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Roen olmi

Researchers in Goa have synthesized gold nanoparticles from a wild mushroom species that is widely eaten as a delicacy in Goa.

- It is an edible mushroom of the ***Termitomyces species.***
- They play a very important role as a powerful biodegrading fungus in forest and grassland ecosystems converting 50% dead plant material on the ground into rich soil.
- **Habitat** - Grows on termite hills in the forested areas of Western Ghats in Goa.
- **Association with termites -** These mushrooms have no independent existence and ***grow only in association with termites***, therefore, impossible to cultivate artificially.
- The termites eat them to obtain enzymes and nitrogen.
- **Ban** - The Goa forest department banned the harvesting of these wild mushrooms in 1992.
- However, the very next year, the ban was amended to cover only wildlife sanctuaries and government-owned protected forests.
- **Effect** - The Goa state biodiversity board has warned that overexploitation of 'Roen Olmi', could result in the outbreak of new forest diseases such as Kyasanur Forest Disease (KFD).

Mushrooms in Goa have interesting local names which are derived from either the:
1. Habitat (Roen olmi for termite hill mushroom),
2. Shape (Khut olmi for mushrooms with a long stem and Fugo olmi for balloon-shaped mushrooms)
3. Colour (tamdi olmi for red mushrooms)
4. Fruiting season (shith olmi that grows in winter)

> *Kyasanur Forest disease (KFD) virus is transmitted by the bite of the tick Haemaphysalis spinigera, a tick often found at the forest margins.*

References

1. The Indian Express – Turning mushrooms into gold
2. Mongabay – Mushroom delicacies in Goa are threatening its forests
3. Times of India – Exploiting Roen Olmi could give rise to new diseases

Raisina Dialogue 2024

The ninth edition of the Raisina Dialogue inaugurated by Prime Minister Narendra Modi was held recently in New Delhi.

- **About -** The Raisina Dialogue is India's premier ***annual conference on geopolitics and geo-economics***.
- **Aim -** The dialogue aims to address the most challenging issues faced by the world.
- **Designed based on** - Singapore's Shangri-La Dialogue.

Shangri La Dialogue (SLD)
• The Shangri-La Dialogue (SLD) is Asia's premier defence summit. • It is an inter-governmental security forum based on the Munich conference on security policy. • It is held annually by an independent think tank International Institute for Strategic Studies (IISS).

- **Host -** Delhi-based think tank Observer Research Foundation (ORF), in partnership with the Ministry of External Affairs, hosts the conference.
- **Chief Guest -** Mr. Kyriakos Mitsotakis (Hellenic Republic - Greece).

Observer Research Foundation (ORF)
• It is an independent global think tank based in Delhi, India. • The foundation has three centres in Mumbai, Chennai and Kolkata. • ORF provides potentially viable inputs for policy and decision-makers in the Indian Government and to the political and business communities of India.

- **Structure -** The Dialogue is structured as a multi-stakeholder, cross-sectoral discussion.
- **Participants -** The Dialogue involves heads of state, cabinet ministers and local government officials, joined by leaders from the private sector, media and academia.
- **2024 Theme -** The theme of the 2024 edition is "Chaturanga: Conflict, Contest, Cooperate, and Create".
- **Six Pillars -** During the three-day conference, the participants will engage with each other over six thematic pillars:
    1. Tech Frontiers: Regulations & Realities
    2. Peace with the Planet: Invest & Innovate
    3. War & Peace: Armouries & Asymmetries
    4. Decolonising Multilateralism: Institutions & Inclusion
    5. The Post 2030 Agenda: People & Progress
    6. Defending Democracy: Society & Sovereignty

References

1. The Indian Express – Raisina Dialogue
2. ORF – Raisina Dialogue
3. MEA – Raisina Dialogue 2024

Gaganyaan Mission

Prime Minister Modi announces four astronauts for Gaganyaan Mission.

- **Introduced -** In 2006, India started work on an *orbital vehicle mission* that was later named Gaganyaan.
- **To be launched in** - 2024-2025
- **Mission by -** It is ***India's first human space mission*** by the Indian Space Research Organisation (ISRO).
- **Objective -** Gaganyaan envisages demonstration of human spaceflight capability by launching crew of members to the Low Earth Orbit (LEO) of 400 km for a 3-day mission.

  Precursor missions such as Gaganyaan-1 will demonstrate the levels of technology preparedness before the manned mission.

- **Demonstrator missions -** These demonstrator missions include Integrated Air Drop Test (IADT), Pad Abort Test (PAT) and Test Vehicle (TV) flights.

  A second unmanned flight is planned with a pressurised crew module, which will carry the robot Vyommitra to record all parameters to study the impact of the flight on humans.

- **Crew -** Group Captain Prasanth Balakrishnan Nair, Group Captain Ajit Krishnan, Group Captain Angad Pratap, and Wing Commander Shubhanshu Shukla are India's astronauts-designate for Gaganyaan.

  ISRO signed a Memorandum of Understanding (MoU) with Glavkosmos, a subsidiary of the Russian space agency Roscosmos, for the training of the crew.

- **Significance -** If India succeeds, it will become the *4th country to send humans into space after the Soviet Union, the US and China*.
- It will lay the foundation for a *sustained Indian human space exploration programme* in the long run.

