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### **1. New species of bent-toed gecko found at Agasthyamalai ( Aug. 22, 2022 )**

**A group of researchers has discovered a new species of bent-toed gecko from Agasthyamalai hills in the Western Ghats recently.**

#### **IMPORTANT FACTS -**

##### ***About the new Species :***

- Scientific name - *Cyrtodactylus aravindi*
- The species has been given the common name Aravind's ground gecko after noted malacologist (a branch of zoology that deals with molluscs) N A Aravind.
- It has been described on the basis of variation and its specificity in molecular DNA data.
- It has so far been found only at two locations, Muppandal and Thuckalay, in Kanyakumari district within the Agasthyamalai biosphere reserve in Tamil Nadu.
- This new species has been described in the journal *Vertebrate Zoology*.

##### ***About Gecko :***

- Geckos are reptiles and are found on all continents except Antarctica.
- These are colorful lizards adapted to habitats ranging from rainforests, deserts to cold mountain slopes.
- Most geckos are nocturnal, they are active at night.

##### ***Agasthyamalai Biosphere Reserve :***

- **It was established in 2001.**
- It straddles the border of Kollam and Thiruvananthapuram Districts in Kerala and Tirunelveli and Kanyakumari Districts in Tamil Nadu, South India at the southern end of the Western Ghats.
- It consists mostly of tropical forests.

### **2. Researchers develop 3D printed artificial cornea ( Aug. 16, 2022 )**

A team of researchers from Hyderabad have successfully 3D-printed an artificial cornea and transplanted it into a rabbit eye for the first time in the country.

#### **Important facts**

- This 3D printed cornea has been made by scientists from LV Prasad Eye Institute (LVPEI), IIT Hyderabad (IITH) and Centre for Cellular and Molecular Biology (CCMB).
- This cornea is made from the corneal tissue of the human eye.
- This cornea has been completely made by the country's scientists with indigenous technology.
- It does not contain any synthetic components and can be applied to patients as well.

### **How was the 3D cornea made?**

- Scientists have created a biomimetic hydrogel by extracting decellularized corneal tissue and stem cells from the human eye.
- Scientists have said that this 3D printed cornea has been prepared from the corneal tissue of the human eye, so it is completely biocompatible and natural.
- This will be helpful in treating diseases like corneal scarring (in which the cornea becomes opaque) and keratoconus (in which the cornea becomes thin).
- Many times the cornea of army soldiers gets damaged due to injury, in such a situation the light of those soldiers can be brought back with 3D printed cornea.

### **What is Cornea?**

- The cornea is the transparent part of the eye that covers the front of the eye.
- It covers the pupil (the centre of the eye), iris (the colored part of the eye), and anterior chamber (the fluid-filled inside of the eye).
- The main function of the cornea is to refract or bend light.
- The cornea is responsible for focusing most of the light that enters the eye.

### **What is 3D Printing?**

- 3D printing uses computer aided design (CAD) to create three-dimensional objects through the layering method.
- The model to be printed with the help of software is first developed by the computer, which then instructs the 3D printer.

## **3. Union Minister Dr Jitendra Singh unveils India's first Saline Water Lantern ( Aug. 13, 2022 )**

Union Minister of State (Independent Charge) Science & Technology, Dr Jitendra Singh on 13 August launched India's first Saline Water Lantern.

### **About Saline Water Lantern**

- It uses the sea water as the electrolyte between specially designed electrodes to power the LED lamps.
- It is the first-of-its kind lantern named “**Roshni**”.
- The Roshni Lamp has been invented by the National Institute of Ocean Technology (NIOT), Chennai.
- This technique can also be used in areas where sea water is not available, as any saltwater or normal water mixed with common salt can be used to power lanterns.

### **Significance**

- It will bring "ease of living" to the poor and needy, especially the fishing community living along India's 7500 km long coastline.
- It will also give a boost to and complement Prime Minister Narendra Modi's UJALA scheme launched in 2015 for the distribution of LED bulbs across the country.
- It is not only cost-effective, but very easy to operate.

### **4. PM Modi dedicate to nation 2nd Generation Ethanol Plant at Panipat in Haryana ( Aug. 10, 2022 )**

Prime Minister Narendra Modi dedicated to the nation the 2nd Generation (2G) Ethanol Plant at Panipat in Haryana on 10 August.

### **Important facts**

- This is part of a long series of steps taken by the government over the years to promote the production and use of biofuels in the country.
- This is in line with the Prime Minister's efforts to make the energy sector more affordable, accessible, efficient and sustainable.

### **About the Plant**

- It has been built at an estimated cost of over Rs 900 crore by Indian Oil Corporation Ltd (IOCL).
- It is located close to the Panipat Refinery.
- The project will use about two lakh tonnes of rice straw (straw) annually to generate about 30 million litres of ethanol annually.
- Farmers will be empowered for better use of agro-crop residues and additional income generation opportunities will be provided to them.
- The project will have zero liquid discharge.
- Reduction in burning of rice straw (stubble) will reduce carbon dioxide emissions by about 3 lakh tonnes per year and reduce greenhouse gases.

