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Perspective

Algae in Aquatic Ecosystems and their Importance

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DESCRIPTION

Every organism depends on water. There are two main forms of algae: Macro algae (seaweeds), which are present in the littoral zone which includes green, brown, and red algae, and microalgae, which are distributed throughout the ocean waters in both bentheic and littoral environments grown as phytoplankton. They appear in a variety of shapes and colours. Algal blooms are distinguished by a prominent coloration of water due to a huge number of pigmented algae cells, which are known to be mostly made up of bio-toxins. Green, red, brown, and yellow are among the colours. Cyanobacteria (blue-green algae) and red tides are the two main forms of algal blooms (red algal blooms).

Some of the prevalent examples of eutrophication reduces the amount of oxygen available and results in death of the animal life. They are an organic and vital component of the ecology. The aquatic food chain in these ecosystems is based on phytoplankton. The water becomes green, has a mouldy flavour, smells bad, and may not be safe to drink. This eventually results in a shortage of freshwater and the widespread extinction of fish and other aquatic life. Monitoring and regulating algal development is necessary for restoring an ecosystem's equilibrium. The phytoplankton is ingested by tiny crustaceans and other small creatures, which are then consumed by larger animals. Dehydration causes an often irreversible aggregation of macromolecules and disintegration of organelles because water molecules are necessary for maintaining the structure of intracellular biomolecules and membranes. Dehydration tolerance and desiccation tolerance are frequently used inter changeably, however they need to be separated.

Desiccation, which is a severe stress factor that causes significant mortality in the majority of phototrophic organisms, is that the process by which an organism adjusts to the relative humidity of the environment. Nevertheless, certain plant species have a great tolerance for desiccation and have the means to safeguard cellular integrity and heal any harm that may result from it.

Many kinds of green algae exist partially or permanently in aero terrestrial environments, where the cells are exposed to the atmosphere and frequently become dehydrated, despite the fact that most green algae normally reside in watery habitats. Desiccation tolerance is the capacity of algal cells to endure in an air-dried state. Green algae can tolerate desiccation, although the mechanisms behind this are still poorly understood.

The manufacture and storage of certain organic osmolytes such polyols serve as efficient way for loss-prevention strategies in members of the *Trebouxiophyceae*, although similar substances have not yet been seen. Aero terrestrial green algae often have physiological strategies that involve a rapid reduction in photosynthesis during desiccation, as well as a relatively rapid recovery after rewetting, whereas aquatic species are vulnerable to drying.

CONCLUSION

Green algae have underlying processes that are poorly understood, including the impacted molecular parts of the photosynthesis. To further understand the molecular processes underlying the physiology of these species under desiccation-stress, contemporary techniques based on transcriptomics, proteomics, and/or metabolomics are highly required. The ecology and evolution of practically all species on Earth have been significantly impacted by the recurring development of multicellularity across the tree of life. Numerous of these beginnings were found in various classes of photosynthetic algae, or eukaryotes.

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