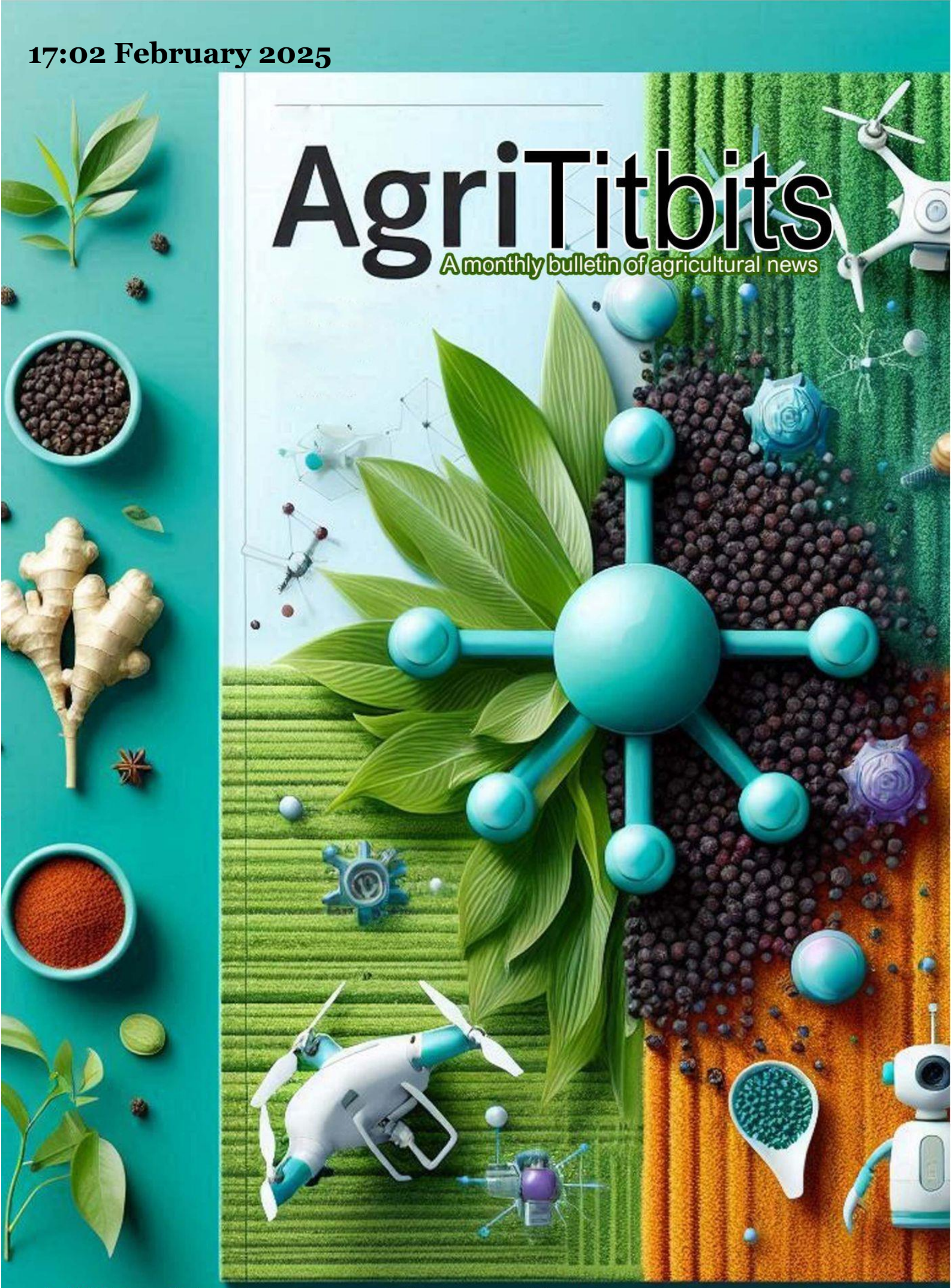
17:02 February 2025



Agri Titbits is an effort to collect and preserve agricultural news, especially spices, appearing in newspapers and online media.
Published by Director, ICAR-IISR, Kozhikode ; Compiled & prepared by Jayarajan K
ICAR - Indian Institute of Spices Research

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GREEN CARDAMOM'S NEW RELATIVES INCLUDE TWO SPECIES FROM KERALA

February 02, 2025 https://www.thehindu.com

Mention spices and invariably the first thing that springs to mind is the supremely aromatic, flavour-rich cardamom. But it now appears that the 'Queen of Spices' has several close, wild relatives and it is not the lone species of the genus Elettaria as previously thought.

An international team of researchers have identified six species that are close cousins to Elettaria cardamomum, better known as green cardamom. Of the six, four were previously placed in a separate genus, Alpinia, while the remaining two have been newly identified and described from Kerala's Western Ghats regions.

The findings have been published in a paper 'The cardamom conundrum resolved: Recircumscription and placement of Elettaria in the only pantropically distributed ginger lineage,' published in the journal Taxon. The international seven-member team from Denmark, India, Colombia, Czech Republic, Singapore, Sri Lanka, and the U.K. included Mamiyil Sabu of the KSCSTE-Malabar Botanical Garden and Institute for Plant Sciences, Kozhikode.

Following the reclassification, the genus Elettaria now has seven species, including Elettaria cardamomum. E. ensal, E. floribunda, E. involucrata and E. rufescens were earlier placed in the genus Alpinia. The remaining two are new species, Elettaria facifera and Elettaria tulipifera, the former described from Kerala's Periyar Tiger Reserve in Idukki district and the latter from the Agasthyamalai hills in Thiruvananthapuram district and Munnar in Idukki by

Dr. Sabu and Jana Leong-Skornickova of the Herbarium, Singapore Botanic Gardens.

These recent developments which highlight potentially overlooked genetic resources could play an important role in spice production in the future, Dr. Sabu said. The paper notes that after saffron and vanilla, green cardamom is the most valuable spice plant in the world and of huge economic importance. Seed capsules of Elettaria cardamomum provide the commercial green cardamom.

The genus name is based on this spice's old Malayalam name, 'elletari,' as used by Hendrik van Rheede in his 17th century botanical treatise Hortus Malabaricus. "As Elettaria cardamomum is one of the three most economically important useful species in the (ginger) family, the realisation that the genus now harbours more species may spur future studies into a more detailed understanding of their potential uses and morphological variation than we can provide in the present study," the research paper notes.

Of the two new species from Kerala, Elettaria facifera is distinguished by sessile leaves, erect flowering shoots that are separate from the leafy shoots, and pure white labellum with purple-red markings. Dr. Sabu notes that the Mannan tribe refer to it as the 'Vai noki elam,' (loosely, Open-mouth cardamom) due to the fruit's resemblance to an open mouth. Elettaria tulipifera has strikingly beautiful tulip-shaped inflorescence and large, bright to dark red, whorled bracts.

Need for conservation

The researchers have underlined the need for conservation efforts as both species face threats arising from natural sources and human activity.

The other five authors of the Taxon paper are Axel Dalberg Poulsen and Mark Hughes of the Royal Botanic Garden Edinburgh; Tomas Fer of Charles

University, Czech Republic; Lakmini Darshika Kumarage Marasinghe of The Open University of Sri Lanka; and Eugenio Valderrama of Fundación Humedales, Bogota, Colombia.

FSSAI TO RELEASE NORMS FOR PESTICIDE RESIDUE LEVELS IN SPICES, OTHER FOOD

Feb 26, 2025 https://timesofindia.indiatimes.com/

Bengaluru: The Food Safety and Standards Authority of India (FSSAI) is set to release 98 maximum residue level (MRL) values for spices soon, which specify the permissible amount of pesticide that can be present in food commodities.

Currently, only 18 such values are specified, and they are very stringent, making it almost impossible for farmers to comply. The final version of the guidance document of the standard operating procedures to fix maximum residue levels for pesticides is currently with the Prime Minister's Office for final approval and will be released soon, said FSSAI officials.

At the international spices conference held at Leela Bharatiya on Wednesday, the use of pesticides was considered one of the biggest challenges faced by the industry. According to experts, chillies and cumin are the two spices where maximum pesticides are used.

"The biggest challenge of the spice industry is that most of it consists of small or marginal farmers. Thus, it becomes very difficult to create awareness about new technologies, quality reports, newer and safer methods of production, etc," said Ramkumar Menon, chairman, World Spice Organisation.

"Earlier, we had very stringent MRLs. Some MRLs were not achievable. Now, a panel of residual chemists, toxicologists, and agriculturalists drew up a new

draft of MRL based on the scientific database, limit of quantitation, and risk assessment based on health-based values," said Paresh G Shah, chairman, sub-committee, Scientific Panel on Pesticide Residues, FSSAI.

"Now, the risk assessment is not done only for the average Indian but for all population classes like children, women of childbearing age, other women, general population, etc., and is aligned with Codex, an international agency," he said. About 240 MRLs for all commodities are expected to be in the draft.

"There are a lot of retailers who try to sell various pesticides to farmers who use them without the know-how. For instance, there is a pre-harvest interval that farmers are advised to follow, during which they should not use pesticides before harvest. However, taking advice from retailers, they use it during this period, which leaves high values of residue on the food commodities," said an expert.

Despite various challenges, the Indian spice market continues to grow. India remains the biggest producer, consumer, and exporter of spices in the world.

"The focus is now on making India not just the largest producer but also the biggest in manufacturing of value-added spices like oil and extracts, retail products, curry powders, etc.," said Ramkumar.

USE OF PESTICIDE TOP IN PADDY; BANANA AND SPICES COME NEXT

Feb 21, 2025 https://timesofindia.indiatimes.com/

Kochi: Most Keralites have a pesticide phobia, but that has not stopped farmers and cultivators in the state from using them. The highest pesticide use in the state in 2023-24 was for the paddy crop, followed by banana and spices, said a report in the Economic Review 2024.

According to the report, the total use of pesticides reported in 2023-24 was the highest in the last three years at 511.4 metric tonnes (MT). This included 236.2 MT of chemical pesticides and 275.2 MT of bio-pesticides. Compared to the previous year, the total consumption of nitrogen, phosphorus and potassium (NPK) fertilisers decreased in 2023-24, to 69,794 MT, 32,740 MT and 57,263 MT respectively. The per hectare (ha) consumption of NPK fertilisers decreased in 2023-24 compared to the previous year, with 26kg per ha, 12kg per ha and 20kg per ha respectively. The ratio of consumption of nitrogenous fertilisers to phosphorus and potassium fertilisers together was 81%, which is less than the previous year. While farmers claim that they use it to eradicate diseases and pest menace, officials admit that the use of fertilisers is callous and without caution.

According to the data, the use of chemical pesticides in the paddy crop increased from 59.2 MT to 68.5 MT from 2021-22 to 2023-24. Except for vegetables and coconut, all other crops like spices and arecanut are high, while there is a slight decrease in the usage in banana from 49.2 MT to 46 MT from 2021-22 to 2023-24. For the banana crop, it was as high as 57 MT in 2022-23.

"Even though it is put in the larger category of spices, the major usage is in cardamom. I believe that there is underreporting on the usage of pesticides and there is no clear idea on how they are getting this data because often farmers will not disclose the usage. So, I don't believe that it has come down, though it shows that there is a drop in the previous year," said AD Dileep Kumar of Pesticide Action Network (PAN) India.

