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SCIENCE & TECHNOLOGY

CSIR-CSIO develops affordable, high-power lens for visually impaired.

Compared to conventional spherical glass-based lenses, these aspheric LVAs are 60 per cent lighter and more powerful, offering better optical performance in terms of reduced aberrations and higher image quality

Some of the children who received low-vision aids (LVA) developed by CSIO.

The Central Scientific Instruments Organisation (CSIO), Chandigarh, has developed high-powered aspheric lens-based spectacles, known as Low-Vision Aids (LVA), to provide an affordable assistive device for patients suffering from severe or functional low vision (FLV).

These lenses have been developed with different power combinations, such as +12D, +16D, +20D, and +26D, and can be customised for other power requirements depending on the patient's needs and extent of vision loss.

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Compared to conventional spherical glass-based lenses, these aspheric LVAs are 60 per cent lighter and more powerful, offering better optical performance in terms of reduced aberrations and higher image quality.

According to scientists at CSIO, "These lenses are like using a magnifying glass for people with extremely low vision." However, conventional lenses of such power would be extremely large and bulky, making LVAs a convenient option, especially for children.

The LVAs were launched at a function chaired by the President of India, Droupadi Murmu, during the National Awards for Empowering Divyangjans 2024, in New Delhi.

Scientists associated with the project explained that FLV is defined as impaired visual function that persists despite treatment or refractive correction. It can also be described as a visual acuity of less than 6/18 or a visual field less than 10 degrees from fixation.

According to estimates, the prevalence of FLV in India is estimated to be 1.05 per cent, affecting roughly 1.4 crore people.

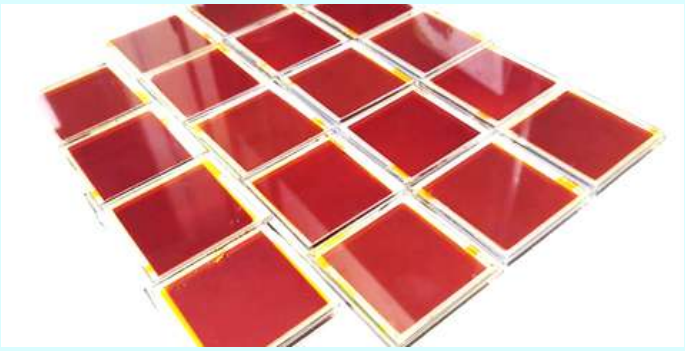
These LVAs have been fabricated using the single-point diamond turning process, an ultra-precision machining technique used for fabrication of aspheric lenses. User trials were carried out in collaboration with the Artificial Limbs Manufacturing Corporation of India, Kanpur, and the National Institute for the Empowerment of Persons with Visual Disabilities, Dehradun.

Plans are underway to scale up the manufacturing of these LVAs using moulding techniques, enabling rapid production and faster deployment among the affected population. The pricing for these lenses is also being worked out.

Source:https://www.tribuneindia.com/news/chandigarh/csio-develops-affordable-high-power-lens-for-visually-impaired/
Dated: December 3, 2024, Tribune News Service

Indian scientists develop 40%-efficient dye sensitzed solar cell for indoor applications

An India-based research team has boosted the power conversion efficiency and stability of indoor dye-sensitized solar cells based on co-sensitized organic dyes. The best indoor PV devices achieved 40% efficiency under 4000 lux fluorescent lighting and 10.40% under standard AM 1.5G one sun illumination.



CSIR National Institute for Interdisciplinary Science and Technology (CSIR-NIIST)

A group of scientists led by India's National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) claims to have boosted the stability and efficiency of dye-sensitized solar cells for indoor PV applications.

This type of solar cell, which is also known as a Grätzel solar cell, named after its inventor, EPFL Professor Michael Grätzel, is used for powering electronic devices such as wireless sensors or Internet-of-things, with indoor light.

"Our study introduces a significant advancement in dye-sensitized solar cells (DSCs) by utilizing starburst triphenylamine dye cocktails with a rigid, triple-bond conjugated π-backbone. This molecular design enhances light-harvesting capabilities in the visible region, providing an excellent overlap with indoor light spectra," Suraj Soman, the research's corresponding author, told pv magazine, noting that the design incorporated an asymmetric dual-species copper(II/I) electrolyte that had been introduced in earlier published research by the group.

The team developed the cell with a novel starburst triphenylamine sensitizer (RJ-C6) that was combined with XY1b dye and its own asymmetric dual-species copper(II/I) electrolyte. "The precise structural design of the dyes fosters synergistic effects, allowing for efficient molecular packing, enhanced dye loading, and improved visible light absorption," Soman went on to say. "Furthermore, this configuration creates a robust barrier against back electron transfer and recombination."

The most challenging aspect of the research was identifying the ideal combination of dyes for co-sensitization. "Small variations in molecular structures, such as altering alkyl chain lengths or incorporating triple bonds, can profoundly affect photovoltaic performance under low-intensity indoor light. Achieving optimal dye packing on the semiconductor (TiO_2) is critical," said Soman.

Source:https://www.pv-magazine.com/2024/12/02/indian-scientists-develop-40-efficient-dye-sensitzed-solar-cell-for-indoor-applications/
Dated: December 2, 2024, pv-magazine.com

SCIENCE & TECHNOLOGY

ISRO successfully executes SpaDeX docking experiment; India joins elite club of nations

The SpaDeX mission is an important project by ISRO which is designed to develop and demonstrate the technology needed for spacecraft rendezvous, docking and undocking using two small satellites.

Dr. V. Narayanan, Secretary DOS, Chairman Space Commission and Chairman ISRO

The Indian Space Research Organisation (ISRO) has successfully executed the SpaDeX docking experiment making India the fourth country after the USA, Russia and China this historic feat.

The two satellites SDX01 (Chaser) and SDX02 (Target) which were launched by the PSLV C60 on December 30, 2024, successfully docked as the space agency officials from the Mission Operations Complex (MOX) at ISRO Telemetry, Tracking, and Command Network (ISTRAC) oversaw the complex docking procedure.

“Docking Success Spacecraft docking successfully completed! A historic moment. Let’s walk through the SpaDeX docking process: Manoeuvre from 15m to 3m hold point completed. Docking initiated with precision, leading to successful spacecraft capture. Retraction completed smoothly, followed by rigidisation for stability. Docking successfully completed. India became the 4th country to achieve successful Space Docking. Congratulations to the entire team! Congratulations to India!,” ISRO posted on X.

ISRO further added that post docking, control of two satellites as a single object is successful. “Undocking and power transfer checks to follow in coming days,” ISRO said.

The SpaDeX mission is an important project by ISRO which is designed to develop and demonstrate the technology needed for spacecraft rendezvous, docking and undocking using two small satellites.

