

# Science & Society in Media

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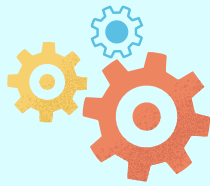
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## New tool predicts how pollen travels through city air

**As climate change stretches the pollen season and urban municipalities plant more trees for shade, understanding where pollen goes has become a public health concern**

Every spring, lakhs of people with allergies prepare for bouts of sneezing and itchy eyes as trees release pollen into the air. Now, a team of researchers from France and the U.S. has developed a tool that can predict how pollen travels through a city once it is carried by the wind.

In a study published in *Physics of Fluids*, the researchers introduced a computer simulation method called DF-PIBM, short for “direct-forcing porous immersed boundary method.” In simple terms, they designed a model that treats a tree like a sponge, allowing air to flow through its leaves and branches, and then tracks how pollen grains are carried away by the wind.

Trees are a major source of airborne allergens in urban areas. As climate change lengthens the pollen season and cities plant more trees for shade, understanding how pollen disperses has become an important public health issue. Until now, scientists lacked precise tools to simulate pollen behavior at the scale of a single tree in a real urban environment.

The simulation works by dividing a tree into small cells and calculating the wind speed and pressure within each one. When the pressure in a cell exceeds the force needed to dislodge a pollen grain from a flower, the model releases that grain into the air and tracks its path using physical laws.

The force required to detach a pollen grain is extremely small—about 50 billionths of a newton, roughly equivalent to the weight of a single human cell. The model incorporates this detail, along with variations in leaf density across different parts of the tree.

Before applying the model to real-world scenarios, the researchers validated it against known cases, such as airflow around cylinders and spheres, to ensure its accuracy. They then compared its predictions with wind measurements taken around an oak tree in Denmark using laser-based instruments called LiDAR. The model’s results matched the measurements within about 5%, which the researchers considered a strong level of accuracy.

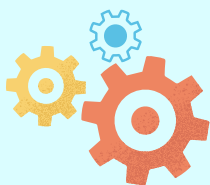
The team then applied the model to two real trees—an oak and a linden—located near a university hospital in Rouen, France. Linden pollen is known to trigger hay fever and coughing.

The simulations revealed that leaf density plays a significant role in pollen dispersion. Trees with fewer, more widely spaced leaves, such as oaks, release pollen in a relatively uniform cloud that spreads gradually. In contrast, denser trees produce more turbulent and uneven bursts of pollen. Within seconds of wind exposure, tens of thousands of pollen grains can become airborne.

In the linden tree experiment, the researchers simulated the release of around one lakh pollen grains and tracked them over four minutes in wind conditions of 5 km/h. The results showed that pollen tends to accumulate in the tree’s wake—the area directly downwind—where pedestrians are most likely to be exposed.

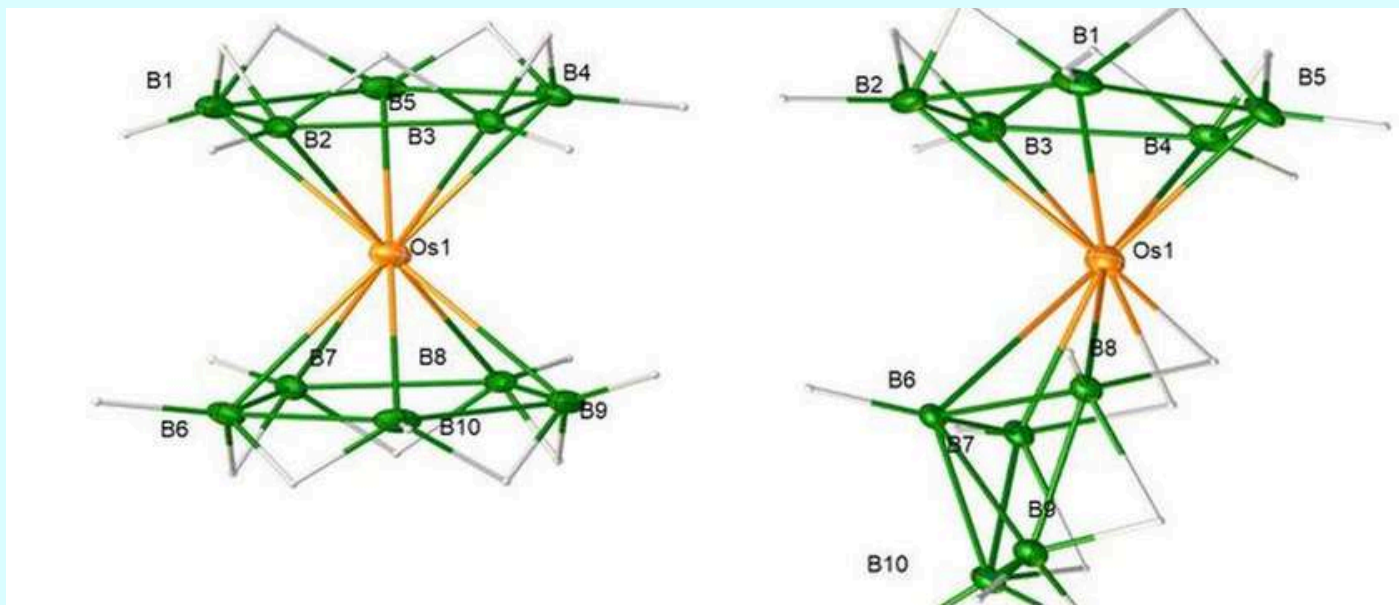
The researchers note that their model is still an early step. It does not yet account for interactions between pollen grains, such as collisions or adhesion to surfaces. Future versions could be expanded to simulate entire neighborhoods, helping urban planners make informed decisions about where and what types of trees to plant.

