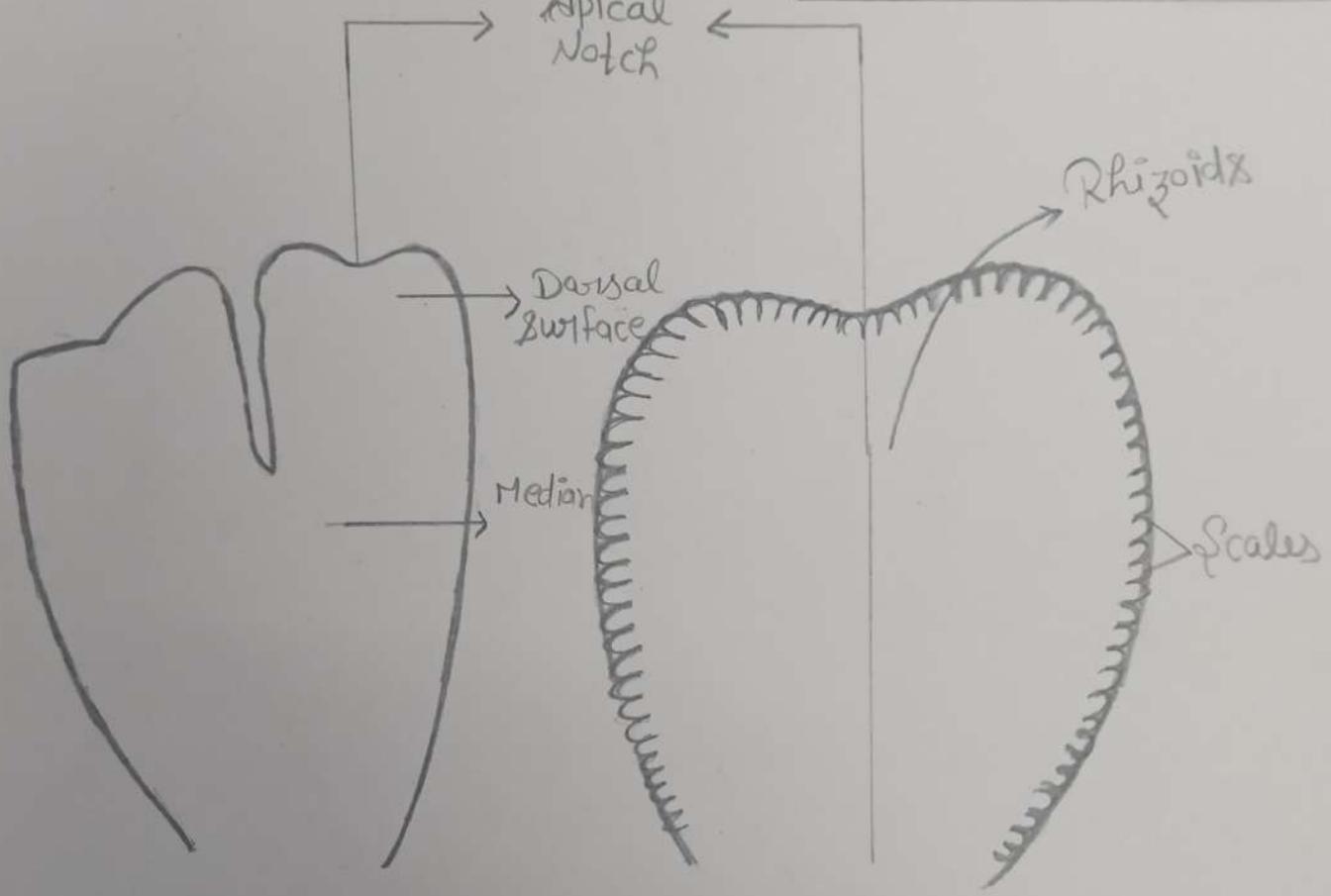
Classification

Kingdom : Plantae
Order : Marchantiales
Family : Ricciaceae
Genus : Riccia



Dorsal surface of thallus

Ventral surface of thallus

Riccia

Date: / /

RICCIA

* Occurence :- All the species are terrestial exept Riccia Fluitans. Which is aquatic. Riccia occurs commonly on moist shady places, damp walls, rocks and moist true trucks. It forms rosette-shaped structures.

* External features

Study dorsal and ventral surfaces of the thallus separate scales and mount in glycerine. also separate rhizoids from the ventral surface. Stain in safranin, mount in glycerine and study.

1. Gametophytic plant body is thalloid prostrate. linear or ribbon shaped and flattened structure.
2. It is dichotomously branched and green to light green in colour.
3. Thallus is thick in the middle and becomes thin towards the margins.

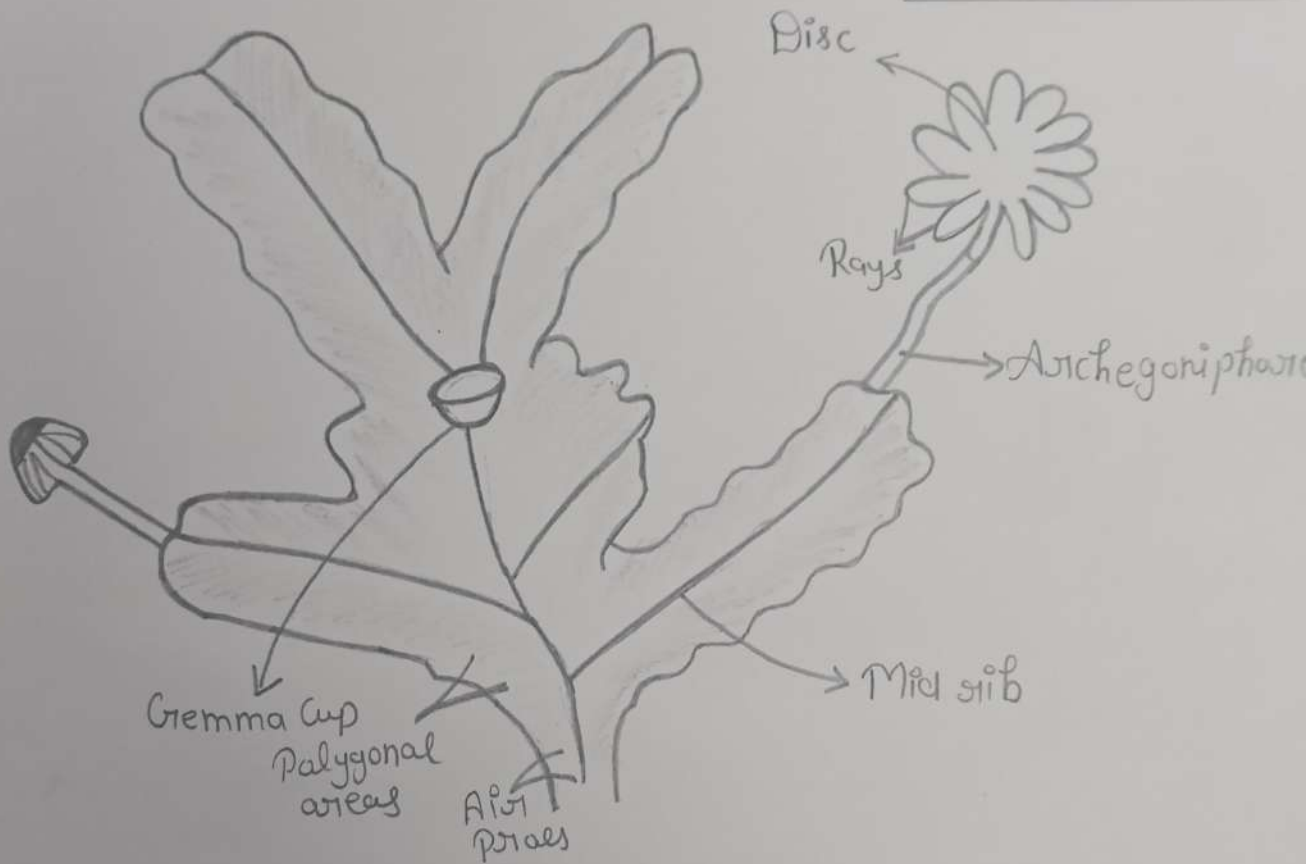
Classification

Kingdom: Plantae

order : Marchanti-ales

family: Marchantia-ceae

Genus: Marchantia



Marchantia

MARCHANTIA

* Occurence :- It is cosmopalitan in distribution and is found commonly in moist and coal surroundings, banks of streams, damp shady places and on the rocks of hills.

* External features of Gametophyte :-

- The plant body is thalloid, prostrate, green in colour, and larger than Riccia.
- It is dichotomously branched and is differentiated dorsiventrally.
- The thalli attain a length of 2 to or more.
- A growing point is situated at the notch of the apex of each lobe.

Dorsal surface :-

- A clear mid-dorsal groove is present
- Many diamond-shaped rhombohidral or polygonal areas are present, if observed under a magnifying lens.

Classification

Kingdom: Plantae

order: sphagnales

Family sphagnaceae

Genus sphagnum

Sphagnum

Page No. :
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SPHAGNUM
(PEAT-MOSS OR BOG-MOSS)

* Occurence :- Plants occur in water commonly in peats on the banks of lakes and sometimes near banks of streams and cold places.

* Mature Gametophyte :-

- from the multicellular thallus-like body, which develops from the germination of spore, arises a single gametophyte.

- Gametophores are varying in size from few inches to 2 to 7 feet.

- Gametophyte are perennial, branched, and differentiated into leaves, axis and rhizoids.

- Rhizoids are present only in young gametophores and are multicellular branched with oblique septa.

- At the apical end of each branch, there are branched present a number of limited branches crowded together, thus forming a coma.

