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MACOSA
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Course code: BIO 102

Course Title: Plant and animal diversity

Assignment

1. Fungi are important to man in the following ways:

a. Fungi are responsible for the mediation of decay of organic matter.

b. Fungi (e.g. yeast and *Penicillium notatum*) are important in food and drug industries.

c. Many fungi species mediate the spoilage of wood, food, clothes and paper.

d. Some fungi are parasites to some horrible, obnoxious pests e.g. houseflies.

and therefore constitute important biological control agents in regards to such pests.

e. Skin diseases e.g. ringworm and dermatitis are caused by fungal agents.

2. Cell structure of Brewer's yeast:

Brewer's yeast is one of the best known example of unicellular forms

in fungi. The cell structure is very simple, though the organism is one

of the more advanced fungal forms from the point of view of its

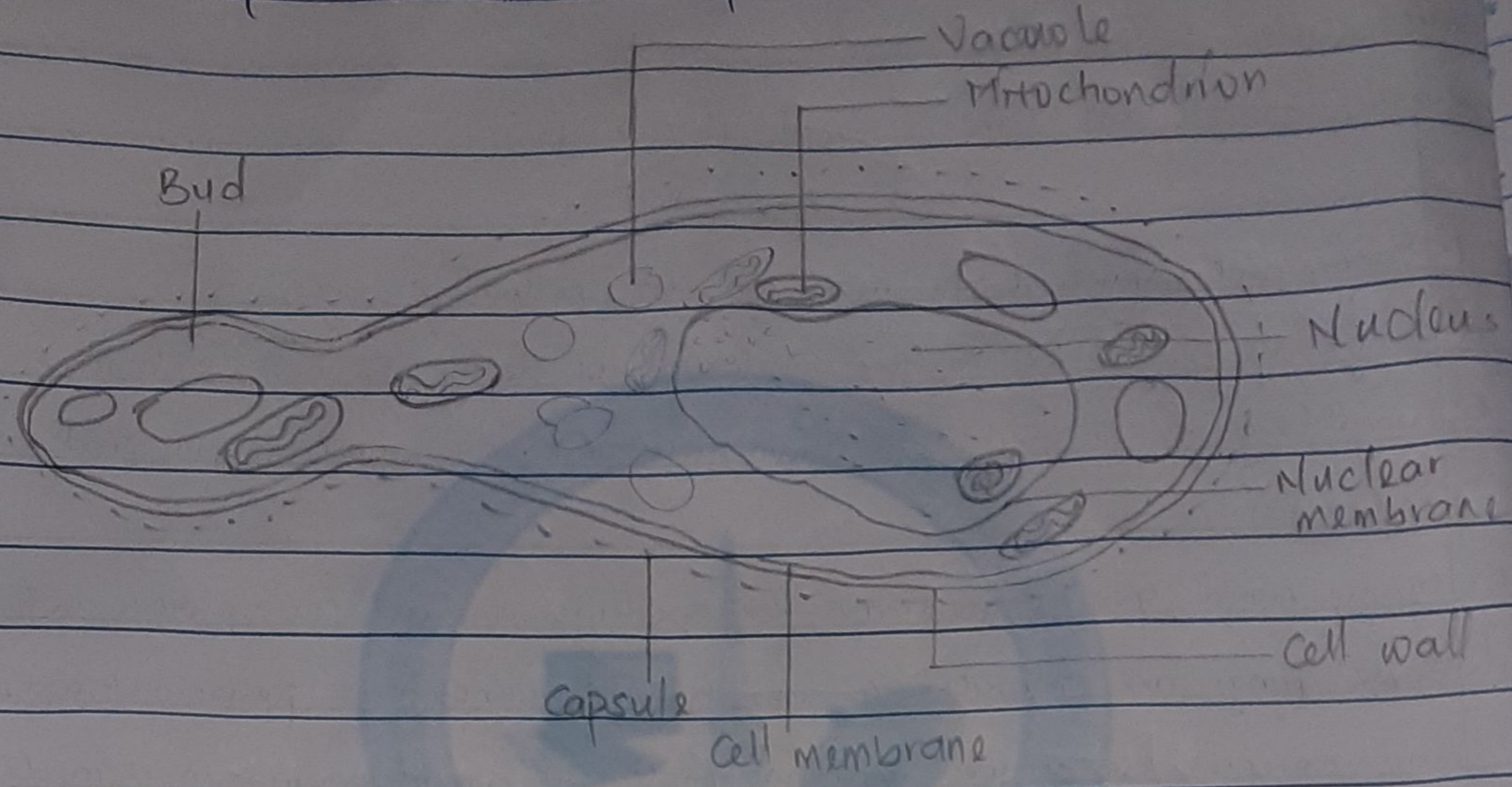
spore-producing structures. Cell exists in diploid/haploid states. Under

