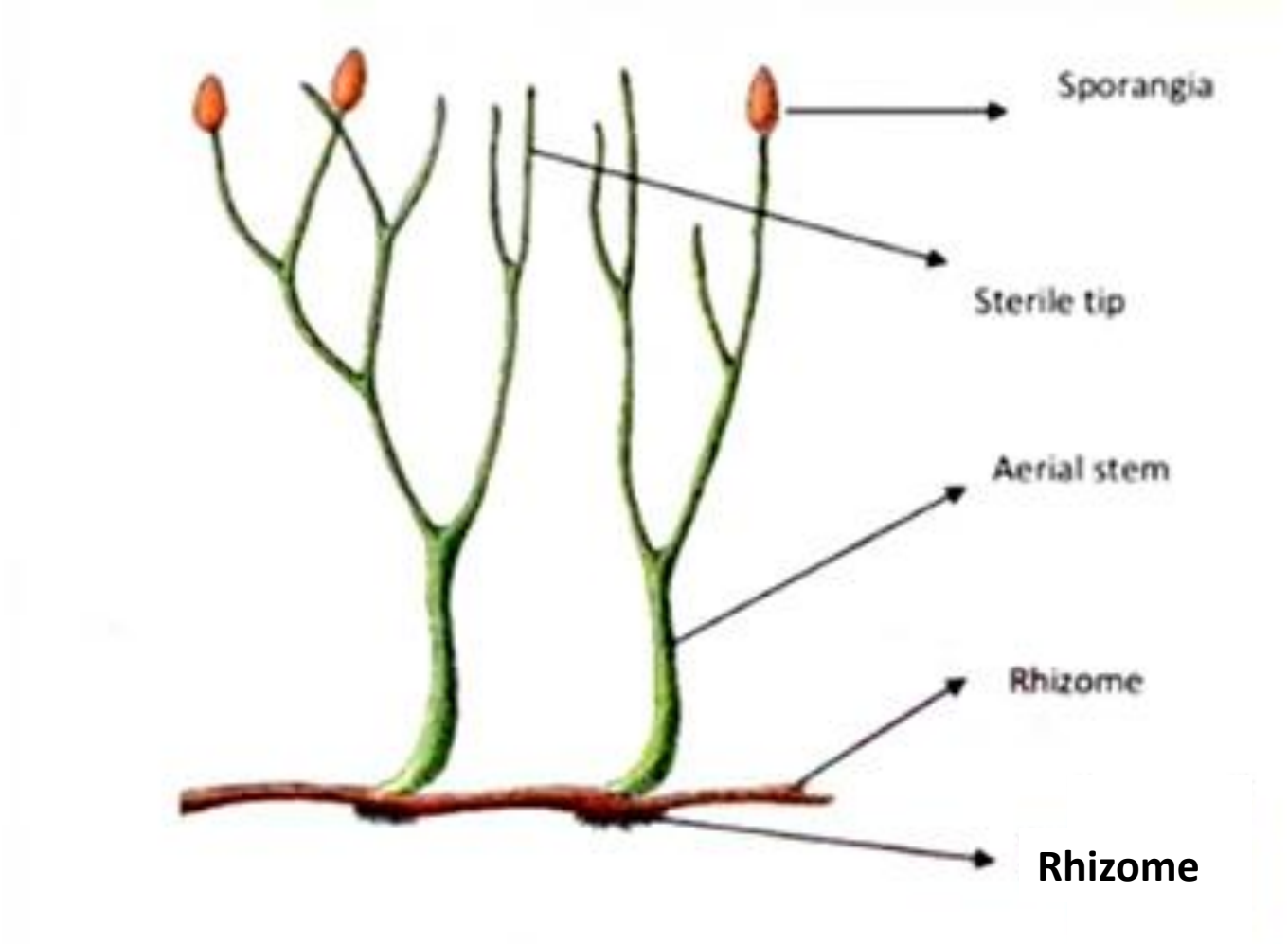
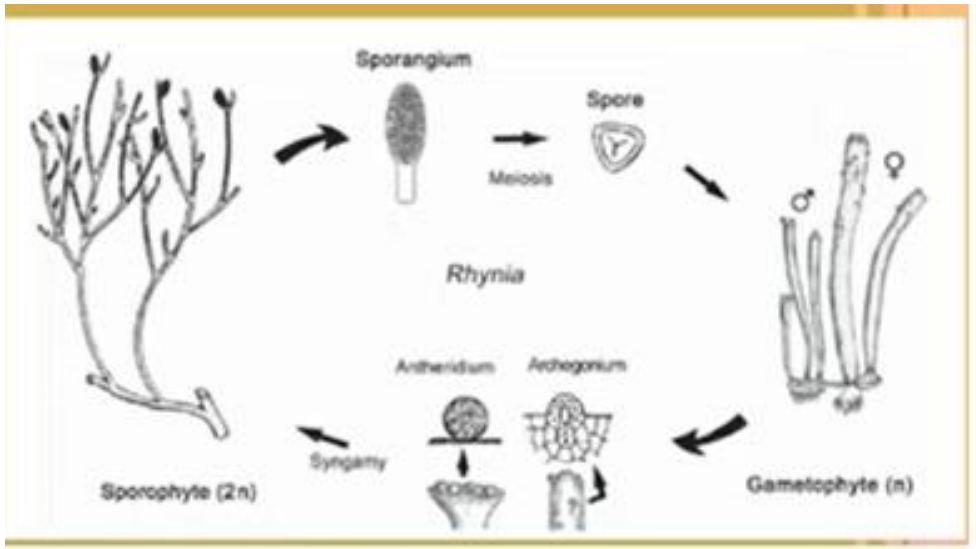
