food.

Caulerpa

Class : *Chlorophyceae*
Order : *Siphonales*
Family : *Caulerpaceae*
Genus : *Caulerpa*

Caulerpa is a green alga. It is placed under the class ***Chlorophyceae. Lamouroux*** named the genus, *Caulerpa*. It belongs to the monogeneric family ***Caulerpaceae.***

Caulerpa includes about 60 species. All the species are marine. The common Indian species are -

Caulerpa racemosa — *Caulerpa prolifera*
Caulerpa taxifolia — *Caulerpa peltata*
Caulerpa scalpelliformis

On the basis of habitat, the various species of *Caulerpa* are classified into three categories:

1. Species growing in mud or sandy bottom. Eg. *Caulerpa prolifera.*
2. Species growing on rock and coral reef. Eg. *Caulerpa taxifolia.*
3. Species growing as epiphytes on the roots of mangroves or epiphytic species. Eg. *Caulerpa verticillata.*

Thallus Structure

Caulerpa is a tubular ***green alga.*** The plant body is a ***diploid sporophyte.*** It looks like a vascular creeping plant. It consists of a ***rhizome, shoots*** and ***rhizoids.***

The rhizome is ***cylindrical*** and ***branched.*** It grows ***horizontally*** over the substratum. From the lower surface of the rhizome, many multicellular ***rhizoids*** arise and fix the thallus over the substratum. From the upper surface of the rhizome arise many erect branches called ***leafy shoots*** or ***assimilatory shoots.*** The erect branches bear many lateral outgrowths called ***assimilators.*** The axis of the assimilatory shoot, in most species, is ***cylindrical*** and it is ***flattened*** in a few cases. The assimilators are ***green*** and ***photosynthetic.***

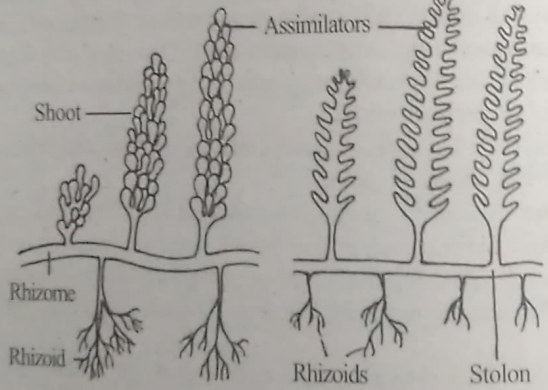

Fig.3.21: Some species of Caulerpa.

The arrangement of assimilators on the axis is characteristic to the species (Fig.5.1 & Fig 3.22):-

1. In *Caulerpa verticillata*, the central axis is ***cylindrical*** and the assimilators are arranged in ***verticillate manner.***

2. In *Caulerpa taxifolia*, the axis is ***cylindrical*** and the assimilators are arranged in ***two opposite rows*** on the axis.
3. In *Caulerpa crassifolia*, the axis is ***cylindrical*** and the assimilators are arranged ***pinnately.***
4. In *Caulerpa prolifera*, the axis is ***flattened*** and ***leaf-like*** and has ***no assimilators.***

