

Systematics and evolution of Rhodophyta

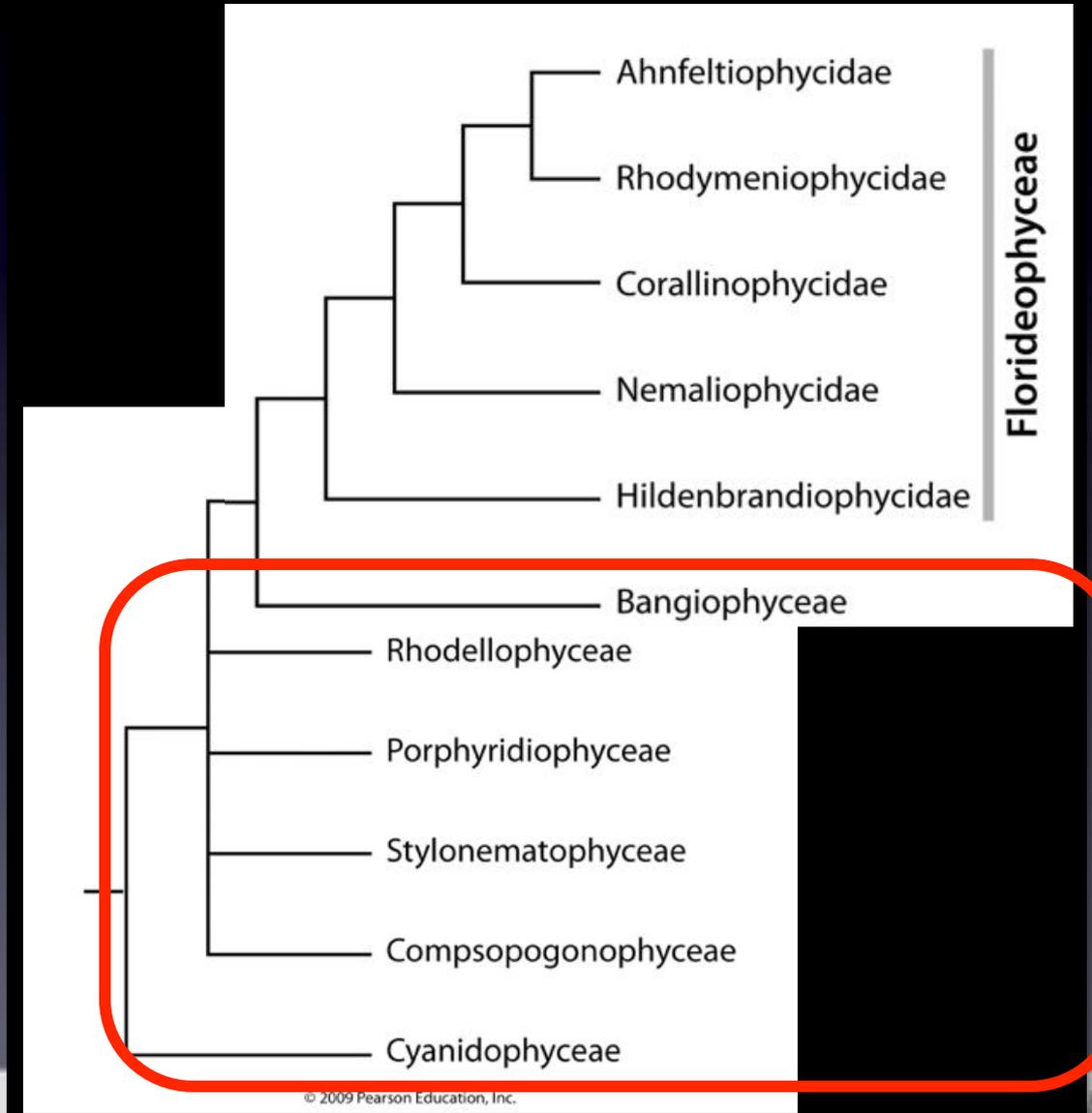
THE EARLY DIVERGENT RHODOPHYTES



They are positioned at the base of the evolutionary tree of the red algae

These early divergent groups contain a small number of taxa with primitive morphological characters and simple life cycles