Normally herbicides and weedicides are used as plant-killers and are used to destroy unwanted plants in an area. These are harmful chemicals, which not only kill unwanted plants but also stay in the environment, harming life in general. The report said as part of quality control enforcement of fertilisers, pesticides, biofertilisers and organic manures distributed in the state, samples were collected from outlets and analysed in departmental laboratories.

Accordingly, 2,212 pesticide samples, 4,276 fertiliser samples and 53 biofertiliser and organic manure samples were analysed.

SAFFRON APPEARS TO BE SAFE, EFFECTIVE ADJUNCT TREATMENT FOR AMD

February 11, 2025 https://www.healio.com/

Crocus sativus , or saffron, appeared to be a safe and tolerable adjunct treatment for age-related macular degeneration, helping to improve visual function and delay disease progression, according to a review article.

"The effects were independent of genetic risk factors and were maintained throughout the follow-up periods, suggesting the potential role of saffron as a long-term treatment option," Ahmad Shamabadi, MD, a researcher at the Psychiatric Research Center of Roozbeh Psychiatric Hospital at Tehran University of Medical Sciences in Iran, and colleagues wrote in a review, published in Medical hypothesis discovery and innovation in ophthalmology.

Although AMD is the leading cause of irreversible blindness in developed countries, current treatments are limited by high costs, variable effectiveness and potential side effects, the researchers wrote, with management of dry AMD presenting additional challenges. Previous research suggests that saffron's antiangiogenic, neuroprotective and antioxidant mechanisms may make it a viable therapy for AMD.

This inspired the researchers to conduct a literature review to investigate the efficacy, safety and tolerability of saffron as a potential AMD treatment. They searched PubMed and MEDLINE to identify nine relevant clinical and preclinical studies.

Mechanisms of action

Researchers reported that the primary active compound in saffron, crocetin, reduces the progression of AMD through two pathways: antiangiogenesis and neuroprotection. By limiting the formation of abnormal blood cells and preserving retinal cells by combating oxidative stress and reducing inflammation, crocetin has potential to manage AMD.

Further, crocetin's antioxidant properties allow it to neutralize reactive oxygen species, helping to limit oxidative damage of retinal tissues.

Notably, saffron's antiangiogenic effect may help treat neovascular AMD by disrupting VEGF and VEGFR2 binding and counteracting the VEGF cascade, which is a key factor in AMD pathogenesis. Also, both crocin, another active compound in saffron, and crocetin reduced the gene expression of MMP-2 and MMP-9, which are involved in inflammation and angiogenesis, potentially protecting against AMD.

Clinical efficacy

Multiple clinical studies reported that participants who received daily supplement of 20 mg to 50 mg of saffron or 5 mg to 15 mg of crocin for 3 to 12 months experienced improved best corrected visual acuity, contrast sensitivity and retinal function, according to ERG and microperimetry measurements. These benefits were recorded among participants with forms of wet and dry AMD and were not altered by genetic risk factors.

Some of the studies reported that saffron supplementation conveyed additional benefits when combined with other adjunct therapies, such as AREDS supplements. Researchers also found that saffron may help treat other macular diseases, including Stargardt disease and refractory diabetic macular edema. Many of the studies emphasized the need for additional research to confirm their findings.

Although multiple adverse events have been linked to saffron consumption, researchers found that these events were not serious and were similar in

frequency to placebo and other medications. None of the studies reported significant increases in adverse events after saffron consumption.

Limitations, next steps

Shamabadi and colleagues noted several limitations to the studies they reviewed, including relatively small sample sizes, short durations and lack of long-term safety data. Concerning this review, the researchers wrote that limited studies on the use of saffron for AMD treatment as well as their usage of only one database may have affected their results.

"While further research is needed to confirm long-term safety and efficacy, current evidence supports the use of saffron or crocin supplements as a safe and tolerable adjunct therapy for [AMD]," Shamabadi and colleagues wrote.

"Long-term studies may provide deeper knowledge of the possible advantages and uses of saffron in [AMD] treatment, improving the dependability, reliability and clarity of findings," they added.

RESEARCH NEWS

SCIENTISTS DISCOVER COMPOUND IN GINGER THAT FIGHTS IBD NATURALLY

February 24, 2025 https://scitechdaily.com/

A ginger compound, furanodienone (FDN), has been found to reduce inflammation and repair gut damage in IBD patients by targeting the pregnane X receptor, offering a safer and more effective alternative to current treatments.

A research team led by scientists at the University of Toronto has identified a compound in ginger, furanodienone (FDN), that selectively binds to and regulates a nuclear receptor linked to inflammatory bowel disease (IBD).

By screening ginger's chemical components for interactions with receptors associated with IBD, the researchers discovered that FDN strongly binds to the pregnane X receptor (PXR). This interaction helps reduce colon inflammation by enhancing PXR's ability to suppress the production of pro-inflammatory cytokines. Although FDN has been known for decades, its biological functions and molecular targets had remained unclear until now.

"We found that we could reduce inflammation in the colons of mice through oral injections of FDN," said Jiabao Liu, research associate at U of T's Donnelly Centre for Cellular and Biomolecular Research. "Our discovery of FDN's target nuclear receptor highlights the potential of complementary and integrative medicine for IBD treatment. We believe natural products may be able to regulate nuclear receptors with more precision than synthetic compounds, which could lead to alternative therapeutics that are cost-effective and widely accessible."

IBD's Impact and the Need for New Treatments

IBD patients typically start to experience symptoms early in life; around 25 percent of patients are diagnosed before the age of 20. There is currently no cure for IBD, so patients must adhere to life-long treatments to manage their symptoms, including abdominal pain and diarrhea, enduring significant psychological and economic consequences.

While patients with IBD have found some relief through changes to their diet and herbal supplements, it is not clear which chemical compounds in food and supplements are responsible for alleviating intestinal inflammation. With FDN now identified as a compound with the potential to treat IBD, this specific component of ginger can be extracted to develop more effective therapies.

Additional Benefits of FDN

An additional benefit of FDN is that it can increase the production of tight junction proteins that repair damage to the gut lining caused by inflammation. The effects of FDN were demonstrated in the study to be restricted to the colon, preventing harmful side effects to other areas of the body.

Nuclear receptors serve as sensors within the body for a wide range of molecules, including those involved in metabolism and inflammation. PXR specifically plays a role in the metabolism of foreign substances, like dietary toxins and pharmaceuticals. Binding between FDN and PXR needs to be carefully regulated because over-activating the receptor can lead to an increase in the metabolism and potency of other drugs and signaling metabolites in the body.

FDN is a relatively small molecule that only fills a portion of the PXR binding pocket. The study shows that this allows for an additional compound to bind simultaneously, thereby increasing the overall strength of the bond and its anti-inflammatory effects in a controlled manner.

“The number of people diagnosed with IBD in both developed and developing countries is on the rise due to a shift towards diets that are more processed and are high in fat and sugar,” said Henry Krause, principal investigator on the study and professor of molecular genetics at U of T’s Temerty Faculty of Medicine. “A natural product derived from ginger is a better option for treating IBD than current therapies because it does not suppress the immune system or affect liver function, which can lead to major side effects. FDN can form the basis of a treatment that is more effective while also being safer and cheaper.”

Reference: “An abundant ginger compound furanodienone alleviates gut inflammation via the xenobiotic nuclear receptor PXR in mice” by Xiaojuan Wang, Guohui Zhang, Zhiwei Bian, Vimanda Chow, Marina Grimaldi, Coralie Carivenc, Savannah Sirounian, Hao Li, Lucia Sladekova, Stefano Mott, Yulia Luperi, Yufeng Gong, Cait Costello, Linhao Li, Matthew Jachimowicz, Miao Guo, Shian Hu, Derek Wilson, Patrick Balaguer, William Bourguet, Sridhar Mani, Laura Bonati, Hui Peng, John March, Hongbing Wang, Shengpeng Wang, Henry M. Krause and Jiabao Liu, 3 February 2025, Nature Communications.

TURMERIC SUPPLEMENTS PROVIDE YET ANOTHER HEALTH BENEFIT, ACCORDING TO STUDY

Feb 08, 2025 https://www.earth.com/

Turmeric is a flowering plant that is a member of the ginger family. It is well known for its bright yellow color and has long been associated with various perceived health benefits.

Curcumin is the major active ingredient in turmeric, and is responsible for the yellow color of the spice, which is commonly used in Asian cuisine, such as curries, to give a characteristic aroma and rich flavor to the food.

Apart from its culinary virtues, turmeric has gained popularity for its use in herbal supplements, cosmetics, dyes and food colorants. It is also used worldwide and for its promising wellness attributes.

The power of curcumin

Turmeric owes much of its health-promoting reputation to the presence of the polyphenol known as curcumin.

This bioactive ingredient is responsible for the spice's distinctive golden hue and is at the heart of its renowned healing properties.

For centuries, curcumin has been a cornerstone of Asian traditional medicine, where it has been used to alleviate inflammation, promote digestion, and support overall well-being.

In the modern era, scientists have taken a keen interest in unlocking the full potential of curcumin.

Extensive research has revealed its powerful antioxidant and anti-inflammatory capabilities, which may contribute to a range of health benefits, from supporting immune function to aiding in pain management.

Its possible uses extend to chronic disease prevention, cognitive health, and even athletic performance, making curcumin one of the most studied natural compounds today.

Despite its promise, researchers continue to explore how best to enhance curcumin's bioavailability to maximize its effectiveness in the human body.

Curcumin, turmeric, and muscles

Researchers from the Universitat Oberta de Catalunya (UOC), particularly the Epi4Health group, have made exciting strides in investigating the effects of curcumin.

They suggest that curcumin could play a vital role in aiding muscle recovery and minimizing pain after an intense bout of physical activity.

"Both pre- and post-exercise curcumin consumption are associated with better outcomes in terms of muscle recovery, reduced pain, and improved antioxidant capacity," said Daniel Vasile Popescu-Radu, a scholar at UOC.

It appears that our musculoskeletal system might just have found a new ally in curcumin.

Faster recovery for athletes

The new research from UOC has introduced the idea that curcumin use may even be beneficial for recovering athletes.

From reducing muscle damage to easing pain and enhancing antioxidant capacity, curcumin shows potential as a promising ally for sportsmen and women.

The crucial factor, as emphasized by the UOC research team, is getting the dosage, bioavailability, and consumption timing right.

A daily intake of 1-4 grams of curcumin, particularly after an exercise session, is suggested to aid muscle recovery. However, expert advice is recommended for optimal results.

A one-size-fits-all solution?

While curcumin's potential is undeniably enthralling, the researchers caution against universal application.

Factors such as an individual's unique metabolism, hormonal effects, intake time, and formulation can influence the effectiveness of this polyphenol substance.

Its absorption and bioavailability can be impacted by other substances present in the blood, or by the type of formulation used.

It's also challenging to extrapolate the findings to specific demographics, like female athletes or individuals undergoing perimenopause and menopause.

Unlocking the full potential

The UOC researchers believe more work is required to consolidate their findings, especially through studies with larger sample sizes.

Despite the need for more research, they conclude positively about curcumin's potential role in improving the well-being of regular fitness enthusiasts.

Curcumin might just be set to make a grand entrance into the world of sports and fitness, with its promise to reduce inflammation and boost antioxidant capacity, among other potential benefits.

Turmeric, curcumin, and future health

While curcumin's role in muscle recovery is gaining attention, its potential use goes far beyond the boosting of athletic performance.

