

Bioluminescence

April 19, 2023

In news— Recently, Visakhapatnam beaches were glowing due to a phenomenon called bioluminescence.

Key updates-

- A group of MTech students noticed something unusual while riding along the coast of Visakhapatnam.
- They saw waves of blue light ebb and flow by the shore.
- With every wave that kissed the shore, the waters turned a shimmering neon blue like a magic guarding the secrets of the mysterious marine world.

What is bioluminescence?

- Known as bioluminescence, **the glow of the waves is caused by tiny marine organisms called phytoplankton**, which emit light on the ocean surface at night. It is best experienced during a moonless night.
- Bioluminescent is widespread among deep sea animals in general.
- **Many marine creatures like sponges, jellyfish, worms, species of fish, anthropods, echinoderms and unicellular alga exhibit bioluminescence to either evade predators, attract prey or during mating.**
- In Visakhapanam, this phenomenon is most likely the result of an algal bloom (significant accumulation) of the dinoflagellate species of noctiluca and ceratium. These emit light when disturbed by breaking waves.
- **This occurs when the luciferase enzyme reacts with luciferin compound** in the presence of oxygen to produce a cold light.
- **Bioluminescence is widespread in lagoons and sometimes breakwaters** and is **particularly visible during warm weather conditions.**
- The dinoflagellates follow a circadian cycle (24-hour

cycle) and as a result this phenomenon occurs during the night which is visible in low light conditions.

- **This unique phenomenon has been visible in some other beaches in India including Havelock Island in the Andamans, Thiruvanmiyur beach in Chennai, Mattu beach in Karnataka and Bangaram Island in Lakshadweep.**
- **While phytoplankton blooms that results in bioluminescence are not rare and are widely reported across coasts worldwide and in India,** marine biologists say that it is a likely indication of environmental changes in seawater in the region of its occurrence.