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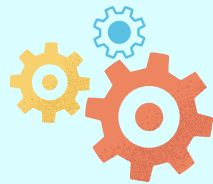


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## SCIENCE & TECHNOLOGY

### IISc scientists develop design capable of controlling temperature for transition of material from electrical insulator to conductor

This work enables the study and control of properties of these exotic materials that can be both insulators and conductors

Scientists at Indian Institute of Science (IISc.), in collaboration with scientists from Japan, Denmark and the United States, have developed a synthetic material design that enables them to control the temperature at which a material can overcome electronic 'traffic jams', a transition from an electricity insulator to a conductor, setting the ground for an electronic switch that is more efficient than a transistor.

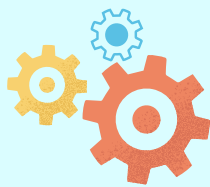


Indian Institute of Science building in Bengaluru

According to the Department of Science and Technology: Most commonly encountered materials are either electrical conductors (such as copper or aluminium) or electrical insulators (such as plastic and paper). Correlated electron materials are a class of materials that undergo an electronic transition from an insulator to a metal. However, these transitions work as a function of temperature, making them less useful in devices such as an electronic switch that usually operate at a constant temperature (usually room temperature). Further, these transitions occur at a temperature that might not be relevant for room temperature operations".

A team of scientists, including Prof. Naga Phani and his colleagues at the solid state and structural chemistry unit at IISc. Bengaluru, proposed and demonstrated a three-layer structure that comprises of an 'active' channel layer that undergoes the metal to insulator transition, a charge reservoir layer that can 'drip' electrons into the active layer and control the temperature at which the transition occurs, a charge-regulating spacer layer between the active layer and the reservoir layer which regulates the flow (or 'drip') of electrons from the reservoir layer to the active layer.

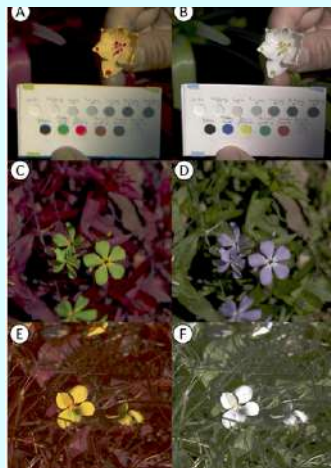
Source: <https://www.thehindu.com/sci-tech/science/iisc-scientists-develop-design-capable-of-controlling-temperature-for-transition-of-material-from-electrical-insulator-to-conductor/article67961383.ece>



## Scientists build a camera to ‘show’ how animals see moving things

Animal-vision video could help farmers spot fruit pests invisible to the human eye but readily visible to some animals

*This illustration compares three flowers - summer snowflake (A, B), blue phlox (C, D), and a blue violet (D, E) - in honeybee false colour (left) and human-visible colours (right)*



We know there are many different ways to ‘see’ the world because that’s the diversity we have found in animals. Organisms with the ability to see have two or more eyes that capture light reflected by different surfaces in their surroundings and turn it into visual cues. But while all eyes have this common purpose, the specialised cells that respond to the light, called photoreceptors, are unique to each animal.

For instance, human eyes can only detect wavelengths of light between 380 and 700 nanometres (nm); this is the visible range. Honey bees and many birds on the other hand can also ‘see’ ultraviolet light (10-400 nm).

While the human visual range is relatively limited, it hasn’t abated humans’ curiosity about how animals see the world. Thankfully we don’t have to imagine too much. Researchers at the University of Sussex and the George Mason University (GMU) in the U.S. have put together a new camera with the ability to view the world like animals do. In a paper published in PLoS Biology, the team has written their device can even reveal what colours different animals see in motion, which hasn’t been possible so far.

### Making the invisible visible

Animals use colours to intimidate their predators, entice mates or conceal themselves. Detecting variations in colours is thus essential to an animal’s survival. Animals have evolved to develop highly sensitive photoreceptors that can detect light of ultraviolet and infrared wavelengths; many even notice polarised light as part of their Umwelt – the biological systems that make a specific system of meaning-making and communication possible.

Source: <https://www.thehindu.com/sci-tech/science/scientists-build-a-camera-to-show-how-animals-see-moving-things/article67960944.ece>

## IIT Jodhpur Researchers Create Prototype of Hybrid Vehicle that Moves in Land, Air, and Water



Indian Institute of Technology Jodhpur researchers have developed a robust control system and design for a hybrid unmanned aerial-underwater vehicle. Hybrid vehicles that can operate both on land and in water are essential for tasks like mapping oil spills on beaches, rivers, or underwater erosion and pollution dispersion. By developing a sound mathematical system that drives these vehicles, this research will help make them more capable and efficient and better applicable to their functions such as lifeguard rescue efforts and even underwater and aerial photography.

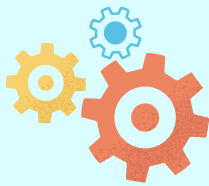
The team has developed this system by taking inspiration from a species of bird, Anhingas, that are both able to move on land and underwater. Based on this, the research team has created a 3D-printed prototype made of various components and waterproofing. The prototype has been tested for aerial, water surface, and underwater manoeuvring using Remote Control (RC) transmission.

The paper highlighting this work was presented at AIR '23: Proceedings of the 2023 6th International Conference on Advances in Robotics. (DOI: <https://doi.org/10.1145/3610419.3610463>)

Dr Jayant Kumar Mohanta, Assistant Professor, Department of Mechanical Engineering, IIT, Jodhpur, explains, “This prototype can sail like a ship on the surface, fly in the air and also navigate when it is submerged in the water. It has a flying time of 15 minutes and can stay underwater for 8 hours. Interest in this topic has been growing over the years but this technology at present is with very few countries like the USA and China. We wanted to develop our indigenous product.”

