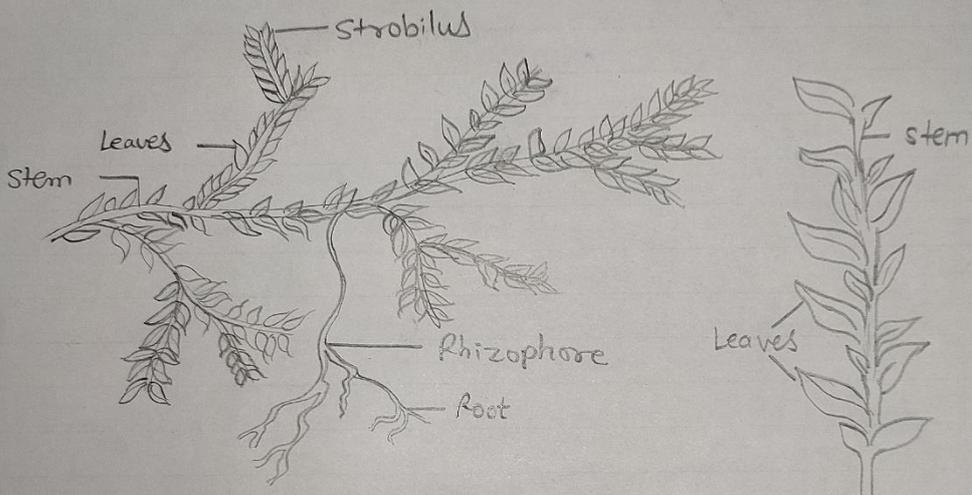




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Selaginella



Selaginella

Characters:-

- Many Species are prostrate, Creeping on the ground e.g. Kraussiana, other are sub-erect e.g. *S. drachyphylla* or erect e.g. *S. erythropus*
- The plant body is divided into root, stem and leaves.
- The primary root is short lived and all other roots are adventitious.
- In homoeophyllum species (*S. Selaginoides*), (*S. rupestris*, etc) the stem is upright and all leaves are like, while in hetero-phyllum species, the stem is prostrate and dorsiventral, and leaves are dimorphic.
- In homoeophyllum, all the leaves are alike spirally arranged, small and simple.

