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CSIR-IHBT scientists with farmers at the Ferula asafoetida sapling plantation drive in Kwaring village of Lahaul valley in Himachal Pradesh, on October 15, 2020. Photo: Special Arrangement/THE HINDU

Hing with a homegrown zing. Here is India's first batch of locally grown asafoetida

CSIR–IHBT

31st October, 2020

CSIR-IHBT scientists with farmers at the Ferula asafoetida sapling plantation drive in Kwaring village of Lahaul valley in Himachal Pradesh, on October 15, 2020. Photo: Special Arrangement/THE HINDU

A pilot project to grow Ferula asafoetida in India may help the country's foodies taste the spice finally cultivated in its spiritual home

There was a frisson of excitement amongst food trend watchers recently when scientists from the Council of Scientific and Industrial Research (CSIR) — Institute of Himalayan Bioresource Technology (IHBT) based in Palampur, Himachal Pradesh, announced that they had planted 800 saplings of *Ferula asafoetida* in the cold desert region of Lahaul and Spiti. An integral part of Indian cuisine and natural medicine, asafoetida is extracted from the fleshy roots of the perennial ferula (part of the celery family) as an oleo-gum resin. Not many people know that the plant behind the spice, which gives a zing to Indian vegetarian dishes, besides being a go-to home remedy for digestion problems, had never been grown in India, until the October 15 effort announced by CSIR-IHBT. Despite its popularity, its pungent smell has earned asafoetida less than flattering monikers such as 'devil's dung' or 'food of the devils' in the West. India, though, has more prosaic names, such as *hing* in Hindi and *perungayam* in Tamil. And given its ubiquity as a standalone element or a component of spice mixtures, it is among the most valuable commodities being traded in the country today. Even though it is used extensively in vegetarian cooking (especially by communities that do not consume onion and garlic due to religious reasons), asafoetida turns up in surprising places, such as Worcestershire sauce and even some fine perfumes.

Indigenous growth

The IHBT plantation drive, held under the aegis of the State Department of Agriculture, Himachal Pradesh, hopes to make India reduce its reliance on imported raw stock.

Cold desert areas of India such as Lahaul and Spiti, Ladakh, parts of Uttarakhand and Arunachal Pradesh are suitable for cultivation of ferula. In inclement weather conditions, it is known to go dormant. "The country imports about 1,540 tonnes of raw asafoetida annually from Afghanistan, Iran and Uzbekistan and spends approximately ₹942 crore per year on it. It is important for India to become self-sufficient in *hing* production," says Sanjay Kumar, Director, CSIR-IHBT, Palampur, in an email interview. Dr Kumar, who planted the first ferula seedling on October 15 in a field in Kwaring village of Lahaul valley, led a team comprising fellow scientists Ashok Kumar, Ramesh and Sanatsujat Singh in the trial project. The Institute raised the plants at the Centre for High Altitude Biology (CeHAB — a research centre of CSIR-IHBT) in Ribling, Lahaul and Spiti. Seeds officially imported from Iran in 2018 were used for the project, under the supervision of National Bureau of Plant Genetic Resources (NBPGR). It will take approximately five years for the project to bear fruit (or rather, resin).

Food and wellness

For the majority of us though, the spice remains an essential part of the kitchen cabinet, irrespective of its country of origin. Asafoetida is bitter in taste and hot in effect, and can also be used to enhance flavours in roasted meat dishes. For Ajit Bangera, senior executive chef, ITC Grand Chola, Chennai, the South Indian *sambar* is a favourite dish that makes best use of *hing*. "Asafoetida gives a comforting onion-garlic flavour in curries. It has a lingering taste that adds a special *umami* flavour to your dish," he says. Chef and food writer Mallika Badrinath feels that the spice's medicinal qualities have only enhanced its place in India's culinary heritage. "Asafoetida is often used as an instant remedy for heartburn, indigestion, constipation and reflux. According to Ayurveda, it has the ability to balance all the three *doshas*," she says.