So far, this prototype, with the algorithm proposed by the IIT Jodhpur team, is capable of performing six manoeuvres for smooth transitions between water and air uncertain conditions. These maneuvers include: (1) Dive from Air to Underwater, (2) Take off from Underwater to Air, (3) Landing from Air to Water Surface, (4) Dive from Water Surface to Underwater, (5) Surfacing from Underwater, and (6) Take off from Water Surface

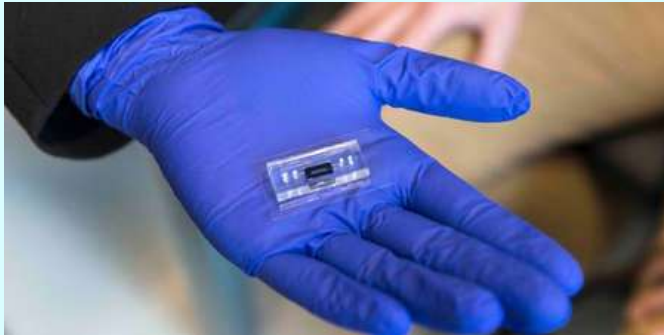
Source: <https://timesofindia.indiatimes.com/city/jodhpur/iit-jodhpur-researchers-create-prototype-of-hybrid-vehicle-that-moves-in-land-air-and-water/articleshow/108622372.cms>



## SCIENCE & TECHNOLOGY

### Engineers develop method to compute data stored in DNA

Researchers have designed new method to compute data store on DNA, in hopes of building a future of very powerful and robust "biocomputers."



*Microfluidic devices are being explored as new options for data storage on DNA.*

Engineers at the Rochester Institute of Technology (RIT) and University of Minnesota claimed to have found a way to process data stored in DNA. The "microfluidic integrated circuit" they envision is designed to perform operations through artificial neural network computations on data stored in DNA, according to RIT.

"We are in the age of big data that needs to be stored somewhere. We don't think that more data centers are the answer, or even the best answer. Each data center requires the equivalent of a city block of power. Building, maintaining, and operating more traditional data centers is not sustainable," said Amlan Ganguly, coauthor of a paper on the biocomputer published in PLOS One, in a press statement.

According to Ganguly, data stored on DNA is a highly unexplored area of research even though it is good at storing information. Theoretically, DNA can be three to six orders of magnitude more compact than most conventional memory hardware we use. It can also be more reliable and durable if used correctly.

There are many parallels between DNA and silicon-based conventional computing — The former can be used to sequence data where the latter reads it. The former is used to synthesize data where the latter writes it. Researchers like Ganguly are developing methods to manipulate materials at a molecular level in a bid to decrease electronic aspects of tech storage and move towards more biocompatible methods of storage and processing systems.

Apart from being more appropriate for forensics and biomedical applications, this technology could potentially pave the way for more robust storage systems that could improve data searches.

Source: <https://indianexpress.com/article/technology/science/computer-data-stored-in-dna-9209486/>

### What is it? IceCube: The big, chill neutrino-spotter



The IceCube neutrino observatory is a device at the Earth's South Pole that detects subatomic particles called neutrinos. It was built and is maintained by the IceCube Collaboration, which consists of many universities worldwide led by the University of Wisconsin, Madison.

IceCube consists of thousands of sensors buried more than 1.4 km beneath the ice plus multiple detectors above the surface. Neutrinos are light particles that very rarely interact with matter. This is why they're called "ghost particles". By some estimates, a human-sized neutrino detector will have to wait for a century for a single neutrino to interact with a sensor. The larger the detector's collecting area, the higher the chances of spotting neutrinos. IceCube is the world's biggest 'neutrino telescope'; its sensors are distributed throughout a cubic kilometre of ice.

When a neutrino interacts with the ice surrounding the sensors, it may produce some charged particles and some radiation. The sensors detect the radiation to infer the detection of a neutrino and use the radiation's properties to understand more about the particle. Neutrinos come in different types. IceCube can identify some of them in real-time. For others, IceCube collects data for many years and scientists then comb through them to find neutrino interaction events.

In such an instance, scientists reported last week they had found instances in IceCube's data from 2011 to 2020 that matched the signature of tau neutrinos, with more than 99.999999% confidence.

Source: <https://www.thehindu.com/sci-tech/science/what-is-it-icecube-the-big-chill-neutrino-spotter/article67967841.ece>



# ENVIRONMENT

## Chemicals in plastics far more numerous than previous estimates, report says

While the UNEP had previously identified around 13,000 plastic chemicals, a report by a European team found more than 16,000



Compressed metal cans are seen at Indaver Plastics Recycling (IPR) plant in Willebroek, Belgium March 14, 2024.

At least 3,000 more chemicals are in plastics — from food packaging to toys to medical devices — than previously estimated by environmental agencies, a report published on Thursday found, raising questions over pollution and consumer safety.

While the United Nations Environment Programme (UNEP) had previously identified around 13,000 plastic chemicals, the report by a team of European scientists found more than 16,000 chemicals in plastics — a quarter of which are thought to be hazardous to human health and the environment.

The report, funded by the Norwegian Research Council, comes as government negotiators grapple with devising the world's first treaty to tackle mounting plastic pollution, as some 400 million tonnes of plastic waste are produced every year.

"To robustly solve plastic pollution, you actually have to look at the full life cycle of plastics and you have to address the chemicals issue," said report co-author Jane Muncke, managing director of the Swiss nonprofit Food Packaging Forum.

That's because plastic chemicals can leach into water and food.

"We're finding hundreds, if not thousands, of plastic chemicals in people now and some of them have been linked to adverse health outcomes," Muncke said. Such impacts include fertility issues and cardiovascular disease.

"When we look into products that we're using on a daily basis, we usually find between hundreds, if not thousands of chemicals in an individual plastic product," said lead author Martin Wagner, an environmental toxicologist at the Norwegian University of Science and Technology.

Source: <https://www.thehindu.com/sci-tech/science/chemicals-in-plastics-far-more-numerous-than-previous-estimates-report-says/article67953883.ece>

## Ocean temperature hit record high in February 2024, EU scientists say

Antarctic sea ice reached its annual minimum extent in February, registering its third lowest extent on record at 28% below average



February's average sea surface temperature surpassed the previous record of 20.98°C (69.77°F) set in August 2023

Ocean temperatures hit a record high in February, with the average global sea surface temperature at 21.06 degrees Celsius (69.91 degrees Fahrenheit), the EU's Copernicus Climate Change Service (C3S) said on March 7.

February's average sea surface temperature surpassed the previous record of 20.98°C (69.77°F) set in August 2023, in a dataset that goes back to 1979. The concerning marine record arrived during what was also the hottest February on record, marking the ninth consecutive month with such a milestone for the respective month.

Marine scientists warned this week that a fourth global mass coral bleaching event is likely unfolding in the Southern Hemisphere, driven by warming waters, and could be the worst in the planet's history.

Corals bleach under heat stress, expelling the colourful, helpful algae that live in their tissues, leaving behind a pale skeleton. This makes them vulnerable to starvation and disease, and many die. This can lead to the collapse of fragile reef ecosystems, with coastlines left unprotected from erosion and storms and fisheries falling short.

