

Science & Society in Media

FEBRUARY 2025, NO. 2, VOLUME 3



Zaheer Science Foundation

Contents

Dr. T. Ramasami - Patron
Prof. Zahid H. Khan- Advisor
Dr. Ram Bhoj- Advisor

Dr. Tabassum Jamal
Chairperson
Dr. D. Shailaja Donempudi
Vice-Chairperson
Dr. Mohd. Rais
Secretary
Mohd. Asad Ullah Khan
Treasurer
Dr. Manish Mohan Gore
Joint Secretary
Dr. Seema Wahab
Member
Dr. Mohammad Irfan Qureshi
Member
Prof. Pramesh N. Kapoor
Member
Dr. Enna Dogra Gupta
Member
Dr. Abhishek Kumar
Member

EDITOR/COORDINATOR

Dr. Manish Mohan Gore
Dr. Enna Dogra Gupta

Executive Assistant
Suman Gulalia

ADDRESS FOR CORRESPONDENCE



Zaheer Science Foundation,
4 Udyan Marg,
New Delhi 110001

Tel: 011-23745697

EMAIL
zsfindia@gmail.com

WEBSITE
www.zaheersciencefoundation.org

Science & Technology

- IISc research offers detection of glucose level through painless photoacoustics* 3
- IISc researchers use batteries to produce hydrogen peroxide* 3
- IIT-M sets up facility for fluid and thermal science research* 4
- Deadly bacteria have developed the ability to produce antimicrobials and wipe out competitors, scientists discover* 4

Environment

- Water is life, but how much of it is actually fresh and accessible?* 5
- What we can do at home to save water* 5
- Air pollution will lower India's solar generation capacity: study* 6
- Climate change, already causing problems on Earth, could soon create a mess for orbiting satellites* 6

Agriculture

- 'Smart' roots modify hydraulics to make strategic use of water, field study confirms* 7
- Spider mite discovery in plant-pest warfare could lead to sustainable farming solutions* 7
- Integrated pest management: A vital strategy to protect Asian rice against fall armyworm* 8
- Protecting crops: RNA-based substances open up new avenue to combat a widespread plant virus* 8

Health

<i>India's burden of rising obesity, the hefty cost to pay</i>	9
<i>The Psychology of Colour: How hues affect our moods</i>	9
<i>Be aware, and beware of colorectal cancer</i>	10
<i>Why awareness about, and early detection of lymphatic disorders is crucial</i>	10

S&T Cooperation for Global South

<i>India-UN Fund: A Lifeline for Mothers and Newborns in Kyrgyzstan – Strengthening Maternal Health</i>	11
<i>UNOSSC and WFP Will Jointly Implement UNOSSC's South-South and Triangular Cooperation Solutions Lab to Address SDG 2</i>	11
<i>Leveraging South-South and Triangular Cooperation to Build Statistical and Data Capacities in Developing Countries</i>	12
<i>FAO and the UN Office for South-South Cooperation reaffirm joint commitments to further mainstream South-South and Triangular Cooperation</i>	12

Other

<i>World's largest insect, Africa's giant Goliath beetle, faces extinction</i>	13
<i>Counting our vulnerable dolphins</i>	13
<i>An equitable future for women in science, in India</i>	14
<i>Cuttlefish 'mesmerize' their prey with a moving skin pattern, study finds</i>	14



IISc research offers detection of glucose level through painless photoacoustics

When a laser beam is shone on biological tissue, the tissue components absorb the light and the tissue heats up. This causes the tissue to expand and contract, creating vibrations. Different materials inside the tissue absorb different amounts of light at different wavelengths, creating individual 'fingerprints' in the emitted sound waves.



The team of IISc researchers who worked on developing the photoacoustic sensing technology.

A new study by researchers at the Indian Institute of Science has offered an alternative to pricking a needle into the skin to detect blood glucose levels in people suffering from diabetes. "People suffering from diabetes have to test their glucose level many times a day. This repeated use of needles is inconvenient, and can increase the risk of potential infections," says the IISc.

Researchers in the Department of Instrumentation and Applied Physics have offered an alternative solution via a technique called photoacoustic sensing. In this technique, when a laser beam is shone on biological tissue, the tissue components absorb the light and the tissue heats up slightly (less than 1°C).

This causes the tissue to expand and contract, creating vibrations, which can be picked up as ultrasonic sound waves by sensitive detectors. Different materials and molecules inside the tissue absorb different amounts of incident light at different wavelengths, creating individual 'fingerprints' in the emitted sound waves. Importantly, this procedure does not damage the tissue sample being studied.

In the current study, the team exploited this approach to measure the concentration of a single molecule, namely glucose. They used polarised light — a light wave that oscillates only in a specific direction. Sunglasses, for example, reduce glare by blocking out light waves that oscillate in certain directions.

Source: <https://www.thehindu.com/sci-tech/health/new-iisc-research-offers-to-detect-glucose-through-painless-photoacoustics/article69352988.ece>

Dated: March 20, 2025, The Hindu

IISc researchers use batteries to produce hydrogen peroxide



Researchers at the Indian Institute of Science (IISc) have developed an alternative, on-site production strategy for Hydrogen Peroxide (H₂O₂), that is widely used as a bleach, disinfectant, and oxidising agent, among other things.

As the industrial production of H₂O₂ is expensive and consumes a lot of energy owing to the rare and precious metal catalysts used in production, the researchers have developed an alternative production strategy for hydrogen peroxide that can also degrade industrial pollutants like toxic dyes.

According to the institute, the scientists have utilised a zinc-air battery in which oxygen reduction generates hydrogen peroxide. Aninda J. Bhattacharyya, professor, Interdisciplinary Centre for Energy Research (ICER) and Solid State and Structural Chemistry Unit (SSCU), and corresponding author of the study said that zinc is a historically-used element which is very cheap and abundant in India.

A metal-air battery has a metal like zinc as the anode (negative electrode) and ambient air as the cathode (positive electrode). When the battery discharges – releases energy – oxygen from ambient air gets reduced at the cathode, producing H₂O₂.

The electrochemical reduction of oxygen proceeds through two ways, one of which forms H₂O₂. "The strategy here is to control the extent of the oxygen reduction reaction. If you don't control it at some level, it will just form water," said Prof. Bhattacharyya.