They are not a monophyletic group



Essential Information

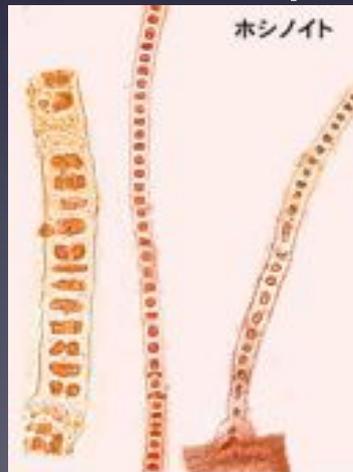
- Unicells, colonial, filamentous or laminar thalli
- Many are marine with a few examples in freshwater habitats
- One central plastid per cell, sometimes with a pyrenoid
- Pit connections are rare
- Asexual reproduction by monospores
- Sexual reproduction rare with a simple carpogonium (no trichogyne)



Porphyridium



Rhodosorus



Erythrotrichia



Boldia



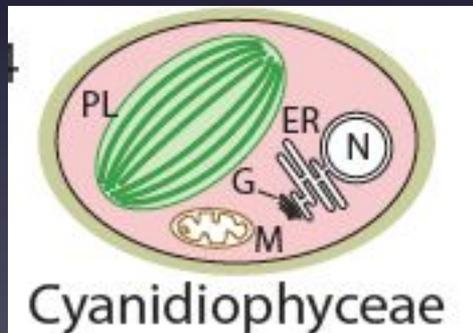
Porphyra

CYANIDIOPHYCEAE

- Unicellular
- Extremophile in acidic and high temperature habitats
- Thick cell wall
- Golgi-ER association
- *Cyanidium*, *Cyanidioschyzon*, *Galdieria*



Cyanidium

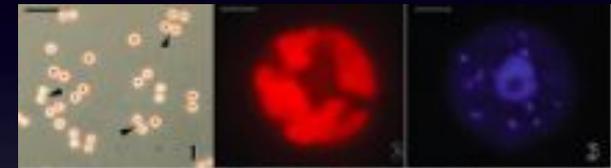


PORPHYRIDIOPHYCEAE

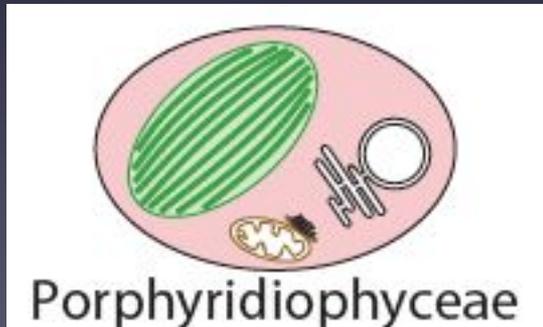
- Unicellular
- No peripheral thylakoid
- Golgi-mitochondrial association
- *Porphyridium*, *Erythrolobus*



Porphyridium

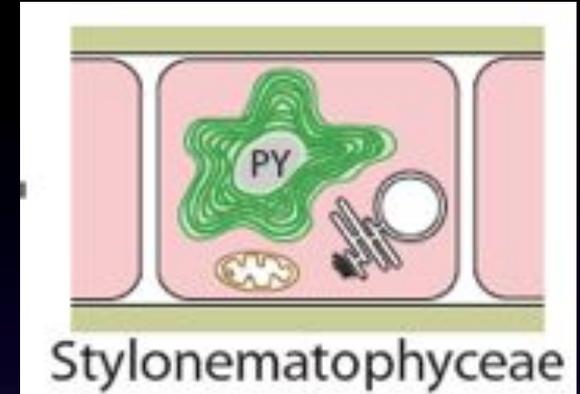


Erythrolobus



STYLONEMATOPHYCEAE

- Unicellular or multicellular with thick mucilage
- One stellate plastid with pyrenoid
- Golgi -ER association
- Sorbitol
- *Stylonema*, *Rhodorus*, *Rufusia*