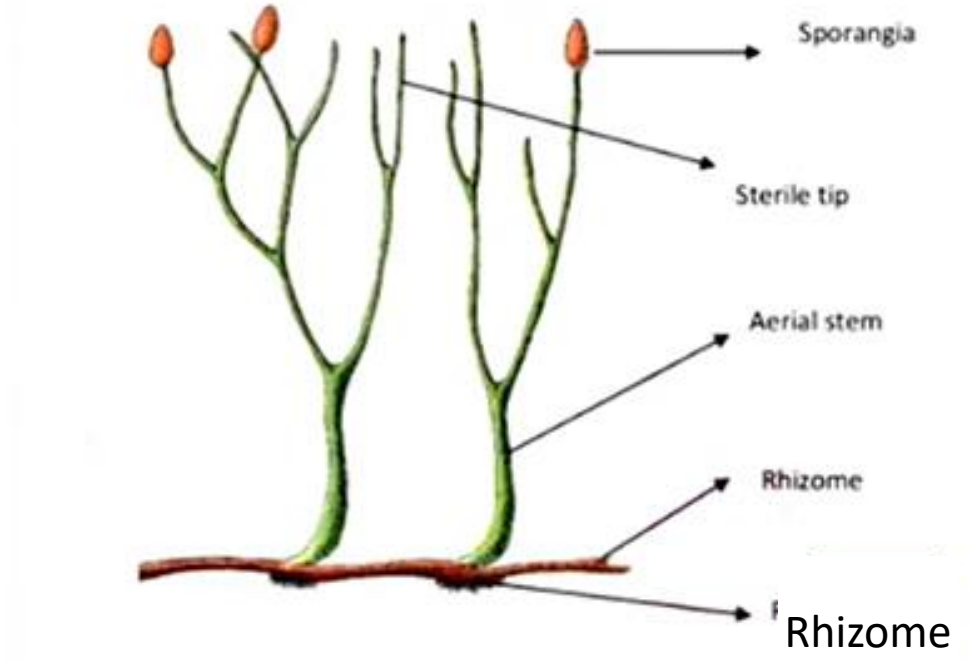
RHYNIA



