Practical

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Sem:II

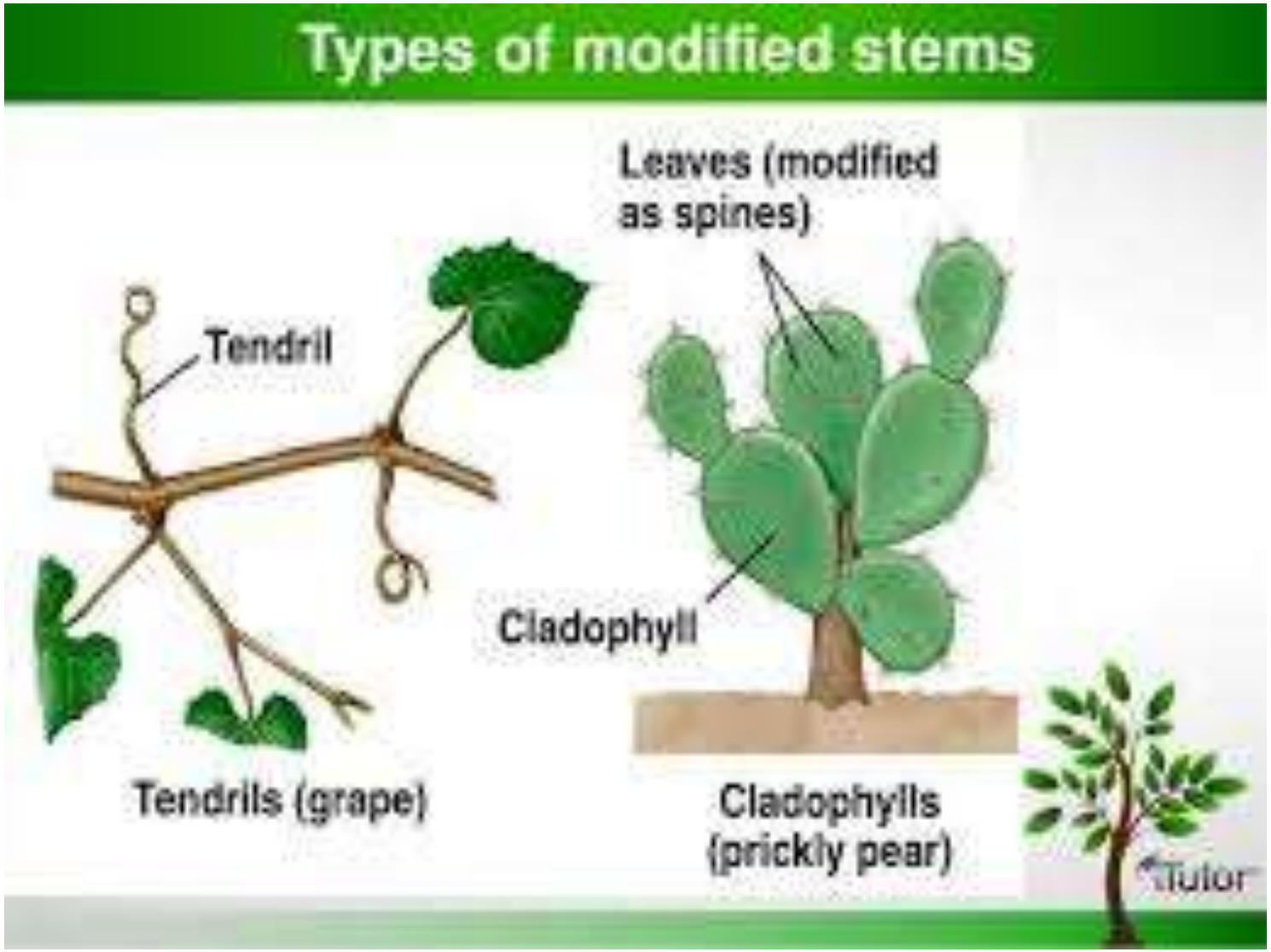
B.Sc.(Life Sciences)

Paper Name: Plant Ecology and Taxonomy

DDU College(Department of Botany)

