

CURRENT AFFAIRS

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Topic: Climatology

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Rain lashes T.N. coast as Mandous makes landfall

Mamallapuram and nearby areas hit by gusty winds as cyclone began land entry around 10 p.m.; disaster response teams put on high alert; more than 15 flights from Chennai airport cancelled

- ▶ Cyclone Mandous is a slow-moving cyclone that often absorbs a lot of moisture, carries a humongous amount of rainfall and gains strength in the form of wind speeds.
- ▶ The name has been suggested by the United Arab Emirates.
- ▶ India Meteorological Department's (IMD) predicted that the storm system may move in the west and northwestward directions and intensify into a depression by the evening of December 6.

- ▶ Cyclones that form in every ocean basin across the world are named by the regional specialised meteorological centres (RSMCs) and Tropical Cyclone Warning Centres (TCWCs).
- ▶ There are six RSMCs in the world, including the India Meteorological Department (IMD), and five TCWCs.
- ▶ In 2000, a group of nations called WMO/ESCAP (World Meteorological Organisation/United Nations Economic and Social Commission for Asia and the Pacific), which comprised Bangladesh, India, the Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand, decided to start naming cyclones in the region.
- ▶ After each country sent in suggestions, the WMO/ESCAP Panel on Tropical Cyclones (PTC) finalised the list.

Hot test of scramjet engine conducted successfully

The Hindu Bureau
TIRUNELVELI

The Indian Space Research Organisation's (ISRO) quest to fabricate credible next generation air-breathing scramjet engines, in order to launch satellites in a predetermined orbit at a low cost, crossed a key milestone on Friday evening.

The engine's 11 second-long hot test was conduct-

ed successfully at ISRO's Propulsion Research Complex at Mahendragiri in Tirunelveli district of Tamil Nadu in the presence of ISRO chairman S. Somanath, according to sources.

The scramjet, a more advanced version of the ramjet engine, can operate efficiently at hypersonic speeds. It allows supersonic combustion by breathing oxygen from the at-

mosphere during flight. It then allows the oxygen to mix with hydrogen already stored in the vehicle to trigger combustion, and produce the desired thrust to lift the satellite to its designated orbit. If the engine in the launch vehicle can breathe oxygen from the atmosphere, that will reduce nearly 70% of the propellant that has to be carried in the vehicle.

Topic: WLP

5

Three Himalayan medicinal plants enter IUCN Red List

Shiv Sahay Singh
KOLKATA

Three medicinal plant species found in the Himalayas have made it to IUCN Red List of Threatened Species following a recent assessment. *Meizotropis pellita* has been assessed as 'critically endangered', *Fritillaria cirrhosa* as 'vulnerable', and *Dactylorhiza hatagirea* as 'endangered'.

Meizotropis pellita, commonly known as Patwa, is a perennial shrub with restricted distribution that is endemic to Uttarakhand. "The species is listed as 'critically endangered' based on its limited area of occupancy (less than 10 sq. km)," the study stated. The species is threatened by deforestation, habitat fragmentation and forest fires.

"The essential oil extracted from the leaves possesses strong antioxidants and can be a promising natural substitute for synthetic antioxidants in pharmaceutical industries," it said.

Fritillaria cirrhosa (Himalayan fritillary) is a perennial bulbous herb. "It is reasonable to conclude a

decline of at least 30% of its population over the assessment period (22 to 26 years). Considering the rate of decline, long generation length, poor germination potential, high trade value, extensive harvesting pressure and illegal trade, the species is listed as 'vulnerable,'" it said.

In China, the species is used for the treatment of bronchial disorders and pneumonia. The plant is also a strong cough suppressant, the IUCN assessment said.

The third listed species, *Dactylorhiza hatagirea* (Salampanja), is threatened by habitat loss, livestock grazing, deforestation, and climate change. It is extensively used in Ayurveda, Siddha, Unani and other alternative systems of medicine to cure dysentery, gastritis, chronic fever, cough and stomach aches.

"The assessment of these plants will set our conservation priorities and help protect the species," said Harsh Kumar Chauhan, member, IUCN Species Survival Commission, Medicinal Plant Specialist Group.

Those fascinating hornbills



SPEAKING OF SCIENCE

D. Balasubramanian

The logo for India's upcoming G20 presidency was officially unveiled recently at the Hornbill festival in Nagaland. This popular festival showcases the art, culture and cuisine of Nagaland. It also brings attention to a family of some of the largest, most magnificent birds in our country.

The Great Hornbill is found in the Himalayan foothills, the Northeast and the Western Ghats. It is the state bird of Arunachal Pradesh and Kerala. With a wingspan of five feet, it presents an awesome (and noisy) spectacle while landing on a perch. The wreathed hornbill, the brown hornbill and the rufous-necked hornbill are slightly smaller, and only found in Northeast India. A great place to spot the oriental pied horn-

bill is the Rajaji National Park, Uttarakhand. The Malabar grey hornbill's loud 'laugh' echoes in the Western Ghats. The smallest of the group, the Indian grey hornbill is found all over (except the Thar Desert), and is often spotted in urban settings such as Theosophical Society gardens in Chennai.

Their large, heavy beaks pose some limitations – for balance, the first two vertebrae are fused. Hornbills can move their heads as in 'yes', but have difficulty in saying 'no'. Large beaks are also seen in toucans from Central and South America – an example of convergent evolution – as both birds have the same feeding ecology.