Source: <https://www.thehindu.com/sci-tech/science/new-tool-predicts-how-pollen-travels-through-city-air/article70863857.ece>  
<https://www.thehindu.com>



## IIT-M, IISc team makes carbon-free version of the ferrocene sandwich

*'Just as ferrocene started a new era in organometallics, these results will start a new era in inorganometallics,' IIT-Madras professor Sundargopal Ghosh said*



A compound called ferrocene has been a landmark in chemistry for more than seven decades. It consists of an iron atom sandwiched between two flat carbon rings. Its discovery gave rise to the field of organometallic chemistry and led to numerous applications in materials science and medicine. Since then, chemists have sought to create a similar “sandwich” compound that contains no carbon atoms.

In a new study published in *Science*, researchers from Indian Institute of Technology Madras and Indian Institute of Science reported that they had finally achieved this goal: a stable, carbon-free analogue of ferrocene built from boron rings and osmium.

“Just as ferrocene started a new era in organometallics, these results will start a new era in inorganometallics and will soon be part of inorganic chemistry textbooks,” said study co-author Sundargopal Ghosh in a statement. “Our efforts are now focused on studying the reactions of these new compounds.”

Boron, which sits next to carbon on the periodic table, can form ring-like structures similar to those made by carbon. Although scientists had previously created sandwich compounds containing both carbon and boron, a fully inorganic version had remained elusive.

To identify the most suitable metal for stabilising a boron sandwich, the researchers relied on computer modelling and eventually selected osmium. They synthesised the compound by reacting a polymeric osmium-bromine precursor with an excess of a borane–dimethyl sulphide reagent.

The X-ray analysis revealed a near-perfect sandwich structure, with a single osmium atom positioned between two parallel five-membered boron rings. Unlike the flat carbon rings in ferrocene, however, the boron rings contained bridging hydrogen atoms between neighbouring boron atoms. These bridges redirected the rings’ electron orbitals toward the metal centre, creating a bond even stronger than that found in ferrocene.

The discovery could pave the way for the development of catalysts that remain stable at much higher temperatures, potentially enabling more efficient pharmaceutical manufacturing.

According to the researchers, the study demonstrates that the iconic sandwich architecture is not limited to carbon-based organic chemistry. “With the renaissance in the 2D chemistry of boron during the last decade — with borophenes, bilayer borophenes, and multilayer borophenes on the horizon — the possibility of metal-sandwiched or intercalated bilayers and multilayers may soon become a reality,” said Eluvathingal D. Jemmis, a chemistry professor at IISc and one of the corresponding authors of the study.

The mixture was then heated to 100 °C for eight hours, producing a colourless solid. The team confirmed the atomic arrangement using X-ray diffraction and nuclear magnetic resonance spectroscopy.

Source: <https://www.thehindu.com/sci-tech/science/iit-m-iisc-team-makes-carbon-free-version-of-the-ferrocene-sandwich/article70968224.ece>  
<https://www.thehindu.com>



## ENVIRONMENT



**What are  
sentinel  
species?**

A sentinel species is a species whose members' health signals the condition of the ecosystem in which they live.

Scientists monitor them because they are among the first to respond to stressors in their environment, such as pollution and disease, and their response also tends to be more apparent than most other species. In other words, they can provide early warnings of ecosystem decline.

