16 May 2021: UPSC Exam Comprehensive News Analysis

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A. GS 1 Related

Nothing here for today!!!

B. GS 2 Related

Nothing here for today!!!

C. GS 3 Related

Category: ENVIRONMENT AND ECOLOGY

1. New skink species from Western Ghats

Context:

- A new species of an **Asian gracile skink** has been discovered recently at **Anaikatti hills, Coimbatore.**

Details:

- The new species has been named *Subdoluseps nilgiriensis.*
    - Based on genetic studies, the new species is closely related to *Subdoluseps pruthi* found in parts of the Eastern Ghats.
- This species is **only the third skink species discovered from mainland India** in the last millennium.
- The reptile has a slender body of just about 7 cm and is sandy brown in colour. The **inconspicuous limbs of skinks make them resemble snakes**.
- Most skinks are diurnal and are **non-venomous.**
- Skinks are known to feed on insects such as termites, crickets and small spiders.

Threats:

- Subdoluseps nilgiriensis is currently classified as a **vulnerable species.**
- The main threats faced by the shinks include the following:
    - Seasonal forest fires
    - Brick kiln industries and their associated activities in the area
    - Rapid urbanisation which has led to high level of housing and road construction in the area, has also threatened the shinks's relatively small geographical range.
    - Given their resemblance with snakes often leads to confusion resulting in humans killing them.

Significance of the new discovery:

- The discovery of the new species in the dry deciduous area, shows that even the **dry zones of India are home to unrealised skink diversity.** This challenges the notion that high biodiversity can be found only in the wet and evergreen forests and calls attention for the conservation of such areas.
- The new discovery also questions the current conservation policy wherein studies are carried out only in the protected areas and focus only on megafauna such as tigers and elephants. There is **the need to study the little-known animal groups which are fundamental and indispensable components of the world's biodiversity**.
- This discovery also highlights the neglected reptile diversity of India.

Category: SCIENCE AND TECHNOLOGY

1. New approach combines biologics, antibody-drug conjugates

Context:

- **University of Massachusetts, Amherst, researchers have engineered a nanoparticle**that has the potential to revolutionize the treatment of diseases in humans.

This topic was previously covered in the following article:

Efficient drug delivery from UPSC Comprehensive News Analysis of 09th May 2021

Details:

- The new method **combines two different approaches to drug delivery- biologics and antibody–drug conjugates** to produce Protein–Antibody Conjugates or PACs.

Biologics:

- A biologic drug (biologics) is a product that is **produced from living organisms or contain components of living organisms**. Biologic drugs include a wide variety of products derived from human, animal, or microorganisms by using biotechnology.
- Biologics can be composed of sugars, proteins, or nucleic acids or complex combinations of these substances.
- Biologics are used to target a defective protein in the system by delivering proteins to it.
    - Example: If a person is short of insulin, which is a protein, they are given a shot of this to balance the system. This is referred to as **insulin treatment.**
- Despite the usefulness of biologics, one drawback of this method is the inability of this method in taking protein specifically inside the affected cells. This mode of protein delivery to cells can be a breakthrough in medical field.

Antibody conjugates:

- This approach **uses antibodies for drug delivery**.
    - An antibody, also known as an immunoglobulin, is a protein used by the immune system to identify and neutralize foreign objects inside the body. The antibody recognizes a unique molecule of the pathogen, called an antigen.
- Antibodies can be developed to recognise cancer cells. Drug molecules can be attached to the antibody, forming drug–antibody conjugates

- **Protein–antibody conjugates or PACs**, have a protein attached to the antibody. These PACs can be used for targeted drug delivery.

Significance:

- The new method offers a **potentially revolutionary approach to treating diseases.**

- This could have an **impact on incurable diseases, so-called undruggable ones like pancreatic cancer.**
    - The issue with designing drugs for diseases such as pancreatic cancer is the fact that it is difficult to design drugs that can bind with the target protein, especially when the associated proteins have an open structure.
        - If the protein has a particular shape – bent concave like a cup, for example, the drug is designed to fit into the bent portion, like a key into a lock, so that the protein's function is inhibited, and it cannot function.
    - Using a protein molecule, which is typically large, can solve the problem of designing drugs for pancreatic cancer.