Source:https://www.thehindu.com/sci-tech/science/isro-successfully-executes-spadex-docking-experiment-india-joins-elite-club-of-nations/article69103462.ece
Dated: January 16, 2025, The Hindu

CMFRI decodes genetic blueprint of Indian squid

Squids are known for their advanced nervous system, exceptional problem-solving skills, and complex behaviours like camouflage and jet propulsions.

The ICAR-Central Marine Fisheries Research Institute (CMFRI) has successfully decoded the gene expression pattern of Indian squid (*Uroteuthis duvaucelii*) which will have major implications for various fields ranging from neuroscience to environmental science.

The institute, in a release, said that the significant achievement has revealed interesting insights into genetic similarity with humans and deeper evolutionary connections.

"With a surprising lead into intelligence and brain development, the study extends beyond marine biology and has monumental implications for fields ranging from neuroscience to environmental science," the release said. The study was carried out by a team under the leadership of Sandhya Sukumaran, Principal Scientist at Marine Biotechnology, Fish Nutrition and Health Division of CMFRI. Squids are known for their advanced nervous system, exceptional problem-solving skills, and complex behaviours like camouflage and jet propulsions, it said.

"This study decoded the gene expression profiles of this intelligent creature which revealed its genetic similarities with higher vertebrates such as fish and humans suggesting evolutionary connections," Sukumaran said, according to the release. She further said that understanding the squid’s intricate brain development could offer ground-breaking insights into neurobiology, intelligence, and the evolution of the complex nervous system.

The research further unearthed vital information that could enhance studies on neutral circuits, learning memory and even neurological diseases. "With this study, Indian squid has been proved to be a key model organism for understanding the evolution of intelligence and brain development across species," Sukumaran is quoted as having said.

Source:https://www.thehindu.com/sci-tech/science/cmfri-decodes-genetic-blueprint-of-indian-squid/article69154785.ece
Dated: January 29, 2025, The Hindu

ENVIRONMENT

Bird survey on Wayanad sky islands records 144 species

Banasura Chialappan

A three-day avian survey, organised by the South Wayanad and North Wayanad forest divisions and Aralam Wildlife Sanctuary in Kannur in association with the Hume Centre for Ecology and Wildlife Biology across the sky islands in the region revealed that the islands in the landscape played host to an array of avian wonders.

According to preliminary findings, the survey recorded an astonishing 144 bird species, including the elusive Hume's Warbler, Nilgiri Sholakili, Eurasian Crag Martin, and the critically endangered Red-headed Vulture and recently described Banasura Chilappan.

The survey, which commenced from an elevation of 1,200 metres above sea level, traversed fifteen sky islands in the Western Ghats, stretching from the southern tip of Wayanad to Ambalapara, bordering the Aaralam Wildlife Sanctuary in Kannur district and Brahmagiri sanctuary in Coorg district of Karnataka.

"The discovery of these rare bird species underscores the importance of conserving Wayanad's unique mountain ecosystem," says C.K. Vishnudas, Director of the Hume Center.

Mr. Vishnudas said that the sky islands of Wayanad were the habitat of the endangered Banasura Chilappan, an endemic bird recently discovered from the mountain peaks of Wayanad. "As none of these areas fall in any protective category, it is important to take immediate steps to declare the Banasura Chilappan National Park covering the entire Camel Hump mountain ranges," he added.

South Wayanad Divisional Forest Officer (DFO) Ajith K. Raman inaugurated the survey.

A rare congregation of as many as 60 Olive-backed Pipit, a migratory bird, atop the Kurichiar Mala in the district was an unusual treat for the birders.

As many as 55 bird enthusiasts from across the State and Mumbai took part in the survey. While Mr. Raman and Martin Lowel, DFO, North Wayanad, coordinated the survey in South and North Wayanad forest divisions, G. Pradeep, warden, and Remya, forest range officer of the Aralam Wildlife Sanctuary, coordinated Amabalappara mountain camps during the survey.

Source:https://www.thehindu.com/sci-tech/energy-and-environment/bird-survey-on-wayanad-sky-islands-records-144-species/article69123943.ece
Dated: January 22, 2025, The Hindu

New infectious diseases among bees threaten world's economies

More than 75% of food crops, fruits, and flowering plants need bees, wasps, beetles, flies, moths, and butterflies to yield successful harvests

A western honey bee rests on a clover flower in Frankfurt, Germany, July 12, 2024

A significant chunk of the world's agricultural productivity and nutritional security relies on small insect pollinators. More than 75% of food crops, fruits, and flowering plants need bees, wasps, beetles, flies, moths, and butterflies to yield successful harvests.

This is why threats to insect pollinators, including pesticides, pollution, and climate change, endanger the economies of entire countries. A new actor on this list is infectious diseases made worse by habitat loss.

While the declining populations of pollinators, particularly bees, has been well-documented in Europe and North America, data from biodiversity-rich regions like the Indian subcontinent are scarce. In fact, most of what scientists know about bees comes from research on managed western honey bees (*Apis mellifera*).

Diversity is better, again

"In many cases, wild bees are more efficient pollinators than the western honey bees. It is essential to study wild bee communities and look at their state of health," Corina Maurer, a postdoctoral researcher at ETH Zürich, wrote in an email to this reporter.

Research has uncovered the transmission of pathogens between managed honey bees and wild pollinators, a process called pathogen spillover and spillback. Western honey bees are often viral reservoirs and can infect wild species when they share habitats. These emerging infectious diseases also threaten the wider pollinator community.

Maurer and her team recently published a paper in Nature Ecology and Evolution exploring the presence of deformed wing virus and black queen virus in 19 wild bee and hoverfly species across different landscapes in Switzerland. They found higher loads of these pathogens in wild pollinators that used floral resources the honey bees accessed as well. The loads were 10-times higher among the wild pollinators in these shared habitats.

Source:https://www.thehindu.com/sci-tech/science/emerging-infectious-diseases-bees-habitat-loss-food-economies/article68878421.ece
Dated: November 18, 2024, The Hindu

ENVIRONMENT

23 species of blood-sucking flies recorded in Andaman & Nicobar Islands

These insects, 13 species of which have been reported in India for the first time, are more like mosquitoes in their feeding habits

Newly recorded blood-sucking flies from the Andaman and Nicobar Islands

Researchers from the Zoological Survey of India (ZSI) have identified 23 species of blood-sucking flies, 13 of them recorded for the first time in the country, in the Andaman and Nicobar Islands.

These tiny insects, also called midges, are similar in appearance to flies but are more closely related to mosquitoes in their feeding habits. Belonging to the Culicoides genus, they are locally called bhusi flies.

The findings were published in the latest issue of the international journal Parasites and Vectors, marking the first comprehensive survey of these insects in the archipelago. The authors of the study are Koustav Mukherjee, Surajit Kar, Atanu Naskar, Chandrakasan Sivaperuman, and ZSI Director Dhriti Banerjee.