Research is continually uncovering its applications in cognitive health, immune support, and even chronic disease management.

Some studies suggest that curcumin may help regulate oxidative stress, support heart health, and even play a role in neuroprotection, offering potential benefits for conditions like Alzheimer's disease.

Furthermore, researchers in other fields, such as arthritis treatment and gut health, are beginning to show interest in the potential positive effects of taking curcumin supplements.

As scientists are refining our understanding of this potent compound, curcumin is set to remain a key player in natural wellness solutions for many years to come.

PLANT EXTRACT INSPIRES NEW CHEMISTRY AND NEW EARLY LEAD AGAINST TRIPLE-NEGATIVE BREAST CANCER

08 Feb, 2025 https://news.emory.edu/

Chemists at Emory University invented a reaction to streamline the total synthesis of a compound, phaeocaulisin A, extracted from a plant used for centuries in traditional Chinese medicine.

In laboratory dish experiments conducted with biologists at Winship Cancer Institute of Emory University, the researchers showed the compound's efficacy against HER2-positive breast cancer cells and triple-negative breast cancer cells. An analogue of the compound the chemists constructed boosted this efficacy.

"We not only efficiently replicated a complex natural product," says Mingji Dai, Emory professor of chemistry. "We also improved upon it by turning it into a more potent compound."

The Journal of the American Chemical Society published the work, led by Dai and Yong Wan, professor of pharmacology and chemical biology at Emory School of Medicine and director of basic research for the Glenn Family Breast Center at Winship Cancer Institute.

Phaeocaulisin A is an extract from Curcuma phaeocaulis, a flowering plant in the ginger family native to Asia with various uses in traditional medicine.

"It is only the first step in a long process," Wan says, "but the new analogue of phaeocaulisin A we have reported shows promising efficacy against triple-

negative breast cancer cells, which are very aggressive and challenging to deal with."

More years of research and testing, Wan explains, first in animal models, are required to further evaluate the compound and determine its potential as a therapeutic treatment.

Meanwhile, the new chemical process offers another tool for constructing complex molecules.

"The icing on the cake," Dai says, "is that that the chemical reaction we invented holds potential for widespread use in organic chemistry to make many other compounds for drug discovery."

First author of the study is Chang Liu, who did the work as an Emory PhD student in chemistry in Dai's lab and has since graduated. Co-authors are Mingyu Zhang, a PhD student in chemistry, and Lidan Zeng, a post-doctoral fellow in Wan's lab.

Dai, Asa Griggs Candler Professor of Chemistry, is also a member of the Discovery and Developmental Therapeutics Research Program at Winship Cancer Institute.

The Dai lab specializes in total synthesis — the construction of complex organic compounds found in nature. His lab has completed the total synthesis of more than 50 natural products with anticancer, antiviral and anti-neurogenerative activities.

Many natural products, or compounds found in plants, soil, deep-sea sponges and fungi, have shown promise for treating various diseases. Penicillin, for instance, was discovered in 1928 when a scientist noticed that mold growing on a petri dish was killing the bacteria in the dish.

Another striking example is Taxol, a landmark cancer drug developed from an extract of the Pacific Yew tree. After decades of research following the discovery of the extract, Taxol went into commercial production in the 1990s.

Despite the therapeutic potential of some natural products, many challenges are involved in turning them into pharmaceuticals.

“When you isolate a natural product from a plant you often get only a tiny amount,” Dai explains. “One kilogram of a plant may yield only a few milligrams of the natural product, sometimes even less.”

While a few milligrams allow preliminary testing of a natural compound’s efficacy, more material is required to continue research on it. Scientists need to study how to reduce any toxicity a compound shows on human cells while also optimizing its activity against a particular disease.

And if a compound makes it through years of tests and trials, its production must be scaled up for commercial use as a therapeutic.

“My lab’s motto is ‘making synthesis beautiful and useful,’” Dai says. “We use inexpensive, abundant materials to efficiently synthesize these natural products.”

In 2019, for instance, Dai built on work by chemists in China who were looking for molecules with medicinal value in a critically endangered fir tree, Abies beshanzuensis. The Chinese scientists had gathered bark and needles that fell from the last three of these trees still standing in southeastern China.

Dai and his colleagues at Purdue University, where he worked at the time, synthesized two of the molecules extracted from the fir tree and developed analogues of them with minor structural tweaks. Tests showed that one of the analogues was a potent inhibitor of SHP2, an important anti-cancer target in pharmaceutical research.

Dai joined the Emory faculty in 2022. Shortly afterward, he met Wan through an event hosted by Emory’s Biological Discovery through Chemical Innovation (BDCI) initiative, a network of investigators working at the intersection of chemistry, biology and human health.

“Emory is a leader nationally in the integration of biology and chemistry,” Wan says. “and the BDCI and the newly established Emory Center for New Medicine are great platforms for bringing people together.”

Wan and Dai bonded quickly. They both come from the same province in China — Sichuan — which is also the home of the giant panda. And both Wan and Dai are passionate about finding treatments for serious diseases.

They began discussing ideas for collaborating, drawing on the complementary strengths of their labs.

“My lab’s focus is to find ways to integrate basic research into translational research,” Wan says. “We are not only trying to understand the mystery of mechanisms behind cancer. We also want to bring strategies to neutralize cancer to the clinical bedside.”

Curcuma phaeocaulis, the source of phaeocausilin A, has been cultivated in Sichuan more than 900 years for traditional medicine. Modern scientific research has identified anti-inflamatory and anticancer activity of phaeocausilin A, including a 2013 paper reporting biological activity of the extract against melanoma cancer cells in lab experiments.

That led Dai and Wan to investigate its potential against various types of breast cancer cells.

Dai compares developing the steps needed to synthesize a natural compound to climbing Mount Everest. The journey is not a success until you reach the peak — the target compound. Researchers typically go down many false trails and impasses along the way.

“Total synthesis is certainly a science, but it is also an art,” Dai says. “The beauty lies in designing a path that leads to the molecule. You see the elegance and ‘scenic beauty’ in the design.”

It’s also one of the best ways to train students, Dai says. “They learn a lot of chemistry, how to plan, manage and execute a project. If anything goes wrong, they may have to reroute by developing a new design.”

Other chemists had previously achieved a total synthesis for phaeocausilin A through a 17-step process. The Emory researchers wanted to find a shorter, more efficient route.

On the way to this goal they invented a new palladium-catalyzed carbonylation reaction, which utilizes cheap and abundant carbon monoxide as a building block. This new reaction helped to streamline their total synthesis of phaeocausilin A to 10 steps.

Going by what Dai describes as "chemist's intuition," the researchers hypothesized that the analogue created during step nine of the total synthesis might prove even more potent.

The Wan lab validated this hypothesis, finding that the analogue for phaeocausilin A boosted its activity against HER2 positive breast cancer cells and triple-negative breast cancer cells.

The findings set the stage for further investigation of the compound as a potential breast cancer therapy, a continuing project of the Dai and Wan labs.

"We're good friends now," Dai says of his partnership with Wan, "and we have several more ongoing collaborations."

The work for the current paper was funded by the National Science Foundation.

A BACTERIA-BASED BAND-AID HELPS PLANTS HEAL THEIR WOUNDS

February 12, 2025 https://www.sciencenews.org/

A pure form of cellulose produced by bacteria can act as a plant bandage, researchers report, significantly boosting healing and regeneration in plants. The finding, described February 12 in *Science Advances*, has potential implications for agriculture and plant research.

Unlike animals, plants cannot escape danger and instead rely on remarkable regenerative abilities. Bacterial cellulose — already used in human medicine for treating wounds and burns due to its biocompatibility, biodegradability and high water retention — has now been found to enhance plant healing as well.

Plant biologist Núria Sánchez Coll and colleagues were testing bacterial cellulose patches embedded with silver nanoparticles to prevent infections in wounded plants. They soon noticed wounds treated with the patches healed better and faster. "This made us interested in finding the molecular cause of this process," says Sánchez Coll, of the Centre for Research in Agricultural Genomics in Barcelona.

To test the effectiveness of the patches as healing devices, the scientists made small cuts in the leaves of two common lab plants, *Nicotiana benthamiana* and *Arabidopsis thaliana*, applying the "Band-Aids" to half the wounds. After one week, more than 80 percent of the treated wounds had healed completely, compared with less than 20 percent of the untreated ones. Microscopic analysis showed that tissues in the treated wounds appeared healthy, while untreated wounds showed signs of distress and dehydration.

The team also discovered that the patches significantly enhance plant regeneration, particularly in cloning experiments. Many plants reproduce asexually through vegetative propagation, a process used in research and agriculture to grow a genetically identical new plant from a piece of another. When bacterial cellulose patches were added to cuttings in petri dishes, the plants regenerated faster, developing roots and leaves more quickly than untreated cuttings. Intriguingly, patches made from plant-produced cellulose did not have the same effect.

A chemical analysis revealed that the bacterial cellulose contained plant hormones, probably produced by the bacteria responsible for its synthesis. Bacteria have coevolved with plants for millions of years, producing hormones that influence plant behavior for the bacteria's benefit. The

researchers were surprised that these hormones remained intact despite previous sterilization of the patches to avoid contamination. “We think that the cellulose matrix is so dense that it preserves the hormones, which remain bioactive,” Sánchez Coll says.

At a genetic level, the bacterial cellulose–induced healing appears distinct from normal plant wound repair. The bacterial cellulose triggered a different set of genes, turning off some typically involved with healing while activating others related to infection defense. The researchers believe this altered response results from a combination of factors: the wound itself, the presence of bacterial hormones and the plant’s reaction to the bacterial cellulose as a foreign body, potentially triggering a defensive mechanism.

Although bacterial cellulose has been widely used in human medicine, this is the first time it has been found to have intrinsic biological activity, says Anna Roig, a materials scientist at the Institute of Materials Science of Barcelona who wasn’t involved in the study.

Plant scientist Javier Agustí, also not involved in the study, sees enormous biotechnological potential. “I would be very interested in seeing how well it works in real crops,” says Agustí, of the Institute for Plant Molecular and Cellular Biology of Plants in Valencia, Spain,

While still in early stages, the findings do suggest potential applications in agriculture, Sánchez Coll says, such as facilitating grafting, preserving cut plant material or serving as a growth medium in laboratories. Other research groups are already looking at these findings at the molecular level, trying to determine if they apply to other regeneration processes that aren’t yet fully understood.

BIODIVERSITY

FARMERS MUST BE AT THE HEART OF BIODIVERSITY ACTION

25 February 2025 https://news.un.org/

Over 150 countries will be meeting from 25 to 27 February to advance biodiversity finance, accountability and the integration of agrifood systems into global conservation strategies.

Despite groundbreaking agreements on genetic data and recognising the stewardship role of Indigenous Peoples at the first round of the COP16 conference in Colombia late last year, this new Conference of the Parties – or COP16.2 – aims to close some crucial gaps which are instrumental for implementing the Kunming-Montreal Global Biodiversity Framework (GBF) to halt and reverse biodiversity loss by 2030.

With nature declining at an alarming rate, the challenge now is turning commitments into action.

Farmers on board

FAO chief Qu Dongyu called for urgent action to transform agrifood systems, stressing that biodiversity must be embedded in food and farming policies. A key focus is the Agri-NBSAPs Support Initiative, launched at COP16 in Cali, Colombia.