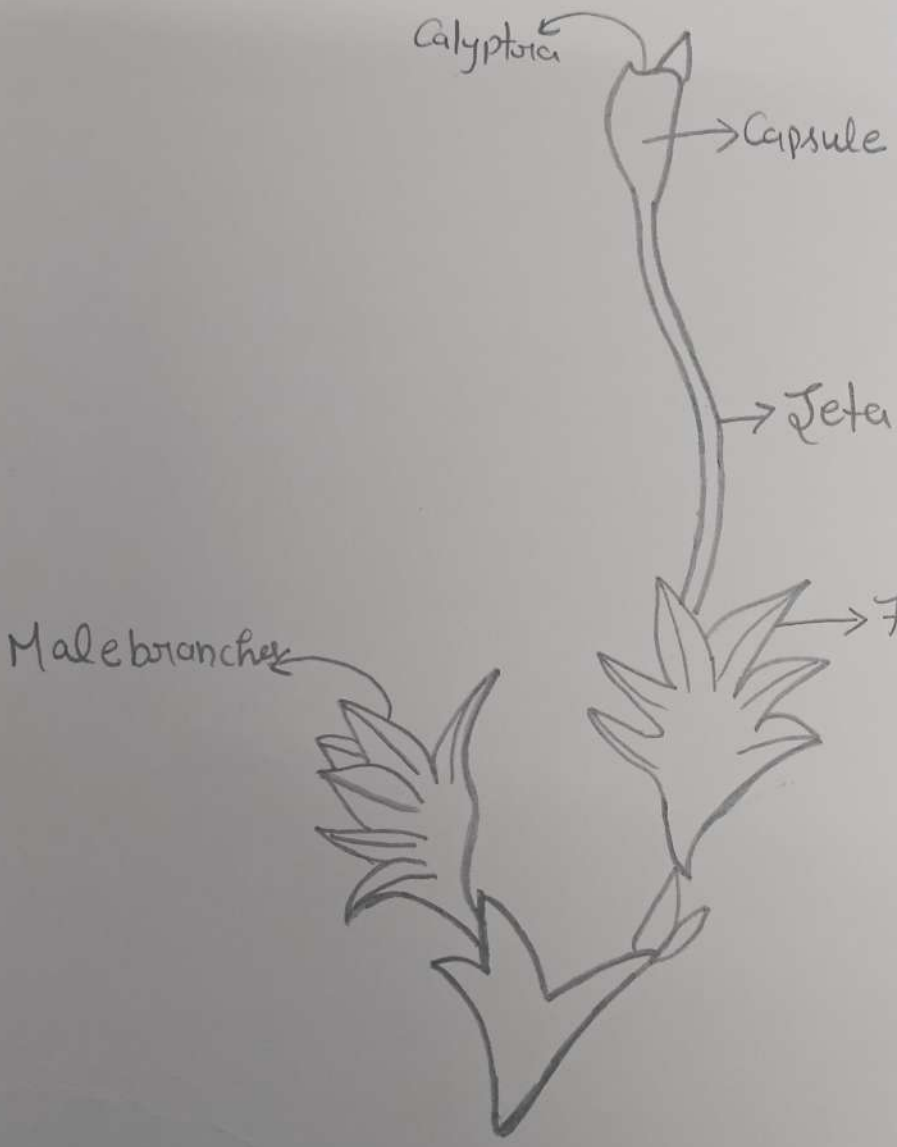
Classification

Kingdom: Plantae

order: Funariales

Family: Funariaceae

Genus: Funaria



Funaria

Page No. :
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FUNARIA

Occurence :- It occurs commonly in winters and rainy season on the tree trunks, crevices, damp walls, moist soil and moist rocks, in the form of close tufts.

* External Features of Gametophore :-

Observe arrangement of leaves, structures of rhizoids, oblique septa in the rhizoids and long nature of seta.

- Plant body is gametophyte and each gametophore consists of rhizoids, stem, and leaves
- Each gametophyte is slender, erect and attains a height of 1 to 3 cm or more.
- Rhizoids arise from the base of the 'stem' in the form of tufts.
- Each rhizoids is branched, filamentous multicellular and containing oblique septa.

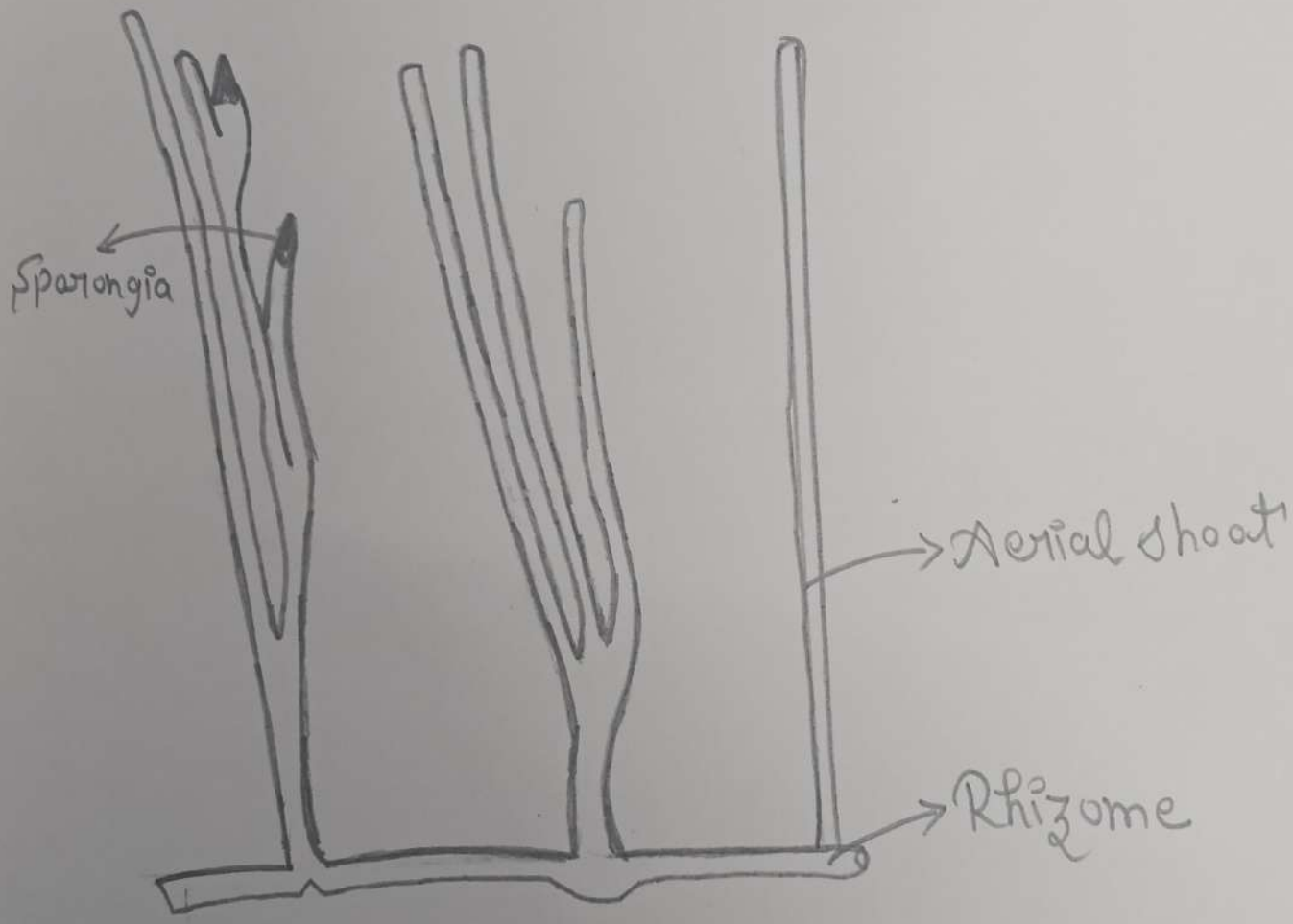
Classification

Kingdom: Plantae

Order: Rhyniales

Family: Rhyniaceae

Genus: Rhynia



Rhynia

RHYNIA

* Occurence :- It is a fossil genus. It was reported is district Aberdenshire of Scotland by kidston and long (1917). It was present in middle Devonian about 3.90 million years ago.

* External features :

- Plant body was sporophylic
- Rhynia major was bigger and attained a height of 50 cm with a diameter of 1.5 mm to 6 mm, while R. gwynne-vaughani had a height of 20 cm and a diameter of 1 to 3 mm.
- Plants had a rhizome which was dichotomously branched.
- From rhizome, developed many dichotomously branched erect aerial shoots towards the upper side while many rhizoids towards the lower side.
- There were no roots on the plants
- Aerial shoots were either ending in simple vegetative tips or having terminal sporangia.

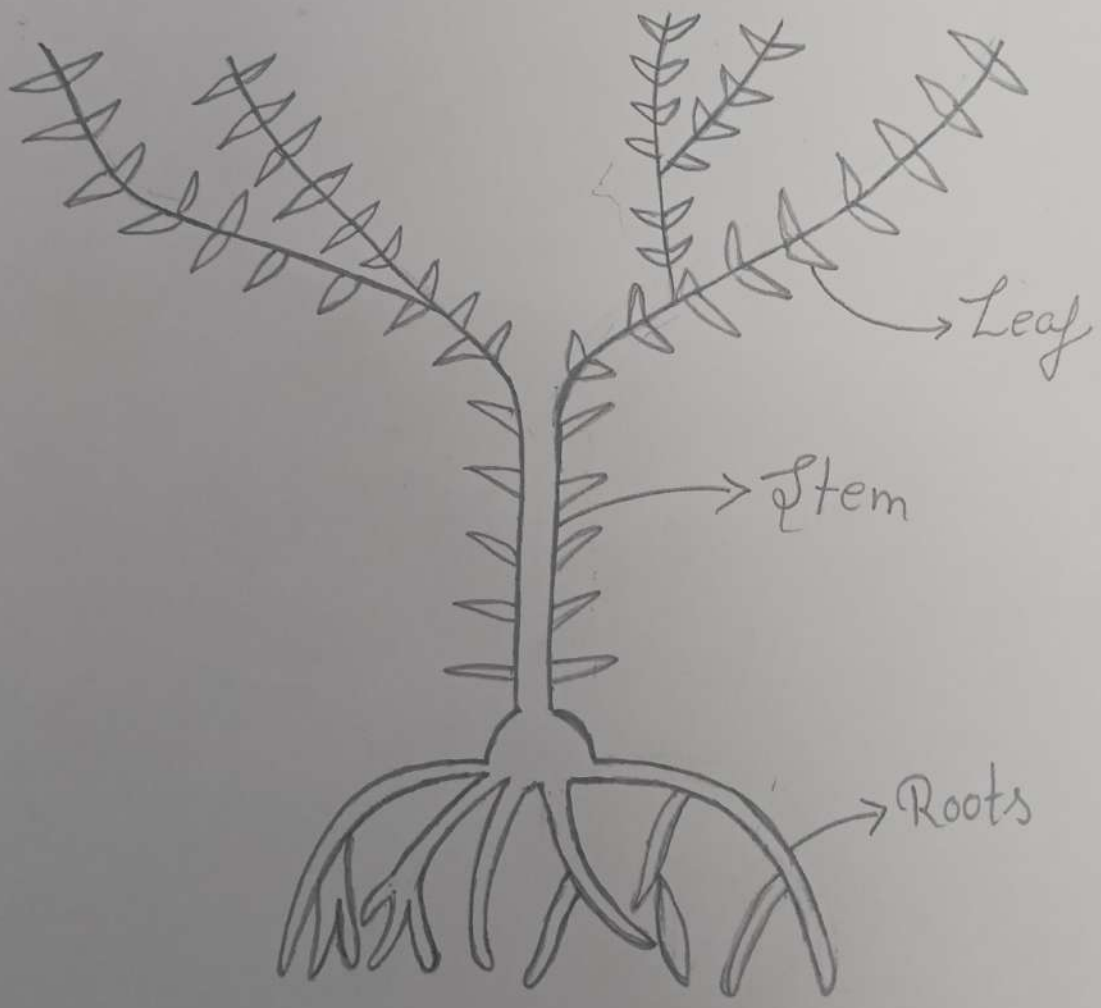
Classification

Kingdom: Plantae

order: selaginellaceae

family: selaginellaceae

Genus: selaginella



SELAGINELLA

SELAGINELLA
(Small Club Moss)

* Occurence :- It is cosmoposition in distribution and occurs commonly in tropical and temperate regions. Many of them occur in damp shady habitats while some in xerophytic conditions, e.g., Selaginella lepidophylla, and a few as epiphytis, Eg. S. arregona.

