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Topic: Morphological and Anatomical Adaptations of Hydrophytes
(continued)
Lecture no.- 09

Anatomical adaptations of Hydrophytes:

An important anatomical feature of all hydrophytes is the sponginess of their tissues. They have extensive air-spaces in their leaves, stems and roots. This helps in keeping the buoyancy of plants and facilitates exchange of gases. The epidermis usually lacks cuticle or periderm and stomata are not present in the submerged leaves. Hydrophytes have reduced vascular elements. The absence of secondary growth in thickness of stems and roots is also an important characteristic of hydrophytes.

1. The root and shoot systems show common features such as cuticle which is very thin or absent.
2. Epidermis is usually a single layer of thin walled cells, not protective in function.
3. Cortex is well developed. It has numerous air chambers. It helps in buoyancy and rapid gaseous exchange.
4. Mechanical tissues are generally absent.

5. In the vascular tissue, xylem vessels are less common. Only tracheids are present in submerged forms.
6. In amphibious form, the xylem and phloem are well developed (e.g.) *Limnophylla heterophylla* or vascular bundles may be aggregated towards the centre. (e.g. *Jussiaea*)
7. Epidermal cells of Phloem leaves contain chloroplasts and they can function as photosynthetic tissue, especially where the leaves and stems are very thin. eg. *Hydrilla*
8. Stomata are totally absent in submerged, but in floating leaves, stomata are confined only to the upper surface. In amphibious plants stomata may be scattered on all the aerial parts.
9. In submerged leaves, air chambers are filled with respiratory and other gases and moisture.
10. In Water Lilly (*Nymphaea*) and some other plants, special type of star shaped lignified cells called astrosclereids are developed. It gives mechanical support to the plants.
11. The aquatic plants exhibit a low compensation point and low osmotic concentration of cell sap.
12. Mucilage cells and mucilage canals secrete mucilage to protect the plant body from decay under water.

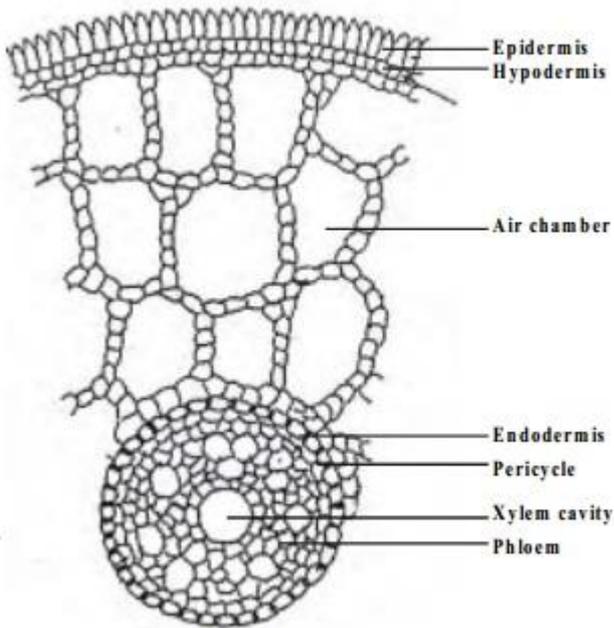


Fig : T.S. Hydrilla Stem

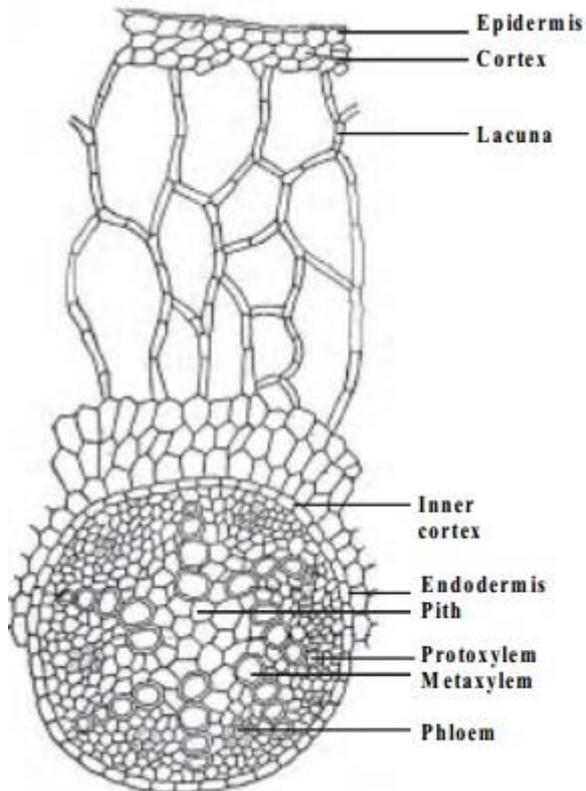


Fig : T.S. of Nymphaea root