Classification:-

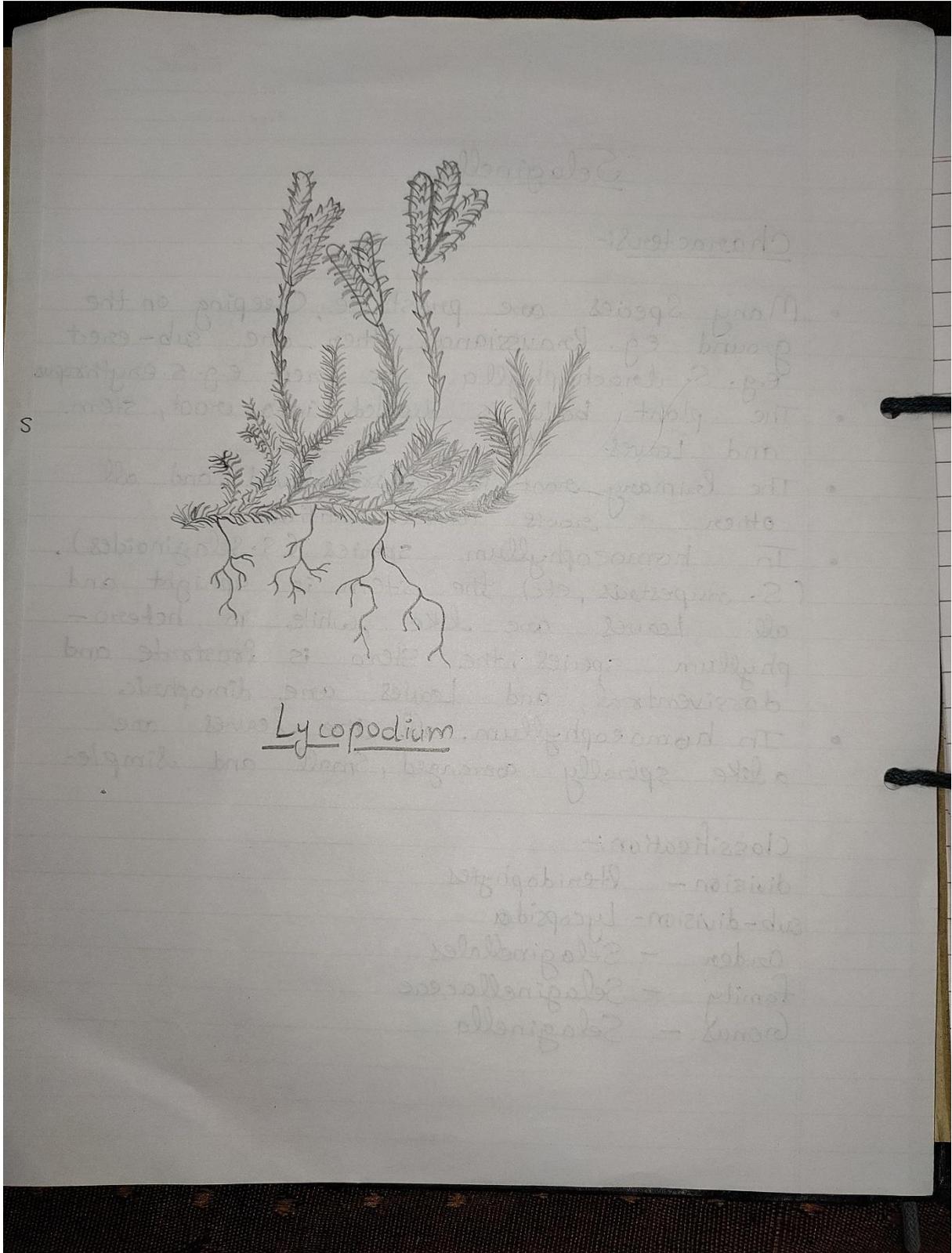
division - Pteridophytes

sub-division - Lycopsidea

Order - Selaginellales

family - Selaginellaceae

Genus - Selaginella





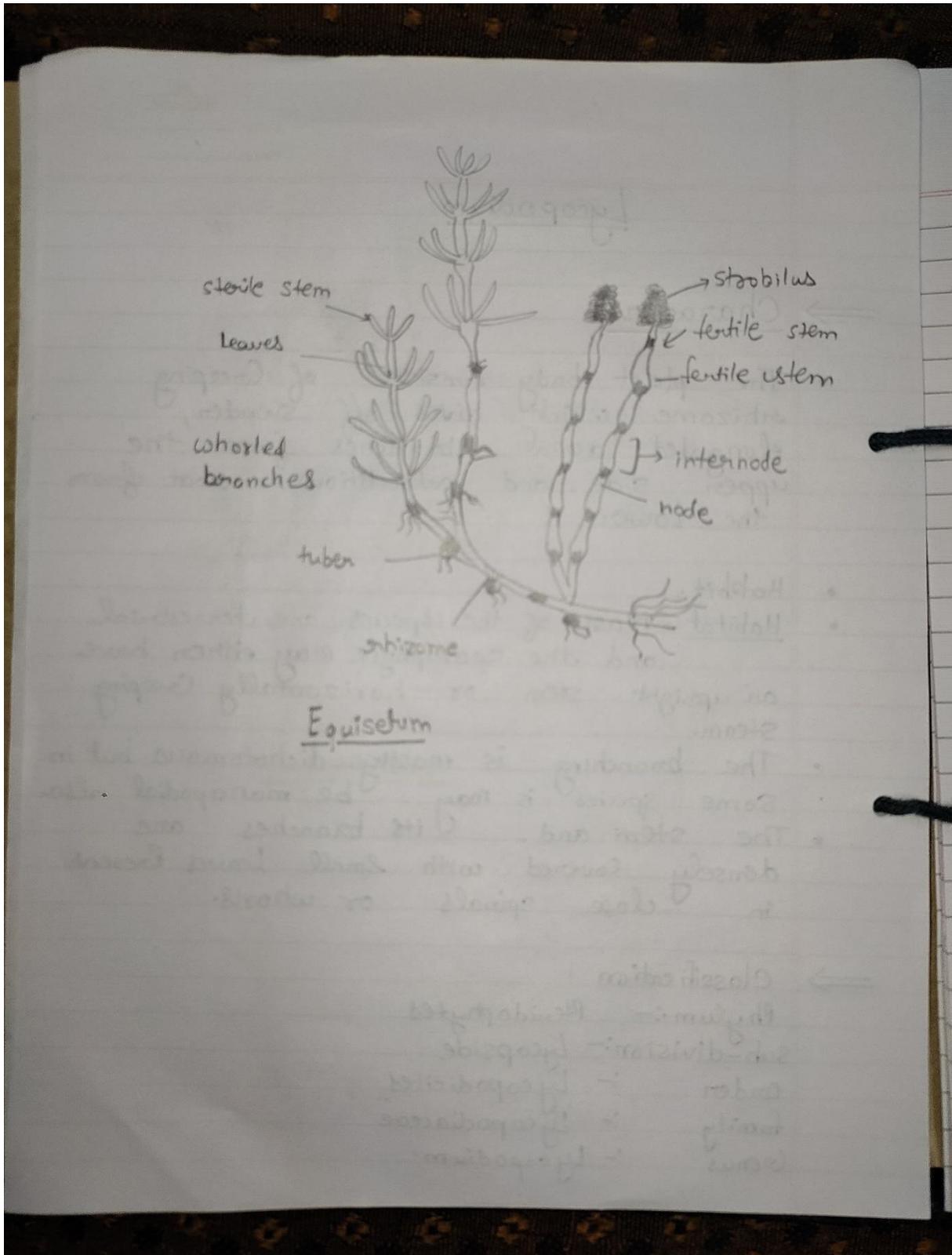
Lycopodium

⇒ Characters:-

- The plant body consists of creeping rhizome which gives off slender, elongated aerial branches from the upper side and adventitious roots from the lower.
- Habitat:- Most of the species are terrestrial and the sporophyte may either have an upright stem or horizontally creeping stem.
- The branching is mostly dichotomous but in some species it may be monopodial also.
- The stem and its branches are densely covered with small leaves present in close spirals or whorls.