Sentinel species tend to occupy a fixed territory and live long enough to accumulate toxins. They also have physiologies that amplify the effects of environmental change. Thus, when something goes wrong in their habitat, they show it first.

The most common example is frogs. Their skin is permeable and absorbs whatever enters the water or soil around them, making them very sensitive to pesticides and pathogens. A declining frog population has often been a sign of wider ecological stress, even before other indicators detect the problem.

Canaries in coal mines worked on the same principle: the bird's faster metabolism made it succumb to carbon monoxide before human miners could notice anything. Researchers also use honeybees to track agricultural chemical loads, polar bears to monitor Arctic contaminant accumulation, and certain fish species to detect industrial runoff.

the International Union for Conservation of Nature (IUCN) declared the emperor penguin to be an endangered species. Emperor penguins are sentinel species for warming in the Antarctic region. Climate change is projected to halve their population by the 2080s.

Source: <https://www.thehindu.com/sci-tech/science/what-are-sentinel-species/article70853746.ece>  
<https://www.thehindu.com/>



# Environment

## How is global warming affecting sea breeze?



*In Miami and Mumbai, higher sea surface temperature has brought down the number of sea-land breeze days by 3%, a new study has found.*

During the day, land heats faster than the sea, pulling cool air onshore. At night, the land cools faster, so the air flows offshore. This is called the sea-land breeze.

A new study in *Nature Climate Change* has reported that as the oceans become warmer, the sea-land breezes around coastal megacities are becoming weaker. In many locations, urban planners consider these breezes to be essential to cool urban areas and improve air quality, rendering coastal cities more liveable.

The study authors simulated conditions around 18 major coastal cities, finding that global warming is heating the oceans significantly, thus reducing the thermal contrast — the temperature difference between the land and the sea — significantly. Since the sea-land breeze is driven by this temperature gap, the breeze becomes weaker and occurs less often as the gap narrows.

The analysis also showed that historical ocean warming has already reduced the number of breeze days by 3% in most of the cities the team studied. Mid-latitude cities such as London, New York, Shanghai, and Buenos Aires have had the most dramatic declines.

Looking ahead to the year 2050, the study warned that if carbon emissions remain high, these breezes could become altogether feeble, potentially weakening 4.5-times faster than historical rates. The researchers concluded that this ‘erosion’ of sea breeze is a major yet often overlooked threat to the health and habitability of coastal cities as it could lead to more intense urban heat and worse air pollution.

Source: <https://www.thehindu.com/sci-tech/science/how-is-global-warming-affecting-sea-breeze/article70880366.ece>  
<https://www.thehindu.com/>



## Call to quantify bat poop nutrition for crops

*A report on India's flying mammals seeks simultaneous studies on the risks of exposure to zoonotic pathogens through long-term use of guano*

A report on bats in India has recommended a systematic quantification of guano, or accumulated bat poop, and its nutritional value compared to existing bio-fertilisers.

Farmers in India do not fancy guano as an alternative to chemical fertilisers as much as their counterparts in Cuba, Indonesia, Jamaica, Mexico, and Thailand. Bat guano is sold in these countries for its high content of nitrogen, phosphate, and potassium — nutrients essential for plant growth.

According to the State of Indian Bats 2024-25, systematic quantification of guano will be crucial for its recommendation as an alternative, likely low-cost, supplement for crops in Indian agricultural ecosystems.

“However, simultaneous studies on the risks of exposure to zoonotic pathogens and disturbance to cave ecosystems through long-term use of bat guano need to be conducted to assess the overall value of using bat guano in the future,” the report states.

*Histoplasma capsulatum*, a dimorphic fungus, naturally occurs in cave soil enriched by bat guano. Caves with guano have been documented as probable sources of exposure for speleologists, casual visitors, or guano miners, with several outbreaks of acute pulmonary histoplasmosis reported over the past five decades.

Histoplasmosis is a fungal infection caused by breathing in *Histoplasma capsulatum* spores found in soil enriched with bird or bat droppings.

### Bat ecosystem services

One of the chapters in the report, authored by Kadambari Deshpande, Baheerathan Murugavel, and Kasturi Saha, outlines the ecosystem services provided by bats.

“Ecosystem services to people are usually assessed at the level of entire ecosystems or of large groups of organisms. However, the direct and indirect contributions of biodiversity to ecosystem services, especially at the species level, are complex to understand,” the chapter reads.

“Additionally, elements of biodiversity can be both beneficial and harmful to people. This may lead to biodiversity-driven ecosystem services as well as disservices, creating both synergies and trade-offs for people. Bats are one such element of biodiversity, with the potential for simultaneous beneficial and harmful effects on human well-being,” it says.