INTRODUCTION

- The fossils of the genus Rhynia were discovered by **Kidston and Lang** in **1917** from the Rhynie locality of Aberdeenshire in Scotland.
- Their rootless sporophyte was differentiated into rhizome and slender aerial branches that were more or less dichotomously branched





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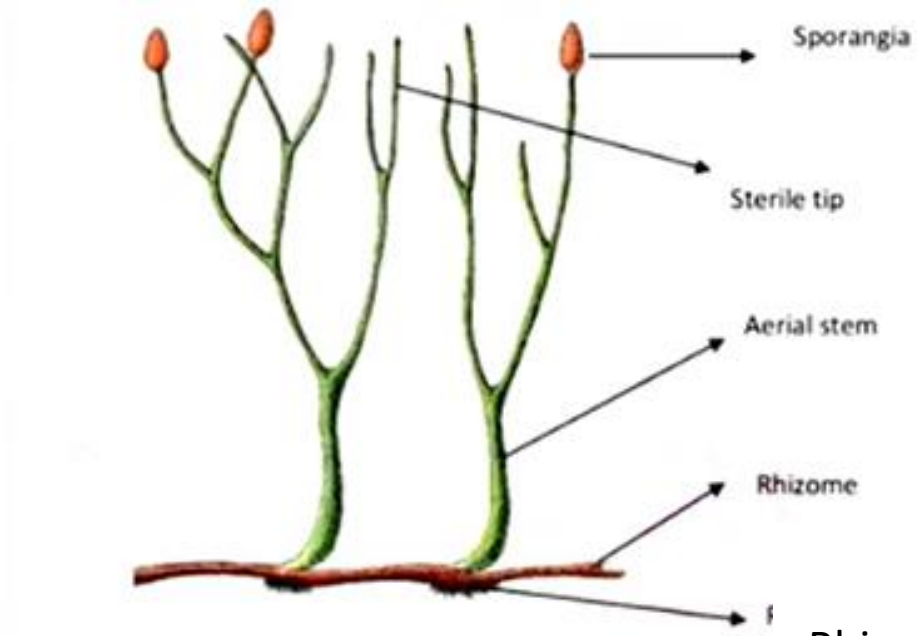
Carboniferous (280 million yrs ago)	**Pteridopl**
Devonian (360 million yrs ago)	**Primitive land plants**