Morphological adaptation of xerophytes

All Cacti are xerophytes


Types of modified stems
Leaves (modified as spines)
Tendril
Cladophyll
Tendrils (grape)
Cladophylls (prickly pear)
Tutor

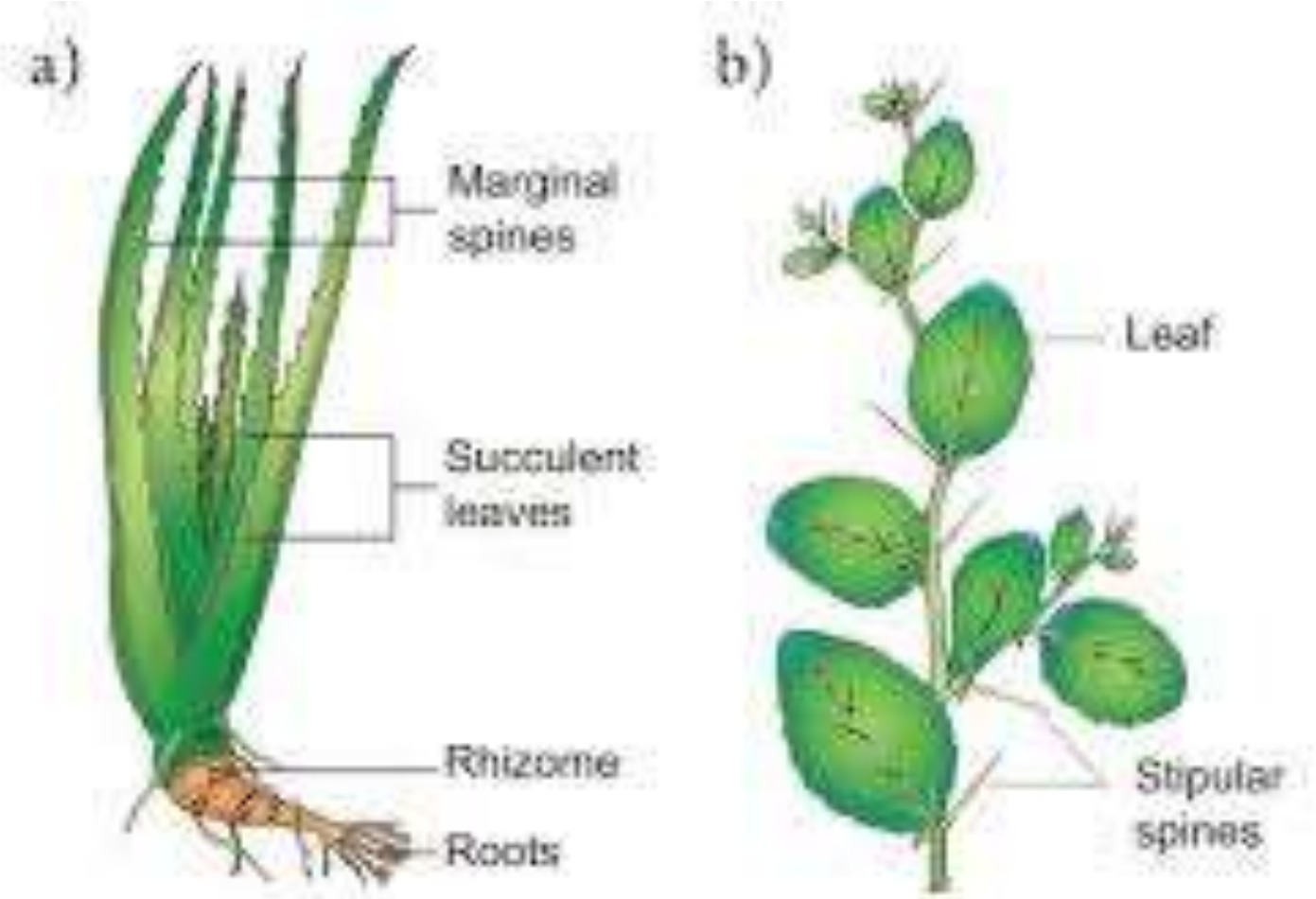
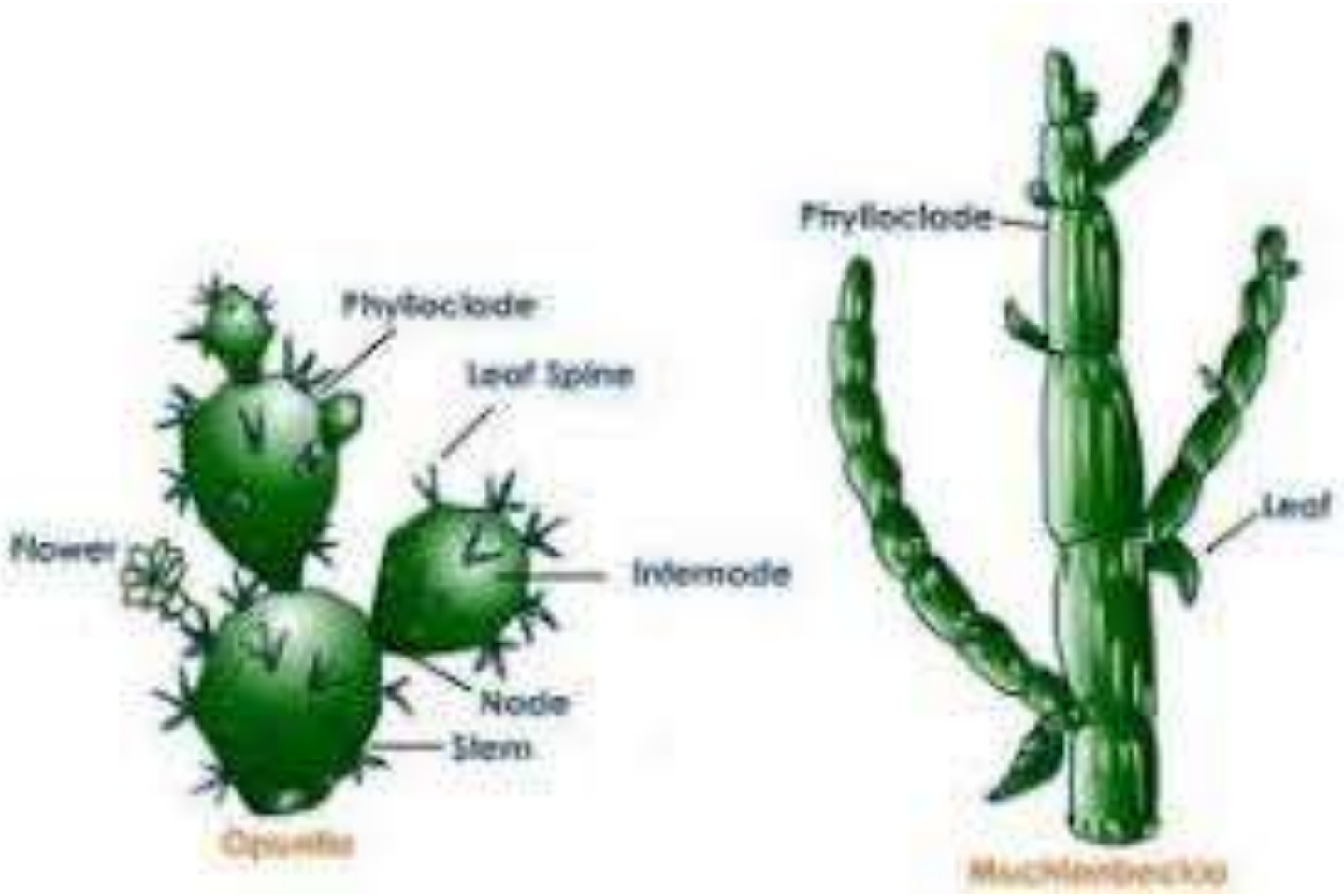
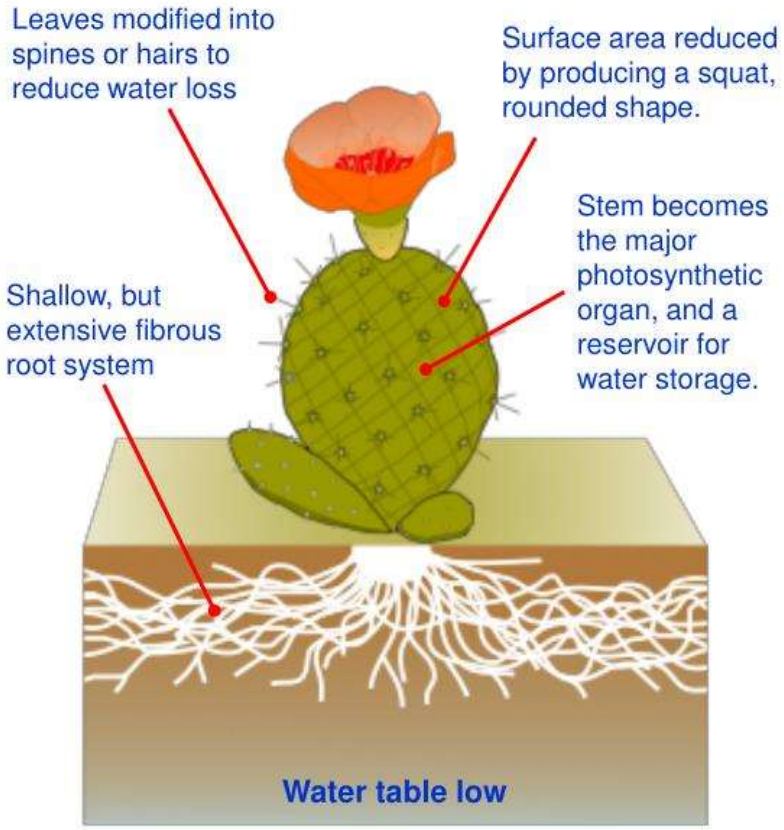


