



New Freshwater Diatom Genus Discovered

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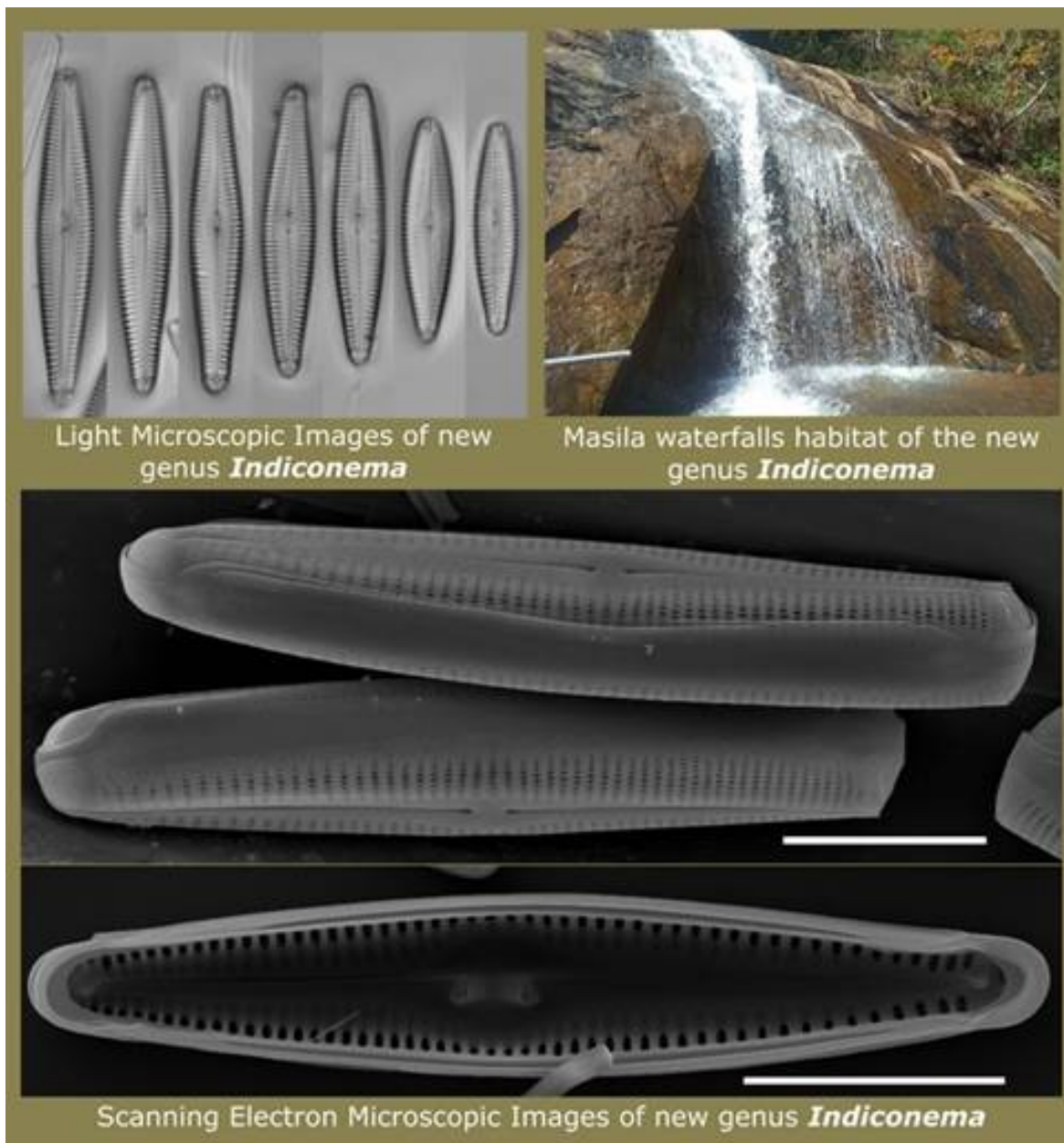
Why in News?

Recently, scientists have discovered a new genus of freshwater [diatom](#) - *Indiconema*, a microscopic algae crucial to life, in the clean rivers of the [Eastern](#) and [Western Ghats](#).

What are the Key Features of *Indiconema*?

- It has been named ***Indiconema*** to value its restricted distribution in the country.
- This genus features unique **valve symmetry** and a **distinct valve structure**, differing significantly from other members in the Gomphonemoid group.
- It has **pore fields** at both the head and foot poles, unlike others that have them only at the foot pole.
- ***Indiconema*** was found in both the Eastern and Western Ghats, reflecting the shared **endemic elements** between these mountain systems seen in other **endemic-rich groups** such as **reptiles**.
- Morphological features suggest that *Indiconema* is closely related to *Afrocymbella*, a genus endemic to [East Africa](#), highlighting biogeographic connections between Indian and East African [diatom species](#).

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What are Diatoms?

- Diatoms are [microscopic algae](#) producing 25% of the [global oxygen supply](#), forming a critical base of the [aquatic food chain](#).
 - They are **sensitive indicators** of aquatic health due to their responsiveness to changes in water chemistry.
- **Diatoms are the first recorded microorganisms in India**, with Ehrenberg's (a German naturalist and zoologist) first report dating back to 1845 in his publication Mikrogeologie.
 - India hosts approximately 6,500 diatom taxa, with about **30% being endemic**, reflecting the country's unique biodiversity.
- **Diverse biogeographic zones** in India support various diatom species across different habitats, including freshwater, marine environments, and high mountain regions.
- The **evolution of monsoons** and the resulting [rainforest biome](#) in the Indian Peninsula has significantly influenced diatom flora.
 - The unique **physiographic** and **climatic gradients** of the Eastern and Western Ghats provide a wide array of habitats for distinct diatom species.

Microalgae	Macroalgae
Unicellular	Multicellular
Need a microscope to see	Can see without a microscope
Dinoflagellates, diatoms, golden-brown, blue-green	Red, green, or brown in color
Referred to as phytoplankton	Referred to as seaweed
Larger population	Smaller population
Superior food source for the soil microbiome	Provides abiotic plant stress mitigation benefits
Improves crop yield and soil health	Improves crop yield

Microorganisms	Characteristics	Beneficial roles
Prokaryotes		
Bacteria	Rigid cell wall, divided by binary fission, some capable of photosynthesis	Recycle biomass, control atmospheric composition, component of phytoplankton and soil microbial populations
Archaea	Rigid cell wall, unusual membrane structure, photosynthetic membrane, lack chlorophyll	Produce and consume low molecular weight compounds, aid bacteria in recycling dead biomass, some are extremophiles
Eukaryotes		
Fungi	Rigid cell wall, single-cell form (yeast), reproducing by budding, multicellular form (hyphae, mycelium), no photosynthetic members	Recycling biomass, stimulate plant growth
Algae	Rigid cell wall, photosynthetic	Important component of phytoplankton

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Consider the following kinds of organisms: (2021)

1. Copepods
2. Cyanobacteria
3. Diatoms
4. Foraminifera

Which of the above are primary producers in the food chains of oceans?

(a) 1 and 2

(b) 2 and 3

(c) 3 and 4

(d) 1 and 4

Ans: (b)

Q. Which one of the following is the correct sequence of a food chain? (2014)

(a) Diatoms-Crustaceans-Herrings

(b) Crustaceans-Diatoms-Herrings

(c) Diatoms-Herrings-Crustaceans

(d) Crustaceans-Herrings-Diatoms

Ans: (a)

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