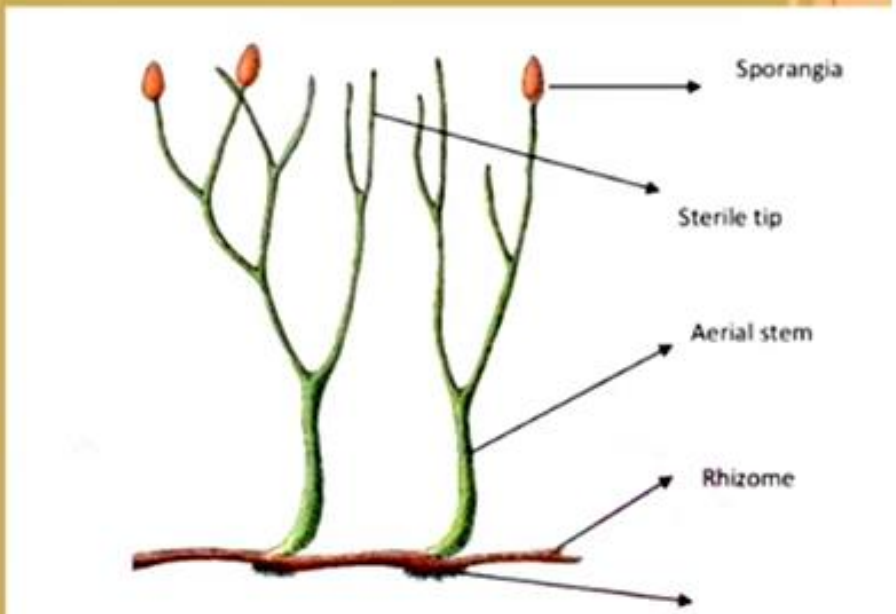


Rhizome

SYSTAMATIC POSITION

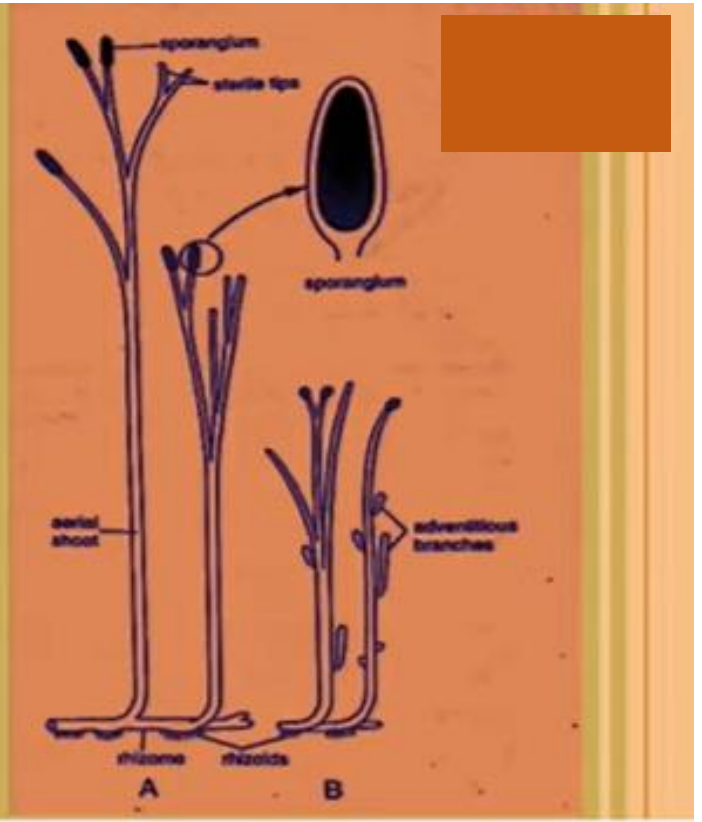
- **Riemers (1954)** placed these simplest fossil plants in the subdivision Psilophytopsida.
- **Psilophytopsida** is an assemblage of the simplest and the earliest land plants.
- Subdivision Psilophytopsida included only a single order Psilophytales.
- Examples of Family Rhyniaceae: ***Rhynia, Horneophyton, Cooksonia, Yarravia***

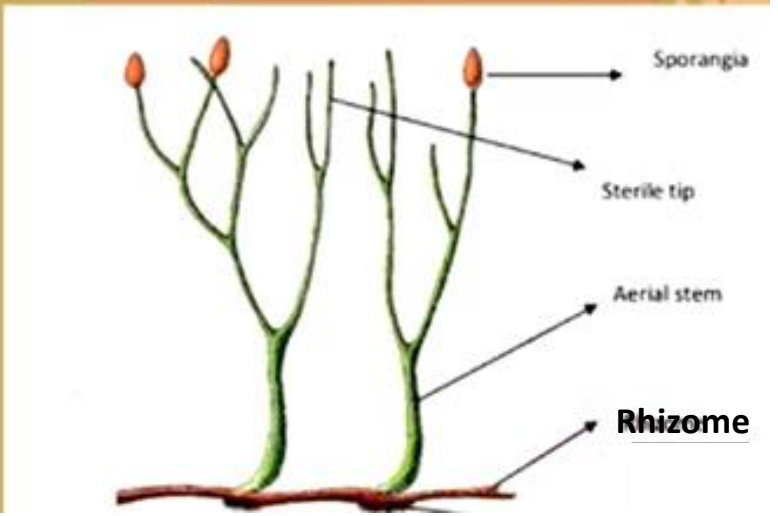
- **Kingdom- Plantae**
- **Division- Pteridophyta**
- **Sub-division- Psilophytopsida**
- **Order- Psilophytales**
- **Family- Rhyniaceae**
- **Genus- *Rhynia***