The report says that plant-visiting bats are important seed dispersers and pollinators of many forest trees and commercial crops, but are also known to cause crop damage and loss. Insectivorous bats prey on and suppress agricultural pests, and their guano is used as an agricultural fertiliser worldwide.

“However, guano may negatively affect people by causing bio-fouling of property and exposing individuals who collect and handle it to potential health risks from zoonotic pathogens. Bats are known to be reservoirs of emerging viral pathogens. Growing human-bat interfaces are leading to an increase in zoonotic spill-overs, which, in turn, are leading to negative outcomes for both bats and people,” the report says.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/call-to-quantify-bat-poop-nutrition-for-crops/article70853987.ece>, <https://www.thehindu.com>



# AGRICULTURE

## Common Soil Fungus Could Reduce Pesticide Use and Boost Tomato Growth



A common soil fungus, *Trichoderma*, may help farmers reduce pesticide use while enhancing tomato plant growth, according to a study by researchers at Penn State. The findings highlight the potential of biological alternatives to chemical pesticides and the importance of soil microbial interactions in crop health.

Published in *The Microbe*, the study examined how different *Trichoderma* species influence tomato growth and soil bacteria in the rhizosphere—the area surrounding plant roots. Researchers aimed to understand why these beneficial fungi sometimes perform inconsistently in real-world farming conditions.

Seogchan Kang, a professor in Penn State’s College of Agricultural Sciences, explained that microbes like *Trichoderma* can protect plants from disease and improve stress tolerance. However, their adoption has been limited due to unpredictable results. “While many biological control agents have shown promise, challenges in reliability have reduced growers’ confidence,” he said.

Soilborne pathogens remain a major challenge in agriculture, reducing crop yields and quality while increasing production costs. These pathogens also lower the efficiency of resources like water, fertilizers, and labor. Although fungicides are widely used to manage these threats, overreliance can harm the environment, raise costs, and pose risks to human health.

Co-author Ananda Y. Bandara emphasized the need for sustainable solutions that balance productivity with environmental responsibility. Biological controls like *Trichoderma* could play a key role if their effectiveness can be better understood and managed.

In the study, researchers collected soil from a Penn State agricultural research center. Some soil samples were sterilized to remove existing microbes, while others were left untreated. Tomato seedlings were planted in both soil types and divided into four groups: one treated with *Trichoderma harzianum*, one with *Trichoderma virens*, one with both species, and a control group.

The team then analyzed plant growth and changes in soil bacterial communities. They also examined how volatile compounds released by these microbes influenced the growth of both *Trichoderma* and *Fusarium oxysporum*, a harmful fungus affecting many crops.

Results showed that *Trichoderma virens* and the combined treatment significantly improved tomato growth, increasing shoot weight in both sterilized and non-sterilized soils. These treatments also altered bacterial communities in the rhizosphere. In untreated soil, some bacteria were reduced, while in sterilized soil, bacterial diversity was partially restored.

The study suggests that *Trichoderma* not only directly benefits plants but also reshapes the soil microbiome in ways that support growth. However, the presence of certain soil bacteria can influence how well the fungus survives and performs, which may explain its inconsistent results in different environments.

Researchers believe these findings could improve the use of biological control agents in agriculture. Future work may explore how *Trichoderma* can help restore soil health after disturbances and how advanced tools like machine learning can predict where these treatments will be most effective.

