UPSC Daily Current Affairs| Prelimbits 21-06-2025

Russell's viper (Daboia russelii)

Prelims : Current events of National and International Importance

Why in News?

Studies carried out in mice have demonstrated that two approved drugs, varespladib and marimastat, effectively counter the systemic and lethal effects of Russell's viper venom, individually or in combination.

- Russell's vipers are responsible for ***over half of India's snakebite cases.***
- **Components** - Phospholipase A_2 (PLA_2), and Snake Venom Metalloproteinase (SVMPs) are two ***main components of Russell's viper snake venom.***
- **Effects -** These toxins interfere with components of the blood clotting cascade to induce anticoagulant and haemorrhagic effects in humans.
- **Drugs** - While the varespladib drug inhibits PLA_2, the marimastat drug inhibits SVMP.
- In the latest study, Russell's viper venom from Punjab and Tamil Nadu exhibited the highest PLA_2 activity, followed by other regions Kerala, Maharashtra, Goa, and Madhya Pradesh.
- Russell's viper snake venom from all other regions exhibited minimal PLA_2 activity.
- Proteinase activity was highest in Karnataka, followed by the Rajasthan, Madhya Pradesh, Goa, and Andhra Pradesh regions.
- In contrast, venom from Tamil Nadu exhibited little to no activity, while venom samples from other regions exhibited modest proteolytic activity.
- The PLA2 inhibitor varespladib was found to neutralise even the high PLA2 activity of the venom found in Tamil Nadu and Punjab.
- The varespladib drug effectively inhibited the modest PLA2 activity of the venom from other Indian regions.
- In the case of the matrix metalloprotease-inhibiting drug, marimastat, the drug effectively inhibited the venom in a concentration-dependent manner.

- The drug was effective even when the proteolytic activity was high, as seen in Karnataka.
- As expected, the drug exhibited highly potent inhibitory effects against the venom with moderate activity, as seen in Madhya Pradesh, Rajasthan, and Goa.
- Overall, the drugs varespladib and marimastat when used individually or in a therapeutic drug combination were found to be very effective in reducing venom-induced cytotoxicity, venom-induced coagulopathy, and fibrinogenolysis.
- When used individually, the drugs were effective in reducing the venom-induced cytotoxicity by snake populations from some regions while being less effective in the case of venom from some other regions.
- However, the therapeutic combination of varespladib and marimastat nearly completely inhibited these activities.

Reference

The Hindu | Hope to cure Russell's viper bites

Energy Transition Index (ETI)

Prelims : Current events of National and International Importance | Energy

Why in News?

From a rank of 63 in 2024, India has now slipped to rank 71 on the Energy Transition Index (ETI).

- It ranks countries on their progress towards energy transition from ***fossil fuels to clean energy.***
- **Developed by** - World Economic Forum (WEF), an international non-profit for public-private cooperation set up in 1971.
- The report that compared the annual progress of 118 countries also noted that India had advanced in energy efficiency and investment capacity.
- **Main Aspects -** The Forum takes into account 2 main aspects to put together the Index.
- One is system performance, which includes 3 factors
    - Energy security (the presence of a stable and resilient energy supply through developing a diversity of energy sources as well as grid and power supply reliability),

    - Equity (wherein there is access to energy for all, including consumers and industries) and
    - Sustainability (promoting energy sources that have lower impacts on the environment, such as lower carbon footprints).
- The second is transition readiness, which includes regulation (legal structures that facilitate energy transition), infrastructure, education, innovation, and investment capacities.
- The Index used ***43 indicators*** under these broad categories, using data from multiple sources and organisations, and scored countries on ***a scale of 0 to 100.***
- **Rankings -** In 2025, 77 out of 118 countries (65%) recorded an increase in their overall ETI scores, with an average gain of 1.1% that signals a broad, though uneven, recovery in transition momentum.
- Overall, advanced economies dominated the ETI rankings, accounting for 16 of the index's top 20 performers.
- The top 4 are all Nordic countries - Sweden, followed by Finland, Denmark, and Norway.
- **India's Position -** At rank 71, India scored 53.3 on the Index.
- India's system performance score was 60.4, and its transition readiness score was 42.7.