An El Nino climate pattern, borne out of warmer than usual surface waters in the Eastern Pacific, alongside human-caused climate change is fueling the extra heat. "What is more surprising is that sea surface temperatures are at record levels over regions far away from the centre of the El Nino action, such as the tropical Atlantic and Indian Ocean," said climate scientist Richard Allan of the University of Reading. This, he said, pointed to the strong influence of rising greenhouse gas emissions in the atmosphere.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/ocean-temperature-hit-record-high-in-february-2024-eu-scientists-say/article6795329.ece>



# ENVIRONMENT

## WMO report out: 6 charts that tell you everything about the health of our planet

You know glaciers are shrinking, oceans are heating up, and the planet is getting warmer at a rapid rate. But how bad are things, exactly? What has led to this? We explain



The 200-foot-tall (60-meter-tall) front of the Getz Ice Shelf in Antarctica is scored with cracks where icebergs are likely to break off, or calve, in this 2016 photo.

The new annual State of the Climate report, published on Tuesday (March 19), by the World Meteorological Organisation (WMO) found that 2023 was the hottest year on record. Numerous records for indicators of the climate system, including greenhouse gas levels (GHGs), surface temperatures, ocean heat, sea level rise, Antarctic sea ice cover, glacier retreat, etc., were broken, the report added.

Here are six figures that show how these indicators have changed over time and what they tell us about the planet's present condition.

### GREENHOUSE GASES

The unprecedented levels of GHGs in the atmosphere are the main culprit behind the rapid warming of the planet. Gases such as carbon dioxide, methane, and nitrous oxide trap the incoming solar radiation in the atmosphere and contribute to global warming. The concentration of aforementioned GHGs reached record-high observed levels in 2022 — the latest year for which consolidated global values are available (1984–2022) — according to the WMO report.

### SURFACE TEMPERATURE

The global average near surface temperature for 2023 spiked to 1.45 degree Celsius — the highest ever on record — above the pre-industrial levels. Although the rise in GHG concentrations in the atmosphere is the primary reason for soaring global temperatures, the onset of El Niño last year also contributed to the increase in mercury.

Source: <https://indianexpress.com/article/explained/explained-climate/wmo-state-of-climate-report-9223032/>

## In climate push, German chemical maker swaps oil for sugar

The pilot project involves producing "aniline", a chemical used in making foams — used widely in mattresses and armchairs, as well as building insulation



The pilot project involves producing "aniline", a chemical used in making foam

At one of Europe's largest chemical complexes, German group Covestro is trialling the manufacture of a key product using sugar as a base material instead of oil, as the industry seeks to reduce its carbon footprint.

The pilot project involves producing "aniline", a chemical used in making foams — used widely in mattresses and armchairs, as well as building insulation.

While large-scale, commercial production is probably years away, the experiment marks a small step in the chemical industry's battle to slash carbon emissions as Earth faces a dire climate emergency. Of the 100 million barrels of oil produced worldwide every day, "a quarter goes directly into the chemical industry," said Walter Leitner, from Aachen University, which has been involved in the aniline project for a decade.

"The chemical industry needs to be completely rebuilt."

Plastics manufacturer Covestro — a former division of chemical giant Bayer — started trials at its complex in the western city of Leverkusen at the end of 2023, after laboratory tests.

In a 100-square-metre (1,080-square-foot) room, aniline, a transparent fluid, is extracted from a 600-metre network of intertwined pipes. Using a process developed by University of Stuttgart researchers, fermented sugar is treated with chemicals to make the product.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/in-climate-push-german-chemical-maker-swaps-oil-for-sugar/article67937761.ece>



# ENVIRONMENT

## World experienced warmest February on record in 2024: European Union climate agency

Scientists attribute the exceptional warming to the combined effects of El Nino — a period of abnormal warming of surface waters in the central Pacific Ocean — and human-caused climate change.



The world, last month, experienced the warmest February on record, with the average temperature being 1.77 degrees Celsius more than the February average for 1850-1900, the designated pre-industrial reference period, the European Union's climate agency said on March 7.

The Copernicus Climate Change Service (C3S) also said that every month since June last year has been the warmest such month on record.

Scientists attribute the exceptional warming to the combined effects of El Nino — a period of abnormal warming of surface waters in the central Pacific Ocean — and human-caused climate change.

C3S last month said the global mean temperature breached the 1.5-degree Celsius threshold for an entire year for the first time in January. A permanent breach of the 1.5-degree Celsius limit specified in the Paris Agreement, however, refers to long-term warming over many years.

According to climate scientists, countries need to limit the global average temperature rise to 1.5 degrees Celsius above the pre-industrial period to avoid the worst impacts of climate change.

Earth's global surface temperature has already increased by around 1.1 degrees Celsius compared with the average in 1850-1900 — a level that has not been witnessed since 1,25,000 years, before the most recent ice age.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/february-2024-warmest-on-record-with-average-temperature-177-degree-celsius-above-pre-industrial-period-european-union-climate-agency/article67923688.ece>

## India's golden langur population estimated at 7,396

The comprehensive population estimation of the endangered primate was carried out in two phases.



There are an estimated 7,396 golden langurs in India, the latest survey of the primate has revealed. The comprehensive population estimation of the endangered primate was carried out in two phases by the Primate Research Centre NE India (PRCNE), Assam Forest Department, Bodoland Territorial Council, Salim Ali Centre for Ornithology and Natural History (SACON), and Conservation Himalayas.

The entire distribution range of the golden langur (*Trachypithecus geei*) covers the Manas Biosphere Reserve and all fragmented forests in the western part of Assam.

In the first phase during March-April 2020, the survey covered the western part of the Manas Biosphere Reserve, including Ripu Reserved Forest — a major part of it was recently upgraded to Raimona National Park – Chirang Reserve Forest, Manas Reserve Forest, and Manas National Park up to the western bank of the Manas River. The second phase during the same months in 2021 focussed on fragmented forest habitats of golden langurs in the Bongaigaon, Kokrajhar, and Dhubri districts of western Assam. The block count method was applied for the first time to assess the abundance, spatial distribution, and densities of the golden langur populations.

