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MINISTRY OF SCIENCE AND TECHNOLOGY



MK Yadav Sir

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THE HINDU

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SUSTAINABLE HYDROGEL

(Syllabus: GS Paper 3 – Sci and Tech)

IISc researchers design novel hydrogel to remove microplastics from water

The Hindu Bureau
BENGALURU

Researchers at the Indian Institute of Science (IISc) have designed a sustainable hydrogel to remove microplastics from water.

According to the IISc, microplastics pose a great threat to health as these tiny plastic debris can enter our bodies through the water we drink and increase the risk of illnesses.

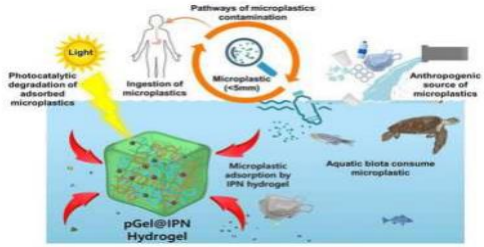
The hydrogel designed by the researchers has a unique intertwined polymer network that can bind the contaminants and degrade them using UV light irradiation.

Scientists have previously tried using filtering membranes to remove microplastics. However, the membranes can become clogged with these tiny particles, rendering them unsustainable.

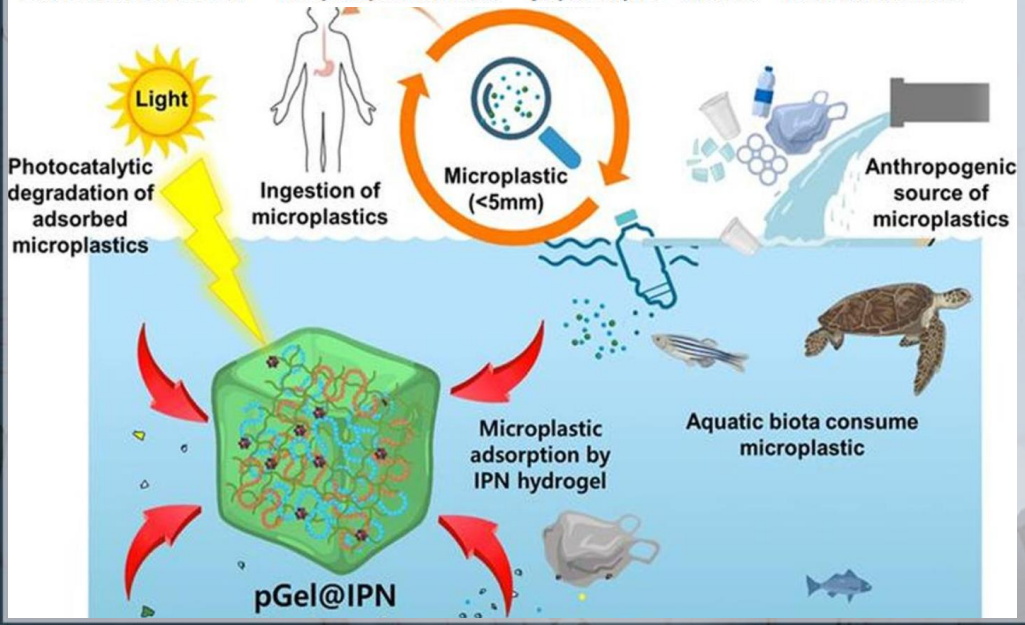
Instead, the IISc team led by Suryasarathi Bose, Professor at the Department of Materials Engineering, decided to turn to 3D hydrogels. The hydrogel developed by the team consists of three different polymer layers - chitosan, polyvinyl alcohol and polyaniline - intertwined together, making an interpenetrating polymer network (IPN) architecture.

The team infused this matrix with nanoclusters of a material called copper substitute polyoxometalate (Cu-POM). These nanoclusters are catalysts that can use UV light to degrade the microplastics. The combination of the polymers and nanoclusters resulted in a strong hydrogel with the ability to adsorb and degrade large amounts of microplastics. The team found that the hydrogel could remove about 95% and 93% of two types of microplastics in water.

The study has been published in *Nanoscale*.



Safe water: The hydrogel can bind the contaminants and degrade them using ultra violet light irradiation, says the IISc study.



Context: Researchers at the Indian Institute of Science (IISc) have designed a sustainable hydrogel to remove microplastics from water.

