

MODEL ANSWER

SEMESTER - V

LBC 501: COMPARATIVE STUDY OF CRYPTOGRAMS

Q1. Multiple choice/one sentence/one fill in the blanks

- i. a) *Gelidium*
- ii. a) Blue green algae
- iii. c) Glycogen
- iv. d) Cell wall is chitinous and chlorophyll is absent
- v. d) all of these
- vi. b) perithecium type
- vii. Sphagnum
- viii. Elaters without spiral thickenings
- ix. Pteridophytes having ability to rejuvenate when they are put under favourable condition.
- x. Sporocarp is a specialised type of structure found in some aquatic ferns like *Marsilea* whose primary function is the production and release of spores

Q 2. Long answer type

i. What are the important characteristics of alga?

Answer

Characteristics of algae

- 1) environment is aquatic marine or freshwater only restricted by amount of light
- 2) little or no tissue differentiation mostly in reproductive cells four general morphological forms: unicellular, filamentous, colonial, or thallose
- 3) diversity of photosynthetic pigments, all have chlorophyll a
other pigments include:
 - a) chlorophylls b, c, d
 - b) carotenoids (carotene, fucoxanthin, xanthophyll)
 - c) biliproteins (phycoerythrin, phycocyanin)carotenoids & biliproteins restricted to algae at greater depths where mostly blue-green wavelength light penetrates
chloroplasts: 1-2 large or many small
many have associated pyrenoids for carbon fixation & starch storage
some have means of detecting light = eye spot

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4) many unicellular species have flagella most unicellular forms have flagella: one or two big exception is the red algae (none) most multicellular forms are attached

5) diversity of cell wall structures most have cellulose common additions into structure: SiO_2 , CaCO_3 many secrete mucilage some lack cell wall

6) variation in reproductive methods asexual of two forms: cell division & fragmentation sexual with variation in gamete types:

a) isogamous - male & female sex cells identical

b) anisogamous - different sizes, male smaller

c) oogamous - female large & nonmotile = egg

male small & motile = sperm

variation in life cycle patterns:

a) diplontic - diploid portion of life cycle largest & longest living

haploid essentially one cell (gamete)

b) haplontic - haploid portion of life cycle largest & longest living

diploid essentially one cell (gamete)

c) alternation of generations - diploid & haploid about equal

both forms may look alike = isomorphic

Example: sea lettuce

the two forms look different = heteromorphic

Example: kelp

ii. List important economic uses of fungi for the humans.

Answer

Following are the important uses of fungi for humans

Useful aspects

- Direct utilization of fungi as food e.g. *Agaricus campestris*, *Morchella esculenta*
- Used as manure: help in decay of organic plant and animal material.
- Processing of food e.g. *Aspergillus wentii* employed for processing of soyabeans
- Production of antibiotics e.g. *Penicillium notatum* for production of penicillin

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- Production of beer and wines
- Preparation of medicines
- Preparation of various acids
- Synthesis of enzymes
- Production of esters
- Production of pigments

Harmful aspects

- Plant pathogens
- Decay of timbers
- Destruction of textiles
- Destruction of paper industry
- Spoilage of food stuffs
- Spoilage of meat

iii. What are the different types of lichens present in nature?

Answer

Lichens are symbiotic association of alga and fungi. Following are the important types of lichens present in nature.

Foliose lichens : which have a flattened thallus, resembling crusts, attached to the substratum partially or completely. e.g., *Graphis*, *Verrucaria*.

Fruticose lichens have a flat, expanded, leaf like thallus with rootlike rhizoids. e.g., *Physcia*, *Gyrophora*.

Crustose lichens Fruticose Lichens which have a thallus that is branched and bushy. It may be erect or pendant. e.g: *Usnea*, *Evernia*.

Lichens are grouped into 3 classes based on the participating fungal component

1. Ascolichens, in which the fungal component belongs to Ascomycetes.
2. Basidiolichens, in which the fungal component belongs to Basidiomycetes.
3. Lichens imperfecti, in which the fungal component belongs to Duteromycetes

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iv. Describe the various types of asexual fungal spores.

Answer

Types of Asexual Spore

Fungi produce two major types of asexual spore: sporangiospores and conidia.

Sporangiospores

Endogenous - formed and contained within a sporangium.

Formed as a result of the cleavage of protoplasm around nuclei.

Followed in some cases by formation of a wall around each nucleate portion of protoplasm.

Characteristic of fungi belonging to the chytridiomycota, oomycota and hyphochytridiomycota.

Two main types - zoospores (motile) and aplanospores (non-motile)

Conidia:

Exogenous - often formed at the tip of supporting hyphae called a conidiophores develop in a variety of ways.

Characteristic of mitosporic fungi and fungi belonging to the ascomycota and basidiomycota.

Two main types - thallic and blastic

v. What are the important characteristics of pteridophytes?

Answer

Following are the important characteristics of pteridophytes

1. Vascular plants with neither flowers nor seeds
2. Spores are produced via meiosis in sporangia (or sporangial clusters known as sori)
3. Spores are usually released from the parent plant (diploid sporophyte) to produce haploid, free-living gametophytes
3. As opposed to flowering plants, gametophytes usually develop outside the spore (exosporic) and both gamete-producing organs (antheridia, archegonia) are usually present
4. Gametes (sperm free-living, motile)
5. Embryo/sporophyte - dominant

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Eusporangiate - a large sporangium developing from several initial cells producing many spores. These are sometimes fused to form synangia.