Reference

The Wire | Energy Transition Index

New Regulation of unused drugs by Central Drugs Standard Control Organization (CDSCO)

Prelims : Current events of National and International Importance | Health

Why in News?

The CDSCO circulated the guidelines on the disposal of expired and unused drugs to all state and Union Territory drug controllers, urging them to encourage wider adoption by relevant stakeholders.

- It outlines methods for the disposal of ***expired or unused drugs,*** existing policies, procedures to be followed by stakeholders, and processes for the collection, storage, and transportation of drugs before disposal.
- They also include a list of 17 drugs under a ***'Flush List',*** which may be

safely flushed down the sink or toilet to prevent harm.
- The guidelines were developed following a 2018 study by the All-India Institute of Medical Sciences, New Delhi.
    - It highlighted the ecological risks posed by the disposal of expired or unused drugs in landfills.
- CSE recommended introducing an extended producer responsibility (EPR) provision, making drug manufacturers, both branded and generic, accountable for the disposal of unused medicines.

Extended Producer Responsibility (EPR) *is a concept under which manufacturers are held responsible for the entire lifecycle of a product, including its take-back and disposal.*

- The current guidelines suggest that drugs should move back through the supply chain, meaning from retailer to supplier to manufacturer for disposal.
- For instance, a retailer should return expired stock to the supplier or manufacturer.
- A wholesaler, distributor or stockist should accept expired or unused drugs from those to whom they have been supplied, and ensure segregation and return.
- Manufacturers, in turn, are to accept all expired or unused drugs from retailers and wholesalers.
- Procurement agencies, including government and private hospitals, may dispose of expired or unused medicines directly under the ***Biomedical Waste Management Rules, 2016***, or return them to suppliers.
- However, the responsibility is not fully placed on manufacturers.
- Moreover, *consumers are not included in the reverse supply chain* process, unlike drug take-back programmes in Europe and the United States, where consumer participation is central under EPR mandates.
- The guidelines, however, place strong emphasis on record-keeping and verification by regulatory authorities when required.
- For public disposal of expired or unused drugs, state drug control departments and chemists' and druggists' associations are encouraged to jointly launch drug take-back sites or programmes at designated locations.
- Citizens can drop off unused or expired medicines from home, which will then be appropriately disposed of by the associations.
- Kerala already has an operational drug take-back initiative, the *New Programme on Removal of Unused Drugs or nPROUD,* launched in December 2024 by the state drug control department.

Reference

Down to Earth | Guidelines on disposal of expired and unused medicines

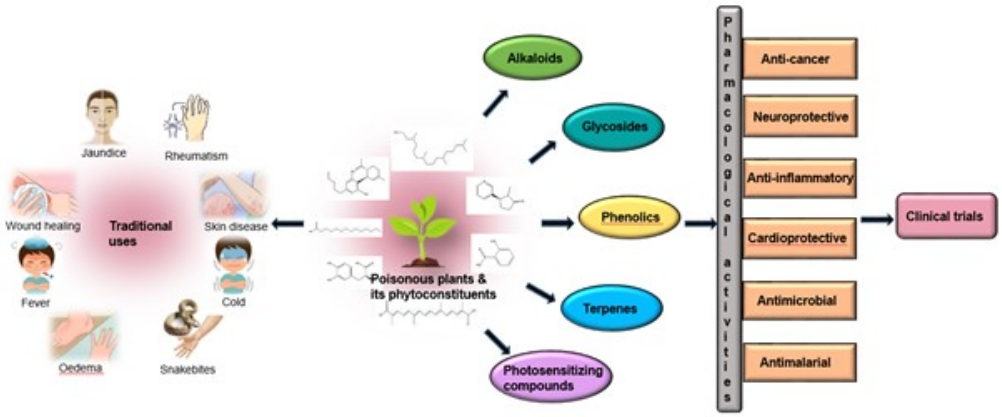
The hidden healers in poisonous plants

Prelims : Current events of National and International Importance

Why in News?

A Research Study by IASST, Guwahati revelaed that there are hidden healers in poisonous plants.