“This method is considered to be relatively simple, cost-effective, and robust for arboreal and small group-living primates such as the golden langur,” H.N. Kumara, the principal scientist of SACON said. The golden langur habitat was demarcated into 51 counting blocks, each overlaid with 50-hectare grid cells. Ten teams, each comprising one or two trained enumerators and three to four forest staff, surveyed the blocks.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/indias-golden-langur-population-estimated-at-7396/article67931902.ece>



# AGRICULTURE

## Strengthening soil organic carbon levels is crucial to achieving T.N.'s carbon sequestration goals: expert

From 560 samples taken from forests across Tamil Nadu, Anna University professor A. Ramachandran found that most appeared to have extremely low carbon content, making them unviable for healthy vegetation growth



*SOC is the carbon that remains in the soil after partial decomposition of any material produced by living organisms. The loss of SOC exacerbates climate change*

Across India, and especially in Tamil Nadu, forests are receiving renewed attention for their role in carbon sequestration, in line with the country's nationally determined contribution target of creating an additional carbon sink of 2.5 to 3 billion tonnes of carbon dioxide equivalent, by 2030.

While the State is on the right path with a thrust on afforestation in areas outside forests through the Green Tamil Nadu Mission and the Trees Outside the Forests India programmes, experts say that one crucial aspect, the soil organic carbon (SOC), requires more attention.

SOC is the carbon that remains in the soil after partial decomposition of any material produced by living organisms. According to the Food and Agriculture Organization of the United Nations, soils represent the largest terrestrial organic carbon reservoir and the loss of SOC exacerbates climate change. At a capacity building programme conducted by Anna University's Climate Studio for senior forest officers on Monday, March 11, A. Ramachandran, Emeritus Professor, Centre for Climate Change and Disaster Management (CCCDM), highlighted the need for enriching soil in forests with the use of plant growth-promoting bacteria.

### A digital repository to take stock of soil health

Conceptualised by Prof. Ramachandran, a web application unveiled on Monday shows a district-wise map and data on deciduous and thorn forests, the present share of SOC in soil, and the amount of compost required to enhance the carbon sink. For instance, as per the app, which has been proposed to be launched in the public domain soon, thorn forests in Dindigul have only 0.25% of SOC and need about 312.5 kg of compost per hectare.

Source: <https://www.thehindu.com/news/national/tamil-nadulstrengthening-soil-organic-carbon-levels-is-crucial-to-achieving-tns-carbon-sequestration-goals-expert/article67943063.ece>

## Average price of tobacco grown in Karnataka has more than doubled in last 9 years



*Much of the FCV tobacco grown in Karnataka, mostly in Mysuru and parts of Hassan district, is export quality tobacco.*

The Flue Cured Virginia (FCV) tobacco auctions in Karnataka for the crop season 2023-24 concluded on Saturday with the marketing of 88.86 million kg at an average price of ₹257.46 per kg.

The average prices during the year were not only higher by ₹29.45 per kg when compared to the average price of ₹228.01 last year, but also reveal that the average prices of tobacco had more than doubled during the last nine years from an average price of ₹107.49 realised during the year 2014-15.

Much of the FCV tobacco grown in Karnataka, mostly in Mysuru and parts of Hassan district, is export quality tobacco. The Tobacco Board has attributed the rise in average prices of tobacco over the last year to "buoyant market conditions".

The average price of tobacco has more than doubled during the last nine years even as anti-tobacco activists have been campaigning against cultivation of tobacco on account of the health hazards its consumption poses. The anti-tobacco campaigners have been urging the government and the tobacco growers to shift to alternative crops.

Though a crop size of 100 million kg had been fixed for the year 2023-24, a total of 88.86 million kg of tobacco was marketed during the auctions for the year, which had commenced on September 25, 2023. While the average price for the year was ₹257.46 per kg, the highest bid realised during the auction went up to ₹290 per kg.

Source: <https://www.thehindu.com/news/national/karnatakav-erage-price-of-tobacco-grown-in-karnataka-has-more-than-doubled-in-last-9-years/article67961617.ece>



# AGRICULTURE

## CSIR-IICT demonstrates tech to turn dry leaves into soil conditioner

Using a method called accelerated anaerobic composting, a demonstration plant installed in a gated community in Hyderabad is turning dry leaves into bio-manure with recommended nitrogen and carbon content



A diagram showing the operation of an Accelerated Anaerobic Composting ACC unit.

CSIR-Indian Institute of Chemical Technology (IICT), which had indigenously developed high rate bio-methanation technology-based Anaerobic Gaslift Reactor (AGR) for the generation of biogas and bio-manure from organic waste, has now successfully demonstrated that it can be re-modelled to convert dry leaves into a 'soil conditioner'.

This method, called Accelerated Anaerobic Composting (ACC), ensure that only a bio-manure is generated, not the biogas. "This is a much simpler process, four times cheaper and does not require much expertise. It only needs RCC structure and pits without any big machinery," explained CSIR-IICT chief scientist A. Gangagni Rao on Sunday.

The ₹7.5-lakh 500-kg capacity ACC 'demonstration' reactor was established in a gated community, Maple Town Villas, at Sun City in Bandlaguda on request of the residents' association and is said to be working well for the past couple of months, generating about 10 tonnes of soil conditioner.

The organic manure thus generated out of the dry leaves from the trees on the 40 acre community land is being utilised by the residents of the 275 villas for various plants and trees on the premises, said Mr. Gangagni Rao, who heads the IICT's bioengineering and environmental sciences division.

"We have tried using dry leaves for the first time after testing it in our laboratory. The soil conditioner parameters adhere to the standards prescribed by the fertiliser control order of the Union Agriculture Ministry about the content of nitrogen, carbon and others," he explained.

Source: <https://www.thehindu.com/sci-tech/agriculture/csir-iict-demonstrates-tech-to-turn-dry-leaves-into-soil-conditioner/article68013124.ece>

## ICRISAT pioneers 'world's first' pigeonpea speed breeding protocol to bolster food security in drylands



The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has pioneered the world's first pigeonpea speed breeding protocol, further bolstering food security in Asia and Africa, the organisation said on 20th Feb. 2024.

The new convention promises to substantially cut the time required to develop new pigeonpea lines with desirable traits, effectively bringing food to dryland communities faster.

Traditionally, pigeonpea breeding can take up to thirteen years. But with the new protocol's emphasis on material breeding and control over factors like photoperiod, temperature, and humidity, the breeding cycle can now be shortened to just two to four years, as opposed to the conventional period of seven years. Pigeonpea, a staple in tropical and subtropical diets, is crucial for food security and soil health globally and is lauded for its nutritional value and versatility.