* External features :- observe the structure of the plant and arrangement, types and shapes of leaves ligule, rhizaphore and roots.

- Plant body is sporophytic and the sporophyte is evergreen and perennial.

- Most of the species are prostrate but Selaginella trachyphytta is sub-erect and S. erythropus is erect.

- Size of the sporophyte ranges from a few cm to several feet in different species.

- Plant body is differentiated into stem, leaves, rhizaphore and roots.

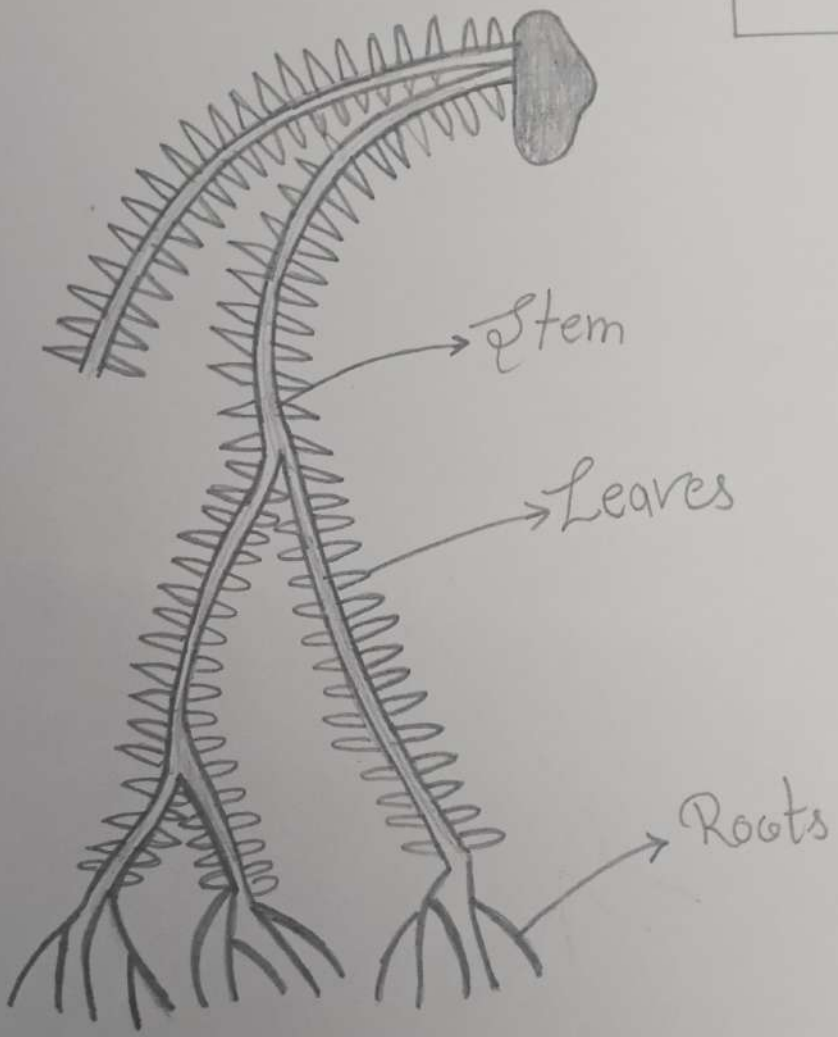
Classification

Kingdom: Plantae

order: Lycopodiales

Family: Lycopodiaceae

Genus: Lycopodium



Lycopodium

LYCOPODIUM

* Occurence :- Most of the Lycopodium species occur in moist shady places rich in humans and other organic matter.

* External Features of the Sporophyte :-

- Plant body is sporophytic and the sporophyte is divisible into roots, stems and leaves.

- Roots are adventitious, dichotomously branched and small.
- Stem is erect or pendant in sub-genus Urostachya, while is prostrate with upright branches is sub-genus Rhopalostachya.

- The branching of the stem is partly monopodial and partly dichotomus.

- The stem is thickly covered with many leaves.

- Leaves contain many equally distributed stomata.

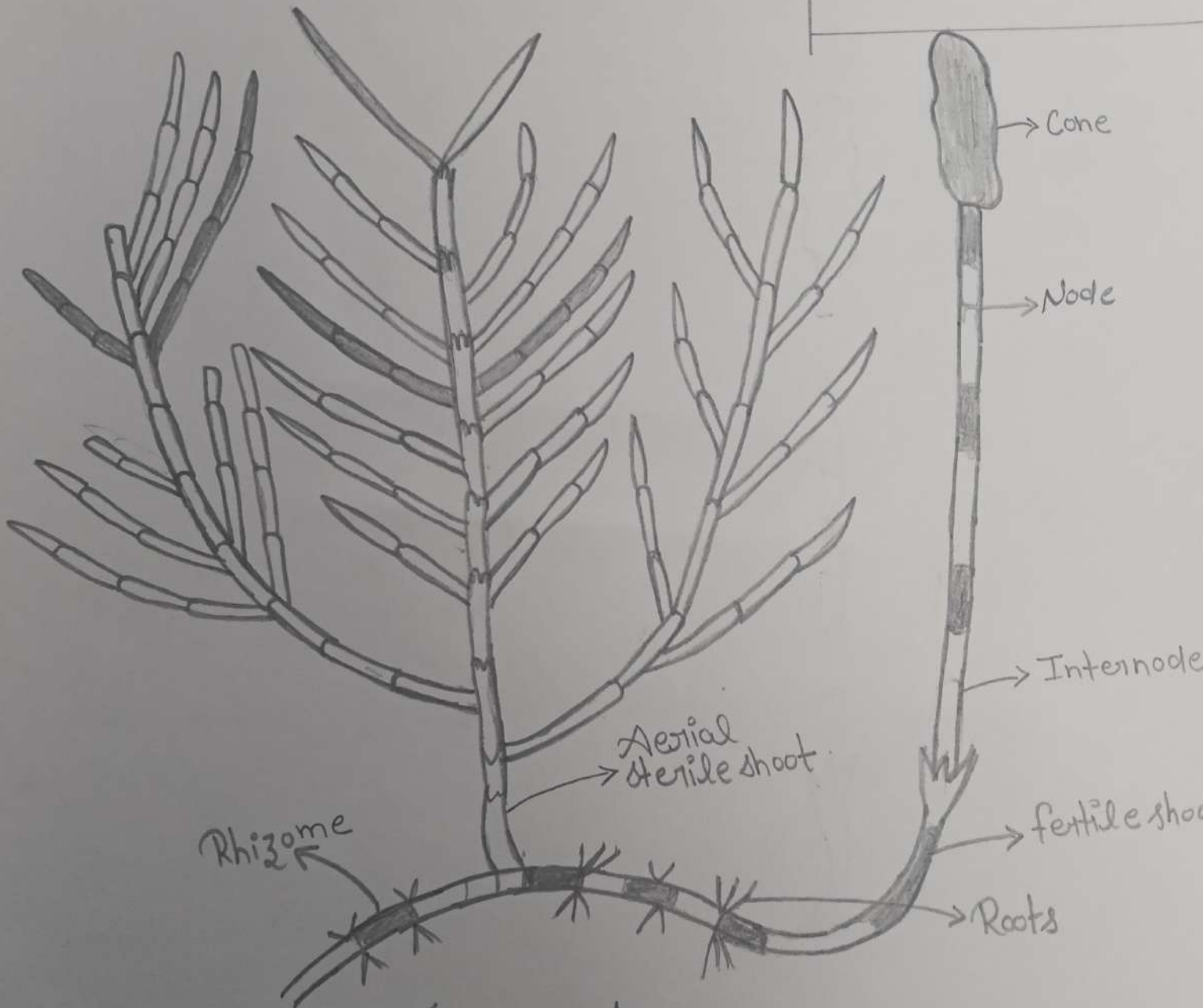
Classification

Kingdom: Plantae

order: Equisetales

Family: Equisetaceae

Genus: Equisetum



Equisetum

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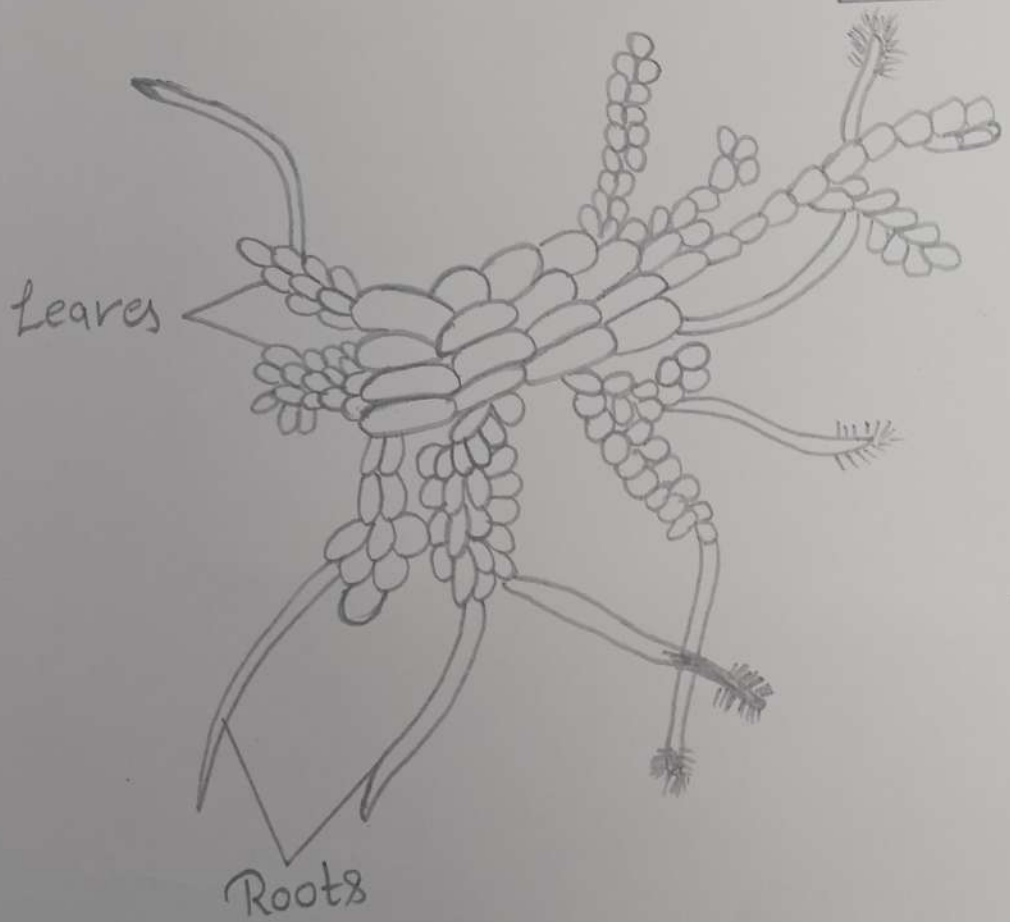
EQUISETUM

