

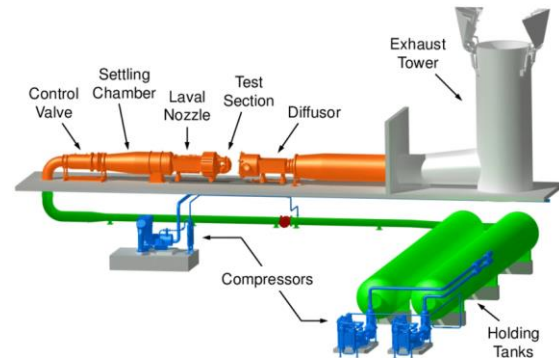
Three medicinal plant

- 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 essential oil extracted from the leaves possesses strong antioxidants and can be a promising natural substitute for synthetic antioxidants in pharmaceutical industries.
- *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,'"
- In China, the species is used for the treatment of bronchial disorders and pneumonia.
- The plant is also a strong cough suppressant, the IUCN
- 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 HINDU

Trisonic wind tunnel



- The Trisonic Wind Tunnel is a system to aid the aerodynamic design of rockets and re-entry spacecraft by characterizing a scaled model by evaluating forces, moments, load distribution, unsteady pressures, acoustic levels, etc.
- The tunnel has an overall length of about 160m and a maximum cross-section of 5.4m.
- The tunnel can be used for testing various space vehicles in three flight regimes - below the speed of sound, at the speed of sound, and above the speed of sound: hence the name trisonic wind tunnel.
- The tunnel can simulate flight conditions from 0.2 times the speed of sound (68 m/s) to 4 times the speed of sound (1360 m/s).
- The new trisonic wind tunnel at the Vikram Sarabhai Space Centre (VSSC) was inaugurated

- For the country as a whole, it is a big step towards self-reliance in the aerospace sector,
- Wind tunnels are devices used to study the effects of air flows on a solid object.
- In a 'blow down test', stored gases are released and blown through the tunnel's test section, simulating flight conditions.

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Scramjet engine- Hot test vs cold test

- The main difference is that a rocket carries its own supply of oxygen (Oxidizer Tank) for combustion while a jet engine utilizes oxygen from the atmosphere for combustion.
- This makes rocket engines less energy efficient when compared to Jet engines.

Jet Engine

- A jet engine is a machine that converts energy-rich, liquid fuel into a powerful pushing force called thrust.
- The thrust from one or more engines pushes a plane forward, forcing air past its scientifically shaped wings to create an upward force called lift that powers it into the sky.
- A Jet Engine has 3 main processes:

COMPRESSION

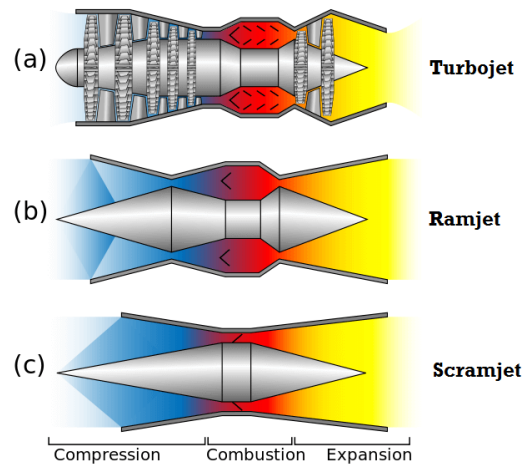
- It increases the pressure of the air trapped inside the chamber.

COMBUSTION

- It increases the temperature of the air-fuel mixture by releasing heat energy from the fuel.

EXHAUST

- It increases the velocity of the exhaust gases, thereby powering the vehicle.



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TURBOJET

- Turbo jet engine is an air-breathing jet engine. This is one of the most common types of jet engines. It is still widely used in airplanes.

TURBOFAN ENGINES

- Turbofans differ from turbojets in the way they have an additional component a fan. The fan sucks in the air and then further gets compressed and combustion takes place in the burner.

RAMJET

- High-speed forward motion is used to compress the air (no compressor).
- Fuel is injected into the combustion chamber where it mixes with the hot compressed air and ignites.
- The average speed of a Ramjet is 3-6 Mach. But the ramjet efficiency starts to drop when the vehicle reaches hypersonic speeds.

SCRAMJET

- Here also, the high-speed forward motion is used to compress the air (no compressor), but it is an improvement over the ramjet engine as it efficiently operates at hypersonic speeds and allows supersonic combustion.
- Speed is greater than 6 Mach (Six times the speed of Sound).

Hot test vs cold test

- A hot test system is a 100% production test used to check all the engine operating parameters as they would function in real-time in an actual vehicle whereas a cold test consists of a leak test, which includes the testing of all cavities and systems that must not leak, such as oil, water, fuel, and air.

