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100 LEVEL

COLLEGE: MEDICINE AND HEALTH SCIENCES

DEPARTMENT: MEDICINE AND SURGERY

BIO 102 ASSIGNMENT

Question 1: Classify plants according to Eichler's grouping of 1883.

ANSWER:

In 1883, A.W. Eichler gave a system of classification for the whole plant kingdom. His system of classification is both a traditional and phylogenetic method. He classified the plant kingdom into two sub-kingdoms, which are:

i. Cryptogamae

(ii) Phanerogamae

I. Cryptogamae (From the Greek words "kryptos" which means concealed and "gamos" which means marriage). Plants under this sub-division are called cryptogams. Cryptogams are flowerless and seedless plants. They are simple plants like algae, mosses and ferns which do not produce flowers, fruits and seeds. Cryptogams are considered as lower plants. They consist of 3 major divisions:

a) Division Algae: This consists of simple lower plants such as Chlamydomonas, Volvox, Cladophora, Sargassum, Laminaria, etc.

b) Division Bryophyta (Bryophytes): They are the simplest land plants with undifferentiated plant body. They are adapted to grow in water and on land. Vascular tissues are absent. Bryophyta is divided into 3 classes:

* Class Hepaticae * Class Anthocerotae * Class Musci

Examples of bryophytes are mosses, liverworts, ferns, etc.

c) Division Pteridophyta (Pteridophytes): Pteridophytes are the most advanced cryptogams. Vascular tissues are present in the plant body. Therefore, pteridophytes are also called vascular cryptogams. The plant body is differentiated into roots, stem and leaves. The ferns are a large group under pteridophytes.

Pteridophytes are divided into four classes which are:

* Class Psilopsida * Class Lycopsidea * Class Sphenopsida

* Class Pteridopsida

Examples of Pteridophytes are Psilotum, Lycopodium, Equisetum, Dryopteris, etc.

for the respective classes as above.

Sub-Division Phanerogamae

The Animals under this sub-division are known as phanerogams. Phanerogams are also known as spermatophytes (from Greek words "Sperma" which means seed and "phyton" which means plant). This tells us that they are seed bearing plants. They are higher plants. The plant body is differentiated into roots, stem and leaves with well developed vascular system. It is made up two classes which are Gymnosperms & Angiosperms.

* Gymnosperms (Gk. gymno = naked; Sperma = seed): Gymnosperms produced naked seeds (seeds are not enclosed in a fruit). They do not produce flowers and are referred to as "primitive seed plants". They mostly include evergreen trees like conifers and cycads. Gymnosperms are divided into 3 different class which include: *

- * Class Cycadopsida (Cycadales)
- * Class Coniferopsida (Coniferales)
- * Class Gnetopsida

Examples of gymnosperms are pines, gnetum, cycas, etc.

* Angiospermae: Angiosperms (Gk. "angion" = hidden; Sperma = seed). Angiosperms are flowering and seed-bearing plants. The seeds are enclosed in fruits. They presently form the dominant vegetation of the earth. They are beautiful, colourful and scented. Angiosperms are divided into two classes: *

- * Dicotyledons
- * Monocotyledons

Examples of Angiosperms are: Maize, coconut, plantain, etc.

Question 2: How are algae of importance to Man?

Answer:

Importance of Algae to Man

1. Food for sea animals and fishes.
2. They have a high mineral content. They contain potassium, sodium and chloride which are found in ionic form in sea weeds.
3. They are also a source of vitamins such as vitamins A, B and E in sea weeds.
4. It is a source of agar which is used in the production of ice cream, jellies, desserts, etc; in-sizing textiles and clearing many liquids.
5. They can be used to eradicate diseases caused by vitamin deficiencies. Vitamins

Diseases such as vitex, asthma, tooth decay, etc can be treated with flavours from sea weeds.

6. Manufacture of soaps and alums. The burning of sea weeds form alkalis that are used to manufacture soaps and alums.
7. Algae can also be used as fertilizer.
8. Algae can be used as ornamental plants.
9. Algae can be used to manufacture paper.
10. Cyanobacteria (blue-green algae) helps in nitrogen fixation.

Question 3: Describe a unicellular form of algae

Answer:

Unicellular form of Algae - Chlamydomonas

Chlamydomonas is a genus of green algae consisting of about 325 species which are all unicellular flagellates. They are found in stagnant water and in damp soil, in fresh water, sea water, etc. Chlamydomonas is used as a model organism for molecular biology. One of the features of Chlamydomonas is that it contains ion channels (channelrhodopsins) that are directly activated by light. Some regulatory systems of Chlamydomonas are more complex than their homologs in gymnosperms, with evolutionary related regulatory proteins being larger and containing domains.