2. AI begins zeolite cargo service

Context:

- National carrier Air India (AI) has begun the first of its "zeolite cargo flights". Through this India has begun the process of importing zeolite from across the world for use in medical oxygen plants.

Background:

- Under the **Prime Minister's Citizen Assistance and Relief in Emergency Situations (PM CARES) Fund, DRDO is to set up medical oxygen plants.**
- The medical oxygen plant technology uses the **pressure swing adsorption process** and **molecular sieve zeolite** in oxygen generation.
    - The oxygen concentrator compresses air and passes it over zeolite, causing the **zeolite to adsorb the nitrogen from the air.** It then collects the remaining gas, which is mostly oxygen, and the nitrogen desorbs from the zeolite under the reduced pressure to be vented.

For more information on the pressure swing adsorption process refer to:

PIB Summary and Analysis of 29th April 2021

Significance:

- The proposed medical oxygen plant technology would help in supplementing oxygen supplies for COVID-19 patients.
- This technology would be especially useful in urban, remote and rural settings with the **on-site generation of medical oxygen in a cost-effective manner.**

Category: DISASTER MANAGEMENT

1. Two killed in Kerala as cyclone intensifies

Context:

- **Cyclonic storm Tauktae** in the Arabian Sea.

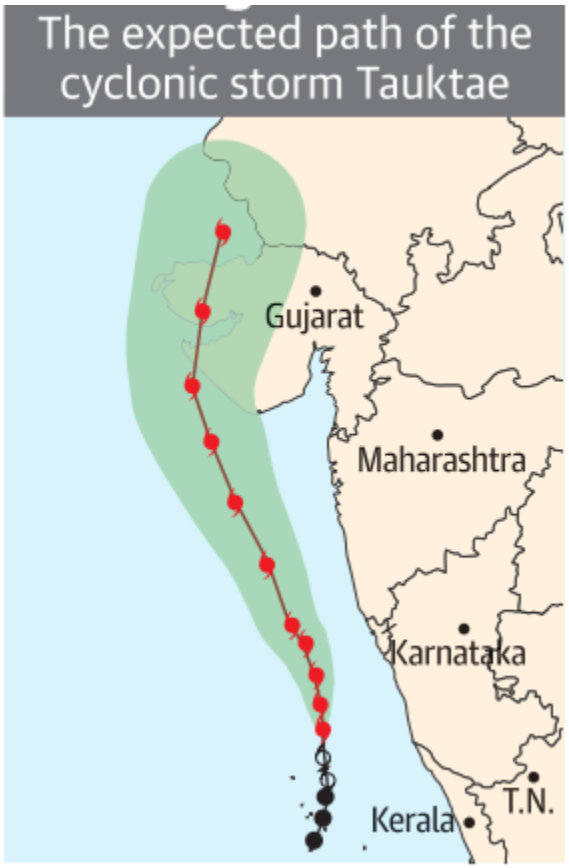
Details:

Crisis in Kerala:

- **Torrential rainfall and strong winds** lashed several Kerala districts under the influence of Cyclone Tauktae, causing extensive damage to crops and buildings, and forcing district administrations to relocate more people to relief camps.
- The power sector has also reported heavy damage.
- **Severe sea erosion** persists in all the nine coastal districts, triggering a crisis.
    - In the face of severe sea erosion Kerala CM has stated that seawalls cannot be viewed as the ultimate solution to sea erosion and stressed the importance of “Punargeham”, the government project to resettle people residing within 50 m of the tide zone.
- The **storm surges have inundated coastal areas**.
- **Low-lying areas of the state have been inundated by runoff water** from the high ranges.
    - The Irrigation Department has opened the Thottappally pozhi mouth to drain floodwaters from Kuttanad into the sea.

Movement of the cyclone:

- The storm has been **moving northwards** and is also expected to cross the Gujarat coast.



- The cyclonic storm Tauktae is **expected to intensify into a very severe cyclonic storm**, with wind speeds expected to touch 160 kmph.