According to the study, these flies feed on the blood of livestock such as sheep, goats, and cattle, as well as wild animals like deer. Of particular concern are five species known to transmit the bluetongue disease virus, a condition that can be fatal to livestock.

Bluetongue disease manifests through symptoms including blue discolouration of the tongue, fever, facial swelling, and excessive salivation. It can potentially lead to death in affected animals and poses a significant threat to livestock farming and the agricultural economy.

“The presence of multiple Culicoides species, particularly those responsible for the bluetongue virus transmission, necessitates regular surveillance and appropriate control measures in the Andaman and Nicobar Islands. This is especially crucial given the region’s importance as a major tourist destination,” Dr Banerjee said.

The study, conducted in 2022 and 2023, revealed that 17 of the 23 species identified are known to bite humans, although no human disease transmission has been reported. “A systematic survey of the entire archipelago is needed to understand the role of these insects in disease transmission,” said Dr Naskar, the officer in charge of ZSI’s Diptera section.

Source:https://www.thehindu.com/sci-tech/science/23-species-of-blood-sucking-flies-recorded-in-andaman-nicobar-islands/article69115378.ece
Dated: January 19, 2025, The Hindu

Moving to a plant-based diet can mitigate climate change, research suggests

With 2024 being the hottest year on record to date, researchers across the globe are addressing the temperature rise by rethinking our food systems and encouraging the switch to a plant-based diet.

For the first time in history, the average global temperature rose to 1.6°C above preindustrial levels, exceeding the 1.5°C vital to preventing accelerating climate change. The effects of climate change are now more visible than ever on every continent.

A team of researchers have found that up to a third of global greenhouse gas production to date can be attributed to animal agriculture and food systems. Yet, most climate change solutions neglect the impact of food systems.

Their study, "Solving climate change requires changing our food systems," which appears in Oxford Open Climate Change, proposes that the pressing nature of irreversible climate change effects requires rethinking our food systems.

Professor Andrew Knight, co-author and Adjust Professor at Murdoch University's School of Veterinary Medicine, said climate change is a major threat to much of life on Earth, including ourselves.

"Animal agriculture is a major emitter of greenhouse gases, and a major cause of deforestation and freshwater use. Yet—compared to smaller emitters, such as the transportation sector—it has received shockingly little attention," he said.

"Emissions from animal agriculture are so large that we cannot effectively slow climate change and environmental degradation by ignoring them. We simply must transition our societies towards more sustainable, plant-based diets," says Professor Andrew Knight.

Source:https://phys.org/news/2025-01-based-diet-mitigate-climate.html
Dated: January 17, 2025, phys.org

ENVIRONMENT

Study reveals how 3D environments affect bacterial growth and survival

For over 300 years, scientists have primarily studied bacteria using liquid cultures or flat 2D plates in laboratory settings

National Centre for Biological Sciences, Bengaluru.

A new study from the National Centre for Biological Sciences (NCBS) has shed light on how three-dimensional (3D) environments influence bacterial growth and survival. By creating 3D models that mimic natural settings like mucus and soil, researchers discovered that the shape of bacteria plays a critical role in their ability to thrive in complex environments.

For over 300 years, scientists have primarily studied bacteria using liquid cultures or flat 2D plates in laboratory settings. “While this is convenient and has been invaluable for biological research, it does not reflect natural 3D environments like soil, mucus, or plant and animal tissues. As a result, little is known about bacterial growth in these complex settings with varying material properties,” NCBS said.

Shaping bacterial survival

Sreepadmanabh M., the study’s lead author, emphasised the significance of environmental factors: “From decades of past research using simple liquid or flat plates, we have learnt that mutations, chemical signals, and behavioural patterns all affect bacterial physiology. But bacteria inhabit a wide range of environments — from the soil beneath our feet to the mucus lining of our guts. So, we wondered how would such physical differences in their environment impact their survival?”

Replicating environment

To mimic the mechanical properties of mucus in the lab, the researchers used Carbomer, a common thickening agent found in creams and gels. This allowed them to create a 3D model that replicated the viscosity, stiffness, and porosity of mucus, while remaining optically transparent for detailed visualization of bacterial cells and colonies.

Source:https://www.thehindu.com/sci-tech/science/study-reveals-how-3d-environments-affect-bacterial-growth-and-survival/article68859676.ece
Dated: November 13, 2024, The Hindu

Mountaineers help scientists find nanoplastics in remote glaciers

Are you thinking "glittering snow" or "plastic pollution?" A new study underscores the pervasive nature of plastic pollution, even in such remote and apparently pristine areas.

In a new study published in Scientific Reports that used a citizen science approach, scientists have worked with trained mountaineers to sample surface snow in otherwise inaccessible areas.

Tire wear particles in the snow
Nanoplastics were found in 5 out of 14 high-altitude glacier sites, with concentrations ranging from 2 to 80 nanograms per milliliter of snow. The most common kinds of nanoplastics detected were tire wear particles (41%), polystyrene (28%), and polyethylene (12%).

Earlier studies have also found evidence of microplastics in remote and high-altitude environments across the world. And where there are microplastics, there are bound to be nanoplastics as well. On addition, atmospheric transport is already known to bring microplastics to remote regions; this is likely to be even more significant for nanoplastics due to their smaller size and weight.

Tracking backwards
One of the scientists working with atmospheric transport of nanoplastics in the study is senior scientist Nikolaos Evangeliou at NILU. "To simulate how the nanoplastic particles traveled through the air to the sampling sites, we used a so-called Lagrangian dispersion model. Thus, we found that their primary sources were regions west of the Alps, including France, Spain, and Switzerland," Evangeliou says.

Nanoplastics may be 'everywhere'
According to Evangeliou, finding nanoplastics in remote glaciers is not surprising. "Our findings merely show that plastic pollution on a micro- and nano scale may be more widespread than earlier assumed. Due to their minuscule size, these particles have large potential to be transported through the atmosphere over long distances, contributing to global pollution," he explains. Future studies will include more comprehensive sampling and analysis techniques to better understand the distribution and sources of nanoplastics.

Source:https://phys.org/news/2025-01-mountaineers-scientists-nanoplastics-remote-glaciers.html
Dated: January 20, 2025, The Hindu

AGRICULTURE

Centre launches scheme to promote natural farming

The NMNF will be a standalone centrally-sponsored scheme under the Ministry of Agriculture and it will have a total outlay of ₹2,481 crore

Centre launched the National Mission on Natural Farming

To promote its pet project of natural farming, the Centre on (November 25, 2024) launched the National Mission on Natural Farming (NMNF). The Union Cabinet, which approved the decision here, said in a release that the NMNF will be a standalone centrally-sponsored scheme under the Ministry of Agriculture and it will have a total outlay of ₹2,481 crore.