Spice profile

Commercially sold asafoetida is mixed with wheat flour and gum Arabic to temper the acrid taste of the resin. "The additives help to adjust the concentration of the asafoetida according to its usage. Asafoetida for *appalams*, for instance, will be different from that used for pickles or

medicines," says CJ Shankar, of the Madurai-based manufacturer PC Perungayam. *Hing kabuli sufaid* (milky white asafoetida) and *hing lal* (red asafoetida) are the two types of resin available in the market. The white or pale variety is water soluble, whereas the dark or black variety is oil soluble. PC Perungayam, which started in 1956 and has branches in Kerala and Karnataka, is one of many Indian family-run businesses that have specialised in processing this spice. "The price of asafoetida fluctuates during the ban on resin collection every two years in the countries of origin," says Shankar. "Processing units have to adjust to the market vagaries. While a kilo of asafoetida used to cost around ₹200 during my grandfather's time, it has now gone up to ₹10,000-15,000 today," he says.

The company imports its stock from Afghanistan and Uzbekistan, through procuring agents in Mumbai, and transports it to Madurai by road. "We receive asafoetida resin as pellets in 20 kg tins, which we dilute with pure drinking water and filter down to a powdery concentrate with the help of cloth and steel mesh sieves. Twenty kilos of high quality resin paste can yield up to 500 kg of asafoetida powder," says Shankar.

His business has been steady even duringlockdown because of the consistent demand for asafoetida in India. "Our ancestors knew the medicinal value of this spice, and it has somehow become a very important part of our diet over generations. The taste that it adds to any food preparation is simply amazing," he says.

Published in:
The Hindu

CSIR-NEIST expands floriculture mission in Arunachal Pradesh

CSIR–NEIST

30th October, 2020

Jorhat-based CSIR-NEIST has inked a Memorandum of Understanding (MoU) with a farmers' cooperative society of East Siang district in Arunachal Pradesh, to promote cooperation in scientific research and dissemination of technology related to aromatic, medicinal, floriculture and other important plants. The MoU was signed between CSIR-NEIST and BosingBangoFarmers Cooperative Society Ltd of Pasighat on Wednesday, wherein NEIST Director Dr G NarahariSastry inaugurated the second multi-locational experimental research field at Runne, an official communiqué informed here on Thursday. Principal investigator of CSIR Aroma Mission Dr S P Saikia and co-investigator Dr Mohan Lal and a team of scientists from CSIR-NEIST were present on the occasion. The institute has undertaken the plan of setting up about 15 multi-locational experimental research fields in the North East The main aim is to achieve identification, domestication, and cultivation of rare, threatened and endangered species of medicinal plants to sustain the modern pharmaceutical industries and also for sustenance of India's strong traditional system of medicines for which the crucial factors such as breeding of new plant varieties, identification of stable performance through multi-locational trials, integration of modern science along with market and industrial application potential are the key High scale production of these medicinal plants would be helpful to meet the industrial demands as well boosting the country's economy. The first field was inaugurated at Rajapara, in Assam's Kamrup district in collaboration with Aroma India Pvt. Ltd on September 15 last. Sustaining the current activities of the aromatic, horticultural, floricultural, fruits, vegetables, rotational crops, new hybrids varieties and

creating new space for medicinal plants and herbal gardens in bringing the health benefits to society and also derive benefits from our immensely rich heritage, culture and traditional knowledge in health care and pass it to the farmers of NE India. Further the post harvest processing, value chain and strong networking with the industries are the key points in which CSIR-NEIST would be helping the farmers to gain maximum profit possible and also by providing an ambience to conduct highest level of fundamental science and translational research, the communiqué added.

Published in:
The Sentinel Assam

Raymold Luminaries, CSIR-CSIO tie up to develop UVGI products

CSIR –CSIO

30th October, 2020

Raymold Luminaires, a Chennai-based end-to-end intelligent lighting solution provider, today announced its partnership with CSIR-CSIO to jointly develop ultraviolet germicidal irradiation (UVGI) products and systems.

The products, using short-wave ultraviolet UV-C technology can effectively deactivate >99.9 per cent of infecting viruses, including the coronavirus, the company said in a press release. Shekhar C Mande, Secretary, DSIR and Director General, CSIR, launched the products today over virtual conference.

Mohan Narasimhan, Director and COO of Raymold, said that the company would soon launch a range of fully autonomous, robotic UV-C trolleys.