favourable environmental condition, in both states, they multiply rapidly by

simple mitotic cell divisions (budding). Diploid cells arise from haploid

cells by processes of plasmogamy and karyogamy. A diploid cell may

undergo meiosis under certain conditions to produce 4 haploid spores - ascospores (contained in simple structure - an ascus).

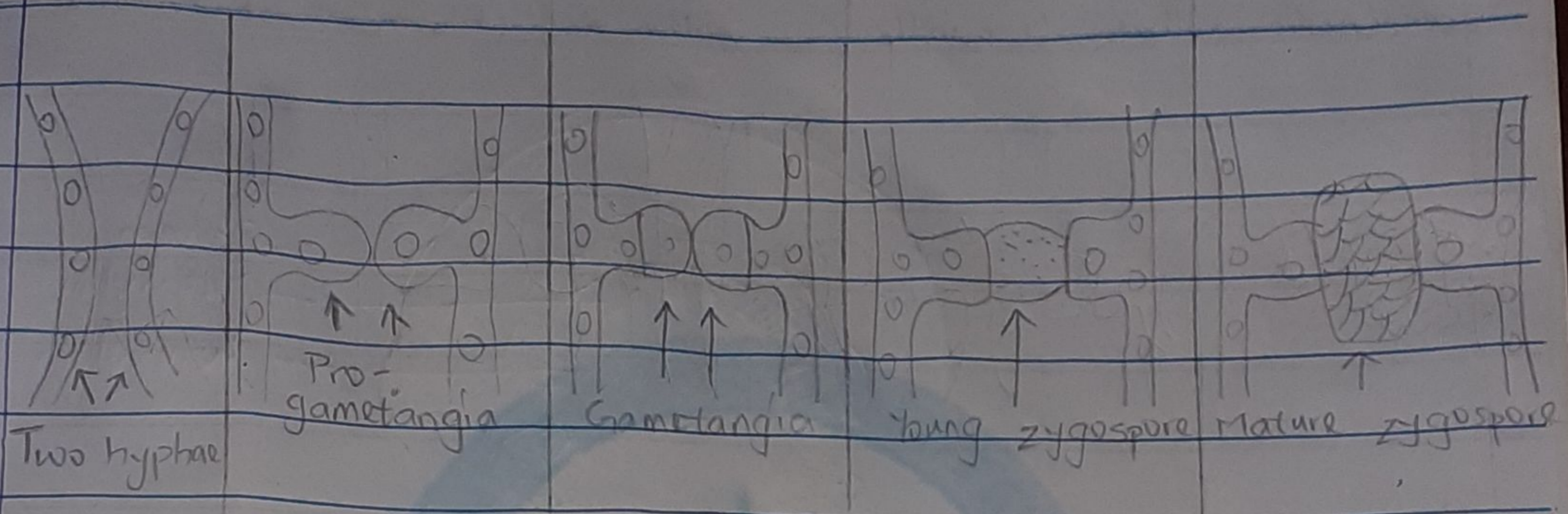


Structure Of *Saccharomyces cerevisiae* (yeast)

3 Sexual Reproduction in *Pezizopus stolonifer*:

Pezizopus stolonifer is a filamentous form of fungi. Sexual reproduction occurs when two mating types of hyphae grow in the same medium. Chemical interaction in the two mating types of hyphae induces growths perpendicular to the hyphae in opposite directions. These growths are delimited by a wall such that many nuclei are isolated in what is called a gametangium. The two gametangia fuse (plasmogamy) and a zygote is formed which may undergo prolonged dormancy or resting stage. The nuclei in the zygotes fuse in twos and undergo meiosis independently.

The zygote germinates under favourable conditions to produce a fruiting which at maturity liberates the haploid spores.



