126 Halophytes

"plants which are growing on saline soils that contain high concentration of salt & insufficient amount of oxygen are called Halophytes eg :- Rhizophora, Alicennia

* They are found in salty, marshes, coastal regions ... etc
* Halophytes form the mangrove forests

Types of Halophytes

* Halophytes are plants growing in saline habitats. They tolerate high salinity
* On the basis of salt tolerance, halophytes are divided into four categories

(1) Salt Escaping plants (3) Salt resisting plants
(2) Salt Evading plants (4) Salt enduring plants

(1) Salt escaping plants :- Halophytes which grow in rainy season to escape from high salinity are called salt escaping plants
* Herbs complete their life cycle during the rainy season when the soil salinity is low.
* Salt escaping plants also called pseudohalophytes eg Agrophyron

(2) Salt Evading plants :- Halophytes having special mechanisms to exclude salt are called salt evading plants
* These plants reduce their inner salt can either by storing them in vacuoles or by removing the salt along with secretions eg Alicennia.

(3) Salt resisting / Evading plants :- these are succulent plants that reduce the concentration of salts in cells by diluting the salt with H_2O & mucilage eg Salicornia.

(4) Salt enduring plants :- These plants have hardened protoplasm to resist high concentration of salt.

Plant's response to salinity

Based on the plants response to salinity, halophytes are divided into

(1) Obligatory halophytes :- plants requiring salinity throughout their life are called obligatory halophytes.

(2) Preferential halophytes :- These halophytes are found in non saline soils but they show optimum growth only in saline soils.

(3) Supporting halophytes :- plants that grow well in non-saline soil but they remains unaffected in the saline soils are called supporting halophytes.

(4) Occasional halophytes :- plants growing in saline habitats occasionally are called occasional halophytes. They are also called accidental halophytes

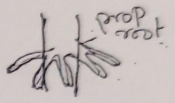
Adaptations of halophytes :- The halophytic adaptations are of three types they are.

(a) Morphological adaptations
(b) Anatomical adaptations.
(c) Physiological adaptations

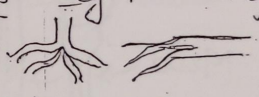
(a) Morphological adaptations :- External features of plants helping for their survival in saline habitats called as morphological adaptations

Roots :- In halophytes normal roots does not grow deep into the soil.

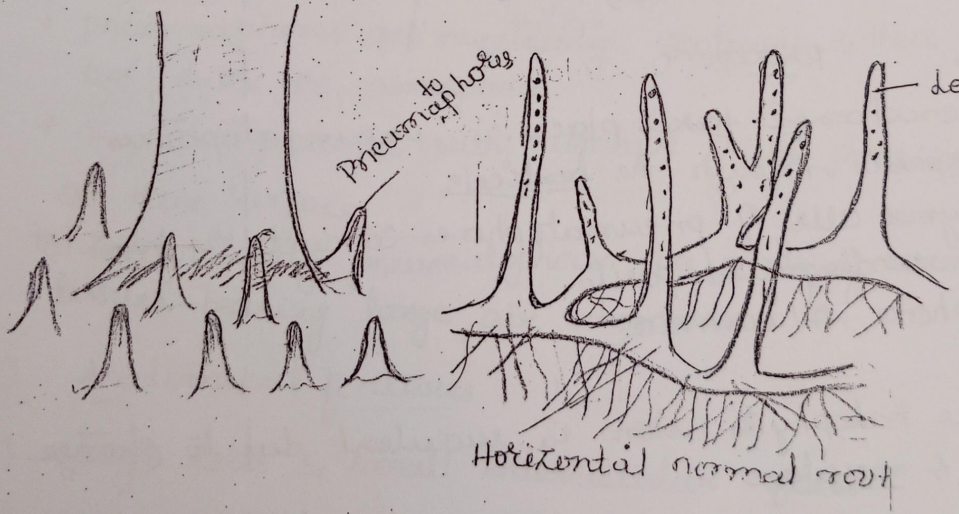
* So, halophytes produce supporting roots from aerial branches or base of stem.
* The supporting roots arising from the base of branches are called prop roots seen in Rhizophore.