Published in:
Business Line

CSIR's IndiGen project helps scientists analyse genomes of 1,029 Indians

CSIR–IGIB, CCMB

27th October, 2020

IndiGen, the Council of Scientific and Industrial Research's (CSIR) resource, was completed in six months, and the results were recently published in the scientific journal Nucleic Acid Research. Scientists have now analysed genomes (complete DNA set) of 1,029 healthy Indians. The analysis was carried out by CSIR constituent labs – CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi, and CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

"Our analysis led to the identification of over 55 million single nucleotide variants in the Indian genome dataset," Dr Sridhar Sivasubu, senior principal scientist, CSIR-IGIB, told The Indian Express.

"Comparisons with the global genome datasets revealed that 32.23 per cent variants were unique and found only in samples sequenced from India. This emphasises the need for an India-centric population genomic initiative." India is the second largest country in terms of population density, with more than 1.3 billion people, encompassing 17 per cent of the world's population. Despite having such rich genetic diversity, the country has been under-represented in global genome studies, and population-specific variants are not adequately captured and catalogued in global medical literature. In order to fill the gap of whole genome sequences from different populations in India, CSIR initiated the IndiGen programme in April 2019. The programme completed the entire genome sequencing of the 1,029 self-declared health Indians. This has enabled benchmarking the scalability of genome sequencing at population scale in a defined timeline. The current IndiGenomes data resource provides a compendium of genetic variants, representing the contemporary Indian population with an objective of classifying variants involved in mendelian disorders,

and improving precision medicine outcomes. The resource can also enable identification of markers for carrier screening, variations causing genetic diseases, prevention of adverse events, and provide better diagnosis and optimal therapy through mining data of clinically actionable pharmacogenetic variants. The phased data will allow researchers to build an India-specific reference genome dataset, and efficiently impute haplotype information. According to Dr Vinod Scaria, senior scientist, CSIR- Institute of Genomics and Integrative Biology, this resource can provide useful insights for clinicians and researchers in comprehending genetics, not only at the population level, but also at individual levels.

The resource is widely accessible to researchers and clinicians in the country, as well as abroad. There have been over 2,00,000 page views on the IndiGenomes web page, by users across 27 countries, demonstrating the uniqueness of the resource, Dr Sivasubu said.

Published in:
The Indian Express

New waste processing model from CSIR-CMERI may lead India to ‘zero landfill’ and ‘zero waste city’ future

CSIR–CMERI

26th October, 2020

In what could be an innovative model to cut down needs of having multiple landfill sites in cities, a Durgapur-based CSIR’s institute has developed a decentralised solid waste processing facility, using new technology, which can be set up at residential colonies and shopping complexes to convert all types of wastes, including plastic, into one or the other useful end products. This facility won’t require segregation of wastes at the household level. Besides converting solid wastes into plasma state for proper disposal, the generated residues, having good carbon content, from this facility can be used in agriculture as a fertilizer and other non-usable can be utilized to make bricks for construction purposes.

The latest technology being used by the Institute for this model can also convert plastics into gas and fuel. “One unit, having the capacity to process one tonne of waste, can easily be upgraded to process up to 10 tonnes of wastes. The model can be economically viable for any residential complex or colony having up to 1,000 families,” said Harish Hirani, director of the Central Mechanical Engineering Research Institute (CMERI) which developed the technology. He told TOI that it can easily be customised as a colony model or market model, reducing expenditure related to transportation logistics and fossil fuel usage. “The primary focus of the CSIR-CMERI facility is to unburden the common households from the segregation responsibilities through ‘advanced segregation technique’. Besides, it envisions a ‘zero-landfill’ and a ‘zero waste city’ future for the country,” said Hirani. He also noted that the scientifically decentralised waste processing hubs will boost the manufacturing potential of residents by converting waste into wealth and unburden land-scarce cities from the requirement of having multiple landfills.

The CMERI's facility has been equipped with special capabilities to deal with a diverse range of waste including masks, sanitary napkins, diapers etc.

It has special disinfection capabilities to help break the COVID chain through UV-C lights and hot-air convection methods.

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The Times of India

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