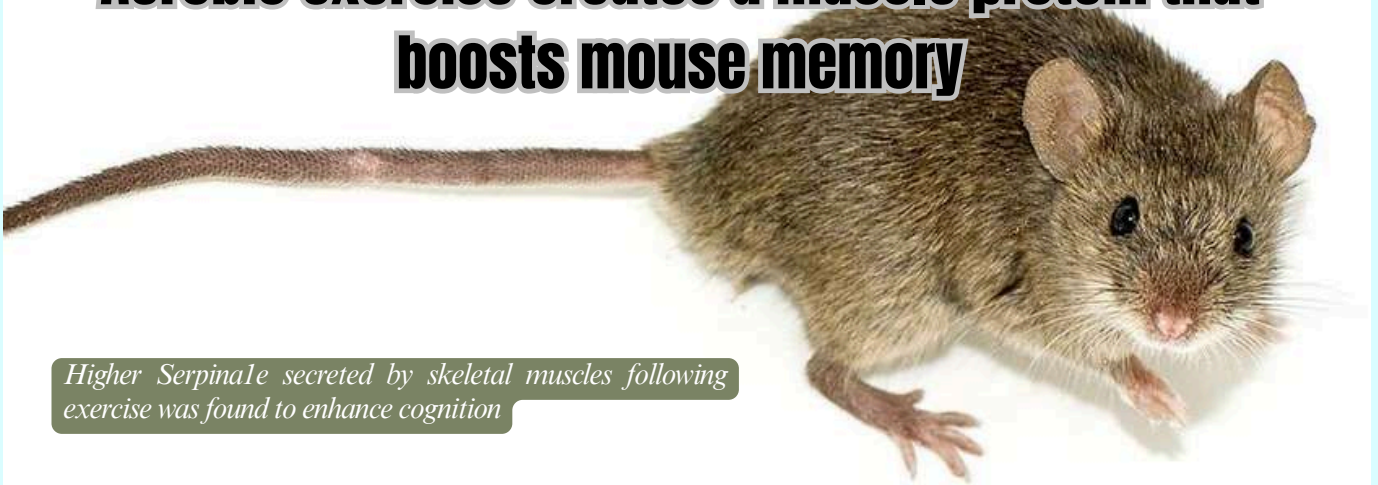
Overall, the study highlights the promise of using natural soil organisms to reduce dependence on chemical pesticides and support sustainable farming practices.

Source: <https://phys.org/news/2026-04-common-soil-fungus-pesticide-tomatoes.html>  
<https://phys.org/>



## HEALTH

### **Aerobic exercise creates a muscle protein that boosts mouse memory**



*Higher Serpina1e secreted by skeletal muscles following exercise was found to enhance cognition*

“All work and no play makes Jack a dull boy,” goes the proverb. Modern science suggests a twist: no exercise may dull the mind as well—at least in mice. Researchers from Seoul National University and the Korea Brain Research Institute have shown that aerobic exercise helps mice produce a muscle protein that travels through the bloodstream to the brain, where it strengthens the conversion of short-term memories into long-term ones. Their findings, published in *Nature Communications* on April 9, highlight a direct biological link between physical activity and cognitive performance.

To test memory, the researchers used several behavioral experiments. In one, mice were trained to associate a brief electric shock with a burst of white noise. After being placed in a “shock cage” and allowed to settle, each mouse received a short shock paired with the sound. When tested the next day, the mice froze upon hearing the noise alone, recalling the unpleasant experience. Even three weeks later, this response persisted, indicating long-term memory retention.

In another experiment, mice explored two identical objects in a cage. The next day, one object was replaced with a new one. Mice with better memory spent more time investigating the unfamiliar object, demonstrating their ability to distinguish it from the familiar one. A third test assessed spatial learning: mice swam in a circular tank to find a hidden platform using visual cues. Faster learning and recall signaled stronger cognitive ability.

To understand the biological mechanism, the researchers engineered mice so that proteins produced in skeletal muscle could be tagged and tracked. They used a system that labeled muscle-derived proteins with vitamin B7, allowing them to isolate and study these proteins after they entered the bloodstream. This revealed which molecules traveled from muscle to brain.

The mice were then given access to running wheels for four weeks. They ran enthusiastically, often covering more than 5 km per night. Compared to sedentary mice, these active mice performed significantly better in all cognitive tests. Analysis of their blood and brain tissue showed increased levels of several muscle-derived proteins, especially one called Serpina1e.

This protein appears to play a key role in brain function. It travels to the hippocampus—a region critical for memory—and promotes the growth of neurites, which are essential for forming neural connections. To confirm its importance, researchers injected Serpina1e into inactive mice and observed improved memory performance. Similarly, boosting Serpina1e production in muscle through genetic methods enhanced cognition. Conversely, mice lacking the Serpina1e gene in their muscles did not benefit cognitively from exercise, proving the protein is both necessary and sufficient for these effects.

The study focused only on male mice to avoid complications from sex-based biological differences, but the researchers noted that future work should include both sexes. They also emphasized that while the findings are promising, it remains to be seen whether the same mechanism applies to humans.

Still, the implications are compelling. Exercise is already known to reduce the risk of lifestyle diseases, and this research adds another dimension: it may directly enhance brain function through muscle-brain communication. If similar processes occur in humans, regular physical activity could be a powerful tool not just for physical health, but for maintaining and improving memory as well.