Of this, ₹1,584 crore will be the Centre's share and the States will contribute ₹897 crore till the 15th Finance Commission (2025-26). The Centre said NMNF will promote natural farming in mission mode across the country. "Rooted in the traditional knowledge inherited from their forefathers, farmers will practise Natural Farming (NF) as a chemical free farming which involves local livestock integrated natural farming methods, diversified crop systems, etc. NF follows local agro-ecological principles rooted in local knowledge, location specific technologies and is evolved as per the local agro-ecology," the government release added.

The NMNF will also promote natural farming practices for providing safe and nutritious food for all. "The Mission is designed to support farmers to reduce input cost of cultivation and dependency to externally purchased inputs. Natural farming will build and maintain healthy soil ecosystems, promote biodiversity and encourage diverse cropping systems to enhance resilience as suitable to the local agroecology are the benefits of natural farming," the release added.

In the next two years, NMNF will be implemented in 15,000 clusters in Gram Panchayats. The Centre's aim is to reach one crore farmers and initiate natural farming in an area of 7.5 lakh hectares. "The willing farmers will be trained in Model Demonstration Farms on the natural farming package of practices, preparation of natural farming inputs, etc. near their villages in Krishi Vigyan Kendras (KVKs), Agriculture Universities and practising natual farming farmers' fields," the release added.

Source:https://www.thehindu.com/news/national/centre-launches-scheme-to-promote-natural-farming/article68911599.ece
Dated: November 26, 2024, The Hindu

Hyd co partners with CSIR to innovate sustainable bioplastics from agricultural waste

Greenworksbio, a Hyderabad-based sustainable packaging solutions provider, has joined hands with the Council of Scientific and Industrial Research – Indian Institute of Chemical Technology (CSIR-IICT) to develop sustainable, high-performance bioplastics and their composites using agricultural waste.

The strategic collaboration leverages advanced research and innovation to harness nanocellulose and starch-based compostable plastics derived from renewable resources, including agricultural residues and biomass, to offer eco-friendly alternatives to conventional single use plastics, said the company, which is promoted by the kin of Apollo Hospitals group promoters.

Through the joint development of advanced mechano-chemical processing techniques, renewable resources are transformed into reinforced thermoplastic starch (R-TPS) and cellulose-derived composites that exhibit exceptional mechanical strength, superior barrier properties, and enhanced thermal resistance, Greenworksbio managing director Rishika Reddy said.

The collaboration also successfully developed reinforced biocomposites, which are blends of biodegradable polymers such as polylactic acid (PLA), polyhydroxyalkanoates (PHA), polybutylene succinate (PBS), polybutylene adipate terephthalate (PBAT), and starch, and are further optimised with nano-cellulose reinforcements. "These biocomposites demonstrate remarkable tensile strength, reduced sensitivity to moisture, and enhanced compostability. These properties make them ideal for applications such as packaging, carry bags, waste collection bags, agricultural films, and much more," she explained.

She said the products being developed as a result of this collaboration have a high loadbearing capacity but are thinner, reducing material usage, and have improved transparency. "These products achieve over 90% biodegradation within 180 days under composting conditions, adhering to ISO/IS 17088 standards. They are licensed by the Central Pollution Control Board (CPCB), ensuring compliance with regulatory frameworks and can help reduce environmental waste significantly," she added. Greenworksbio already set up a 1,000 metric tonnes per month facility at the medical devices park at Sultanpur where it will make compostable granules, eco-friendly tableware, sustainable hygiene solutions, among others, she said.

Source:https://www.csir.res.in/sites/default/files/2025-01/06_to_10_december_2024.pdf
Dated: December 10, 2024 , CSIR News Bulletin

International scientists unveil genetic insights in largest ever wheat genome sequencing project

An international team of scientists from Australia and China has uncovered crucial genetic and genomic insights in the most comprehensive wheat genome sequencing and assembly project ever conducted. The groundbreaking study, published in Nature, addresses critical questions about wheat's evolution and lays a strong foundation for future genome references and global breeding programs.

Led by scientists from the Centre for Crop and Food Innovation (CCFI) at Murdoch University, the Chinese Academy of Agricultural Sciences (CAAS), and China Agricultural University (CAU), the four-year project successfully assembled 17 high-quality wheat genome references. This effort identified 250,000 structural variations that determine key traits, including environmental adaptation, disease resistance, and dietary preferences.

The research team included representative wheat varieties spanning 70 years, uncovering valuable insights into how wheat has influenced food culture and habits. The study also revealed how wheat evolved from a spring-grown crop to one capable of thriving in winter—a transformation closely tied to climate change over the past century.

Importantly, the researchers identified genes responsible for novel disease resistance and environmental adaptation. These findings provide essential tools to enhance future breeding programs. "We have created the most detailed resource for wheat genetic and genomic information, offering fascinating insights into its origins, evolution, and impact on human culture," said Professor Rajeev Varshney, co-lead of the study and Director of CCFI.

"For example, we now know that wheat's shift from a spring to a winter crop, a question that puzzled researchers for years, is closely linked to climatic changes. Additionally, we discovered that a genetic region previously considered a 'dead zone' plays a crucial role in variety differentiation. Structural variations in the proximal region of the centromere reduce cross-recombinations between varieties, enabling faster integration of superior genes," Professor Varshney explained.

Source: https://agriculturepost.com/agri-research/international-scientists-unveil-genetic-insights-in-largest-ever-wheat-genome-sequencing-project/
Dated: November 20, 2024, https://phys.org/

Keep the bran on millets to retain health benefits: study

Removing the bran from millets -- dehusking -- could squander away the benefits of eating them, say the authors who studied five small Indian millets: foxtail, little, kodo, barnyard, and proso

Foxtail millet ready for harvest at a farm in Dindigul district

Removing the bran from millets results in decreasing the protein, dietary fibre, fat, mineral and phytate content in them, while increasing the carbohydrates and amylose content, a recent paper in the peer-reviewed journal Nature Springer has shown. This removal could squander away the benefits of eating millets.

The article, 'Impact of debranning on the nutritional, cooking, microstructural characteristics of five Indian small millets', by Shanmugam Shobana etal makes a case for consuming millets as whole grains without de-branning. "Dehusked millets are nutritious and should be promoted in Indian diets to improve diet quality, debranned millets are nutritionally inferior, can increase the glycemic load of Indian diets", the authors say. The study was conducted by the department of Madras Diabetes Research Foundation (MDRF), Chennai, and the Indian Institute of Millet Research, (IIMR) Hyderabad.

High in minerals

Millets are high in minerals such as calcium, iron, phosphorus, and potassium, and they are an excellent source of phyto-chemicals such as phenolic compounds when compared to other major cereals (rice, wheat, maize), conferring a range of health benefits such as antiaging, anticarcinogenic, anti-atherosclerogenic, antibacterial, and antioxidant effects. The Food and Agriculture Organization (FAO) recognised 2023 as the International Year of Millets and the Indian government went all out to celebrate it.

