

## **Prelim Bits 26-02-2023 & 27-02-2023 | UPSC Daily Current Affairs**

### **Bisphenol A**

*A study conducted in Thiruvananthapuram, Kerala, suggests Bisphenol A can indirectly aid in the spread of vector-borne diseases in humans and animals.*

- The bisphenol A, or BPA is a human-made chemical.
- The chemical is widely used to soften plastics, paints and other products.
- BPA has adverse effect on human health.
- When ingested, it disrupts the endocrine system by interfering with the hormones and affects the brain and prostate gland of foetuses, infants and children.
- The chemical can cause high blood pressure, diabetes and cardiovascular disease in adults.
- BPA is known to impair reproduction and development in aquatic organisms.
- For example, BPA exposure delays larval development and pupation time in common fruit fly (*Drosophila melanogaster*).
- The study establishes that BPA can significantly shorten the breeding time of southern house mosquitoes and thereby aid in its quick multiplication.

*The southern house mosquitoes (*Culex quinquefasciatus*) is a major carrier of the West Nile virus, Rift Valley fever virus and avian pox in tropical and subtropical countries.*

### **References**

1. [Down To Earth - Accelerated Breeding](#)

### **Organ-on-chip**

*The US government agreed to the computer-based and experimental alternatives to animals to test new drugs through the U.S. Food and Drug Administration Modernization Act.*

- Organ-on-chips are microfluidic cultural devices that recapitulate the complex structures and functions of living human organs.
- These micro devices are composed of a clear flexible polymer that contains hollow microfluidic channels lined with living human organ cells and human blood vessel cells.
- These living, 3-dimensional cross-sections of human organs are alternative models for drug development that mimic human diseases.
- These properties provide a window into their inner workings and the effects that drugs

can have on them, without involving humans or animals.

*Donald E. Ingber, a professor of bioengineering and director of the Wyss Institute at Harvard University, and his colleagues developed the first human organ-on-chip model in 2010. It was a 'lung on a chip' that mimicked biochemical aspects of the lung and its breathing motions.*

- Several different chips were created including of the bone marrow, epithelial barrier, lung, gut, kidney, and vagina.
- Apart from organs, researchers are also trying to mimic different disease states using chips.

### **Advantages**

- Use of human cells make them more human-relevant than animal models.
- Free from ethical issues associated with the use of animal models.
- Organ chips created from the cells of the patient can be used to develop personalised therapies for individual patients.
- Better at predicting the treatment outcomes than conventional cell culture systems as they model different aspects of the human body such as the flow of fluids like blood and lymph.

*In conventional cell culture system researchers grow cells in dishes in the lab.*

### **References**

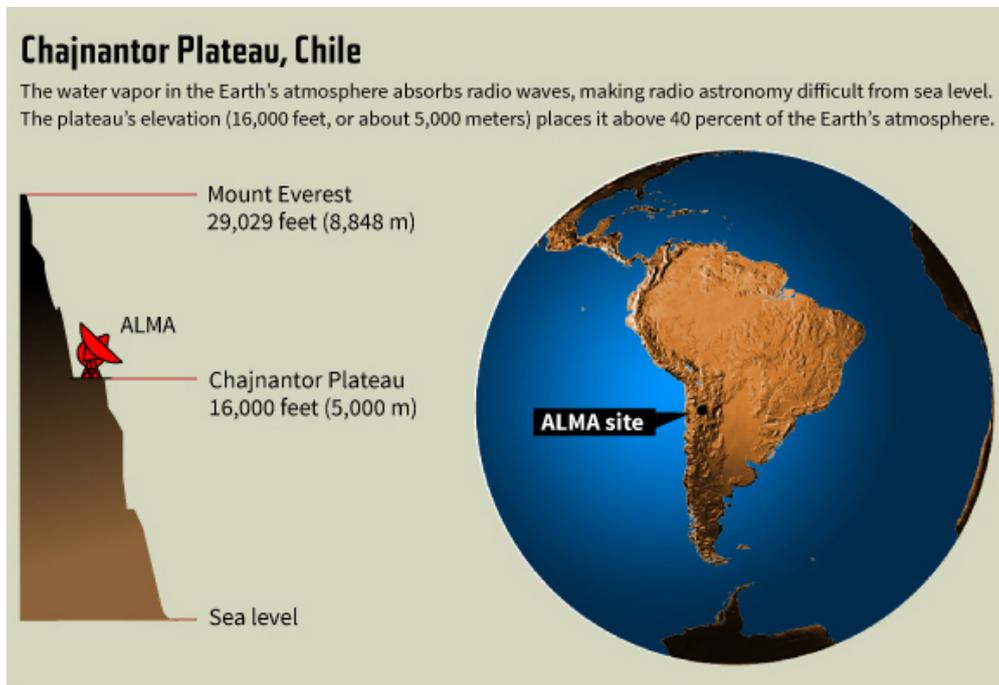
1. [The Hindu - 'Organ on a chip': To test new drugs](#)
2. [Wyss Institute: Harvard - Human Organs-on-Chips](#)

### **ALMA Telescope**

*ALMA telescope is set to get software and hardware upgrades which would take around 5 years to finish.*

- The Atacama Large Millimetre/submillimetre Array (ALMA) is a radio telescope located in the [Atacama Desert](#) of northern Chile.
- The telescope consists of 66 high-precision antennas, spread over a distance of up to 16 km at an altitude of 5,050 metres above sea level.
- **Function** - ALMA studies celestial objects at millimetre and submillimetre wavelengths penetrating through dust clouds.
- It also has extraordinary sensitivity, which allows it to detect even extremely faint radio signals.
- **Operation** - ALMA is fully functional since 2013.
- ALMA is operated under a partnership among the United States, 16 countries in Europe, Canada, Japan, South Korea, Taiwan, and Chile.
- The radio telescope was designed, planned and constructed by the

1. US's National Radio Astronomy Observatory (NRAO),
  2. The National Astronomical Observatory of Japan (NAOJ) and
  3. The European Southern Observatory (ESO).
- **Notable Discovery** - The starburst galaxies and the dust formation inside supernova 1987A.