Hydrogel

- **About**: Hydrogels are polymer chain networks that can store more than 90% of water in the space between the polymer chains. They are sometimes found as colloidal gels.
  - This hydrogel possesses the capability to bind contaminants and degrade them through UV light exposure.
- **Water Retention Capability**: Their hydrophilic nature enables hydrogels to retain substantial amounts of water within their three-dimensional networks.
- **Microplastic Removal Efficiency:** Studies have demonstrated the high efficiency of hydrogels, with removal rates of approximately 95% and 93% for two distinct types of microplastics from water.
- **pH Sensitivity**: Hydrogels exhibit notable efficacy even at near-neutral pH levels, around 6.5.

The sustainable hydrogel: Designed by the researchers has a unique intertwined polymer network that can bind the contaminants and degrade them using UV light irradiation.

VOLCANIC VORTEX RINGS
(Syllabus GS Paper 1 – Geography)

VOLCANIC VORTEX RINGS

When does a volcano spout volcanic vortex rings, and what is it about Mount Etna and this activity?

SINCE LAST week, Mount Etna, the largest volcano in Europe, and among the world's most active and iconic volcanoes, has been sending up almost perfect rings of smoke into the air that scientists refer to as volcanic vortex rings.

Mount Etna volcano

Mount Etna, or simply Etna, is a UNESCO World Heritage Site on the east coast of Sicily, the largest island in the Mediterranean Sea, lying just off the toe of the Italian "boot". Etna's summit has five craters, which are responsible for most of its eruptions; there are also "flank" eruptions that occur out of 300-odd vents of varying sizes along the slopes.

Etna's eruptive history can be traced back 500,000 years. Since 1600, at least 60 flank eruptions and many more summit eruptions have taken place. In recent years, summit eruptions have occurred in 2006, 2007-08, on two occasions in 2012, in 2018, and 2021; flank eruptions have taken place in 2001, 2002-03, 2004-05, and 2008-09.

Volcanic vortex rings

Vortex rings are generated when gas, predominantly water vapour, is released rapidly through a vent in the crater. The vent that has opened up in Etna's crater is almost perfectly circular, so the rings that have been seen above the mountain since April 2 are also circular.

Boris Behncke, a volcanologist based in Catania, a port city at the foot of Etna, had said in a post on X in July 2023 that the rings "are produced by the explosion of gas bubbles within a narrow conduit, which shoots the gas at high speed toward the surface. Attrition along the conduit walls slows the movement of the gas jet, relative to the center of the conduit".

A scientific paper published in February 2023 noted that the phenomenon was first observed at Etna and Vesuvius in Italy in 1724, and has been documented in an engraved plate from 1755. In more recent times, volcanic vortex rings have been observed at several other spots, including Redoubt in Alaska, Tungurahua in Ecuador, etc. ('Dynamics of Volcanic Vortex Rings': Scollo et al., *Scientific Reports*)

Simona Scollo, a volcanologist at the INGV Etna Observatory in Catania, Sicily and a co-author of the 2023 study, told *The New York Times* that volcanic smoke rings were produced in the same way as dolphins blow bubble rings.



Volcanic vortex rings emerge from the Etna Volcano in Sicily, Italy. *AP/PTI*

"They (dolphins) compress the water in their mouths... using their tongue they push it out of their mouths and create such a pressure that it forms a ring," Scollo said.

According to the report, the rings can remain in the air for up to 10 minutes, but tend to quickly disintegrate if conditions are windy and turbulent.

Etna and the rings

Behncke said on Facebook this month that "no volcano on Earth produces as many vapour rings as Etna". In July 2023, Behncke had reported seeing "dozens of gas rings every day" above Etna.

Behncke said: "…Now Etna is breaking all previous records. In the late afternoon of April 2, 2024, a small mouth opened on the northeastern edge of the Southeast Crater, producing gusts of incandescent gas. The next morning it was obvious that these blows were producing an impressive amount of steam rings, and the business has since been going on, having already issued hundreds if not thousands of these pretty rings."

This activity does not, however, mean Etna is going to erupt in a particularly spectacular way. In fact, the activity from the new vent was slowing down. **ENS**

Context: Recently, Mount Etna, Europe's largest volcano and one of the world's most active and iconic volcanoes, has been consistently emitting nearly perfect rings of smoke into the air.

