

### NEWSPAPER HIGHLIGHT

Scientists have grown plants in soil from the Moon, a first in human history. University of Florida researchers (Communications Biology) showed that plants can successfully sprout and grow in lunar soil. Their study also investigated how plants respond biologically to the Moon's soil, also known as lunar regolith, which is radically different from soil found on Earth. This work is a first step toward one day growing plants for food and oxygen on the Moon or during space missions. In future, longer space missions might use the Moon as a hub or launching pad.

The use of antibiotics to control bacterial infections has taken a beating with the emergence of multi-drug resistant pathogens, and researchers are looking to develop other ways of tackling such bacterial infections. In this context scientists have developed a new biomaterial that can be used to disinfect wounds and hastens the process of healing, as seen in mouse models.

Dive into the cytoplasm of any cell and one comes across structures made of messenger RNA (mRNA) and proteins known as RNA granules, in general. Unlike other structures in the cell (such as mitochondria), the RNA granules are not covered and confined by a membrane. This makes them highly dynamic in nature, thereby allowing them to constantly exchange components with the surrounding. RNA granules are present in the cytoplasm at low numbers under normal conditions but increase in number and size under stressful conditions including diseases.

A team of Australian researchers have identified a biochemical marker in the blood that could help identify newborn babies at risk for sudden infant death syndrome (SIDS), a breakthrough they said creates an avenue to future tragedy preventing interventions. In their study, babies who died of SIDS had lower levels of an enzyme called butyrylcholinesterase (BChE) shortly after birth, the researchers said. BChE plays a major role in the brain's arousal pathway, and low levels would reduce a sleeping infant's ability to wake up or respond to its environment.

Chemists say they have solved a crucial problem in a theory of life's

### ALBINO STRIPED NARROW SNAKE

1. A specimen of an albino Striped Narrow Headed Snake (Xylophis perroteti) was collected from the Nilgiris forest division in Tamil Nadu. Habitat - The snake is endemic to the Southern Western Ghats. It usually occupies Shola-grassland mosaic ecosystems above 1,000 meters above sea level. It is also known as Striped wood-snake.

2. **Food - It feeds on earthworms, insect larvae and caecillians. For the first time albinism has been recorded in the species collected from Nilgiris forest.** Albinism is an inherited disease characterized by a substantially lower rate of melanin production. People with albinism often have lighter colored skin and hair.

3. Melanin normally protects the skin from damage due to UV radiation exposure, so people with albinism are more sensitive to sun exposure. Albinism has two main types: Ocular albinism (OA) which primarily affects the eyes. Oculocutaneous albinism (OCA) which affects the skin, hair, and eyes.

### BUDDHAVANAM PROJECT

1. Buddhavanam is a Buddhist heritage theme park developed by the Telangana State Tourism Development Corporation at Nagarjunasagar in Nalgonda district. It is the largest Buddhist tourism centre in Asia spread across 274 acres.

2. **The park is divided into 8 segments Buddhacharitanam (elegant entrance plaza) Jatakavanam (Bodhisattva Park) Dhyavanam (Meditation Park) Stupavanam Mahastupa Buddhist education centres such as monasteries, educational institutions Buddhist art and craft village Traditional Buddhist medical centre.** Main Tourist attractions - Amaravati Stupa - At the Centre of Buddhavanam is a replica of the original Amaravati Stupa in its original dimensions, shape, and design.

3. The Mahastupa is the main attraction of the Buddhist Theme Park. The Stupa is embellished with sculptures depicting major events from the life of Gautama Buddha and his previous birth stories and miniature stupas. Inside of Mahastupa upper-level dome ceiling is decorated with lotus petals and sky panels made in an aluminum acoustic system Under the dome of Maha Stupa, stands a massive brass-coated mandapam with eight statues of Buddha in five postures facing eight directions.

4. 40 famous sculptures from Jataka tales, models of 13 Buddhist stupas from various countries, a 100-foot-tall Buddhist Stupa and 200-foot-wide Pradakshina Padam with thousands of sculptures can be seen. The Government of Sri Lanka has donated a replica of the Avukana Buddha statue and Dhamma bell under Indo-Sri Lankan Cultural Exchange programme.

5. The Sri Lankan Government has also evinced interest in building 'Simhala Vihara' complex on the premises of the Buddhavanam. The theme park was developed to attract local as well as foreign tourists, particularly those coming from South-East Asian countries.

### 35 MILLION YEARS RARE SNAKE FOSSIL

1. Scientists have discovered a 35 million years old Madtsoiidae snake fossil from the molasse deposits of Ladakh. This reveals their prevalence in the subcontinent for much longer time than previously thought.

2. Madtsoiidae is an extinct group of medium-sized to gigantic snakes. They first appeared during the late Cretaceous and mostly distributed in the Gondwanan landmasses. Their Cenozoic record is extremely scarce.

3. From the fossil record we infer that the whole group disappeared in the mid-Paleogene across most Gondwanan continents. However in Australia the species survived with its last known taxon Wonambi till late Pleistocene.

### RURAL TRIBAL TECHNICAL PROGRAM

1. Objective - The Project envisages Skilling of Tribal Youth through Technical Training Program. It is implemented by the

beginnings, by demonstrating that RNA molecules can link short chains of amino acids together. This might have allowed for ever-more complex RNAs, proteins and combinations of the two — a possible path to the chemistry of life that we know today.

Parasitic worms are increasingly being named after scientists' friends and family — and more often honour male rather than female scientists. Researchers analysed nearly 3,000 species discovered in the past 20 years. The analysis uncovers biases in taxonomy and could be used as a jumping-off point for rethinking how scientists name species.