- Rain is expected to intensify in coastal Karnataka, Maharashtra and Gujarat over the next 48 hours, raising concerns about damage to plantations and existing infrastructure.

Linkage between climate change and cyclones:

- **Storms are common in the Bay of Bengal and the Arabian Sea in May, ahead of the monsoon onset** though climatologists have said there is **an increase in the number** of such storms in the Arabian Sea in recent years.
    - Tauktae is the fourth cyclone in as many years over the Arabian Sea in the pre-monsoon months.
- This is being attributed to a **rise in average sea surface temperatures driven by global warming.**

D. GS 4 Related

Nothing here for today!!!

E. Editorials

Category: HEALTH

1. Mucormycosis in COVID-19 patients

Context:

- Hospitals across India have started to report an **increasing number of cases of mucormycosis.**

Mucormycosis:

- Mucormycosis is an aggressive and invasive **fungal infection** caused by a group of molds called mucormycetes.
- It is also known by the name **'black fungus'.**

Causative factors:

- According to a study, **Diabetes mellitus is the most common underlying cause**, followed by haematological malignancies and solid-organ transplants for mucormycosis.
    - Diabetes mellitus was reported in 54% to 76% of cases, according to a report.

Effect:

- It can affect various organs but is currently manifesting as an **invasive rhino-orbito-cerebral disease**, affecting the ear, nose, throat, and mouth and at times the brain, leading to blindness, stroke or death. It can cause a lot of damage internally and can be fatal if not detected early.
    - The Centers for Disease Control and Prevention, U.S., calls it a serious but rare disease.

Treatment:

- The main line of treatment is an **anti-fungal drug called amphotericin B**, which is given over an extended period of time under the strict observation of a physician. Surgery to remove the fungus growth might also be warranted.

Reasons for sudden spike in cases:

- Mucormycosis has been affecting patients who have recently recovered from COVID-19. The sudden increase in the mucormycosis cases can be attributable to the following reasons:
    - The **indiscriminate use of a high dose of steroids** in COVID-19 patients, sometimes even in minimally symptomatic patients is a major reason. This leads to spikes in the sugar level among diabetics, which, in turn, renders them vulnerable.
    - The **use of monoclonal agents like Tocilizumab** may be a factor, too. Monoclonal antibodies are man-made proteins that act like human antibodies in the immune system. The overuse of such antibodies reduces the inherent immunity of the body in the long run making it vulnerable to future infections.
    - Though the disease is not contagious, the **use of nasal prongs and other devices for oxygen delivery** and possible breach of sterile conditions can possibly lead to cross-infection and **hospital-acquired infection.**

Recommendations:

- Following appropriate **treatment protocols as recommended by the World Health Organization for COVID-19**, including **rational use of steroids and monoclonal antibodies** only when they can help a patient, is important.
- In case of usage of steroids, **constant monitoring of sugar levels** and resorting to insulin use to control these levels if required, is essential.
- Recognising the symptoms and **seeking treatment early** would be the key intervention. Like most illnesses, if detected early, mucormycosis can be cured.

Category: POLITY AND GOVERNANCE

1. The hurdles in accessing foreign COVID-19 aid

Background:

- Nasscom has urged the Prime Minister to temporarily relax **the Foreign Contribution (Regulation) Act (FCRA) norms.**
    - Given that the amended provisions of the FCRA 2020 are proving to be a deterrent for inflow of foreign aid, Nasscom has requested the government to grant a temporary waiver to the FCRA Act and the 2020 amendments.
- Petitions concerning the restrictive FCRA provisions are being heard in the High Courts.
- A Bench of the Delhi High Court has asked the Finance Ministry to consider dropping GST levies on all oxygen concentrator imports as they can be linked to the **Right to Life under Article 21 of the Constitution** amid the COVID-19 pandemic.
- State governments are expected to raise the issue of GST levies on COVID-19 supplies, including vaccines, at the upcoming GST Council meeting.