**About ethanol**

- Ethanol is a kind of alcohol, it is also called ethyl alcohol.
- It can be used as fuel in vehicles by mixing it with petrol.
- After sugarcane, the central government is now focusing on preparing ethanol from rice.
- By producing ethanol, farmers can make their economic condition better by earning good profits.
- Ethanol is mainly produced from the sugarcane crop, but it can also be prepared from different types of sugar crops.

**Ethanol blending programme (EBP) in India**

- Under this programme 5 per cent ethanol-blended petrol will be supplied to retail outlets.
- It aims to popularize 5 per cent ethanol-blended petrol in 9 states and 4 union territories.
- Its aim is to reduce the country's dependence on crude oil imports, cutting carbon emissions and boosting farmers' incomes.

**5. Indian army launches “him- drone-a-thon” ( Aug. 8, 2022 )**

Indian Army in collaboration with Drone Federation of India has launched 'Him Drone-a-thon' program on 8 Aug 22.

**What is the 'Him Drone-a-thon' programme?**

- It is a pan-India continuous interaction between all stakeholders including industry, academia, software developers and drone product manufacturers.
- It will be conducted in different phases with quantitative parameters (like height, weight, range, stability etc.), which will be progressively enhanced based on the demonstrated abilities.
- The wide range of activities planned under this include interactions and ideas among users, development agencies, academicians etc., seeking industry feedback, visits to operational locations by development agencies.

**Development in the following categories are included under this programme**

- Logistics/ Load carrying Drone in High Altitude Areas
- Autonomous Surveillance/ Search & Rescue Drone
- Micro/ Nano Drones for Fighting in Built Up Areas

**What is a drone?**

- Drones are also known as unmanned aerial vehicles (UAVs) or unmanned aircraft.
- A drone is a flying robot that can be controlled remotely or can fly independently using software-controlled flight technology in its embedded systems.
- It works in conjunction with onboard sensors and a global positioning system (GPS).
- Drones first came to the market in the 1990 and were developed by the military.
- Drones can be used for surveillance, situational analysis, crime control, VVIP security, disaster management, etc.
- It offers benefits to almost every sector of the economy, including national defence, agriculture, law enforcement, and mapping, among others.
- The Central Government has approved the Production Linked Incentive (PLI) Scheme of Drones and Drone Components.

## **6. ISRO's first SSLV mission fails, satellites placed in wrong orbit ( Aug. 8, 2022 )**

The Indian Space Research Organization (ISRO) on 7 August placed its first Small Satellite Launch Vehicle (SSLV) satellites in the wrong orbit.

### **Important facts**

- After this the earth observation satellite and AzadiSat satellite are “no longer usable”.
- SSLV has placed the satellites on an elliptical orbit instead of a circular one.
- When satellites are placed in such an orbit, they cannot stay there for long and come down.
- SSLV-D1 placed the satellites into 356 km x 76 km elliptical orbit instead of 356 km circular orbit.
- The space agency said a committee would analyze why it failed and ISRO would soon be back with SSLV-D2.
- SSLV had suffered 'data loss' in its terminal phase, after performing "as expected" in all phases.

### **EOS-02**

- Earth observation satellite EOS-02 and co-passenger student satellite AzadiSat are important payloads for SSLV.
- EOS-02 is an experimental optical remote sensing satellite and has high spatial resolution.
- It aims to realize and fly an experimental imaging satellite with a short turnaround time and demonstrate launch-on-demand capability.

EOS-02 belongs to the family of microsatellite series of spacecraft.

### **AzaadiSAT**

- It is a 8U CubeSat weighing around 8 kilograms.
- It carries 75 different types of payloads each weighing around 50 grams.
- The Guidance for manufacturing these payloads was provided to girl students from rural areas of India.
- The payload has been integrated by the student team of 'Space Kidz India'.
- The ground system developed by 'Space Kids India' will be used to receive data from this satellite.

### **What is SSLV?**

- The Small Satellite Launch Vehicle (SSLV) is 34 metres long, which is about 10 metres less than PSLV.
- Its vehicle diameter is two metres as compared to PSLV's 2.8 metres.

### **Objectives of SSLV**

- To provide inputs on thermal anomalies for ancillary applications in the fields of geo-environmental studies, forestry, hydrology, agriculture, soil and coastal studies etc.
- To create greater synergy between the government space sector and private Indian industries and institutions.

## **7. Nallathambi Kalaiseelvi became the first woman Director General of CSIR ( Aug. 8, 2022 )**

Senior electrochemical scientist Nallathamby Kalaiselvi has become the first woman director general of the Council of Scientific and Industrial Research (CSIR).

### **Important facts**

- She will succeed Shekhar Mande, who retired in April.
- After Mande's retirement, Rajesh Gokhale, Secretary, the Department of Biotechnology, was given additional charge of CSIR.
- Known for her work in the field of Li-ion batteries, Kalaiseelvi is the Director of CSIR-Central Electrochemical Research Institute in Karaikudi, Tamil Nadu.
- She will also take over as the Secretary, Department of Scientific and Industrial Research.
- Kalaiseelvi begins her job at CSIR and built a good reputation at the institute and became the first woman to head CSIR-CECRI in February 2019.