This control can be achieved using specific catalysts. "We are using a metal-free catalyst based on carbon," said Asutosh Behera, first author and PhD student at SSCU. Despite the many challenges, the researchers believe that the strategy is scalable and may have other applications, like generating electricity in remote locations. "This method is very sustainable, low-cost, and highly energy-efficient," said Prof. Bhattacharyya.

Source: <https://www.thehindu.com/news/national/karnataka/iisc-researchers-use-batteries-to-produce-hydrogen-peroxide/article69289852.ece>

Dated: March 04, 2025, The Hindu



SCIENCE & TECHNOLOGY

IIT-M sets up facility for fluid and thermal science research

The facility will help India's Space mission with ISRO scientists working alongside academia



A state-of-the-art research facility for fluid and thermal science was commissioned at the Indian Institute of Technology-Madras (IIT-M). The S. Ramakrishnan Centre of Excellence in Fluid and Thermal Science Research will focus on critical advancements in spacecraft and launch vehicle thermal management. Research on heat transfer, cooling systems, and fluid dynamics, essential for the next generation of spacecraft and satellite technologies will be undertaken at the centre. The centre is housed at the Department of Mechanical Engineering.

S. Ramakrishnan, a distinguished alumnus of IIT-M, was the project director for PSLV and GSLV MK3. He also served as the Director of LPSC and VSSC and was honoured with the Padma Shri in 2003 for his contributions in the areas of science and engineering. On the occasion, V. Kamakoti, Director, IIT-M, commissioned the Arcot Ramachandran Seminar Hall. Ramachandran was the Director of the institute from 1967 to 1973, and was instrumental in establishing the heat transfer and thermal power lab.

V. Narayanan, Chairman, Indian Space Research Organisation (ISRO), recalled that when India was denied the cryogenic engine technology, it faced a challenge. Now, the country had three different engines, one of them human-rated. "Only six countries have this technology. We have made three world records in this technology — we got it right on our third attempt. Second, from engine test to flight, we got it done in 28 months. Other countries took between 42 months and 18 years. Finally, we conducted the test in 34 days, whereas other countries took around five to six months."

Urging the institute to aim for Nobel Prizes, Mr. Narayanan said: "The Department of Space will support IIT-M completely in its (research) efforts." The Centre will work on addressing heat dissipation challenges in satellites and launch vehicles; conducting experimental and numerical studies on cooling systems; and performing cutting-edge computational fluid dynamics simulations and experimental set up for real-world validation. ISRO scientists will be encouraged to pursue advanced degrees at the institute, while fostering industry-academia collaborations.

Source: <https://www.thehindu.com/sci-tech/science/iit-m-sets-up-facility-for-fluid-and-thermal-science-research/article69340344.ece>

Dated: March 18, 2025, The Hindu

Deadly bacteria have developed the ability to produce antimicrobials and wipe out competitors, scientists discover



A drug-resistant type of bacteria that has adapted to health care settings evolved in the past several years to weaponize an antimicrobial genetic tool, eliminating its cousins and replacing them as the dominant strain. University of Pittsburgh School of Medicine scientists made the discovery when combing through local hospital data—and then confirmed that it was a global phenomenon.

The finding, published in Nature Microbiology, may be the impetus for new approaches in developing therapeutics against some of the world's deadliest bacteria. It also validates a new use for a system developed at Pitt and UPMC that couples genomic sequencing with computer algorithms to rapidly detect infectious disease outbreaks.

"Our lab has a front row seat to the parade of pathogens that move through the hospital setting," said senior author Daria Van Tyne, Ph.D., associate professor of medicine in Pitt's Division of Infectious Diseases. "And when we took a step back and zoomed out, it quickly became apparent that big changes were afoot with one of the world's more difficult-to-treat bacteria."

The Enhanced Detection System for Health Care-Associated Transmission (EDS-HAT) analyzes the genetic signatures of infections in hospitalized patients and flags patterns, allowing clinicians to intervene and stop potential outbreaks in real-time. But lead author Emma Mills, a microbiology and immunology graduate student in Van Tyne's lab, realized that EDS-HAT was also a treasure trove of detailed historical information that she could mine to learn about the evolution of bacteria over time.

Mills focused on vancomycin-resistant Enterococcus faecium (VRE_{fm}), so-called because it can't be eradicated with the popular antibiotic vancomycin. VRE_{fm} kills about 40% of the people it infects and is a particular plague on immunocompromised and hospitalized patients, who are often taking antibiotics that decrease the diversity of bacteria in their microbiomes, allowing drug-resistant bacteria, such as VRE_{fm}, to thrive.

Source: <https://phys.org/news/2025-03-deadly-bacteria-ability-antimicrobials-competitors.html>

Dated: March 21, 2025, <https://phys.org/>



ENVIRONMENT

Water is life, but how much of it is actually fresh and accessible?

Did you know? About 71% of Earth's surface is covered by water, but only 2.5–3% of it is freshwater. Most of this freshwater is frozen in ice caps (69%) or stored underground (30%), leaving less than 1.2% available in lakes, rivers, and swamps.



A man searches for coins, offered by devotees during holy dip and prayers at Sangam, confluence of Ganga, Yamuna and mythological Saraswati river during Kumbh Mela on February 25, 2025 in Prayagraj.

India boasts a vast and diverse surface water network. This water is an interconnected network of natural water bodies like rivers, lakes and ponds. The major rivers in India being Ganga, Brahmaputra, and Godavari along with countless lakes, ponds and traditional water tanks. These water bodies support agriculture, drinking water supply, and groundwater recharge while also playing a role in cultural and ecological preservation. From the lakes of Kashmir to the stepwells of Rajasthan, water storage and conservation have been integral to India's history.

Surface water is like India's lifelines. India's permanent surface water resources are divided in three categories: Lakes, rivers and wetlands.

Rivers

The major river systems in India that include the Ganga, Brahmaputra, Indus, Godavari and Krishna, provide water for agriculture, drinking and hydropower. These rivers, acting as the backbone of India's water supply, are nourished by monsoons, glaciers, and tributaries. The Ganges-Brahmaputra-Meghna system is the largest river network in India, contributing significantly to the surface water availability.

Lakes

India is home to both natural and man-made lakes. Famous natural lakes include Dal Lake (Jammu & Kashmir), Chilika Lake (Odisha), Loktak Lake (Manipur), and Sambhar Lake (Rajasthan). Many artificial lakes, such as Udaipur's Lake Pichola, were created for water storage and irrigation.