⇒ Classification

Phylum:- Pteridophytes
Sub-division:- Lycopside
Order :- Lycopodiales
Family :- Lycopodiaceae
Genus :- Lycopodium



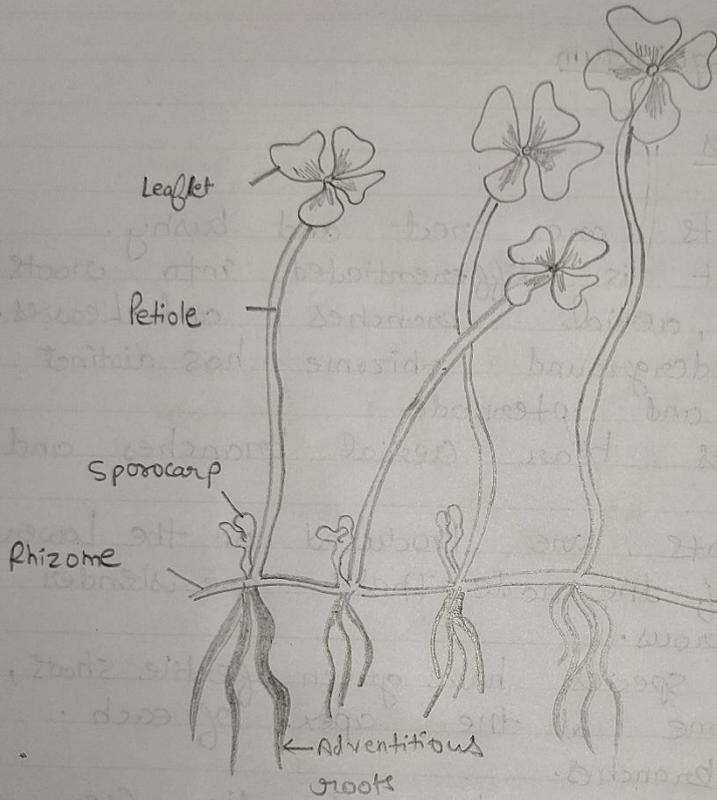
Equisetum

⇒ Characters

- The plants are erect and bushy.
- The plant is differentiated into roots, rhizome, aerial branches and leaves.
- The underground rhizome has distinct nodes and internode.
- The nodes bear aerial branches and roots.
- The roots are produced on the lower side of the node. These are slender and fibrous.
- Some species have green, fertile shoots, with a cone at the apex of each lateral branches.
- Such branches do not die after the spores are shed.

⇒ Classification:-

Division - Pteridophytes
sub-division
Order -
family -
Genus - Equisetum



Classification:

- Division - Equisetophyta
- Sub-division - Equisetum
- Order - Equisetales
- Family - Equisetaceae
- Genus - Equisetum

