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NEWS BULLETIN

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Tequila Bacteria Boosts Tomato Health and Soil Life Against Disease

CSIR-NBRI

30th April , 2024

Tomatoes are a staple in diets worldwide, but they face a formidable foe in Fusarium wilt disease, caused by the soilborne pathogen *Fusarium oxysporum*. This disease not only wreaks havoc on tomato plants but can also affect over 100 other plant species and even pose risks to human health in immune-compromised patients[2]. Researchers at the CSIR-National Botanical Research Institute



have made a significant breakthrough in the fight against this disease[1]. Their recent study provides hope for a sustainable solution to protect tomatoes and potentially other crops from the destructive pathogen.

The study focuses on a biological control agent, *Bacillus tequilensis* PBE-1, and its effects on tomato plants and soil microflora when under attack from Fusarium wilt. *B. tequilensis* PBE-1 is a type of beneficial bacteria that can help plants resist diseases. The researchers found that treating tomato plants with PBE-1 led to increased lignin deposition in the plants' cells, which serves as a barrier against the invading pathogen, thereby reducing cellular damage.

Metabolite profiling, which involves analyzing the chemical fingerprints that specific cellular processes leave behind, revealed that PBE-1 treatment helped alleviate the stress caused by *F. oxysporum* infection. This was evidenced by the improved transpiration, photosynthesis, and stomatal conductance in the tomato plants. Essentially, the plants could breathe, produce energy, and regulate water more effectively when treated with PBE-1.

Gene expression analysis using a technique called quantitative reverse transcription PCR

(qRT-PCR) showed that defense-related genes in the tomato plants were highly activated during *F. oxysporum* infection. These genes included *FLS2* and *SERK*, which are involved in the plant's immune response [3]. However, when PBE-1 was present, these genes were either downregulated or expressed at normal levels, suggesting that the plant did not perceive the bio-control agent as a threat, and it helped maintain the plant's normal metabolism and gene expression. An interesting aspect of the study was the examination of soil microflora, the community of microorganisms living in the soil around the plant roots. The researchers used a method called Average Well Colour Development (AWCD) to measure the activity of these microorganisms. They found that the soil microflora's activity increased over time following pathogen infection, with PBE-1 treatment leading to distinct patterns in the utilization of energy sources by the microbes, such as tannic and fumaric acids.

Further analysis through Principal Component Analysis (PCA) and diversity indices like McIntosh, Shannon, and Simpson revealed significant shifts in the microbial community composition over the study period. This is crucial because the soil microflora plays a vital role in plant health and soil fertility, and any treatment for plant diseases must not disrupt these beneficial communities. The incorporation of sugars in plant defense mechanisms has been previously suggested [4], and while the current study does not delve into this directly, the overall improvement of plant health with PBE-1 treatment may indirectly support the role of sugars in the plant's immune response by maintaining a healthier plant metabolism.

In conclusion, the study by the CSIR-National Botanical Research Institute demonstrates that *B. tequilensis* PBE-1 is not only effective in reducing the damage caused by Fusarium wilt in tomatoes but also does so without disturbing the ecological balance of the soil microflora. This positions PBE-1 as an ideal candidate for field application in the management of Fusarium wilt disease, offering a safer and potentially cheaper alternative to toxic agrochemicals. The findings also underscore the importance of a holistic approach to plant health, considering both the plant's internal defense mechanisms and the surrounding soil ecosystem.

Published in:

[Naturalsciencenews](https://www.naturalsciencenews.com)

Workshop on IPR, patent filing and drafting on Thursday

CSIR-NIIST

30th April , 2024

The National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, will host a workshop on 'IPR, Patent filing and drafting on Thursday in connection with World IPR Day celebrations.



GM Nair, President, Kerala Academy of Sciences, will inaugurate the one-day event at 9.30 am to be presided over C Anandharamakrishnan, Director, NIIST. An official spokesperson said here technical sessions will cover topics ranging from a general introduction to IPR and patent, patent filing procedures and patentability, patent search, drafting and case studies to strategies on intellectual property management.

Registrations may be made with RS Praveen Raj, Senior Principal Scientist, NIIST, on 9995632522 or by email praveenraj@niist.res.in.

Published in:

[Thehindubusinessline](https://www.thehindubusinessline.com)

Rethinking sizes

CSIR-CLRI

28th April , 2024

When the shoe does not fit, it's time to rethink size measures! And that's what is happening in India. There may soon be a new sizing system called 'Bha' to measure footwear for Indians. Currently Indians use Europeans standards to gauge sizes. The need for a local system for shoe sizes has arisen given the differences in the Indian population's foot shape and size.

Indian feet are flatter and wider. This was uncovered by a study conducted by The Council of Scientific and Industrial Research (CSIR) and the Central Leather Research Institute (CLRI) that surveyed over a lakh of people in 79 locations on the size, structure and dimension of an average Indian Foot. The survey found that most Indians wear a size larger since European footwear measures are narrower. The proposed 'Bha' system — that is likely to be out by 2025 — is being spearheaded by the Department of Promotion of Industry and Internal Trade (DPIIT) and the Bureau of Indian Standards (BIS). The expectation is that Indians will get better fitting footwear with the 'Bha' sizing.