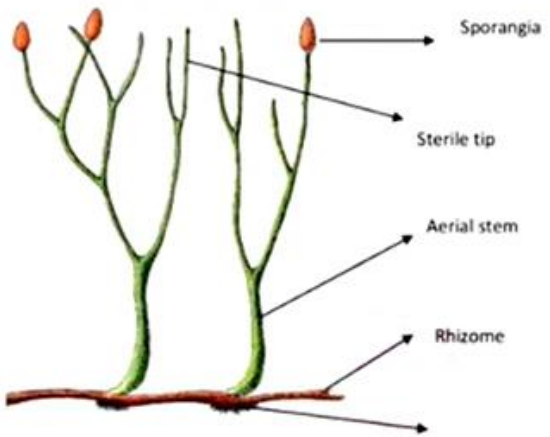
External Morphology

- The plant body of Rhynia was sporophytic.
- Both species of Rhynia were herbaceous.
- The plant body consisted of a subterranean, creeping, cylindrical and dichotomously branched rhizome and upright, simple dichotomously branched aerial leafless shoots.

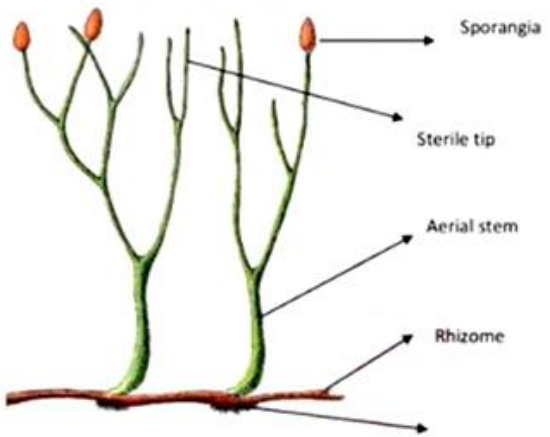




- The aerial shoots of *R. major* were about 50 cm in height and 1.5-6 mm in diameter.
- *R. gwynne-vaughani* were comparatively small, measuring about 20 cm in height and 1-3 mm in diameter.
- Roots were absent but tufts of rhizoids were present on the underside of the rhizome.