(Common name = "Horse tail")

* External features of Sporophyte :-

- Plant body is sporophytic and the sporophyte is a well-branched perennial herb.
- Size of the plant body ranges from a few centimeter as in Equisetic Stirpaids to several meters as in E. giganteum (upto 3 meters) Most of the species are less than a meter in ht.
- Plant body consists of a long horizontal, underground rhizome, from which arise many roots towards the lower side and many erect aerial shoots towards upper side.
- Rhizome is long creeping and well-Branched It is divisible into nodes and internodes.
- Roots, which develop from the node of rhizome, are long, slender, well-branched and adventitious.

Classification
Kingdom: Plantae
order: salviniales
Family: Azollaceae
Genus Azolla



AZOLLA

AZOLLA

* Occurence :- Azolla plants grow free-floating on the surface of water of permanent pools. It forms red coloured bloom in ponds and ditches. Because of their small crowded leaves, Azolla plants resemble gametophyte of moss or leafy jungermanniales.

* External Features of Plant :-

- The plant body of this small-sized, free-floating pteridophyte is sporophytic. Each sporophytic plant is differentiated into stem, roots and leaves.
- The stem or rhizome is thin, branched and horizontally floating. The branches are extra-axillary.
- Roots remain submerged in water. They are produced from the lower side of the stem.
- Leaves remain arranged in two alternate and overlapping rows on the stem and its branches.

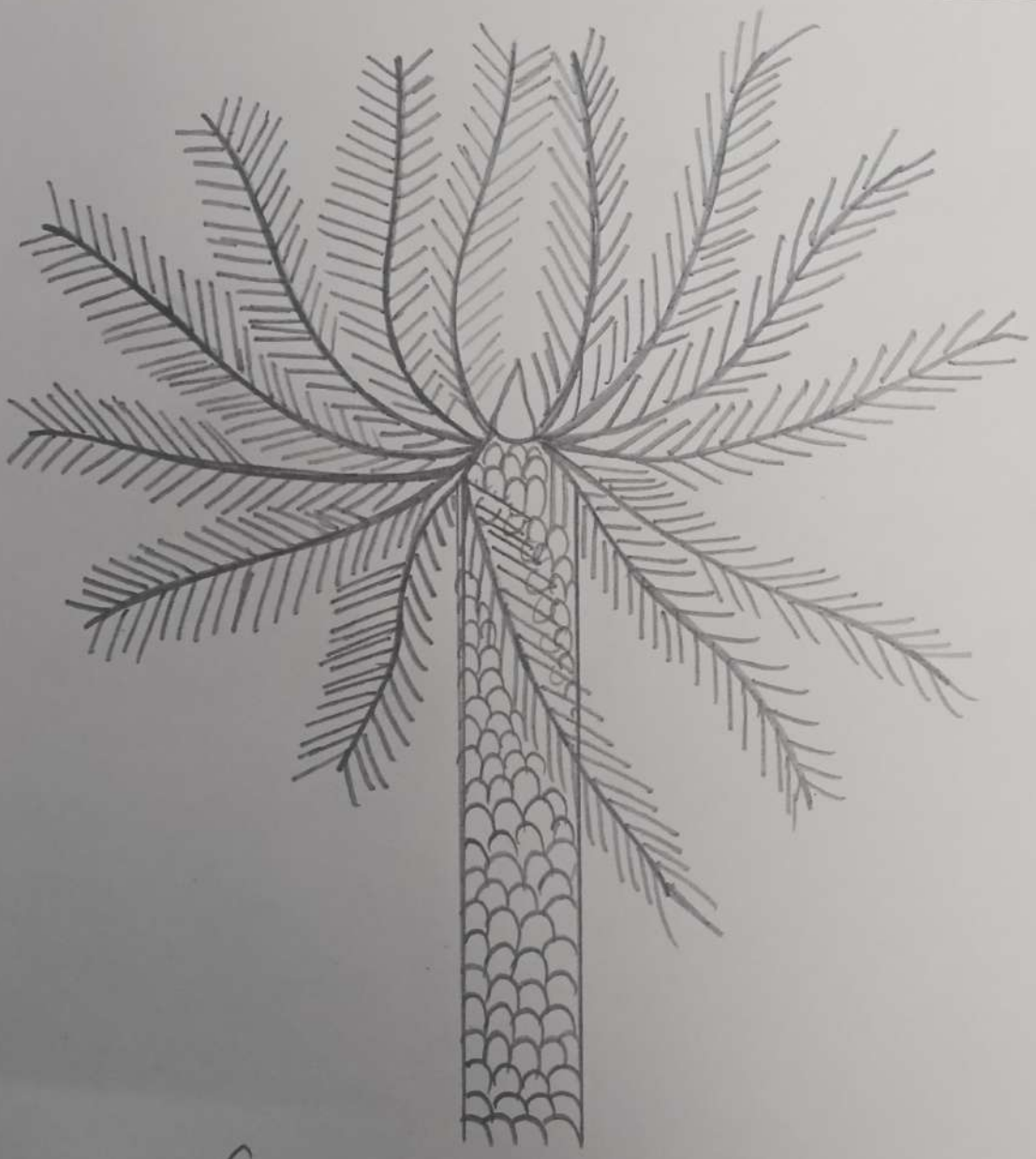
classification

Kingdom : Plantae

order : Cycadales

Family : Cycadaceae

Genus : Cycas



Cycas

CYCAS

* External features :-

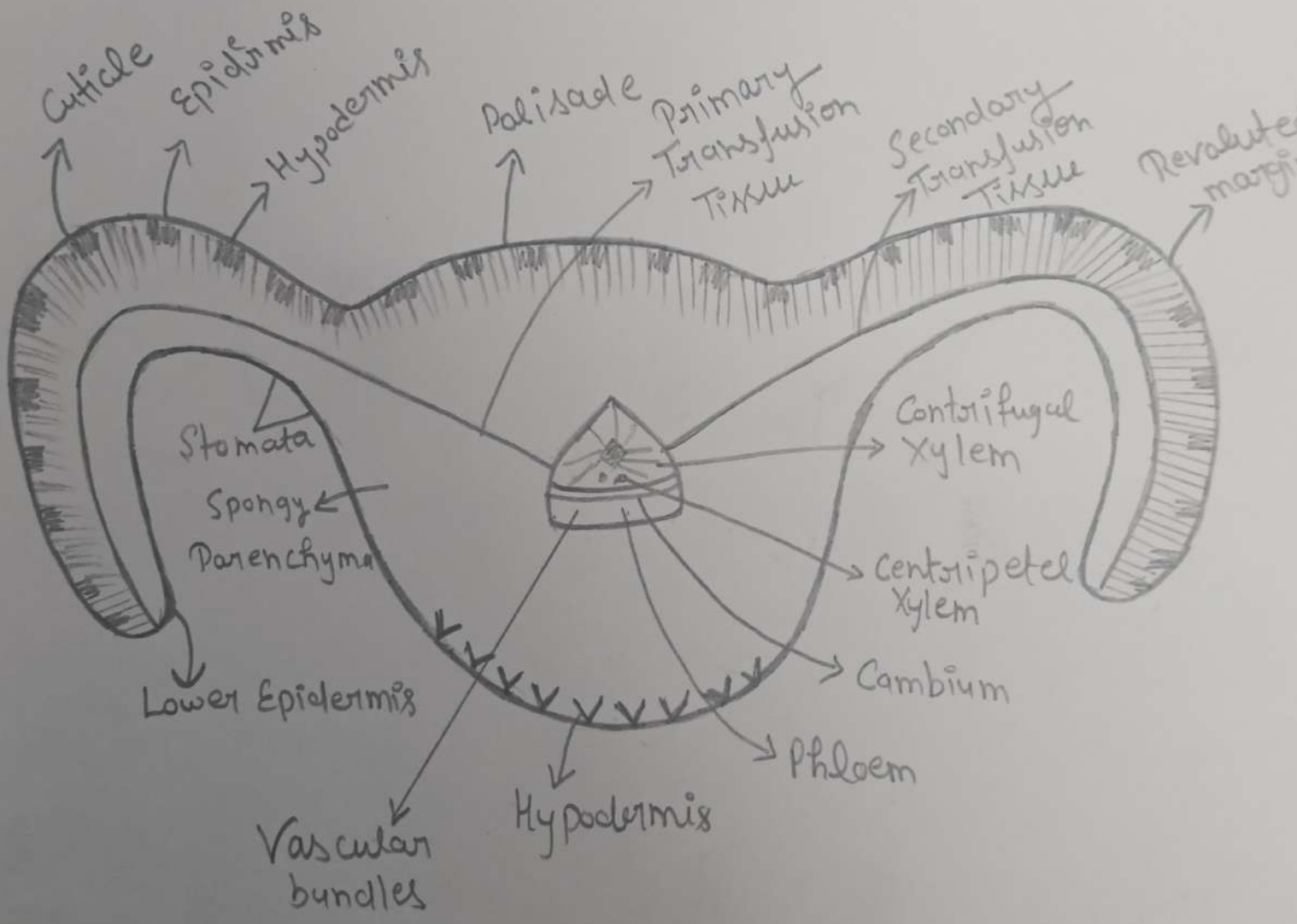
- Sporophytic plant body attains a height of 8 to 15 ft or more and appears like a small palm.

- The margin of leaflets is revoluted or curved downward in C. revoluta, while it is flat in C. circinalis and C. rumphii

- Leaves are circinately coiled when young

- Scaly leaves are dry, brown-coloured, covered with many hairs and present at the apex of stem.