Mount Etna

- **About**: It also known simply as Etna, is an active volcano situated on the east coast of Sicily, the largest island in the Mediterranean Sea.
- **Location**: It lies just off the toe of the Italian "boot" and boasts the highest peak in Italy south of the Alps.
- **Size and Activity**: Etna is Europe's largest and one of the most active volcanoes, characterized by almost constant activity.
- **Crater Formation**: The summit of Etna features five craters, primarily responsible for its eruptions, alongside over 300 vents of varying sizes along its slopes.
- **Eruption Frequency**: Since 1600, Etna has experienced around 60 flank eruptions and numerous summit eruptions, occurring at intervals over the years, with notable eruptions in 2006, 2007-08, 2012 (twice), 2018, and 2021.
- **UNESCO World Heritage Site**: Designated as a World Heritage Site in 2013, Etna's eruptive history spans back 500,000 years, with documentation covering at least 2,700 years of activity.

Volcanic Vortex Rings

- **Definition**: Volcanic vortex rings are circular formations of gas, primarily water vapor, rapidly released through a vent in a volcano's crater.
- **Origin at Etna**: Etna's nearly perfect circular vent has been releasing these rings since April 2, creating observable circular formations above the mountain.
- **Historical Documentation**: First observed at Etna and Vesuvius in Italy in 1724, documented in an engraved plate from 1755, according to a scientific paper published in February 2023.
- **Global Observations:** Volcanic vortex rings have been observed at various volcanoes worldwide, including Redoubt in Alaska, Tungurahua in Ecuador, Pacaya in Guatemala, and others listed in the scientific paper "Dynamics of Volcanic Vortex Rings" by Scollo.

DTE Apr 12

ALZHEIMER DISEASE

(Syllabus: GS Paper 3 – Sci and Tech)

A gene variant could lower chances of developing Alzheimer's by 70%, could help in design of new treatments: Study

Context: Researchers seem to have worked out why some people are protected from Alzheimer's disease despite carrying a high risk gene linked to the debilitating condition.

Key Points of Study

- **Protective Function of Mutated Gene**: Carries out a protective function by producing a mutated version of a gene responsible for fibronectin production.
- **Role in Blood-Brain Barrier (BBB)**: Fibronectin is a crucial component of the blood-brain barrier (BBB), regulating substance movement in and out of the brain.
- **Alzheimer's Disease Risk Reduction**: This gene variant significantly reduces the risk of developing Alzheimer's disease by 71%, as indicated by a study in Acta Neuropathologica.
- **Identification of APOEε4 Variant**: Previous research has identified the APOEε4 gene variant as a major genetic risk factor for Alzheimer's disease.
- **Mechanisms in Healthy Individuals**: Some healthy individuals possess the APOEε4 variant, suggesting the presence of mechanisms in the brain that mitigate its pathological effects.

Alzheimer Disease

- **About:** It is a brain disorder that slowly destroys memory and thinking skills and, eventually, the ability to carry out the simplest tasks.
- **May Occur:** Between a person's 30s and mid-60s (mostly) and is very rare.
- **Symptoms:** Memory loss, language problems, and unpredictable behaviour.
- **Cure:** So far, there has been no concrete cure, but some treatments are done to reduce its effectiveness.

Cases of Alzheimer in India

- Deaths due to Alzheimer's in India were the highest in three decades in 2019, according to a **2021 Lancet study.**
- **A 2022 Lancet report** estimates that globally, the population suffering from Alzheimer's will triple by 2050 from 57 million in 2019. And in the same period, India's Alzheimer's patients are estimated to increase to about 11.5 million.
- **Expenditure on Mental Health in India:** Meanwhile, India's expenditure on the **National Mental Health Programme (NMHP)** has been decreasing.
  - The expenditure on NMHP has dropped by about 82 percent in FY 2020-21.

INDIAN EXPRESS

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CDP-SURAKSHA

(Syllabus: GS Paper 3 – Economy)



How a new platform will instantly disburse subsidies to farmers

HARIKISHAN SHARMA
NEW DELHI, APRIL 12

THE UNION government has developed a new digital platform to disburse subsidies to horticulture farmers under the Cluster Development Programme (CDP), an initiative by the Centre to promote horticulture crops. The platform is known as CDP-SURAKSHA.

In recent years, the total production of horticulture crops has spiked in India. While in 2010-11, their production stood at 240.53 million tonnes, production increased to 334.60 million tonnes in 2020-21.

The horticulture sector makes a substantial contribution to the Indian economy as it contributes nearly one-third to the agriculture gross value added (GVA) – the measure of the value of goods and services produced by an industry, sector, manufacturer, area or region.

What is the CDP-SURAKSHA?

