

adaptations of plants

① Halophytes - sea lavender

- plants that can live in a habitat w/ ↑ con. of salt + ↓ cont. O_2

- leaves:
 - thick cuticle + sunken stomata
 - reduce rate of trans.

- succulent leaves
 - store water
- hydathode
 - eliminate excess salt
- old leaves
 - store salt + fall off when con. of salt too ↑

roots

- branched
 - pneumatophore root
 - many lenticels
 - enable gaseous ex.
- cell sap of roots
 - hypertonic to sea water
 - prevent cell sap lose
- H_2O thru osmosis

prop roots

- provide support in soft + muddy soil
- prevent plants from uprooted due to strong wind

② Mesophyte

- habitat × too dry / wet w/ adequate supply of H_2O

leaves

- more stomata @ lower epi.
 - prevent dir. exposed to sunlight
- prevent excessive loss of H_2O

- waxy, waterproof + transparent cuticle
 - reduce excessive loss of H_2O

roots

- branches widely
 - prov. support to cont. living
- vascular tissues
 - support 2nd growth
 - provide mechanical support
- xylem tissues
 - transport H_2O + min. salts

stems

- vascular tissues
 - support 2nd growth
 - strong + thick
 - protect from phy. injuries, pathogen infections + excessive water loss
- xylem
 - transport H_2O + min. salts via transpirational pull

③ Hydrophytes (submerged)

- plants that grow completely under the water

- leaves
 - thorn + small
 - increase diffusion of dissolved gases, mineral salts
 - × stomata + waxy cuticle
 - dissolved gases diffuses dir. in the plants thru epidermis

roots

- fibrous roots
 - large S.A.
 - trap air bubbles
- × xylem

stems

- small + hollow
 - float upright
 - reduce water resistance
- all cells ✓ chloroplast
- carry out photosynthesis

Hydrilla sp.

Elodea sp.

Vallisneria

④ Hydrophytes (floating)

- plants live in aq. habitats by floating on the water surface

leaves

- broad, thin + flat
 - absorb max. sunlight for photosyn.

- waxy, waterproof cuticle

- stomata always open

roots

fibrous

- large S.A.
 - trap air bubbles
 - ↑ buoyant force exerted by the surrounding H_2O

- × anchored to the bottom

stems

- aerenchyma
 - plenty air spaces - float

water lettuce

water lily

water hyacinth

lotus

lenna

⑤ Xerophytes - cactus, date palm, aloe vera

- plants live in hot + dry habitat w/ min. presence of H_2O

- leaves → small
 - reduce SA exposed to light
- leaves → thick waxy cuticle
 - store H_2O
 - reduce H_2O loss thru eva.

- modified in thorns
 - supply H_2O to plant by collecting dew
 - prevent plant from being eaten by animals

- embedded stomata
 - reduce H_2O eva.

roots

- long
 - penetrate deep in soil
- grow widely
 - obtain water + mineral salts from soil

shoots stems

- succulent stem
 - store water
- carry out photosyn. → growth