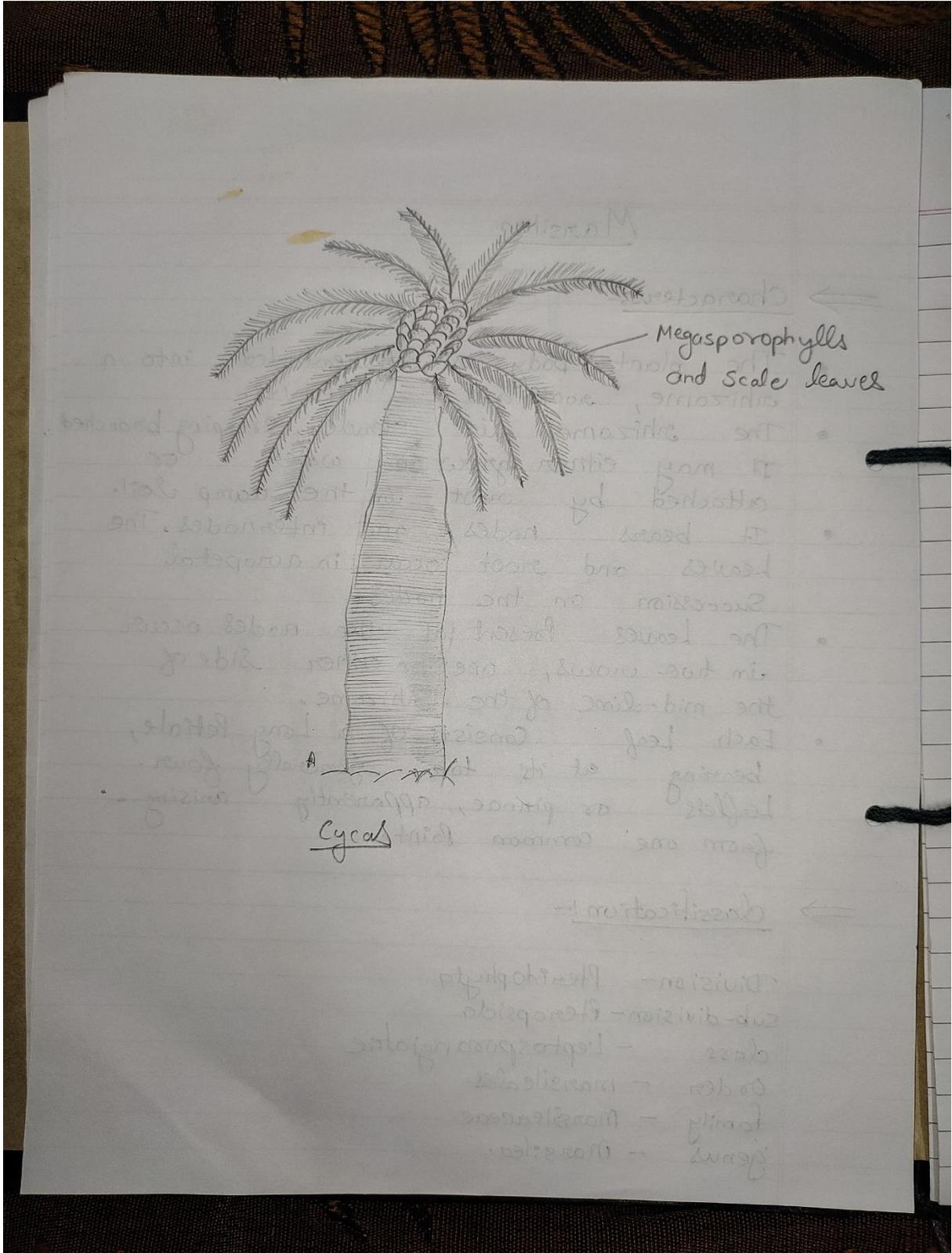
Marsilea

⇒ Characteristics-

- The plant body is differentiated into a rhizome, roots and leaves.
- The rhizome is slender, creeping branched. It may either grow in water or attached by root in the damp soil.
- It bears nodes and internodes. The leaves and root occur in acropetal succession on the nodes.
- The leaves present at the nodes occur in two rows, one on either side of the mid-line of the rhizome.
- Each leaf consists of a long petiole, bearing at its top, generally four leaflets or pinnae, apparently arising from one common point.

⇒ Classification:-

Division - Pteridophyta
sub-division - Pteropsida
class - Leptosporangiateae
order - Marsileales
family - Marsileaceae
genus - Marsilea.



Cycas

⇒ Characters

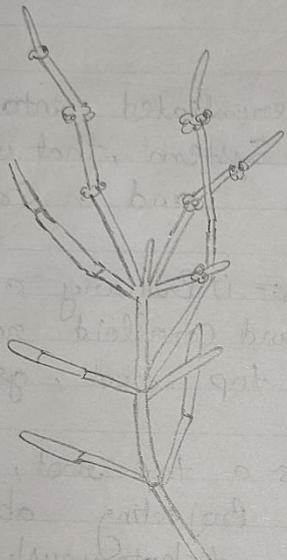
- Plant body is differentiated into an Under ground root system, that is distinguished into an erect stem and a Crown of Leaves
- Roots are two types:- i) Primary and normal root. ii) Secondary and Coralloid root.
- Normal root is a tap root, growing into deep the Soil.
- Secondary roots is a tap root, a are negatively geotropic Projecting above the Soil Surface, repeatedly dichotomously branched and appear as coralloid clusters.
- Leaves the stem bears a terminal group of Leaves which are dimorphic → two types.
 - i) foliage Leaves (green assimilatory founds)
 - ii) Scales Leaves (brown and hairy)
- Young foliage Leaves are Circinately Coiled and are covered with urameta hairs.

classification

- Division - Gymnosperm
- Class - Cycadopsida
- Order - Cycadales
- family - Cycadaceae
- Genus - Cycas

Clonal

Character ←



- Plant body is differentiated into an underground part and an aerial part.
- Plants are two types:
 - (i) Primary and secondary roots.
 - (ii) Secondary roots are growing into deep the soil.
- Secondary roots are negatively geotropic that grow above the soil surface, repeatedly and eventually connected to the primary roots.
- and appear as small roots.
- leaves the stem bears a terminal group of leaves which are dimorphic - two types.
 - (i) foliage leaves (green assimilatory leaves)
 - (ii) scale leaves (brown and hairy)
- Young foliage leaves are characteristically called and are covered with wax crystals.

Classification

Division - Gymnosperms
 Class - Cycadales
 Order - Cycadales
 Family - Cycadaceae
 Genus - *Ephedra*



Ephedra (jointed fir)

→ Characteristics

- Plants are small bushy, trailing or climbing shrubs attaining a height of not more than 2 meters.
- The plant body is branched and possesses only minute leaves at the nodes.
- It is differentiated into stem, leaves and underground roots.
- The stem remains anchored by a deep tap root and many adventitious roots.
- Leaves are borne in a whorl of 2-4 at each node.
- foliage leaves are completely absent.
- The male and female in small strobili.
- The plants are mostly dioecious and bear only one type of reproductive organs.