The acronym SURAKSHA stands for "System for Unified Resource Allocation, Knowledge, and Secure Horticulture Assistance." The CDP-SURAKSHA will allow an instant disbursal of subsidies to farmers by utilising the e-RUPI voucher from the National Payments Corporation of India (NPCI). The e-RUPI voucher is a cashless and no-contact electronic payment mechanism, which can be shared with the beneficiaries for a specific purpose or activity by organisations or government via SMS or QR code, according to NPCI.

The platform will have features such as database integration with the PM-Kisan scheme, cloud-based server space from National Informatics Centre (NIC), content management system, geotagging, etc.

How will the CDP-SURAKSHA work?

The platform will allow access to farmers, vendors, implementing agencies (IA), cluster development agencies (CDAs), and officials of the National Horticulture Board (NHB).

A farmer can log on to the platform using her mobile number and place an order for planting materials such as seeds, seedlings, and plants, based on her requirement.

Once the demand has been raised by the farmer, the system will ask her to contribute her share of the cost of the planting material. The subsidy amount paid by the government will appear on the screen automatically.

After the farmer pays her contribution, an e-RUPI voucher will be generated. This voucher will then be received by a vendor, who will provide the planting material to the farmer.

After the planting material gets delivered to the farmer, she will have to verify the delivery through geo-tagged photos and videos of her field. Once the verification is done, the IA will release the money to the vendor, who will have to upload an invoice of the payment on the portal.

The IA will collect all the documents and share them with the CDA, after which the latter will release the subsidy amount to the IA.

EXPLAINED POLICY

However, the farmer, who raised the demand for the plant material using the platform, can avail of the subsidy amount at the first stage of the platform.

How is the new system different from the old one?

In the old system, a farmer had to give the full amount to buy planting materials. She would then have to approach the officials concerned for the release of the subsidy amount.

The new platform, however, will provide the subsidy amount to a farmer upfront, at the time of purchasing planting materials. Vendors will receive their payment only after the farmer verifies the delivery of her orders.

How many farmers and banks have come on board?

While the platform is yet to be unveiled at the national level, around 8,400 farmers' details have been uploaded on the platform so far. These include 8,000 farmers of Sahyadri Farms Private Ltd, which is implementing the grape cluster in Nashik, Maharashtra. The rest of the 400 farmers are from the Meghalaya Basin Management Agency (MBMA), which is implementing the turmeric cluster in Meghalaya.

Four banks – HDFC Bank, ICICI Bank, State Bank of India (SBI) and Bank of Baroda – have also been onboarded on the platform. These banks will generate e-RUPI vouchers for fund disbursement.

What is the CDP?

The CDP is a component of the central sector scheme of NHB. It is aimed at leveraging "the geographical specialisation of horticulture clusters and promoting integrated and market-led development of pre-production, production, post-harvest, logistics, branding, and marketing activities".

So far, 55 horticulture clusters have been identified, out of which 12 have been selected for the pilot. These clusters are in various stages of development.

According to the Union government, about 9 lakh hectares of area will be covered through all 55 clusters, covering 10 lakh farmers. It is estimated that the initiative will attract private investment of Rs 8,250 crore, in addition to the government's assistance, which is fixed according to the size of the cluster – up to Rs 25 crore for mini cluster (size up to 5,000 hectares), up to Rs 50 crore for medium clusters (5,000 to 15,000 hectares), and up to Rs 100 crore for mega clusters (more than 15,000 hectares).

Context: The government has recently introduced a new platform, known as **CDP-SURAKSHA,** to disburse subsidies to horticulture farmers as part of the **Cluster Development Programme (CDP),** the Centre's initiative aimed at promoting horticulture crops.

CDP-SURAKSHA

- **About**: It is a digital platform designed to assist farmers in India.
- **Meaning of SURAKSHA**: "System for Unified Resource Allocation, Knowledge, and Secure Horticulture Assistance."
- **Functionality of the platform:** It facilitates the instant disbursal of subsidies to farmers directly into their bank accounts.
- **Features of CDP-SURAKSHA:**
  - Database integration with PM-KISAN, Cloud-based server space from NIC, UIDAI validation, eRUPI integration, Local government directory (LGD), Content management system, Geotagging and geo-fencing.

How does CDP-SURAKSHA work?

- **Access:** Various stakeholders like farmers, vendors, implementing agencies, and officials can access CDP-SURAKSHA.
- **Order Placement:** Farmers can log in and place orders for planting material according to their needs.
- **Payment and Verification**: Farmers contribute their share of the cost, government subsidy is displayed automatically, and upon payment, **an e-RUPI voucher** is generated. After material delivery verification, vendor payment is released, and subsidy is processed by the implementing agency.

e-RUPI

- **About:** It is a one-time payment mechanism.
- **Mechanism**: It functions without a card, digital payments app, or internet banking access.
- **Redemption**: The voucher is redeemable at merchants accepting e-RUPI.
- **Usage**: It can be shared with beneficiaries for specific purposes or activities.
- **Distribution**: Organisations or government entities can distribute e-RUPI via SMS or QR code.