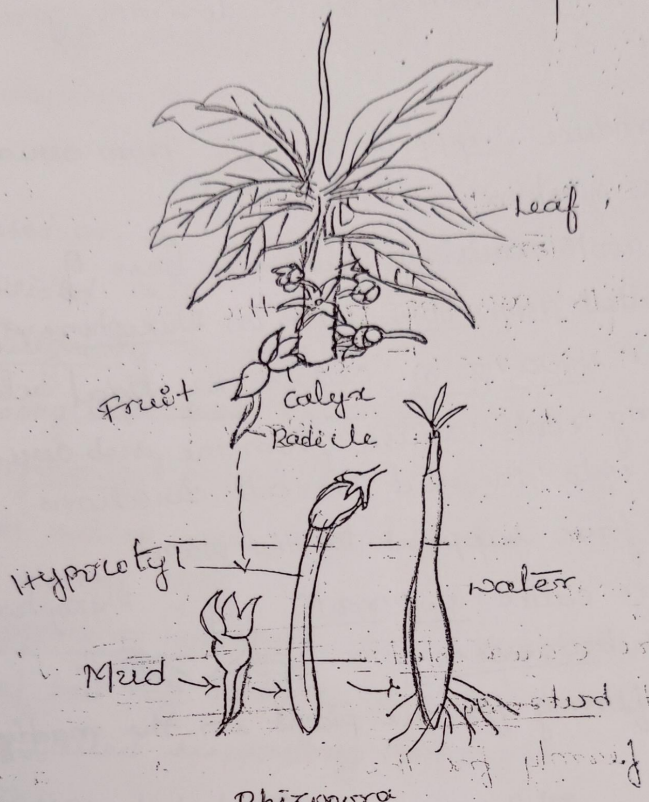
* They prevent the shaking of crown by tidal action
* Some supporting roots arise from the sub aerial of stem & grow into the soil in all directions.
* They provide firm support to the plant
* There roots are called stilt roots eg :- Rhizophore.
* The form root buttresses.



* The stilt roots firmly fix the plant in the muddy soil



Avicennia



Rhizopora

* Gaseous exchange takes place in pneumatophores & atmosphere through the lenticels
* Aerenchyma cells of pneumatophores conduct the gases to various underground parts
  Eg Rhizophora, Avicennia
* Stem
  * In some halophytes, stem is succulent due to storage of water & mucilage
* Leaves
  * Leaves are thick, leathery & they are densely covered with branched or unbranched hairs
  → Some plants are leafless.
  Fruits and Seeds
* Fruits & seeds are well adapted for dispersal through air & water
* They are light in weight & bear pneumatocysts air chamber

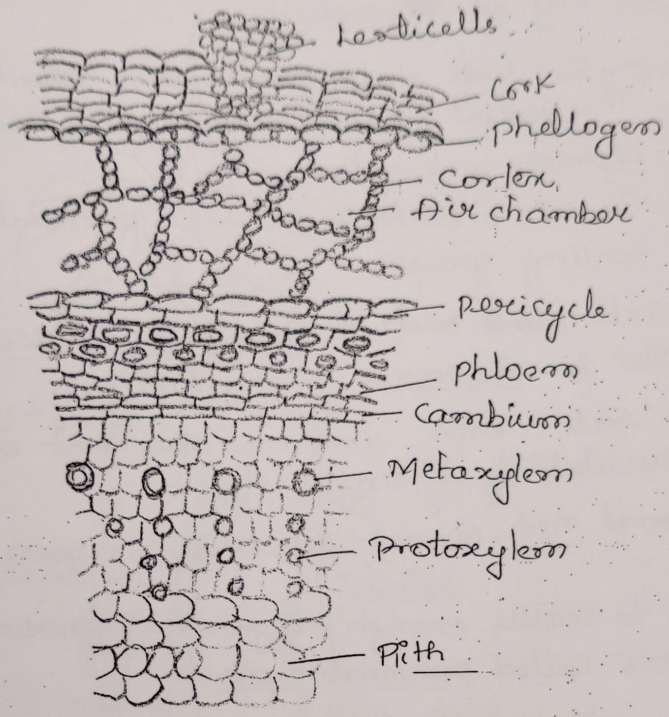
* So the seeds are easily dispersed by water

Viviparey in Rhizophora

* In halophytes seeds start germination when they remain attached to the parent plants. They made of seed germination is called Vivéporous germination
* Saline soils are unsuitable for seed germination & early stages of seedling growth
* In such soils plants such as Rhizophora, Avicennia are better adapted for Viviporous germination
* In saline soils, water remains stagment almost throughout the yeare & availability of oxygen is low
* Their normal root, cannot get enough oxygen from soil atmosphere
* In order to recille enough oxygen they produce a special type of roots called pneumatophore
* Respiratory roots / breathing roots from their horizontal roots
* pneumatophores are negatively geotropic & their growing tips enter the atmosphere
* They are provided with number of air pores or lenticles on their surface
* Anatomically pneumatophores are made of aerenchyma tissues bearing large air chambers

(b) Analomical features

(1) Large cells & small intercellular spaces
(2) High elasticity of cell walls
(3) Extensive development of water storing tissues
(4) Smaller relative surface area
(5) Small & fewer stomata
(6) Low chlorophyll content



TS of Pneumatophore

Pneumatophore develop a number of lenticels on the surface. The cortex is spongy & consists of extensive developed aerenchyma enclosing large air chamber. highly developed ~~xylem~~ ; Generally they show Conjoint Collateral Vascular bundles