*Source: <https://www.thehindu.com/children/water-is-life-but-how-much-of-it-is-actually-fresh-and-accessible/article69352461.ece>
Dated: March 22, 2025, The Hindu*

What we can do at home to save water

Implement lifestyle changes to reduce water pollution and conserve water

Think of the various products we use to clean ourselves and our homes. Toothpastes, shampoos, soaps, dishwashing soaps and more. Did you know that all of these contain chemicals that pollute the water you use daily? Where does this polluted water go?

Once drained through your washbasin and bathroom, the dirty water — known as sewage — travels for many kilometres through a big network of pipes to specialised buildings known as treatment plants. Here, massive tanks treat millions of litres of water per day, using cleaning chemicals and the power of tiny dirt-eating bacteria. After this, the water is released into rivers and nearby water bodies. All good, right?

Not really. In India, only half the sewage water is treated. This means truckloads of polluted, untreated sewage enter our rivers daily ... threatening river ecology and biodiversity.

Sewage contains two major pollutant types: food waste and chemicals from our homes. Soap water with huge quantities of nitrogen, fluorine and phosphorus compounds from untreated sewage damages the chemistry of river water. This "chemical overload" leads to the overgrowth of tiny plants called algae that cover the surface of water bodies entirely. Algae eat up so much oxygen that the fish underwater hardly get any! Water hyacinth is another quick-growing plant that chokes rivers and stops their flow. Also, food waste is eaten by fast-growing bacteria that consume the river's oxygen, further cutting down the oxygen supply for riverine insects and fish. Soon, underwater life dies off, killing the river. Sadly, many urban rivers and lakes in India suffer this fate due to sewage pollution.

What you can do

Do not lose hope! We can reduce this toxic pollution, starting from our homes. This World Water Day, implement the below changes in your lifestyle and product use to preserve our ailing water bodies:

Use chemical-free products: Today, we have chemical-free, plant-based soaps (made with herbs, lemons, aloe vera and so on) for dishwashing, bathing and floor-cleaning. These are eco-friendly and safer for our lakes and rivers.

Reduce water use: Did you know that filling a bucket of water to bathe saves more water than taking a shower? If you see a leaking tap, ask your parents to get it fixed. This helps save many litres of water per day.

Reuse water: While washing vegetables in the sink, ask your parents to put a big bowl or bucket under the tap and place a strainer or muslin cloth over it. Leave the water till the dirt settles at the bottom and pour the clear water into a watering can. Use it to water plants.

*Source: <https://www.thehindu.com/children/what-we-can-do-at-home-to-save-water/article69309059.ece>
Dated: March 21, 2025, The Hindu*



Environment

Air pollution will lower India's solar generation capacity: study

India has 300 sunny days a year but their quality is declining due to air pollution



Workers install solar panels at the Adani Group-owned Khavda Renewable Energy Park in Khavda, Gujarat, January 12, 2024.

A study by researchers at IIT Delhi has found that air pollution and climate change will impair solar panel performance in India. It was published in Environmental Research Letters in November 2024.

According to the paper, India is the fifth-largest solar power producer worldwide. The country has set a target to produce 50% of its electric power from non-fossil fuel sources by 2030, and plans to install 500 GW of renewable energy capacity to this end by then. One-fifth of this capacity is expected to be in the form of solar power. India also has plans to develop more solar parks and promote rooftop solar generation.

Solar power and climate

Like other forms of renewable energy sources are, solar photovoltaic energy is at the mercy of weather and climate. "Accurately assessing future renewable energy resources, particularly solar energy in India, where solar deployment is expanding rapidly, is crucial for ensuring a sustainable and resilient energy future," Sushovan Ghosh, lead author of the new study, then at the Centre for Atmospheric Sciences at IIT Delhi and now a researcher in the Earth Sciences Department of the Barcelona Supercomputing Centre, said.

The study is the first to examine how climate change will affect solar-cell efficiency in India. "Studies of this kind give impetus to the innovations towards mitigating greenhouse gases through the exploration of viable energy alternatives and, more importantly, improvements in photovoltaic cell design," T.V. Ramachandra, faculty member at the Centre for Ecological Sciences of the Indian Institute of Science, Bengaluru, said.

India has 300 sunny days a year but their quality is declining due to air pollution. "Solar radiation at the earth's surface is not stable over time but undergoes significant long-term variations, referred to as global dimming and brightening," Ghosh said.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/air-pollution-will-lower-india-solar-generation-capacity-study/article69336330.ece>

Dated: March 17, 2025, The Hindu

Climate change, already causing problems on Earth, could soon create a mess for orbiting satellites

Part of the greenhouse effect that warms the air near Earth's surface also cools the upper parts of the atmosphere where space starts and satellites zip around in low orbit.



Climate change is already causing all sorts of problems on Earth, but soon it will be making a mess in orbit around the planet too, a new study finds.

Climate change is already causing all sorts of problems on Earth, but soon it will be making a mess in orbit around the planet too, a new study finds. Researchers at the Massachusetts Institute of Technology calculated that as global warming caused by burning of coal, oil, gas continues, it may reduce the available space for satellites in low Earth orbit by anywhere from one-third to 82% by the end of the century, depending on how much carbon pollution is spewed. That's because space will become more littered with debris as climate change lessens nature's way of cleaning it up.

Part of the greenhouse effect that warms the air near Earth's surface also cools the upper parts of the atmosphere where space starts and satellites zip around in low orbit. The cooling also makes the upper atmosphere less dense, which reduces the drag on the millions of pieces of human-made debris and satellites.

That drag pulls space junk down to Earth, burning up on the way. But a cooler and less dense upper atmosphere means less space cleaning itself. That means that space gets more crowded, according to a study in journal Nature Sustainability. Climate change is already causing all sorts of problems on Earth, but soon it will be making a mess in orbit around the planet too, a new study finds.

Researchers at the Massachusetts Institute of Technology calculated that as global warming caused by burning of coal, oil, gas continues, it may reduce the available space for satellites in low Earth orbit by anywhere from one-third to 82% by the end of the century, depending on how much carbon pollution is spewed. That's because space will become more littered with debris as climate change lessens nature's way of cleaning it up.

Part of the greenhouse effect that warms the air near Earth's surface also cools the upper parts of the atmosphere where space starts and satellites zip around in low orbit. The cooling also makes the upper atmosphere less dense, which reduces the drag on the millions of pieces of human-made debris and satellites.