Leptosporangiate - small, specialized sporangia developing from a single initial cell producing a small, definite number (< 128) of spores. These often occur in a cluster (sorus) that is often covered by a flap of tissue known as an indusium

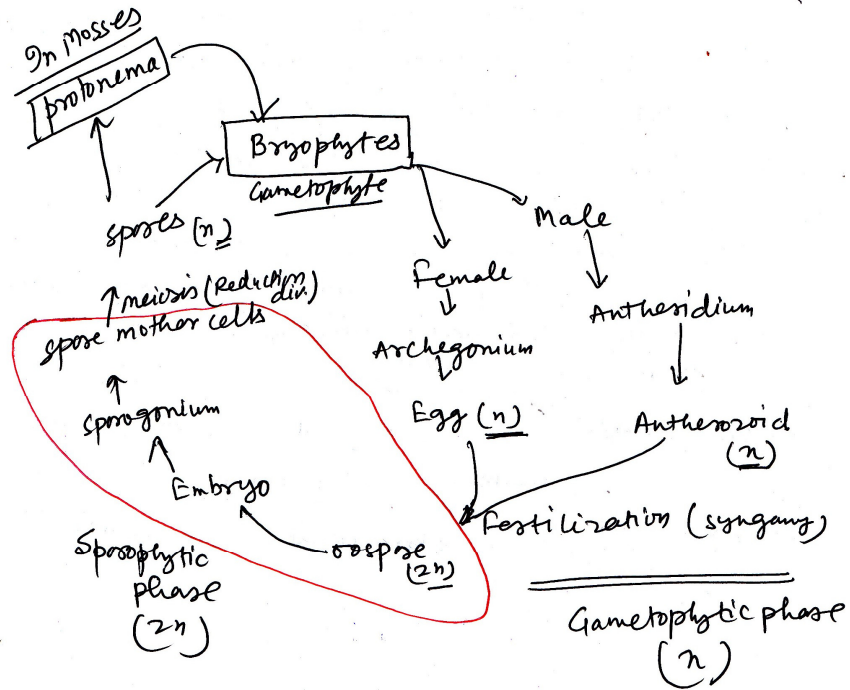
Homosporous - differing from flowering plants in that all spores are the same, producing bisexual gametophytes vs. heterosporous - similar to flowering plants in that two types of spores are produced, and these produce two types of gametophytes: megaspores (develop to form the egg-producing gametophyte or megagametophyte) and microspores (develop to form the sperm-producing gametophyte or microgametophyte);

Nature of the leaf: microphyll - usually small (awn or scale-like) with one vein that is superficially connected to the stem vascular system vs. megaphyll - usually a large leaf (frond) with reticulate venation that has direct connection to the stem vascular system and develops by unrolling circinate venation.

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- vi. Discuss the alternation of generation in bryophytes giving a suitable schematic diagram.



Alternation of generation in Bryophytes
Haploid (n) or gametophytic phase alternates with diploid or sporophytic phase.

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vii. **Describe the anatomy of *Marsilea* rhizome.**

Answer

Anatomy of *Marsilea* Rhizome

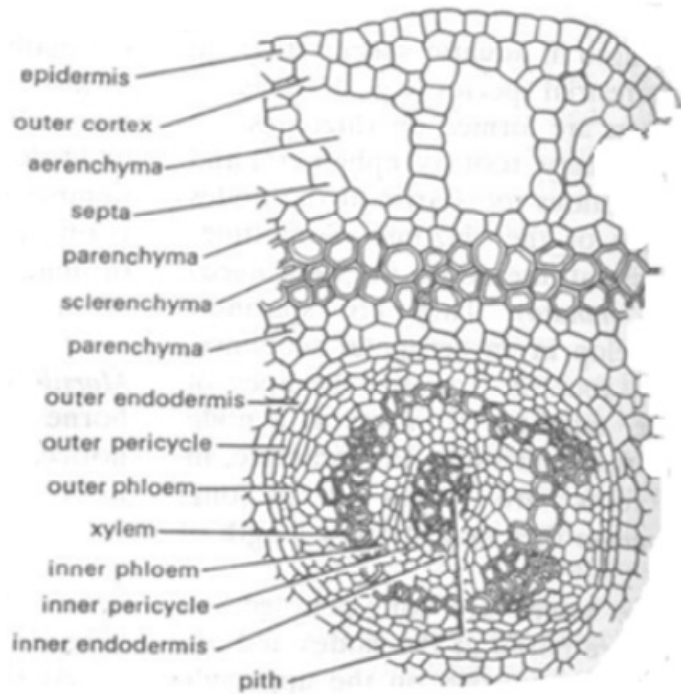
- Epidermis is single-layered, made up of compactly arranged thick walled cells.

- Cortex is differentiated into three regions, viz. outer cortex, the middle cortex and the inner cortex:
 - a. outer cortex is aerenchymatous, one to several cells in thickness, sometimes also consists of tannin cells,
 - b. middle cortex consists of sclerenchymatous tissue filled with air cavities arranged in the form of ring, and
 - c. inner cortex is solid tissue of several cells in thickness. The inner layer of inner cortex is parenchymatous, filled with starch, while outer region of inner cortex is sclerenchymatous in nature.

- The vascular cylinder is siphonostele; limited externally and internally by endodermis, hence called outer endodermis and inner endodermis, respectively.
- The siphonostele is medullated. The xylem is in the form of ring. Phloem is present on both sides of xylem. Such a stele is called amphiphloic siphonostele.
- The deposition of the several tissues from inwards is outer endodermis, outer pericycle, outer phloem, xylem, inner phloem, inner pericycle and inner endodermis

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Anatomy of *Marsilea* rhizome