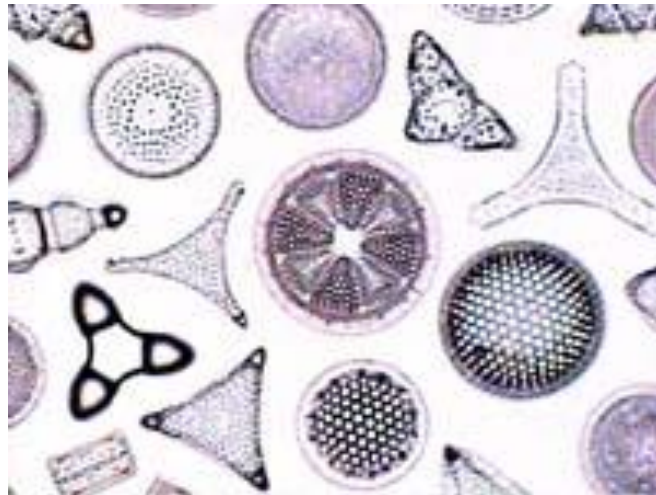


Diversity of Algae

- There are millions of algal species, but we'll focus in these five groups:
- Diatoms
- Dinoflagellates
- Red Algae
- Kelps or Brown Algae
- Green algae

1. Diatoms

- Diatoms: Division *Bacillariophyta*
- Large group of algae (many unidentified).
Relatively recently evolved group
- Habitat: Diatoms live in cool oceans
- Structure: mostly unicellular, have silica in their cell walls



Diatoms

- Very important for aquatic food chains: they provide *phytoplankton*

sun



Phytoplankton → Zooplankton → small fish → larger fish
mollusks whales

- Can reproduce asexually for many generations, then sexually

3. Red Algae

- Red algae: Division *Rhodophyta* (4000 species)
- Are some of the oldest eukaryotic organisms on earth (2 billion year old fossils)
- Abound in tropical, warm waters
- Act as food and habitat for many marine species
- Structure: from thin films to complex filamentous membranes

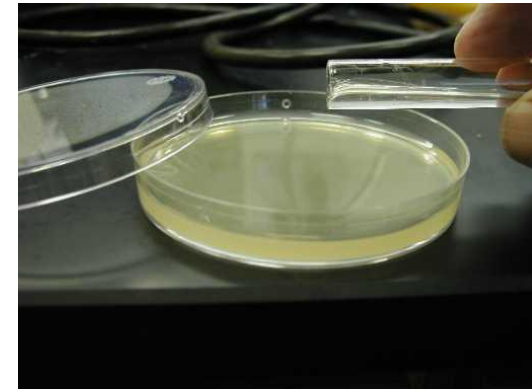
Why are Red algae **red**?

- Accessory pigments! Phycobilins mask the *Chlorophyll a* – thus they look red.
- Due to these accessory pigments, red algae can photosynthesize in deeper waters (at different light wavelengths).



Red algae

- Commercial uses: **Carrageenan** used for making ice cream, jellies, syrups, breads.
- Also for lotions, toothpaste, pharmaceutical jellies.
- Agar for growing bacteria and fungi for research purposes.
- As food.



4. Kelps or Brown Algae

- Kelps: Division *Phaeophyta*
- Closely related to diatoms, also a recent group... but look very different from diatoms!
- Habitat: rocky coasts in temperate zones or open seas (cold waters)
- Structure: multicellular only
- Holdfast, stipe, blade, air bladder
- Up to 50 meters long