Source: <https://www.thehindu.com/sci-tech/science/climate-change-already-causing-problems-on-earth-could-soon-create-a-mess-for-orbiting-satellites/article69316356.ece>

Dated: March 11, 2025, The Hindu



AGRICULTURE

'Smart' roots modify hydraulics to make strategic use of water, field study confirms



Plants are able to modify their root hydraulics to maintain water status and strategically use soil water, according to a new study published today in the *New Phytologist*. When soils are drying, plants can decrease water use from topsoil while boosting uptake at greater depths. Conversely, when topsoil is rewetted, the plants can instantly rearrange their water uptake to be more energy efficient by making maximum use of water near the surface and reducing uptake lower down.

The study focused on wheat and permanent grass fields and found that water uptake of deep roots was controlled by topsoil water, and thus the topsoil water serves not only as a resource but also as a cue coordinating optimal use of soil water in different depths.

"These findings have important implications for improving understanding of the mechanisms plants use to cope with periodic water stress and screening drought-tolerant varieties," said the corresponding author for the study Dr. Xiaoxian X Zhang. "We believe this is the first time this has been demonstrated in field conditions."

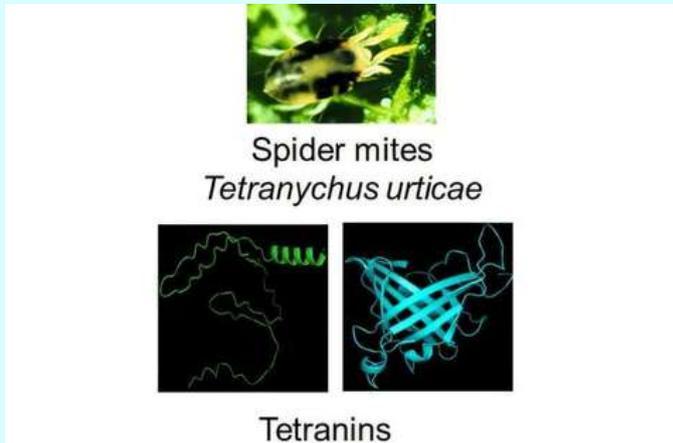
In the field, plants experience periodic water stresses, and their roots penetrate much deeper than in pot-based studies. To date, the strategies plants use in fields to cope with such stresses are poorly understood because of the difficulty of in situ measurements.

"Our findings suggest that topsoil water not only serves as a resource but also acts as a regulatory trigger coordinating root water uptake in the whole soil profile," said Zhang. "When topsoil dries, plants increased their water uptake from the subsoil, whereas when the topsoil was rewetted by rainfall, the plants promptly reduced their water uptake from the subsoil while increasing water uptake from the topsoil. Such adaptive changes in root water uptake from different soil layers may arise because absorbing topsoil water is more energy-efficient for plants."

Source: <https://phys.org/news/2025-03-smart-roots-hydraulics-strategic-field.html>

Dated: March 19, 2025, <https://phys.org/>

Spider mite discovery in plant-pest warfare could lead to sustainable farming solutions



As global food demand continues to increase, effective pest control remains one of agriculture's most pressing challenges. Worldwide, farmers apply nearly 4 million tons of chemical pesticides annually to protect their crops, representing a \$60 billion industry.

While these compounds have significantly boosted agricultural productivity, their widespread use has raised concerns regarding environmental impact, health risks, and the long-term sustainability of modern farming.

The two-spotted spider mite, *Tetranychus urticae*, exemplifies the limitations of conventional pesticide-based pest management in agriculture and horticulture. These microscopic arachnids infest a wide range of crops and fruit trees and can reproduce extremely quickly.

More importantly, unlike many other pests, they rapidly develop resistance to chemical pesticides, making control efforts increasingly challenging. With pesticide resistance on the rise, farmers worldwide are urgently seeking alternative, sustainable pest control strategies.

A research team led by Professor Gen-ichiro Arimura from the Department of Biological Science and Technology, Faculty of Advanced Engineering, Tokyo University of Science, Japan, closely examined the fine molecular interplay that occurs between *T. urticae* mites and their host plants.

Their study was published online in *The Plant Journal*. The team focused on specific substances called elicitors, secreted by *T. urticae*, and examined their biological effects on various crops.

Source: <https://phys.org/news/2025-03-spider-mite-discovery-plant-pest-warfare.html>

Dated: March 17, 2025, <https://phys.org/>



AGRICULTURE

Integrated pest management: A vital strategy to protect Asian rice against fall armyworm



A new study published in the journal CABI Reviews highlights the critical role that integrated pest management (IPM) plays in combating the threat fall armyworm poses to Asian rice security.

Asian rice production accounts for over two-thirds of global rice output, but the region is highly vulnerable to the fall armyworm (*Spodoptera frugiperda*), which can threaten the food, nutrition and income security of millions of farming households.

The scientists say that rapid reproduction, extensive dispersal capabilities, and remarkable adaptability pose significant risks, with the potential for substantial yield losses comparable to those observed in other crops, including maize in Africa. Concerning host shift of the corn-specialized fall armyworm strain

Dr. Lekhnath Kafle, Associate Professor, Department of Tropical Agriculture and International Cooperation, National Pingtung University of Science and Technology, and Dr. Ravindra Chandra Joshi, Senior Consultant of the Philippine Rice Research Institute, and Associate at CABI South-East Asia, say recent reports highlight a concerning host shift of the corn-specialized fall armyworm strain towards rice cultivation in Asia.

They stress that, beyond direct yield losses, fall armyworm infestations can lead to the excessive use of pesticides, posing serious threats to human health and environmental safety. Effective and sustainable fall armyworm management is crucial for ensuring long-term agricultural sustainability.

Dr. Kafle said, "Control strategies encompass a diverse range of approaches, including cultural techniques, biological methods, chemical interventions, and habitat manipulation. The absence of rice varieties resistant to fall armyworm underscores the urgent need for accelerated development through genetic engineering.

Source: <https://phys.org/news/2025-03-pest-vital-strategy-asian-rice.html>

Dated: March 19, 2025, <https://phys.org/>

Protecting crops: RNA-based substances open up new avenue to combat a widespread plant virus



New RNA-based active agents reliably protect plants against the Cucumber mosaic virus (CMV), the most common virus in agriculture and horticulture. They were developed by researchers at the Martin Luther University Halle-Wittenberg (MLU).