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CFTRI Celebrates Women Achievers

CSIR-CFTRI

28th April , 2024

As part of International Women's Day 2024, CSIR-Central Food Technological Research Institute (CFTRI), Mysuru, celebrated "She Leads: Celebrating Women Achievers" function recently. International Women's Day theme for 2024 is 'Invest in Women: Accelerate progress.' Also, 'Inspire inclusion' is the campaign theme for Women's Day, which emphasises the importance of diversity and empowerment in all aspects of society.



Dr. S. Rathnamma, Research Associate, JSS, Mysuru and Prema N. Mahendrakar from Mysuru, were the chief guests. Dr. Sridevi Annapurna Singh, Director, CSIR-CFTRI, presided. Dr. Poornima Priyadarshini, Principal Scientist, CFTRI, welcomed.

One of the chief guests Dr. Rathnamma is the first woman from Soliga community in Karnataka to earn a Ph.D. She works with Sai Pragathi Foundation to educate tribals, empower women and organise vocational training for women. She also raises awareness about sickle cell disease, a genetic disorder that has killed many people in her tribal community.

Speaking about her childhood in forest, family history and coming over to Mysuru City for PU College and studies afterwards, Dr. Rathnamma said education can address many social issues among the State's forest tribes and also emphasised the importance of food and nutrition with respect to various indigenous leafy vegetables and tubers grown and available in the forest area. She also dwelt upon finger millet (ragi) and 10 varieties of it with reference to nutritional health aspect.

Prema, wife of late Dr. N. Mahendrakar, retd. Scientist & former Head, Meat Marine Sciences Dept., CFTRI, who lives in CFTRI Employees Layout, Bogadi, makes cloth bags (ANMOL) instead of plastic bags and distributes them to needy people. During Covid pandemic, she and her husband made cloth masks and distributed to retired staff and families in their layout.

Dr. Sridevi Annapurna Singh, the first woman Director of CSIR-CFTRI, spoke about how women should respect themselves and feel strong.

On the occasion, the Director felicitated both the chief guests Dr. Rathamma and Prema Mahendrakar, who are leaders and achievers in their fields. CFTRI also felicitated 4 women entrepreneurs — Manasa of Saakya Foods, Hampapura village, H.D. Kote taluk; Parvathi and Team of Asare Sanjeevini food products, Bilikere village, Hunsur taluk; G. Shilpa of Hamasavahini Eco Products, Mysuru; Anitha Sadanand of Mamma Mills, Himmavu village, Nanjangud taluk, who have taken CSIR-CFTRI technologies and these entrepreneurs spoke about their success about their products of millets and fruits especially banana and gave samples of their products to the guests.

The event concluded with vote of thanks by V. Vanajakshi.

CSIR-IIIM, NDTL Extend MoU On Collaborative Work

CSIR-IIIM

28th April , 2024

In their collective endeavour to work together to achieve excellence in the field of Dope Testing in Sports in India and to promote the Anti-Doping Science and Research in the country, CSIR-Indian Institute of Integrative Medicine (IIIM), Canal Road, Jammu and the National Dope Testing Laboratory (NDTL), Government of India on Saturday renewed their Memorandum of Understanding (MoU) for another three years.



Dr. Zabeer Ahmed, Director of CSIR-IIIM and Dr. Puran Lal Sahu, Director, NDTL New Delhi have signed the MoU on behalf of their respective institutes, for the continuance of their collaborative research and reference standard synthesis work for the next term.

While giving detail of the work to be done under the MoU, Dr. Zabeer said that in 2021, a groundbreaking scientific collaboration was initiated jointly by CSIR-IIIM and NDTL for the synthesis of reference standards and cells-based and pharmacokinetics studies on the metabolites with the main emphasis on the national goals in the area of Dope Testing and Global Positioning.

“Quite significant work was done during the initial phase of collaboration” he underlined and mentioned that to meet the pressing need for reference materials essential in accurately detecting and deterring prohibited substances in sports, CSIR-IIIM has accomplished the successful synthesis of multiple secondary metabolites intricately associated with substances banned by the World Anti-Doping Agency (WADA).

Dr. P.L. Sahu strongly advocated for future collaborations between CSIR-IIIM and NDTL, envisioning a roadmap for global projects aimed at advancing research in doping analysis. To achieve the excellence in the field of Dope Testing in Sports in India and to advance the Anti-Doping Science and Research in the country, he underscored the need to put together the expertise of both the partner institutions, offering substantial value in elucidating metabolic pathways and augmenting detection capabilities of drug in sports.

Dr. Qazi Naveed Ahmed, Head of the Natural Products and Microbial Chemistry (NPMC) Division attributed these accomplishments to the institute's leadership, which have elevated the institution's national standing in scientific and societal endeavors.