Dr Jacqueline Hughes, Director General of ICRISAT, underscored the consequence of the innovation. "This pigeonpea speed breeding protocol represents a significant advancement for major pigeonpea-producing regions, paving the way for self-reliance in pulse production and meeting the dietary necessities of nations such as India, Myanmar, Kenya, Tanzania and Mozambique.

"I commend our researchers and partners for developing this protocol, which promises to enhance food and nutrition security in the drylands. This achievement is particularly timely, coinciding with World Pulses Day celebrations, highlighting the global significance of pulses," said Dr Hughes.

Historically, pigeonpea's long growth cycle and sensitivity to day length have hindered breeding efforts, with only about 250 varieties released globally over six decades.

Source: <https://agriculturepost.com/agri-research/icrisat-pioneers-worlds-first-pigeonpea-speed-breeding-protocol-to-bolster-food-security-in-drylands/>





# HEALTH

## Experts emphasise the need to cut salt intake for better health

Sapiens Health Foundation launches the 'Losalter Group' and a website to create awareness on the impact of salt on health at an event held ahead of World Kidney Day 2024



*Dignitaries at the World Kidney Day event organised by Sapiens Health Foundation*

Sapiens Health Foundation launched the 'Losalter Group', emphasising the need to cut salt intake and a website to create awareness on the impact of salt on health.

At an event held ahead of World Kidney Day 2024, Rajan Ravichandran, chairman of Sapiens Health Foundation, said the 'Losalter Group' will create awareness on various issues, including the problems caused by an excess consumption of salt.

"We have received a grant from 'Resolve to Save Lives' for 'Losalter Group'. We will train 300 physicians throughout the country. They will be educated on salt and health and given toolkits to propagate the message to the people," he said. The World Health Organization (WHO) recommended a salt intake of less than 5 g per day. He added that the onus of reducing salt intake was with the public, government, and food industry and stressed on 'signal labelling' for food products.

Umesh Khanna, Chairman, Mumbai Kidney Foundation, said there was a huge gap in kidney care. "This World Kidney Day, our aim is to translate what we know into what we do," he said. He stressed the need to make people and general practitioners aware of the risk factors of chronic kidney disease (CKD) and provide them with workable solutions.

Dr. Khanna highlighted the need to target the youth and bring in cultural changes in salt, sugar, and oil consumption. Stating that India is facing an epidemic of non-communicable diseases, he said young Indians were suffering from lifestyle illnesses, and it was rapidly spreading from the urban to the rural population, raising the need to act fast.

Source: <https://www.thehindu.com/news/cities/chennai/experts-emphasise-the-need-to-cut-salt-intake-for-better-health/article67943860.ece>

## An apple cider vinegar drink a day? New study shows it might help weight loss

Apple cider vinegar is acidic and there are concerns it may erode tooth enamel. This can be a problem with any acidic beverages, including fizzy drinks, lemon water and orange juice



*Made from fermented apples and naturally high in acetic acid, apple cider vinegar has been popular in recent years for its purported health benefits*

Made from fermented apples and naturally high in acetic acid, apple cider vinegar has been popular in recent years for its purported health benefits – from antibacterial properties to antioxidant effects and potential for helping manage blood sugars.

Its origins as a health tonic stretch much further back. Hippocrates used it to treat wounds, fever and skin sores.

An experimental study, released today, looks into whether apple cider vinegar could be effective for weight loss, reduce blood glucose levels and reduce blood lipids (cholesterol and triglycerides).

The results suggest it could reduce all three – but it might not be as simple as downing an apple cider vinegar drink a day.

### What did they do?

A group of scientists in Lebanon did a double-blinded, randomised, clinical trial in a group of overweight and obese young people aged from 12–25 years. Researchers randomly placed 30 participants in one of four groups.

The participants were instructed to consume either 5, 10 or 15ml of apple cider vinegar diluted into 250ml of water each morning before they ate anything for 12 weeks. A control group consumed an inactive drink (a placebo) made (from lactic acid added to water) to look and taste the same. Typically this sort of study provides high quality evidence as it can show cause and effect – that is the intervention (apple cider vinegar in this case) leads to a certain outcome.

Source: <https://indianexpress.com/article/lifestyle/food-wine/apple-cider-vinegar-drink-a-day-new-study-weight-loss-9211279/>



# HEALTH

## Indians love their ultra-processed foods but with new study linking it to 32 health problems, it's time to quit

Did you know that India's ultra-processed food sector has seen explosive growth? One of the highest rates globally, from 2011 to 2021.



Fancy a packet of chips? Perhaps it's time to re-evaluate your diet. A new study published in The BMJ suggests that regularly consuming ultra-processed foods like sweets, crisps, and pre-packaged meats can increase your risk of death from cardiovascular disease by 50%.

But that's not all. These foods are also linked to a significant rise in other illnesses, with the study finding a 32% increase in the occurrence of conditions like cancer, type 2 diabetes, cardiovascular issues, gastrointestinal and respiratory problems, depression, and anxiety.

Did you know that India's ultra-processed food sector has seen explosive growth? According to a report by the World Health Organization in collaboration with the Indian Council for Research on International Economic Relations, the sector grew at a compound annual growth rate of 13.37% between 2011 and 2021 – one of the highest rates globally.

This upward trend, the report's authors warned, needs to be curbed through policy interventions to prevent an obesity crisis in India similar to what some Western countries are already experiencing.

According to G Sushma, clinical dietician, CARE Hospitals, Banjara Hills, Hyderabad, this upward trend can be attributed to a couple of reasons, like urbanisation and changing lifestyles, globalisation and market influence, along with growing time constraints that come with the modern lifestyle. For the unversed, ultra-processed foods are characterised by extensive industrial processing and the inclusion of additives, preservatives, flavourings, and other substances. Common examples include soft drinks, chips, crackers, instant noodles, sweetened breakfast cereals and fast food items.

Source: <https://indianexpress.com/article/lifestyle/food-wine/indians-ultra-processed-foods-illnesses-how-to-quit-9207974/>

## Karnataka bans use of harmful colouring agents in Cotton Candy and Gobi Manchurian

The ban comes into effect immediately with a notification issued by the Commissioner of Food Safety on March 11

Karnataka Government has banned the use of harmful colouring agents in cotton candy and Gobi Manchurian, and warned of severe action against offenders.



*A vendor selling cotton candy*

“We have decided to ban the use of Rodamine B, the colouring agent used in cotton candy. As per the existing law, Rodamine B is already banned. There is no ban on sale of white cotton candy,” Health and Family Welfare Minister Dinesh Gundu Rao told mediapersons in Bengaluru on March 11.