The active ingredients have a broad spectrum effect; a series of RNA molecules support the plant's immune system in combating the virus. In laboratory experiments, 80 to 100% of the treated plants survived an infection with a high viral load, as the team reports in *Nucleic Acids Research*.

Their paper has been selected as a "breakthrough article" by the journal. The researchers are now working on transferring the idea from the laboratory into practice.

Cucumber mosaic virus is a particularly devastating virus for crops. About 90 species of aphids transmit the virus, which affects more than 1,200 plant species. These include numerous agricultural crops such as squash, cucumbers, cereals and medicinal and aromatic plants. Infected plants are easily identified by a characteristic mosaic pattern on their leaves.

Once infected, the plants fail to thrive and their fruits cannot be sold. To date, there exist no approved agents against CMV. However, the new work by researchers at MLU could provide a long-term solution. The basic idea is to fight the virus by directing the plant's natural defenses in the right direction.

When a virus infects a plant, it uses the plant's cells as a host. The virus multiplies via its genetic material in the form of ribonucleic acid (RNA) molecules in the plant cells. Once injected, these foreign RNA molecules trigger an initial response from the plant's immune system. Special enzyme scissors recognize and cut the viral RNA molecules.

Source: <https://phys.org/news/2025-03-crops-rna-based-substances-avenue.html>

Dated: March 18, 2025, www.phys.org



HEALTH

India's burden of rising obesity, the hefty cost to pay

The general societal attitude in the country which normalises overweight or obesity must change; holistic interventions are needed to ensure a healthy nation



In the last two decades in India, a major epidemiological transition has happened that has not captured sufficient public attention — the challenge of overweight and obesity. The National Family Health Survey round 5 (NFHS-5, 2019-21) suggests that nearly one in every four men or women is obese. The proportion of those who are overweight and obese ranges from 8% to 50% across States, in both men and women, and in rural and urban settings. The World Obesity Federation estimates that India's annual increase in childhood obesity is one of the world's steepest. Overweight and obesity in adults and children have doubled in the last 15 years and tripled in the last three decades. A nationwide study by the Indian Council of Medical Research in *The Lancet Diabetes and Endocrinology* (2023) had estimated that amongst adults over 20 years of age in India, one in every third (35 crore) has abdominal obesity, one in every fourth person (25 crore) has generalised obesity and one in every fifth person (21 crore) has high levels of blood cholesterol. Why the subject needs urgent attention.

Being overweight and obese is often considered to be a personal issue. Also, the general societal attitude in India normalises obesity or being overweight. Over the past few decades, India has made another positive epidemiological shift: from being a 'food or calorie deficient' to becoming 'food or calorie sufficient (with inequitable distribution) nation. Yet, the 'State of Food Security and Nutrition in the World' report (2024), estimated that around 55% (78 crore) of India's population could not afford a healthy diet and that nearly 40% of people fall short of an adequate-nutrient diet. In the last two decades, easy and low-cost availability of high fat, salt, sugar (HFSS) and the ultra-processed food (UPF) has compounded the challenge. Urbanisation has led to a sedentary lifestyle for many. A recent World Health Organization (WHO) report says that 50% of Indians fail to meet recommended physical activity levels.

Source: <https://www.thehindu.com/opinion/lead/indias-burden-of-rising-obesity-the-hefty-cost-to-pay/article69286903.ece>

Dated: March 04, 2025, *The Hindu*

The Psychology of Colour: How hues affect our moods

Colours silently shape our emotions—red can stir excitement, blue brings calm, and yellow sparks energy. But how much do they really influence our mood and behaviour?



Colour is more than just a visual sensation; it's a powerful force that subtly shapes our moods, behaviours, and even our subconscious thoughts. From the vibrant hues that invigorate us to the soothing shades that calm our minds, colour holds an undeniable influence over our experiences.

Science of colour psychology

Colours aren't just visual experiences—they're processed by our brain in ways that influence our emotions and behaviours. Each colour has its own wavelength, which interacts with our brain and body, triggering different responses. For example, colours like red and yellow have longer wavelengths, which can increase heart rates and signal alertness, while colours like blue and green have shorter wavelengths, promoting calm and relaxation.

This response is partly biological. Our brains associate certain colours with specific emotional triggers based on evolutionary survival instincts. For instance, red is often linked to danger or urgency, which explains why it can increase our stress or energy levels. Blue, on the other hand, is associated with the sky and calm waters, triggering feelings of serenity and focus.

Cultural associations also play a significant role in how we perceive colours. While white may symbolise purity in Western cultures, it represents mourning in some Eastern traditions. These varying meanings can change how we emotionally respond to a colour, depending on our cultural background.

The mood palette: How colours affect emotions

- Red: Evokes energy and passion but can also trigger aggression. Often used in fast food branding for stimulation.
- Blue: Promotes calmness, trust, and productivity, making it popular in offices and hospitals.
- Yellow: Represents optimism and warmth but can cause anxiety if overused.
- Green: Associated with relaxation, harmony, and nature, promoting balance and renewal.
- Purple: Linked to creativity, luxury, and spirituality, often used to inspire deep thinking.
- Black/White/Grey: Neutral tones with strong meanings—black for power, white for purity, and grey for neutrality.

Source: <https://www.thehindu.com/children/the-psychology-of-colour-how-hues-affect-our-moods/article69046097.ece>

Dated: March 13, 2025, *The Hindu*



HEALTH

Be aware, and beware of colorectal cancer

Colorectal cancer is the fourth-most common cancer in India for both sexes. Despite its incidence being low in India compared to the West, it is a leading cause of cancer deaths here, underscoring the crucial need for more awareness

The incidence of large intestine cancers is increasing all over the world, including in India. Much like any other cancer, if the diagnosis is early, colorectal cancers (CRCs) can be cured. Unfortunately in India, diagnosis is generally late, with patients coming in only at the advanced stages, at which point, only palliative care and treatment is possible.



Understanding colorectal cancers

CRC ranks as the third-most prevalent cancer globally, and is the second primary cause of deaths associated with cancer around the world. In the United States, CRC ranks as the second-most common cause of cancer-related deaths, following lung cancer. Many CRC cases however, are preventable. The American Association for Cancer Research observes March as Colorectal Cancer Awareness Month in order to raise awareness about the disease.

