unlock new opportunities and overcome challenges, paving the way for inclusive growth and prosperity.

The Council of Scientific & Industrial Research (CSIR) - Advanced Materials and Processes Research Institute (AMPRI), in collaboration with Knowledge & Awareness Mapping Platform (KAMP) conducts Scientific Excursion for over 250 Students

CSIR-NIScPR, AMPRI

02nd May , 2024

The Council of Scientific and Industrial Research (CSIR) - Advanced Materials and Processes Research Institute (AMPRI), in collaboration with the Knowledge and Awareness Mapping Platform (KAMP), conducts Scientific Excursion on April 29th, 2024 at Bhopal, Madhya Pradesh. The Scientific Excursion was conducted by KAMP under the CSIR Jigyasa and Viksit Bharat



Program with 250 students accompanied by their teachers from DPS Kolar Road Bhopal, IES public school Sehore, and IES public school, Ratibad, Bhopal. The programme was inaugurated by Dr. D.P Mondal, Chief Scientist. Head, Alloys, Composites and Cellular Materials Division, CSIR-AMPRI, Bhopal and Dr. Satanand Mishra Principal Scientist & Jigyasa Coordinator, CSIR-AMPRI, Bhopal.

This excursion provided the students with a unique opportunity to delve into the world of science, technology, and innovation. It aimed to instill a passion for scientific exploration and discovery within the students. Dr. Mishra and his Jigyasa team inspired the students in their scientific pursuits through interactive discussion and lab visits. Within the labs, the students learnt several new things in a practical manner with respect to 3D printing Lab, Raman Spectrometer lab, Hybrid Composite, Centre for Advanced Radiation Shielding and Geopolymeric Materials (CARS&GM).

Advanced Materials and Processes Research Institute (AMPRI), Bhopal was instituted in May 1981 as “Regional Research Laboratory” (RRL).

The Knowledge and Awareness Mapping Platform (KAMP), an initiative and knowledge alliance between the Council of Scientific & Industrial Research (CSIR) - National Institute of Science Communication and Policy Research (NIScPR) and industrial partner M/S Nysa Communications Pvt. Ltd. (NCPL) provides a platform for students to explore and engage with scientific concepts, develop a holistic understanding, and ignite their scientific curiosity.

A lecture titled "Health and Sanitation: Both are linked together" held at the National Institute of Science Communication and Policy Research (NIScPR) of the Council for Scientific and Industrial Research (CSIR)

CSIR-NIScPR

02nd May , 2024

Prof. Shridhar Dwivedi, Senior Consultant Cardiologist & Head of Academics at National Heart Institute delivered a lecture titled "Health and Sanitation: Both are linked together" at the National Institute of Science Communication and Policy Research (NIScPR) of the Council for Scientific and Industrial Research (CSIR), New Delhi today during the Swachhata Pakhwada.



The lecture was held on the second day of the 15 days programme of Swachhata Pakhwada organized by CSIR-NIScPR at the institute's Vivekananda Hall and drew attention to the intrinsic connection between cleanliness and overall well-being.

In his address, Prof. Shridhar Dwivedi emphasized the importance of not only physical health but also mental and spiritual well-being. He pointed out that all religions encourage cleanliness and urged the audience to continue the healthy habits adopted during the COVID-19 pandemic. Prof. Dwivedi's message resonated with the attendees, highlighting the need for a holistic approach to health that includes proper sanitation practices and a balanced lifestyle.

The Director of CSIR-NIScPR, Prof. Ranjana Aggarwal reiterated the institute's commitment to making cleanliness a mission, aiming to rectify and enhance India's image as a clean nation. The Swachhata Pakhwada initiative is a testament to this commitment, fostering awareness and action towards a healthier and cleaner India.

The CSIR-National Institute of Science Communication and Policy Research (NIScPR) is a

constituent laboratory under the Council of Scientific & Industrial Research, Ministry of Science and Technology, Government of India. It is dedicated to science communication, evidence-based science technology and innovation policy research, and the promotion of scientific awareness among the public.

CSIR-NIIST opens innovation centre for start-ups

CSIR-NIIST

02nd May , 2024

The CSIR-National Institute for Interdisciplinary Science Technology (CSIR-NIIST) has set up a dedicated innovation centre on its campus here to incubate technology-driven start-ups and help them develop innovative and marketable products.