Singapore declaration –ILO

- The 17th Asia and the Pacific Regional Meeting of the International Labour Organisation (APRM of ILO) set ten-point priorities of national action for the member countries to deal with the issue of dwindling wages of workers, inflation, and unemployment.
- The “Singapore Declaration”, which was adopted agreed that social dialogue was essential to address labor market challenges and find solutions in crisis situations.
- It urged the governments to ensure labor protection for all through the promotion of freedom of association and the effective recognition of the right to collective bargaining throughout the regions, including for workers in vulnerable situations and workers in the informal economy, as enabling rights for decent work.

- It called for closing gender gaps in the world of work through measures that increase women’s labor force participation, promote equal pay for work of equal value, balance work, and responsibilities, and promote women’s leadership.
- The declaration also urged the governments to strengthen governance frameworks and respect freedom of association to protect the rights of migrant workers.

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G20 as an alternative to UNSC

- The alphabetical rotation of the G-20 presidency has brought India to the right place at the right time, especially when the world is looking for an alternative to the United Nations Security Council (UNSC), which has been paralyzed by the veto.
- Most recently, during the COVID-19 pandemic and the Russian invasion of Ukraine, the UNSC’s credibility hit rock bottom.
- Any reform of the UNSC, particularly the expansion of its permanent membership, will be strongly resisted by the permanent members and a large majority of the General Assembly because it does not benefit anyone except those who aspire to be permanent members.
- A gradual transformation of the G-20 from an economic body to a political body can be initiated on the basis of the Bali Declaration, which constitutes the consensus in the group on the Russia-Ukraine war.
- If the G-20 emerges as a peacemaker in Europe, it will attain legitimacy as a group to promote international peace and

security; it can gradually become an alternative to the UNSC.

- The most important difference will be that no one can prevent its meetings by the use of the veto.
- The legitimization of the G-20 as a global arbiter in international affairs will create a multilateral instrument where all members are equal.
- Though it may take a very long time for it to replace the UNSC, a beginning will have been made in making the UN an effective instrument in stopping wars and building cooperation.

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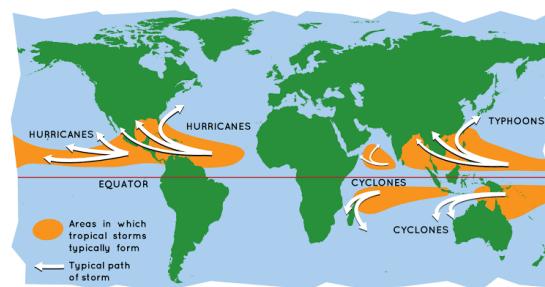
Cyclone mandous

- The cyclonic storm will cross north Tamil Nadu, Puducherry, and adjoining south Andhra Pradesh coasts between Puducherry and Sriharikota.

About the Bay of Bengal Region

- This region of the world has two distinct tropical cyclone seasons - April to June and October to November.
- The conditions will become favorable for the advance of the southwest monsoon over the south Bay of Bengal, Andaman Sea, and Andaman and Nicobar Islands around May 16.
- During the monsoon season, upper-level winds are not favorable for tropical cyclone development.
 - BoB water is warmer than Arabian Sea water,
 - Landlocked- less heat circulation (b) less powerful winds- again lesser heat circulation
 - Fresh water from rivers falls into BoB, (as suggested in and above) making the water a light thin layer, more prone to evaporation

- Easterly jet - causing the windfall in the eastern coastal States of India. And in the Arabian Sea, these winds will steer the windfall toward eastern Africa, not toward the western coast of India.
- On average, five to six significant cyclonic storms emerge in the Bay of Bengal region every year.
- The months of April and May just before the start of the monsoon, and then October to December immediately after the end of the monsoon, are the prime seasons for tropical cyclones.
- A big difference between the strengths of cyclones in April-May and October-December is that the former originate in situ in the Bay of Bengal itself, barely a few hundred kilometers from the landmass.
- On the other hand, cyclones in October-December are usually remnants of cyclonic systems that emerge in the Pacific Ocean but manage to come to the Bay of Bengal, considerably weakened after crossing the Southeast Asian landmass near the South China Sea.



- Cyclones are named as per guidelines decided by the World Meteorological Organisation (WMO). The WMO says that countries in the affected region should name the cyclones.
- In the north Indian Ocean region, eight countries decide the names of cyclonic storms. These countries include India, Bangladesh, Maldives, Myanmar, Oman, Pakistan, Sri Lanka, and Thailand.

- 'Mandous' was a name submitted by WMO member United Arab Emirates and is pronounced as 'Man-Dous.

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