Figure 6.21: a)Succulent xerophyte – *Aloe*
b) Non succulent perennial - *Ziziphus*


Phylloclade
Leaf Spine
Flower
Internode
Node
Stem
Opuntia
Phylloclade
Leaf
Muehlenbeckia

Dry Desert Plants

- Plants adapted to dry conditions are called **xerophytes** and they show structural and physiological adaptations for water conservation.
  - **Desert plants**, e.g. cacti, cope with low rainfall and potentially high transpiration rates.
  - They develop strategies to reduce water loss, store water, and tap into available water supplies.



More Adaptations

- **Plants can have a variety of other adaptations, including:**
  - A thick waxy coating on their surface to reduce water loss.
  - Sunken stomata to reduce water loss.
  - Hairy leaves to reflect excess light.
  - Succulent leaves to store extra water.
  - Bulbs and tubers to safely store food underground.
  - Needles, thorns, and spines to avoid predation.
  - Modified stems called tendrils that can grasp objects by wrapping around them.

Needles

Help conserve water

Spines

Help conserve water and protects from predators

Tendrils

Allows plants to grow upwards to reach sunlight.

Thorns

Protects plant

Source: http://barrettmath.edu.glogster.com/plant-adaptations/

Xerophyte adaptations summary:

Adaptation	How it works	Example
thick cuticle	stops uncontrolled evaporation through leaf cells	
small leaf surface area	less surface area for evaporation	conifer needles, cactus spines
low stomata density	smaller surface area for diffusion	
sunken stomata	maintains humid air around stomata	marram grass, cacti
stomatal hairs (trichores)	maintains humid air around stomata	marram grass, couch grass
rolled leaves	maintains humid air around stomata	marram grass,
extensive roots	maximise water uptake	cacti

Xerophytes

Xerophytes are plants that have adaptations to reduce water loss or to conserve water.

They occupy habitats in which there is some kind of water stress. Examples of such water stress habitats include:

- Desert (high temp, low precipitation)
- High Altitude & High Latitude (low precipitation or water locked up as snow or ice)
- Rapid drainage (sand dunes)