Krishna Ella, chairman and managing director, Bharat Biotech International Ltd. and chairman of Research Council of CSIR-NIIST, inaugurated the facility recently, in the presence of CSIR-NIIST director C. Anandharamakrishnan.

After executing the agreements with the selected incubatees, the keys for the co-working spaces for them were handed over by Dr. Anandharamakrishnan on May 1, marking the commencement of their collaboration with the institute.

The facility envisages an inclusive ecosystem to develop and translate scientific and technical knowledge into innovations and convert them into commercial and technopreneurial ventures. It is expected to serve as a leading innovation hub in the country for translational research and incubation, knowledge-based entrepreneurship, and value creation in market-oriented business strategies.

A pressnote issued by NIIST said the facility would cater to the demand for strategic evaluation, protection, licensing, and transfer of technologies in an attempt to nurture start-ups and early-stage companies.

“The centre seeks to provide handholding, mentor start-up companies, and nurture them to develop innovative products and find markets,” Dr. Anandharamakishnan said. “It will be a one-stop place for technology-driven innovations by facilitating collaborative co-working space for young entrepreneurs to incubate their ideas and get access to thought-provoking

scientific inventions, thinking labs, and funding opportunities,” he added. The facility will encourage ideation, support transition from concept to market-ready solutions, and contribute to the growth of entrepreneurial endeavours at CSIR-NIIST. It will provide a platform for interaction between entrepreneurs, founders, scientists, technologists, and technocrats. It will also provide value-added services, including those relating to intellectual property rights (IPR), legal, financial and technical advisory, tailored to the needs of the incubatees.

The innovation centre will enable start-ups to develop into sustainable business models by leveraging the shared use of CSIR-NIIST facilities to generate resident incubatees and associate incubatees.

Director CSIR-IIIM launches Swachhata Pakhwada

CSIR-IIIM

01st May , 2024

In its staunch to enthusiastically work for Swachh Bharat Abhiyan, the CSIR-Indian Institute of Integrative Medicine has launched a fortnightly cleanliness drive here today at its main campus at Jammu. An official spokesperson of the institution said the Swachhata Pakhwada activities were inaugurated by Dr. Zabeer Ahmed, Director, CSIR-IIIM, with the plantation of saplings, followed by administering the Swachhata Pledge to scientists, technical, administrative staff, research scholars and other workers.



It is pertinent to mention that Swachhata Pakhwada is an initiative of the Prime Minister started in 2014 with the objective of bringing a fortnight of intense focus on the issues and practices of Swachhata by engaging GOI Ministries/Departments in their jurisdictions.

Dr. Zabeer Ahmed while launching the Swachhata Pakhwada activities schedule for next two weeks in the institute said that Swachhata Pakhwada is a significant initiative under the Swachh Bharat Abhiyan Mission and it is imperative for government offices to provide a clean and healthy working environment for its employees/visitors.

He also emphasised the need to educate people about the virtues of good sanitation practices and urged everyone to undertake special drives to clean their workplaces. CSIR-IIIM, Jammu under the Council of Scientific and Industrial Research has been observing this program every year, he added and mentioned that planting of more trees, cleaning of all labs, disposal of wastes, cleaning whole premises of institute and its beautification have been scheduled

during the Pakhwada. For undertaking the various activities during this Swachhta Pakhwada, scientists, students, supporting staff and Safai Karamcharies will take active part, he said.

It was also mentioned that IIIM has a standing "Swachh Bharat Mission Committee" comprising of Dr. P N Gupta, Senior Principal Scientist, Vikram Singh, Sr. Controller of Administration, Rajesh Gupta, Administrative Officer, Dr. Ajay Kumar, Principal Scientist, Dr. Ravi Shanker, Principal Scientist, Dr. Rajendra Bhanwaria, Senior Scientist, Dr. Love Sharma, Scientist, Arvind Kumar Yadav, Senior Technical Officer, Chandra Pal Singh, Technical Officer, Er. Jai Sharma, AEE Civil & Bal Krishan, Security Officer, who would monitor and oversee the activities which are going to be happened during the Pakhwada.

Prominent among other present were Er. Abdul Rahim, Chief Scientist, All HoDs, Ajay Kumar, Controller of Finance & Accounts, Dilip Gehlot, Store and Purchase Officer.

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