

Common Aquatic Plants: A Brief Introduction

Khemraj Bunkar¹, Chetan Kumar Garg¹, Udai Ram Gurjar¹ and Suman Takar²

¹ICAR-Central Institute of Fisheries Education, Versova, Mumbai

²TNMFU- Fisheries College and Research Institute, Thoothukudi

ARTICLE ID: 074

Introduction

We are all aware that plants come in a variety of forms. We're all familiar with plants that grow on land, but what about those that live beneath the water? They are plants that are intended to live in water. Aquatic plants are fascinating, with distinct characteristics that contribute to the preservation of key functions and biodiversity in freshwater ecosystems (Bornette and Puijalon, 2009). Many shorebirds and water birds consume aquatic plant seeds and aid in the dispersal of aquatic plants (Green et al., 2002)

What exactly are aquatic plants?

Aquatic plants are those that can be found in any saltwater or freshwater environment, such as a small fish tank, home aquarium, lake, pond, or ocean. It doesn't matter if they live above water, fully submerged in water, or somewhere in between; the main concept to understand is that aquatic plants are any species that naturally thrive in a wet environment. Aquatic plants share a range of traits that enable them to thrive in such environments. (Rascio, 2002)



Fig.1 Aquatic Plants

Characteristics of Aquatic Plants

The characteristics of aquatic plants can vary depending on the type, but there are a few that remain the same. For example, aquatic plants can utilize less of their resources for the purpose of supporting tissues as they are naturally able to stay afloat. Furthermore, water loss doesn't have to be a concern because these plants are constantly surrounded by it. But aside from those characteristics that are consistent, here are some that vary based on classification:

- To avoid excessive dryness, submerged plants usually lack a cuticle layer.
- Submerged plants have no xylem because their leaves do all of the work.
- Stomata are rarely found on the leaves of submerged plants.
- Immersed plants have leaves that protrude from the water, allowing them to get air and sunlight, despite the fact that their roots are always at the bottom of a body of water.
- The leaves of free-floating plants float on the surface of the water rather than sticking out of it.

Importance of Aquatic Plants

Usually, we refer to these aquatic plants as 'submerged macrophytes'. It is essential to learn their importance. Though they may not be seen in our daily lives, nonetheless, they carry great importance. They are quite an essential part of the aquatic ecosystem.

Furthermore, they provide oxygen to the animal species living underwater. It is very important for their metabolic processes. Moreover, they also supply food to some of the species of animals living underwater. For instance, the turtles eat the algae present in freshwater pond surfaces. While some remain underwater, some of the aquatic plants float above the surface of freshwater. Their stems and roots allow them to remain firmly affixed despite strong currents. For instance, moss clings onto rocks.

Types of Aquatic Plants

Aquatic plants are those that grow primarily in water. They vary greatly in type, with some looking very similar to common land plants and others looking very different. Aquatic plants are classified into four types: algae, floating plants, submerged plants, and emerged plants. The positioning of their roots and leaves determines grouping.

