Name: Wale Fadire Oluwatunmise Benita

Department : Medicine and Surgery

Matric no: 19/MHS01/437

Course code: Bio 102

Answers to the assignment

1)In 1883, A.W. Eichler gave a system of classification for the whole plant kingdom. it is a traditional system as well as a phylogenetic system of classification of plants.

Eichler classified the plant kingdom into two sub-kingdoms. They are Cryptogamae and Phanerogamae.

I) Cryptogamae (Gk. Kryptos=concealed; gamos=marriage)

The 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.

a) Algae:

Examples of Algae: Chlorella, Chlamydomonas, Volvox, Cladophora, Zygnema, Sargassum, Gelidium, Polusiphonia, Spiulina, Laminaria.

b) Bryophytes Are the the simplest land plants with undifferentiated plant body. They are adapted to grow in water and on land. The more advanced forms only on land. Vascular tissues are absent

Bryophyta is divided into three classes:

- Hepaticae-Liverworts eg: Riccia, Marchantia etc.
- Anthocerotae-Horn worts eg: Anthoceros
- Musci: Mosses eg: Funaria

c) Pteridophyta

Are 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 included under pteridophytes.

Pteridophyta is divide into four classes. They are the following

Psilopsida- eg: Psilotum

Lycopsida- eg: Lycopodium, Selaginella etc

Sphenosida- eg: Equisetum

Pteridopsida-eg: Nephrolepis, Pteris , Dryopteris etc.

II) Phanerogamae

Phanerogams are seed bearing plants. So they are also known as spermatophytes (Gk. Sperma=seed; phyton=plant). They are higher plants. The plant body is differentiated into roots, stem, and leaves with well developed vascular system.

a) Gymnospermes (Gk.gymno=naked;

Are naked-seeded plants. The seeds are not enclosed in fruits. They do not produce flowers and they are regarded as primitive seed plants. They include mostly evergreen trees like conifers and cycads.

Gymnosperms are divided into three different classes. They are the following

- Cycadopsida-eg: Cycas
- Coniferopsida- eg: Pinus, Cedrus etc.
- Gnetopsida-eg: Gnetum

Gymnosperms vs Angiosperms

b) Angiospemae

Angiosperms (Gk.angion=hidden; sperma=seed) are flowering and seed bearing plants. The seeds are enclosed in fruits. They form the dominant vegetation of the earth at present. They enrich the earth with unmatched beauty, colour and scent.

Angiosperm is divided into two classes.

Dicotledons vs Monocotledons

- Dicotledons-eg: Pea, Sunflower, Mango tree

Monocotledons-eg: Maize, Paddy, Musa, Coconut

2)

a) Food for sea animals and fishes:

The algae are used as a direct source of food by several sea animals and fishes.

The marine algae are rich in iodine and several other important minerals. This makes the fundamental source of food for all marine animals and in this respect sea is the richest food producing area.

b) Mineral contents:

High mineral content, upto five percent of the wet material, in which all the mineral elements important in human and animal physiology are found, makes sea weeds a unique supplement for a well balanced diet. Potassium, sodium and chloride are found in the ionic form in sea weeds

c) Direct use of algae as food for man:

Since the pre-historic times, several sea weeds have been used as direct source of food to human beings. Several fresh water algae have also been utilised in the preparation of various kinds of vitaminized food. As we know well that the fundamental food of sea living stock are algae and they are used as food by human beings.

Since the algae are rich in vitamins and minerals, all the deficiencies are over run by the use of algae as food. The algae (sea weeds) form the most important part of the diet of Japan and China. And some people think that the artistic taste and cultural development of the people of Japan is because of the use of the sea weeds as food. In our country, a few species of Spirogyra and Oedogonium are utilised as food in South India.

d) As a source of agar:

The best agar is manufactured from Gelidium of Rhodophyceae, which is also called vegetative agar; Japan produces the largest quantity of agar. It produces 95% of the World production. Agar is also obtained from several other marine algae, the yield of agar, setting temperature and gel strength of the product from ten species belonging to Gelidium, Sarconema, Hypnea and Gracilaria were obtained by Thivy (1951). Japan is the chief agar producing country and it exports agar to most of the countries of the world.