Dr. Shobana says: "We did a small market survey in 2018, and found that millets, polished like white rice, were being sold in stores. There are differences between polished millets and whole grains, in terms of colour and texture, but if you are buying packaged products, it is difficult to tell." This particular study looked at the smaller millets — foxtail, little, kodo, barnyard, and proso.

Source:https://www.thehindu.com/sci-tech/agriculture/keep-the-bran-on-millets-to-retain-health-benefits-study/article68841361.ece
Dated: November 08, 2024, The Hindu

HEALTH

Gene mutation likely cause of autism in early childhood RGCB Study

Autism, a developmental disorder that causes functional abnormalities in brain development, is influenced by a combination of genetic and environmental factors, with symptoms appearing in early childhood, according to a study by the Rajiv Gandhi Centre for Biotechnology.

The complexities of Autism Spectrum Disorder (ASD) include single-gene mutations in early developmental genes, with symptoms often manifesting as early as the age of two, the study noted, as per an RGCB release.

The latest study, led by Dr Jackson James and his team at BRIC-RGCB, has been published in the prestigious journal iScience.

The research identified a novel mutation in the Tlx3 gene linked to abnormal cerebellum development—a major region of the hindbrain responsible for balance, motor coordination, and other complex functions—and autism, the release said.

The study demonstrated that deleting the Tlx3 gene in the cerebellum of a transgenic mouse embryo (genetically modified through engineering techniques) disrupts cerebellar function. When these embryos were allowed to develop into adulthood, the mice exhibited hallmark autistic traits, including social skill deficits, repetitive behaviours, and motor function abnormalities, the release added.

In collaboration with the Council of Scientific and Industrial Research–Institute of Genomics and Integrative Biology (CSIR-IGIB), New Delhi, the RGCB team assessed the prevalence of this mutation in humans. They identified TLX3 mutation variants linked to nine ASD cases and other co-morbid neurodevelopmental conditions.

Dr James emphasised the need for a genome-wide global cohort analysis to determine the frequency of this TLX3 mutation and its association with specific populations, such as Indians and others. These findings highlight how dysregulation of this embryonic gene contributes to ASD in early childhood, the release said.

RGCB Director Prof Chandrabhas Narayana stated, "Autism is a serious childhood issue worldwide. In India, it has also emerged as a significant challenge for researchers and the medical fraternity due to its wide social and medical ramifications. The RGCB study provides new insights into this behavioural disorder."

Source:https://www.theweek.in/wire-updates/national/2024/12/09/mes11-kl-autism-rgcb-study.html
Dated: December 09, 2024 , The Week

Global study estimates Vitamin D as most common deficiency in diabetics, magnesium second-most

Women with diabetes were found to be at a higher risk of micronutrient deficits, also termed “hidden hunger”, compared to men, the researchers found

Vitamin D is the most common deficiency, affecting over 60 per cent of people with diabetes, according to a global analysis published in the British Medical Journal (BMJ) Nutrition, Prevention & Health.

The analysis, based on 132 studies conducted between 1998 and 2023 involving more than 52,000 participants, also found that magnesium deficiency affects 42 per cent of people with diabetes, while 28 per cent suffer from iron deficiency.

Researchers, including those from the Indian Institute of Health Management Research (IIHMR), Rajasthan, said that the study helps assess the global prevalence of micronutrient deficiency -- whereby levels of vitamins and minerals essential for healthy bodily function are far too low -- in people with type 2 diabetes.

Women with diabetes were found to be at a higher risk of micronutrient deficits, also termed "hidden hunger," compared to men, the team found. The authors explained that risk factors for developing diabetes include genetic tendencies, along with environmental factors, such as a sedentary lifestyle, unhealthy diet and obesity.

Studies have shown that micronutrients have a key role in the development of diabetes, by affecting how glucose is metabolised and insulin pathways. However, this study was aimed to resolve conflicting evidence from previous studies that mainly focused on one specific micronutrient, the authors said.

"The pooled prevalence of multiple micronutrient deficiency (vitamins, minerals and electrolytes) was 45.30 per cent among T2D patients," they wrote. Further, the prevalence was found to be higher in women with the condition -- at nearly 49 per cent -- compared to men.

The analysis also found that vitamin B12 deficiency affects 29 per cent of diabetes patients globally and is even higher among those taking metformin, a common anti-diabetes drug.

Source:https://www.thehindu.com/sci-tech/health/global-study-estimates-vitamin-d-as-most-common-deficiency-in-diabetics-magnesium-second-most/article69154347.ece
Dated: January 29, 2025 , The Hindu

HEALTH

Study finds link between smartphone use and mental health of adolescents

Although numerous factors have traditionally been identified as drivers of poor mental health, one key change in the younger generations is the arrival of smartphones, which were introduced in 2008, coinciding with the onset of rising mental health problems

A survey of over 10,000 adolescents (13-17 years) in the United States and India has revealed that mental well-being is closely linked with earlier age of initiation of mobile phones usage, and could decline significantly with each younger year of age.

Sapien Labs' report titled The Youth Mind: Rising Aggression and Anger, documented the responses of 10,475 Internet-enabled adolescents across India and the United States in 2024. Although numerous factors have traditionally been identified as drivers of poor mental health, one key change in the younger generations is the arrival of smartphones, which were introduced in 2008, coinciding with the onset of rising mental health problems.

The report highlighted key trends, with a particular focus on rising feelings of aggression, anger, irritability, and hallucinations in this age group. The decline in mind health is characterised not only by sadness and anxiety but also by new symptoms, including unwanted thoughts and a sense of being detached from reality. Highlighting the differences between the American and Indian cohorts, Tara Thiagarajan, neuroscientist with Sapien Labs, said the pace of deterioration of mental well-being is slower in India. "While the overall decline in mental well-being in younger ages is strongly present for males and females in the U.S., it is only present for females in India and not in males (where only select aspects deteriorated, while others improved). Even for females, it (the overall decline in mental well-being) is not as steep in India," Dr. Thiagarajan said.

"On the other hand, both adolescent males and females in India have worse mental well-being on the whole, than their counterparts in the U.S. While aggression, anger and hallucinations are consistently related to the age of smartphone initiation for both U.S. and Indian females, for girls in India, getting their phones very young is more likely to result in increased sleep and health problems as adults," she said.