- Scientists have unravelled some of nature's most poisonous plants are also among its most powerful healers.
- Plants have been used for their medicinal value since ancient times.
- While some plants are known for their toxicity, they also contain beneficial phytochemicals important for both plants and humans, indicating their dual nature.
- Despite being notorious for toxicity, they possess extraordinary compounds that ***<u>can be converted into powerful weapons for healing</u>*** when meticulously isolated and altered.
- With the advancement of research and development in this domain, the therapeutic potential of phytochemicals derived from toxic plants has surfaced as a promising direction for contemporary medicine.
- Researchers tracing the secrets held in the leaves, roots, and sap of the natural world have comprehensively investigated various poisonous plant species and their phytochemical constituents.



- Research team has reviewed existing literature and identified 70 poisonous plant species that are used traditionally to treat a wide array of

illnesses, from fevers and colds to skin diseases and oedema.
- These plants are *already utilized in homeopathy and traditional Indian medicine.*
- The researchers emphasized that plants produce phytochemicals, natural compounds used for their survival, which can also affect human biology.
- While some of these are toxic, others, when isolated and modified, hold immense medicinal promise.
- Modern pharmacology is beginning to recognize the potential of these phytochemicals.
- These toxic compounds can be transformed into potent therapeutic agents with careful scientific processing.
- The study explores how these natural toxins can be studied, validated, and potentially turned into life-saving drugs.
- The findings draw upon ethnopharmacology, how indigenous cultures use plants for healing.
- From treating snakebites to managing jaundice, these traditional remedies are now being re-evaluated through the lens of modern science. The implications are vast.
- With rigorous testing, these plants could help discover novel drugs for diseases still lacking effective treatment.
- The researchers have stressed the importance of rigorous scientific validation before clinical use.
- Toxicity must be carefully studied to ensure safety.

Reference

PIB | Hidden healers in poisonous plants

Alien species in India

Prelims : Current events of National and International Importance

Why in News?

The number of alien species rose 20x by the early 19th century.

- Invasive alien species are introduced by increased human activity around the globe.
- The introduction of these exotic species can be deliberate or accidental.
- For example, the introduction of cane toads (Bufo marinus) in Australia, Gambusia in India, and Poecilia reticulata in Japan are examples of

deliberate biocontrol initiatives gone wrong.

- For Example, the giant African snail (Lissachatina fulica) entered India without fanfare, admired at first for its size and shell.
- But what seemed ornamental soon revealed itself to be the country's most persistent invasive alien species.
- Thriving in the region's warm, humid climate and free from natural predators, the snail spread rapidly with human help, from Bengal's gardens to the farmlands of the Western Ghats.
- By the mid-20th century, crops and ornamental plants had been ravaged, native snails displaced, and soil ecosystems altered.
- Worse, the snail had become a carrier for parasites like the rat lungworm, threatening humans and wildlife.
- On the other hand, accidental introductions often happen via the export and import of biological goods, such as timber, plant products, vegetables, fruits, and grains.
- **Biofouling -** It is one such introduction scenario. When ships travel between countries without cargo, they are filled with ballast water to help the ship stay stable on the high seas.
- Biofouling, the undesirable accumulation of plants, animals, and algae on surfaces, sometimes occurs during the filling and flushing of ballast water, transporting exotic species from one region to another.
- The Asian paddle crab was introduced from the Northwest Pacific and East Asian waters to New Zealand, where it carries the white-spot syndrome virus, in this way.
- To reduce the risk of importing invasive alien species, India needs to strengthen its national policy.
- Specifically, it means enforcing stricter biosecurity at ports and other entry points and developing real-time species-tracking and early-warning systems that can catch invasion events before they get out of control.
- The country also needs greater collaboration between government departments and researchers to maximise knowledge generation about potentially invasive species and their spread, given various climate change scenarios and shifting trade routes.
- Finally, India must implement mandatory post-trade biological impact assessments, typically in quarantine facilities managed by the respective department.

Reference

The Hindu | Invasive alien species

One Liners 20-06-2025

History, Art and Culture

International Seminar on Deciphering Indus Valley Script.

The Archaeological Survey of India (ASI) will organize a three-day international seminar from August 20–22, 2025, in Greater Noida to focus on deciphering the Indus Valley script.

• **Aim** – To decode the Undeciphered Script.