We, in India, need to follow this example, as CRC is the fourth-most common cancer in India for both sexes, and one of the six most common gastrointestinal cancers in India. Despite the incidence of colorectal cancer (CRC) being low in India compared to the West, it is a leading cause of cancer deaths here. If patients report early to a doctor, CRC can also be cured. Unfortunately, as is the case, reporting to the physician late in an advanced stage severely limits the kind of interventions medicine can provide.

Why is there a need for awareness?

In order to understand the need for awareness one needs to understand the intervals in healthcare. People often ask doctors why there is an awareness month, or talk, or media information, when they are ready to consult a doctor if they become symptomatic. To explain this, one needs to understand three types of intervals: disease interval, diagnosis interval, and treatment interval.

Disease interval is the time a disease takes to manifest: it may remain silent at an early stage and cause symptom(s) later in an individual, urging him/her to report to a doctor. The diagnosis interval is the time taken from a patient presenting with symptoms to the final diagnosis. Unfortunately, symptoms can be vague, non-specific, and common to many diseases, challenging even an astute clinician and specialist, and potentially delaying the diagnosis. The third interval is the 'treatment interval'. This is the time taken by the patient to begin the right treatment. If all these three intervals are taken care of wisely and remain short, the disease outcome is most likely to be favourable. Public awareness about these intervals therefore, is essential and to do so becomes the responsibility of the medical fraternity and media in every society.

Source: <https://www.thehindu.com/sci-tech/health/be-aware-and-beware-of-colorectal-cancer/article69352248.ece>
Dated: March 22, 2025, The Hindu

Why awareness about, and early detection of lymphatic disorders is crucial

The lymphatic system is often forgotten or neglected, with many not knowing its important role in maintaining good health; awareness of signs and symptoms and early detection are crucial

The immune and circulatory systems heavily depend on the vital functions of the lymphatic system. Self-regulation of fluids and eliminating unwanted substances while boosting immune functions are among the essential functions of the lymphatic system.

Understanding the lymphatic system

The lymphatic system consists of lymph nodes, lymph vessels, and lymphatic fluid. This system eliminates the body's toxins while fighting infections and moving white blood cells throughout the body. The impairment of this system results in lymphatic problems.

When the lymphatic system gets compromised, which can be caused by surgery, radiation therapies, infections, or may be congenital (by birth), it automatically creates a space for lymphatic disorders to prevail. Untreated causes of improper functionality in patients lead to serious health complications. A quick and proper approach to lymphatic disorders produces better outcomes to treating patients with these ailments. Treatment needs immediate focus because lymphatic disorders are usually chronic and can be life-threatening.

Lymphedema is a prolonged condition caused by swelling due to the build-up of lymphatic fluid. A cancerous condition of the lymphatic node is called lymphoma, and can cause serious health consequences. Both lymphangitis and cellulitis hold an important standing among other conditions as well.

Diagnosis and treatment

The diagnosis of these progressive conditions is important in order to be able to take timely action. A person must immediately seek medical attention when symptoms like prolonged swelling, unexplained fatigue, the showing up of skin conditions like tightening and thickening, and infections that keep repeating themselves are noticed. Symptoms of lymphoma include swollen lymph nodes, night sweats, and inexplicable weight loss.

Diagnosis is through a lymphangiogram, lymphoscintigram, and MR lymphangiogram, along with basic blood investigations. The earliest evidence for a lymphatic problem may sometimes look trivial or benign. It is to be noted that not every doctor can identify the underlying causes; hence, necessary medical intervention by an expert doctor is always suggested.

Source: <https://www.thehindu.com/sci-tech/health/why-awareness-about-and-early-detection-of-lymphatic-disorders-is-crucial/article69368032.ece>
Dated: March 24, 2025, The Hindu



S&T COOPERATION FOR GLOBAL SOUTH

India-UN Fund: A Lifeline for Mothers and Newborns in Kyrgyzstan – Strengthening Maternal Health



By leveraging technology and fostering collaboration, the technical equipment handover to five pilot maternity hospitals demonstrates the commitment of all involved partners to ensuring the safety and well-being of women and newborns across the country

In remote regions of Kyrgyzstan, expectant mothers once faced significant barriers to quality maternal healthcare, with distance, resource constraints, and limited access to specialized medical expertise standing in the way of safe deliveries.

“Preeclampsia and eclampsia are the leading causes of maternal and perinatal mortality in the Kyrgyz Republic,” said UNFPA’s Gulaiym Shigaibaeva in Osh. “Though competent pregnancy management and timely assistance can prevent most deaths.” Despite high coverage of antenatal services and skilled birth attendance, maternal mortality rates stood at 27.3 per 100,000 live births in 2022.

Addressing this challenge, a project supported the India-UN Development Partnership Fund, managed by the United Nations Office for South-South Cooperation (UNOSSC), and implemented by the United Nations Population Fund (UNFPA), equipped maternity hospitals in some of Kyrgyzstan’s most remote regions with telemedicine technology that is revolutionizing maternal and neonatal care. The initiative, titled “Increase access of rural women to quality reproductive and maternal health services in maternity hospitals with the highest number of deliveries”, is ensuring that no mother has to give birth without the support of qualified specialists.

“It is a great honor for me to be a part of the equipment handover event as well as a project related to the health of the population of the Kyrgyz Republic,” said Mr. Mohan Singh, Chargé d’Affaires of the Embassy of India in the Kyrgyz Republic. “Health is the most important value in life, and when it comes to mothers, the issue becomes paramount. And when we invest in the health of a mother, we invest not only in the health of one person, but also in the health of her children, her loved ones and, accordingly, the whole society. Such health-related costs become not expenses, but investments. And when we invest in the health of the population, we contribute to the development of the country itself.”

Source: <https://unsouthsouth.org/2025/02/21/india-un-fund-a-lifeline-for-mothers-and-newborns-in-kyrgyzstan-strengthening-maternal-health/>

Dated: February 21, 2025, <https://unsouthsouth.org/>

UNOSSC and WFP Will Jointly Implement UNOSSC’s South-South and Triangular Cooperation Solutions Lab to Address SDG 2



UNOSSC Director Dima Al-Khatib and Laura Turner, WFP Multilateral and Programme Country Partnerships Division (MPC) Deputy Director, signed a Memorandum of Understanding (MOU) aiming to jointly implement UNOSSC’s South-South and Triangular Cooperation Solutions Lab to address key development challenges related to SDG 2 (zero hunger) by leveraging innovative solutions, testing new solutions, building coherent portfolios of innovative South-South and triangular cooperation solutions, and enhancing cooperation.

