

## CHRYSOPHYCEAE AN IMPORTANT CLASS OF THE HETEROKONTOPHYTA

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### ABSTRACT

Algae are the heterogeneous group of organism, they exert the profound kinds of the effects on the ecosystem, as they harbours the very big amount of the oceanic ecosystem, they produces the very large amount of the atmospheric oxygen and produces the tremendous amount of the organic carbon in the ecosystem. Much of the organic carbon works as the food into the biogeochemical cycles and the food chains. Algae produce a large amount of the secondary metabolites and they are used for the variety of the purposes. In this review articles we

are presenting some of the aspects of the class chrysophyceae of the algae. Most of the species of the chrysophyceae are the unicellular and the colonial, which may or may not be flagellates, the flagella are not inserted near the lateral side but at the apex of the cells. The chloroplast are the golden brown and the colour of the chloroplast are covered by the accessory pigment Fucoxanthin. The chrysophyceae are restricted to the fresh water habitats. These species have the haplontic kinds of the life cycles, the zygote of the cells are the resting stage and they are of the siliceous kinds. This class is best known for the planktonic kinds of the representatives. Then name of the class is due to the colour golden brown due to the presence of the accessory pigments due to which the green colours is masked by the these kinds of the pigments. The members of the class are the primary producers and they play an important variety of roles in aquatic ecosystem.

**KEYWORDS:** Chrysophyceae, aquatic flora, planktonic, accessory pigments, Haplontic life cycles, golden brown colour, resting zygote, apical inserted flagella.

### INTRODUCTION

The algae are heterogonous assemblage of the organism, they ranges in the sizes from the unicells to the large and gignateous kinds of the thallus, the evolutionary lineages of theses

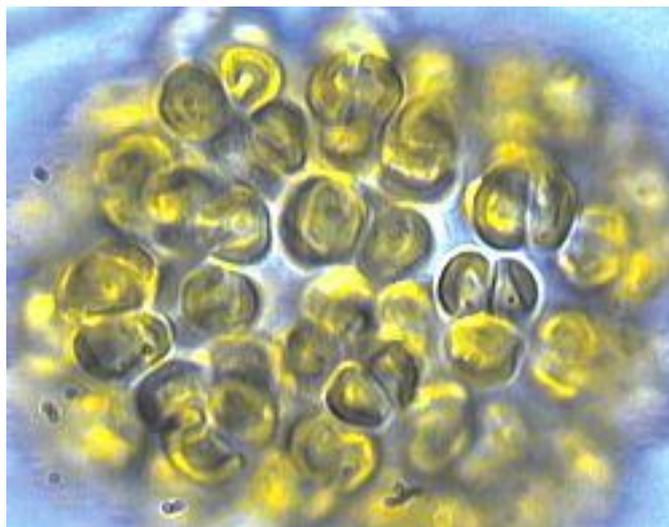
thallus also ranges from most primitive to the most advanced types. Algae are generally produces the photosynthetic oxygen and they are the algae are also present in the found in the aquatic habitat, however some of them also present in the moist habitat. Algae lacks the well defined kinds of the thallus body and it is not differentiated in to the any kinds of the division in to the leaves, stem and the roots. Algae are defined as the microalgae, macro algae on the basis of the thallus origination. Algae reproduces by the Varity of the methods these are asexual as well as the sexual methods of the reproduction. Asexual spores are the zoospores, aplanospores and the autospores. Sexual reproduction occurs by the formation of the zygote. On the basis of the types' of the gametes the reproduction are the isogamous, oogamous and the anisogamous types.



**Figure 1: Chrysophyceae colonies (sources brtinnica.com).**

Here in this review articles we are working on the some of the aspects of the class chrysophyceae, this is the important class of the heterokontophyta by the Hoek, Manns, Jahns 1995.

The flagellate cells of the heterokonyophyta are of the two types, the one flaggers of the heterokontophyta are the long and the pleuonematic kinds and they have the stiff hairs called as the mastigonemes and another one is the smaller flagella. The chloroplast is enclosed by the double membranes and the membrane has been termed as the chloroplast ER. The chlorophyll a and the, c c-1 is present but the chlorophyll b is absent. The principles accessory pigments are fucoxnathin. The main food material is  $\beta$  1-3 linked glucan.



**Figure 2: Ochromonas species (sources: microbewiki).**

**Hoek, Jhan, Mannes 1995**, involves the about nine algal classes in the Heterokontophyta. these are enlisted as the.

- A) Chrysophyceae
- B) Parmophyceae
- C) Sarcinochrysidiophyceae
- D) Xanthophyceae
- E) Eustigmatophyceae
- F) Bacillariophyceae
- G) Raphidophyceae
- H) Dictyophyceae
- I) Phaeophyceae

This class is best known for its planktonic representatives in the aquatic ecosystem. The chrysophyceae owe their names on the basis of their golden brown colour due to the presences of the accessory pigments in the chloroplast and these colours are masked by the green pigments. The dominant accessory pigments is the Fucoxanthin. in addition to the Fucoxanthin other kinds of the xanthophylls pigments are also present these are the zeaxanthin, antheroxanthin, vioxanthin, diatoxanthin.