The initiative is designed to help governments integrate agrifood systems into their National Biodiversity Strategies and Action Plans, to eliminate any conflicts between agricultural policy and biodiversity goals.

Colombia's COP16 President, Environment Minister María Susana Muhamad, and Agriculture Minister Martha Carvajalino, underscored the importance of full implementation.

Mr. Dongyu highlighted the deep connections between biodiversity and food security, noting that over half of the Kunming-Montreal Framework's 23 targets are directly linked to agriculture.

He explained that "biodiversity is also in the soil and in the water" and that it is critical "to look at biodiversity from a holistic, three-dimensional perspective".

'On the brink': Guterres

Despite commitments made at COP15, funding remains a sticking point.

Secretary-General António Guterres, warned in a statement that biodiversity is "on the brink" and urged governments to translate pledges into investment. "Success requires accountability. And action demands finance," he said.

With only a fraction of the required $200 billion per year mobilised, developing nations are pushing wealthier countries to meet their financial obligations.

Discussions in Rome are expected to focus on accountability frameworks to track spending and ensure resources reach the communities most affected by biodiversity loss.

What's next?

In the coming days, negotiators will work to finalise agreements on biodiversity finance, implementation strategies and monitoring frameworks.

Mr. Dongyu closed his statement by calling for an integrated approach across government sectors.

"We need an integrated approach across government sectors, across Ministries, to ensure the Four Betters: better production, better nutrition, better environment and a better life – leaving no one behind," he said.

With time running out to meet the 2030 targets, COP16.2 is a key test of global commitment – whether countries will step up or risk falling short on protecting the planet's ecosystems.

CMFRI OFFERS LESSONS ON MARINE BIODIVERSITY CONSERVATION, DISTRIBUTES MANGROVE SAPLINGS

Feb 19, 2025 https://www.sakshipost.com/

ICAR-Central Marine Fisheries Research Institute (CMFRI) on Wednesday distributed mangrove saplings to school students, with an aim to instil the importance of marine biodiversity conservation among the young generation.

The initiative was organised on the sidelines of the inauguration of a short-term training programme on integrated taxonomic techniques for marine biodiversity conservation.

The distribution of saplings of mangroves - shrubs or trees that grow mainly in coastal saline or brackish water and have particular adaptations to take in extra oxygen and remove salt, allowing them to tolerate conditions that kill most plants - takes place at a time when all the state's districts except Idukki, Pathanamthitta, Palakkad, and Wayanad have some mangrove cover, with Kannur having the largest extent. However, despite their ecological significance, the total area of Kerala’s mangrove forests is estimated to be less than 50 square kilometres.

Participants of the training programme, including scientists or officials from various research institutes under the Indian Council of Agricultural Research (ICAR), distributed the saplings to the school students.

The students were urged to plant these saplings in areas near their school and to focus on developing mangrove patches.

The CMFRI will further help students monitor the growth of the patches through field visits and expert guidance.

CMFRI Director Dr Grinson George emphasised the role of mangroves in using as a bio-shield against storm surges, coastal erosion, and flooding.

"Mangroves will play a critical role in combating the impact of climate change and protecting coastal biodiversity, especially in tropical ecosystems," he said.

The 10-day training will cover both theoretical concepts and practical applications, providing insights into the critical role of taxonomy and its applications in fisheries research

Over the past 50 years, human activity has led to a drastic decline in mangrove cover.

To tackle this the Kerala Forest Department, along with the local government bodies and NGOs, are actively working to conserve Kerala's remaining mangroves and also promoting mangrove tourism, fostering a sense of appreciation for these natural wonders.

MANY ANIMALS AND PLANTS ARE LOSING THEIR GENETIC DIVERSITY, MAKING THEM MORE VULNERABLE

Feb 1, 2025 https://tucson.com/

Two-thirds of animal and plant populations are declining in genetic diversity, which makes it harder to adapt to environmental changes, according to new research published in the journal Nature.

Long before a species goes extinct, the population becomes smaller and more fragmented, shrinking the number of potential mates and therefore genetic mixing. This leaves a species more vulnerable to future threats such as disease.

“A surprising trend was that we saw genetic diversity declining even among” many species that aren’t considered at risk, said co-author Catherine Grueber, a conservation biologist at the University of Sydney, a co-author of the study released last week.

Researchers examined data for 628 species studied between 1985 and 2019. The greatest losses in genetic variation were seen in birds and mammals.

“When a species has different genetic solutions, it’s better able to deal with changes,” said David Nogués-Bravo at the University of Copenhagen, who was not involved in the study.

If a new disease spreads through a population or climate change alters summer rainfall, some individuals will fare better than others, in part because of their genes. Higher genetic diversity also means there’s a greater chance of a species’ survival.

Conservation efforts to connect isolated populations — basically expanding the dating pool for a particular species — can help maintain or even restore genetic diversity.

Florida panthers are an endangered species that have steadily lost habitat to freeways and urban sprawl. By the mid-1990s, the remaining big cats in southern Florida showed clear signs of inbreeding – with kinked tails and low sperm counts in males.

Biologists brought eight female panthers from Texas to Florida. Twenty years later, the number of Florida panthers in the wild has grown significantly and genetic diversity increased.

“Isolated populations suffer,” said Duke University ecologist Stuart Pimm, who was not part of the research. “The solution is to reconnect them.”

Nayagarh, India - December 29, 2024 A rare black panther sighted with its cub in the forest has delighted wildlife enthusiasts, marking a significant ecological development. The incident took place in the Nayagarh forest of Nayagarh district in Odisha, eastern India, on December 29. Visuals show the black

panther, also known as a rare melanistic leopard, carrying its cub in its mouth while wandering through the dense forest of Nayagarh. According to reports, the video was shared by the Principal Chief Conservator of Forests (Wildlife), Prem Kumar Jha. He stated, “A rare melanistic leopard with a cub has been sighted in central Odisha, reflecting the region's incredible biodiversity. These elusive 'black panthers' are vital to the ecosystem—protecting their habitat ensures a thriving wildlife heritage.”

CLIMATE CHANGE

MAHARASHTRA: AS CLIMATE CHANGE HITS ONION, FARMERS LOOK FOR CROP COVER

February 13, 2025 https://indianexpress.com/

Last year Sandip Pansare’s gamble to insure his five acres of onion crop paid off when, just before the state elections in November, he received Rs 60,000 as compensation for crop loss. “In April, unseasonal rains ruined my harvest-ready crop. While this was not enough to cover the losses, it was enough to tide over the sowing cost. With unseasonal rains and pests becoming more common, crop insurance is a good cover for onion growers like us,” said this 40-year-farmer from Naigaon village in Nashik district of Maharashtra.

“More and more farmers in our areas are going for crop insurance. The premium is Rs 1 and as my experience goes, the compensation is not bad,” he said.

Eknath Sanap, another farmer from Naigaon agreed. “The insurance cover is a good cushion for crop loss. Slowly farmers are opting for this,” he said.

Sanap and Pansare are not alone in realizing the benefits of the crop insurance scheme. The state agriculture department has seen a steady rise in onion farmers

insuring their fields under the Pradhan Mantri Fasal Bima Yojana. Government data shows that in 2024-25, over 7.43 lakh hectares of onion crop was insured in Maharashtra. Five years ago, in the year 2019-20, this number was just about 45,000 hectares.

Officials say the decision to charge a nominal premium was one of the biggest reasons for this significant rise in insurance cover. “Since 2023, farmers in Maharashtra have to pay only Rs 1 as premium. This has boosted the area insured in the state,” said an Agriculture Department officer.

The biggest increase in farmers opting for insurance happened immediately after the premium was lowered.

Farmers say climate change, which has brought greater uncertainty in rainfall and made excessive rainfall a fairly frequent event, had also contributed to greater acceptance of the crop insurance scheme.

Maharashtra is the biggest onion producer of the country, accounting for over 34 per cent of the national production. In the last five monsoon seasons, its onion growing regions have reported excess rainfall especially in Nashik division for four of the five seasons. Heavy rainfall in the tail end of the monsoon has led to kharif losses. Also, heavy summer rainfall, especially in 2023, has led to losses in the rabi crop for farmers like Pansare.

Tushar Ugale, an onion agronomist from the Nashik-based KK Wagh College of Agriculture, said onion growers have faced issues due to frequent climatic changes over the last few years. Late November rains, he said, had led to rabi nursery beds being washed away. Onion, he said, requires constant climate and the variances led to attacks of fungus, thrips etc. “Crop insurance is now being seen as a safety net which allows some losses to be absorbed.”

MORE CLIMATE LITERACY AND DIVERSIFICATION COULD HELP TRIBAL MILLET FARMERS ADAPT TO IMPACTS

26 Feb 2025 https://india.mongabay.com/

Perched at more than 1,200 metres above sea level, Kolli Hills, a mountain block in Tamil Nadu's Namakkal district, is a bastion of millet cultivation. The Malayalis – a tribal community inhabiting the Hills – have cultivated various millets for generations. The advent of climate change, however, is making cultivation more challenging, and its impacts haven't gone unnoticed.

India launched its Millet Mission in 2023, with the aim of creating awareness and increasing the production and consumption of millets across the country. States such as Tamil Nadu followed suit, introducing schemes that incorporate millets in public food distribution networks and offering subsidies for processed minor millets.

However, these schemes not always suitable for the needs of millet farmers in places like Kolli Hills, said Israel Oliver King E.D., Director of Biodiversity at the M. S. Swaminathan Research Foundation (MSSRF). "In agro-ecologies where tribal communities are cultivating a diverse bundle of millets, including less popular ones, it needs to be respected and encouraged. With mission-led schemes, there is a risk of homogenisation towards popular varieties," said King, adding, "The right kind of incentive – either a form of assured procurement for extra millets, or access to processing facilities – can go a long way in ensuring crop diversity and resilience."

Although millets have earned a reputation for being climate resilient, changing weather patterns are adding to the challenges in sowing and harvesting millets. A recent study published in Frontiers in Climate surveyed millet farmers in Kolli Hills and found that changing weather patterns were perceptible in the community and negatively impacting crop productivity.

How millet farmers perceive climate

Kolli Hills are spread over 440 square kilometres, and the Malayali group of tribals are the most populous inhabitants of the region. Millets occupy a significant role in local cuisine and agriculture, where production is primarily geared towards local consumption and secondarily as goods to be sold in other markets.

The study surveying 125 millet farming households in this region was jointly conducted by the Indian Institute of Millets Research (under the Indian Council of Agricultural Research) and MSSRF to understand how "the intersection of socio-economic, personal, and agroecological factors shape tribal farmers' perceptions of climate change and their adaptation strategies."

Meteorological data from 2011 to 2023 collected for the study shows that annual average rainfall fluctuated between 870 mm and 1,200 mm, a high variability for farming that depends entirely on rain and not irrigation. Yields also fell to below two tonnes per hectare in 2022 and 2023 when average temperatures rose above 29 degrees Celsius, the study found.

Most farmers surveyed said they believed climate change to be impacting all aspects of farming, and more specifically that frequent drought was impacting crop productivity. Farmers also noticed that those with fewer resources were worse off. A majority of farmers interviewed had land holdings of less than 1.5 hectares (78%), while around 16% had between 1.6 and 3 hectares of land. "Most of the poor farmers who had low risk-bearing capacity were affected to a greater extent than the resource-rich farmers having more resources such as finance, land, and equipment," the study found.

