Department of biology

((Plant groups))

Stage 2

Seventh Lecture

Xanthophyta (Yellow-green Algae)

By

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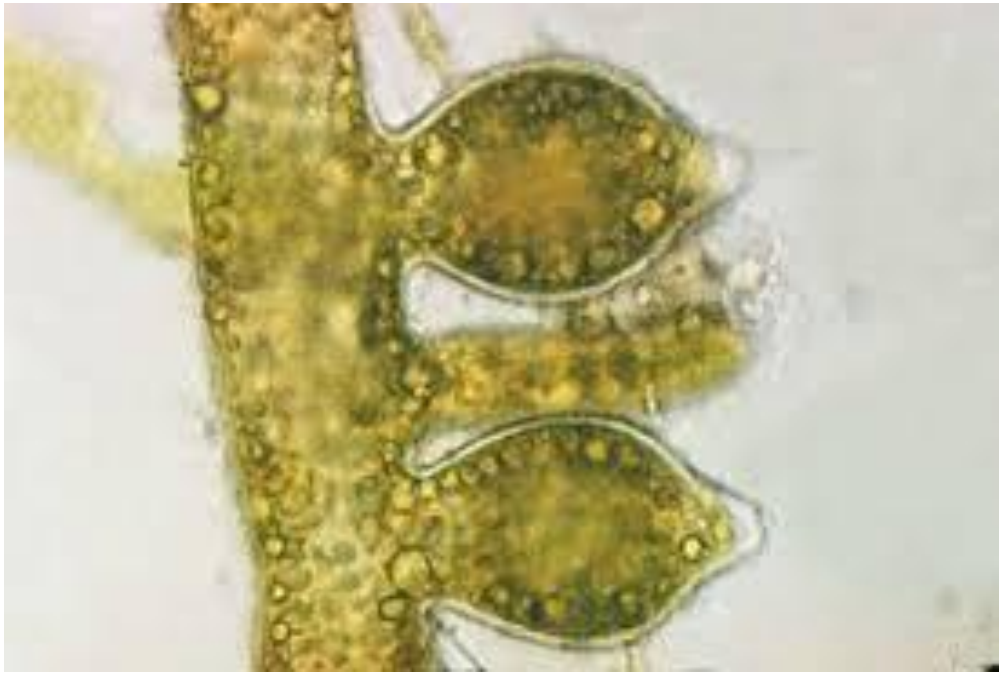
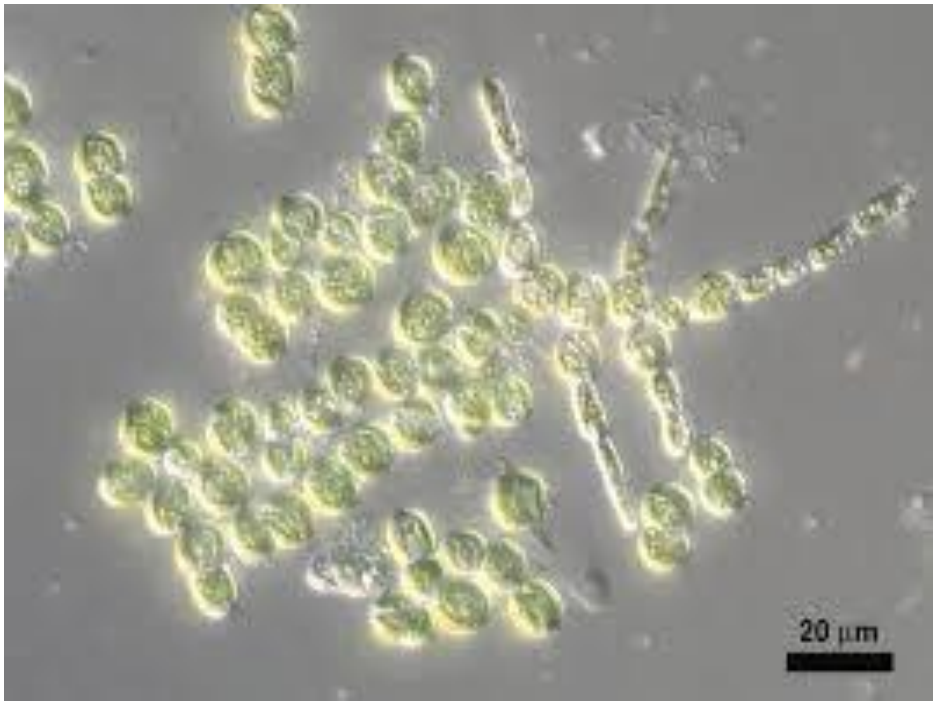
Xanthophyta (Yellow-green Algae)

- Yellow-green algae are an important group of heterokont algae. Most live in freshwater, but some are found in soil habitats. They vary from single-celled flagellates to simple colonial and filamentous forms. Xanthophyta chloroplasts contain the photosynthetic pigments Chlorophyll a , β-Carotene, and the carotenoid diadinoxanthin. Unlike other heterokonts, their chloroplasts do not contain fucoxanthin, which accounts for their lighter colour. Its storage polysaccharide is chrysolaminarin. Xanthophyte cell walls are produced of cellulose and hemicellulose.

Environment and presence

- Xanthophyta are generally found in freshwater, wet soil and tree trunks, but there are several marine species. Most of the species occur singly and are found around other algae, making it difficult to find the same species twice. They do very well at low pH in habitats that are rich in iron. It was also found that Xanthophyta loses its cytoplasmic streaming ability and organization of other vegetative filaments, when it is in an aluminum-rich environment. Many of them are found in late winter in still water.




20 µm

General feautres of Xanthophyta

- 1- Occurrence: Mostly freshwater and a few found marine water.
- 2- Pigments: Chlorophyll a, β carotene and xanthophylls.
- 3- Pyrenoids: Usually absent.
- 4- Reserve food material: Chrysolaminaran, Oil and fat.
- 5-Cell wall: Rich in pectic compounds and composed of two equal pieces overlapping at the edges.
- 6-Structure: Eukaryotic unicellular motile to simple filamentous,
- 7- Flagella: Present, two unequal, situated anteriorly. Longer one tinsel and shorter one whiplash.
- 8-Reproduction: Vegetative, Asexual and Sexual.

Cell Structure and Metabolism

- Xanthophyceae are a photosynthetic group of yellow-green algae. Their photosynthate is stored as oils and the storage polymer chrysolaminarin.
- Most Xanthophyta are coccoid or filamentous, but some are siphonous, meaning that they are composed of multiple tubular cells with several nuclei. What makes up the cell wall is unknown but inside some there are two silica valves similar to those in diatoms. For the species that are filamentous the interlocking halves are in the shape of **H**.

Cell Structure and Metabolism

- While not much is known about the life cycle of xathnophyta generally their reproduction is **asexual**, in which the cell divides bilaterally and creates and produces an endogenous cyst.

Differences between Xanthophyta and green algae

1. They lack chlorophyll, and are characterized by a high percentage of xanthophyll and carotenoids, so they appear in a yellowish-green color.
2. The stored food is in the form of Leucosin oils or Chrysolaminarin fats and is not stored in the form of starch.
3. The cell wall contains more pectin materials than in green algae in addition to the deposition of silica.

Reproduction has only been observed in two xanothophtyes : in Vaucheria, it was found to be (oogamous), and Botrydium reproduces by means of bimastigote (zoospores or aplanospores)


Thank You!