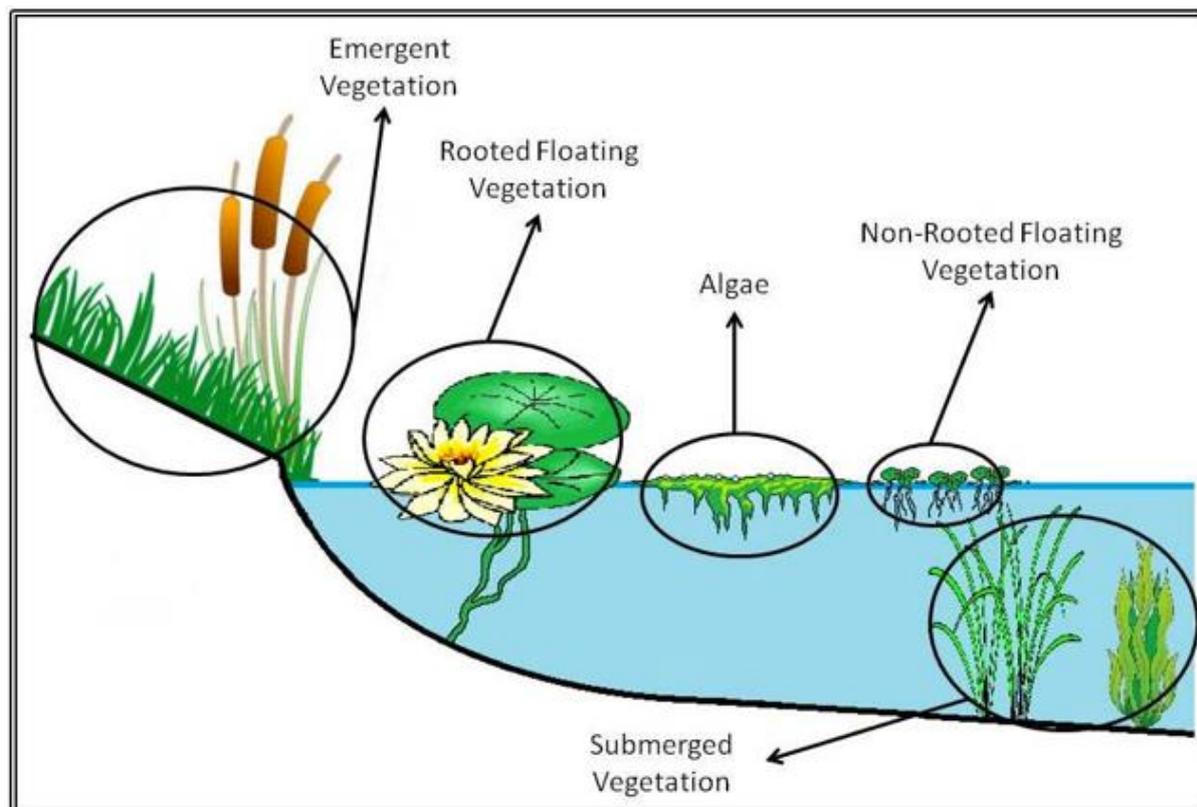


Fig. 2 Emergent, floating, and submerged aquatic vegetation groups

Algae

Freshwater algae can be found growing beneath the water's surface on rocks and mud in streams and rivers. They are more common in slower-flowing streams than in fast-flowing rivers. Didymo, the exotic pest alga known colloquially as 'rock snot,' is one of the few species that thrives in swift rivers. Even didymo, however, cannot withstand the turbulence of floodwaters.

What kinds of freshwater algae exist?

Green algae (*Chlorophyta*), red algae (*Rhodophyta*), blue-green algae (*Cyanobacteria*), and diatoms are the four major groups of algae found in streams (*Bacillariophyta*).

Green algae (*Chlorophyta*): Green algae frequently resembles strands of green hair flowing in the current. Spirogyra is a common type of green algae. Its chloroplasts are clearly visible as spirals under a microscope.



Fig.3 Green algae

Red algae (*Rhodophyta*): Red algae, such as *Audouinella*, uses a different part of the light spectrum, it can grow in places where other algae cannot, so it is commonly found in shaded areas such as under rocks or on banks.



Fig.4 Red algae (*Rhodophyta*)

Blue-green algae (*Cyanobacteria*): The alga's chlorophyll *Cyanobacteria* are not found in chloroplasts but are found throughout the cell. Other pigments than chlorophyll contribute to the colour of cyanobacteria, so they are not always bright green. Another cyanobacteria that can be found in streams is *Nostoc*. It appears to be bubbles of firm jelly clinging to the rocks. The 'bubbles' are clumps of small cell chains.



Fig.5 Blue-green algae (*Cyanobacteria*)

Diatoms (*Bacillariophyta*): To the naked eye, diatoms appear as brown growth mats, fluffy masses, or slimy layers on rocks. Gomphoneis forms thick, gleaming, light-brownish mats on river substrates and is frequently confused with didymo. Didymo, on the other hand, has much larger cells and grows in tougher, more fibrous mats..