Steps taken to facilitate imports of relief supplies:

- As India ran out of critical supplies for managing the severe second wave of the COVID-19 pandemic, the Centre unveiled gradual measures over the past month to ease the imports of some items.
    - **Import duties and taxes** were cut in some cases.
    - The government allowed individuals to import oxygen concentrators for personal use through courier from e-commerce portals or global vendors. The customs department was directed to clear them as 'gifts' till July 31.
    - Special protocols have been put in place by the Shipping Ministry to ensure that vessels with COVID-19 relief material are **unloaded on a priority basis and paperwork and cargo clearances are processed expeditiously** by Customs and the Directorate General of Foreign Trade.

Concerns:

- Despite several facilitative measures introduced by the government to aid inflow of critical materials, serious lacunae's continue to exist.

GST on critical imports:

- Not all critical COVID-19 imports have been made temporarily tax-free.
- Though customs duties have been slashed, **imports such as oxygen concentrators and related equipment, vaccines still attract the Goods and Services Tax (GST),** specifically termed the Integrated GST (IGST).
- GST payments are mandatory for the material to be released at the customs. Several shipments sent by foreign donors, including groups of NRIs, or procured online by resident Indians from abroad, were held up due to a lack of awareness of this. This would lead to delay in the release of critical relief material and also would dent the quantities of relief material they send.

Exemptions for exemption of GST:

- Recently, the Finance Ministry granted a conditional 'ad-hoc' GST exemption for imports of all COVID-19 relief material, including vaccines, medical oxygen and Remdesivir vials, et al, till June 30. However the **regulations in place to avail of this IGST exemption have made the relaxation redundant in some cases.**
    - The regulation that the incoming material has to be "received free of cost for free distribution anywhere in India for COVID relief" has rendered domestic companies or charities importing these items by purchasing them, even if for free distribution in the country, unqualified for availing the GST break.
    - Entities that wish to import relief material for free distribution need a prior certification from State governments. So, global donors and their intended recipients for the donations would need to register with individual States where they wish to route relief material.

FCRA regulations:

- No entity in India is allowed to receive foreign aid or cash donations unless they have an **approval to do so under the Foreign Contribution (Regulation) Act (FCRA).**

- Pre-existing rules that require such NGOs to open a bank account for receiving foreign funds at the State Bank of India's Parliament Street branch has also further curtailed their ability to receive foreign aid.
- Also an NGO receiving foreign funds or material can no longer transfer foreign aid to any other person, which would make it difficult to pass on the relief material to patients or smaller NGOs or groups working on the ground.

F. Prelims Facts

1. Mars landing gives China's space programme a leg-up

- China landed a spacecraft on Mars carrying its first Mars rover.
    - China has previously launched its **first Mars mission, called Tianwen-1**, carrying a lander and rover. Tianwen-1 had been in orbit and recently a lander descended successfully on to the surface of the red planet carrying a **rover named Zhurong.**
- This **makes China the third country to achieve this feat**. Only the Soviet Union and the U.S. had previously carried out a successful landing on Mars.
    - China had previously tried to launch a Mars orbiter along with Russia in 2011, but that failed to enter orbit.
- The space programme marks another landmark progress in China's space industry development. China's Mars mission, along with lunar mission and space station, is key to its space programme.
    - In 2019, the fourth **lunar probe, Chang'e-4**, carried out the world's first landing on the far side of the moon.
    - **China's first space station called the Tianhe** is set to be functional by the end of next year and only the second space station after the International Space Station.

G. Tidbits

Nothing here for today!!!

H. UPSC Prelims Practice Questions

Q 1: Which of the following statement(s) regarding Zeolites is/are correct?

1. Zeolites do not occur naturally but are produced industrially on a large scale.
2. Zeolites are used as molecular sieves to create purified oxygen from air using its ability to trap impurities.
3. Zeolites are reusable

Options:

a. 1 & 2
b. 1 & 3
c. 2 & 3
d. All of the Above

Answer: c

Explanation:

- Zeolites are crystalline solids structures made of silicon, aluminum and oxygen that form a framework with cavities and channels inside them. Zeolites are basically microporous, aluminosilicate minerals commonly used as commercial adsorbents and catalysts.
- They are often also referred to as molecular sieves.
- Zeolites occur naturally and are also produced industrially on a large scale. Conventional open-pit mining techniques are used to mine natural zeolites.
- The oxygen concentrator compresses air and passes it over zeolite, causing the zeolite to adsorb the nitrogen from the air. It then collects the remaining gas, which is mostly oxygen, and the nitrogen desorbs from the zeolite under the reduced pressure to be vented. Hence it is reusable.