Tall trees preferred

Hornbills prefer tall trees for their nests (breast height being 1.5 metres or more). There is a mutualism between these birds and the trees where they nest. As large fruit-eating birds, hornbills play a vital role in dispersing the seeds of



Preferred habitat: Natural-growth rainforest are most suited for hornbill populations. GETTY IMAGES

about 80 rainforest trees. Some trees, such as the cup-calyx white cedar suffer a 90% decline in seed dispersal beyond the parent tree when hornbill populations decline, negatively impacting the biodiversity of forests.

The towering Tualang tree of Southeast Asia is so entwined in folklore that it is considered a taboo to fell this tree. It is the preferred habitat of the helmeted hornbill. The fruiting season coincides with the birds' reproductive cycle. Traditional ecological know-

ledge stresses the value of hornbills in dispersing the seeds, which are expectorated from the throats of the birds. "When the seeds sprout, the hornbills hatch", a saying goes.

Prone to hunting

Unfortunately, tall trees are the first targets of illegal logging, and so there has been a slow decline in hornbill numbers, as reflected in bird counts. Slow, because these birds are long lived (up to 40 years). Their large size makes

them prone to being hunted. The helmeted hornbill of Sumatra and Borneo is critically endangered because its helmet-like casque (a horny outgrowth over the skull), called red ivory, is highly prized. Luckily, the casque of the Great Hornbill is not suitable for carving.

Hornbill populations appear to be faring better in South India. The Nature Conservation Foundation, Mysuru, has collected data to show that forest plantations are not as suited for hornbill populations as natural-growth rainforest, although nests are sometimes built in non-native silver oaks.

The adaptable nature of hornbills is also seen in their feeding on the fruits of the African Umbrella tree, which has been introduced as a shade tree in our coffee plantations.

(The article was written in collaboration with Sushil Chandani who works in molecular modelling. sushilchandani@gmail.com)

Topic: State Executive

7

CMs must be consulted for appointing, removing Governors, says DMK MP

The Constitutional Amendment Bill brought by P. Wilson seeks to clear certain grey areas in the Constitution regarding the powers of Governors, including the provisions of gubernatorial pleasure

The Hindu Bureau
NEW DELHI

Senior DMK leader, lawyer and member of the Rajya Sabha P. Wilson has brought a Constitutional Amendment Bill in Parliament as a private Bill seeking to set guidelines for the appointment and removal of Governors.

Stating that the Bill is meant to clear certain grey areas in the Constitution regarding the powers of Governors, including the provisions of gubernatorial pleasure, Mr. Wilson said the Centre should consult the respective Chief Ministers of a State before appointing a Governor. Recently, Opposition-ruled States, such as West Bengal, Kerala, Tamil Nadu and Rajasthan, have raised concerns over the powers of the Governors.

The Bill says that if a person has even been a Governor of a State, he or she shall be disqualified from becoming a member of either House of Parliament. It says that the Governor of a State shall be appointed



There is no reason why the elected de facto head of the State should not be consulted over the issue, says Wilson

ed by the President by warrant under his hand and seal, after obtaining the concurrence of the Chief Minister of the State. It also adds that a Governor may be removed from office before the expiry of his term by the President on the recommendation of the Chief Minister.

10-year cool-off period

The Bill suggests amendments to Article 157 so that no person shall be eligible for appointment as Governor unless they are an eminent personality in some walk of life. The person shall be disqualified if they have attained the age of 75

years or have been in the employment of the Union or State governments or any Union or State-owned undertaking or body or corporation or agency or any local authority in the preceding 10 years.

It also blocks a person who has served as a Minister in the Union, any State or Union Territory government, or a Member of Parliament or Assemblies, or judges in higher courts, or members of local governments in the preceding 10 years from becoming a Governor. It is suggested that any office-bearer of a registered or recognised political party in the preceding 10 years, anyone

with charges framed against them by a court for an offence involving moral turpitude, or anyone who had been convicted of any criminal offence with a punishment of one year, or anyone who is of unsound mind as declared by a competent court also be barred from becoming Governors under this Bill.

“There are three broad issues with the way Governors are appointed and function under our Constitution: (i) they are appointed by and can be removed by only the President, by extension, the party in power at the Centre; (ii) the State to which they are appointed has no say whatsoever in appointment or removal; (iii) there are no sufficient qualifications, disqualifications and safeguards prescribed in the Constitution for a person to be appointed to the highest office in the State,” Mr. Wilson said in the Statement of Objects and Reasons of the Bill. He said there was no reason why the elected de facto head of the State should not be consulted over the issue.



Question Corner

Toughest material

Which is the toughest material ever developed?

Scientists have measured the highest toughness ever recorded of any material while investigating a **metallic alloy made of chromium, cobalt, and nickel**. Not only is the metal exceptionally strong and **ductile – which, in materials science, means highly malleable and impressively strong – its strength and ductility improves as it gets colder**. This runs counter to most other materials in existence.

CrCoNi is a subset of a class of metals called high entropy alloys (HEAs). All the alloys in use today contain a high proportion

of one element with lower amounts of additional elements added, but **HEAs are made of an equal mix of each constituent element**. These balanced atomic recipes bestow some of these materials with an extraordinarily high combination of strength and ductility when stressed, which together make up what is termed “toughness”. The toughness of this material near liquid helium temperatures (20 kelvin, -424 Fahrenheit) is as high as 500 megapascals square root metres.

Readers may send their questions / answers to questioncorner@thehindu.co.in

THANK YOU