- Sometimes, many "bulbils" arise in between the leaf bases of the stem they are covered with scaly leaves at the base and germinate into new plants in favourable conditions.



T.S Leaflet of Cycas revaluta

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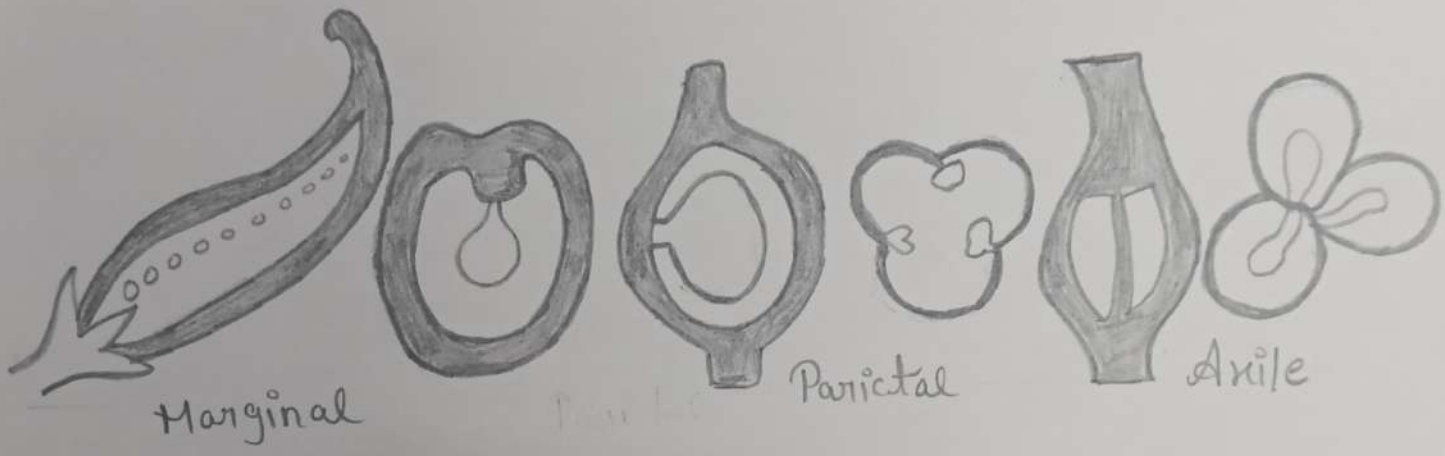
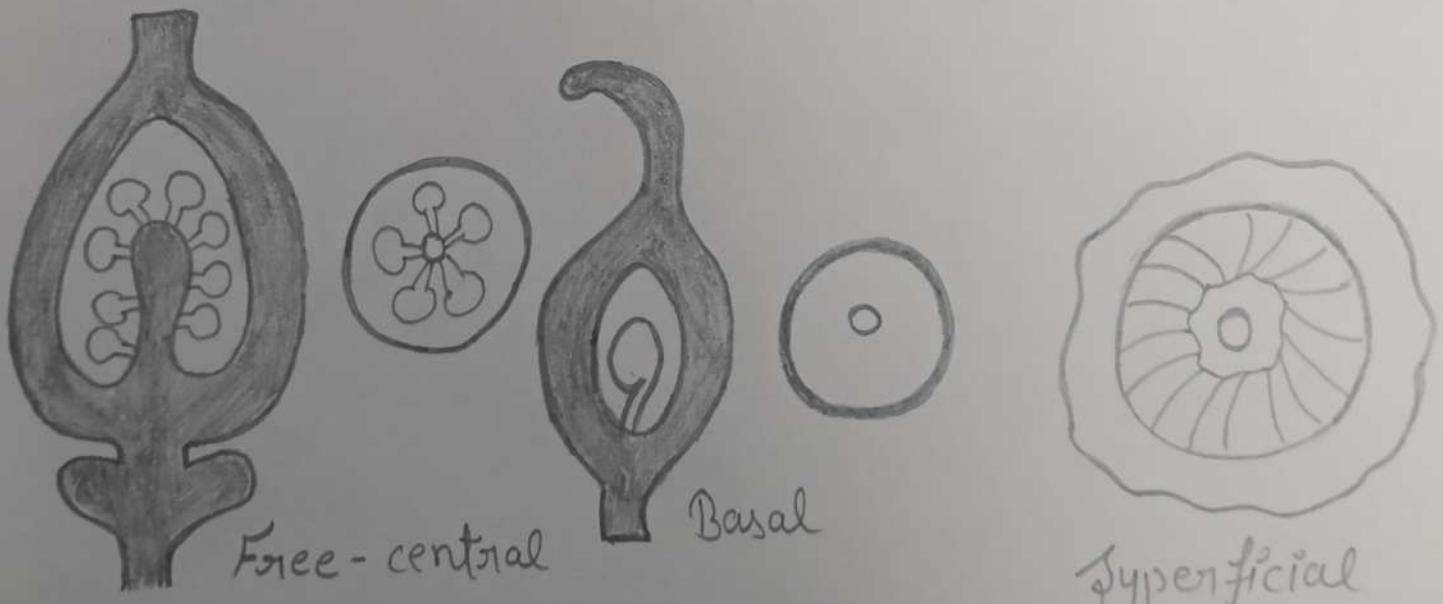
T.S Leaflet of Cycas revoluta

- It can be differentiated into a swollen midrib portion and two lateral wings.
- The wings are curved downward or revoluted at the margins.
- Outermost layer consists of thick-walled epidermis surrounded by a layer of cuticle.
- Upper epidermis is a continuous layer while the continuity of lower epidermis is present the broken by many Suker stomata.
- Below the upper epidermis is present the sclerenchymatous hypodermis which is more cells thick in the midrib region.
- Hypodermis is absent below the lower epidermis, except in the midrib region.





PLACENTATION

Date: / /

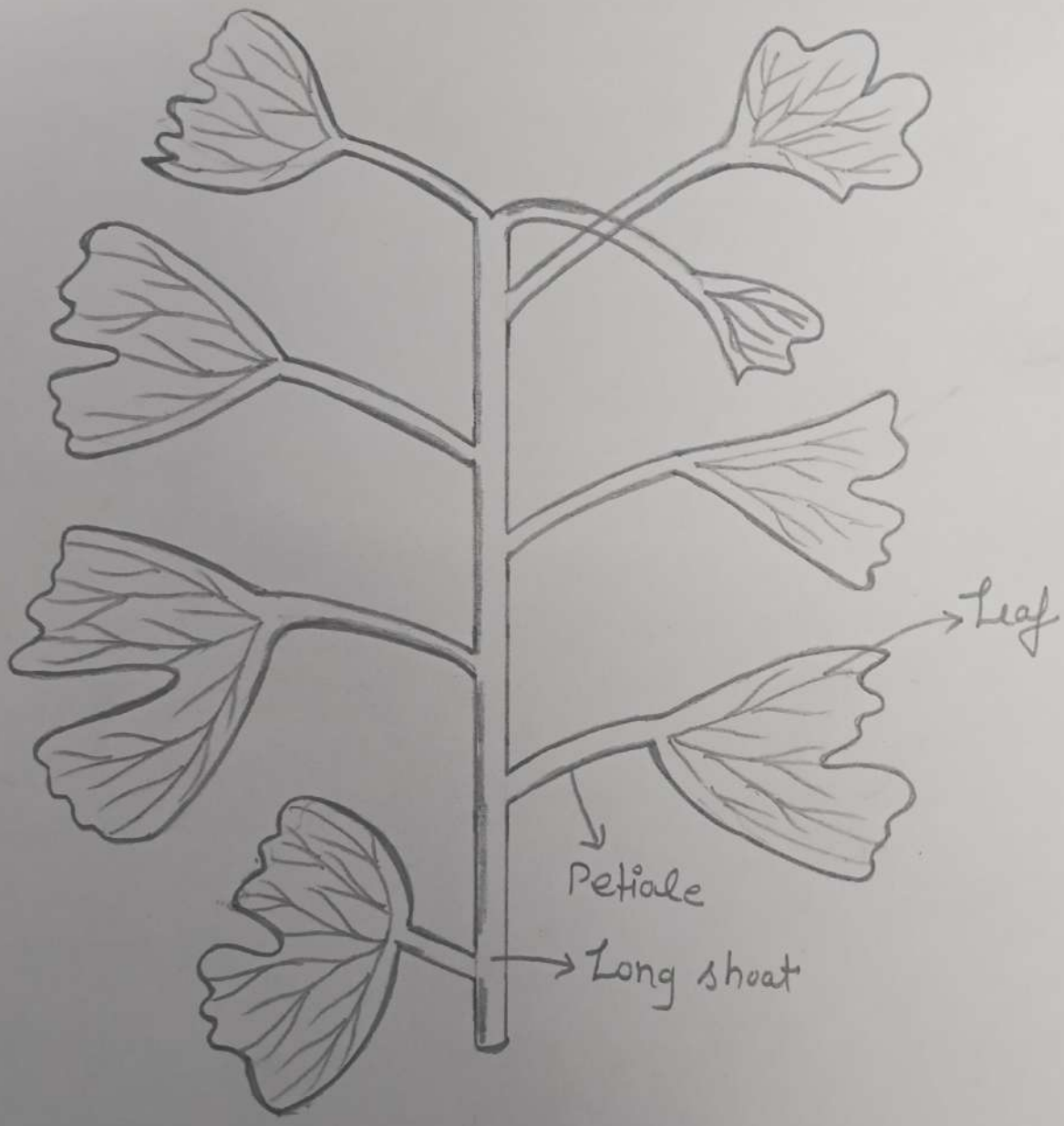
PLACENTATION

- Placenta :- A cushion - like structure, formed by the tissues of carpels at the place where infolded margins of the megasporophylls meet, is called placenta. From the placenta originates the ovules.

- Placentation :- Arrangement of ovules with in the ovary is called placentation.

* It is of following six types:

1. Marginals : The ovules develop in rows near the margin on the placenta, formed along the ventral suture. It occurs in monocarpellary and unilocular ovary.
   Eg. Leguminaseae
2. Parietal : The placenta formed by the swelling up of cohering margins, and on the latter develop the ovules.
   Eg. papaveraceae in rows. It occurs in bicarpellary or multicarpellary but unilocular ovary.
3. Axile : Here the placentae develop from the central axis which corresponds to the confluent Eg. Solanaceae margins of carpels. It occurs in bi to multilocular ovary.


