



Lecture No.:01

Date: 12th May, 2020

CORE CONCEPT OF

HONOUR'S PART 1

Group A - Algae

Paper - 1

RANGE OF THALLUS STRUCTURE

Algae are plants of simple structure, simplest of which consists of a non-motile single-celled to filamentous forms with no well-organized nucleus and plastids. There exist many unicellular motile forms which may be solitary or colonial. Particularly, certain brown algae possessing long flexuous stem-like structure and an expanded blade portion, have holdfasts attaching them to rocks. Some of these plants have considerable differentiation of tissue very similar to higher plants. But they lack vascular tissues. On the other hand, in the terrestrial forms there are distinct adaptations in the plant body to survive under constant inadequate supply of moisture. Again, there are **heterotrichous** forms where the plant body is highly developed being differentiated into prostrate and erect portions resembling prototype of simplest plant body of Bryophyte level with very clear division of labour.

1. Unicellular motile form - Single-celled plant body being spherical, oval or pear-shaped bearing two flagella in the



anterior region.

2. Unicellular non-motile (sedentary) form - The cells are commonly small and spherical without any flagella and do not exhibit any movement. Some are solitary, others in groups being embedded in a gelatinous material. Also there are slightly elongated forms which can be differentiated into base and apex.

3. Motile coenobial form - Definite number of motile cells are embedded in a gelatinous matrix with their flagella protruded out, or are held together by cytoplasmic connection. The cells may be compact or loosely arranged. Thus a colony is formed of definite number of cells arranged in a specific manner forming what is called a **coenobium** (pl. **Coenobia**).

4. Non-motile coenobial form - Coenobita may be composed of non-motile cells arranged in a single layer being closely adpressed to each other along the long axis or may be attached end to end forming a network, the meshes of the net being pentagonal or hexagonal. The coenobium may also be star-shaped in appearance with a single central cell surrounded by peripheral cells of the coenobium.

5. Filamentous form - Filamentous thallus may be of indefinite



length. Cell division in filamentous forms occurs in one place so that a single row of cells is formed. The filamentous form may be of various kinds - **unbranched**, **branched** and having **false branches**.

6. Thalloid form - A parenchymatous thallus is resulted by the division of cells in more than one place. Growth of parenchymatous thalli may be **diffuse** (all cells capable of division), **intercalary** (well defined dividing regions not located terminally), **trichothallic** (a specialized intercalary meristem at the base of a terminal hair) or apical (one or more well-defined apical cells dividing to give remainder of the thallus).

7. Siphonaceous form - The thallus is non-septate multinucleate, a **coenocyte**. Depending on the organism, a coenocyte may be simple branched or very elaborately developed with clear division of labour being differentiated into aerial and subterranean and in some cases in to subaerial portions.

8. Heterotrichous form - This is a highly advanced type of thallus which is characterized by the differentiation of the vegetative body into a prostrate system growing along the substratum and a projecting system developing away from the substratum. In some algae both the system are equally well developed,



whereas in others one system is highly developed at the cost of the other. For example, the prostrate system may be very elaborately developed and the aerial portion being rudimentary and in others, reverse is the case.

9. Special forms - The thallus in some algae is highly complex being differentiated into a perennial portion, an annual portion, and a meristematic region in between. The meristematic region produces the annual portion every year. In others, there is extreme degeneration of heterotrichous condition. The aerial portion is very elaborately developed being represented by a repeatedly branched erect system and the anchorage is performed by very poorly developed prostrate system. Again in others, the aerial portion of the thallus is highly developed into a multiseriate.

10. Polysiphonous - Branched condition with clearly visible cytoplasmic connections from cell to cell.