

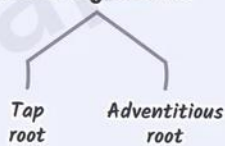
root to fruit, one modified structure at a time



The root system

- the radicle of the embryo grows into the primary root, which usually persists as the tap root in dicots, giving off lateral branches
- in most monocots the primary root is short-lived, replaced by roots arising from the base of the stem, called adventitious roots, forming a fibrous root system
- root functions: absorption of water and minerals, anchorage, and in some plants, storage or support

Root systems



the two root systems branch here: tap root keeps the primary root, adventitious root replaces it with roots from elsewhere on the stem

Root modifications *

Storage, tap root

swollen with food, e.g. conical (carrot), fusiform (radish), napiform (turnip)

Storage, adventitious

swollen roots that are not the primary root, e.g. the tuberous root of sweet potato

Support

prop roots hang down for extra support, as in banyan; stilt roots arise from the lower stem, as in maize

Respiratory

pneumatophores grow upward out of waterlogged soil, with pores for gas exchange, as in mangrove plants

The shoot system: stem and leaf

- the plumule of the embryo develops into the aerial stem, which bears nodes (where leaves arise) and internodes (the gap between two nodes)
- a leaf is a lateral outgrowth of the stem, borne at a node, and is the chief organ of photosynthesis
- a leaf has three parts: the leaf base, the petiole (stalk), and the lamina (blade); it can be simple (one undivided blade) or compound (blade divided into leaflets)