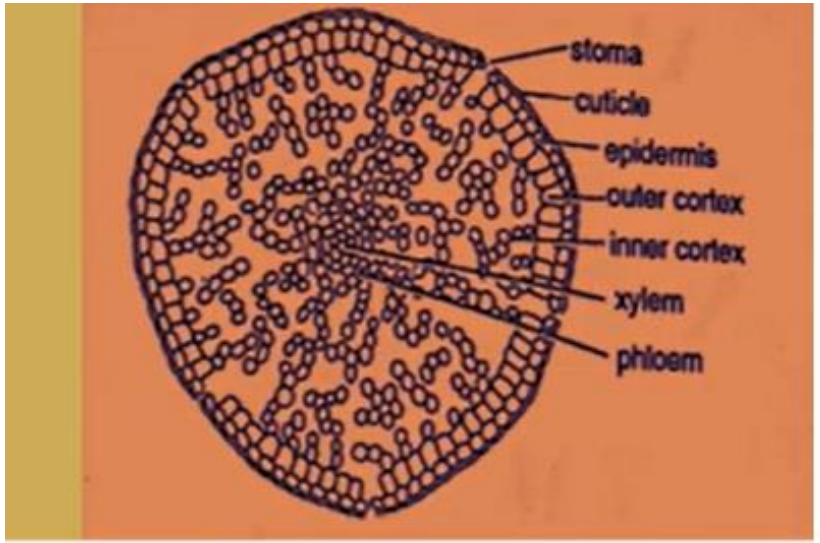


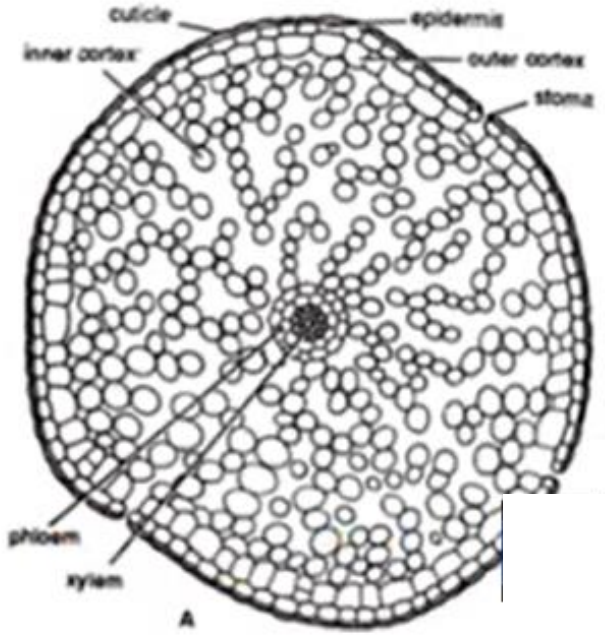
- The rhizome and aerial shoots of *R. gwynne-vaughani* had many adventitious branches which probably developed by proliferation of the cortical cells.
- These branches had no vascular connection with the main axis and they probably helped in vegetative propagation.
- The aerial branches end in tapering vegetative apices or bore **pear-shaped terminal sporangia**.



INTERNAL STRUCTURE

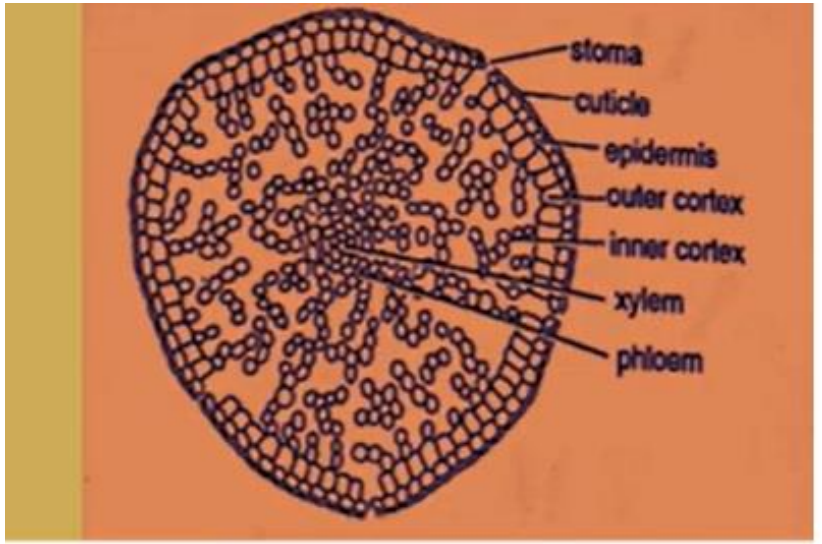
- **Epidermis:** single-layered envelope covered by a thick layer of cuticle, interrupted by stomata.
- **Cortex:** broad cortex, differentiated into an **outer region** (1-4 layered, compactly arranged, polygonal parenchymatous cells) and an **inner region** (sphaerical, parenchymatous cells with intercellular spaces).

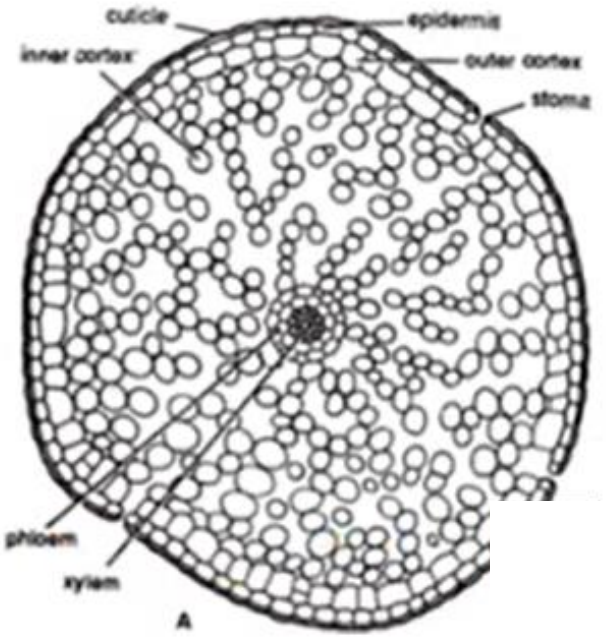




Morphology of Rhynia/BSc 1st year

- **Central Cylinder:** Protostele, xylem surrounded by phloem. Xylem composed of tracheids with annular and spiral thickening.
- The phloem was represented by 4-5 layers of thin walled elongated cells with oblique end walls.
- some very minute sieve-like areas were present on the lateral walls.