Human rated LVM3 - HLVM3

- **LVM3 rocket -** The well proven and reliable heavy lift launcher of ISRO, is identified as the launch vehicle for Gaganyaan mission.

  LVM3 was earlier called as the GSLV-MkIII.

- **Stages -** It consists of solid stage, liquid stage (Vikas engine) and cryogenic stage.

- **HLVM3 -** All systems in LVM3 launch vehicle are re-configured to meet human rating requirements and christened Human Rated LVM3.

  HLVM3 will be capable of launching the Orbital Module to an intended Low Earth Orbit of 400 km.

- HLVM3 consists of ***Crew Escape System (CES)*** powered by a set of quick acting, high burn rate solid motors.
- **CES -** This ensures that Crew Module along with crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.



Orbital Module (OM)

- **Components -** It will be orbiting earth and comprises of Crew Module (CM) and Service Module (SM).
- **CM -** It is the habitable space with Earth like environment in space for the crew.
- It consists of ***pressurized*** metallic Inner Structure and unpressurised External Structure with Thermal Protection System (TPS).
- **SM -** It will be used for providing necessary support to CM while in orbit.
- It is an ***unpressurized*** structure containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.



References

1. The Indian Express – PM announces 4 astronauts for Gaganyaan
2. ISRO – Gaganyaan
3. Times of India – IAF pilots selected for Gaganyaan

Steadfast Defender

The North Atlantic Treaty Council (NATO) has started its largest military exercise in Europe, the Steadfast Defender 2024.

- **Steadfast Defender -** It is a military exercise which incorporates land, air, sea, cyber, and space operations to enhance civil-military cooperation, by NATO.
- It is the largest exercise conducted by the NATO since the Cold War.

  The last exercise on a similar scale to Steadfast Defender 24 was REFORGER 88.

- **Aim** - To highlight its collective military might and commitment to the security of its members in light of Russia's invasion of Ukraine.
- **Phases** - North American troops cross the Atlantic, moving across Europe and exercise with European forces.

1. **1st Part** - Focuses on securing the Atlantic up to the Arctic
2. **2nd Part** - Focuses on moving troops across Europe, from the High North to Central and Eastern Europe

- **Participants** - Over 90,000 troops from 31 NATO allies as well as special invitee Sweden will participate in the exercise.

*Russian exclave **Kaliningrad** is situated between EU and NATO members Lithuania and Poland, and is also the headquarters of Russia's Baltic Sea fleet, and the country's only ice-free European port.*

North Atlantic Treaty Organisation (NATO)
• NATO is a transatlantic military alliance of 31 countries with the majority of members from Europe. - Sweden is set to join NATO as 32nd member. • It was set up in 1949 as a collective security against Soviet Union. • Headquartered in ***Brussels, Belgium.*** • **NATO plus** - Security arrangement of NATO and the five treaty allies of the ***U.S., Australia, New Zealand, Japan, Israel, and South Korea***.

References

1. The Hindu – NATO's Steadfast Defender 2024 military exercise
2. NATO – Steadfast Defender 24
3. Times of India – Steadfast Defender 2024

Genome India Project

The Department of Biotechnology (DBT) said that the exercise to sequence 10,000 Indian human genomes and create a database under the Centre-backed Genome India Project is about two-thirds complete.

Genome Sequencing

- **Genome -** The human genome is the entire set of deoxyribonucleic acid (DNA) residing in the nucleus of every cell of each human body.
- It carries the complete genetic information responsible for the development and functioning of the organism.

The DNA Technology (Use and Application) Regulation Bill regulates the use of DNA technology for establishing the identity of persons.

- **Genome sequencing -** The process of ***deciphering the order of base pairs***, to decode the genetic fingerprint of a human is called genome sequencing.
- While the sequence or order of base pairs is identical in all humans, compared to that of other species, there are differences in the genome of every human being that makes

them unique.

- **Applications**
    1. Evaluate rare disorders, preconditions for disorders and cancer.
    2. Tool for prenatal screening, to investigate whether the foetus has genetic disorders or anomalies.
    3. Liquid biopsies, where a small amount of blood is examined for DNA markers.

Human Genome Project (HGP)

- Carried out from 1990–2003, the Human Genome Project was a landmark global scientific effort to generate the first sequence of the human genome.
- The first results of the complete human genome sequence were given in 2003, while the HGP released the latest version of the complete human genome in 2023, with a 0.3% error margin.

Genome India Project (GIP)

- **Goal –** To collect 10,000 genetic samples from citizens across India, to build a reference genome grid.
- The Genome India Project is based on the Next-Generation Sequencing (NGS) platform.
    - *The basic next-generation sequencing process involves fragmenting DNA/RNA into multiple pieces, adding adapters, sequencing the libraries, and reassembling them to form a genomic sequence.*
- **Launch -** In 2020.
- **Initiative by -** Indian Institute of Science's (IISC) Centre for Brain Research.
- **Partner organisations -** 20
- **Fund -** By the Department of Biotechnology.

References

1. The Hindu – What is Genome Sequencing?
2. The Hindu – 10,000 genome project completed
3. The Indian Express – 10,000 human genomes sequenced in India

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