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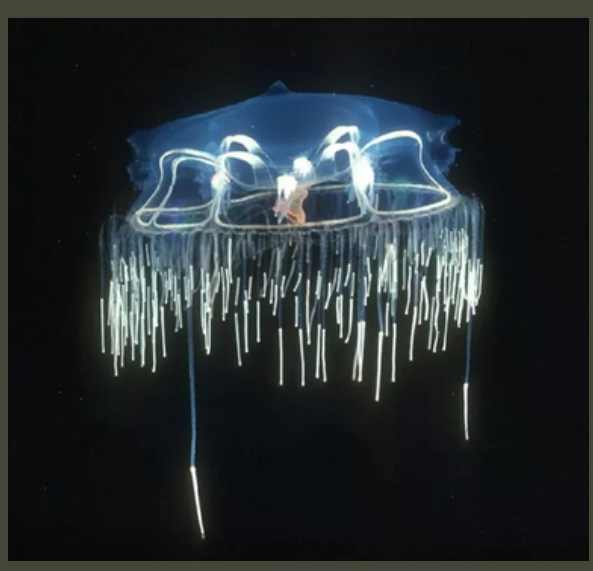
THE MARINE BIOLUMINESCENCE PHENOMENON OF: NOCTILUCA SCINTILLANS

By Athena Tran - Charles Campbell College (1007)

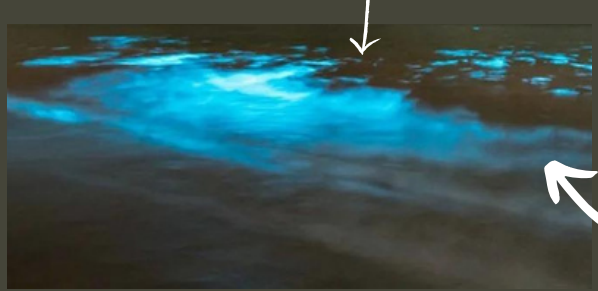
WHAT IS BIOLUMINESCENCE?

Marine bioluminescence, is defined by the Encyclopaedia of Britannica as the "biochemical emission of light made by a living organism". To put in simpler terms, it is a heatless or "cold" light that is chemically made by marine animals. This light is made when Luciferin is exposed to oxidation, creating the visible neon colours. (Encyclopaedia of Britannica, 2018)



Midwater Jellyfish - Photography credits to Marsh Youngbluth/MAR-ECO, Census of Marine Life

Blooms (rapid accumulation of algae population) of Noctiluca Scintillan are highly sensitive and react to mechanical stimulus when their cell wall is touched causing the reaction of a neon blue bioluminescence. (Good Living, 2021)



Preservation Bay, Tasmania - Photography credits to Brett Chatwin, Chatwin Photography

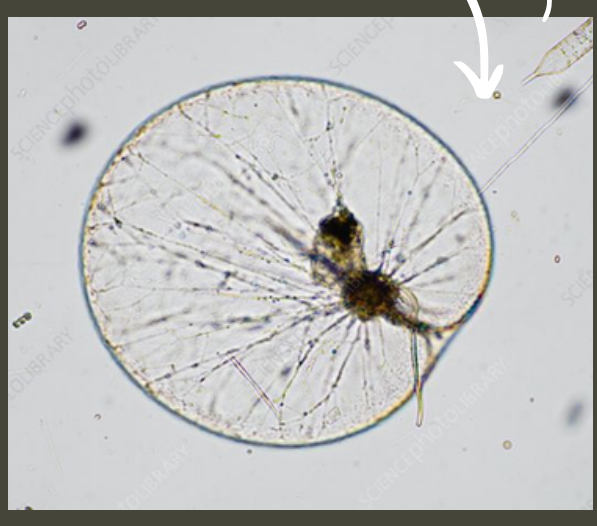
NOCTILUCA SCINTILLANS

Marine bioluminescence isn't strictly confined to animals though, single celled organisms such as the **Noctiluca Scintillans** are known to produce bioluminescence. These microorganisms are a species of **dinoflagellate**, a type of **phytoplankton algae bacteria**. (National Geographic, 2022) They are positively buoyant due to having a high accumulation of ions in the cytoplasm and are less dense than sea water.

APPEARANCE OF NOCTILUCA SCINTILLANS

Noctiluca Scintillans have an average diameter of 0.5 mm, but can range from 0.2mm to 2 mm. (IMAS, 2013) consumes through the process of phagocytosis - the process of a living cell ingesting another cell or particle. (Encyclopaedia of Britannica, 2018)

It is a balloon-like shaped cell with a short flagellum, colourless cytoplasm and a larger tentacle used to capture prey by using sense. (BioWeb, 2007)



Noctiluca Scintillans - Photography credit to Benedikt Pleyer, Nomadic Nostoc / Science Photo Library

WHEN AND WHERE DO THEY OCCUR?

Noctiluca Scintillans are commonly found in coastal regions with either temperate, subtropical or tropical waters, but can also be found after heavy rainfall due to mechanical stimulus. (Encyclopaedia of Britannica, 2018) they are more likely to occur during warmer seasons as warmer water temperatures allow algae to grow thicker and faster.

TOXICITY?

Although this species of dinoflagellate does not produce organic toxins , they are toxic to marine life and invertebrates and have been the cause of massive fish mortality rates in the past due to the high ammonia presence in the vacuole. (IMAS, 2013)

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