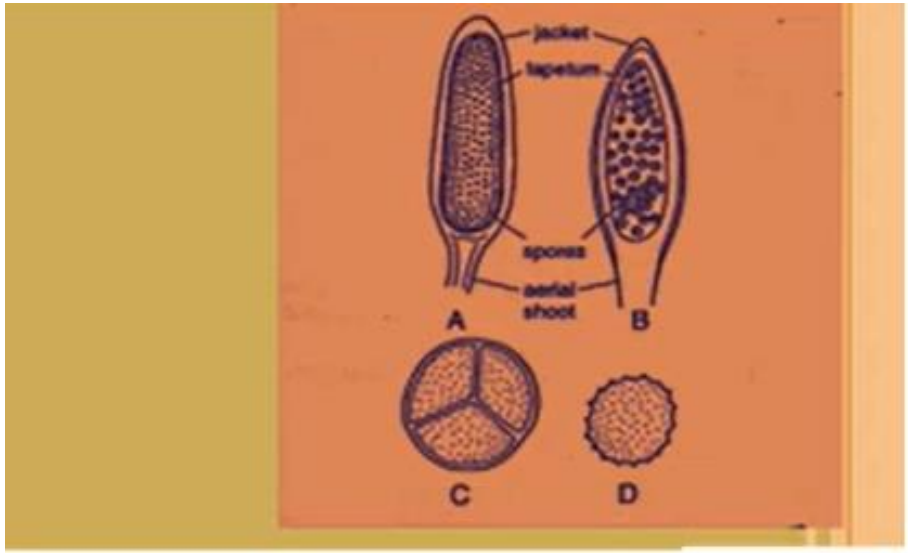


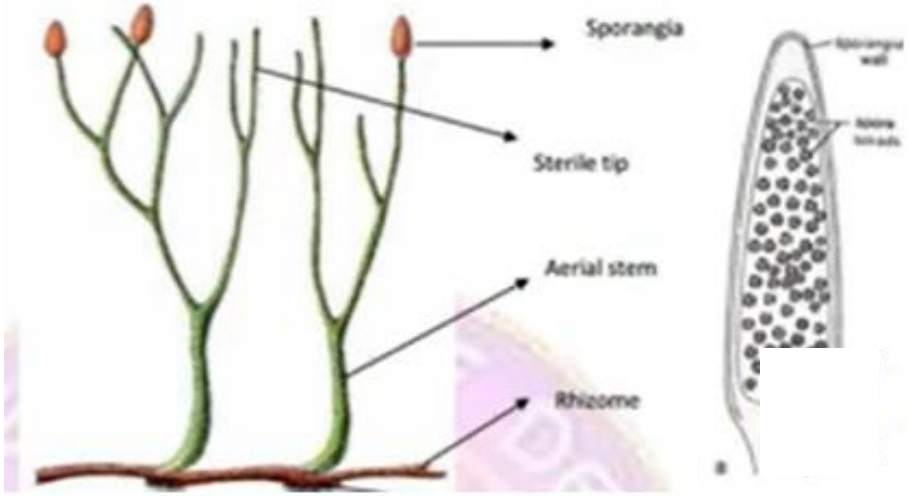


Morphology of Rhynia/BSc 1st year

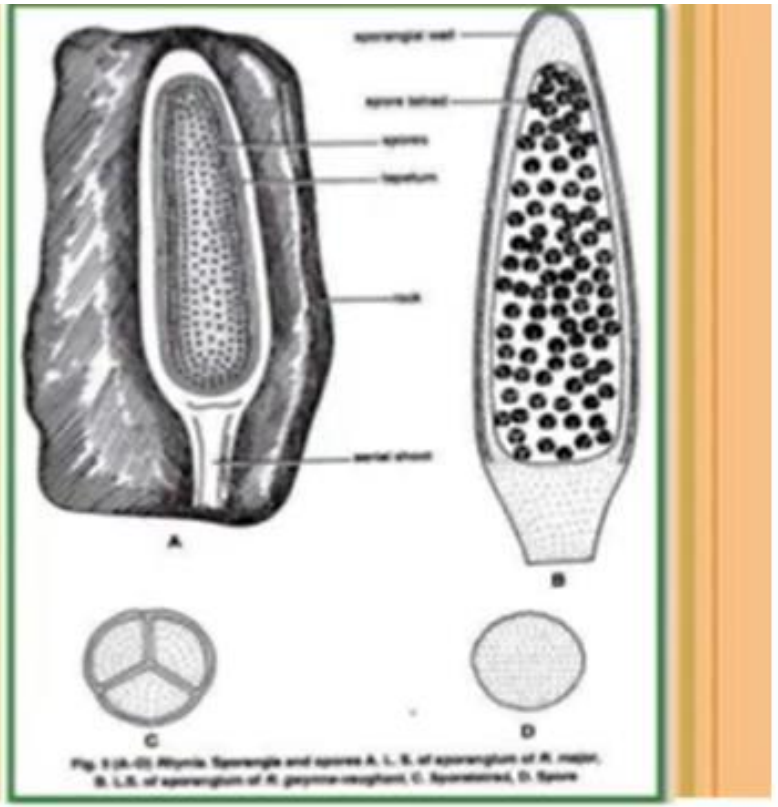
Reproductive Structure: Sporangia

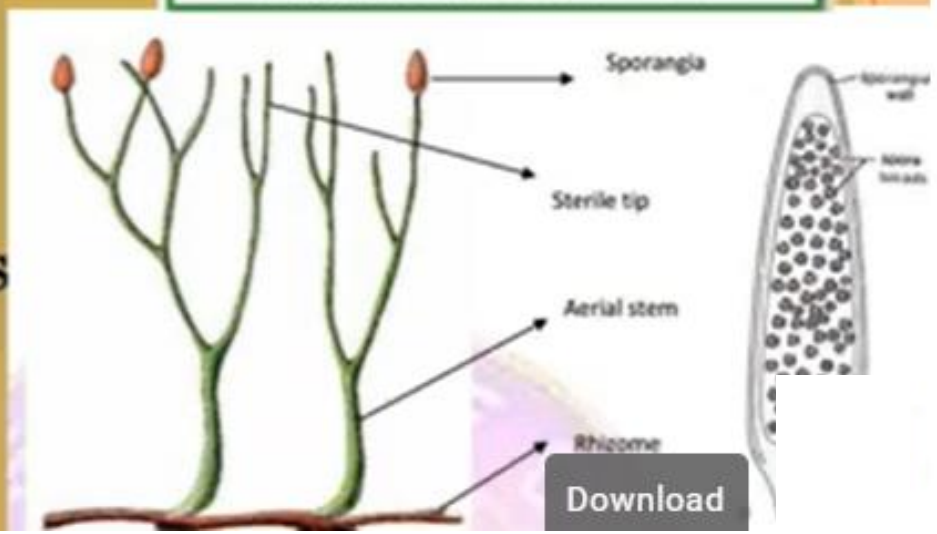
- Borne singly on the apices of some of the aerial branches.
- Oval or slightly cylindrical.
- The sporangia of *R. major* were approx. 10mm long and up to 4 mm in breadth and those of *R. gwynne-vaughani* were comparatively small.
- Each sporangium surrounded by multilayered jacket, outer wall composed of heavily cuticularised thick walled cells.





- The innermost layer made up of small rounded thin-walled cells, which formed a nutritive layer like tapetum.
- There were numerous spore tetrads in sporangial cavity.
- All spores were (**homosporous**).
- Spores heavily cutinized and measured up to 65 microns in diameter.
- The spores had typical **triradiate markings.**
- The tetrahedral arrangement of spores reveals that they were formed by reduction division.





THANK YOU