A Recent Discovery on Life under Antarctic Ice Shelf

Why is in News?

Scientists have discovered potential new species on the Antarctic seafloor exposed by the A-84 iceberg's (detached from the George VI Ice Shelf) breakaway.

- **Ice shelves-** These are floating tongues of ice that extend from grounded glaciers on land.
- **Formation -** They are formed by the *accumulation and compaction of snow*, which, over time, turns into ice.
- Ice shelves are ***common around Antarctica***, and the largest ones are the Ronne-Filchner, Ross and McMurdo Ice Shelves.
- These are crucial for understanding climate change and sea level rise.
- **Role -** Ice shelves stabilize land-based glaciers, acting as a ***"buttress"*** against the ocean.

Key Highlights

- **Unveiling a Hidden Ecosystem -** Following the breakaway of the *A-84 iceberg*, a *remotely operated submersible (ROV)* recently explored the newly exposed Antarctic seafloor.
- The team of scientists conducted *deep-sea exploration* at depths of up to *1,300 metres* beneath the ice.
- They discovered a *thriving ecosystem* with an abundance of marine species, including
    - *Icefish and Octopi* – Adapted to extreme Antarctic conditions.
    - *Giant Sea Spiders* – Deep-sea arthropods that have evolved in isolation.
    - *Large Corals and Sponges* – Supporting complex underwater habitats.
    - *Giant Phantom Jelly* – A rare jellyfish species that can grow up to *one metre wide*.
    - *Vase-shaped Sponges* – Some of these specimens could be *hundreds of years old*.

Scientific Significance

- The discovery was *unexpected as these deep-sea environments* were assumed to lack sufficient nutrients for complex ecosystems.
- Normally, deep-sea life relies on *organic material from photosynthetic organisms* falling from the ocean surface.
- However, the *150-metre-thick ice shelf* covering this area for centuries *blocked access to surface nutrients*, making the existence of rich biodiversity surprising.
- Scientists speculate that essential nutrients might be transported by
    - *Ocean Currents* – Carrying organic matter from distant areas.
    - *Glacial Meltwater* – Potentially introducing nutrients trapped in ice.
    - *Unknown Biological or Chemical Processes* – Yet to be fully understood.

Global Research Initiative

- The expedition was part of *Challenger 150, a UNESCO-endorsed global deep-sea research initiative.*
- Conducted by an international team of scientists, the mission aimed to *explore the world's least-studied marine environments.*
- The research will provide *crucial insights into climate change*, ice shelf dynamics, and deep-sea ecosystem functioning.
- Previous signs of bottom-dwelling life under Antarctica's ice shelves were only *reported in 2021*, making this discovery a major advancement in marine science.

Reference

The Indian Express - Life under Antarctic ice shelf

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