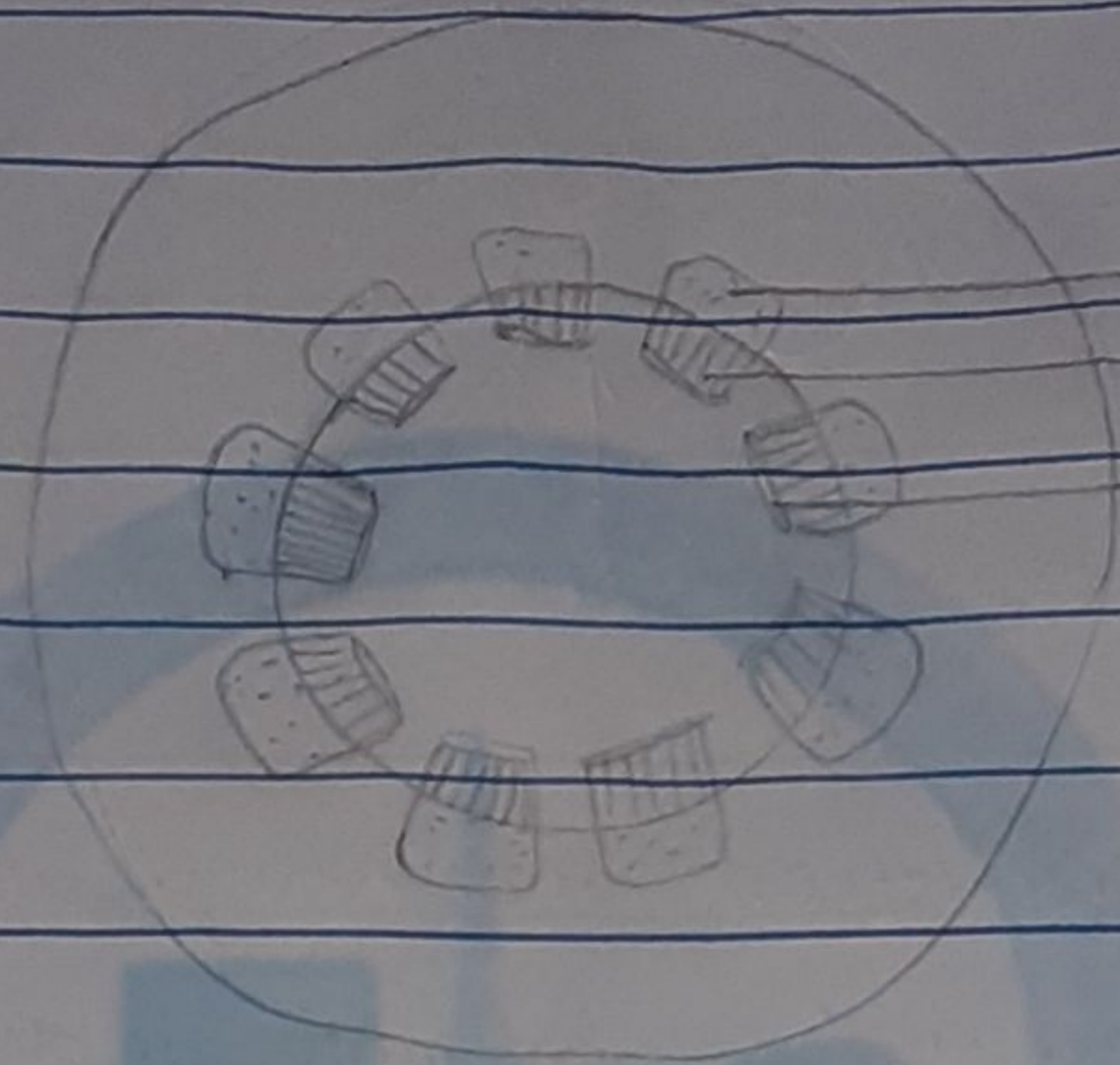
Sexual Reproduction in Rhizopus Stolonifer

4. Bryophytes adapt to their environment in the following ways!
 - a. They have definite structures for water and nutrient absorption from the soil; therefore the plant body is divided into two (an aerial portion and a subterranean portion). The subterranean portion is the rhizoid and is not a true root as the case of land plants that are ^{advanced} advanced.
 - b. The aerial portion being exposed to the atmosphere demands some modifications that prevents excessive loss of water through the body surface (desiccation)
 - c. Some other modifications that permit elimination of excess water from the plant body and not only exchange of gases between the internal parts of the plant and the atmosphere therefore openings are available on the aerial parts of the plant.