The MoU signing ceremony was witnessed by the notable dignitaries, including Er. Abdul Rahim (Chief Scientist & Head of the Research Management, Business Development and Information Sciences and Technology and Head of IIIM Srinagar Branch), Dr. Qazi Naveed Ahmed, Dr. Mir M. Asrar, Dr. Rajkishor Rai, Dr. Kapendra Sahu, Dr. Saurabh Saran, Dr. Sheena Mahajan, and Dr. Ashiq Hussain Padder.

Er. Abdul Rahim presented a vote of thanks.

Council of Scientific & Industrial Research (CSIR)-Indian Institute of Petroleum (IIP) celebrated its 65th Foundation Day

CSIR-IIP

27th April, 2024

Council of Scientific & Industrial Research (CSIR)-Indian Institute of Petroleum (IIP), Dehradun, celebrated its 65th Foundation Day on its campus today. It is a premier R&D organization established on 14th April 1960. Padma Bhushan Dr V K Saraswat, Hon'ble Member NITI Aayog and Mentor CSIR-IIP, graced the occasion as the Chief Guest. The celebration marked the institute's rich history of pioneering research, innovative technologies, and industry collaborations.



Dr V.K. Saraswat while speaking on the occasion congratulated the team CSIR-IIP and conveyed his best wishes on the 65th Foundation Day of the Institute. He also delivered a lecture on the "Energy Transition in India". In his talk, Dr Saraswat emphasized the cleaner and carbon-free technologies that will drive the world in the near future. He also invited scientists to undertake challenging research in e-Methanol and Green Hydrogen. The takeaway from the talk could be summarized as follows: For Indian technologies to remain competent around the globe, we need to start working on carbon neutrality rigorously.

Dr V.K. Saraswat also interacted with the scientific fraternity of CSIR-IIP. During the interaction, He praised the team of scientists, technicians, students, and staff, which added glory to the institute. The Director CSIR-IIP presented the roadmap of the institute from 2024 to 2030 to accomplish the Vikasit Bharat. Dr. Saraswat appraised the roadmap and proposed various suggestions for making it more beneficial to the nation.

Dr Harender Singh Bisht, Director CSIR-IIP, highlighted various achievements made by the institute during the last 64 years, which included the Numaligarh Wax Plant, Sustainable Aviation Fuel, US Grade Gasoline, Medical Oxygen Units, Sweetening Catalyst, PNG Burner, Improved Gur Bhatti etc to mention a few. The students and teachers from the Oak Grove School, Mussoorie, also attended the program as a part of the Jigyasa 2.0 program. The students visited various laboratories at the institute and interacted with the scientists and research scholars working in them. The motive of the Jigyasa 2.0 program is to inculcate scientific temperament among school-going kids so that they grow up as budding scientists in the country.

The celebration concluded with the vote of thanks delivered by Shri Anjum Sharma, Sr Controller of Administration CSIR-IIP. Team CSIR-IIP sincerely thanks all the individuals who provided unconditional support in making the program successful.

Geothermal energy resource potential map mooted

CSIR-NGRI

27th April , 2024

The necessity of developing a resource potential map for geothermal energy, the urgency to enhance survey activity for geothermal exploration; and initiating a pilot project to showcase the effectiveness of geothermal potential was emphasised by Ministry of Earth Sciences Secretary M. Ravichandran on Friday.

Participating in a brainstorming session on 'Geothermal Energy' organised by the CSIR-National Geophysical Research Institute (CSIR-NGRI) here, he said there is a need to evaluate technical feasibility and economic viability for the proposed work and called for robust collaborations among various entities, including national research institutes, State organisations, industries, and other relevant stakeholders.

Oil India Chairman and Managing Director Ranjith Rath advocated repurposing of existing deep bore wells originally drilled for hydrocarbon exploration to harness geothermal energy and establishing a steering committee to expedite geothermal energy-related initiatives.

ONGC-Energy Centre Director General Ravi shared insights into recent endeavours in Ladakh and explained about the ambitious plans to construct deep bores of 1 MW energy-generating wells.

CSIR-NGRI Director Prakash Kumar, chief scientist Abehy Ram Bansal, convenor BPK Patro, co-convenor Labani Ray and scientists from various institutions participated in the session, said a press release.

Published in:

[The Hindu](#)

CSIR-NEIST BioNEST's Ideathon Challenge to fuel innovation in NE

CSIR-NEIST

26th April , 2024

CSIR-North East Institute of Science and Technology (CSIR-NEIST BioNEST) has announced an Ideathon Challenge worth Rs. 8 lakh to support entrepreneurs and start-ups in the region.

The challenge, named 'Udyamita 1.0 – Empowering Innovation from NE India', is open to individuals or groups of individuals, entrepreneurs, early-stage start-ups, research scholars, scientists, students, faculties, and other professionals with a passion for problem-solving. The initiative is aimed at providing a platform for the growth of innovative ideas and business models in the sectors of food technology, nutraceutical, health technology, industrial biotechnology, green technology, agriculture, and other allied areas.

“Currently the entrepreneurial culture is gaining pace in Northeast India and as an incubation centre we would like the innovators of the region to make the most out of the resources of CSIR-NEIST,” said DipulKalita, Principal Investigator of CSIR-NEIST BioNEST.

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