STUDY MATERIALS FOR ALGAE

DEPARTMENT OF BOTANY, GOUR MAHAVIDYALAYA

Evolutionary classification of Lee, 2008 (upto groups)

There are four distinct groups within the algae. **1.Prokaryotes.** The cyanobacteria are the only prokaryotic algae. **2.**Eukaryotic algae with chloroplasts surrounded by the two membranes of the chloroplast envelope. **3.**Eukaryotic algae with the chloroplast surrounded by one membrane of chloroplast endoplasmic reticulum.**4.** Eukaryotic algae with the chloroplast surrounded by two membranes of chloroplast endoplasmic reticulum.

Group 1 Prokaryotic algae

Cyanophyta (cyanobacteria): chlorophyll a; phycobiliproteins.

Group 2 Eukaryotic algae with chloroplasts surrounded only by the two membranes of the chloroplast envelope.

Glaucophyta: algae that represent an intermediate position in the evolution of chloroplasts; photosynthesis is carried out by modified endosymbiotic cyanobacteria.

Rhodophyta (red algae): chlorophyll a; phycobiliproteins; no flagellated cells; storage product is floridean starch.

Chlorophyta (green algae): chlorophylls a and b; storage product, starch, is found inside the chloroplast.

Group 3 Eukaryotic algae with chloroplasts surrounded by one membrane of chloroplast endoplasmic reticulum.

Euglenophyta (euglenoids): chlorophylls a and b; one flagellum with a spiraled row of fibrillar hairs; proteinaceous pellicle in strips under the plasma membrane; storage product is paramylon; characteristic type of cell division.

Dinophyta (dinoflagellates):

mesokaryotic nucleus; chlorophylls a and c1; cell commonly divided into an epicone and a hypocone by a girdle; helical trans verse flagellum; thecal plates in vesicles under the plasma membrane.

Apicompexa: heterotrophic flagellates with colorless plastids.

Group 4 Eukaryotic algae with chloroplasts surrounded by two membranes of chloroplast endoplasmic reticulum.

Cryptophyta (cryptophytes): nucleomorph present between inner and outer membrane of chloroplast endoplasmic reticulum; starch formed as grains between inner membrane of chloroplast endoplasmic reticulum and chloroplast envelope; chlorophyll a and c; phycobiliproteins; periplast inside plasma membrane.

Heterokontophyta (heterokonts): anterior tinsel and posterior whiplash flagellum; chlorophyll a and c; fucoxanthin; storage product usually chrysolaminarin occurring in vesicles.

Chrysophyceae (golden-brown algae)

Synurophyceae

Eustigmatophyceae

Pinguiophyceae

Dictyochophyceae (silicoflagellates)

Pelagophyceae

Bolidophyceae

Bacillariophyceae(diatoms)

Raphidophyceae (chloromonads)

Xanthophyceae (yellow-green algae)

Phaeothamniophyceae

Phaeophyceae (brown algae)

Prymnesiophyta (haptophytes): two whiplash flagella; haptonema present; chlorophyll a and c; fucoxanthin; scales common outside cell; storage product chrysolaminarin occurring in vesicles.