The ban comes into effect immediately with a notification issued by the Commissioner of Food Safety on March 11.



*Gobi Manchurian*

The Public Health Department had collected samples of coloured cotton candy and Gobi Manchurian. Laboratory tests revealed the use of harmful colouring agents. Of the 25 samples of cotton candy, 15 contained Sunset Yellow, Tartrazine and Rodamine B. Of the 171 samples of Gobi Manchurian, 107 were found to contain Tartrazine, Sunset Yellow and Carmoisine.

The findings of a survey, conducted from February 12, reveal that the samples with artificial colouring agents were unsafe for consumption as per The Food Safety and Standards Act, 2006, and The Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.

With respect to the use of Tartrazine in Gobi Manchurian, the Minister said that though Tartrazine is an approved artificial food colour, there are restrictions on its usage. “There are a list of food items in which it can be used, and the quantum to be used is also prescribed. This is for packed food items. However, Tartrazine cannot be used for a freshly prepared food item,” Mr. Rao explained.

Violators face a fine of upto ₹10 lakh, cancelling of licence, and prison terms ranging from seven years to life imprisonment under the Food Safety and Standards Authority of India (FSSAI) Act.

Source: <https://www.thehindu.com/sci-tech/health/karnataka-bans-use-of-harmful-colouring-agents-in-cotton-candy-and-gobi-manchurian/article67938569.ece>



# HEALTH

## Big Swedish study hints at link between bowel disease, infant diet

Children who had a high intake of fish and vegetables at one year of age were at lower risk of developing IBD, the study found



*Researchers followed the dietary habits of more than 80,000 children through adolescence in Norway and Sweden as they consumed plenty of vegetables and fish in the first year of life.*

Inflammatory Bowel Disease (IBD) describes disorders where the lining of the digestive tract is inflamed. There are two types of IBD disorders: ulcerative colitis, where the large intestine and the rectum are prone to inflammation and sores, and Crohn's disease, which usually affects the small intestine.

Researchers have reported diet, age, family history, cigarette smoking, and certain medications, among other factors, as being responsible for causing or worsening IBD.

They have also said changing diet patterns can help explain changing patterns of the prevalence of IBD. For example, a 2023 study in *The Lancet* attributed a higher incidence of IBD in rural Telangana to the greater availability and consumption of processed foods.

**A diet that predicts IBD**

More recently, a study published in the journal *Gut* in January reported that the diet of infants as young as a year old could affect their chances of developing IBD in future. Researchers behind the study followed the dietary habits of more than 80,000 children through adolescence in Norway and Sweden as they consumed plenty of vegetables and fish in the first year of life, and were associated with a lower future risk of developing IBD.

Consuming sugar-sweetened beverages in this time was associated with a higher risk of IBD, they reported. According to their analysis, at three years of age, no dietary factor other than fish intake was associated with IBD risk. The researchers suspect the developing gut microbiome may be at the heart of the apparent age-dependent relationship of dietary intake and IBD.

*Source: <https://www.thehindu.com/sci-tech/science/inflammatory-bowel-disease-infant-diet-predict-risk-study/article67914194.ece>*

## Indian team uses repurposed drug to treat oral cancer subtype

In animal studies, the FDA-approved deworming drug was able to significantly inhibit the tumour cells and improve the survival rate in mice carrying the fusion gene-overexpressing cells



A study by Mumbai-based researchers has successfully identified a novel fusion transcript in head and neck cancer patients. The researchers not only found the fusion transcript to be a promising therapeutic target for head and neck cancer but also found that an FDA-approved deworming drug called pyrinium pamoate can be a potential drug to treat such cancer. The results of the study were published in the journal *NPJ Precision Oncology*.

Fusion transcript arises when small segments of two chromosomes exchange their positions leading to structural rearrangement of the chromosomes. For instance, a translocation involving chromosomes 6 and 18 will result in chromosome 6 having a small segment of chromosome 18, while chromosome 18 will have a small segment of chromosome 6. As a result of the segment exchange between two chromosomes, two different genes are brought together at the point where the segments meet leading to the emergence of a chimeric gene or fusion transcript. In this case, researchers from the Advanced Centre for Treatment, Research, and Education in Cancer (ACTREC), Mumbai were able to identify the fusion transcript (UBE3C-LRP5) as well as map the translocation event to single-base resolution. The translocation event involves chromosome 11 and 7.

The team led by Dr. Amit Dutt, who is currently a Professor at the Department of Genetics at the University of Delhi South Campus, screened 151 oral cancer patients from India using whole transcriptome sequencing and RT-PCR analysis and found 5.3% of patients were positive for the fusion transcript. The team also found the fusion transcript in 1.2% of Caucasian patients; samples of 502 Caucasian patients from the Cancer Atlas were studied. Oral cancer is the most predominant form of cancer among Indian patients with about 2,00,000 new cases being reported every year. "Of them, nearly 10,000-11,000 patients each year may be harbouring the particular fusion transcript (UBE3C-LRP5)," says Dr. Sudhir Nair, an oral cancer surgeon at ACTREC and a co author of the paper. "This prevalence suggests a potentially critical role for the UBE3C-LRP5 fusion in head and neck cancer development, representing a major advancement in our understanding of the disease."

*Source: <https://www.thehindu.com/sci-tech/science/indian-team-uses-repurposed-drug-to-treat-oral-cancer-subtype/article67954811.ece>*



# S&T COOPERATION FOR GLOBAL SOUTH

## Leveraging South-South Cooperation for Gender Equality



“By fostering partnerships and exchanging knowledge, the Global South can create innovative frameworks and policies that promote gender equality and empower women,” said UNOSSC Director Dima Al-Khatib during a 68th Session of the Commission on the Status of Women side event focusing on ‘Leveraging South-South Cooperation for Gender Equality’. “South-South cooperation – rooted in collaboration and mutual support among countries in the Global South – can serve as an enabler.”

The side event was co-sponsored by Development Alternatives with Women for a New Era (DAWN), UNOSSC, the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women), South-South Cooperation Research and Policy Centre (Articulação Sul/ASUL), China International Development Research Network (CIDRN), and GenDev Centre for Research and Innovation (GenDev CRI).

Participants focused on why and how to leverage South-South and triangular cooperation to accelerate the implementation of the Beijing Platform for Action (BPfA) and the Sustainable Development Goals toward achieving gender equality and empowerment of all women and girls, particularly by examining current South-South and triangular cooperation practices and approaches from experience of women in the Global South.

