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Aquatic Plants

For Beautification and Ecological Balance

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Introduction

Aquatic plants are a category of plants that are adapted to grow in water or in soil that is saturated with water. These plants have evolved various structural and physiological adaptations to thrive in aquatic environments, including freshwater and marine habitats. Aquatic plants can be found in a wide range of water bodies, including ponds, lakes, rivers, streams, wetlands, estuaries, and oceans. They serve several important ecological roles and provide numerous benefits to aquatic ecosystems.

Ecological Roles

a. **Nutrient Absorption**: Aquatic plants can absorb excess nutrients like nitrogen and phosphorus from the water. These nutrients often enter water bodies through agricultural runoff, sewage, and other sources. When these nutrients accumulate in water bodies, they can lead to problems like eutrophication, which can harm aquatic ecosystems. Aquatic plants help mitigate this by taking up these nutrients, thereby reducing their concentrations in the water.

b. **Bacteria and Contaminant Removal**: Plants in aquatic environments can also capture and remove bacteria, metals, and certain chemicals from the water. The root systems of these plants provide habitat and substrate for beneficial microorganisms that break down and detoxify contaminants.

c. **Sediment Stabilization**: Aquatic plants help stabilize the sediment on the bottom of water bodies, preventing erosion and reducing the turbidity of the water. This, in turn, improves water clarity and quality.

d. **Oxygenation**: Just as terrestrial plants release oxygen into the air, aquatic plants release oxygen into the water during

photosynthesis. This oxygenation is crucial for the survival of aquatic organisms, including fish.

e. Water Filtration: As you mentioned, plant-based water filtration systems are gaining attention as a sustainable and natural method for cleaning water without the use of chemicals. Constructed wetlands, for example, use a variety of aquatic plants to filter and treat wastewater, removing pollutants and improving water quality before it re-enters natural water bodies or is reused.

f. Habitat: Aquatic plants provide habitat and food for a variety of aquatic organisms, including fish, amphibians, invertebrates, and waterfowl.

g. Erosion Control: The root systems of aquatic plants help stabilize shorelines and prevent soil erosion.

Human Uses

Ornamental: Some aquatic plants are cultivated for ornamental purposes in ponds and water gardens.

Food: Certain aquatic plants, like water chestnuts and lotus roots, are edible and used in various cuisines.

Phytoremediation: Phytoremediation is an environmentally friendly and cost-effective technique that uses plants to remove, degrade, or contain various contaminants from soil, water, and air. It is a sustainable approach to environmental cleanup and remediation, as it harnesses the natural abilities of plants to improve the quality of polluted or contaminated environments. Phytoremediation can be employed to address a wide range of pollutants, including heavy metals, organic compounds, and even radioactive materials. Aquatic plants are used in phytoremediation projects to clean up polluted water by absorbing contaminants.

Adaptations for Life in Water

Root Systems: Aquatic plants typically have specialized root systems that help anchor them in waterlogged or muddy substrates. These roots also aid in nutrient uptake.

Aerenchyma: Many aquatic plants have aerenchyma tissue, which contains air spaces that enable them to float and exchange gases, particularly oxygen, with the surrounding water.

Floating Leaves: Some aquatic plants have leaves that float on the water's surface, maximizing their exposure to sunlight for photosynthesis.

Types of Aquatic Plants

Submerged Plants: These plants grow entirely underwater, with their leaves and stems submerged. Examples include various species of underwater grasses and algae.

Floating Plants: These plants float on the water's surface and do not have their roots anchored in the substrate. Examples include water hyacinth and duckweed.

Emergent Plants: Emergent aquatic plants are rooted in the substrate but have leaves and stems that extend above the water's surface. Examples include cattails and water lilies.

Marginal Plants: Marginal plants grow along the edges of water bodies, often in shallow water or wetland areas. Examples include bulrushes and sedges.

Best plants to filter impurities

- **Water Iris-**Water Iris are known to be one of the best aquatic plants to remove toxins from the water in your pond or water garden. Iris adds a splash of color to the pond in early spring when other plants are not yet blooming.
- **Taro-**Taro roots have a large surface area to help take up nutrients from the water. Taro come in many varieties to add showy leaves and it gives beautiful aesthetic factor to pond garden.
- **Canna-**Canna come in many varieties and adds beauty, color and interest, while helping to remove nutrients, heavy metals and toxins from the pond.

- **Pickerel Rush-**Pickerel Rush is a staple in the water garden world. Pickerel Rush is a tall and stately plant with striking foliage and bottle brush flowers in pink, blue and white. Pickerel Rush will definitely help to clean and purify the water in water garden or bio-filter.

Water Iris

Taro

Canna

Pickerel Rush

- **Watercress-**Watercress does an amazing job of cleaning impurities from the pond, is edible and is a lovely green plant that adds texture and interest in the water garden.
- **Water Celery-**Water Celery is a lovely marginal pond plant with light green, cream and subtle pink coloration. It does a good job of cleaning the water of toxins and extra nutrients in your pond.
- **Water Hyacinths-**Water Hyacinths are a true floating plant with thick, bulbous, emerald- green foliage and heavenly lavender flowers. The water hyacinths do an amazing job of pulling toxins, impurities, sediment and extra nutrients from the water.
- **Water Lettuce-**Water Lettuce is another true floating plant that helps to purify your pond water. Green rosettes float effortlessly across the surface of the water adding texture and interest while cleaning the impurities from the water.
- **Hornwort-**Hornwort is an oxygenator that grows beneath the surface of the water. Hornwort aids in algae elimination by taking up extra nutrients from the water, helping to starve out algae and by also emitting a hormone to inhibit algae growth.

Watercress

Water celery


Water Hyacinths


Water Lettuce


Hornwort

Conclusion

Plants are essential contributors to maintaining the quality of both air and water in our ecosystems. Recognizing and preserving these ecological services is important for the well-being of both the environment and human populations. Aquatic plants are an essential component of aquatic ecosystems, contributing to their health and functioning. However, some invasive aquatic plants can disrupt these ecosystems by outcompeting native species and causing ecological imbalances. Efforts are often made to manage and control invasive aquatic plants to protect the biodiversity of water bodies.