

Quadrant II – Transcript and Related Materials

Programme : Bachelor of Science (First Year)

Subject : Botany

Paper Code : BOC -102

Paper Title : Biodiversity- II (Vascular Plants)

Unit : 02

Module Name : Classification and Morphology of *Cycas*

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Notes

Cycas

Classification (Coulter and Chamberlain)

Division: Gymnospermae (Seeds exposed; Wind pollination;

Fertilization siphonogamous; Sperms motile)

Order: Cycadales (Plants resemble palm; Formation of male cone; Megasporophylls loosely arranged; Wood soft and manoxylic)

Family: Cycadaceae (Leaves pinnately compound; Stem unbranched; Leaflets with single main vein, veinlets absent; Ovule orthotropous).

Genus: *Cycas*

Occurrence and distribution: *Cycas* is found in wild or cultivated in the tropical and subtropical regions of the world. Its species are distributed in Japan, India, China, Australia, Africa, Nepal, Bangladesh, Sri Lanka, Myanmar, Mauritius etc. *Cycas revoluta*, a native of China and Southern Japan and is the most widely

cultivated species grown throughout the world for its ornamental value. In India *Cycas* grows widely in the North East, East Bengal, Orissa, Assam, Meghalaya, Tamil Nadu, Karnataka etc. In India the genus is represented by 15 species viz., *Cycas annaikalensis* ; *Cycas beddomei*; *Cycas circinalis*; *Cycas darshii*; *Cycas indica* ; *Cycas nathorstii*; *Cycas nayagarhensis*; *Cycas orixensis* ; *Cycas pectinata*; *Cycas pschannae*; *Cycas revoluta*; *Cycas seshachalamensis*; *Cycas sainathii*; *Cycas sphaerica* ; *Cycas zeylanica*. Cultivated species is *Cycas revoluta*.

External Morphology:

Cycas is dioecious, slow growing, evergreen, long lived plant. It grows to a height of about 4 to 6 feet. The sporophytic plant body is differentiated into root, stem and leaves.

Roots are dimorphic with two types of roots, normal roots and coralloid roots.

Normal roots: The primary roots are tap root which are short lived and are replaced by adventitious roots. Normal roots penetrates the soil and hence positively geotropic and helps in attachment and absorption.

Coralloid roots: These are special types of adventitious roots developing from some of the normal roots, resembling corals in appearance, greenish brown in colour, Coralloid roots are negatively geotropic formed near the soil surface, shows dichotomous branching with rounded or blunt tips, root cap is absent.. The roots are inhabited by N₂ fixing blue green algae (Cyanobacteria) and thus helps in nitrogen fixation.

Stem: Stem is erect, stout, thick, columnar and usually unbranched having a crown of leaves at the apex. The stem is covered by persistent and woody leaf bases

giving an armoured appearance. Most part of the older stem is covered with a number of large foliage leaves and small scale leaves in male plants and scale leaves and megasporophyll in females plants.

Leaves: *Cycas* exhibits dimorphic heterophylly. It bears two types of leaves, Large, green assimilatory foliage leaves and small brown scale leaves arranged in alternating whorls.

Scale leaf (cataphylls) are small, rough, dry, triangular brown in colour, and protects the foliage leaves when the foliage leaves are young.

Foliage leaves: Foliage leaves are megaphyllous, produced in large number, and are unipinnately compound with about 50 – 100 pairs of sessile opposite/alternate leaflets. The leaves are attached to the stem with the help of transversely expanded rhomboidal leaf base. Rachis is hard, stout, with 2-3 pairs of short stiff spines near the base. Leaflets are thick, stiff, leathery, and sessile with narrow bases and decurrent margins. In most species the leaflets are elongated, ovate, or lanceolate. In *Cycas revoluta* the leaflets are lanceolate with revolute margins and spiny apex. Arrangement of leaflets on rachis may be opposite or alternate. The size and number of leaflets vary in different species. In very young leaves the rachis may be circinate with circinately coiled leaflets like those of ferns.