5a. Eustele: These steles are found in



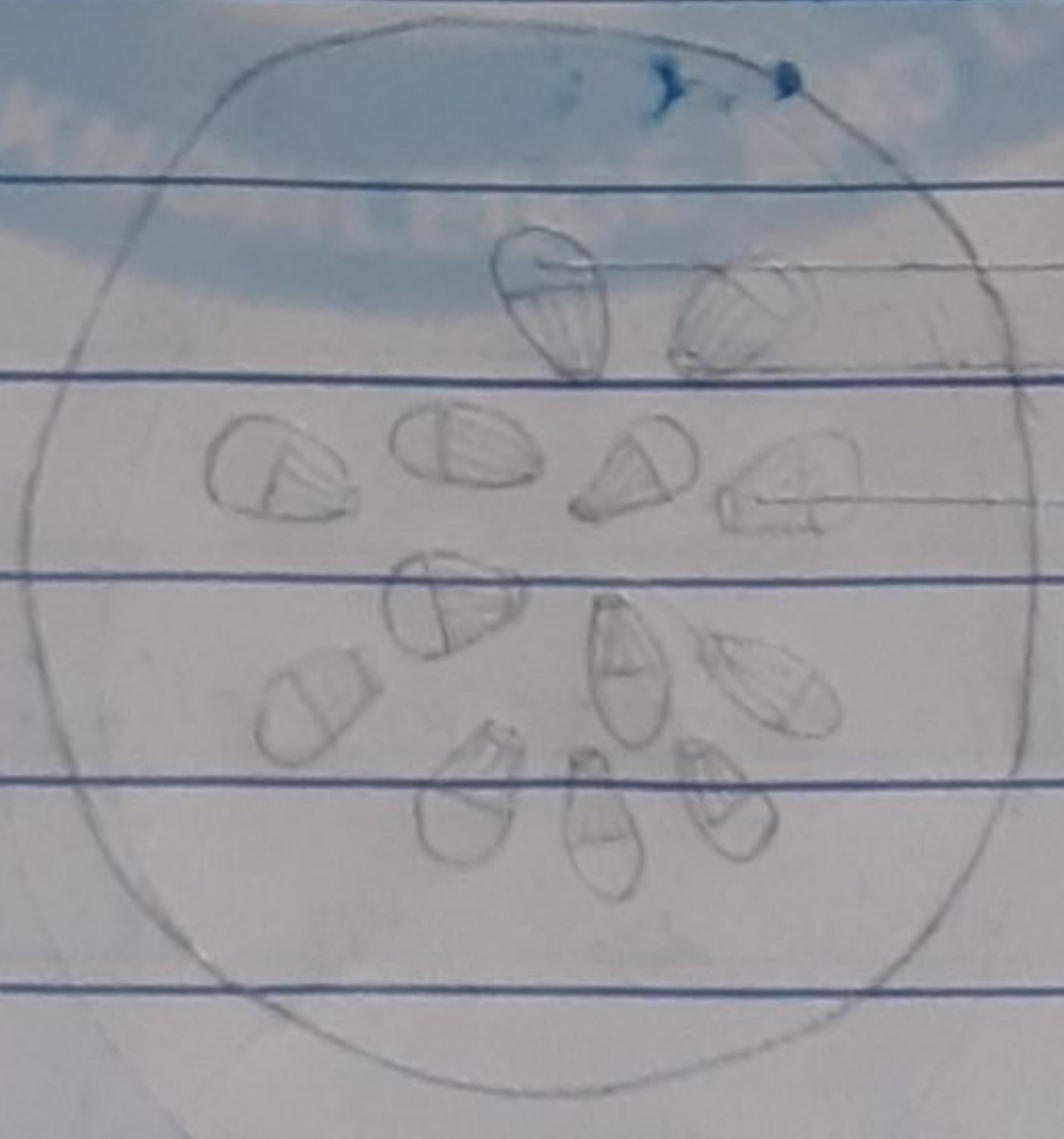
herbaceous dicotyledonous plants. The vascular bundles are discrete, concentric collateral bundles of xylem and phloem as shown below