Source: <https://www.thehindu.com/sci-tech/science/aerobic-exercise-creates-a-muscle-protein-that-boosts-mouse-memory/article70863651.ece>  
<https://www.thehindu.com/>



# HEALTH

## UTIs, tooth decay: how common infections may be fast-tracking dementia

*Experts believe that these infections don't necessarily cause dementia, but act as a catalyst. Many people have a silent buildup of proteins or plaques in their brains for years, without showing symptoms. A wave of inflammation from a severe infection may simply fast-forward the damage*

For decades, dementia has been seen as a gradual condition shaped mainly by genetics and lifestyle. However, new research published in PLOS Medicine suggests that sudden health events—like severe infections—may speed up its onset. Conditions such as cystitis (urinary tract infections) and advanced tooth decay appear to act as accelerators, bringing forward a dementia diagnosis by several years.

This shifts the way we understand brain health. Instead of being influenced only by long-term factors, cognitive decline may also be affected by short-term illnesses elsewhere in the body. What seems like a routine infection could have deeper consequences.

### The link: inflammation

The connection lies in inflammation, the body's natural response to infection. When fighting bacteria, the immune system releases chemicals designed to protect us. But in severe cases, this response can spread beyond the original infection site.

Sometimes, inflammation can disrupt the blood-brain barrier, the system that protects the brain from harmful substances. When this barrier is weakened, inflammatory molecules may reach the brain and damage nerve cells. For people already experiencing silent brain changes linked to dementia, this can accelerate decline and make symptoms appear sooner.

### Key findings

The study analyzed data from over 62,000 people with dementia and more than 312,000 without it. Researchers found that serious infections—including urinary tract infections, pneumonia, and dental disease—were linked to a higher risk of developing dementia within a few years.



These infections don't directly cause dementia. Instead, they act as triggers. Many individuals have underlying brain changes long before symptoms show. A major infection may simply speed up this process, pushing the condition toward earlier diagnosis.

### The five-year warning

A striking finding is the timing: severe infections often occurred about five to six years before dementia was diagnosed. This creates an important window for action.

Rather than treating these infections as isolated events, they can be seen as warning signs. Early treatment and better monitoring of cognitive health during this period may help delay progression.

### Rethinking care

The research also highlights gaps in healthcare. Dental and urinary health are often treated separately from brain health, but they may be closely connected.

Oral care, for instance, is frequently overlooked. Yet untreated tooth decay can lead to chronic infection and inflammation that may affect the brain. Similarly, better management of urinary tract infections—through hydration, early detection, and timely treatment—can prevent complications.

### A more holistic approach

Overall, the findings suggest that brain health is closely tied to general physical health. Small, preventable conditions can have wider effects, especially in older adults.

By focusing on early care and prevention—especially for infections—we may be able to slow cognitive decline. Maintaining good hygiene, seeking timely treatment, and paying attention to routine health issues could play a meaningful role in protecting brain function over time.

Source: <https://www.thehindu.com/sci-tech/health/utis-tooth-decay-how-common-infections-may-be-fast-tracking-dementialarticle70872802.ece>  
<https://www.thehindu.com/>



# HEALTH

## **RICH NATIONS MIGHT ELIMINATE CERVICAL CANCER BY 2048, PROGRESS SLOW IN POOR COUNTRIES: STUDY**

*States with high cervical cancer incidence could see the greatest relative reduction in cases*

High-income countries are on track to eliminate cervical cancer—largely preventable through vaccination and screening—by 2048. In contrast, low- and middle-income countries (LMICs) are expected to see only modest reductions over the next century, according to a study published in *The Lancet*.

This disparity is projected to significantly widen the global gap, leaving women in LMICs facing much higher rates of a preventable disease, researchers—including those from CHU de Québec-Université Laval Research Center—noted.

Nearly all cervical cancer cases (about 99%) are linked to infection with high-risk human papillomavirus (HPV), a common virus transmitted through sexual contact, according to the World Health Organization. The disease is largely preventable through HPV vaccination and regular screening.

The WHO has set a global elimination target of fewer than four cases per 100,000 women. To achieve this, countries are urged to meet the “90-70-90” targets by 2030: vaccinating 90% of girls against HPV by age 15, screening 70% of women by ages 35 and 45, and ensuring 90% of women with pre-cancer or cancer receive treatment.

Researchers emphasize that achieving these vaccination and screening goals—or implementing universal high-coverage vaccination—is essential for eliminating cervical cancer in LMICs and reducing global inequalities. Meeting these targets could prevent up to 37 million cases over the next century and significantly accelerate progress.

However, current models suggest that many LMICs are unlikely to reach these goals without increased investment. Under a “status quo” scenario, cervical cancer incidence in LMICs would decline by only 23%, while high-income countries achieve elimination by 2048, further widening disparities.

