CYATHEALES, SALVINIALES AND POLYPODIALES

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Cyatheales

- Cyatheaceae – fifteen genera;
- *Cyathea (300) – Stout trunks – croen of large leaves – height of 25 metres*
- *Alsophila (300)*
- *Lophosoria*
- *Metaxya*
- *Culcita*
- *Hemitelia*
- *Cnemidaria*
- *Dicksonia*
- *Saccoloma*
- *Cystodium*
- *Thrysopteris*
- *Dennstaedtia*
- *Orthiopteris*
- *Hyolepsis*

Leaves of *Cyathea*

- Large, bipinnate – quadripinnate – rarely simple
- Venation – dichotomous with occasional anastomosis
- Simple hairs – dermal appendages
- Sori – marginal / Submarginal
- Two lipped indusium
- Radially symmetrical indusium – saucer like through cup-shaped to globose, surrounds the sorus of Cyathea
- Alsophila – Sori – naked ; Sporangia – protected by hair and some species – vestigeal indusium
- Cyatheoid sporangia – relatively large – oblique and uninterrupted annulus – differentiation – stomium

Cyathea – Steles

- Simple Solenostele with non-over lapping leaf gaps – dictyostele with over lapping leaf gaps – more complex polycylis one
- Cythea, Alsophila – Dictyostele with additional medullary strand and cortical bundles
- Cauline bundles – Sclerenchymatous sheath
- Metaxya – creeping stem – Solenostelic with simple leaf traces
- Stele, Leaf traces, absence of cortical, medullary bundles – eelvated to indivisual family

Cyathea - gametophytes

- Cyatheoids - Surface living cordate and massive – promient cushion
- Sex organs – borne – usual position
- Antheridium – five cells, a stalk cell, funnel cell, two ring cells and a cap cell
- Archegonium – only neck canal cell – many four nuclei
- G – dennataedtiods – delicate thinner cushions and neck canal cells in archgonium rarely – more than two nuclei

Salviniales

- *Marsilea, Salvinia, Azolla*
- *MARSILEA*
  - *Slender creeping, dichotomously branched rhizome*
  - *Each nore – one / two adventitous roots and an upright leaf*
  - *Flexible petiole and lamina – four leflets*
  - *Four leaf clover - leaves – circinate – young*
  - *Night – leaf lets – folded upwards – sleeping position*
  - *Presence of latex – petiole = Angiosperm*
  - *Reproduction St. – Sporocarps – short / long stalks inserted a short distance above the base of petiole*
  - *Shallow water – wet places – few grow in soil*
  - *M. hirsuta – Xerophytic*

Marsilea Rhizome

- Apical cell – three cutting faces – regularly forms segments – building uits of stem
- Amphiphloeic siphonostele – solenostele
- Xylem surreounded externally – internally – endodermis, pericycle and phloem
- Middle cortex – aerenchymatous – single ring chambers
- Septum – divide the chambers
- Stele – Petiole – triangular – single endodermis

Marsilea Reproduction

- Sporocarp – flattened bean shaped, spherical to ovoid, epipetiolar, stalked structures, Sporocarp per petiole – M. polycarpa – more number of sporocarps

Salvinia

- Slender branched rhizome without roots
- Free floating – node – three leaves – two laterals – floating - third one – submerged
- Submerged leaf – highly branched – covered with waxy hairs
- Atem – fragile
- Reproduction – sporocarps – borne in clusters – sporocarp – two layered
- Microsporangium – slender stalk – single row of cells – leptosporangiate – prominent tapetum – sporangial wall – delicate – magasporangium – 32 spores
- Microsporangium – 16 sporocytes – 64 microspores (trilete)

Azolla

- Crowded moss –like leaves – free floating rhizome – submerged roots
- Branching – free ; roots – lower side
- Leaves – alternate rows – leaf – divided into two lobes
- Submerged lobe – one cell thick
- Aerial lobe – more than one cell thick – photosynthetic with stomata – both surface
- Upper epidermis – ½ celled hairs
- Lower surface – mucilage cavities harbouring live colonies – Anabaena
- Sporocarp – lateral branch – pair of lower lobe of leaf

Azolla

- Stem- apical cell – with three cutting faces
- VB – Siphonostele
- Xylem – one layer of tracheids
- Cortex – 5-8 cells thickness
- Thin walled parenchymatous cell – intercellular spaces
- Reproduction \ Sporocarp – dimorphic
- Bigger – MiCROSPORANGIATE
- Smaller – Megasporangiate
- Sporocarp – two layered
- Microspore – 64
- Megaspores – 32

Polypodiales

- Absence of indusium – epiphytes – restricted to tropics
- Rhizome – dictyostele
- Leaves – simple – pinnate with anastomsing
- Sori – round ; Acrostichoid - Platycerium