DTE Apr 12

FAOs FOOD PRICE INDEX
(Syllabus: GS Paper 3 – Economy)

Export bans, restrictions: How government is trying to keep food prices in check ahead of elections

Context: Recently, the Indian government has implemented measures to ensure affordable food prices nationwide, as reflected in the Food and Agriculture Organization (FAO) of the United Nations' food price index.

FAOs Food Price Index

- **About:** It was introduced in 1996 as a public good to aid in monitoring global agricultural commodity market developments.
- **Measure of Monthly Changes:** It serves as a measure of the monthly change in international prices of a basket of food commodities.
- **Commodity Coverage**: The index tracks changes in prices for a basket of cereals, oilseeds, dairy products, meat, and sugar.
- **Base Period:** 2014-2016.

Food and Agriculture Organization (FAO)

- **About**: It is a specialised agency of the United Nations that leads international efforts to defeat hunger. Its sister bodies are the World Food Programme and the International Fund for Agricultural Development (IFAD).
- **Formation**: 16th October, 1945.
- **Headquarter**: Rome (Italy).
- **Goal**: To achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives.
- **Members**: 195 members - 194 countries and the European union
- **World Food Day**: Celebrated every year on 16th October.

LIVEMINT Apr 12

METHANE

(Syllabus: GS Paper 3 – Env & Eco)

Toxic hand sanitisers! US recalls several lots of methanol-containing products over risk of 'permanent blindness, coma'

Context: The United States has recalled several lots of hand sanitisers and aloe gel due to toxic methanol content, citing health risks like nausea, coma, and even death.

Methane

- **About**: It is a hydrocarbon that is a primary component of natural gas.
- **Properties**: Colourless, odourless and highly flammable gas.
- **Greenhouse Gas Properties**: Methane is classified as a greenhouse gas (GHG), influencing Earth's temperature and climate patterns.
- **Diverse Emission Sources**: Methane emissions stem from various anthropogenic and natural origins, contributing to its presence in the atmosphere.
- **Anthropogenic Emission Sources**: Human activities such as landfills, oil and gas systems, agriculture, and industrial processes are major contributors to methane emissions.

Risk of exposure to toxic hand sanitisers

- **Wide Range of Adverse Effects**: Exposure to toxic hand sanitisers can lead to various side effects, including nausea, vomiting, headache, blurred vision, coma, seizures, permanent blindness, permanent damage to the central nervous system, or even death.
- **Children's Vulnerability**: The US FDA highlights that children are particularly susceptible to the dangers of toxic hand sanitisers due to the possibility of accidental ingestion.
- **Substitute for Alcohol Consumption**: Adolescents and adults who mistakenly use these products as a substitute for alcohol (ethanol) face a heightened risk of methanol poisoning.