• The event, titled '**Decipherment of the Indus Script**: **Current Status and the Way Forward'**.

• It will bring together Indian and international experts to review progress and chart future research.

• **Research fellowship planned** – ASI is planning to launch a fellowship for scholars to conduct dedicated research on the Indus script as part of its broader push for decipherment.

• **Linked to Tamil Nadu CM's $1 Million Prize –** This initiative follows Tamil Nadu CM M.K. Stalin's earlier announcement of a $1 million prize for anyone who can successfully decode the Indus script, raising global attention.

• The Indus Valley Civilisation was discovered in 1921, and efforts to decipher its script have continued since the first excavation report in 1931, which documented symbols and variants.

Polity & Governance

Sakura Science Programme

Recently, the Japan Science and Technology Agency (JST), organized the programme offers a short-term immersive experience in Japan's scientific ecosystem and cultural heritage under Sakura Science Programme.

• **Scientific and Cultural Exchange** – It is initiated by Japan in 2014, the programme invites talented students and researchers from Asia, including India, to experience Japan's advancements in science, technology, and culture.

• **Student Participation** – In 2025, 20 Indian students from Jawahar Navodaya Vidyalayas and government schools in remote regions like Ladakh, Mizoram, and Andaman were selected to visit Japan under the High School Track.

• **Promotes Innovation and NEP Goals –** The programme supports India's National Education Policy (NEP) 2020 by fostering experiential learning, global exposure, and innovation among youth through collaborative international visits.

• **Participants from Remote Regions –** Students were chosen from Jawahar Navodaya Vidyalayas and government schools in Andaman & Nicobar, Ladakh, Mizoram, Nagaland, and Tripura, ensuring inclusivity.

International Relations and Issues

India-Croatia Term Defence Partnership

Recently, PM Modi announced plans for a long-term defence cooperation roadmap, focusing on joint production, training, and military exchanges.

• **Joint ventures in space and coastal infrastructure –** India invited Croatian participation in space research and Sagarmala-linked coastal development, including shipbuilding and port modernization.

• **Boost to strategic industries and investments –** India plans to increase investments in Croatia's key sectors like pharma, semiconductors, IT, clean and digital technology, and agriculture.

• **Academic and cultural collaboration –** India and Croatia will jointly fund research projects, enhance Indology studies, and implement a 5-year cultural exchange programme.

• **Support for mobility agreement –** India and Croatia will soon sign a mobility pact for people-to-people ties; both nations reiterated commitment to dialogue over war, condemning terrorism.

Economy

Foreign Direct Investment Decline

Foreign Direct Investment (FDI) inflows into India fell by 1.8% in 2024, amounting to $27.6 billion, less than half of 2020 levels.

• **Shrinking role in capital formation –** FDI's share in India's total capital formation dropped to 2.3% in 2024, down from 8.8% in 2020, reflecting its diminishing role in India's development financing.

• **India dominates south Asia's FDI –** Despite the decline, India received 80% of South Asia's total FDI inflows and contributed to over a quarter ($110 billion) in projected capital expenditure in Asia.

• **Rise in manufacturing projects** – India saw record levels of manufacturing investment, particularly in semiconductors and basic metals, even as overall FDI declined.

• **M&A activity declined due to divestments** – Cross-border mergers and acquisitions fell, partly due to asset sales to Indian firms (e.g., Disney's Star India merger with Viacom18 and exits in pharma sector).

SEBI Relaxes Hive-Off Rule

Recently, SEBI has allowed merchant bankers to carry out unregulated advisory and consultancy services without creating a separate legal entity, reversing its earlier 2024 directive.

• **Hiving off** – It refers to the requirement that financial intermediaries like merchant bankers, must carry out unregulated or non-core activities (like consultancy or advisory) through a separate legal entity, rather than within the regulated entity.

• **SEBI's earlier rule (Dec 2024) –** SEBI had mandated that merchant bankers must hive off their non-regulated businesses to ensure risk separation and regulatory clarity.

• **Boost to Non-fund revenue –** This relaxation may enhance fee-based income and profitability for merchant bankers, especially as their traditional roles in corporate actions have reduced.

