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Classification of Algae (Lee, 1999)

Algae have different characters in their cell structure, the form of flagella and storage materials, gene sequence, etc. Most scientists are categorized according to these morphological, physiological and molecular variations. In 1999, Robert Edward Lee suggested classifying algae in his book "Phycology" (Phycology, R.E.Lee, 1999, 3E). This classification scheme is a revised, updated Algae by Lee(1989).

Basis of Classification

The classification of algae by Lee(1999) emphasizes the following points-

1. Structure of the algal cell.
2. Flagella
3. Cell wall and mucilages.
4. Plastids
5. Division of chloroplasts and mitochondria
6. Storage products
7. Contractile vacuoles
8. Nutrition

Classification:

R.E.Lee (1999) classified the algae into 4 evolutionary groups, nine phyla and different classes.
There are four distinct groups within the algae.
Group 1: Prokaryotes. The cyanobacteria are the only prokaryotic algae.
Group 2: Eukaryotic algae with chloroplasts surrounded by the two membranes of the chloroplast envelope.
Group 3: Eukaryotic algae with the chloroplastsurrounded by one membrane of chloroplastendoplasmic reticulum.
Group 4: Eukaryotic algae with the chloroplastsurrounded by two membranes of chloroplastendoplasmic reticulum.

In the Algal systematics, the standard botanical classification scheme is used:

Phylum – phyta
Class – phyceae
Order – ales
Family – aceae
Genus-
Species-

Outline of Classification:

Group 1	Group 2
Prokaryotic algae **Cyanophyta (cyanobacteria):**	**Glaucophyta:** **Rhodophyta (red** algae**):** **Chlorophyta (green algae):**
Group 3	**Group 4**
Euglenophyta (euglenoids): **Dinophyta (dinoflagellates):** **Apicompexa:**	**Cryptophyta (cryptophytes)** : **Heterokontophyta (heterokonts):** 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):**

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Evolutionary Significance:

Evidence from molecular studies suggest that red algae differed from the common line leading to higher plants around 1400 million years ago (Saunders and Hommersand, 2004). It was accompanied by a differentiation of green algae and, eventually, multiple isolated secondary endosymbiosis of those algae with endoplasmic chloroplastic reticulum.

Reference:

R. E. Lee, “Phycology,” 3rd Edition, Cambridge University Press, New York, 1999.