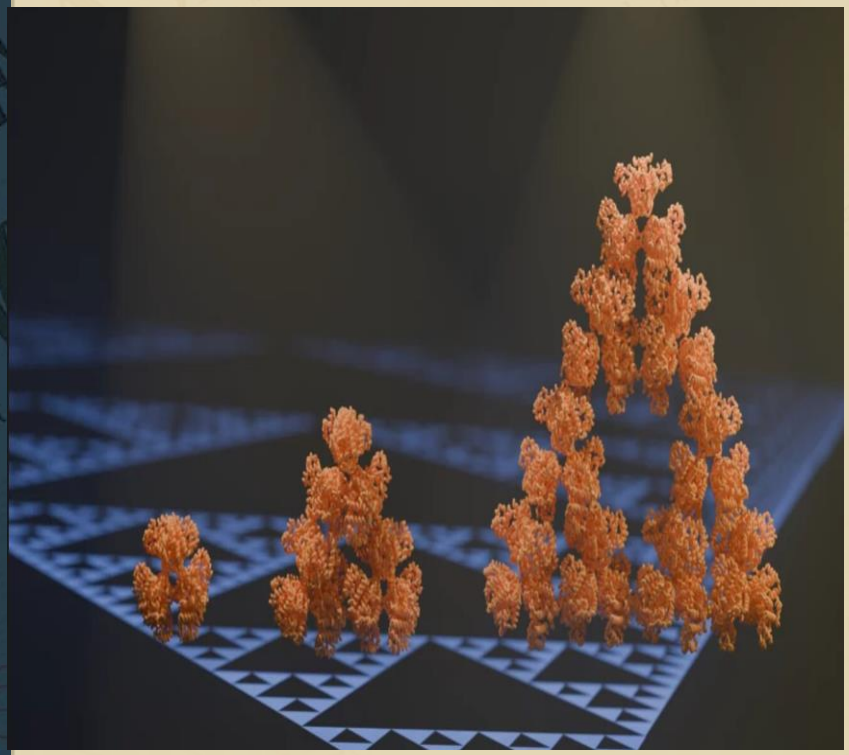
PHY.ORG

Apr 12

FRACTALS

(Syllabus: GS Paper 3 – Sci and Tech)

Discovery of the first fractal molecule in nature



Context: Recently, an international team of researchers' discovered first fractal molecule in nature.

Fractals

- **About**: A fractal is a never-ending pattern. Fractals are infinitely complex patterns that are self-similar across different scales.
  - They are created by repeating a simple process over and over in an ongoing feedback loop.
- **Self-Similarity Across Scales**: They exhibit self-similarity across different scales, meaning every part resembles the whole image.
- **Research Highlights**:
  - **Sierpinski Triangle Discovery:** Researchers found a microbial enzyme that forms the Sierpinski triangle—a repeating series of triangles within triangles.
  - **Natural Examples**: Notable examples of fractals include human fingerprints, tree stumps, snail shells, human veins, river networks, plant leaf veins, and snowflake edges.
- **Applications**:
  - **Modeling Structures**: Fractals are used to model structures like eroded coastlines and snowflakes, where similar patterns emerge at smaller scales.
  - **Describing Chaos:** They describe chaotic phenomena such as crystal growth, fluid turbulence, and galaxy formation, providing insight into partly random processes.

WORLD CYBERCRIME INDEX
(Syllabus: GS Paper 3 – Cyber Security)

India ranks number 10 in cybercrime, study finds

Context: After three years of extensive research, an international team of researchers has assembled the inaugural 'World Cybercrime Index'.

World Cybercrime Index

- **About**: It is a tool that ranks nations based on their significance as sources of cybercrime, providing insights into global cyber threats.
- **Development and Collaboration**: Developed through a collaboration between the University of Oxford and UNSW Canberra, the World Cybercrime Index aims to offer a comprehensive understanding of cyber threats.
- **Data Gathering Methodology**: The index's data is sourced from a survey of 92 prominent cybercrime experts worldwide, who are actively engaged in intelligence gathering and investigations within the cybercrime domain.
- **Scope and Categorization**: The index evaluates approximately 100 countries, categorizing them based on various cybercrime types, including ransomware, credit card theft, and scams.
- **Key Findings:**
  - Russia leads the index, with Ukraine, China, the USA, Nigeria, and Romania following closely.
  - India occupies the 10th position in the rankings, indicating its significant involvement in cybercrime.
  - Specific cybercrime types are often associated with certain countries, such as data and identity theft being linked to the United States, and technical product-related crimes to China.
  - **Regional Specializations**: India is identified as a "specialist" in scams, while Romania and the US are noted for both high-tech and low-tech crimes. India is deemed a "balanced hub," focusing on mid-tech crimes.
  - **Identified Cybercrime Categories**: Major categories of cybercrime include technical products and services, attacks and extortion, data and identity theft, scams, and cashing out or money laundering involving illegitimate virtual currency.

TIMES OF INDIA

Page 2

LARGE BRANDED SWIFT

(Syllabus: GS Paper 3 – Env and Eco)

Himalayan butterfly creates first flutter in city

Kushagra.Dixit@timesgroup.com

New Delhi: For the first time, the large branded swift, a butterfly species seen commonly in the Himalayas and Northeast, has been spotted in Delhi. The species has never been found previously in northwest India due to its arid or semi-arid climate.

The findings were published recently in Journal of Threatened Taxa by ecologist Rajesh Chaudhary of Acharya Narendra Dev College's biomedical science department and Sohail Madan, an ecologist and former member of Ridge Management Board. They observed three specimens of the butterfly, with dark olive brown uppersides and paler undersides, at a farm in southwest Delhi's Najafgarh during the previous monsoon and are trying to establish the reasons behind the presence of the Himalayan butterfly in the region.

"It's an exciting development as it highlights the hidden biodiversity that exists even within urban environments. The findings signify the importance of preserving green spaces and creating butterfly corridors within the city," said Madan, adding that further studies are needed to identify more such gaps and understand ecological needs to ensure the conservation and development of habitats in Delhi.