Q 2: Zeolites are used in the following:

1. Water softeners
2. Water filters
3. Odor control
4. Pet litter

Select the correct option from below:

a. 1 & 2
b. 1, 2 & 3
c. 2 & 4
d. All of the Above

Answer: d

Explanation:

- Oxygen concentrators use zeolites in conjunction with pressure swing adsorption to remove nitrogen from compressed air to supply oxygen for aircrews at high altitudes, as well as home and portable oxygen supplies.
- Zeolites are widely used as ion-exchange beds in domestic and commercial water purification, softening, and other applications.
- Zeolites are used to adsorb a variety of materials. This includes applications in drying, purification, and separation.
    - Zeolite controls odors by absorbing moisture from waste and adsorbing the ammonia produced by microbial activity on the liquids
    - Zeolites also absorb up to 50 percent of their weight in liquids without expansion, and individual wet grains bind into clumps. Because of these characteristics, zeolite is added to many bentonite and non-bentonite litters to provide additional odor and moisture control.

Q 3: Consider the following statements:

1. China is the fifth country to perform a successful soft landing successfully on Mars.
2. China's Tianhe Rover landed on the Moon in its first attempt.
3. India's Mangalyaan, launched in 2013, landed on the surface of Mars in its first attempt.

Which of the above statement(s) is/are correct?

a. Only 1
b. Only 1 & 2
c. Only 1 & 3
d. None of the Above

Answer: d

Explanation:

- China landed a spacecraft on Mars carrying its first Mars rover.
    - China has previously launched its first Mars mission, called Tianwen-1, carrying a lander and rover. Tianwen-1 had been in orbit and recently a lander descended successfully on to the surface of the red planet carrying a rover named Zhurong.
- This makes China the third country to achieve this feat. Only the Soviet Union and the U.S. had previously carried out a successful landing on Mars.
    - China had previously tried to launch a Mars orbiter along with Russia in 2011, but that failed to enter orbit.
- China's first space station called the Tianhe is set to be functional by the end of next year and only the second space station after the International Space Station.
- India's 2013, Mangalyaan mission involved only a orbiter and did not involve a rover. India's second mission to mars failed to land a spacecraft on Mars.

Q 4: NASA's Perseverance rover is related to:

a. Mars
b. Moon
c. Sun and its Influence on Earth
d. Venus

Answer: a

Explanation:

- Mars 2020 is a Mars rover mission forming part of NASA's Mars Exploration Program that includes the rover Perseverance and the small robotic, coaxial helicopter Ingenuity.

Q 5: Which one of the following is a purpose of `UDAY', a scheme of the Government?(UPSC 2016)

a. Providing technical and financial assistance to start-up entrepreneurs in the field of renewable sources of energy
b. Providing electricity to every household in the country by 2018
c. Replacing the coal-based power plants with natural gas, nuclear, solar, wind and tidal power plants over a period of time
d. Providing for financial turnaround and revival of power distribution companies

Answer: d

Explanation:

- Ujjwal DISCOM Assurance Yojana is the financial turnaround and revival package for electricity distribution companies of India initiated by the Government of India with the intent to find a permanent solution to the financial mess that the power distribution is in.

For more information on this refer to:

UDAY Scheme – Centrally Sponsored Scheme

I. UPSC Mains Practice Questions

1. Has Climate change led to cyclones becoming fiercer and frequent? Examine. (10 marks, 150 Words)[GS-1, Geography]
2. With foreign aid pouring in for India, discuss the hurdles in accessing foreign COVID-19 aid. (10 marks, 150 Words)[GS-2, Polity and Governance]