“As we navigate the complex terrain of development with the Global South, it is imperative that we recognize the power of collaboration particularly through South-South and triangular cooperation to drive transformative change together,” said Kanta Singh, Deputy Representative of UN Women India.

Source: <https://unsouthsouth.org/2024/03/13/csw68-leveraging-south-south-cooperation-for-gender-equality/>

## Advancing Women’s Empowerment through South-South Cooperation



Promoting gender equality through sports: The second annual youth basketball tournament saw 41 girls from Micronesian states come together, breaking barriers in a traditionally male-dominated sport. Photo: UNDP Pacific Office

Equality and horizontality are fundamental principles of South-South cooperation, inscribed into its core international instruments, including the Outcome of the Second High-level United Nations Conference on South-South Cooperation, or BAPA+40. These principles should not be construed to simply apply to equality among nations. Instead, equality must include all stakeholders and permeate all layers of cooperation from the supra-national to the individual.

South-South cooperation, which focuses on empowering women, and mainstreaming gender into activities across all SDGs – be it in agriculture, technology, financial inclusion, health or others – is instrumental in contributing to long-lasting benefits for those furthest behind.

In a proof of case, the South-South Trust Funds and programmes managed by the United Nations Office for South-South Cooperation (UNOSSC) provide rich examples of impactful and innovative approaches through which women have enhanced their livelihoods, improved their health and further fulfilled their potential – impacting not only themselves, but generating lasting change for the betterment of their communities. Marking International Women’s Day, let us celebrate some of the projects improving the lives of women across the Global South.

The India-UN Development Partnership Fund makes strides toward financial inclusion and reproductive health

Established in 2017, the \$150 million India-UN Development Partnership Fund supports Southern-owned sustainable development projects across the developing world, focusing on least developed countries and small island developing states. While its projects span all 17 Sustainable Development Goals, gender considerations are mainstreamed across its initiatives implemented through various United Nations Entities.

Source: <https://unsouthsouth.org/2024/03/08/advancing-womens-empowerment-through-south-south-cooperation/>



# S&T COOPERATION FOR GLOBAL SOUTH

## Global Advocacy Dialogue Series: South-South and Triangular Cooperation Crucial to Tackle Global Challenges



Islamic Development Bank and United Nations Office for South-South Cooperation (UNOSSC) launched Joint Global Advocacy Dialogue Series

South-South cooperation has emerged as an important development cooperation modality for many of today's largest development challenges and should be seen as a critical complement to North-South Cooperation.

A Global Advocacy Dialogue Series was launched Wednesday by the United Nations Office for South-South Cooperation (UNOSSC) and the Islamic Development Bank (IsDB) to explore the latest development and partnerships trends focusing on the innovative and evolving nature of South-South and triangular cooperation.

The first dialogue in the IsDB-UNOSSC series – organized together with the Government of Portugal – introduced the potential for triangular cooperation to accelerate sustainable development, as an important bridge between South-South and North-South cooperation.

“This new Global Advocacy Dialogue Series represents a unique opportunity to bolster our collective efforts,” said UNOSSC Director Ms. Dima Al-Khatib. “Together we are sharing experiences, finding creative solutions to the challenges we face, and fostering a spirit of partnership that brings sustainable development within reach.”

Delivering his opening remarks, Dr. Mansur Muhtar, Vice President of Operations, IsDB said, “The current Global Advocacy Dialogue Series is a timely initiative that casts light on South-South and triangular cooperation for sustainable development as one of the most important topics.” He added that, “IsDB as a South-South Multilateral Development Bank, with a pivotal role to play in furthering the global advocacy agenda on South-South and triangular cooperation.”

Source: <https://unsouthsouth.org/2024/03/07/south-south-and-triangular-cooperation-crucial-to-tackle-global-challenges/>

## India-UN Fund: Sparking Innovation in Barbados' Energy Sector



Minister of Energy and Business, Senator Lisa Cummins, accepts the final documents for the Barbados Energy Local Content Development Project from Economic Adviser/Project Lead ONR, Commonwealth Secretariat, Victor Kitange

At the core of a new energy initiative in Barbados, supported by the India-UN Development Partnership Fund, are insights and methodologies drawn from the experiences of Nigeria, Tanzania, and Trinidad and Tobago. The project is broadening the engagement of local actors in the energy market to promote more and better livelihood opportunities.

“Barbadians have a stake in the ownership of their own assets – sun, wind and wave energy,” said Senator Lisa Cummins, Minister of Energy and Business of Barbados, speaking about the project. “Here in the Ministry, it is a priority for us to make sure we facilitate that.”

The initiative was rolled out through a series of capacity-building workshops and the innovative ‘Share Fair’, designed to equip local suppliers with the skills and knowledge necessary to excel in the international energy arena.

The active participation of experts from the Nigerian Content Development and Monitoring Board (NCDMB) provided practical tools and insights, directly contributing to the project's success by offering proven strategies tailored to the unique challenges and opportunities of the Barbadian context.

With over 215 beneficiaries, the outcomes of this South-South cooperation initiative have contributed to bolstering the capacity and competitiveness of local suppliers in Barbados.

A pivotal achievement of the project was the development and implementation of a Supplier Data Management System (SDMS), along with a structured Supplier Development Program, both informed by Nigeria's pioneering efforts. These systems not only facilitated efficient management of local content development, but also ensured the sustainability and scalability of the project's impact.

Source: <https://unsouthsouth.org/2024/03/01/india-un-fund-sparking-innovation-in-barbados-energy-sector/>



# S&T COOPERATION FOR GLOBAL SOUTH

## 28th Annual Meeting of the China South-South Cooperation Network Held in Kunming



Under the framework of Global South-South Development Center (GSSDC) Project, hosted by the United Nations Fund for South-South Cooperation, with funding support from the Government of China, the 28th Annual Meeting of the China South-South Cooperation Network was organized by the China International Centre for Economic and Technical Exchanges (CICETE) in Kunming, China, from 28 to 29 February 2024. The event was attended by over 90 representatives from 50 member institutions of the China South-South Cooperation Network and United Nations partners.

Established in 1995, the China South-South Cooperation Network has expanded from a UNDP and UNIDO Assistance Projects to today's network of 50 technical institutions, covering a wide range of technical areas including agricultural technology, biotechnology and fertilizer, clean and renewable energy, environmental protection, and industrial development. The Network has played a crucial role in promoting technical and economic cooperation between China and other developing countries.