“The partnership between UNOSSC and WFP is strategically significant, harnessing the complementary strengths of both organizations to address global challenges related to SDG 2,” said UNOSSC Director Dima Al-Khatib at the MOU signing.

This collaboration aims to identify, scale, and support impactful South-South and triangular cooperation solutions that contribute to eradicating hunger and improving food security. Together, the partners will focus on incubating and testing innovative solutions, developing comprehensive portfolios that empower governments and key stakeholders with actionable tools for sustainable impact. Additionally, the partnership will facilitate the identification and sourcing of new solutions through global innovation challenges, with the first challenge currently underway, inviting innovators worldwide to contribute their solutions. “This strategic alliance is designed to drive long-term, transformative change through collaboration and innovation,” said UNOSSC Director Dima Al-Khatib.

The Solutions Lab is a global platform for incubating, testing, and scaling up development solutions. WFP’s participation as one of the first UN entities to join the Solutions Lab demonstrates its commitment to innovative and collaborative approaches to achieving SDGs.

Source: <https://unsouthsouth.org/2025/02/25/unossc-and-wfp-will-jointly-implement-south-south-and-triangular-cooperation-solutions-lab-to-address-sdg-2/>

Dated: February 25, 2025, <https://unsouthsouth.org/>



S&T COOPERATION FOR GLOBAL SOUTH

Leveraging South-South and Triangular Cooperation to Build Statistical and Data Capacities in Developing Countries

Unlocking the Power of Data Through Cooperation

In today's world confronted with complex and interlinked development challenges, data is more than just numbers—it is an essential asset and a public good for sustainable development. Recognizing this, South-South and triangular cooperation has emerged as a powerful mechanism for strengthening statistical and data capacities across developing countries. These collaborative efforts facilitate peer learning, knowledge exchange, and digital innovation, enabling developing countries to build robust national data ecosystems that drive evidence-based policymaking.

From national-level census modernization to city-to-city smart transportation planning, South-South cooperation is empowering countries to use data to inform policies and improve lives. Let's explore how this works in practice and what more can be done to scale up its impact.



Seminar titled "Capacity Development for Relevant, Resilient, and Agile National Statistical Systems: Are We on the Right Track?" addressed by Ms. Xiaojun Grace Wang, Trust Fund Director, UNOSSC, on the topic.

How Is South-South Cooperation Facilitating Knowledge Sharing and Data Innovation?

National-Level Impact: Strengthening National Statistical Systems

With support from the India-UN Development Partnership Fund, Moldova is leveraging experiences from India and Estonia to enhance registry-based census technologies and conduct the Generations and Gender Survey (GGS). These efforts are improving data accuracy, timeliness, and efficiency, ensuring gender-sensitive and evidence-based policymaking.

Regional-Level Impact: Strengthening Multi-Country Data Collaboration

Through triangular cooperation with the Republic of Korea, the Mekong River Commission and Mekong Institute are working with Cambodia, Thailand, Vietnam, and Lao PDR to develop data-driven solutions for managing the water-food-energy nexus and strengthening the early warning systems for climate resilience.

Source: <https://lunsouthsouth.org/2025/03/05/leveraging-south-south-and-triangular-cooperation-to-build-statistical-and-data-capacities-in-developing-countries/>

Dated: March 5, 2025, <https://lunsouthsouth.org/>

FAO and the UN Office for South-South Cooperation reaffirm joint commitments to further mainstream South-South and Triangular Cooperation



FAO's Director of the South-South and Triangular Cooperation Division (PST), Mr Anping Ye, met this week with UN Office for South-South Cooperation (UNOSSC) Director, Ms Dima Al-Khatib, to discuss new and ongoing fruitful joint collaborations on South-South and Triangular Cooperation (SSTC).

Since 1974, UNOSSC has been promoting, coordinating and supporting South-South and triangular cooperation within the United Nations system and globally.

FAO's portfolio of SSTC projects has also dramatically grown in recent years, in line with the increasing institutionalization of SSTC in the Organization's programme. The two organizations discussed a series of important joint collaborations.

UNOSSC has recently launched a new e-module Leveraging South-South and Triangular Cooperation to Accelerate Transformation Towards Sustainable Development developed with financial contributions from FAO and other key UN agencies. During the event, FAO reaffirmed its commitment to work closely with UNOSSC to further promote this key tool at regional and country levels. During the meeting, FAO, once again, expressed its appreciation of UNOSSC's dedicated work on the module.

The meeting with Ms Al-Khatib also focused on the imminent signing of two new joint project documents on Climate Smart Agriculture in the Fergana Valley, and on Irrigation Water and Land Management in the Sahel region.

"This collaboration is a testament to the continued support and efficient work undertaken by both agencies to further mainstream SSTC towards the achievement of the Sustainable Development Goals." said Mr Anping Ye. "I am very glad to see that our joint efforts have resulted in the development of two key projects that will further mainstream and operationalize South-South and triangular Cooperation at country and regional levels" he added.

Source: <https://lunsouthsouth.org/2025/03/05/fao-and-the-un-office-for-south-south-cooperation-reaffirm-joint-commitments-to-further-mainstream-south-south-and-triangular-cooperation/>
Dated: March 5, 2025, <https://lunsouthsouth.org/>



OTHERS

World's largest insect, Africa's giant Goliath beetle, faces extinction

New research has found that one species of the enormous Goliath beetles has been almost wiped out by the west African cocoa industry and, to a lesser extent, by the international trade in dried insects.



One of Africa's giant beetles is just one step away from extinction. New research has found that one species of the enormous Goliath beetles has been almost wiped out by the west African cocoa industry and, to a lesser extent, by the international trade in dried insects. Luca Luiselli, a professor of biostatistics and ecology at the University of Lomé (Togo), has researched threatened species in African forests for 30 years. He explains what has gone wrong and how the Goliath beetle could be saved.

What is the Goliath beetle and why is it so important?

The Goliath beetles (genus *Goliathus*) are among the world's biggest insects. There are five different species. They grow up to 110mm long; males have Y-shaped horns and females do not have horns. The beetles are found in the rainforests of Sierra Leone, Liberia, Guinea, Côte d'Ivoire, Ghana, Burkina Faso, Benin, Nigeria, Cameroon, the Democratic Republic of Congo, Uganda and South Sudan.