Fig.6 Diatoms (*Bacillariophyta*)

Floating-Leaved Plants

Floating plants have roots that absorb water but are not attached to the water's surface. Floating plants are found in both fresh and salt water. These plants' leaves are firm and flat in order to absorb more sunlight. Floating plants commonly include water hyacinth (*Eichhornia crassipes*) and water lily (*Nymphaeaceae sp.*)

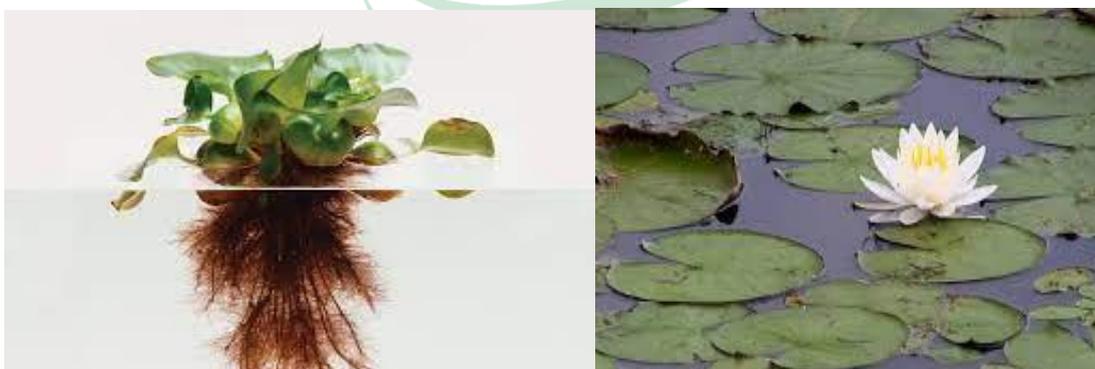


Fig.7 Water hyacinth (*Eichhornia crassipes*) Fig.8 Water lily (*Nymphaeaceae sp.*)

Submerged Plants

Submerged or submersed plants are usually, but not always, rooted to the bottom, and the majority of their vegetation is submerged. These plants' leaves are thin and narrow. Hydrillas (*Hydrilla verticillate*) and Vallisneria (*Vallisneria spiralis*) are examples of submerged plants.



Fig.9 Hydrilla (*Hydrilla verticillate*) Fig.10 Vallisneria (*Vallisneria spiralis*)

Emerged Plants

Emerged plants (also known as emersed) are rooted to the ground of the water but have most of their vegetation above water. These plants need constant exposure to sunlight. Examples of emerged plants include cattail (*Typha latifolia*) and horsetail (*Equisetum sp.*).



Fig.11 Cattail (*Typha latifolia*)

Fig.12 Horsetail (*Equisetum sp.*).

Benefits of Aquatic Plants

Aquatic plants aren't just used to add interest to a fish tank or to provide a safe place for frogs (though their ability to add to the aesthetics of bodies of water is certainly something worth mentioning). Rather, they are an essential component of aquatic environments because they can:

- Give fish protection.
- Increase the amount of oxygen in the water
- Filter water to
- Prevent the growth of undesirable plants
- Serve as food

Many animals, including fish, birds, mammals, mollusks, and arthropods (insects and crustaceae), consume aquatic plants (Gross et al., 2001).

Furthermore, in larger bodies of water, they can assist our shores in combating aggressive currents and erosion.

References

Bornette, G., &Puijalon, S. (2009). Macrophytes: ecology of aquatic plants. *eLS*.

Green AJ, Figuerola J and Sanchez MI (2002) Implications of waterbird ecology for the dispersal of aquatic organisms. *Acta Oecologica* 23: 177–189.

Gross EM, Johnson RL and Hairston NG Jr (2001) Experimental evidence for changes in submersed macrophyte species composition caused by the herbivore *Acentriaephemerella* (Lepidoptera). *Oecologia* 127: 105–114

Rascio N (2002) The underwater life of secondarily aquatic plants: some problems and solutions. *Critical Reviews in Plant Sciences* 21: 401–427.