Source:https://www.thehindu.com/sci-tech/health/establishing-the-link-between-smartphone-use-and-adolescents-mental-health/article69137308.ece
Dated: January 25, 2025, The Hindu

The hidden dangers of Rhodamine B: a global and local perspective

Rhodamine B is a synthetic dye known for its bright pink hue, commonly utilised in industries such as textiles, paper, and leather; however, its use in consumable products is fraught with health risks

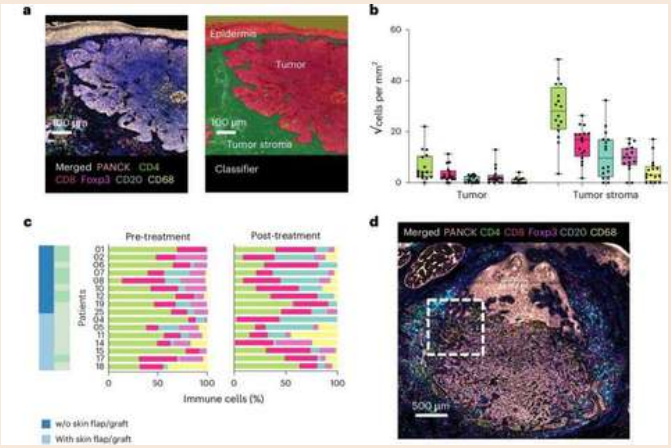
Imagine indulging in an appetizing looking, sweet treat, only to discover it contains a dye primarily used in textiles and linked to cancer. This alarming reality has prompted significant health interventions worldwide, including recent decisive actions in India. Rhodamine B is a synthetic dye known for its bright pink hue, commonly utilised in industries such as textiles, paper, and leather. Its application extends to scientific research due to its fluorescent properties. However, its use in consumable products is fraught with health risks. Studies have indicated that Rhodamine B can cause DNA damage, leading to mutations and potentially triggering cancerous growths. Animal research has demonstrated tumor development in organs like the liver and bladder following prolonged exposure to the dye.

Recognising its potential dangers, many countries have put in place strict regulations on use of Rhodamine B. In the United States, the Food and Drug Administration (FDA) has long prohibited its use in food products, classifying it as unsafe for human consumption. A recent ban issued by the FDA in January 2025 further reinforces these restrictions, prohibiting the use of Rhodamine B in any food-related applications due to increasing evidence of its carcinogenic properties. The FDA cited growing concerns over children's exposure to high levels of the dye in candies, baked goods, and other processed foods, prompting an urgent call for manufacturers to reformulate their products. This ban stems from studies indicating its potential carcinogenicity and other health risks. Similarly, the European Union classifies Rhodamine B as a substance of very high concern, restricting its use in cosmetics and other consumer goods.

Source:https://www.thehindu.com/sci-tech/health/the-hidden-dangers-of-rhodamine-b-a-global-and-local-perspective/article69131089.ece
Dated: January 24, 2025, The Hindu

HEALTH

Genetically modified virus therapy reduces tumor size and enhances surgical success in skin cancer study



Basal cell carcinomas, the most common form of skin cancer, occur in chronically sun-exposed areas such as the face. Locally advanced tumors in particular can be difficult to treat surgically. A research team from MedUni Vienna and University Hospital Vienna has now investigated the effectiveness of a new type of therapy and achieved promising results.

The active substance Talimogene Laherparepvec (TVEC) led to a reduction in the size of the basal cell carcinoma in all study participants, which not only improved surgical removal, but also led to a complete regression of the tumor in some of the patients. The study was published in the journal Nature Cancer.

In the study, TVEC was used, which has so far only been approved for the treatment of superficial melanoma metastases. TVEC is a genetically modified herpes simplex virus that specifically destroys tumor cells and simultaneously activates the immune system.

The aim of the study was to reduce the size of the tumor before a planned operation so that patients would not suffer any functional or cosmetic restrictions after the procedure. The study included 18 patients who would have required a flap or skin graft due to the size and localization of their basal cell carcinoma. They each received six intralesional injections of TVEC over a period of 13 weeks before the tumor was surgically removed.

"This enabled the tumor to be reduced in size in half of the patients to such an extent that surgery with direct wound closure was possible. In a third of the cases, the subsequent histological examination even showed no more living tumor cells. All treated tumors at least became smaller, and no tumor grew further under the therapy. The treatment was well tolerated by the patients," says the principal investigator Christoph Höller, Head of the Skin Tumor Centre at the Department of Dermatology, summarizing the results.

Source: https://medicalxpress.com/news/2025-01-genetically-virus-therapy-tumor-size.html
Dated: January 24, 2025, https://medicalxpress.com/

Newfound nerve-muscle crosstalk means exercise can help neurons grow

While the effects of exercise on our physical health are widely recognised, researchers hadn't explored the specific impact of exercise on neurons

Regular exercise is proven to be beneficial for our overall well-being. It strengthens our muscles, improves cardiovascular health, helps to maintain a healthy body weight, and can be considered an effective stress buster. But what if there is more? What if the benefits of exercise go beyond general health?

A recent study by engineers at the Massachusetts Institute of Technology (MIT), published in Advanced Healthcare Materials, has revealed that exercise may also stimulate the growth of neurons through its physical and biochemical effects. This finding can pave new pathways for reparative therapies and perhaps even cures for neurodegenerative disorders.

Nerve-muscle crosstalk

While the effects of exercise on our physical health, like strengthening muscles and supporting the immune system, are widely recognised, researchers haven't explored the specific impact of exercise on neurons (nerve cells).

Given the nerves control the movements of muscles and carry vital information all over the body, understanding the effects of neurons can lead to the development of plausible therapies for nerve injuries. In a November 2023 paper in the journal Biomaterials, researchers established a hint of a biochemical connection between muscle activity and nerve health. Ritu Raman, the Eugene Bell Career Development assistant professor of mechanical engineering at MIT, and her colleagues discovered that they could restore the mobility of mice by implanting muscle tissue at the site of a severe muscle injury and stimulating the new tissue using light.

While examining the graft, the researchers found the grafted muscle had produced certain biochemical signals that induced the growth and development of nerves and blood vessels.

Source:https://www.thehindu.com/sci-tech/science/newfound-nerve-muscle-crosstalk-means-exercise-can-help-neurons-grow/article69118443.ece
Dated: January 21, 2025 , The Hindu

Advancing Inclusive Education through South-South Cooperation in Nicaragua

In Nicaragua, children with disabilities have faced significant barriers in accessing quality education. Limited resources, infrastructure, and a lack of inclusive teaching practices have been challenges for these students, preventing them from reaching their full potential.

The pressing need to ensure that every child, regardless of ability, receives an equitable opportunity to learn and thrive has driven the Ministry of Education (MINED), with the support of UNICEF, to initiate transformative efforts. At the core of this mission lies the 'More Inclusion' Communication Strategy for Social and Behavioral Change, designed to foster the seamless integration of children with disabilities into the national education system.

"Our commitment extends beyond the confines of government institutions; it's about ensuring that individuals with disabilities are provided with the support they need," said H.E. Lilliam Herrera, Nicaragua's Minister of Education, underscoring the importance of this collaborative effort. "Together, we have made great strides, and our resolve remains unwavering. We will continue our efforts until Nicaragua sets a new benchmark for inclusivity."