Phloem
Metaxylem
Protoxylem

Structure Of an Eustele

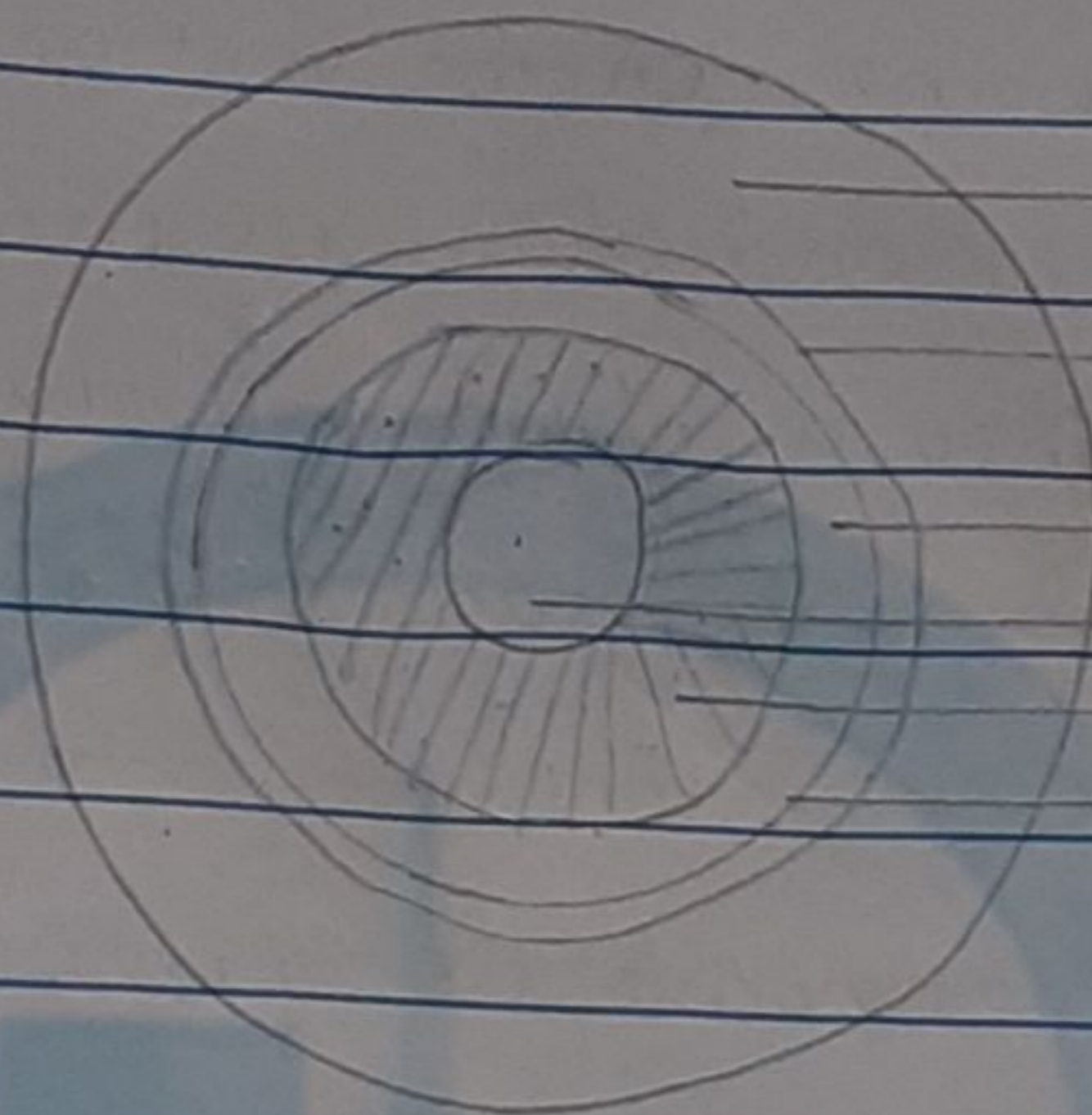
b. Atactostele: This type of stele is found in grasses and many monocotyledonous plants. The vascular bundles are scattered.