• **Investor protection emphasized** – Despite the relaxation, SEBI maintained that only "credible and well-governed" entities would be permitted to act as intermediaries, reinforcing investor confidence.

Security

Operation Sindhu

The evacuation of Indian students from Iran under Operation Sindhu was carried out by the Government of India

• Amid the ongoing Israel-Iran conflict, the Indian government launched Operation Sindhu to rescue 110 students, primarily from Urmia University, Iran.

• **Multi-Nation transit via Armenia –** Students were moved overland to Yerevan, Armenia, on June 17 and then flown to New Delhi after a 52-hour journey across borders.

• **Ministry of External Affairs (MEA)** – Led the diplomatic and logistical efforts.

• **Majority of evacuees from Jammu & Kashmir –** Of the evacuees, 94 students were from J&K, with others from Delhi, Maharashtra, Uttar Pradesh, and Rajasthan.

Miscellaneous

NeSDA (National e-Governance Service Delivery Assessment)

Recently the Department of Administrative Reforms & Public Grievances (DARPG) released its 25th monthly "NeSDA Way Forward" report in June 2025, highlighting significant developments in digital public service delivery .

• **NeSDA** – It is launched by DARPG in **2019**, that tracks the progress of e-service delivery across States/UTs and Central ministries.
• **Seven focus areas** —Finance, Social Welfare, Local Governance, Education, Labour, Tourism, and Environment.
• **e-Services –** A total of 21,062 e-services are being provided across all States and Union Territories, with Local Governance & Utility Services being the top sector.
• **New e-Services added –** States/UTs added 424 new e-services, with Tripura leading in service additions across all focus sectors.
• **Mandatory e-Services achieved –** Out of 2,016 mandatory e-services, 1,599 are now online, reaching 79% saturation; Maharashtra and Uttarakhand achieved 100% saturation.
• **Unified service portals –** Several States/UTs are shifting to single unified portals, enhancing real-time transparency and ease of access for citizens.
• The report includes three new assessment parameters Open Government Data, e-Participation, and Emerging Technologies, showcasing portals like GST and National Cyber Crime Reporting as best practices.

Advanced Tribal Health Research Centre at AIIMS

Recently the Ministry announced the establishment of a National Tribal Health and Research Institute under AIIMS Delhi to study tribal health issues and guide policy formulation.

• The Centre will offer outpatient and inpatient facilities, oversee research on tribal health concerns, and serve as a reference institution supporting healthcare and disease surveillance across tribal-dominated regions.
• **Bhagwan Birsa Munda Drug Development Prize –** A new drug development prize (Rs.1–10 crore) was announced to incentivize the discovery of new treatments for Sickle Cell Disease (SCD), which currently has only one approved drug.
• **Centre of competence in 15 tertiary hospitals** – Centers of Competence (CoC) offering state-of-the-art SCD diagnosis and management will be set up in 15 top hospitals including AIIMS, functional by November 2025.
• **Mission to Eliminate SCD by 2047** – India aims to eradicate sickle cell disease by 2047, with focused screening, awareness, and treatment in tribal-dominated areas under the Sickle Cell Anaemia Elimination Mission.
• **World Sickle Cell Day** – Observed on June 19, 2025, events were held across 17 mission states and 365 districts, emphasizing public awareness and support for tribal communities affected by the disease.

National Reading Day

National Reading Day is celebrated every year on June 19 to promote reading habits across India. In the Kannampadi tribal settlement, the new libraries were inaugurated to coincide with this day.

• **Libraries in tribal areas** – As part of Reading Day celebrations, three libraries were established at Memari, Kathitheppan, and Kollathikkavu in the Kannampadi tribal settlement within the Idukki Wildlife Sanctuary, Kerala.
• **Theme** – Reading is the True Addiction
• The Forest Department launched the initiative with the theme 'Reading is the true addiction', aiming to make books accessible in remote tribal areas.
• **Access to education and news** – These libraries are stocked with children's books, novels, study guides, and newspapers, helping students prepare for PSC exams and stay informed.
• Tribal Empowerment Through Literacy
• The initiative also aims to reduce educational disparity by training local youth as librarians, and possibly introducing coaching programs, aligning with the spirit of National Reading Day to empower through reading.



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