Leaf
Petiole
Long shoot

GINKGO
(Maiden-hair tree)

* General characteristics :-

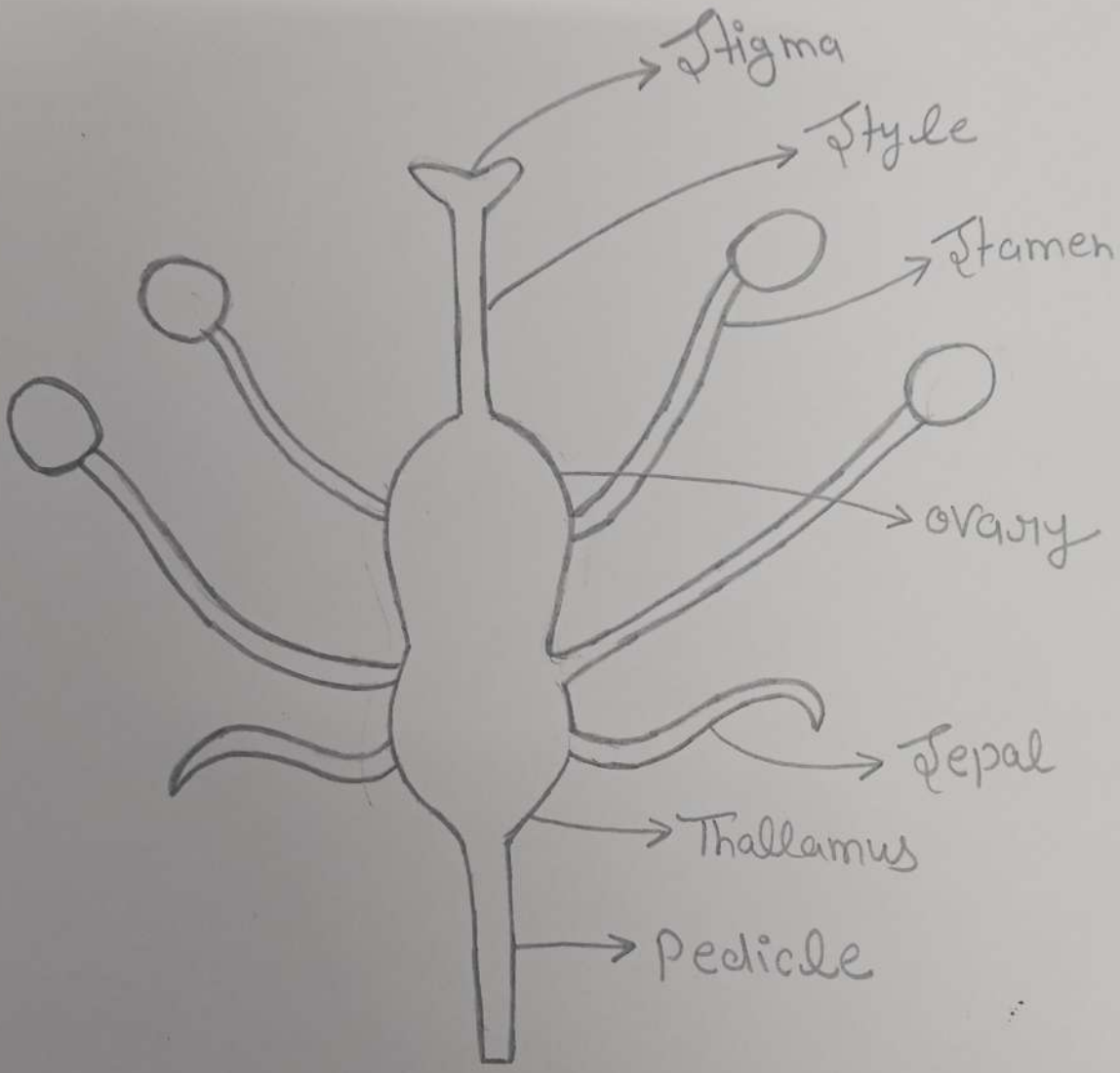
- Ginkgo biloba is a tall slender and beautiful tree, commonly called Maiden-hair Tree (Spare, 1965) because its new leaves resemble very much like those of Adiantum (called maiden hair fern) both in form and venation.

* Morphology features :

- The plant body of Ginkgo biloba is sporophytic, and the sporophyte resembles several conifers in general habit.

- The trees attain a height up to 30 meters.

- The branches are dimorphic i.e, bear long shoots which are of unlimited growth with scattered leaves and dwarf shoots which are shoots-branches of limited growth. Long shoots elongate rapidly, sometimes as much as 50 cm in a year. Dwarf shoots grow rather slowly.



Parts of Flower

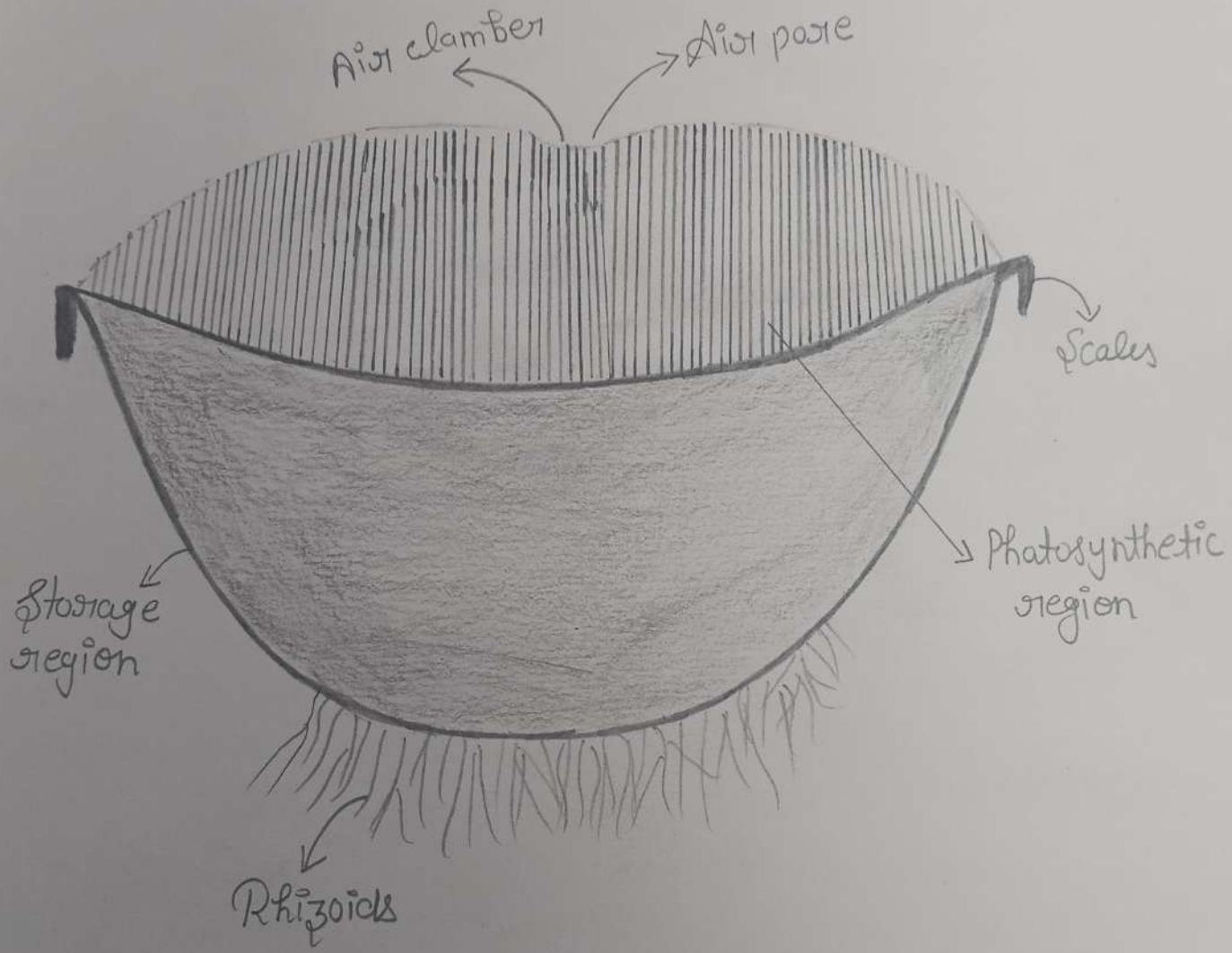
Date: / /

FLOWER

- A part of the plant which is capable of producing either male or female or both the reproductive element's is called flower. It may or may not be surrounded by the accessory whorls i.e, calyx and corolla.

(A) Some terms related to flower -

1. Accessary whorls of flower:- Calyx and corolla.
2. Essential whorls of flower:- Androecium and Gynoecium.
3. Sepal:- Individual unit of calyx.
4. Petal:- Individual unit of corolla.
5. Stamen:- Individual unit of Androecium.
6. Carpel:- Individual unit of Gynoecium.
7. Thalamus:- Tip of the axis passing the floral appendages.
8. Bract:- A leaf-like structure, from the axil of which develops the flower.
9. Sessile:- Flower without stalk
10. Complete:- Having all the four flower parts.
11. Unisexual:- Flowers with only one sex i.e either male or female.
12. Bisexual:- Flowers having both the sex organ



Ventral T.S thallus of Riccia

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Anatomy of Gametophyte

- Cut thin transfer section of thallus. Stain in safranin, mount in glycerine and study.

* Following two distinct regions are visible

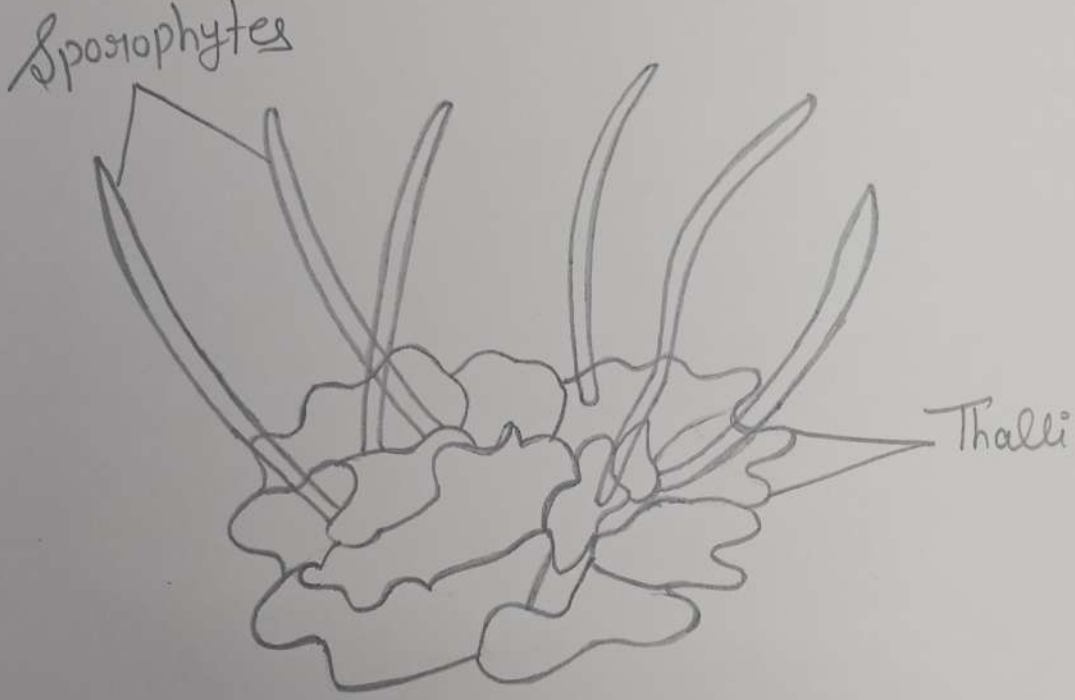
(a) Photosynthetic region
(b) Storage region

Photosynthetic region

1. It is situated on the upper or dorsal surface of the thallus and consists of loose green tissue. It is also known as assimilatory region.
2. It consists of a layer of epidermis, many air pores, air spaces or air chambers and many one-celled thick vertical rows of chlorophyll-containing cells.