Phloem
Metaxylem
Protoxylem

Structure Of an Atactostele

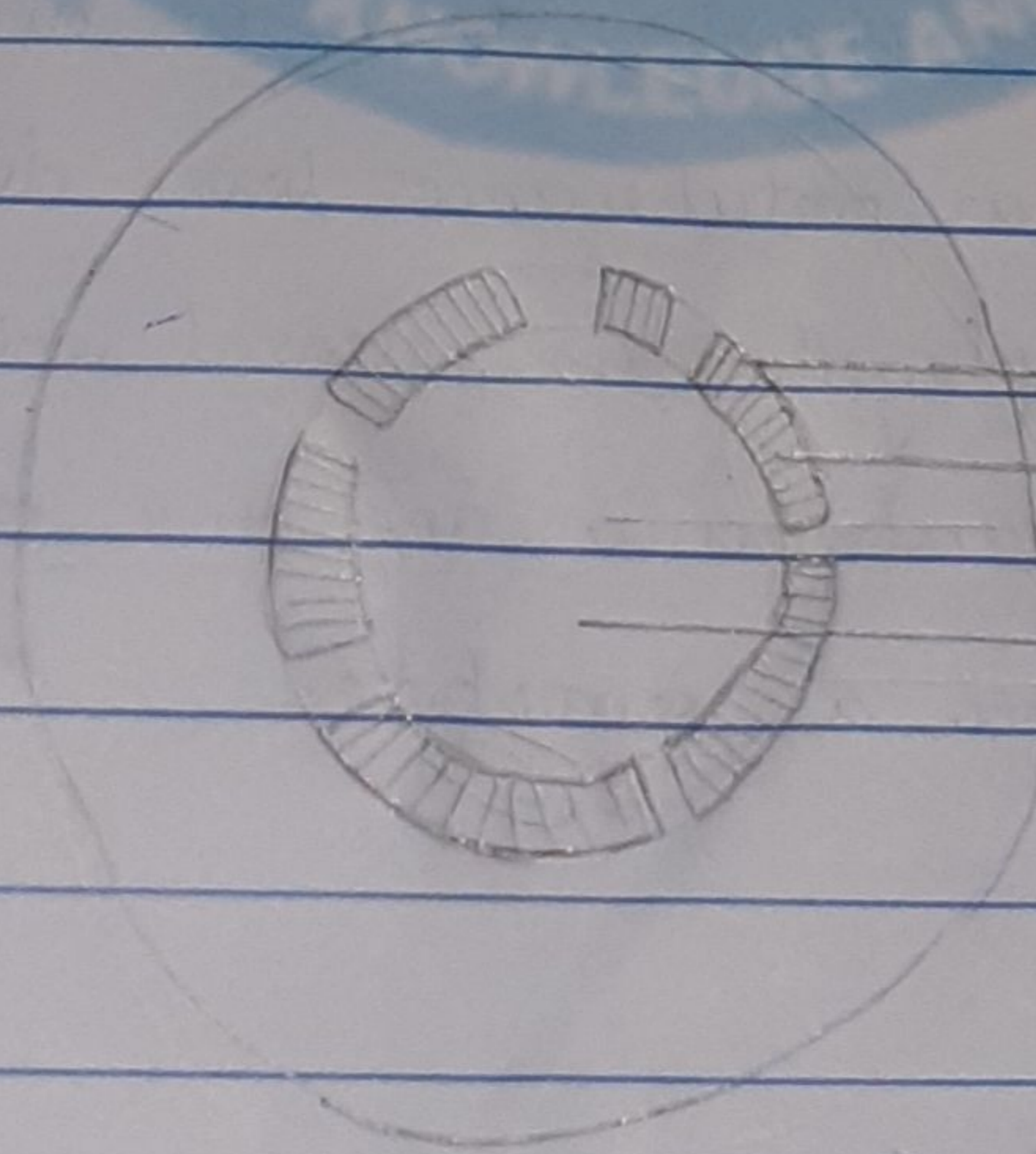
c. Siphonostele: This stele consists of a cylinder enclosing a parenchymatous pith and is found in more advanced vascular systems e.g. stems of ferns and higher vascular plants.



Cortex
Pericycle
Phloem
Pith
Xylem
Endodermis

Structure Of a Siphonostele

d. Dictyostele: This is a type of siphonostele found in ferns in which the vascular supply to leaves is associated with leaf gaps and the conducting cylinder is a dissected one.



Phloem
Xylem
Pith

Structure Of a Dictyostele



6. Life Cycle Of Psilotum

Psilotum is a very primitive vascular plant. Branching is dichotomous as in other primitive forms. The sporophyte is the dominant generation among these vascular plants. Three-lobed sporangia (each subtended by two scales) are borne on the vertical axes. The sporangium contains haploid spores and originates from diploid cells of the stem. Sporangium develops into a globose structure inside which sporogenous cells undergo meiosis to produce haploid spores. Short stalks of the sporangium has a trace connected to the stele of the vertical axis. The plant is homosporous i.e. spores have uniform shape and size. Spores after liberation germinate into cylindrical, dichotomously-branched gametophytes. Gametophytes are saprophytic, and often associated with certain filamentous fungi in mycorrhizal relationship and are hardly visible to the naked eye. Externally, they have many rhizoids but internally, they are largely parenchymatous. At maturity, the terminal ends of the cylindrical branches bear the archegonia while the antheridia are borne as protuberances lower down on the branches. Sperms having many flagella are released when antheridia are ripe which swim to the archegonia and the resulting zygote subsequently develops into a sporophyte.