Increasing HPV vaccination coverage to 90% among girls in LMICs could substantially reduce these inequalities and lead to elimination in most regions outside sub-Saharan Africa. Recent advancements—such as lower-cost vaccines, single-dose regimens, and expanded screening programs—offer promising pathways forward. Strategies like multi-age cohort vaccination and including boys in immunization campaigns could further accelerate progress.

Still, researchers stress that coordinated global efforts involving governments and international health agencies are critical to making cervical cancer elimination a reality.

A separate 2022 study published in *The Lancet Oncology* found that a single-dose HPV vaccine with long-lasting protection and 90% coverage could prevent up to 78% of cervical cancer cases among vaccinated groups in India, with the greatest impact seen in states with the highest incidence rates.

*Source: <https://www.thehindu.com/sci-tech/health/rich-nations-might-eliminate-cervical-cancer-by-2048-progress-slow-in-poor-countries-study/article70928461.ece>  
<https://www.thehindu.com/>*



## OTHERS

### Critically endangered Peacock Tarantula in spotlight after Pawan Kalyan post



**A scientific survey to assess the critically endangered Peacock Tarantula has begun Nagarjunasagar Srisaillam Tiger Reserve in Andhra Pradesh, aiming to map its population and habitat**

A striking electric-blue spider from the Eastern Ghats has spun its way into public conversation after Pawan Kalyan, Andhra Pradesh's Deputy Chief Minister, shared a post on Instagram describing the Peacock Tarantula as "a rare jewel of the Eastern Ghats... finally getting the attention it deserves."

The species in focus, the Peacock Tarantula (*Poecilotheria metallica*), is among India's most visually stunning yet least-known arachnids. Endemic to a tiny forest patch in Andhra Pradesh, it is classified as "critically endangered" by the International Union for Conservation of Nature. Its survival is under threat due to habitat loss and its extremely restricted range.

#### Early scientific record

The first known specimen of the Peacock Tarantula entered scientific records in 1898, when it was sent to the British Museum by H.R.P. Carter. The spider had been collected by H.C. West, chief engineer of the Madras Railway, who discovered a female in his bungalow near Gooty along the north-west railway line in present-day Andhra Pradesh.

Source: <https://www.thehindu.com/sci-tech/energy-and-environment/critically-endangered-peacock-tarantula-in-spotlight-after-pawan-kalyan-post/article70923573.ece>  
<https://www.thehindu.com/>

#### Conservation efforts underway

In a significant step, the Andhra Pradesh Forest Department, in collaboration with the Eastern Ghats Wildlife Society, has launched a comprehensive conservation survey within the Nagarjunasagar Srisaillam Tiger Reserve—one of India's largest tiger reserves.

The survey aims to map the spider's distribution, assess population numbers, and evaluate habitat conditions across the reserve. Experts say the findings will be critical for shaping long-term conservation strategies, strengthening habitat management, and informing policy decisions for the species' protection.

Adding an international dimension, Wingham Wildlife Park is serving as a knowledge and technical partner. The UK-based zoo plays a key role in breeding captive European populations of the species, contributing to global conservation efforts.

Conservationists see this initiative as part of a broader shift—from focusing solely on charismatic megafauna to protecting lesser-known yet ecologically vital species. As attention grows around the Peacock Tarantula, scientists hope it will spark wider awareness of the fragile biodiversity of the Eastern Ghats and the urgent need to safeguard it.



# OTHERS

## Why We Can't Tickle Ourselves



We instinctively associate tickling with laughter—the kind that makes you squirm, pull away, and lose control. But try tickling yourself, and... nothing happens. If tickling is just a form of touch, why does the brain react so differently depending on who's doing it? That's where the science gets interesting.

“I knew you'd do that”

Your brain isn't just reacting to touch—it's predicting it.

Think of a jump scare in a movie. If you already know it's coming, you barely flinch. The surprise is gone. In the same way, when you try to tickle yourself, your brain already knows what's about to happen—where your hand will land and what it will feel like.

Scientists call this a forward model: a system the brain uses to predict the outcome of its own actions. It's almost as if your brain pre-writes the sensation before it even occurs.

Because of this, the touch isn't surprising. And without surprise, the brain turns down the intensity, softening and filtering the sensation.

So it's not that you can't feel the touch—it's that your brain doesn't consider it worth reacting to.

### Why Others Can Tickle You

When someone else does the tickling, your brain can't predict the exact timing or location. That unpredictability creates surprise, making the sensation feel more intense—and often triggering laughter.