Some bats can imitate the sound of buzzing hornets to scare off owls — the first documented case of a mammal mimicking an insect to deter predators. The buzzing sound of the European hornet and distress call of greater mouse-eared bats differed when the bat's call included only frequencies that owls can hear.

Hydrated minerals discovered by China's robotic rover, Zhurong, on Mars suggest water was present on the planet's surface for longer than previously thought, said Chinese scientists. According to an analysis of data, signs of water were detected in the sampled minerals from just 700 million years ago, the scientists said.

Citing a threat to food security, the Centre has "prohibited" the export of wheat with immediate effect. The decision was announced on Saturday in view of the "sudden spike in the global prices of wheat arising out of many factors", the Ministry of Commerce and Industry said.

Indian children are the youngest to reach mobile maturity, said a McAfee study conducted among parents and children across 10 geographies. According to the study, smartphone use in the country among children in the age group of 10-14 is 83%, which is 7% higher than the international average of 76%. This put children in India at high exposure to online risks. Additionally, some 22% of Indian children experienced cyberbullying at some time, which was notably higher than the global average of 17%, the study revealed.

President Joe Biden promised a long-term commitment to Southeast Asia in the face of China's growing clout as he met regional leaders for a first summit in Washington.

Russian troops are withdrawing from

Ministry of Skill Development & Entrepreneurship. **Training is provided for about 250 beneficiaries in 17 clusters of 17 districts selected from 6 states of India – Madhya Pradesh, Chhattisgarh, Gujarat, Rajasthan, Maharashtra and Odisha and will be organized at Vikas Bharti, Gumla, Jharkhand.**

2. Training will be provided to the beneficiaries in 5 disciplines electrical and solar energy agricultural mechanization e-governance plumbing and masonry two wheeler repair and maintenance.

3. This training will enable the youth to start their own business, thus generating more employment opportunities for other youth as well.

#### **NATIONAL DATA & ANALYTICS PLATFORM**

1. NITI Aayog has launched the National Data & Analytics Platform (NDAP) for open public use. Objective - To improve access and use of government data. It is a simple, interactive, visual, and robust platform that will host various Central and state government datasets.

2. **The platform aggregates and hosts datasets from across India's vast statistical infrastructure Key Features - Making data accessible - Democratize access to public government data. Interoperable** - This enables users to merge datasets from different sectors and sources for easier cross-sectoral analysis.

3. Interactive function – users can create flexible tables and visualizations like maps, bar charts, line charts, pie charts for easy exploratory analysis. User-friendly platform - The platform follows a use-case based approach.

4. This ensures that the datasets available on NDAP are relevant to the needs of real-life data users like government, academia, journalism, civil society, and the private sector.

#### **TWIN CYCLONES**

1. A pair of tropical cyclones, Asani & Karim (one in the northern hemisphere and one in the southern hemisphere) one on each side of the equator, have been formed. These are cyclones originating in the same longitude and now drifting apart. Cyclone Asani has formed in the Bay of Bengal. Cyclone Karim has created a path in the open seas west of Australia.

2. **Twin cyclones-The interplay of the wind and the monsoon system combined with the Earth system produces twin cyclones. They are basically caused by equatorial Rossby waves.** Rossby waves are named for famous meteorologist Carl-Gustaf Rossby who was the first to explain that these waves arose due to the rotation of the Earth. They are huge waves in the ocean with wavelengths of around 4,000–5,000 kilometres.

3. This system has a vortex in the northern hemisphere and another in the southern hemisphere, and each of these is a mirror image of the other. The vortex in the north spins counterclockwise and has a positive spin, while the one in the southern hemisphere spins in the clockwise direction and therefore has a negative spin. Both have a positive value of the vorticity which is a measure of the rotation.

4. **Twin cyclones formed-**When the vorticity is positive in both Northern and Southern hemispheres, as is the case with Rossby waves, the air in the boundary layer, which is moist, is lifted slightly. That is enough to set off a feedback process. When the air is lifted slightly, the water vapour condenses to make clouds. As it condenses, it lets out the latent heat of evaporation.

5. The atmosphere warms, this parcel of air rises, and a positive feedback is set off by this process. The warmer parcel of air can rise further because it is lighter than the surrounding air, and it can form deeper clouds. Meanwhile, moisture comes in from both sides. This leads to the formation of a cyclone if certain conditions are present.

#### **MADDEN-JULIAN OSCILLATION OR MJO**

1. Karim and Asani are "twin" cyclones not only because they formed at the same time in the same general area but also because they were formed primarily from the same "parent" circulation: the Madden-Julian Oscillation or MJO.

2. The MJO is a large cluster of clouds and convection, around 5000-10,000 kilometres in size. It is composed of a Rossby wave and a Kelvin wave, which is a type of wave structure that we see in the ocean.

3. On the eastern side of the MJO is the Kelvin wave, while on the western, trailing edge of the MJO, is the Rossby wave, once again with two vortices on either side of the equator. However, not all tropical cyclones are born from the MJO. Sometimes it is a mere

**around Ukraine's second largest city after bombarding it for weeks, the Ukrainian military said on Saturday, as Kyiv and Moscow's forces engaged in a grinding battle for the country's eastern industrial heartland.**

**Rulers in the United Arab Emirates unanimously appointed Abu Dhabi's Sheikh Mohammed bin Zayed Al Nahyan as the West Asian nation's President, signalling both unity and stability in this key energy rich country that hosts Western militaries.**

Rossby wave with two vortices on either side.