The most perceptible climate impacts, according to the households surveyed, were longer duration of summers, shorter duration of winters, changes in the timings of summer and winter onset, and a fall in the number of rainy days in a year. “As a response to this, we found that farmers were sometimes switching to shorter duration millets, like the proso millet or foxtail millet, which take 70 days to mature compared to the finger millet and little millet, which take 100 to 120 days,” said Rajendra Chapke, a scientist at the ICAR-Indian Indian Institute of Millets Research who led the study.

While most households had low literacy levels, a higher proportion – 66% – had access to smartphones. Most households also reported being part of farmer cooperatives and other networks through which they received information about agriculture. “Leveraging mass media through these networks can be an effective tool to communicate climate impacts and improving farming practices to prevent yield losses. Government support in the form of crop insurance is needed too,” Chapke said.

Harnessing millet diversity

Kolli Hills are known as a hub of millet cultivation, but the area sown under millets has ceded way to other cash crops like tapioca over the years. The MSSRF began interventions in Kolli Hills in the 1990s to revive millet cultivation, and to study the circumstances under which millet cultivation and consumption could thrive.

Over a 20-year study period, researchers, led by King, found that providing milling and processing equipment and decentralising production and seed conservation helped maintain continuity in cultivation. “In these regions, millet diversity is key, because it also aids adaptation when there is climate variability. If sowing windows are delayed or come early, the farmer has a choice for which millet to cultivate,” said King of MSSRF. “But to do that, they need to have

access to seeds so that the choice is made available. In many places, the cultivation of minor millets with smaller maturation windows, is vanishing."

Major millets include sorghum, pearl millet, and finger millet, while minor millets include little millet, foxtail millet, proso millet, barnyard millet, and kodo millet. Trends in millet cultivation in Tamil Nadu from 2011 and 2022 show that the area under sorghum (jowar) cultivation grew the most, followed by pearl millet (bajra). Minor millets, on the other hand, were on a declining trend.

M. Karthikeyan, former Chief Executive of the Dhan Foundation's Small Millet Foundation, who was not involved in the ICAR-IIMR or MSSRF studies, agreed that minor millets were in need of more policy support. "Finger millet is preferred because it needs the least processing – it is a single layer grain. The other minor millets are closed grains which require more processing post-harvest. Removing these layers is a traditional skill that's also being lost across generations. If farmers don't have access to processing facilities, they prefer not to sow these varieties," he said.

Among the interventions introduced by MSSRF in Kolli Hills was the community-led seed banks that kept a diverse variety of millet seeds. By 2022, 12 of the 15 seed banks were still functional, with hundreds of transactions each year, indicating an interest in cultivation. Women play a central role in the management of millets, and distribution of small-scale processing units was found to reduce their drudgery, MSSRF's 20-year study found.

A combination of seed conservation, access to processing, and support incentives can help sustain and encourage the cultivation of minor millets, said King. "If monocultures of millet crops come up bolstered by mission schemes, what will happen once the mission or scheme moves out of those areas? A ruling variety may fail when the impact of weather is extreme. Having a variety of seeds is the route for resilience."

KASHMIR'S SAFFRON GROWERS EXPERIMENT WITH INDOOR FARMING AS CLIMATE PRESSURES MOUNT

February 06, 2025 https://www.thehindu.com/

Tucked in a valley beneath the snow-capped Himalayas of the Indian Kashmir region is the town of Pampore, famed for its farms that grow the world's most expensive spice - the red-hued saffron.

This is where most of saffron is farmed in India, the world's second-largest producer behind Iran of the spice, which costs up to 325,000 rupees ($3,800) a kg (2.2 pounds) because it is so labour-intensive to harvest.

About 90% of India's saffron is produced in Kashmir, of which a majority is grown in Pampore, but the small town is under threat of rapid urbanisation, according to the Indian Council of Scientific & Industrial Research (CSIR).

Experts say rising temperatures and erratic rainfall pose a risk to saffron production, which has dropped from 8 metric tons in the financial year 2010-11 to 2.6 metric tons in 2023-24, the federal government told parliament in February, adding that efforts were being made to boost production.

One such programme is a project to help grow the plant indoors in a controlled environment in tubes containing moisture and vital nutrients, which Dr. Bashir Ilahi at state-run Sher-e-Kashmir University of Agricultural Sciences said has shown good results.

"Growing saffron in a controlled environment demonstrates temperature resistance and significantly reduces the risk of crop failure," said Ilahi, standing in his laboratory between stacks of crates containing tubes of the purple flower.

Ilahi and other local experts have been helping farmers with demonstrations on how to grow the crocus plant indoors. “It is an amazing innovation,” said Abdul Majeed, president of Kashmir’s Saffron Growers Association, some of whose members, including Majeed, have been cultivating the crop indoors for a few years. Manzoor Ahmad Mir, a saffron grower, urged more state support.

“The government should promote indoor saffron cultivation on a much larger scale as climate change is affecting the entire world, and Kashmir is no exception,” Mir said.

ORGANIC FARMING

ENGINEER-TURNED-FARMER PROMOTES ORGANIC CROPS: CHEMICALS AREN’T ALLOWED IN THESE FIELDS

Feb 13, 2025 https://www.tribuneindia.com/

A land measuring 5 acre on the National Highway in the urban area of Amritsar may be worth billions of rupees to real estate developers, but for Navtej Singh, it holds a different value. He cultivates traditional crops, which are not altered through breeding, for his family and commercial purpose.

A computer engineer by profession, Navtej Singh became aware of the importance of nature, health and food during the Covid pandemic. This realisation prompted him to return to his ancestral occupation of farming at Verka village on the outskirts of Amritsar. In 2020, he decided to transition from chemical-based farming to organic one. Over the past five years, he has

experimented with various traditional crops, but primarily focuses on growing indigenous varieties of wheat and rice.

“I have cultivated ragi and other millets, but realised that wheat and rice are staples in our daily diet. These should be organic and natural. Our ancestors used to preserve crop seeds, but due to the over-commercialisation of farming and the emergence of high-yielding modified wheat and paddy varieties, we all shifted to cultivating for the market rather than for our health. I have sourced seeds of the Sona Moti wheat variety and Pakistani Basmati rice and have noticed a significant improvement in nutritional value, flavour and aroma,” said Navtej Singh.

Now a full-time farmer, he has started commercialising these traditional crops, which are not modified. However, growing crops without chemical-based pesticides and fertilisers remains a challenge, as it requires farmers to accept lower yields. While regular wheat varieties produce a yield of 20 quintals per acre, Sona Moti wheat yields only 6 quintals per acre. Similarly, the yield of Pakistani Basmati rice is just 10-12 quintals per acre. Additionally, weed management without chemical insecticides is labour-intensive and costly, requiring manual removal of weeds. The use of organic fertilisers further adds to the cost of cultivation. Despite these challenges, health-conscious consumers seek him out and are willing to pay a premium for his organic farm produce.

“Instead of a family doctor, urban dwellers need a family farmer, who provides them organic food. I am planning to launch my own brand soon and have applied for certification from the Food Safety and Standards Authority of India (FSSAI). As people face increasing health issues and environmental crises, organic farming

CLIMATE CHANGE THREATENS COCOA PRODUCTION

Feb 17 2025 https://www.azocleantech.com/

Cocoa (Theobroma cacao L.) is a key cash crop for 4–6 million smallholder farmers in the tropics, supporting a global chocolate industry valued at over USD 100 billion annually. Growing demand and farmer dependence on cocoa have led to the expansion of plantations and the intensification of agricultural practices, often at the cost of biodiversity and long-term sustainability.

The scientists also discovered farm management practices that can enhance crop resilience while improving yields without expanding plantations into forests.

Conducted in Brazil, Ghana, and Indonesia—countries responsible for 33 % of global cocoa production—the study examined key factors affecting yields. Findings indicate that increasing pollination rates above current levels could boost yields by 20 %, suggesting that many cocoa farms do not receive optimal pollination.

Beyond pollination, the study found that areas experiencing temperatures up to 7 °C higher had 20–31 % lower cocoa yields, underscoring the vulnerability of cocoa-producing regions to climate change.

To promote sustainable cocoa production, researchers recommend pollination-friendly practices such as maintaining leaf litter and understory biomass, preserving soil organic matter, providing moderate shade, and reducing agricultural chemical use. These measures not only support pollinator populations but also help regulate plantation temperatures and improve soil health, enhancing plantation resilience over time.

This research shows that sustainable agricultural methods can significantly improve cocoa yields without farm expansion or intensification. By adopting biodiversity-centred, climate-resilient farming techniques, the cocoa sector can both increase production and safeguard farmers' livelihoods.

Dr. Tonya Lander, Study First Author and Research Associate, University of Oxford

Dr. Tom Wanger of Westlake University, China, added, “The rising demand for cocoa and the short-term economic benefits to farmers has led to plantation expansion and ecological homogenization at the expense of biodiversity and vital ecosystem services, like pollination. This study highlights the long-term risks of this approach, and how pollination can be a solution that works alongside climate-resilient agricultural systems to achieve long-term, ecologically and financially sustainable solutions.”

SEAWEED FARMING POTENTIAL TO DEAL WITH CLIMATE CHANGE IMPACT

Feb 19, 2025 https://www.etvbharat.com/

Seaweed farming has the potential to deal with climate change impact, simultaneously its rich properties help cultivators to get better financial returns by selling as its biomass has multiple nutritional and medicinal values to be used in the pharmaceutical and food industry.

As per the Indian Council of Agricultural Research (ICAR), seaweed farming is a green technology with zero input which can act as an important mitigation measure for reducing the adverse impact of climate change and has the potential to earn carbon credits for the county.

Assistant Professor, Marine Biotechnology, Gujarat Biotechnology University, Dr Nitin Trivdi told ETV Bharat, "The seaweed farming is helpful to deal with climate change as these are photosynthetic plants which absorb CO2 from the environment for their growth. Second, it helps mitigate ocean acidification by absorbing CO2 from the ocean and increasing the pH of the seawater. These processes improve the environment and reduce the impact of climate change on marine ecosystems."

"In order to address climate change issues, the ICAR-CMFRI, and CSIR-Central Salt and Marine Chemical Research Institute have identified potential sites for seaweed farming in 9 coastal States and 4 Union Territories of the country. The sites identified (384) were categorised into green zones (3999.37 ha), amber zones (14,076.77 ha), and blue zones (6,631 ha), with 24,707 hectares identified as suitable for seaweed farming," Indian Council of Agriculture Research annual report 2023-24 states.

Seaweeds have industrial importance due to the presence of sulphated polysaccharides like agar, algin, and carrageenan. Further seaweeds are rich in minerals which makes them a potential source of biostimulants. He said, "Seaweeds are a rich source of bioactive components which has applications in pharmaceutical, nutraceutical, cosmaceutical, food and agriculture industries".

United Nations Environment Programme Report 2023 says:

The Environment Programme (UNEP) recognises the growing global interest in seaweed farming as a potentially scalable ocean-based solution to climate change that may provide environmental and social co-benefits as part of the advancement of resilient and climate-smart aquaculture. As per the report, seaweeds absorb pollutants (nutrients including nitrogen phosphorous and heavy metals) in coastal waters.