### The Brain Behind the Trick

At the center of this process is a small but powerful part of the brain called the cerebellum, which helps control movement and coordination. You can think of it as a highly efficient internal assistant, constantly monitoring your body's actions.

Every time you move your hand to tickle yourself, the cerebellum sends a signal to the brain's touch-processing areas, essentially saying: “This is self-generated—no need to react.”

This process is known as sensory attenuation—the brain's way of filtering out sensations it creates itself so it can stay alert to more important, external signals.

### When the System Slips

There are rare situations where this system doesn't work as expected.

Some studies suggest that people with schizophrenia may be able to tickle themselves, because the brain's ability to distinguish between self-generated and external sensations is less precise.

Scientists have also explored this using robotic experiments. In one study, participants used a robotic arm to tickle themselves and felt almost nothing. But when researchers introduced a tiny delay—just a fraction of a second—the sensation became ticklish again.

That slight lag was enough to disrupt the brain's predictions, turning a familiar touch into something unexpected.

Source: <https://www.thehindu.com/children/why-we-cant-tickle-ourselves/article70945658.ece>  
<https://www.thehindu.com/>



## OTHERS

### The green and crimson chemistry of the watermelon

*In a 2017 paper, researchers found watermelons are rich in dietary fibres, vitamins A and C, antioxidants, and anti-inflammatory agents, and is easily digested*



The summer season has arrived, and fruit markets are brimming with watermelons—known as turbuz in Hindi, vathakkai in Tamil, tormuj in Bengali, and *Citrullus lanatus* in botanical terms. With their green-striped rinds and juicy red interiors dotted with dark seeds, watermelons are a familiar and refreshing sight. Originally from Africa, this fruit has found a second home in India and now ranks among the top five most widely cultivated fruits globally, alongside apples, bananas, oranges, and grapes.

Over centuries, watermelons have become deeply integrated into India's agricultural and culinary landscape, thanks to the country's favorable climate. They are easy to grow, transport, and consume, making them popular in both rural and urban areas. In *A Historical Dictionary of Indian Food* (1998), K.T. Achaya highlights the long-standing use of gourds, including watermelon, in everyday diets.

According to the Indian Institute of Horticultural Research, several states with fertile soil and ample sunlight cultivate watermelons for both domestic consumption and export. Uttar Pradesh leads production, yielding approximately 7.07 lakh tonnes annually. Other major producing states include West Bengal, the northeastern states, Odisha, Andhra Pradesh, and Tamil Nadu. India also exports watermelons and related products to countries such as the UAE, Qatar, Oman, the Maldives, and Bangladesh, generating significant revenue.

#### Nutritional and Medicinal Value

A 2017 study published in *Popular Kheti* by researchers Reetu and Maharishi Tomar (affiliated with ICAR institutions) outlines the fruit's impressive nutritional profile. Watermelon is rich in dietary fibre, vitamins A and C, antioxidants, and anti-inflammatory compounds. It is easily digestible and is believed to have potential anti-cancer properties.

The fibre supports healthy digestion, while lycopene—a powerful antioxidant—helps protect against heart disease. The seeds are also nutritious, containing iron and zinc that contribute to improved immunity. In several parts of India, traditional practitioners recommend watermelon and its by-products for their medicinal benefits. Similar practices are observed in West Asia and Africa, where the fruit is used as a natural health promoter.

Research teams in Africa have further explored these properties. A group led by Ahmed Attariha in Nigeria has used watermelon components in traditional remedies for managing diabetes, urinary tract infections, and kidney health. Meanwhile, researchers from the University of Health Sciences in Ghana, led by David Negio, have documented the antioxidant and antimicrobial properties of the fruit's rind, pulp, skin, and seeds. Their findings suggest that the rind and seeds may contain even higher concentrations of beneficial compounds than the edible flesh.

Despite this, the rind—the green outer layer—is often discarded. This is a missed opportunity, as both the rind and seeds offer valuable health benefits. Even watermelon juice is highly nutritious: one cup of diced watermelon contains about 46 calories along with vitamins A and C, potassium, and manganese. Regular consumption may help reduce inflammation and oxidative stress.

So, the next time you prepare watermelon, consider using not just the juicy pulp but also the rind and seeds in your cooking. Doing so allows you to enjoy the fruit's full range of nutritional benefits while reducing waste—making your summer diet both healthier and more sustainable.

Source: <https://www.thehindu.com/sci-tech/science/the-green-and-crimson-chemistry-of-the-watermelon/article70864430.ece>  
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