- Kalaiselvi's research work for more than 25 years has focused primarily on the development of electrochemical power systems, especially electrodes.
- She is currently working on the development of sodium-ion/lithium-sulphur batteries and supercapacitors.
- Hailing from the town of Ambasamudram in Tirunelveli district in Tamil Nadu, Kalaiseelvi did her schooling in Tamil medium.

**What are Lithium Ion Batteries?**

- It is also called as Li-ion battery is a type of rechargeable battery.
- These are commonly used for portable electronics and electric vehicles and are growing in popularity for military and aerospace applications.
- It is also used in handy consumer electronics goods such as mobile phones, laptops, cameras and many other portable consumer gadgets apart from industrial applications and aerospace.
- China dominates the Li-ion battery market.
- The majority of current domestic demand is met by imported batteries from China, South Korea and Taiwan.

**Council of Scientific and Industrial Research (CSIR)**

- It is the largest research and development organisation in India in the field of science and technology.
- It has a dynamic network of 37 national laboratories, 39 outreach centres, 3 innovation complexes and 5 units.
- It is ranked 37th out of 1587 government institutions around the world.
- The Chairman (ex-officio) of CSIR is the Prime Minister and the Union Minister of Science and Technology is the Vice President (ex-officio).
- It is funded by the Ministry of Science and Technology.
- Established - September 1942
- Located - New Delhi

**8. ISRO to launch its smallest rocket to unfurl Tricolour in Space ( Aug. 5, 2022 )**

Indian Space Research Organisation (ISRO) will launch its smallest commercial rocket on 7 August to unfurl Tricolour in space.

**Important facts**

- The launch will be done from Satish Dhawan Space Center in Sriharikota.

- It will drive India's dreams of breaking into the lucrative and booming small satellite launch market.
- On August 15, 2018, Prime Minister Narendra Modi announced that the tricolor would be unfurled in space during India's 75th year of independence.
- To mark the celebration of the country's 'Azadi Ka Amrit Mahotsav', the SSLV will carry a co-passenger satellite named 'Azadisat', which will carry 75 payloads built by 750 young girl students from 75 rural government schools across India.
- The project was conceptualized especially for the 75th Independence Day celebrations to encourage scientific temper and to create opportunities for young girls to choose space research as their career.

## **9. DRDO successfully test-fires indigenously developed laser-guided Anti-Tank Guided Missiles ( Aug. 5, 2022 )**

India on 4 August successfully test fired the indigenously developed laser-guided anti-tank guided missiles (ATGM) at Ahmednagar in Maharashtra.

### **Important facts**

- The ATGM was test-fired from Main Battle Tank (MBT) Arjuna by DRDO and Indian Army in collaboration with Armored Corps Center and School (ACC&S) at KK Range.
- The missiles struck with precision and successfully destroyed targets at two different ranges.
- The telemetry system has recorded satisfactory flight performance of the missiles.
- The ATGM has been developed with multi-platform launch capability and is currently undergoing technical trials with the 120 mm rifled gun of MBT Arjun.
- This indigenous anti-tank guided missile is fitted with a Tandem High Explosive Anti-Tank (HEAT) weapon, which is capable of destroying armoured vehicles with state-of-the-art Explosive Reactive Armour (ERA).
- Earlier in June, the DRDO and the Indian Army successfully test-fired an indigenously built tank destroyer missile at the KK range in Ahmednagar, Maharashtra.

## **Defence Research and Development Organisation (DRDO)**

- It is a premier defence research and development agency under the Ministry of Defence, Government of India.
- It aims to make India self-reliant in critical defence technology and systems.
- It was set up in 1958.
- Headquarters - New Delhi
- Chairman - G. Satheesh Reddy

**10. Hellfire R9X missile used to kill Ayman al-Zawahiri ( Aug. 3, 2022 )**

The US Central Intelligence Agency (CIA) used its 'secret weapon' — the Hellfire R9X missile to kill Al Qaeda chief Ayman al-Zawahiri on the balcony of a safehouse in Kabul.

**What is the Hellfire R9X missile?**

- It is basically a modified version of the renowned Hellfire missile which was an anti-tank weapon developed in the 1980s.
- It was modified several times to specifically target individuals after the 9/11 attacks.
- It is an American-origin missile developed to target individuals and cause minimal collateral damage.
- This missile has no warhead, it deploys razor-sharp blades in the final phase of the attack.
- It also helps it break through thicker steel sheets and lowers the target by using the kinetic energy of its propulsion.
- The blades eject from the missile and hit the intended target without causing massive damage to the surroundings.

**Why was the Hellfire R9X missile developed?**

- The main reason for the development of the Hellfire R9X missile was to reduce civilian casualties.
- The missile was also developed to eliminate doubts about the structural robustness of a building such as the mud and thatched huts that terrorists commonly use as a hideout.
- In January 2019, this missile was used to kill Jamal al-Badawi while Ahmed Hassan Abu Khair al-Masri was killed in February 2017.