

Plant habit

Plant habit refers to the general form of a plant, encompassing a variety of components such as stem duration and branching pattern, development, or texture. Most plants can be clearly designated as an herb, vine, liana, shrub, or tree. A **herb** is a plant in which any aboveground shoots, whether vegetative or reproductive, die back at the end of an annual growth season. Although the aboveground shoots are annual, the herb itself may be annual, biennial, or perennial, the last by means of long-lived underground rootstocks. Such perennial herbs, having a bulb, corm, rhizome, or tuber as the underground stem, are termed **geophytes**.

A **vine** is a plant with elongate, weak stems that are generally supported by means of scrambling, twining, tendrils, or roots; vines may be annual or perennial, herbaceous or woody. A **liana** (also spelled liane) is a vine that is perennial and woody, large; lianas are major components in the tree canopy layer of some tropical forests. A **shrub** is a perennial, woody plant with several main stems arising at ground level. A **subshrub** is a short shrub that is woody only at the base and that seasonally bears new, non-woody, annual shoots above. Finally, a **tree** is defined as a generally tall, perennial, woody plant having one main stem (the trunk) arising at ground level.

Plant habitat

Plant habitat refers to the general environment where the plant is growing. General habitat terms include whether the plant is **terrestrial**, growing on land; **aquatic**, growing in water; or **epiphytic**, growing on another plant. If aquatic, a plant can be **emersed**, occurring under water; **floating**, occurring at the water surface; or **emergent**, having roots or stems anchored to the substrate under water and aerial shoots growing above water. Other aspects of the habitat include the type of substrate that the plant is growing in (e.g., whether on sandy, loam, clay,

gravelly, or rocky soil, the slope, elevation, moisture, and surrounding vegetation, community, or ecosystem).

ROOTS

Roots are plant organs that function in anchorage and in absorption of water and minerals. Roots are found in all of the vascular land plants except for the Psilophytes *Psilotum* and relatives. (non-vascular land plants generally have **rhizoids** that assume a similar function.)

Roots, like shoots, develop by the formation of new cells within the actively growing **apical meristem** of the root tip. The apical meristem is covered on the outside by a **root cap**, functioning both to protect the root apical meristem and to provide lubrication as the root grows into the soil. The epidermal cells away from the root tip develop hair like extensions called **root hairs**; these function in greatly increasing the surface area available for water and mineral absorption.

Roots of many (if not most) species of plants have an interesting symbiotic interaction with a species of fungus, known as **mycorrhizae**. Although the exact function of mycorrhizae is often unclear, in some species at least the fungus host aids the plant both in increasing overall surface area for absorption and in increasing the efficiency of mineral uptake, particularly phosphorus. Roots have a central **vascular cylinder** of conductive cells, xylem and phloem. This vascular cylinder is surrounded by a special cylinder of cells known as the **endodermis**. Lateral roots develop by cell divisions within the **pericycle**, a cylindrical layer of parenchyma cells located just inside the endodermis itself.

The first root to develop in a vascular plant is the **radicle** of the embryo. If the radicle continues to develop after embryo growth, it is known as the **primary root**. Additional roots may arise from internal tissue of either another root, the stem/shoot (often near buds), or (rarely) a leaf. Roots that arise from other roots

are called **lateral roots**. Roots that arise from a non-root organ (stem or leaf) are **adventitious roots**.