

Morphology of Cycas

Habit

- Unbranched, palm-like trunk with a crown of large, pinnately compound leaves.
- Dioecious (male and female plants separate).

Root System

- Tap root with coralloid roots for nitrogen fixation.

Stem

- Unbranched, columnar stem with persistent leaf bases.

Leaves

- Large, pinnately compound leaves with circinate vernation (young leaves coiled like a fern).

Reproductive Structures

- Male: Pollen-bearing microsporophylls arranged spirally on a cone-like structure.
- Female: Ovules borne on megasporophylls, aggregated in a compact strobilus.

Seeds

- Large, fleshy seeds with a thick outer coat.

Economic Importance

- Ornamental plant, source of starch.

INTERNAL ANATOMY OF CYCAS

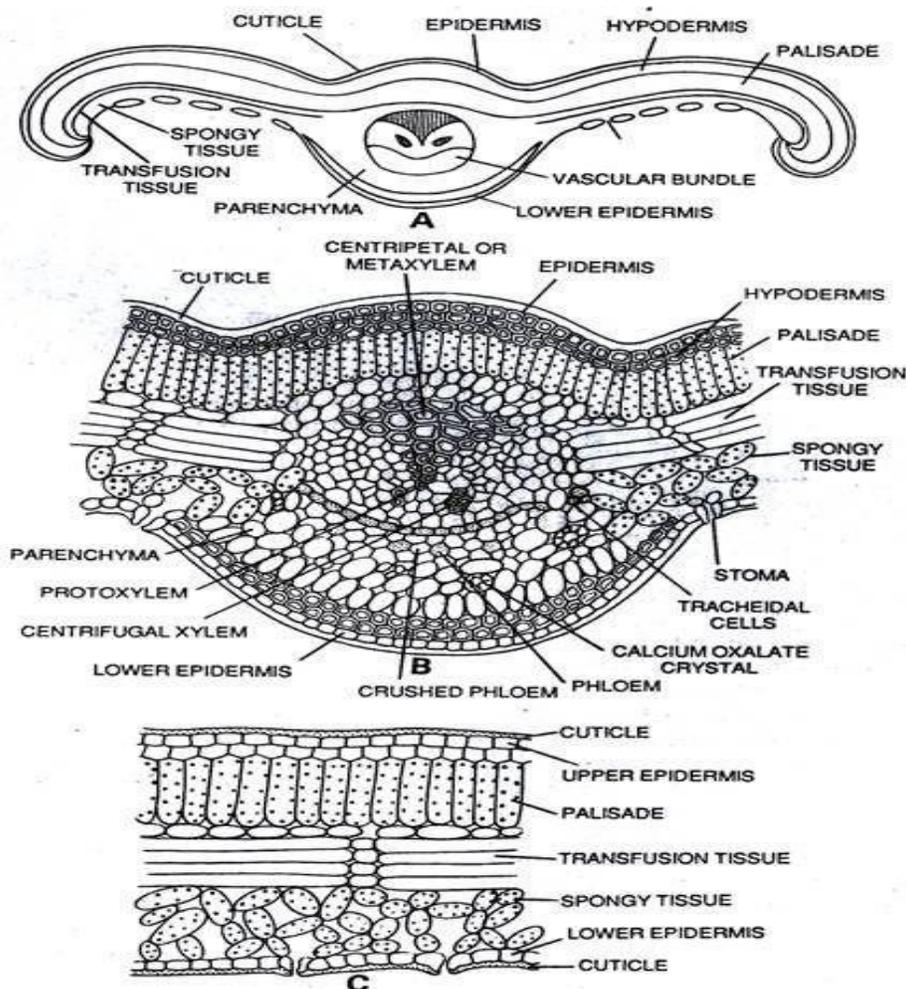


Fig. 3.22. *Cycas* sp. Anatomy of leaflet. A, T.S. of leaflet (diagrammatic structure); B, the detailed structure of mid-rib portion of the leaflet; C, T.S. of a portion of the wing of leaflet.

Morphology of Pinus

Habit

- Evergreen, resinous tree with a branched trunk and needle-like leaves.
- Monoecious (male and female reproductive structures on the same plant).

Root System

- Tap root followed by a well-developed lateral root system.

Stem

- Branched, woody stem with distinct nodes and internodes.

Leaves

- Needle-like leaves in clusters (fascicles).

Reproductive Structures

- Male: Pollen-bearing microsporophylls arranged in microsporangiate cones.
- Female: Ovules enclosed in ovuliferous scales, arranged in cones.

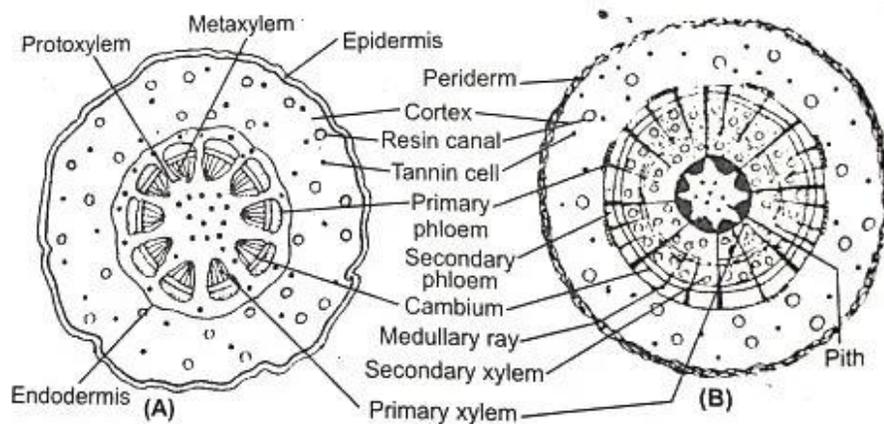
Seeds

- Winged seeds for dispersal.

Economic Importance

- Timber, paper, resin, turpentine.

INTERNAL ANATOMY OF PINUS



चित्र— पाइनस के तने की अनुप्रस्थ काट : (A) सामान्य, (B) द्वितीयक वृद्धि।

पाइनस के तने में द्वितीयक वृद्धि
(Secondary Growth in *Pinus* Stem)

Morphology of Ephedra

Habit

- Shrubby or scandent plant with jointed green stems.
- Dioecious (male and female plants separate).

Root System

- Adventitious root system.

Stem

- Jointed, green stem with photosynthetic function.

Leaves

- Reduced, scale-like leaves.

Reproductive Structures

- Male: Staminate flowers with reduced perianth and stamens.
- Female: Ovules enclosed in a fleshy, red or orange strobilus-like structure.

Seeds

- Small, dry seeds.

Economic Importance

- Medicinal (ephedrine).

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INTERNAL ANATOMY OF Ephedra