The project, funded by the India-UN Development Partnership Fund managed by the United Nations Office for South-South Cooperation, represents a collaborative approach to overcoming these challenges. With an investment of US$1,200,000, it is strengthening institutional capacities and creating inclusive classrooms across Nicaragua's schools – ensuring that children, irrespective of their abilities, can learn and grow together.

The project's approach is built around the belief that enhancing institutional capacities, promoting inclusive teaching practices, and fostering a culture of community support can create a lasting impact on educational inclusivity. Central to this approach is the establishment of 15 prototype centers that embody the principles of Universal Design for Learning (UDL). These centers provide a blueprint for inclusive education, utilizing digital textbooks that incorporate sign language videos, audio support, and interactive exercises.

Source:https://unsouthsouth.org/2024/11/04/advancing-inclusive-education-through-south-south-cooperation-in-nicaragua/
Dated: November 4, 2024, https://unsouthsouth.org/

India-UN Fund: Vocational Training Strengthens Saint Lucia's Workforce

In Saint Lucia, high youth unemployment has posed significant challenges, contributing to social instability and limiting opportunities for young people.

Youth, in particular, face hurdles in accessing vocational training, making it difficult to gain the skills needed for stable employment. To address this issue, the India-UN Development Partnership Fund, alongside the International Labour Organization (ILO) and the Government of Saint Lucia, launched the project "Upgrading Saint Lucia's Capacity to Provide Impactful Vocational Training for Marginalized Youth."

Rooted in the principles of South-South cooperation to build mutual benefit, among others, this project aims to build pathways for Saint Lucian youth to acquire in-demand skills and access better job prospects. A major achievement of the initiative is the new hospitality and catering training facility at the Center for Adolescent Renewal and Education (C.A.R.E.) in Castries. "This is more than just a building; it's a symbol of our commitment to ensuring every young person in Saint Lucia has the chance to build a better future," said Prime Minister Hon. Phillip Pierre, highlighted the impact of the new facility.

Inaugurated in September 2024, this state-of-the-art center offers training programs that align with the needs of the local economy, particularly in the tourism sector, a key driver of Saint Lucia's growth.

The success of the C.A.R.E. vocational training center is a result of effective South-South cooperation. India's support, through financial contributions and shared expertise, played a crucial role in bringing this project to fruition. The partnership allowed for knowledge exchange and the adaptation of best practices to meet Saint Lucia's specific needs. Local support also played a key role, providing the land and overseeing the work; with the Department of Physical Development contributing technical expertise to ensure the project's success.

Source:https://unsouthsouth.org/2024/11/04/india-un-fund-vocational-training-strengthens-saint-lucias-workforce/
Dated: November 4, 2024, https://unsouthsouth.org

Small and Medium-sized Enterprises at the Forefront of South-South Trade

At the 7th China International Import Expo (CIIE) in Shanghai, the United Nations Office for South-South Cooperation (UNOSSC), in partnership with the International Trade Centre (ITC) and the CIIE Bureau, launched a report titled 'Unlocking Opportunities: SME Stories in South-South Trade Facilitation at CIIE'.

The launch, held at the ITC booth, brought together representatives from ITC, the CIIE Bureau, and small and medium-sized enterprises (SMEs) featured in the publication.

In her opening remarks, UNOSSC Director Dima Al-Khatib emphasized the critical role of SMEs in the global economy, noting that they represent approximately 90% of businesses worldwide and account for more than 50% of global employment.

She also highlighted UNOSSC's commitment to supporting SMEs, including a series of cross-border e-commerce seminars under the Global South-South Development Centre (GSSDC) Project, which has benefited policymakers and entrepreneurs from over 90 countries and territories. She further encouraged stakeholders to explore resources such as UNOSSC's South-South Galaxy platform and the newly launched Solutions Lab, designed to foster knowledge exchange and collaboration.

"The new report being launched today with the collection of success stories is illustrative evidence of the impact of South-South cooperation," said Director Dima Al-Khatib. "The publication showcases success stories of SMEs that have participated in CIIE, demonstrating the transformative impact of South-South trade platforms. Since 2018, ITC has supported nearly 300 SMEs from over 30 developing countries, including many from landlocked developing countries (LLDCs), participating at CIIE."

Source:https://unsouthsouth.org/2024/11/07/small-and-medium-sized-enterprises-at-the-forefront-of-south-south-trade/
Dated: November 7, 2024, https://unsouthsouth.org/

COP29: Catalyzing Impactful South-South and Triangular Cooperation Partnerships

A high-level global event focusing on leveraging UNOSSC's new South-South and Triangular Cooperation Solutions Lab to accelerate collaborative innovation and build coherent portfolios of new South-South and triangular cooperation solutions was held alongside COP29 in Baku, Azerbaijan.

The event aligned with the Lab's mission to address complex development challenges through co-design, incubation, financing and scaling of innovative solutions, all contributing to the 2030 Agenda for Sustainable Development. Current partners of the Lab (alphabetically) are: Gulf Organisation for Research and Development (GORD), International Atomic Energy Agency (IAEA), Masdar City, United Nations Economic Commission for Europe (UNECE), World Food Programme (WFP) and Zayed International Foundation for Environment.

Speakers highlighted the potential of collaborative innovation, coherent solution portfolios building, and building resilient development pathways.

Dr. Yousef Alhorr, Founding Chairman, Gulf Organisation for Research and Development (host of the event), said, "The path to achieving the United Nations Sustainable Development Goals is not one that can be walked alone. It requires a united effort, driven by partnerships and the sharing of knowledge, expertise, and resources across borders. By joining forces for the creation of the South-South and Triangular Cooperation Solutions Lab, we are continuing our commitment to driving innovation and fostering practical solutions that meet the unique development challenges of the Global South. As the UN rightly identifies across its 17 SDGs, collaboration is the key to transforming our collective ambitions into tangible impact. Through cooperation, we can unlock solutions that not only address the immediate needs of developing nations but also pave the way for long-term, sustainable progress across the globe."

"South-South and Triangular Cooperation are a key part of how the IAEA technical cooperation programme functions. We believe that our experience in institutionalizing mechanisms to support South-South and triangular cooperation offers valuable examples that can be replicated by other international organizations and in other settings," said Mr. Liu Hua, Deputy Director General, International Atomic Energy Agency.

Source:https://unsouthsouth.org/2024/11/14/cop29-catalyzing-impactful-south-south-and-triangular-cooperation-partnerships/
Dated: November 14, 2024, https://unsouthsouth.org/

OTHERS

How do monkeys recognise snakes so fast?