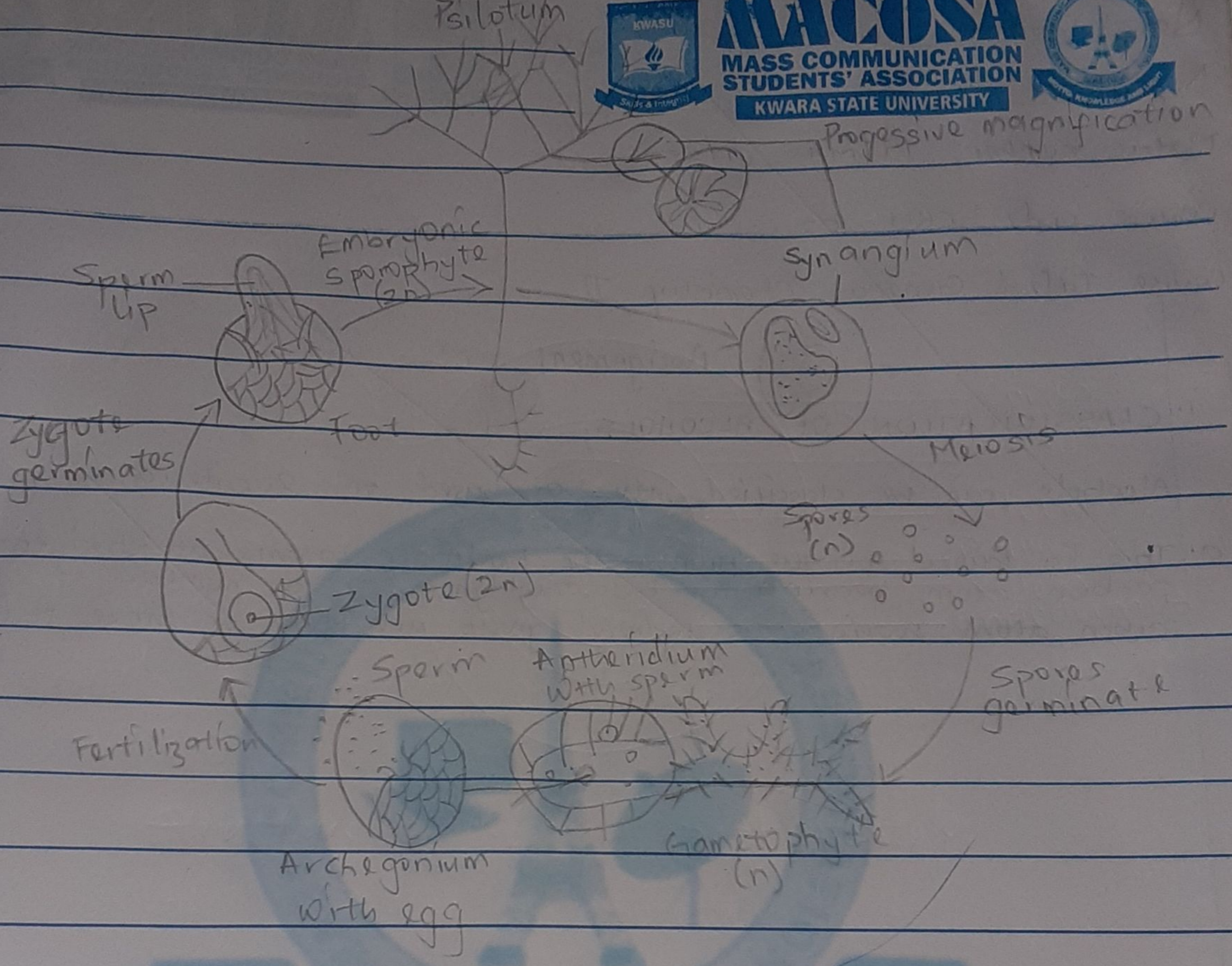
Psilotum



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Progressive magnification



Life Cycle Of Psilotum