

Quadrant II- Transcript and Related Materials

Programme: Bachelor of Science (First Year)

Subject: Botany

Semester: I

Paper Code: BOC - 101

Paper Title: Biodiversity I (Microbes, Algae, Fungi and Bryophyta)

Unit 2: Algae

Module Name: Range of thallus organisation in algae

Module Number: 20

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Notes:

Range of thallus organisation in Algae

The plant body of algae is thallus, On the basis of organisation of number of cells the algal thalli are categorized into the following two groups - Unicellular algae and Multicellular algae

Unicellular algae –Algal thallus here have a single cell. e.g. *Chlamydomonas*, *Chlorella* etc.

Multicellular algae –Algal thallus have more than one cell. e.g. *Spirogyra*, *Ulothrix* etc.

The Unicellular algae is categorized into a) Motile forms and B) Non-motile forms.

Motile forms: The algal cell which have the capability of movement or locomotion. Motile form of algae is either Flagellated or Rhizopodial forms. **Flagellated forms** –The algal cell have thread like structure known as flagella and function as the locomotory organ. The size and number of flagella vary in different types. e.g. *Chlamydomonas*, *Euglena* etc.

Rhizopodial forms – this type of thallus shows no flagella, no cell wall, but shows Amoeboid movement e.g. *Chrysamoeba*.

Non-motile forms: The algal cell which do not have capability of movement. Non-motile forms of algae are either Spiral filamentous or Coccoid.

Spiral filamentous- The non-motile algal cell is spiral without flagella or rhizopodia. e.g. *Spirulina*.

Coccoid –The non-motile algal cell is spherical without flagella or rhizopodia. e.g. *Chlorella*.

Multicellular Algae: There are four main categories of multicellular algae-1. Colonial 2. Filamentous 3. Siphonaceous 4. Parenchymatous.

Colonial – A colony is made of large number of cells in a common mucilaginous sheath. All the cells of the colony remain connected with each other by cytoplasmic strands. Colonial algae are found in Coenobium and Aggregated forms.

Coenobium –A colony that possess constant shape and size of cells and with definite number of cells is called coenobium.

The coenobium form of algae may be motile or non-motile in nature.

Motile forms- In this form the whole coenobium moves by joint action of flagella of all cell. e.g. *Volvox*, *Pandorina* etc.

Non-motile forms -The flagella are absent so that the complete coenobium is not motile e.g. *Scenedesmus*

Aggregated forms: The colony does not have definite number of cells, no definite shape and size. The cells are arranged irregularly.

Aggregated forms can be three types –Palmelloid, Dendroid and Rhizopodial

Palmelloid forms -In this form of algae, the colonial members of algae in which non-motile cells remain embedded in a mucilaginous matrix and all the cells of palmelloid forms are independent of one another. All the cells perform all the functions as individual. In this algal form the no of cells, shape and size of cells are not constant e.g. *Tetraspora*

Dendroid forms- The thallus appears like a tree. The mucilaginous thread is found usually at the base of each cell. In this type the number, shape and size of cells are variable e.g. *Dinobryon*

Rhizopodial forms -In this type of algal thallus the cells are united through rhizopodial e.g. *Chrysidiastrum*

Filamentous algae: The algal thallus is formed through repeated cell division in single plane and in single direction resulting in many cells arranged upon the other, forming a thread like filament. The filamentous algae may be Unbranched or Branched filaments.

Unbranched filaments –The free floating unbranched filaments are not differentiated into apical and basal cell so that all the cells are alike in filament. e.g. *Spirogyra*, *Nostoc* etc. or may be attached to the substratum with the help of holdfast.

Branched filaments: In this algal plant body shows branching. The branching may be False, Simple, Heterotrichous and Pseudoparenchymatous.

False branching- The trichomes of blue greens may break either due to death or decay of the intercalary cells. The broken ends emerge out of the mucilaginous sheath in the form of a branch. They do not arise as lateral out-growths, e.g., *Scytonema*

Simple branching- The branches arise immediately below the cross walls, and the growth and divisions are restricted to the end-cells of the branches e.g., *Cladophora*

Heterotrichous branching- This thallus shows the most highly evolved type of plant-body, it consists of two distinct parts: (1) A basal or prostrate creeping system, and (2) An erect or upright system. The prostrate system is attached to some substratum, grows apically and gives

rise to numerous photosynthetic and rhizoidal filaments. Rhizoidal filaments sometimes penetrate the substratum e.g. *Ectocarpus*

Pseudoparenchymatous branching- If one or more central or axial filaments together with their branches fuse to form a parenchymatous structure, it is called pseudoparenchymatous thallus. It is formed by the branches of a single filament it is known as uniaxial or it may be multiaxial where more than one filament is involved e.g. *Polysiphonia*.

Siphonaceous forms: In this algal form the thallus is aseptate and multinucleate i.e. coenocytic in condition. A large central siphon like vacuole is present in the thallus so it is called siphonaceous. e.g. *Vaucheria*.

Parenchymatous forms: In this type of algal thallus, the cells are divided in all directional plane, resulting in the formation of parenchymatous thallus which become foliose and flat. e.g. *Chara*, *Laminaria*, etc.