Classification

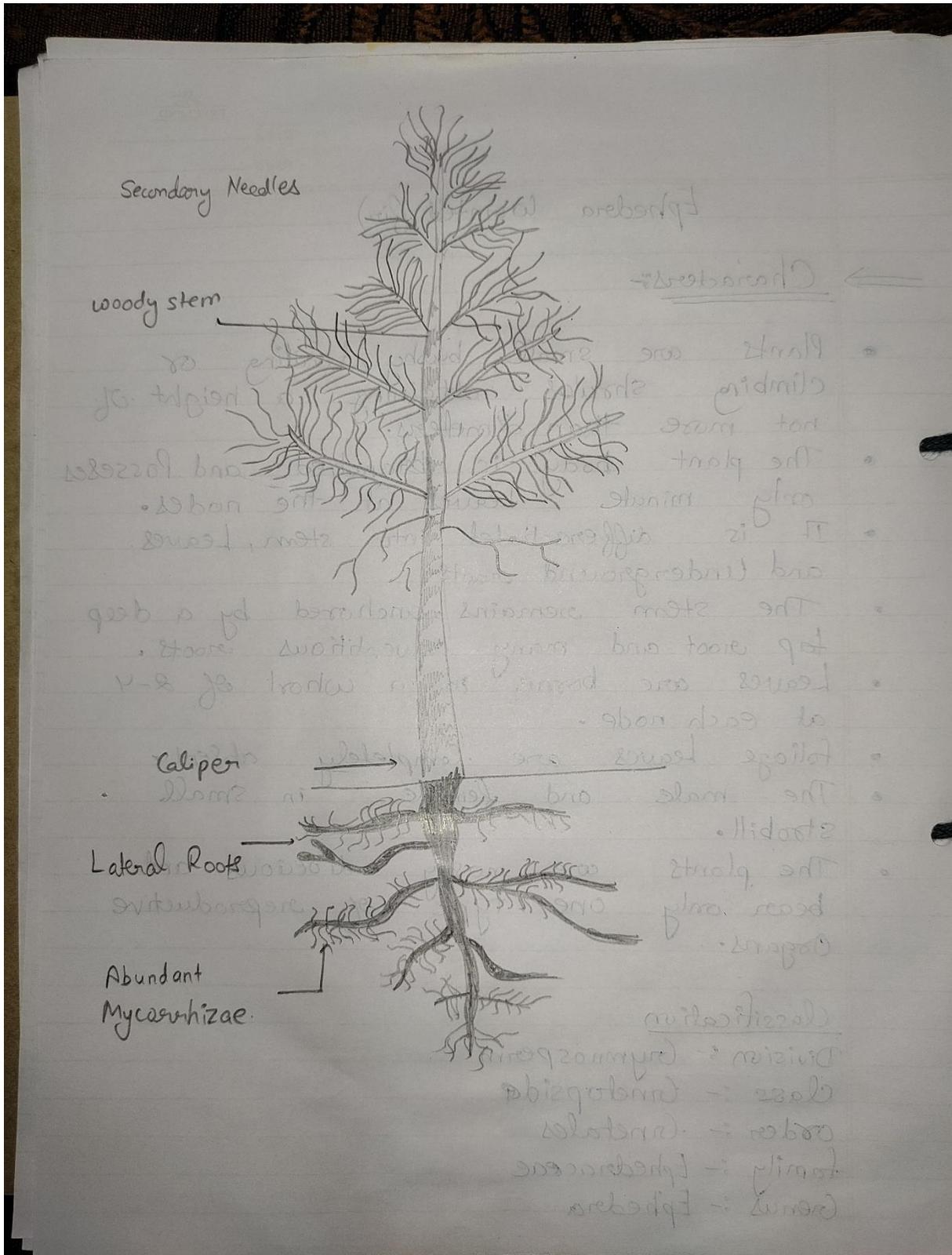
Division :- Gymnosperm

Class :- Gnetopsida

Order :- Gnetales

Family :- Ephedraceae

Genus :- Ephedra



Pinus (Pine)

⇒ Characters:-

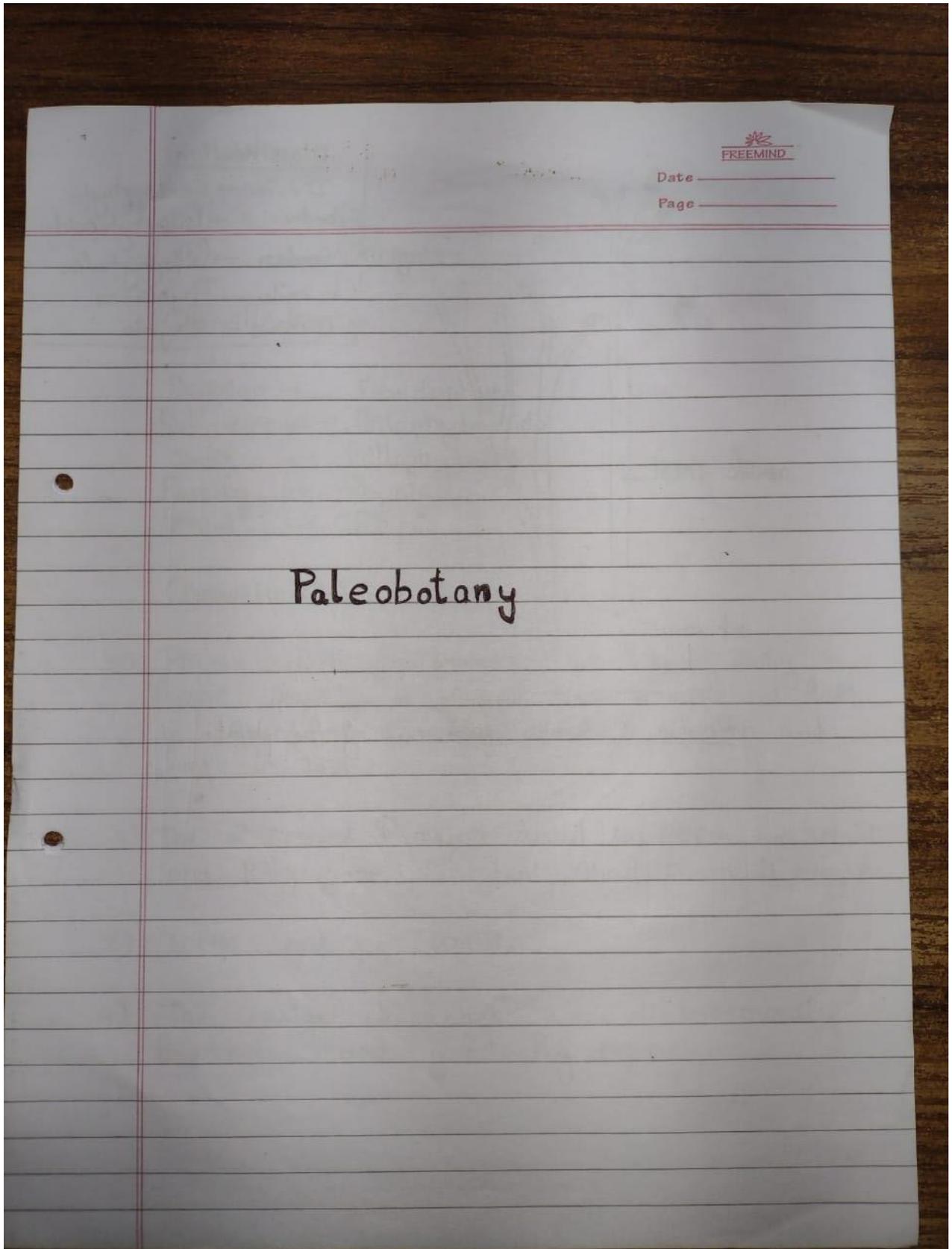
- It is a tall conical tree and therefore, commonly grouped under Conifers.
- The plant body is differentiated into root, stem and leaves.
- Under ground root system is formed by tap root which disappear early and only lateral roots persists later on.
- The young root are generally surrounded by fungal hyphae - the ectotrophic Mycorrhizae.
- Aerial branches system consists of cylindrical rough (being covered with scaly bark) and branched stem.
- The branching is monopodial and the branches are arranged in whorls.
- The leaves are also dimorphic (of two types) - Scale leaves and foliage leaves.
- Plant bears male and female reproductive parts in cones ^{on} of same plant.