Stylonema



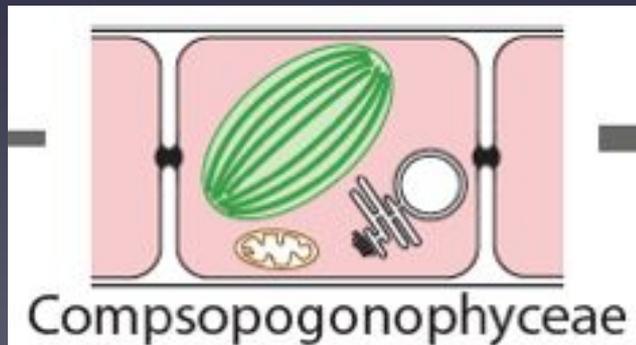
Rhodorus



Rufusia on sloth's hairs

COMPSOPOGONOPHYCEAE

- Freshwater and marine taxa
- Multicellular with pit connections
- Golgi– ER association
- encircling thylakoids in the plastid
- Sexual reproduction, biphasic
- *Compsopogon*, *Boldia*



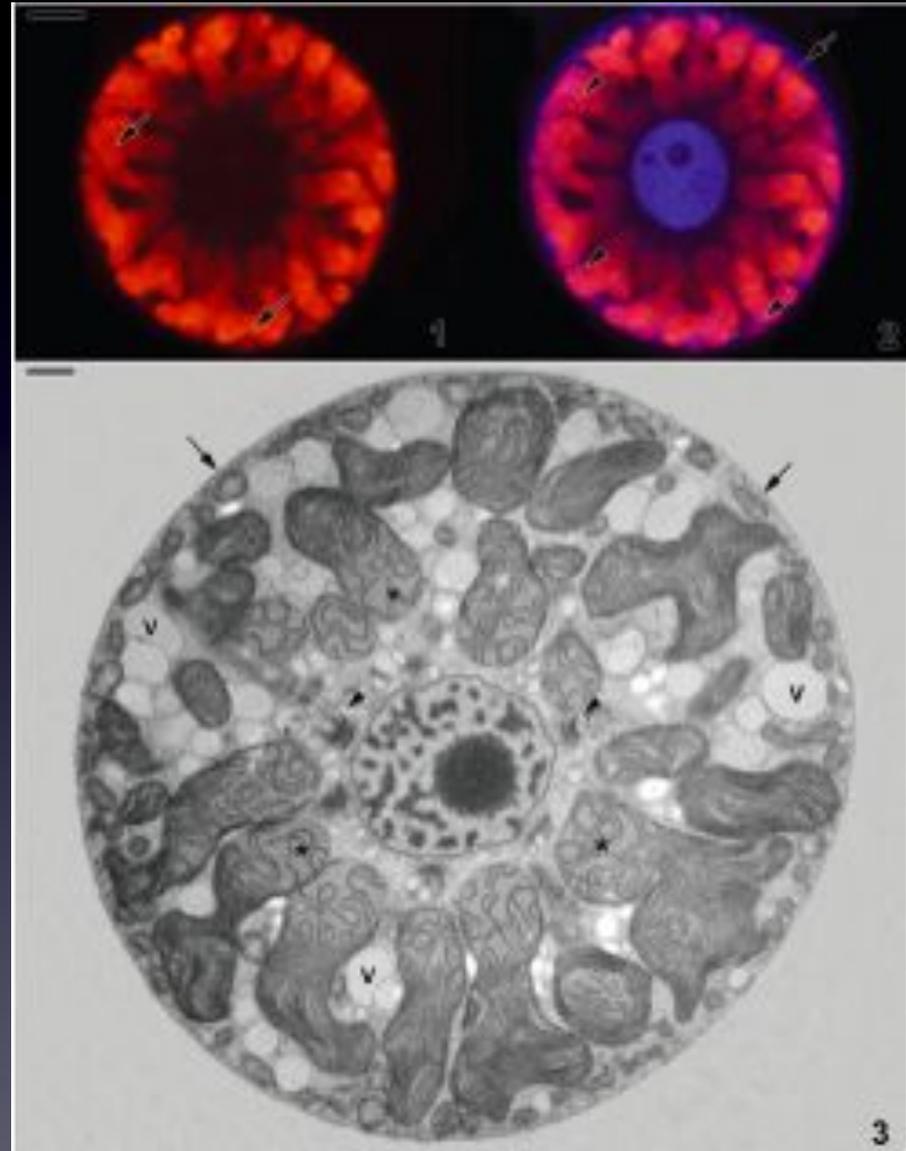
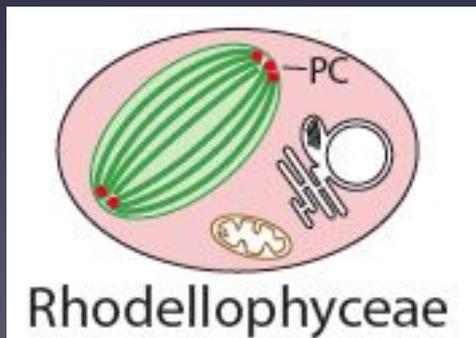
Compsopogon



