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Fluoride Remediation

A new study shows rice husk biochar removes fluoride from groundwater and reduces fluorosis.

- Fluoride is one of the pollutants in groundwater.
- It is primarily caused by geological processes but is also contributed through anthropogenic activities across India.
- A team from Nalanda University investigated the potential of renewable biochar produced from rice husk biomass to absorb fluoride pollutants from groundwater.
- Fluoride remediation using biochars showed significant removal at neutral pH.
- Biochar-mediated sand columns can be used for defluoridation in hand pumps and tube wells.
- **Fluorosis** - It results from excessive fluoride intake from various sources, including food, water, air and excessive use of toothpaste.
- Prolonged fluoride consumption in higher concentrations in drinking water can cause dental fluorosis, skeletal fluorosis, kidney diseases and arthritis.
- Dental fluorosis, or brown stains on the teeth caused by weakened enamel, is one of the most noticeable symptoms due to fluorosis.

References

1. Down To Earth - Rice husk biochar removes fluoride from groundwater

Holi Colours

Holi is a harvest festival which is celebrated by playing with colours.

- Traditionally, natural gulaal or colour is made from dried flower petals, vegetable dyes, starch, leaves, etc.
- Natural Holi *gulaals* are made with turmeric or henna (mehndi) flowers such as Marigold, Chrysanthemum, and Rose.
- They also have ingredients like gram flour or rice flour.
- Food-grade colours are also used in making colours are synthetic.
- The dry colours, commonly known as '*gulals*' or '*abeer*', have 2 components – a colorant and a base.

Colours	Ingredients
Black	Lead oxide
Green	copper sulphate and Malachite green
Silver	Aluminium bromide

Blue	Prussian blue
Red	Mercury sulphate

- **Ill effects of synthetic colours** - Dry colour may cause cutaneous problems.
- The chemicals in the synthetic colours can harm skin, respiratory tract, and eyes.
- They also harm the environment, adding particulate matter (PM) to the air.
- These particulate matter cause ocular infections and breathing trouble.
- These chemicals take years to decompose.

References

1. IE - 'organic' Holi colours and their safety

Scrub typhus

A team of Indian scientists has identified a significantly more effective treatment for severe scrub typhus.

- Scrub typhus is a life-threatening infection that kills thousands of people every year.
- Scrub typhus infection is caused by the bacteria *Orientia tsutsugamushi*.
- **Transmission** - Scrub typhus is transmitted to humans by bites from tiny infected mites.
- It is a major public health threat in India, other South Asian countries, and around the tropics.

  Scrub typhus kills an estimated 10% of the approximately one million people infected by it every year.

- **Symptoms** - Fever associated with headaches, coughs, shortness of breath, confusion and disorientation.
- **Treatment** - Till date, monotherapies using either doxycycline or azithromycin was the commonly used treatment.
- Combination therapy with doxycycline and azithromycin is more effective than monotherapies is now identified.

References

1. The Hindu - Indian scientists identify better drug treatment for severe scrub typhus
2. The Hindu - Scrub typhus: combination therapy can save more lives

Decentralised Algorithms

Twitter's former CEO and co-founder Jack Dorsey launched his new social media platform, Bluesky, a decentralised Twitter spinoff.

- A traditional Web2 social media platform runs on a centralised server controlled by a single company.
- A decentralised social networks are networks where user data and content are stored

on a block chain and independent servers rather than centralized servers.
- **Disadvantages of centralised social media platforms** - Increasing censorship by big tech, data exploitation, and non-democratic administration of their social media platforms.
- Collection of user information by tech platforms to better monetise their social media business.
- One-sided censorship from owners of such platforms.
- **Advantages of decentralised social media platforms** - Decentralised algorithms are gaining popularity in cryptocurrency, NFTs, etc.
- A decentralised social network allows for more privacy and security and gives users control over their data, digital identity and content, fostering transparency, as anyone can view the data at any time.
- Other decentralised platforms - Mastodon, Minds, and Steemit.

References

1. Business Line - Decentralised algorithms and social media

PMLA against Cryptocurrency

The central government has brought the trading of cryptocurrency and digital assets within the ambit of the Prevention of Money Laundering Act (PMLA) through a gazette notification.

- Any activities related to the trading of cryptocurrency and digital assets would be covered within the ambit of Prevention of Money Laundering Act (PMLA).
- These include
    1. Exchange between virtual digital assets and fiat currencies.
    2. Exchange between one or more forms of virtual digital assets.
    3. Transfer of virtual digital assets.
    4. Safekeeping or administration of virtual digital assets or instruments enabling control over such assets.
    5. Participation in and provision of financial services related to an issuer's offer and sale of a virtual digital asset.
- **Virtual Assets** - The definition of 'virtual assets' includes cryptocurrencies and non-fungible tokens as that in the Income-Tax Act.
- **Agencies** - The responsibility of maintaining transparency, identity, and following regulations is on cryptocurrency exchanges.
- Indian crypto exchanges will have to report suspicious activity to the Financial Intelligence Unit India (FIU-IND).
- Any financial wrongdoing involving cryptocurrency assets can now be investigated by the Enforcement Directorate.

References

1. The Hindu - Money laundering laws to cover cryptocurrency trade
2. IE - Govt imposes PMLA provision against cryptocurrency
3. Business Standard - Centre brings crypto assets under PMLA



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