Classification

Division - Gymnosperm
 class - Coniferopsida
 Order - Coniferales
 family - Pinaceae
 Genus - Pinus



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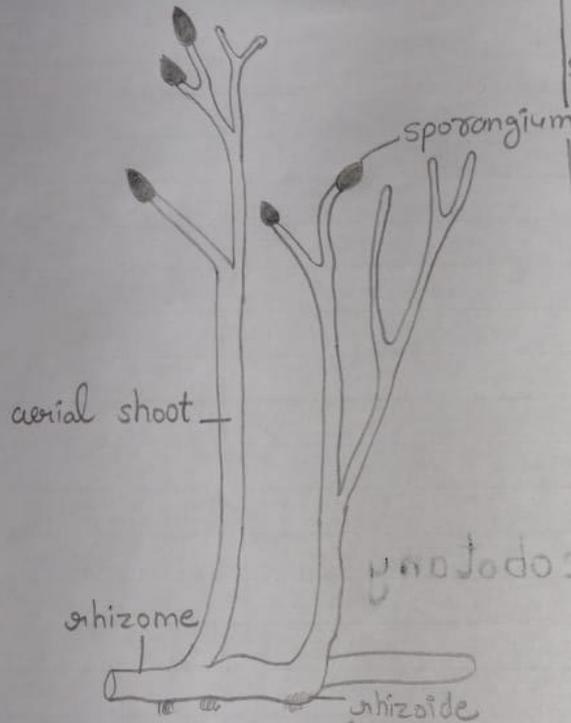
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Paleobotany



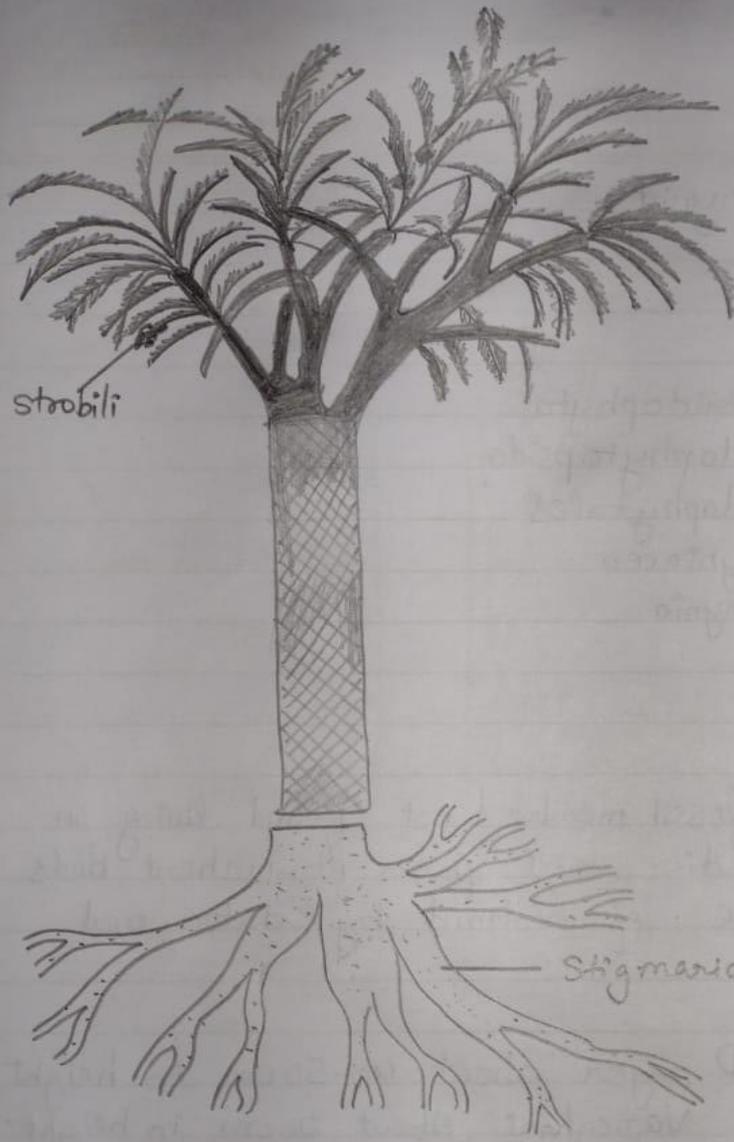
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Classification