Boldia

RHODELLOPHYCEAE

- Unicellular red algae
- a single highly lobed plastid with eccentric or centric pyrenoid
- Golgi –ER association
- Plastoglobuli cluster near peripheral thylakoid
- contains mannitol
- reproduction by cell division
- *Glaucosphaera*, *Neorhodella*

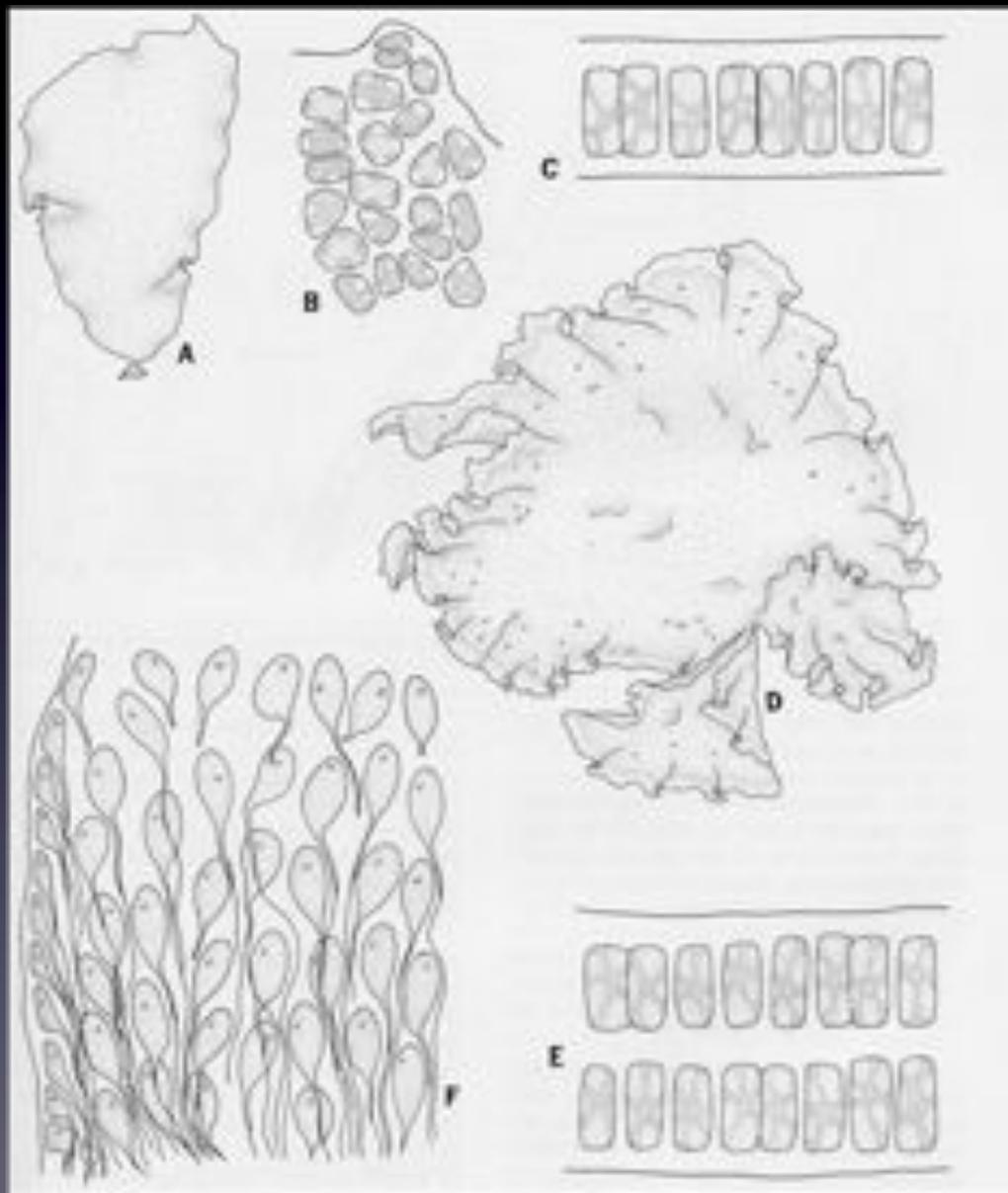
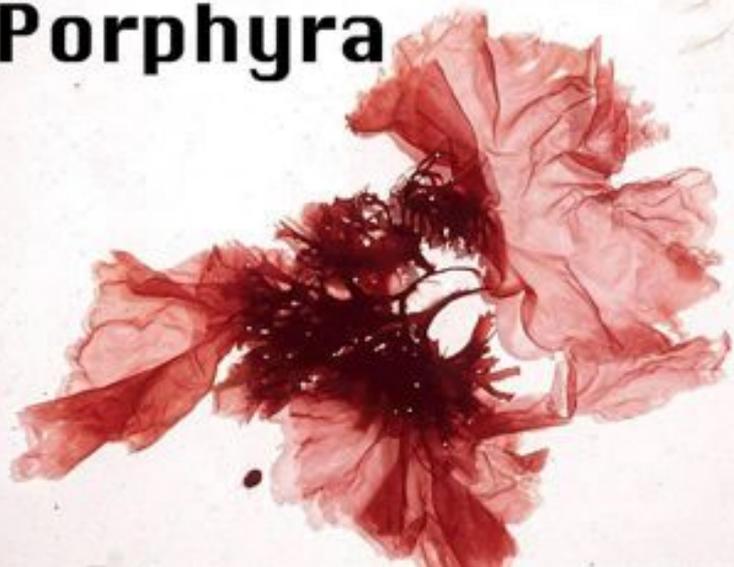