"The species were recorded in Najafgarh, which signifies the importance of such wetlands not just for birds but also for other creatures. We must focus on protection of the lake and development activity should be carried out with sensitivity," he emphasised.

Courtesy: Rajesh Chaudhary



The large branded swift has never been found previously in northwest India

Chaudhary said it might be a migratory species, but further studies were required in the coming years to confirm whether the sighting was due to migration or a case of range extension of the species in the region.

The journal noted that this was the first reported sighting of the species in the semi-arid regions of northwestern India, and likely to be a range extension. "Three male butterflies were spotted roosting on foliage in a private farm compound on July 30, 2023 at 1700-1800 hours in Najafgarh. The weather was humid, the temperature was 33-34°C, and the sky was clear. The butterflies were photographed, and the species was identified as Pelopidas sinensis," it stated.

The farm compound, surrounded by agricultural fields, has medicinal herbs, grasses, and ornamental and fruit plants. While a perennial canal with reeds and aquatic flora flows by it, "about 5-6km from the site... exists a large freshwater reservoir — Najafgarh Lake", the journal noted.

In 2022, the ecologists had recorded Common Cerulean, another butterfly species, for the first time in National Capital Region. Another species, Tailless lineblue, was also spotted in the region in 2022.

Context: Recently, the large branded swift, a butterfly species commonly seen in the Himalayas and Northeast, has been spotted in Delhi for the first time.

- The species has never been found previo- usly in northwest India due to its arid or semi-arid climate.

Large Branded Swift

- **About:** It is a butterfly belonging to the family Hesperiidae found in India.
- **Scientific name:** Pelopidas subochracea
- **Unexpected Presence**: Ecologists in southwest Delhi's Najafgarh discovered three specimens of a Himalayan butterfly during the previous monsoon.
- **Significance of Urban Biodiversity**
  - The discovery underscores the presence of hidden biodiversity within urban environments.
  - It highlights the importance of preserving green spaces and creating butterfly corridors within cities.
  - Najafgarh's significance extends beyond birds, supporting diverse creatures like butterflies.
- **Rarity of Large Branded Swift:** The large branded swift, previously unseen in northwest India, was recorded, showcasing the region's biodiversity surprises.

Past Discoveries: Earlier sightings of the Common Cerulean and Tailless Lineblue butterflies in 2022 emphasize the ongoing exploration and documentation of butterfly diversity in the National Capital Region.

INDIAN EXPRESS Page 16

CORRUPT PRACTICES UNDER RPA

(Syllabus: GS Paper 2 – Polity)



When is moveable asset sizeable enough to declare? It depends, says SC

KHADIJA KHAN
NEW DELHI, APRIL 12

THE SUPREME Court has said voters do not have an absolute right to know all details of a candidate's private life, and candidates are not required to disclose every item of moveable property they own, unless its value amounts to a "sizeable asset".

Emphasising a candidate's right to privacy in matters that are irrelevant to his candidature for public office or are of no concern to voters, the court allowed an appeal by Karikho Kri, whose election to the Arunachal Pradesh Assembly in 2019 was challenged on the ground that he had failed to disclose full information in his nomination papers.

"...There is no absolute mandate that every non-disclosure, irrespective of its gravity and impact, would automatically amount to a defect of substantial nature, thereby materially affecting the result of the election or amounting to 'undue influence' so as to qualify as a corrupt practice," the judgment passed on April 9 by a Bench of Justices Aniruddha Bose and Sanjay Kumar said.

The Election Petition

After Kri won the Tezu seat as an Independent, the Congress candidate, Nuney Tayang, filed a petition accusing him of suppressing material particulars in his election affidavit.

Tayang argued that Kri had not disclosed the ownership of vehicles, including his wife's Maruti van and scooty, and his son's motorcycle, and had not submitted a 'no dues certificate' for electricity and water charges of his government-provided accommodation.

Tayang asked the Itanagar Bench of the Assam, Nagaland, Mizoram, & Arunachal Pradesh HC to declare Kri's election void under Sections 100(1)(b), 100(1)(d)(i), and 100(1)(d)(iv) of The Representation of the People Act, 1951, and to declare him elected instead.

Section 100(1) of the 1951 Act enumerates the grounds on which a candidate's election can be invalidated.

Under Section 100(1)(b), an election can be declared void if "any corrupt practice has been committed by a returned candidate or his election agent or by any other person with the consent of a returned candidate or his election agent".