- Division → Pteridophyta
- Sub-division → Psilophytopsida
- Order → Psilophytales
- Family → Rhyniaceae
- Genus → Rhynia

Rhynia. External features of the plant.



strobili

Stigmarian system

Lepidodendron

Classification:→
Division → Pteridophytes
Sub-division → Lycopsidea
Order → Lepidodendrales
Family → Lepidodendraceae
Genus → Lepidodendron



Rhynia

Classification: →

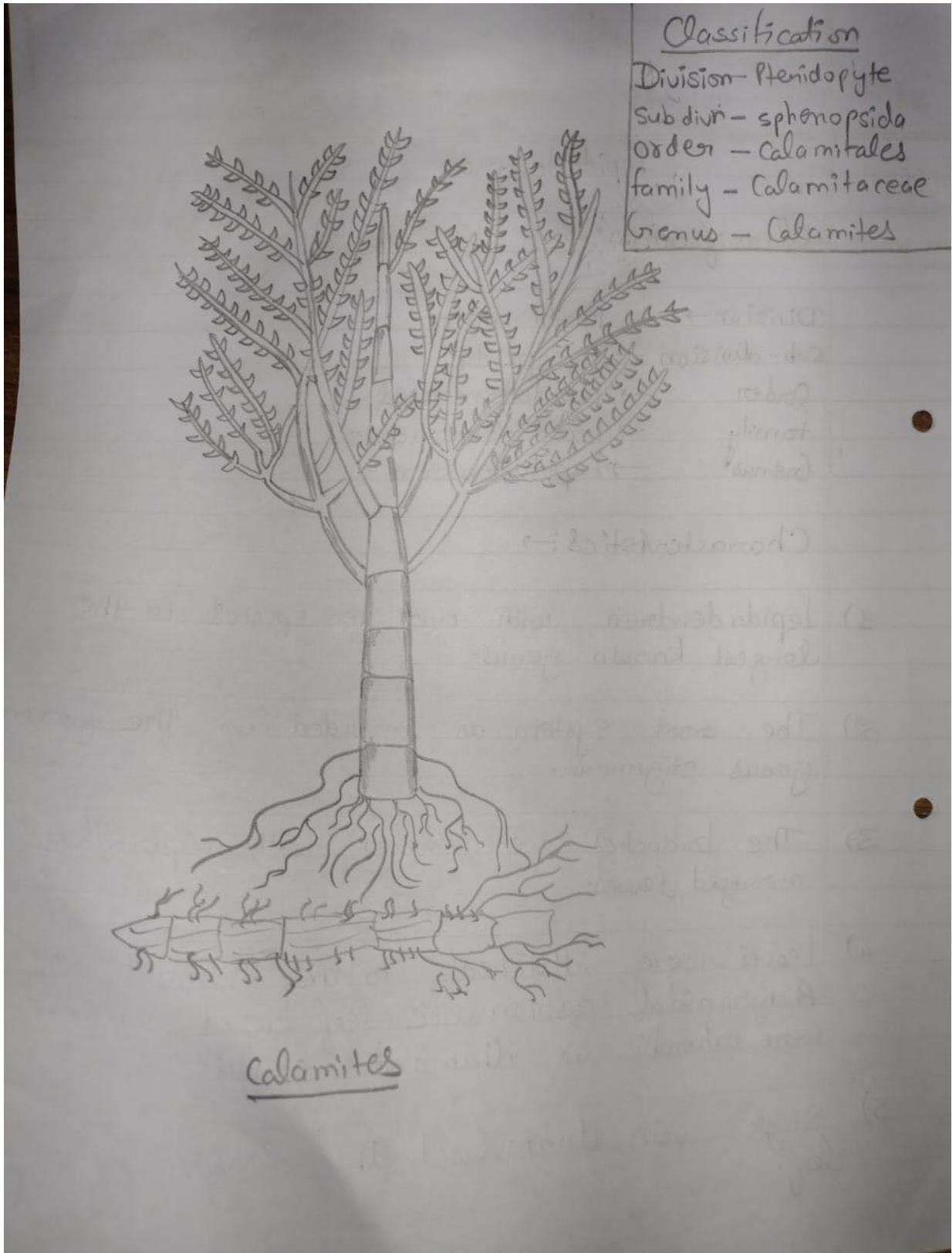
Division → Pteridophyta
Sub-division → Psilophytopsida
Order → Psilophytales
Family → Rhyniaceae
Genus → Rhynia

Characteristics: →

- 1) Rhynia is a fossil member (not found living in present stage), discovered from Rhynichert Beds in Aberdeenshire of Scotland, by Kidston and Lang in 1917.
- 2) The 2 species *R. major* about 40-50cm in height and *R. guynne* Vazeghani, About 20cm in height.
- 3) There are no roots.
- 4) The upright branches were dichotomously branched and gradually tapering.



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Lepidodendron

Classification: →

Division → Pteridophyta
Sub-division → Lycopsidea
Order → Lepidodendrales
Family → Lepidodendraceae
Genus → Lepidodendron.