A Japanese researcher has found that a monkey's ability to rapidly detect snakes is because of the presence of snake scales as a visual cue. The findings highlight an evolutionary adaptation of primates to identify snakes based on specific visual characteristics. In an experiment the researcher demonstrated that monkeys exhibited an immediate response to images of snakes but not to images of salamanders, implying a specific fear of snakes. On the basis of this observation, the researcher wondered what would happen if he edited the images of the salamanders to have snakeskin without changing anything else. When edited images of salamanders with snakeskin were shown to monkeys, they reacted to the altered images of the harmless creature equally fast, or even faster, than to the snake. The results are "consistent with the snake-detection theory that snakes were a strong selective pressure favouring modifications in the primate visual system that allow them to detect snakes more quickly or reliably. This strongly suggests that "primates' snake detection depends on the snake-scale shapes, which are both snake-specific and common to all snakes". Humans too react rapidly to snakes; infants as young as 8-14 months respond more rapidly to snake images than to say, flower, and snake pictures elicited specific neural responses in infants who are just 7-10

Source:https://www.thehindu.com/sci-tech/how-do-monkeys-recognise-snakes-so-fast/article69085274.ece
Dated: January 04, 2025 , The Hindu

Young Scientist Award for CIFT scientist

Aniesrani Delfiya, a scientist at ICAR-Central Institute of Fisheries Technology (CIFT), has been honoured with the prestigious Young Scientist Award by the National Academy of Agricultural Sciences for 2025. Ms. Delfiya was chosen for the award for her contributions to Agricultural Engineering and Technology, said a communication. The award, which includes a citation, will be presented during the annual general body meeting of the Academy at the NASC Complex, New Delhi, on June 5, 2025.

Source:https://www.thehindu.com/news/cities/Kochi/young-scientist-award-for-cift-scientist/article69046834.ece#:~:text=Aniesrani%20Delfiya%2C%20a%20scientist%20at,of%20Agricultural%20Sciences%20for%202025.
Dated: January 01, 2025 , The Hindu

Are ants in groups smarter than humans in groups?

The small size of ants has nothing to do with their stature among insects and in fact in the animal kingdom. Over the years, they have colonised almost every major landmass on the planet and their total biomass is expected to exceed that of birds and mammals combined. They are eusocial insects: their colonies are organised with a great degree of cooperation and division of labour.

A study published in Proceedings of the National Academy of Sciences on December 23 offered to add one more feather to their caps. In the study, Israeli researchers explored how two species — longhorn crazy ants and humans — dealt with challenges by working together.

Just as it's easier to haul a heavier object with a large number of people, the researchers have reported that a large number of ants can together make more complicated decisions by having different ants make different parts of each decision.

In an experiment, the researchers had the ants carry a T-shaped object through a series of ant-sized obstacles. This is a difficult task for ants because they can't talk to each other about how they can fit the object through a particular entrance using only their pheromone-based communication.

In a parallel setup, the team had a bunch of people navigate a similar obstacle course carrying a similar oddly shaped object. To level the playing field, the humans were made to wear sunglasses and masks and barred from speaking or gesturing to each other. The team found that the ant groups outperformed their human counterparts. While individual ants struggled, ant groups were able to coordinate their efforts in ways that exceeded individual capabilities — an example of emergent persistence.

On the other hand, the people weren't able to discuss and strategise their course, and often failed to improve on individual performances. Sometimes, in fact, human groups fared worse than individual humans.

Source:https://www.thehindu.com/sci-tech/science/science-newsletter-are-ants-in-groups-smarter-than-humans-in-groups/article69053761.ece
Dated: January 11, 2025 , The Hindu

OTHERS

Female birds can't reproduce without male sex hormones, study finds

Male and female chickens lacking the androgen receptor showed clear differences in various aspects compared to their normal counterparts. These aspects were hormone-dependent. Surprisingly, certain male traits, for example the length of tail feathers and of spurs, remained unaffected by the genetic modification

In the study, female chickens that lacked androgen receptors failed to develop and lay eggs.

The androgen sex hormones are responsible for male sexual development while oestrogen and progesterone essay the same roles in females. But new research by a team at the Max Planck Institute of Biological Intelligence and Technical University, Munich, could force scientists to redraw these boundaries. The team has reported that androgen receptors are as important for sexual development and fertility in females as in males.

Specifically, the researchers found that both male and female chickens devoid of androgen receptors turned out to be infertile. But the males still developed testicles and the females ovaries, and produced gonadal hormones. The testicles and ovaries were smaller than in chickens that retained their androgen receptors.

Additionally, female chickens that lacked the receptors failed to develop and lay eggs. And while a few sex-specific peculiarities like tail feathers, spurs, and differences in body size and weight persisted in both sexes, their sexual behaviours failed to develop. Their eye rings remained unpigmented as well.

"For years, one of the key players in avian sexual development has been reported to be testosterone, a steroid hormone belonging to the class of hormones called androgens, commonly thought of as only a male hormone," Mekhla Rudra, a scientist at the Max Planck Institute of Biological Intelligence and a coauthor of the study, said. "One of the key insights this study provides is that testosterone action via androgen signalling is critical in both male and female birds."

Source:https://www.thehindu.com/sci-tech/science/female-birds-cannot-reproduce-without-male-sex-hormones-research/article69075641.ece
Dated: January 9, 2025, The Hindu

A hopping treasure trove: Scientist discovers 16 new grasshopper species

A Mississippi State University scientist has discovered a hopping treasure trove—16 new species of grasshoppers living in the thorny scrubs of U.S. and Mexican deserts.

Prior to JoVonn Hill's finding, only three species of Agroecotettix were known. Hill, director of MSU's Mississippi Entomological Museum, said the careful examination of our environment remains critical.

"It is important to keep exploring our biodiversity, especially from a conservation standpoint, before we lose it," Hill said.

These newly uncovered species, native to the southern U.S. and Mexican deserts, showcase the thriving biodiversity in arid ecosystems. Published in the journal ZooKeys, Hill's article "Desert Diversification: Revision of Agroecotettix Bruner, 1908 (Orthoptera, Acrididae, Melanoplinae) with Descriptions of Sixteen New Species from the United States and Mexico" provides valuable insights into the region's evolution and ecology.

Hill, an assistant professor in MSU's Mississippi Agricultural and Forestry Experiment Station, said this grasshopper genus likely diversified during the Pleistocene Epoch, also known as the Ice Age. He noted that in the Rocky Mountains, species of this subfamily in alpine grasslands likely became isolated as glaciers receded and their habitats shifted to higher elevations. Hill suspects the desert species his team discovered underwent a similar process of isolation and speciation.

"These grasshoppers we described live in a lowland thorny scrub habitat. Somewhere along the line, they, too, got isolated and speciated, because each one is still associated with a specific mountain range," he said. "Their sexually selective nature and lack of premating rituals have kept populations stable and tied to specific mountain ranges." he added.

Source:https://phys.org/news/2025-02-treasure-trove-scientist-grasshopper-species.html
https://phys.org/news/