Under Sections 100(1)(d)(i) and (iv), an HC can rule that election results have been "materially affected" if there is "improper acceptance" of a nomination or non-compliance of the provisions of the Constitution, the 1951 Act, or any Rules or orders made under the Act.

EXPLAINED LAW

'Corrupt Practices'

On July 7, 2023, the HC declared Kri's 2019 victory void under Sections 100(1)(b), 100(1)(d)(i), and 100(1)(d)(iv) of the 1951 Act. However, it rejected Tayang's prayer to declare him elected in place of Kri.

The HC ruled that non-disclosure of a vehicle registered in the name of a candidate or a dependent member of his family was sufficient to constitute the corrupt practice of "undue influence" under Section 123(2) of the RP Act, 1951.

Under Section 123 of the RPA, "corrupt practices" include bribery, undue influence, false information, and promotion or attempted promotion of "feelings of enmity or hatred between different classes of the citizens of India on grounds of religion, race, caste, community, or language" by a candidate for the furtherance of his prospects in the election.

Under Section 123(2), "undue influence" is "any direct or indirect interference or attempt to interfere on the part of the candidate or his agent, or of any other person, with the consent of the candidate or his election agent, with the free exercise of any electoral right." This could include threats of injury, social ostracism, and expulsion from any caste or community.

Convincing a candidate or elector that they will become "an object of divine displeasure or spiritual censure" too will be considered an interference "with the free exercise of the electoral right of such candidate or elector."

No hard and fast rule

Upholding Kri's appeal against the HC's order, the SC said it was "not inclined to accept the blanket proposition that a candidate is required to lay his life out threadbare for examination by the electorate". The candidate's "right to privacy would still survive as regards matters which are of no concern to the voter or are irrelevant to his candidature".

In its 42-page order, the court noted that "it is not necessary that a candidate declare every item of movable property that he or his dependent family members owns, such as, clothing, shoes, crockery, stationery and furniture, etc., unless the same is of such value as to constitute a sizeable asset in itself or reflect upon his candidature, in terms of his lifestyle, and require to be disclosed".

Every case must be "judged on its own facts", the court said. "...There can be no hard and fast or straitjacketed rule as to when the non-disclosure of a particular movable asset by a candidate would amount to a defect of a substantial character," it said.

Thus, if a candidate and his family own several high-priced watches aggregating to a large monetary value, they would constitute "high value" assets and reflect a "lavish lifestyle", and suppressing such information would amount to "undue influence".

"However, if a candidate and his family members each own a simple watch, which is not highly priced, suppression of the value of such watches may not amount to a defect at all," the court said.

Context: The Supreme Court recently ruled that voters do not possess an absolute right to access all aspects of a candidate's private life, and candidates are not obligated to disclose every piece of movable property they own, unless its value constitutes a "sizable asset."

What was the petition?

- **Allegations of Suppressed Information**: Opposition candidate, filed a petition against Karikho Kri, alleging that he suppressed material particulars in his election affidavit after winning the Tezu seat as an Independent.
- **Non-Disclosure of Vehicle Ownership**: Candidate argued that Kri failed to disclose the ownership of vehicles, including his wife's Maruti van, scooty, and his son's motorcycle, in his election affidavit.
- **Grounds for Election Invalidation**: Section 100(1)(b) permits election invalidation if "any corrupt practice has been committed by a returned candidate or his election agent or by any other person with the consent of a returned candidate or his election agent".
- **Material Effects on Election Results:** Sections 100(1)(d)(i) and (iv) allow an HC to rule election results as "materially affected" due to "improper acceptance" of a nomination or non-compliance with constitutional provisions, the 1951 Act, or related rules and orders.

Corrupt Practices under the RPA

- **Definition under Section 123:** "Corrupt practices" encompass bribery, undue influence, dissemination of false information, and incitement of hostility between different groups based on religion, race, caste, community, or language to further a candidate's electoral prospects.
- **Undue Influence under Section 123(2)**: It includes direct or indirect interference by the candidate, their agent, or any other person, with the free exercise of any electoral right.
    - This interference could manifest as threats, social exclusion, or expulsion from social groups.
- **Religious or Spiritual Coercion**: Convincing a candidate or elector that they will incur divine displeasure or spiritual censure for not supporting a particular candidate constitutes interference with their electoral rights.

Supreme Court's Interpretation

- The Supreme Court, in a ruling on Kri's appeal against a High Court order, asserted that a candidate's right to privacy is not absolute but persists concerning matters irrelevant to their candidacy or not of concern to the electorate.

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