Characteristics: →

- 1) Lepidodendron with over 100 species is the largest known genus.
- 2) The root system is included in the form genus *Stigmaria*.
- 3) The branches were covered with spirally arranged leaves.
- 4) Leaves were attached to the summit of a pyramidal cushion like leaf bases which were rhombic or diamond shape.
- 5) Single vein transversed the length of a leaf.



Calamites

Classification

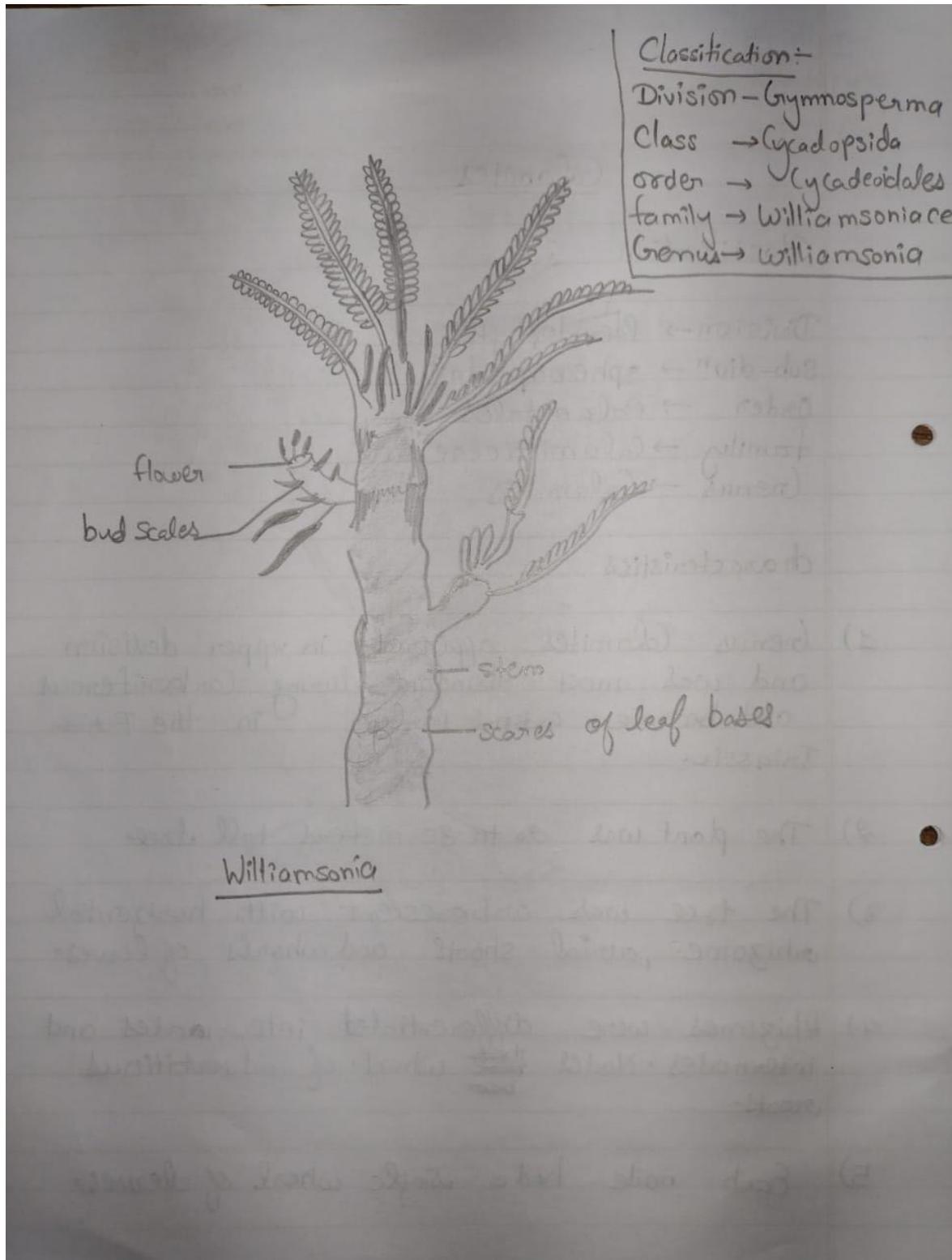
Division → Pteridophytes
Sub-divⁿ → sphenopsida
Order → Calamitales
Family → Calamitaceae
Genus → Calamites

Characteristics

- 1) Genus Calamites appeared in upper Devonian and was most abundant during Carboniferous and became extinct early in the ~~Fr~~ Triassic.
- 2) The plant was 20 to 30 meters tall tree.
- 3) The tree was arborescent with horizontal rhizome, aerial shoots and whorls of leaves.
- 4) Rhizomes were differentiated into nodes and internodes. Nodes ~~had~~ bear whorl of adventitious roots.
- 5) Each node had a single whorl of leaves.



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Williamsonia

Classification:-

Division → Gymnosperma
Class → ~~to~~ Cycadopsida
Order → Cycadeoidales
Family → Williamsoniaceae
Genus → Williamsonia

Characteristics:→

- 1) Many species have so far been reported from upper triassic and jurassic of India, Europe and north america.
- 2) It was earlier placed under Zamia gigas by Williamson (1868).
- 3) The leaf was placed in from genus Ptilophyllum it has linear and parallel veined leaflets similar to those found in Zamia.
- 4) The lateral branches were born through leaf bases and ~~posses~~ possessed flowers.
- 5) flowers are unisexual.