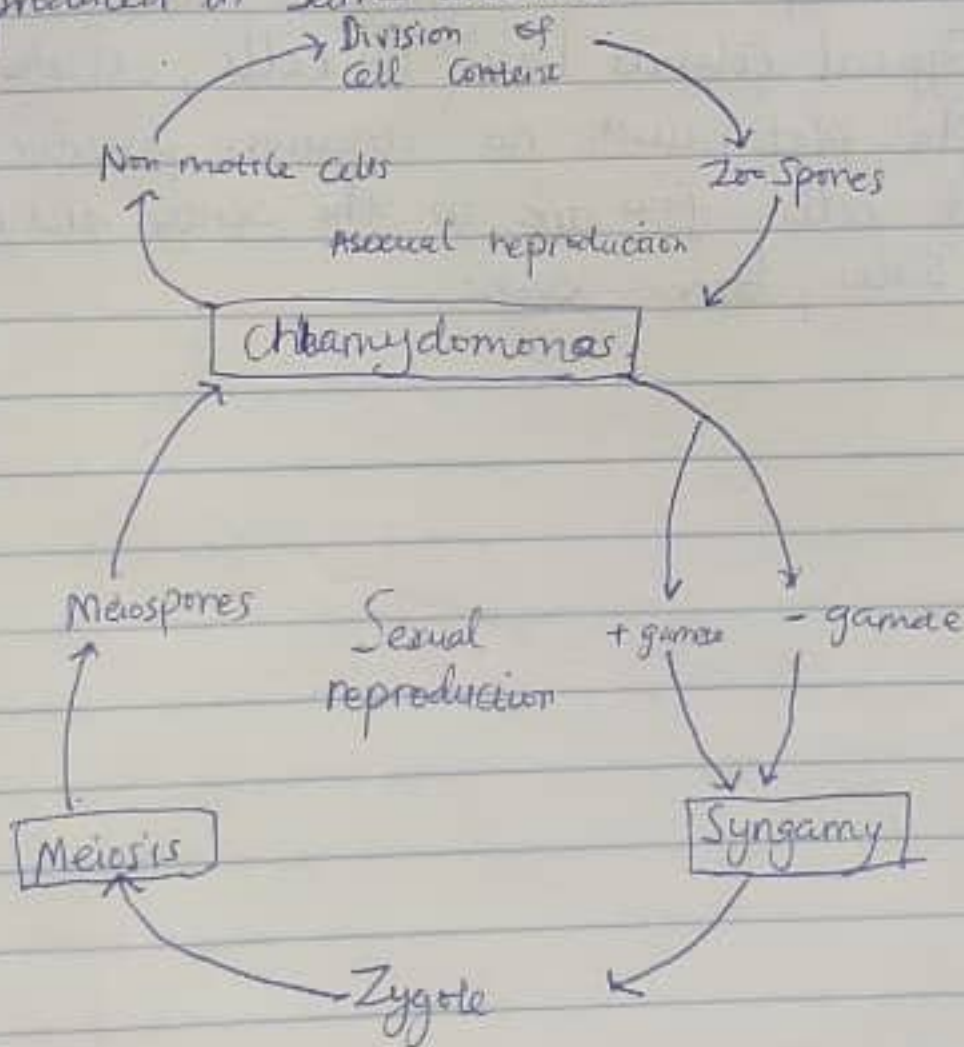
Scientific Classification	
Phylum	Chlorophyta
Class	Chlorophyceae
Order	Chlamydomonadales
Family	Chlamydomonadaceae
Genus	Chlamydomonas Ehrenb

Question 4: How does this unicellular alga described in question 3 carry out its reproduction

Answer:

Reproduction in *Chlamydomonas* (*Chlamydomonas reinhardtii*)

Under favourable conditions, *Chlamydomonas* reproduces asexually and reproduces sexually under unfavourable conditions. During asexual reproduction, cells grow and undergo two or more rounds of mitosis and cytokinesis before the daughter cells hatch from the old cell wall. Asexual reproduction is by zoospores while sexual reproduction is by formation of gametes through isogamy, anisogamy or oogamy. In sexual reproduction, both types of gametes are produced in same thallus.



Question 5: Differentiate between the two types of colonial form of algae

Answer

Pandorina

Volvox

1 Occurs in water bloom

Occurs in ponds, ditches and shallow puddles.

2 Colony of sixteen cells attached to one another.

Colony consists of more cells, numbering up to thousands and connected with

3 Sexual reproduction is anisogamous (pairing by flagella ends)

Cytoplasmic strands that run through the cells.

Sexual reproduction is oogamous i.e. the male gamete is motile while the female gamete is not motile

Question 6: Describe a named complex form of algae

Answer

Complex Alga — Gonium

Gonium is a genus of colonial algae, a member of the order Chlamydomonadales. Typical colonies have 16 cells, all the same size, arranged in a flat plate, with no anterior-posterior differentiation. In a colony of 16 cells, four are in the center and the other 12 are on the four sides, three each.