The agar is used in several ways. It is employed in the preparation of ice cream, jellies, desserts, etc., in sizing the textiles and clearing many liquids. It is also used in preparing shaving creams, cosmetics and shoe polishes. The agar has constantly been used in biological laboratories for media preparation.

e) Medicines and minerals:

Several diseases caused by vitamin deficiency such as vitex, asthma, tooth decay, etc., may be eradicated, if flour of the sea weeds is added to the food. According to Dr. Weston, iodine is the

most important element to enable the thyroid glands to secrete the thyrosin which contains 60% iodine. It controls the general development of the animal. Sea weeds are the best source of iodine for human beings.

3) Description of Diatoms(A type of unicellular algae)

It is a large group of algae consisting of 200 genera and over 10,000 species, out of which 92 genera and about 569 species are reported from India. They are commonly known as Diatoms. The diatoms are the most beautiful microscopic algae due to their structure and sculpturing of their walls.They occur in various habitats like fresh water, saline water and also in terrestrial condition on or within the soil. Sometimes they also occur as epiphytes along with algae, on the leaf of forest trees, mostly in tropical rain forests. Depending on the mode of nutrition they may be photosynthetic autotrophs or photosynthetic symbionts or heterotrophs

4)Diatom Reproduction

Vegetative cell division is the predominant method of reproduction in diatoms. Like many other eukaryotes, diatoms are diploid during the vegetative stage of their life cycle, dividing by mitosis and cytokinesis. Mitosis first begins as the nucleus migrates to a specfic location-- usually somewhere along the bisecting valvar plane. The exact site is characteristic for each species. The nucleus then proceeds through mitosis, with the small chromosomes condensing and forming a ring around a typically cylindrical core of microtubules by metaphase. The chromosomes separate, towards opposite sides of the cell, after which diatoms undergo cytokinesis. More typical of animal than plant cells, diatoms undergo cytokinesis by progressive closure of a cleavage furrow, which pinches the cytoplasm in two. Each daughter cell, now associated with one of the halves (theca) of the parental cell wall, makes and secretes one new cell wall half (theca), thus regenerating a cell wall of two thecae. After formation of the new half of the cell wall, the daughter cells grow and separate from one another.

5) Volvox

A Volvox colony is a hollow sphere of mucilage having 500 or more biflagellate algal cells that are equally spaced around on its outer surface.

Synura

They have varied number of ovoid golden brown cells. Each cell bears two flagella, whose beatings propel the colony, through the water with a smooth rolling motion. The individual cells divide longitudinally and the colonies also divide into two, as they grow larger.

6) Seaweed (or macroalgae) Is a complex form of algae and are a diverse group of mostly photosynthetic algae found in marine and freshwater environments. They are eukaryotic organisms and lack any vascular tissue (for the transport of water and other compounds such as sugars) or any organised tissue. The macroalgae are extremely diverse and have evolved in three different divisions within the algae clade; the Rhodophyta or ‘red seaweeds’, Phaeophyta

or ‘brown seaweeds’ and Chlorophyta or ‘green seaweeds’.

As seaweeds are mostly photosynthetic, they play a similar role to plants in terrestrial ecosystems. Being able to create sugars from carbon dioxide means seaweeds provide the basis of many food chains in both marine and freshwater ecosystems and can sometimes be a significant source of food in terrestrial environments. Along with the production of food, macroalgae can also provide shelter and habitat, as plants do, but for small fish and invertebrates in aquatic environments and are important buffers against erosion as they help to stabilize sediments.

There are a large number of physical differences between the seaweed and plants which identifies their distinct evolutionary paths. A big generalisation, but nonetheless useful, is that macroalgae are far more structurally simple than plants. Instead of the typical root, stem and leaf structure that plants have, seaweeds have no roots but have a holdfast that secures them to the ground, and have a non-vascular stype and blades instead of a stem and leaves. They lack a waxy cuticle and multi-cellular sex organs and instead of storing their energy in starch, as plants typically do, they use other compounds such as mannitol and floridean.