Beetle larvae, or grubs, are omnivorous and likely scavenge on meat as well as debris of plants. This means they have an important role in moving nutrients throughout the forest ecosystem to nourish other plants and animals. The adult beetles feed only on the sap of a few tree species in mature rainforest areas.

The Goliath beetle is an excellent indicator of forest health: if they are abundant in a forest, it means the forest is in a good enough condition to support other species. But when their populations decline, this is an early warning indicator of emptying forests and eroding ecosystems.

Source: <https://www.thehindu.com/sci-tech/science/worlds-largest-insect-africas-giant-goliath-beetle-faces-extinction/article69293502.ece>
Dated: March 05, 2025, The Hindu

Counting our vulnerable dolphins

There are two kinds of river dolphins. Facultative river dolphins occur in both marine and fresh waters.



Earlier this week, the Ministry of Environment, Forests and Climate Change released the findings of a population study of dolphins found in Indian rivers, putting their numbers at 6,327. These playful creatures with their torpedo-like bodies generate excitement whenever they are spotted. People flock to see them. Urban teenagers describe them as 'cute'. There are two kinds of river dolphins. Facultative river dolphins occur in both marine and fresh waters. In India, Irrawaddy dolphins are seen around the Chilka lake, where an estimated 155 of these are a major tourist attraction, and off the Sunderbans. The smaller tucuxi is found in the Amazon and Orinoco rivers, and the Yangtze finless porpoise is about 1 metre long.

Obligate river dolphins are found only in fresh water bodies. The Yangtze river dolphin of China is presumed to be extinct, having been last spotted in 2007. The distinctively pink Amazon river dolphin is over 2.5 metres long. The equally large Ganges river dolphin has a widespread habitat, and is found in the main bodies and some tributaries of the Ganges and the Brahmaputra. Closely related to the Ganges dolphin, the Indus river dolphin is the State aquatic animal of Punjab. Here, it is found in the river Beas and its Harike wetlands in the Tarn Taran district. The Environment Ministry study could locate only three of these dolphins, indicating their precarious existence. Only about 1,800 survive in the Indus in Pakistan.

Adapting to muddy water

Dolphins and toothed whales have a prominent, fatty mass on their foreheads called the melon. It acts as a lens that focuses sound, and is very important in echolocation. Our river dolphins prefer waters that are muddy, with low salt content. An unusual feature of the Ganges and Indus river dolphins is their poor eyesight. Navigation and feeding is done by echolocation, where ultrasound waves, in the form of distinctive clicks, are emanated from their vocal chords, and the melon on the forehead is used to sense the echoes of these waves bouncing off nearby objects. These dolphins also show a tendency to swim on their sides, using the fins on the sides of bodies to feel along the bottom of riverbeds in their search for food.

Source: <https://www.thehindu.com/sci-tech/science/counting-our-vulnerable-dolphins/article69303206.ece>
Dated: March 08, 2025, The Hindu



OTHERS

An equitable future for women in science, in India

With India continuing to push the boundaries of scientific and technological advancement, it must ensure the full inclusion of women in this journey



Women in science navigate a minefield of challenges that often start early. Educational barriers, such as limited access to quality schools and gendered societal norms, can discourage girls from pursuing science, technology, engineering, and mathematics (STEM). For those who persist and are fortunate to get past these early hurdles, cultural expectations frequently demand that they prioritise family over careers, severely jeopardising professional growth. Gender stereotypes further restrict opportunities, affecting hiring, promotions and funding. Harassment and discrimination in academic settings add another dimension of hostility that push many women out of the field.

A study of STEM scientists

Globally, as well as in India, we see similar patterns. A study of STEM scientists across 38 countries reveals higher attrition rates for women, driven by non-inclusive workplaces, work-life balance struggles, and limited access to high-impact research.

These barriers slow career progression and reduce access to senior roles and professional networks, increasing dropout rates. The postdoc-to-faculty transition is especially challenging for women, with familial responsibilities, low confidence, and a lack of female role models cited as key factors, as highlighted by research from the National Institutes of Health.

These barriers compel us to consider why it is vital to prioritise the retention of women in science. Diverse teams drive creativity and innovation, leading to breakthroughs by integrating multiple perspectives. More women in science also results in role models for future generations, inspiring girls to pursue STEM. Promoting equity ensures that women can contribute fully to scientific progress, enriching society with a more inclusive workforce.

Source: <https://www.thehindu.com/opinion/oped/an-equitable-future-for-women-in-science-in-india/article69303932.ece>

Dated: March 08, 2025, The Hindu

Cuttlefish 'mesmerize' their prey with a moving skin pattern, study finds



While sneaking up on prey, cuttlefish employ a dynamic skin display to avoid detection in the last moments of approach, researchers at the University of Bristol have found.

Maintaining camouflage while moving is a challenge faced by many pursuit predators. In this study, "Stealth and deception: adaptive motion camouflage in hunting broadclub cuttlefish" published in *Science Advances*, the team uncovered a novel form of motion camouflage, whereby the broadclub cuttlefish pass dark stripes downward across their head and arms to disguise their hunting maneuvers. Lead author Dr. Matteo Santon from the University of Bristol's School of Biological Sciences said, "Camouflage has predominantly been studied as an adaptation that prey use to hamper their detection or recognition from predators, and almost exclusively focused on still prey as motion tends to disrupt camouflage."

Senior author Dr. Martin How explains, "Most cuttlefish rely on stealth to sneak up on prey. Due to their fast color-changing skin, these remarkable animals have a wider range of options than most when it comes to camouflage while moving."

By taking a prey crab's eye-view, the scientists were able to show that the passing-stripe display is camouflaging the predator while hunting. Their findings suggest that the visual system of the prey may be overwhelmed by the strong motion produced by the stripes, causing them to fail to detect the looming cues of the approaching predator.

Dr. Santon added, "To our eyes this dynamic display looks very conspicuous, standing out strongly from the background, but it is exploiting the effect of the strong dynamic motion cues produced by the rhythmic passing stripes to deceive the prey."

Source: <https://phys.org/news/2025-03-cuttlefish-mesmerize-prey-skin-pattern.html>

Dated: March 26, 2025, The Hindu