

algae to angiosperms, and the life cycle that keeps changing



The five groups, and what separates each from the next

- **Algae** : no vascular tissue, no embryo stage, body a thallus, mostly aquatic
- **Bryophytes** : land plants without vascular tissue, still needing water for fertilisation. The amphibians of the plant kingdom
- **Pteridophytes** : the first with true vascular tissue, and with roots, stems and leaves, but still no seed
- **Gymnosperms** : seeds present but naked, not enclosed in a fruit, since there is no ovary wall around them
- **Angiosperms** : seeds enclosed within a fruit, flowers present, and double fertilisation unique to them

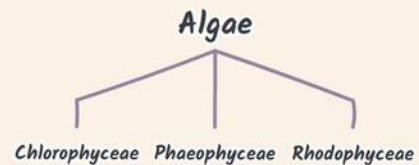
Kinds of classification, and why it moved



- **artificial systems**, such as Linnaeus's, use one or a few characters, chiefly floral ones, and give equal weight to vegetative and sexual features
- **natural systems**, such as Bentham and Hooker's, use all the observed features together and group by overall similarity
- **phylogenetic systems** arrange organisms by evolutionary relationship, on the assumption that members of a taxon share a common ancestor
- modern additions are **numerical taxonomy**, which scores many characters by computer, and **cytotaxonomy** and **chemotaxonomy**, using chromosome data and chemical constituents

Algae, and the three classes

- chlorophyll bearing, simple thalloid autotrophs; largely aquatic, some on soil, stone, wood and even in other organisms
- **Chlorophyceae**, the green algae : chlorophyll a and b, starch stored, cell wall of cellulose. Chlamydomonas, Volvox, Spirogyra, Ulothrix
- **Phaeophyceae**, the brown algae : chlorophyll a and c plus fucoxanthin, which gives the brown colour; food stored as laminarin or mannitol, wall with algin. Ectocarpus, Fucus, Laminaria, Sargassum
- **Rhodophyceae**, the red algae : chlorophyll a and d plus r phycoerythrin, food as floridean starch, and they grow at the greatest depths because red pigment absorbs the blue light that penetrates furthest. Polysiphonia, Gracilaria, Gelidium
- **economic value** : at least half of all photosynthesis on the planet, plus agar from Gelidium and Gracilaria, algin from brown algae and carrageen from red algae



the three classes, separated by pigment, stored food and cell wall