Storage region

- It is situated on the lower or ventral surface of the thallus and consists of colourless cells.
- Cells are closely packed and parenchymatous.



Anthocerose

Page No. :
Date : / /

ANTHOCEROS

* External features of Gametaphyte

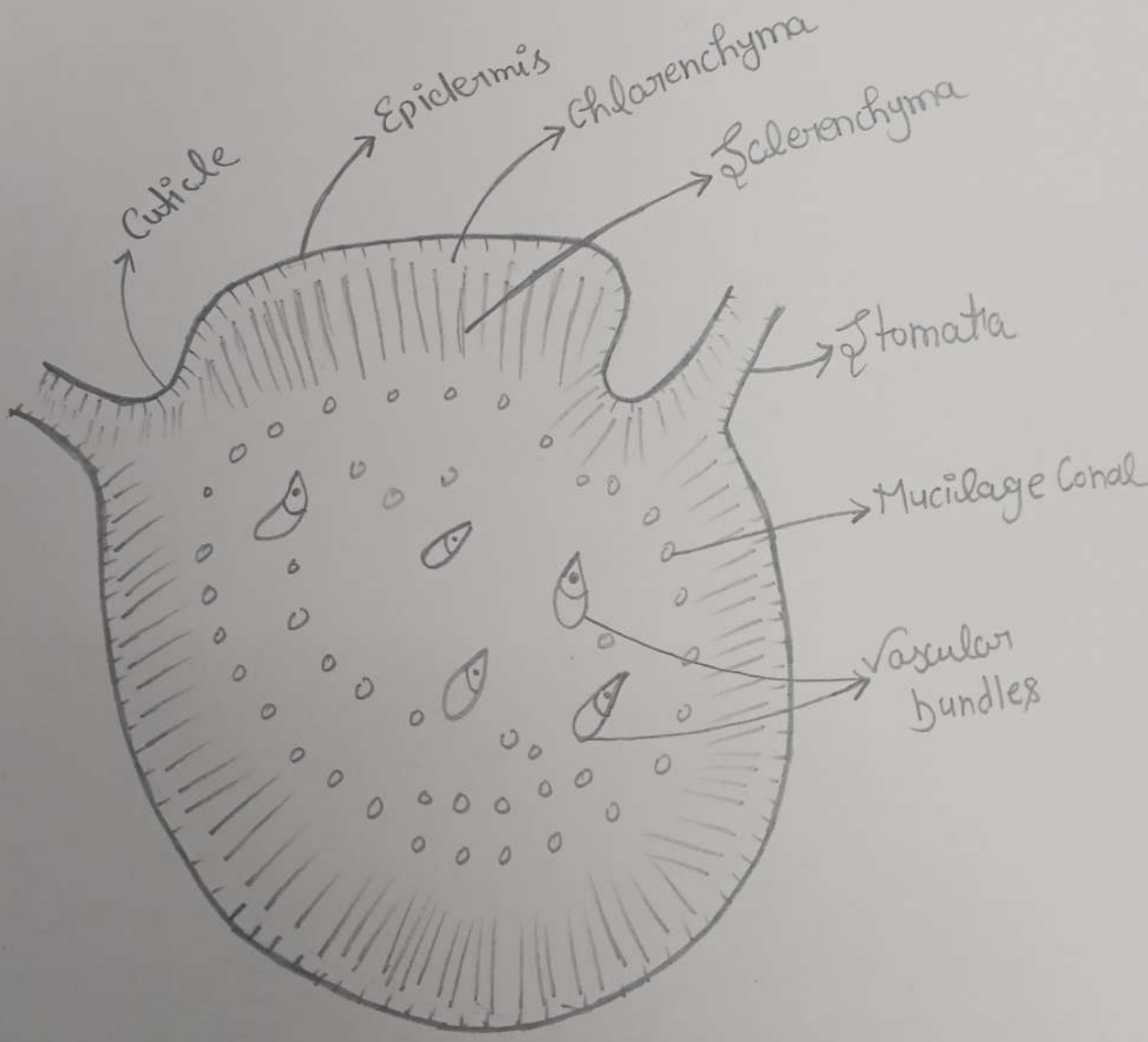
Observe dorsal and ventral surfaces of the thallus of different species, prepare a glycerine mount of rhizoids and study

- Plants are terrestial, prostrate, lobed or radially dissected and pale green in colour.
- Shape of the plant is variable.
- Columella is endothecial in origin

- Just outside the columella is the region of sporogenous cells which develops from the inner layer of epithecium.

- Sporogenous tissue is one cell thick in the begining but at maturity it becomes 2 to 4 cells thick.

- Slightly above in the capsule is the sporogenous tissue is differentiated into fertile spore mother cells and sterile pseudoelater mother cells, arranged in alternate bands.

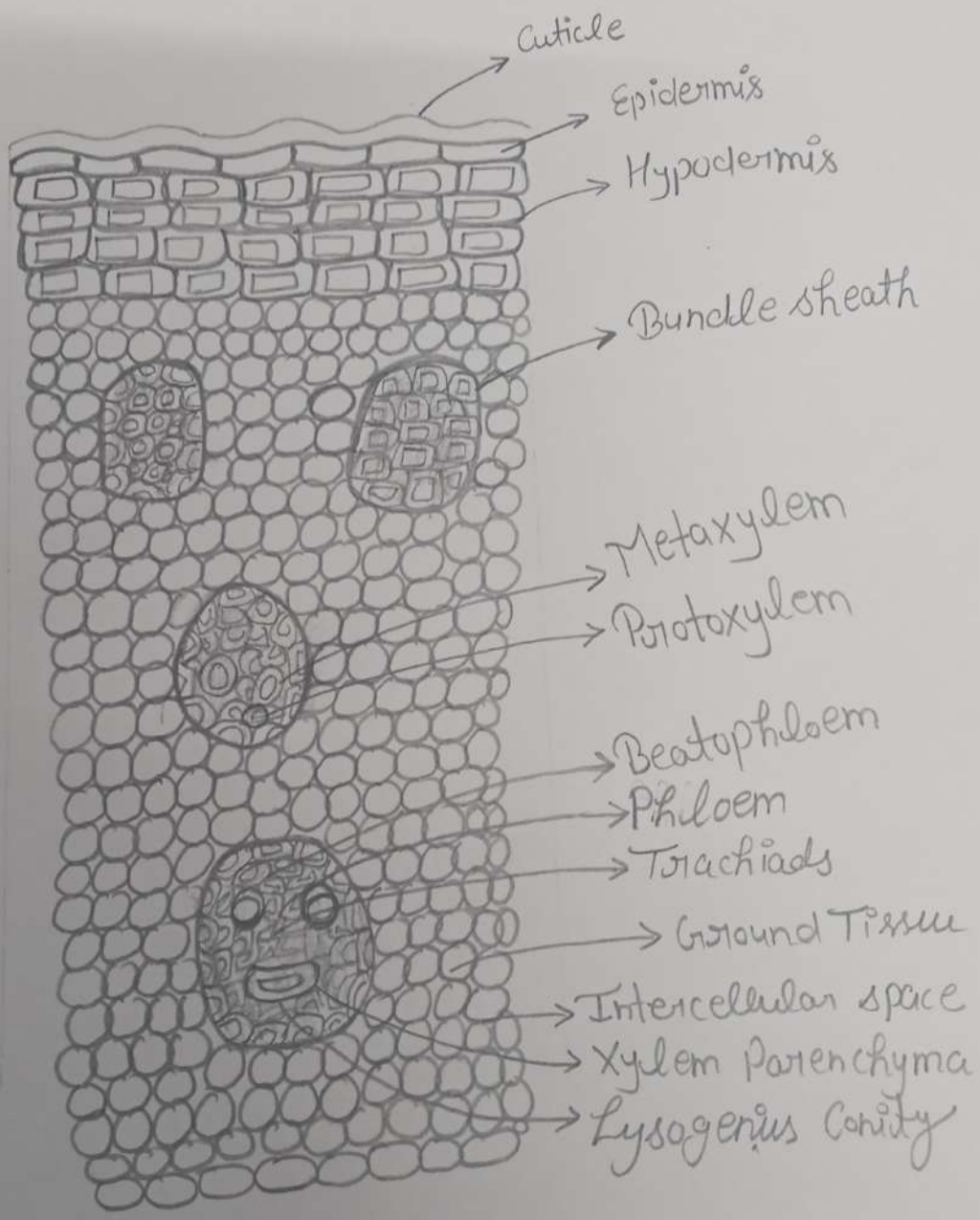

Cuticle
Epidermis
Chlorenchyma
Sclerenchyma
Stomata
Mucilage Canal
Vascular bundles

T.S. Rachis

Page No. :
Date : / /

Trans Section of Rachis

- It is rhombaidal, bioconvex or roughly cylindrical in outline, if the section passes through the base, middle or apex of the rachis, respectively.
- Two arms are present on rachis, one on each side. These are the bases of the leaflets, which arise from the rachis.
- The outermost layer consists of thick walled epidermis which is bearing cuticularized.
- The continuity of epidermis is broken by many sunken stomach present on upper as well as lower sides of rachis.
- Below the epidermis are present chlorophyll containing cells of chlorenchyma, followed by thick-walled sclerenchymatous region.
- Sclerenchymatous is four to six layered.
- Below the sclerenchyma is present a large region of ground tissue consisting of thin-walled parenchymatous cells.
In this region are present many mucitaginous canals and vascular bundles.