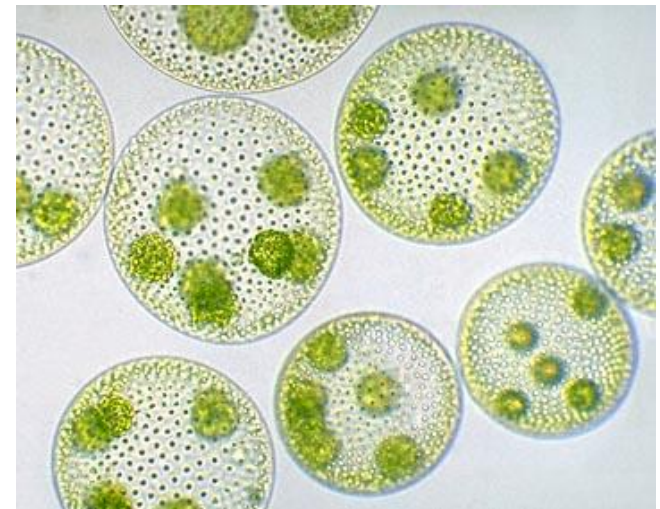
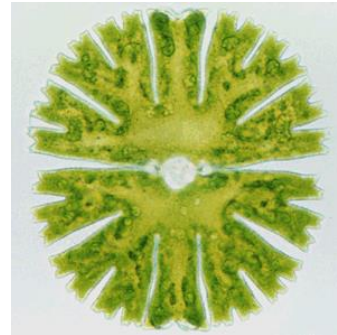
5. Green Algae

- Division: *Chlorophyta*
- Largest and most diverse group of algae
- Habitat: found mostly in fresh waters and on land.
- Float in rivers, lakes, reservoirs, creeks.
- Can also live on rocks, trees, soil



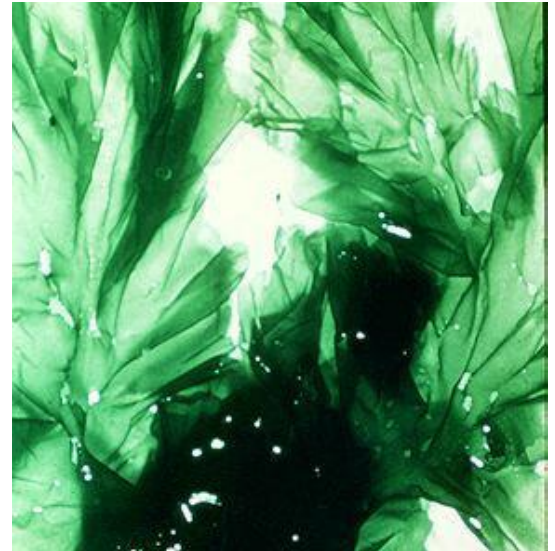
Green algae

- Sea lettuce (*Ulva*) lives in salt waters along the coast.
- Structure of green algae: from
- Single cells (*Microsterias*)
- Filaments
- Colonies (*Volvox*)
- Thalli (leaf-like shape)



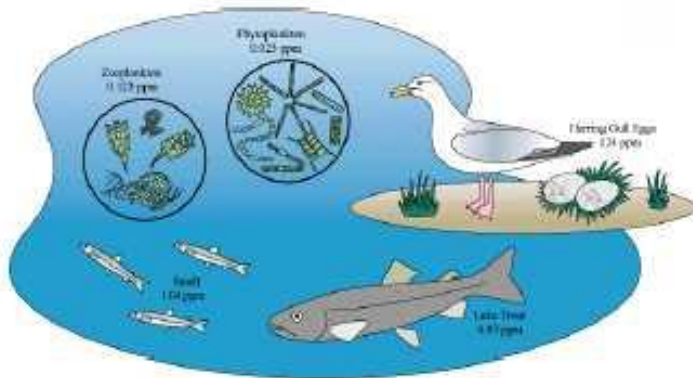
Green algae

- Terrestrial plants arose from a green algal ancestor
- Both have the same photosynthetic pigments (Chlorophyll a and b).
- Some green algae have a cell wall made of cellulose
- Cells divide similarly



Benefits of Algae

- Beneficial algae:
- They are the base of the aquatic food chain – photosynthetic organisms
- Lichens: algae and fungi symbiosis
- Also serve as shelters: Kelps form underwater forests; red alga form reefs



Harmful algae

- Excessive growth of algae causes:
- Clogging of water ways, streams, filters... makes the water taste bad.
- Can be toxic to animals
- “**Red tides**” caused by dinoflagellates