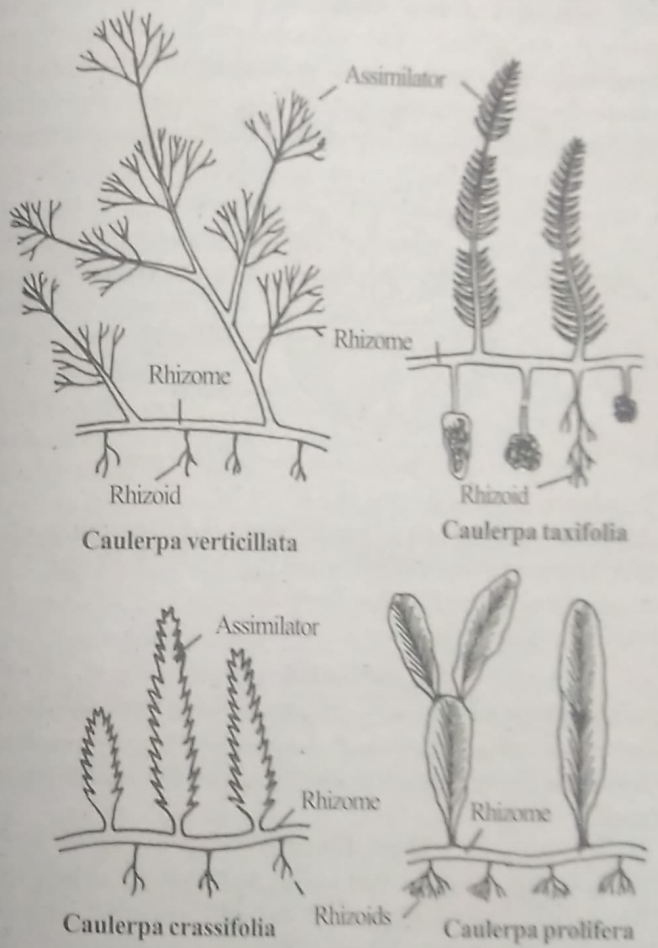

Fig.3.22: Some species of Caulerpa.

Internal Structure

The entire thallus is a long, ***one-celled,*** branched, unseptate, ***tubular cell.*** It is bounded by a ***cell wall*** made up of callose, pectin and pentose sugar. Cellulose is absent. Inner to this is a thin ***plasma membrane.*** The plasma membrane surrounds a dense ***protoplasm.***

The protoplasm is ***coenocytic*** and ***vacuolate.*** The nuclei are ***eukaryotic*** and diploid.

There are numerous discoid ***chloroplasts*** in the protoplasm. The chloroplasts contain ***chlorophyll-a and-b, carotene, xanthophylls, siphoenin*** and ***siphonoxanthin.*** Pyrenoid is absent. The nuclei and chloroplasts exhibit ***streaming movement*** along with the cytoplasm. Starch granules are also found in the cytoplasm. There is a large central vacuole running throughout the entire length of the plant. The vacuole is traversed by many small cylindrical strands. These strands are called ***trabeculae*** or ***skeletal strands.***

The trabeculae are strongly developed in rhizomes and in the axis of mature assimilatory shoots. They are poorly developed in the assimilators. Trabeculae arise from a row of structures called ***microsomes*** in the cytoplasm and run irregularly in the ***vacuole.*** They are composed of callose and chitin. They are always connected with the walls in the ***adult*** condition.

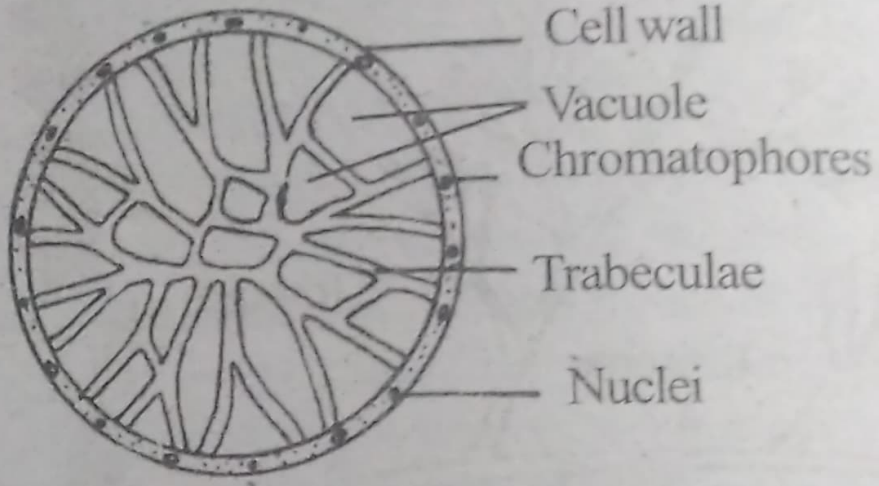

Fig.3.23: Caulerpa thallus - Internal structure.

Various functions attributed to the trabeculae are -

i. to provide ***mechanical strength*** so as to resist high ***turgor pressure.***

ii. to increase the protoplasmic surface of the cell.

iii. to facilitate easy and quicker diffusion of minerals.

However, the exact role of trabeculae is not yet clear.

Diatoms