Zea - mays - Stem

Date: / /

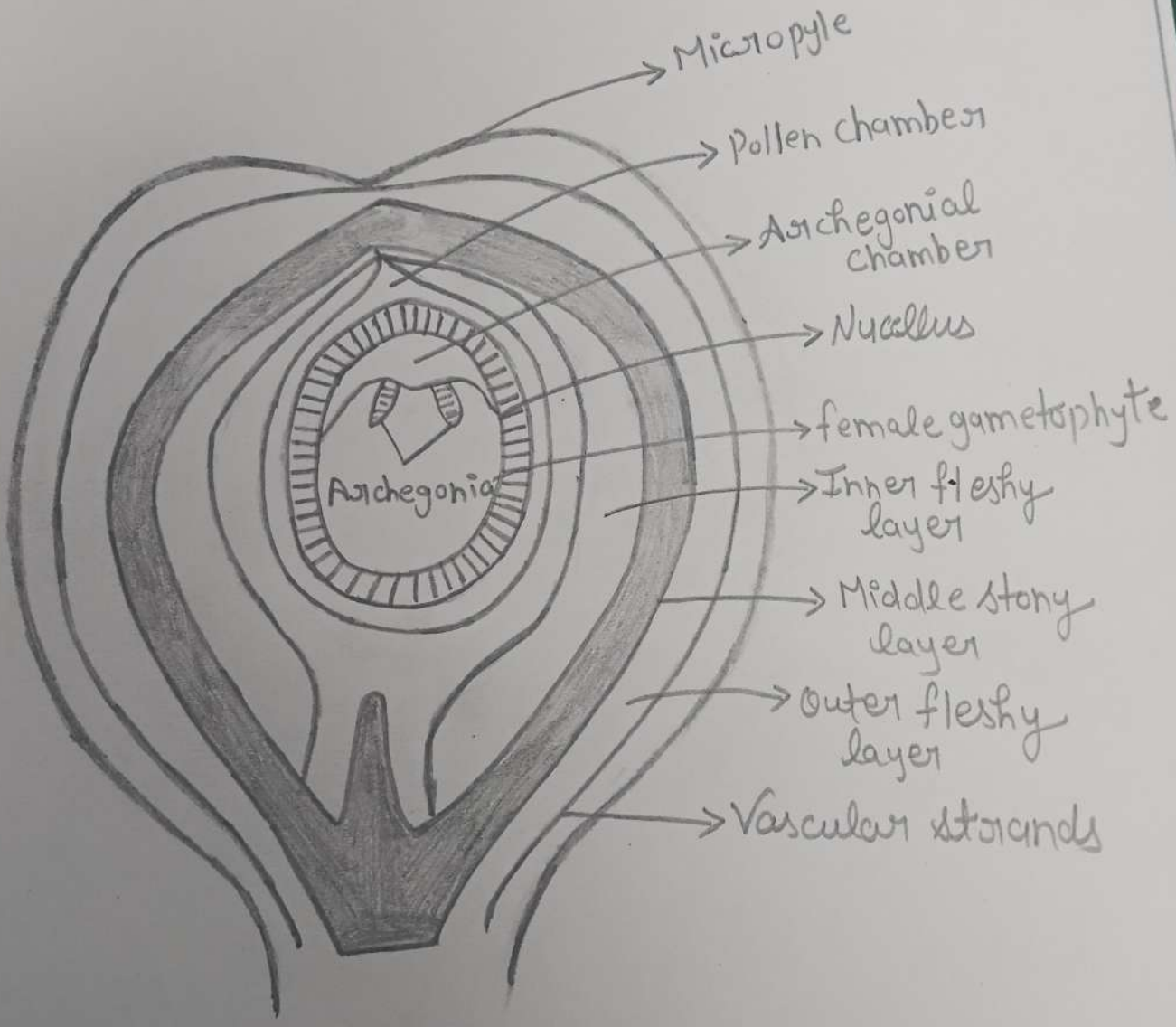
Zea mays - Stem

- T.S of the material shows the following tissues from outside within. It is circular in outline with a well-defined epidermis, hypodermis, ground tissue and many scattered vascular bundles.

* Epidermis ① It is the outermost layer of most stem.
② The outer wall of the cells is covered by a thick cuticle.
③ The continuity of the epidermal layer is broken by a few stomata.
④ Epidermal hairs are absent.

* Hypodermis ⑤ It is two to three cells thick, sclerenchymatous and present just below the Epidermis.
⑥ Its cells are polygonal in shape.
* Ground tissue ⑦ It is not differentiated into cortex, endodermis, pericycle and pith.
⑧ Its cells are parenchymatous and extend from below the sclerenchyma upto the centre.
* Special Points:-

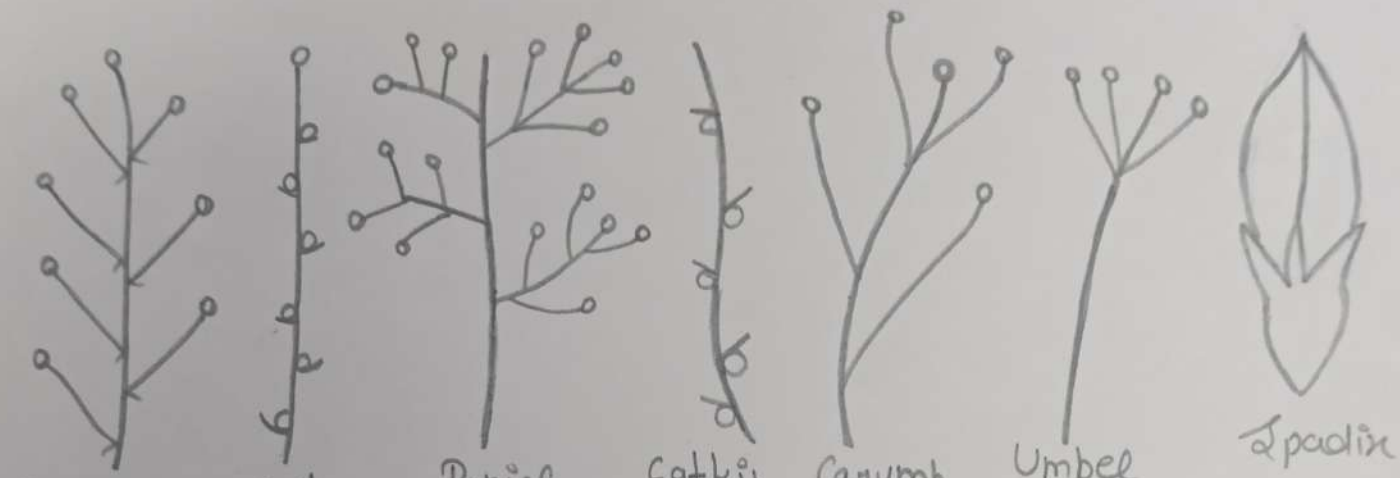
1) Scattered vascular bundles
2) Y-shaped vessels
3) Presence of protophloem and metaphloem.



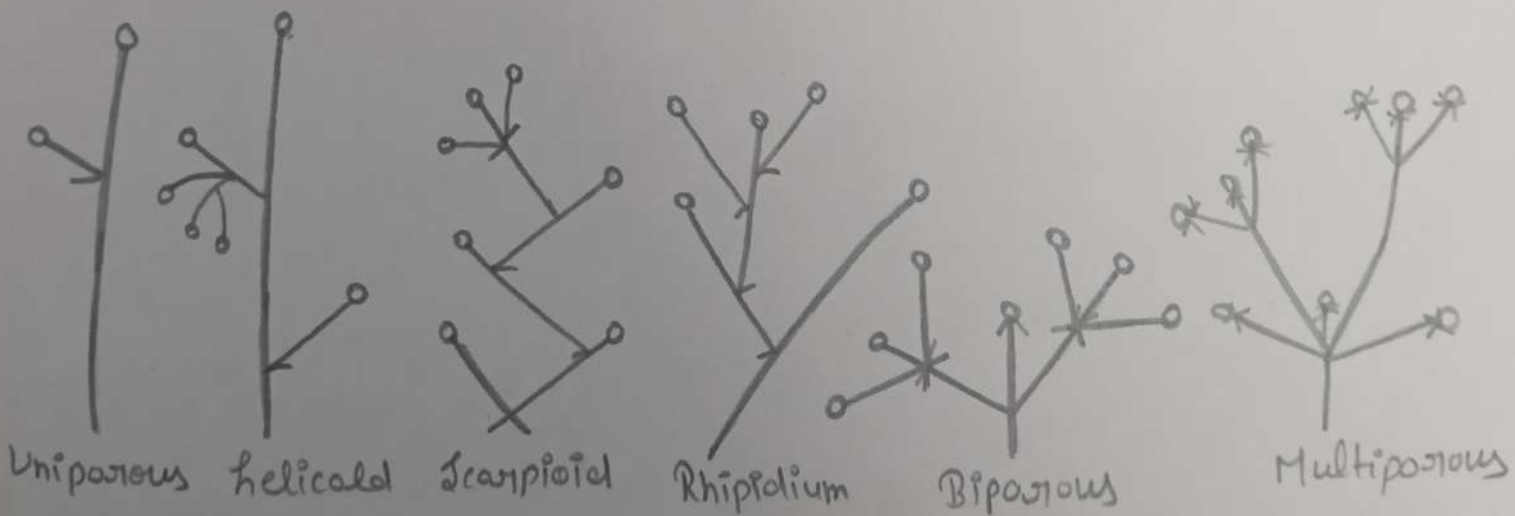
L. S Mature Ovule

L.S Mature Ovule

- The ovule is orthotropus and unitegmic
- The single integument is very thick and covers the ovule from all the sides except at mouth-like opening called micropyle.
- Single integument consists of three layers.
- Integument remains in close association with the nucellus
- The nucellus develops the Nucellar beak in the micropylar region.
- In the nucellar beak is present a hollow small cavity or chamber called pollen chamber.
- In the centre of the ovule is present a female gametophyte, in which an archegonial chamber just below the pollen chamber.



Types of racemose Inflorescence



Types of Cymose Inflorescence

Date: / /

Inflaroscence

- Made of the arrangements of flowers on the plant is called inflaroscence.

* Two types of Inflaroscence:-

A) Racemose or Indefinite

The arrangement in which youngest flower is present near the apex and older towards the base, i.e, flowers present in acropetal succession. So, in this case the growing point does not stop the growth and keeps on forming continously the lateral flower. It is of following 3 types.

B) Cymase or Definite or Determinate

When the apical growth of the floral axis is checked by the formation of a flower, it is called Cymase inflaroscence flowers are arranged in besipetalous manner, i.e, the terminal flower is oldest and young flowers are present on lower side. It is of following 3 types.