- **Location Significance** - The millimetre and submillimetre waves observed by ALMA are very susceptible to atmospheric water vapour absorption on Earth.
- The Atacama Desert is the driest place in the world, most of the nights here are clear of clouds and free of light-distorting moisture.
- Most of the nights here are clear of clouds and free of light-distorting moisture making it a perfect location for examining the universe.

## References

1. [IE - What is ALMA telescope that will soon get a 'new brain'?](#)
2. [European Southern Observatory - ALMA](#)

## Clean Plant Centres

*With the demand for foreign planting materials of fruits like apple, avocado and blueberry the Centre plans to set up 10 'Clean Plant Centres'.*

- The Centre plans to set up 10 'Clean Plant Centres' to boost domestic production of the selected crops.
- These centers will be set up under the '[Atmanirbhar Clean Plant Program](#)', which was announced in the Union Budget 2023-24.
- The concept of Clean Plant Centres is unique and does not exist in India.
- The 10 centres will be established for fruit crops like apple, walnut, almond, grapes, mango, pomegranate, among others in the next 7 years.
- **Budget and Period** - The overall budget of Rs 2,200 crore till 2030.

- **Fund** - Fully funded by the Centre.
- **Services provided by the centres**
  1. Disease diagnostic
  2. Therapeutics
  3. Multiplying of plants
  4. Generation of mother plants
- **Implementation** - In a PPP mode in partnership with research organisations, agriculture universities and private sector partners.
- The **National Horticulture Board** (NHB) will anchor the clean plant programme.
- **Need** - It is very difficult to get disease-free and genuine planting materials for horticultural crops in India.
- The process of importing plants is very cumbersome, as the imported plants must be kept in quarantine for 2 years.
- After the establishment of the Clean Plant Centres, this period will be reduced to 6 months.
- **Fruit plants import in India**
  - The demand for imported planting material of various fruit plants has risen sharply over the years.
  - The permissions given by the EXIM committee for import of planting material of fruits during 2018-2020 show that

Year	Apple Plants	Avocado Plants	Blueberry Plants
2018	21.44 lakh	1,000	1.55 lakh
2020	49.57 lakh	26,500	4.35 lakh

- Besides, fruit plants of banana, date palm, kiwi, pomegranate, raspberry, strawberry, walnut, wine grape, grape, guava, olive, peach, pear and plum plants are also being imported in the country.

## References

1. [IE - Govt plans 10 'Clean Plant Centres'](#)

## Arts in Mann Ki Baat

*In Mann Ki Baat Prime Minister spoke about Ustad Bismillah Khan Yuva Puraskar awardees and their art forms.*

## Sursingar

- Sursingar is a stringed musical instrument that is similar to the sarod, but which is older and produces deeper notes.
- The instrument is made of wood and has a gourd attached to a hollow wooden handle with a metal fingerboard.
- The strings of the instrument, usually 4 in number and made of brass or bronze, are plucked with a metal pick.

- The Sursingar can be played holding it vertically in front of the musician and supported by his left shoulder like the Veena.
- It can be played holding it parallel to the ground like the Sarod, or like the Sitar, which is held at an angle of 50-60 degrees to the ground.
- The Sursingar usually accompanies Dhrupad, the genre of Hindustani vocal music.

*Kolkata-based multi-instrumentalist Joydeep Mukherjee is credited with reviving the Sursingar, along with another “lost” stringed instrument, the Radhika Mohanaveena, named after its creator, Radhika Mohana Maitra.*



**Sursingar**

## **Mandolin**

- Mandolin is a stringed instrument, usually with 8 strings that are plucked with a pick, similar to a lute.
- The Mandolin is a moderately sized instrument, smaller than the Veena, Sitar, or guitar, and was developed in Europe in the 18<sup>th</sup> century as an evolution of the older Mandora (Mandola).
- The greatest exponent of the Mandolin in Indian classical music was the late Uppalapu Srinivas, often known as ‘Mandolin’ Srinivas who, however, used the electric instrument rather than the acoustic one.
- Uppalapu Nagamani, a mandolin player is the winner of the Ustad Bismillah Khan Yuva Puraskar 2021 for Carnatic Instrumental.



## Mandolin

### Karakattam

- Karakattam is an ancient folk dance of Tamil Nadu.
- The Karakattam performers wear colourful saris and dance with a pot (karakam) on their head.
- The dance is performed to invoke Mariamman, the goddess of rain.
- V Durga Devi of Salem is a well-known Karakattam dancer and has won the award for Karakattam.

### Perini Odissi

- Perini Natyam is a dance dedicated to Lord Shiva that was quite popular during the Kakatiya dynasty.
- Raj Kumar Nayak had organised the Perini Odissi, which lasted for 101 days in 31 districts of Telangana.

### Ustad Bismillah Khan Yuva Puraskar

- The Ustad Bismillah Khan Yuva Puraskar was introduced in the year 2006.
- It is given to artists up to the age of 40 years by [Sangeet Natak Akademi](#), the apex body of the performing arts in the country.
- It identifies and encourages outstanding young talents in performing arts and give them national recognition early in their life.
- The Ustad Bismillah Khan Yuva Puraskar carries a purse money of Rs 25,000, an Angavastram and a plaque.

### References

1. [PIB - 98th Episode of 'Mann Ki Baat'](#)
2. [IE - Arts and artists Prime Minister mentioned in Mann Ki Baat](#)