It is estimated that the chrysophyceae includes the about 200 genera's and the 1000 species. The members of the class are distributed in the fresh water; however some of the members are also have been found in the salt and the brackish water.<sup>[1][2][3][4]</sup>

Freshwater Chrysophyceae are found in the oligotrophic lakes, the members of the Chrysophyceae also play a very significant role in the primary production of the aquatic ecosystem.<sup>[1][2][3][4]</sup>

### Various level of the structural organization of the chrysophyceae

In this class following level of the organization can be found.

- A) Unicellular flagellates (Moenoid level of organization):** Ochromonas is the representative members of the group. Some of them lie in the cup and urn shaped shells or theca, called as the loricae. Pseudokephyrion, Dinobryon.<sup>[1][3]</sup>
- B) Colonial flagellate level of organization:** In this level of organization several flagellate cells are interlinked with each other and form the colony. Each cell possesses the two chloroplast and bear two unequal flagella eg Synura.<sup>[3][4]</sup>
- C) Amoeboid level of organization:** Here in this level of organization the cells are naked and they bear the pseudopodia when they are thick, the pseudopodia take the food inside.<sup>[1][2]</sup>
- D) Palmelloid level of organization:** In Palmelloid forms, the cells are embedded in the mass of mucilage. In this mucilage they form the colonies and the green algae are the Tetraspora. Hydrurus.<sup>[1][2][3][4]</sup>
- E) Coccoid level of organization:** These algae are the nonmotile and the non flagellate cells, each of which is surrounded by the cell wall. Sometimes the cells are united to form the colonies, examples Chrysothrix.<sup>[1][2][3][4]</sup>
- F) Filamentous level of organization:** At this level the cells are arranged in the filamentous body whether they are branched or unbranched Phaeothamnion.
- G) Thallus level of organization:** Here the cells are organized into the Parenchymatous tissues. The mass of the thallus may be one or two layer thick and form the margin outer fibres arise. Examples are the Thallochrysis.

Siphonous level of organization are absent in the chrysophyceae.<sup>[1][2][3]</sup>

Different level of classification of the Chryoshyceae has been proposed by the different algologists from time to time, here we are presenting one of the accepted and the advanced kind of the classification of the Chrysophyceae.

Some of the orders of the Chrysophyceae are as follows

- 1) Ochromonadales

- 2) Mallomonadales
- 3) Pedinellales
- 4) Chytramoebales
- 5) Chrysocapsales
- 6) Phaeothamniales.

Some of the features of the genus *Ochromonas* are presented here as the basic example of the class.<sup>[1][2][3]</sup>

These members live in freshwater and they are generally unicellular in nature. They are generally found in ponds, ditches and rain water harvesting reservoirs. About 50 species are found of the *Ochromonas*.

**Cell exterior:** The cells are naked and they have no cell wall. These organisms have the capacity of amoeboid movements.<sup>[1][2]</sup>

**Flagella:** They arise from the anterior of the cells. They are generally of unequal sizes. The structure and the dimension of the flagella is of the very typical and they are according to the typical eukaryotic organization.<sup>[2][3][4]</sup>

There may be one or two contractile vacuoles per cell.

The cells contain one or two plate-like chloroplasts, the thylakoids are in the group of the three and they are very unusual from the green chloroplast of the higher plants.<sup>[2][3][4]</sup>

**Eyespot and Flagella swelling:** The eyespot can be seen in many algae groups and they are the part of the flagella.

**Endogenous cysts:** *Ochromonas* produces the endogenous cysts, these cysts generally form in the vegetative cells. The cysts are formed in the silica deposition vesicles.<sup>[3][4]</sup>

Sexual reproductions are unknown in the *Ochromonas* but in some of the members of the Chrysophyceae like the Dinobryon the isogamous kinds of the reproduction have been reported.<sup>[3][4]</sup>

## CONCLUSION

Well this is the short review articles of the Chrysophyceae class, these are the groups which forms the significant part of the aquatic ecosystem or the biota. They forms the major part of the aquatic food chains and the primary productivity. these are the basic planktonic, the colour of the class are the yellow green, due to the major presences of the pigments which cover the absolute green colour of the chlorophylls A, well these creatures are the mains in the aquatic ecosystem. Due to the change of the ecosystem theses organisms are degrading and they are the living fossils of the fascinating evolution of the algae in the remote past, so careful analysis of this class is essential for the study of the plants.

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