UN Trade & Development:

Within a sustainable ocean economy, seaweed collection, culture, processing, and trade are one of the sectors with the most opportunities to achieve sustainable growth by 2030. Seaweed farming culture is closely linked to food

security, income, livelihoods, and traditional knowledge of rural coastal communities, particularly for women and Indigenous Peoples.

Government's initiative:

In a significant move, the Centre has notified the 'Guidelines for Import of Live Seaweeds into India'. This initiative aims to bolster the development of seaweed enterprises as a key economic driver for coastal villages, ensuring livelihood sustainability and socio-economic upliftment of the fisher community while upholding environmental protection and biosecurity concerns at the core of all actions. Pradhan Mantri Matsya Sampada Yojana (PMMSY), the flagship scheme of the Government of India envisaged to revolutionise the seaweed sector, aiming to increase seaweed production of the country by over 1.12 million tonnes by 2025.

National Fisheries Development Board:

Some 844 species of seaweeds have been reported from Indian seas, their standing stock is estimated to be about 5,715 tonnes (wet weight). Among them, 221 species are commercially important and abundant along the Tamil Nadu and Gujarat coasts and around Lakshadweep and Andaman & Nicobar Islands. Rich seaweed beds occur around Mumbai, Ratnagiri, Goa, Karwar, Varkala, Vizhinjam and Pulicat in Tamil Nadu, Andhra Pradesh and Chilka in Orissa.

ICAR Report:

Seaweeds have a variety of commercial applications in food, pharmaceutical, cosmetics and mining industries. India has a seaweed production potential of 9.88 million tonnes wet weight per year while the current production stands at merely 52,107 tonnes wet weight per year. Keeping in view the immense potential of seaweed farming in the country, ICAR-CMFRI has brought out a document on good management practices to promote and support the sustainable farming of seaweeds in India.

What seaweed farmers say :

Abla Bhai Waghel, who is a Seaweed farmer, is a witness of significant transformation in his life after engaging in seaweed farming as selling seaweed

biomass has improved his financial condition as well as skills to increase productivity in this sector.

Satisfied with his significant growth, Abla Bhai of Gujarat's Kutch coast area told ETV Bharat, "I was earlier in traditional fishing where I hardly managed to earn daily bread and butter for my family. Then it decided to shift my focus on cultivating seaweed which has now proven a boon for me in terms of financial point of view."

"I harvest seaweed five times in a year and get around 200-300 kgs of produce which depends on climate and weather conditions in a circle. Now, I promote my product online and earn more by selling it to pharmaceutical-related persons," he added.

Altaf, a seaweed farmer of Gujarat, told ETV Bharat, "I have been in this field for the past two years and getting benefit from the produce. But last time heavy rainfall disturbed the normal situation only. Initially, the farmers have to invest in equipment like bamboo, rope and others and start their farming."

Training facility:

Dr Nitin Trivedi informed that a proposal has been submitted to GSBTM, DST-Goverment of Gujarat to provide onsite training for seaweed cultivation at various coastal areas of Gujarat to strengthen the seaweed cultivation and research as Gujarat is blessed with a 1600 km long coastline. "We have a plan to provide training to a group of 25-30 coastal community people," he said.

Farmers face Challenges:

The farmers have to deal with several issues including a lack of proper marine spatial plans, worst weather conditions, natural calamities, financial conditions, crop loss due to high temperatures and some other issues.

ICAR IN PRINT

ICAR-DMAPR GRANTED INDIAN PATENT FOR NOVEL KALMEGH-BASED DRUG FORMULATION

10/02/2025 https://icar.org.in/

ICAR-Directorate of Medicinal and Aromatic Plants Research has been granted an Indian Patent (Patent No. 556149) for the development of a novel drug formulation using Kalmegh (Andrographis paniculata). The patented formulation, entitled 'Development of microencapsulated formulation based on Andrographolide and Method of Preparation,' improves the bioavailability and sustained release of Andrographolide, the active compound in Kalmegh, for enhanced therapeutic efficacy.

Dr Manish Das, Director, ICAR-DMAPR, highlighted that the microencapsulated formulation is expected to have greater demand in the pharmaceutical industry due to its enhanced properties.

Kalmegh [Andrographis paniculata (Burm.f.) Wall. Ex Nees], an important medicinal plant used in Ayurveda. Kalmegh is a branched annual herb of the family Acanthaceae and is about 30-100 cm tall. Andrographolide is the active principle having the therapeutic action. The herb is used for treating diabetics, bronchitis, piles, jaundice, and fever. It is considered as a blood purifier and used for the treatment of skin diseases. It is cultivated as a kharif season crop in Gujarat, Uttar Pradesh, West Bengal, Madhya Pradesh, Orissa, Andhra Pradesh, and Tamil Nadu.

The invention also describes the method of obtaining the enriched Andrographolide extract from Kalmegh. The key benefits of the technology include improved bioavailability and sustained release of the bioactive compound Andrographolide for better efficacy due to its diverse biological activities.

The technology was developed by Dr Narendra A. Gajbhiye and Jitendra Kumar of ICAR-DMAPR.

ICAR HAS DEVELOPED 2,900 CROP VARIETIES IN 10 YEARS: BHAGIRATH CHOUDHARY

Feb 05, 2025 https://timesofindia.indiatimes.com/

PUDUCHERRY: The Indian Council of Agricultural Research (ICAR) has developed 2,900 varieties of crops in the last 10 years, said Union minister of state for agriculture and Wednesday. As many as 2,661 of these crops are tolerant to one or more biotic and or abiotic stresses. Furnishing a written reply to the queries posed by Puducherry Lok Sabha member V Vaithilingam, Choudhary said the council had developed 156 technologies, machines and process protocols for production and post-harvest production.

ICAR GETS LICENSE FOR WORLD'S FIRST LUMPY SKIN DISEASE VACCINE

11 Feb 2025 https://www.newindianexpress.com/

Bharat Biotech in collaboration with the Indian Council for Agricultural Research(ICAR) has developed the world's first vaccine for cattle's Lumpy Skin Disease (LSD), which received green signal from the drug controller authority.

The vaccine, named BIOLUMPIVAXIN, has received approval from India's drug regulatory authority, the Central Drugs Standard Control Organisation (CDSCO).

This is the first-ever Differentiating Infected from Vaccinated Animals (DIVA) marker vaccine for LSD. The disease, which affects cattle and Asian water buffaloes, is spread by insects and causes a significant loss of milk production, leading to economic damage for farmers.

Lumpy Skin Disease (LSD) was first detected in India in July 2019 in Odisha and later spread to 20 states by the end of 2020, putting at risk India's 303 million cattle and buffalo population that drives the country's milk production. Over the past two years, nearly 200,000 cattle have died, and millions more have lost their milk-producing ability due to the disease.

India is the world's largest milk producer, contributing over 22% of global milk production, followed by the EU-28 and the United States.

The vaccine's quality, safety, and effectiveness have been thoroughly tested at the ICAR-National Research Centre on Equines (ICAR-NRCE) in Hisar and the Indian Veterinary Research Institute (IVRI) to ensure it meets global standards. This new indigenous live-attenuated marker vaccine was developed

using the LSD virus/Ranchi/2019 strain from ICAR-NRCE in collaboration with Bharat Biotech's Biovet.

"The CDSCO licensure for this vaccine is a significant step toward India's self-reliance (Atmanirbhar Bharat) in veterinary healthcare, which avoids dependency on imported vaccines," said Dr. Krishna Ella, Founder of Biovet, a Bharat Biotech group company.

He further stated that the vaccine will be commercially available soon. It will be provided in a freeze-dried form with stabilizing agents for long-term storage. A separate diluent will be supplied for reconstitution before use.

The disease was first discovered in Zambia in 1929. Since then, it has spread across Africa, the Middle East, Southeastern Europe, Central Asia, and more recently, South Asia and China.

LUMPY SKIN DISEASE VACCINE DEVELOPED BY BHARAT BIOTECH GROUP FIRM WITH ICAR GETS CDSCO LICENCE

February 10, 2025 https://www.thehindu.com/

Animal health vaccine maker and Bharat Biotech group firm Biovet on Monday (February 10, 2025) said it has received the Central Drug Standards Control Organization (CDSCO) licence for the lumpy skin disease (LSD) vaccine for dairy cattle and buffaloes Biolumpivaxin it developed in collaboration with Indian Council of Agriculture Research (ICAR).

As the first Differentiation of Infected from Vaccinated Animals (DIVA) marker vaccine globally for LSD, it offers a high safety and efficacy profile while

enabling serological differentiation between naturally infected and vaccinated animals, the Karnataka-based Biovet said in a release on Monday.

The vaccine will soon be made commercially available. Biovet's Mallur facility can produce 500 million doses of the vaccine annually, it said

ICAR and its scientists made significant contributions and played a crucial role in the development of this collaborative, world-class vaccine for animal health. The novel indigenous live-attenuated marker vaccine was developed using the LSD virus/Ranchi/2019 vaccine strain from ICAR-National Research Centre on Equines, Hisar. The quality, safety and efficacy of the vaccine was tested at ICAR-NRCE and at the Indian Veterinary Research Institute (IVRI).

The vaccine is the result of three years of research by scientists at NRCE led by Naveen Kumar (now Director, NIV-Pune) under the leadership of B.N.Tripathi, former DDG, Animal Sciences, ICAR and presently Vice Chancellor, SKUAST, Jammu, Biovet said.

"The CDSCO licensure is a significant step toward India's self-reliance in veterinary healthcare, which avoids dependency on imported vaccines. This DIVA marker vaccine is a game-changer for veterinary medicine for disease surveillance and eradication programmes and poised to play a crucial role in ensuring the dairy industry's sustainability," Biovet founder Krishna Ella said.

Over the past two years in India, approximately 2 lakh cattle died and many more lost their milk production capabilities due to LSD. Biolumpivaxin, which comes in freeze-dried form, is a single vaccination regimen given once in a year to cattle and buffaloes above 3 months of age.

SCIENTISTS IDENTIFY NEW FUNGAL DISEASE IN GINGER CROPS ACROSS KODAGU

06 Feb 2025 https://www.newindianexpress.com/

MADIKERI: Ginger cultivation has picked up pace across Kodagu, especially in the northern part of the district, for its profitable returns. However, the Indian Institute of Spice Research (ICAR) has detected a new fungal disease affecting ginger crops across the district and has issued a set of guidelines to control the spread of this disease.

As confirmed by the ICAR officials, the Kozhikode ICAR research centre has identified a new fungal disease that had severely affected ginger crops across the district in 2024. As confirmed by the ICAR scientists, the fungal pathogen Pyricularia spp has become a new threat to the ginger crops. The scientists confirmed that while Pyricularia is well known to cause blast disease in monocot plants including paddy, it is the first time that these pathogens are affecting the cash crop of ginger.

“The disease appears as yellowing of the ginger plant leaves, accompanied by black /dark olive green spots in the early stages. Once the infection takes hold, it spreads rapidly and can cover the entire field within hours, leading to severe crop loss and plant death,” confirmed the Head Scientist of the ICAR at Appangala in the district.

He explained, “The problem lies in the premature yellowing and drying of the leaves, which affects the proper formation of ginger rhizomes. As a result, farmers in Kodagu have experienced losses up to 30% in rhizome weight,” he added.

According to the researchers, the spread of the disease is largely driven by the specific climatic conditions prevailing in Kodagu. During August and September last year, the region experienced dew fall in the mornings, which is said to have provided the ideal environment for the fungal pathogen to thrive and spread. This has led to the rapid spread of the disease throughout ginger fields in some parts of the district.