This annual network meeting centered on new trends and challenges in South-South cooperation, and was cohosted with the Centre for Mountain Futures (CMF), Kunming Institute of Botany, Chinese Academy of Sciences who is the lead institution of the Kunming-Montreal Global Biodiversity Framework.

Xiaojun Grace Wang, Trust Fund Director of UNOSSC, delivered a video message at the meeting, highlighting the findings and observations of the past four and half years of GSSDC project implementation and stakeholders' perspectives gathered during next phase design consultations. She addressed the pressing priorities and challenges to achieving the Sustainable Development Goals (SDGs) and emphasized the strong demands from developing countries for concrete and pragmatic support on the ground, as well as needs for technology cooperation and capacity development. Additionally, she underscored the pivotal role of South-South cooperation in accelerating progress towards these goals, advocating for enhanced policy coordination; and regional cooperation to address pressing global challenges.

Source: <https://unsouthsouth.org/2024/02/29/un-fund-for-south-south-cooperation-and-global-south-south-development-centre-design-next-project-phase/>

## Carnegie Council: Unlocking Cooperation – The Global South and Global North



“Every high-level meeting over the last year has emphasized the importance of South-South and triangular cooperation – as a complement to traditional cooperation – in addressing development challenges,” said UNOSSC Director Dima Al-Khatib during the inaugural panel of the Carnegie Council for Ethics in International Affairs’ “Unlocking Cooperation” discussion series.

Participants – including Archie Young, UK Ambassador to the UN General Assembly; Fernando Marani, Program Director, Center on International Cooperation; and Joel Rosenthal, President, Carnegie Council for Ethics in International Affairs – reflected on systemic challenges while simultaneously seeking to enhance cooperation on shared issues, many of which pose existential risks to humanity.

Together with experts, moderator Ramu Damodaran, senior advisor to the UN University for Peace, addressed questions, including:

- How can Global South and Global North nations collaborate more effectively?
- What roadblocks hinder joint action on crucial issues such as security, development, climate, and AI?
- How can ethical reflection and engagement pave the way for a more inclusive and equitable multilateralism?

“UNOSSC invites partners to engage in more advocacy for South-South and triangular cooperation through experimentation, co-decision-making, and scaling-up of results and triangular initiatives through financing,” said UNOSSC Director Dima Al-Khatib. With regard to capacity building and broad knowledge sharing, she encouraged participants to utilize the new Guidelines for the Integration of South-South and Triangular Cooperation into the Country- and Regional-level Work of the United Nations Development System; and to explore the South-South Galaxy and South-South Global Thinkers network.

Source: <https://unsouthsouth.org/2024/03/26/unlocking-cooperation-the-global-south-and-global-north/>



# OTHERS

## Study of polyglots offers insight on brain's language processing

Polyglots are helping to provide insight into how the brain deals with language



*In a new study involving a group of polyglots, the brain activity of the participants was monitored using a method called functional magnetic resonance imaging as they listened to passages read in various languages*

While most people speak only one language or perhaps two, some are proficient in many. These people are called polyglots. And they are helping to provide insight into how the brain deals with language, the principal method of human communication.

In a new study involving a group of polyglots, the brain activity of the participants was monitored using a method called functional magnetic resonance imaging as they listened to passages read in various languages.

With one intriguing exception, activity increased in the areas of the cerebral cortex involved in the brain's language-processing network when these polyglots - who spoke between five and 54 languages - heard languages in which they were the most proficient compared to ones of lesser or no proficiency.

"We think this is because when you process a language that you know well, you can engage the full suite of linguistic operations - the operations that the language system in your brain supports," said Massachusetts Institute of Technology neuroscientist Evelina Fedorenko, a member of MIT's McGovern Institute for Brain Research and senior author of the study published on Monday in the journal *Cerebral Cortex*.

"You can access all the word meanings from memory, you can build phrases and clauses out of the individual words, and you can access complex, sentence-level meanings," Fedorenko added.

But an exception caught the attention of the researchers. In many of the participants, listening to their native language elicited a lesser brain response compared to hearing other languages they knew - on average down about 25%. And in some of the polyglots, listening to their native language activated only a part of the brain's language network, not the whole thing.

Source: <https://www.thehindu.com/sci-tech/science/study-of-polyglots-offers-insight-on-brains-language-processing/article67941764.ece#:~:text=With%20one%20intriguing%20exception%2C%20activity,of%20lesser%20or%20no%20proficiency.>

## Sprouting a sandalwood sapling

The sandalwood fruit is probably even more unfamiliar. About 1.5 cm in diameter, the fleshy fruit is a shiny purplish black when ripe.



*Passage through the digestive system of birds is good for the seeds as they germinate quickly and have better chances of maturing into trees*

Sandalwood has been valued for many centuries, for its fragrant oil, its prized wood, and the many medicinal uses it has been put to. The tree that all this comes from, however, is not all that familiar. Growing in deciduous forests, it is a partial, or hemiparasite that needs four or five other trees growing around it. Under the ground, sandalwood roots form a haustorium that forms an octopus-like hold on the host tree's roots, from where water and nutrients are taken. The sandalwood fruit is probably even more unfamiliar. About 1.5 cm in diameter, the fleshy fruit is a shiny purplish black when ripe. The one seed inside is a hard, dry kernel, not the usual tough seed coat protecting a fleshy interior. This makes it difficult for the seed to survive beyond one season.

Both the above properties - the need for other trees in the early growth phase, and the seeds, which are short-lived and cannot be stored, have added to the overexploited tree's difficulties. This has led to a drastic fall in the number of sandalwood trees in the forests of South India. The IUCN has classified sandalwood as a vulnerable species. It is not surprising that Australia is now the world's largest supplier of sandalwood and its oil.

### Dispersal by birds

The fruit is bitter, and unappealing to humans. But it is loved by birds. About 10 species, such as the Asian Koel, and the Gray Hornbill swallow the fruit whole, and over time drop the seeds at great distances from the tree they feasted on. These birds are among India's larger frugivores, or eaters of fruit. The sandalwood tree's fruit is just right for the Koels and Hornbills. It has been established that sandalwood trees that produce larger seeds usually end up with the seeds close by. Although the large seeds are better equipped for germination, birds cannot swallow those large seeds, and end up dropping them after pecking away at the flesh.

Source: <https://www.thehindu.com/sci-tech/science/sprouting-a-sandalwood-sapling/article68006566.ece>