To manage the disease, scientists recommend the use of fungicides such as Propiconazole or a combination of Carbendazim and Mancozeb in proper ratio. These fungicides can be used to treat seed rhizomes for 30 minutes. The scientists also urge the farmers to act immediately with fungicide application if symptoms of the disease are observed. Farmers whose crops have been affected by this disease are advised to temporarily refrain from cultivating ginger in the affected areas. The research team is conducting further studies to better understand the pathogen's behaviour and its environmental triggers.

IISR TO HOST 'IDEATHON' TO PROMOTE INNOVATIVE IDEAS IN SPICE SECTOR

February 07, 2025 https://www.thehindu.com/

The Indian Institute of Spices Research (IISR), Kozhikode, will host an 'ideathon' with the support of the Kerala State Start-up Mission for promoting innovative ideas and enterprises related to spices as part of its three-day 'Rise up' entrepreneurship fair scheduled to commence on February 19. George Ninan, director, Central Institute of Fisheries Technology, Kochi, will open the event.

According to IISR officials, six topics related to the development of technologies to expose adulteration in spices, harvesting machines for pepper, nutmeg and cinnamon, artificial intelligence-based devices for finding pest

infections, manufacturing of value-added spice products, technologies to combat human-wildlife conflicts, and sustainable agriculture models exploring the scope of AI and drones will be considered at the event.

Interested individuals, students and entrepreneurs can submit their proposals online to the authorities by February 15. The shortlisted candidates will be allowed to present their proposals on the opening day of the fair, which will be attended by around 70 shortlisted entrepreneurs with their products. The winners will be awarded cash prizes at the event. Agriculture Minister P. Prasad will be the chief guest at the valedictory ceremony to be held on February 21.

GENERAL

PLANTS LOSING APPETITE FOR CARBON DIOXIDE AMID EFFECTS OF WARMING CLIMATE

26 Feb 2025 https://www.theguardian.com/

Our planet is losing its appetite for mopping up carbon dioxide. Analysis of atmospheric carbon dioxide measurements show that Earth's plants and soils reached peak carbon dioxide sequestration in 2008 and absorption has been declining ever since. Passing this tipping point increases the chances of runaway climate breakdown.

Plants and trees have had it good for the last century or so. Rising levels of carbon dioxide helped to spur growth and warmer temperatures gave rise to a longer growing season. But at some point these benefits start to be outweighed by the negatives of a warming climate: wildfires, drought, storms, floods, the spread of new pests and diseases and plant heat stress all reduce the amount of carbon dioxide that plants absorb.

James Curran, the former chief executive of the Scottish Environment Protection Agency, and his son Sam analysed the ups and downs in atmospheric carbon dioxide concentration, revealing that peak carbon sequestration occurred in 2008, and since then the amount of carbon dioxide absorbed by plants has declined by an average of 0.25% a year. “The findings are very stark. Emissions now need to fall by 0.3% per year, just to stand still. That’s a tall order since they typically increase by 1.2% per year,” said James Curran, whose findings are published in the journal Weather.

THAILAND UNVEILS SMART FARMING PLATFORM POWERED BY AI AND IOT

FEBRUARY 22, 2025 https://www.nationthailand.com/

Thailand has unveiled a new smart farming platform, “HandySense B-Farm”, which harnesses the power of smart sensors, artificial intelligence (AI) and Internet of Things (IoT) to help farmers control and manage their farms efficiently.It will help reduce cost and boost the Thai agricultural sector’s competitiveness at the global level.

HandySense B-Farm was recently launched by the National Electronics and Computer Technology Centre (NECTEC) as part of the digital agriculture promotion policy of the National Science and Technology Development Agency.

"The launch of HandySense B-Farm marks another important milestone for Thailand's agricultural sector, enabling farmers to utilise digital technology to enhance their capabilities and promote sustainability in the country's agriculture,” NECTEC deputy director Panita Pongpaibool said on Friday.

"The platform reflects the goals of NECTEC and all partner organisations in helping Thai farmers navigate into the digital era at their fullest potential. We believe that digital technology is not just a tool, but an opportunity that will help Thai agriculture compete and grow sustainably," she said.

She explained that HandySense B-Farm uses smart sensors, Big Data, AI and Internet of Things technology to gather and analyse data in real time with high accuracy, which will help farmers in making informed decisions in farm management.

The platform also makes use of NECTEC's expertise in other fields including embedded system, machine vision, photonic and phonotype, she added.

"These not only help improve production efficiency but also enhance accuracy, reduce waste, and elevate the quality of life for farmers, enabling them to earn higher incomes from quality produce, especially high value crops and medicinal plants," said Panita.

WONDERS OF USING CLOVE WATER FOR HEALTHY LOCKS

10, 02, 2025 https://www.msn.com/

Clove water is a hidden gem for promoting long, healthy tresses. With its antibacterial, antifungal, and stimulating properties, it offers a multitude of benefits for hair health. Far from just a common kitchen spice, clove water has incredible potential to enhance the overall health, quality, and appearance of your hair. Let's explore some of the key benefits of using clove water for hair growth and more.

Clove water lastly enhances hair elasticity and lowers the risk of split ends. It strengthens the hair shafts, making the strands more resistant to the damage of heat, styling, and environmental factors as well. It also treats scalp irritation and inflammation, solving issues of redness, itching, and discomfort as well.

How to make and use?

Step 1: Boil a handful of cloves in water for 15-20 minutes and allow it to cool down before straining out the cloves.

Step 2: Transfer it to a spray bottle for easy application, and simply by sectioning your hair, you can directly spray it on your scalp. Gently massage the scalp with your fingertips and distribute the water equally.

Step 3: After applying clove water to the scalp, leave it on for 30 minutes, allowing the compounds to penetrate and nourish your hair follicles.

Step 4: Rinse out the clove water and style your hair while enjoying the subtle scent of cloves lingering in your locks.

You can also add aloe vera gel, essential oils like lavender and rosemary, coconut oil, and more to improve your hair care needs. Also, start with a patch test and then include it in your beauty routine.

MALAYALAM NEWS

സുഗന്ധരാജാവും റാണിയും നിലനിൽപിന് ക്ലേശിക്കുന്നു; റബർവില ഇടിഞ്ഞു: ഇന്നത്തെ (4/2/25) അന്തിമ വില

Feb 04, 2025 https://www.manoramaonline.com/

സംസ്ഥാനത്ത് വരണ്ട കാലാവസ്ഥ അടുത്ത രണ്ടാഴ്ച്ചകൂടി തുടരാനുള്ള സാധ്യത കാലാവസ്ഥ വിദഗ്ധരിൽനിന്നു പുറത്തു വന്നത് കാർഷിക മേഖലയിൽ ഞെട്ടലുളവാക്കി. ഉയർന്ന പകൽ താപനിലയിൽ കൃഷിയിടങ്ങൾ പലതും നിലനിൽപ്പ് ഭീഷണിയെ അഭിമുഖീകരിക്കുകയാണ്. പുതിയ സാഹചര്യത്തിൽ മുന്നിലുള്ള ആഴ്ച്ചകളിലും ചൂടിനു ശമനം വന്നില്ലെങ്കിൽ കാർഷികോൽപന്നങ്ങളുടെ നിലനിൽപ്പിന് അത് കനത്ത വെല്ലുവിളി ഉയർത്തും. പല ഭാഗങ്ങളിലും മൂപ്പ് എത്തും മുന്നേ കുരുമുളകുമണികൾ അടർന്നുവീണത് മൊത്തം ഉൽപാദനം ഈ വർഷം കുറയാൻ ഇടയാക്കുമെന്നാണ് ഉൽപാദകകേന്ദ്രങ്ങളിൽനിന്നു ലഭ്യമാവുന്ന വിവരം. സുഗന്ധരാജാവിന്റെ അവസ്ഥ ഇതാണെങ്കിൽ സുഗന്ധറാണി ഇതിലേറെ പരിതാപകരമായ സാഹചര്യത്തിലൂടെയാണ് കടന്നുപോകുന്നത്. പല തോട്ടങ്ങളിലും ശരങ്ങൾ കനത്ത ചൂടിനു മുന്നിൽ വാടിക്കരിയുന്നു. മാസത്തിന്റെ രണ്ടാം പകുതിയിൽ വിളവെടുപ്പിൽനിന്നു പൂർണമായി പിൻതിരിയേണ്ടിവരുമെന്ന സ്ഥിതിയാണ്. ഇതിനിടയിൽ ശരാശരി ഇനം ഏലത്തിന് മൂവായിരം രൂപയുടെ നിർണായക താങ്ങ് നഷ്ടപ്പെട്ട് കിലോ 2919 രൂപയായി.

അന്തരീക്ഷ താപനില ഉയർന്നതോടെ റബർ മരങ്ങളിൽ ഇലപൊഴിച്ചിൽ വ്യാപകമായി. ഇതിനിടെ ചൂടിനു മുന്നിൽ മരങ്ങൾക്ക് പിടിച്ചുനിൽക്കാനാവില്ലെന്നു വ്യക്തമായതോടെ സംസ്ഥാനത്തിന്റെ പല ഭാഗങ്ങളിലും കർഷകർ ടാപ്പിങിൽനിന്നും പിൻതിരിഞ്ഞു, ചില പ്രദേശങ്ങളിൽ റബർ വെട്ട് ആഴ്ച്ചയിൽ രണ്ടു ദിവസമായി കുറച്ചു. നാലാം ഗ്രേഡ് കിലോ 192 രൂപയിലും ലാറ്റക്സ് 130 രൂപയിലും ഒട്ടുപാൽ 133 രൂപയിലും വിപണനം നടന്നു. ഇതിനിടെ തായ് മാർക്കറ്റായ ബാങ്കോക്കിൽ റബർവില തുടർച്ചയായ രണ്ടാം ദിവസവും കുറഞ്ഞു. ചൈനീസ് വാങ്ങലുകാരുടെ അഭാവം മൂലം രണ്ടു ദിവസം കൊണ്ട് കിലോ 216ൽനിന്ന് 211ലേക്ക് ഇടിഞ്ഞു.

സംസ്ഥാനത്ത് നാളികേരോൽപ്പന്നങ്ങളുടെ വിലയിൽ ഇന്ന് മാറ്റമില്ലെങ്കിലും തമിഴ്നാട്ടിലെ പ്രമുഖ വിപണികളിൽ നിലനിൽക്കുന്ന ചരക്കുക്ഷാമം മൂലം മില്ലുകാർ വില ഉയർത്തി കൊപ്ര ശേഖരിച്ചു. മാസാരംഭ വേളയായതിനാൽ പ്രദേശിക തലത്തിൽ വെളിച്ചെണ്ണ വിൽപ്പന ഉയർന്നത് വിപണി നേട്ടമാക്കി.

വേനൽ ലക്ഷ്യമിട്ട് തണ്ണിമത്തൻ കൃഷി

Feb 18, 2025 https://janayugomonline.com/

വേനൽക്കാലം മുന്നിൽക്കണ്ട് തണ്ണിമത്തൻ കൃഷിയിലേക്ക് തിരിഞ്ഞിരിക്കയാണ് തിരുപ്പൂർ ജില്ലയിലെ പല പച്ചക്കറി കർഷകരും. ഹോർട്ടിക്കൾച്ചർ വകുപ്പിൽനിന്ന് ലഭിച്ച കണക്കുപ്രകാരം നിലവിൽ 168 ഹെക്ടറിലാണ് തണ്ണിമത്തൻ കൃഷി ഇറക്കിയിരിക്കുന്നത്. മടത്തുക്കുളം (58 ഹെക്ടർ), കുണ്ടടം (30 ഹെക്ടർ), ഉദുമൽപേട്ട (28 ഹെക്ടർ), ധാരാപുരം (20 ഹെക്ടർ) എന്നീ ബ്ലോക്കുകളിലാണ് കൃഷി നടക്കുന്നത്. ബാക്കിയുള്ളത് ഗുഡിമംഗലം, കാങ്കയം, ഊത്തുക്കുഴി തുടങ്ങിയ ബ്ലോക്കുകളിലാണ്. വരും ആഴ്ചകളിൽ കൂടുതൽ സ്ഥലത്ത് കൃഷി വ്യാപിക്കുമെന്ന് പ്രതീക്ഷിക്കുന്നതായി ഹോർട്ടിക്കൾച്ചർ വകുപ്പ് ഡെപ്യൂട്ടി ഡയറക്ടർ എസ്. ശശികല പറയുന്നു.

ഭൂരിഭാഗം കർഷകരും സ്വകാര്യ വിത്ത് വിൽപ്പനക്കാർവഴി വാങ്ങിയ ഹൈബ്രിഡ് ഇനങ്ങളാണ് കൃഷിചെയ്യുന്നത്. കീടങ്ങളെ ചെറുക്കുന്ന ഗുണങ്ങളും ഉയർന്ന വിളവുമാണ് അത്തരം ഇനങ്ങൾക്ക് മുൻഗണന നൽകുന്നതിന് കാരണമായി കർഷകർ പറയുന്നത്. ഗുഡിമംഗലം, ഉദുമൽപേട്ട ബ്ലോക്കുകളിൽ വിളവെടുക്കുന്നതിന്റെ വലിയൊരുഭാഗം കേരളത്തിലേക്കായിരിക്കും കൊണ്ടുപോവുകയെന്നാണ് കർഷകർ പറയുന്നത്. ഇതിനകം തന്നെ കേരളവിപണികളിൽ വിൽക്കുന്ന വ്യാപാരികൾ, വിളവെടുപ്പ് ഘട്ടത്തിൽ കൃഷിയിടങ്ങളിൽ നേരിട്ടുവന്ന് കൊണ്ടുപോകാൻ താത്പര്യം അറിയിച്ചിട്ടുണ്ടെന്നും പറയുന്നു. തണ്ണിമത്തനിൽ 92 ശതമാനം വെള്ളവും വിറ്റാമിൻ-സി, പൊട്ടാസ്യം, ഇരുമ്പ്, മഗ്നീഷ്യം തുടങ്ങിയവയാൽ സമൃദ്ധമായതിനാലും വേനൽക്കാലത്ത് ആവശ്യക്കാരുള്ള പ്രധാന പഴങ്ങളിലൊന്നാണിത്.

കൗതുകകാഴ്ചയായി 16 അടി പൊക്കമുള്ള പച്ചമുളക് ചെടി

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സാധാരണ ഒരു പച്ചമുളക് ചെടിക്ക് എന്തു പൊക്കം കാണും? രണ്ടോ മൂന്നോ അടി. എന്നാല് പത്തനംതിട്ട ജില്ലയിലെ കല്ലൂപ്പാറ കടമാന്കുളം മേട്ടിന് പുറത്ത് ജെയിംസ് ഏബ്രഹാമിന്റെ മുറ്റത്തു വളര്ന്ന പച്ചമുളക് ചെടിക്ക് പൊക്കം 16 അടിയാണ്.

വീട്ടുമുറ്റത്തെ ഭീമന് പച്ചമുളകു ചെടിയൊന്നു കാണാന് കൃഷി പ്രേമികള് ധാരാളമെത്തുന്നുമുണ്ട്. കൗതുകകാഴ്ചയൊരുന്നുന്ന പച്ചമുളക് പ്രദേശവാസികളെയും കാര്ഷിക ശാസ്ത്രജ്ഞരെയുമെല്ലാം അത്ഭുതപ്പെടുത്തുകയാണ്.

കഴിഞ്ഞ ജൂണില് മല്ലപ്പള്ളി ചന്തയിലെ പച്ചക്കറിതൈ വില്പനകാരനില് നിന്നു വാങ്ങിയ തൈകള്ക്കൊപ്പമാണ് ഇതും കിട്ടിയത്. കാഴ്ചയില് പ്രത്യേകതകളൊന്നും തോന്നാത്തതിനാല് മറ്റു തൈകള്ക്കൊപ്പം വീടിനു സമീപം നട്ടു. സാധാരണ പരിചരണവും നല്കി. ഒരു ചെടിക്കു മാത്രം അസാധാരണ വളര്ച്ച കണ്ടതോടെ ജെയിംസിന് കൗതുകമായി. വീടിന്റെ ബീമില് വലിച്ചു കെട്ടിയും വലിയ താങ്ങുകാല് ഉപയോഗിച്ച് ഊന്നുകൊടുത്തും ചെടിയെ കേടുകൂടാതെ സംരക്ഷിച്ചു. വളര്ച്ച പോലെ ഉത്പാദനത്തിലും ചെടി ഉയര്ന്നു തന്നെ നില്ക്കുന്നു.

Health Tips : രാത്രി കിടക്കുന്നതിന് മുമ്പ് ഏലയ്ക്ക കഴിച്ചാലുള്ള ഗുണങ്ങൾ ഇവയൊക്കെയാണ്

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രുചിയും മണവും കൂട്ടാനായി ഭക്ഷണത്തിൽ നാം പതിവായി ഉപയോഗിക്കുന്ന സുന്ധവ്യഞ്ജനമാണ് ഏലയ്ക്ക. എന്നാൽ അതിലുപരി ഒരുപാട് ഔഷധ ഗുണങ്ങളുള്ള ഒന്നാണ് ഏലയ്ക്കയിൽ അടങ്ങിയിട്ടുണ്ട്.

ദിവസവും നിങ്ങൾ കഴിക്കുന്ന കറികളിലോ അല്ലെങ്കിൽ വെള്ളത്തിലോ അല്ലെങ്കിൽ ചായയിലോ രണ്ട് ഏലയ്ക്ക പൊടിച്ച് ചേർക്കുന്നത് നിരവധി ആരോഗ്യഗുണങ്ങളാണ് നൽകുക. ആന്റിഓക്സിഡന്റ്, ആന്റി -ഇൻഫ്ലമേറ്ററി ഗുണങ്ങളുള്ള ഏലയ്ക്ക വിവിധ ആരോഗ്യപ്രശ്നങ്ങൾ തടയുന്നതിന് സഹായകമാണ്. വിറ്റാമിനുകൾ, ധാതുക്കൾ എന്നിവയാൽ സമ്പന്നമാണ് ഏലയ്ക്ക.

ഉറങ്ങുന്നതിനുമുമ്പ് ഏലയ്ക്ക കഴിക്കുന്നത് പ്രത്യേകിച്ച് ഗുണം ചെയ്യും. കാരണം ഇത് ദഹനത്തെ സഹായിക്കുന്നു. ഉറക്കത്തിന്റെ ഗുണനിലവാരം മെച്ചപ്പെടുത്തുന്നതിനും സഹായകമാണെന്ന് പഠനങ്ങൾ പറയുന്നു.

ഏലം ഒരു സ്വാഭാവിക ദഹന സഹായമായി പ്രവർത്തിക്കുന്നു. ഇത് വയറുവേദന, ഗ്യാസ് ട്രബിൾ പോലുള്ള പ്രശ്നങ്ങൾ കുറയ്ക്കാൻ സഹായിക്കുന്നു. ഇത് ആസിഡ് റിഫ്ലക്സ്, ഓക്കാനം, ആമാശയത്തിലെ അസ്വസ്ഥതകൾ എന്നിവയ്ക്കുള്ള മികച്ച പ്രതിവിധി കൂടിയാണ്.

സമ്മർദ്ദം കുറയ്ക്കാനും മികച്ച ഉറക്കം നൽകാനും സഹായിക്കുന്ന സംയുക്തങ്ങൾ ഏലയ്ക്കയിൽ അടങ്ങിയിരിക്കുന്നു. ഉറങ്ങുന്നതിനുമുമ്പ് ഏലയ്ക്ക വെള്ളം കുടിക്കുന്നത് ഉറക്കമില്ലായ്മയെയും അസ്വസ്ഥതയും പരിഹരിക്കാൻ സഹായകമാണ്.

ഉറങ്ങുന്നതിനുമുമ്പ് ഏലയ്ക്ക കഴിക്കുന്നത് മെറ്റബോളിസം മെച്ചപ്പെടുത്താനും ശരീരത്തിലെ അധിക കൊഴുപ്പ് കുറയ്ക്കുന്നതിന് ഫലപ്രദമാണ്. കൂടാതെ, ഇത് രക്തത്തിലെ പഞ്ചസാരയുടെ അളവ് നിയന്ത്രിക്കാനും ശരീരഭാരം നിയന്ത്രിക്കുന്നതിനുള്ള മികച്ച പ്രതിവിധിയാണെന്ന് പഠനങ്ങൾ പറയുന്നു.

ഏലയ്ക്ക രക്തസമ്മർദ്ദം കുറയ്ക്കാനും രക്തചംക്രമണം മെച്ചപ്പെടുത്താനും ഹൃദയത്തിന്റെ ആയാസം കുറയ്ക്കാനും സഹായിക്കുന്നു. പതിവായി ഏലയ്ക്ക കഴിക്കുന്നത് കാലക്രമേണ ഹൃദയത്തെ ആരോഗ്യകരമായി നിലനിർത്താൻ സഹായിക്കും. ചുമ, ആസ്ത്മ തുടങ്ങിയ പ്രശ്നങ്ങൾ അലട്ടുന്നുണ്ടെങ്കിൽ ഏലയ്ക്ക വെള്ളം കുടിക്കാവുന്നതാണ്. ഏലയ്ക്കയ്ക്ക് ശ്വാസനാളം വൃത്തിയാക്കാനും രാത്രിയിൽ ശ്വസനം എളുപ്പമാക്കാനും കഴിയും.

ഏലയ്ക്ക ഇൻസുലിൻ സംവേദനക്ഷമത മെച്ചപ്പെടുത്തുകയും രക്തത്തിലെ പഞ്ചസാരയുടെ അളവ് സ്ഥിരപ്പെടുത്തുകയും ചെയ്യുന്നുവെന്ന് വിദഗ്ധർ പറയുന്നു. ഉറങ്ങുന്നതിനുമുമ്പ് ഇത് ഏലയ്ക്ക കഴിക്കുന്നത് രക്തത്തിലെ പഞ്ചസാരയുടെ അളവ് ഉയരുന്നത് തടയാൻ സഹായിക്കും.

ഇത് പ്രമേഹരോഗികൾക്കും ഇൻസുലിൻ പ്രതിരോധശേഷിയുള്ളവർക്കും ഗുണം ചെയ്യും. സമ്മർദ്ദത്തിന് കാരണമാകുന്ന ഹോർമോണായ കോർട്ടിസോളിന്റെ അളവ് സന്തുലിതമാക്കാൻ ഏലയ്ക്ക സഹായിക്കുന്നു.