Neorhodella

Porphyra: nori



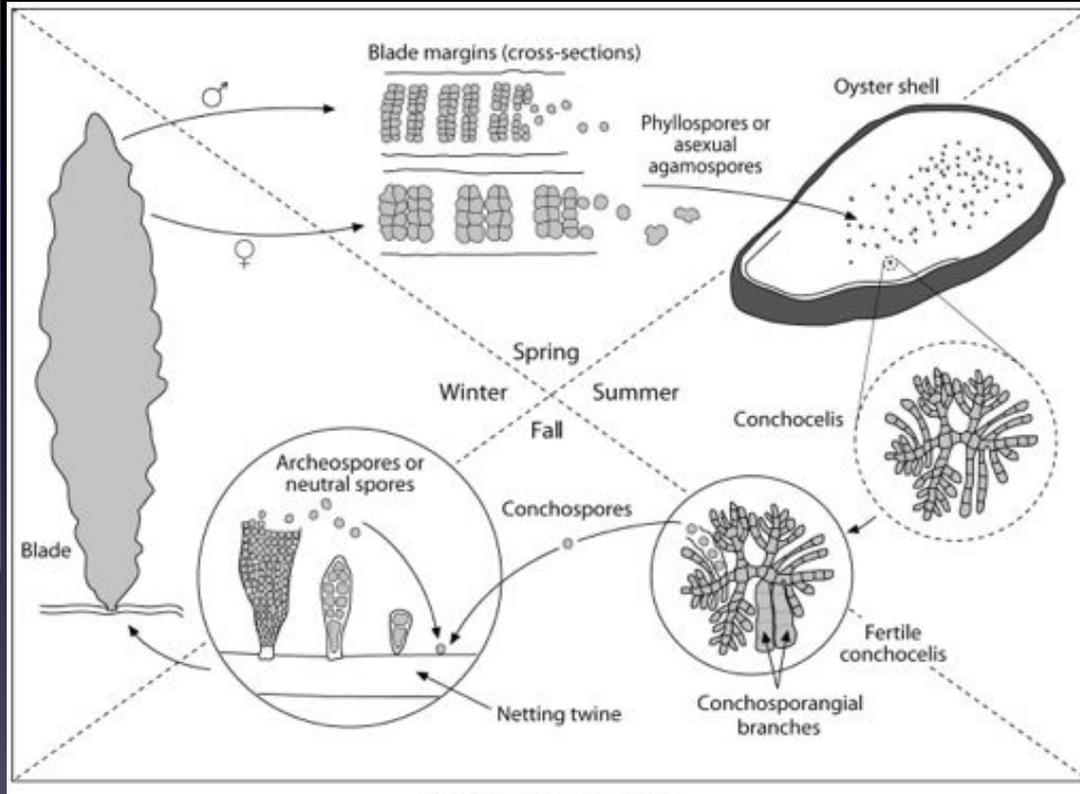
Porphyra



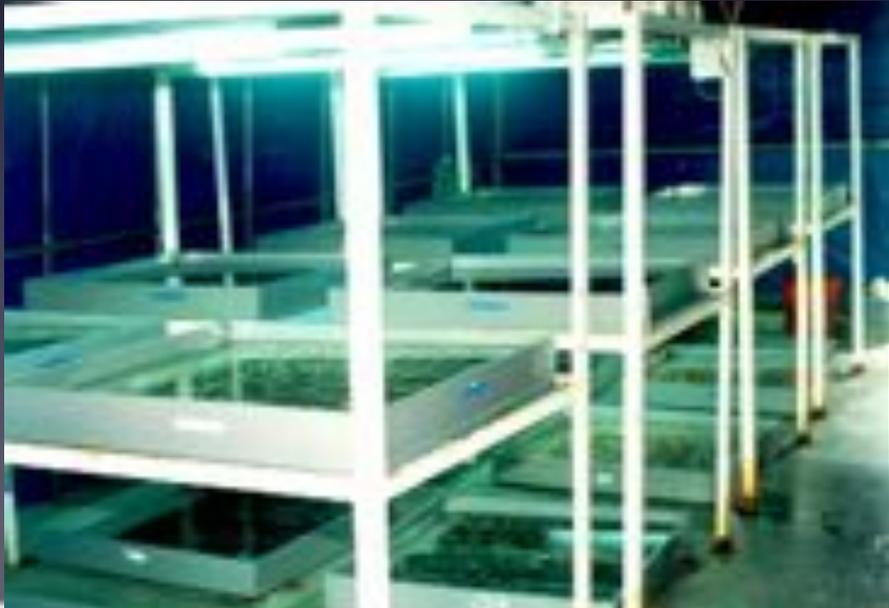
Porphyra life cycle



Macrothallus:
Porphyra blades



Microthallus: “*Conchocelis*”
phase filaments inside shells



FLORIDEOPHYCEAE or Florideans

- Multicellularity
- Growth by means of apical cells and lateral initials forming branched filaments in which the cells are linked throughout by pit connections
- Sexual reproduction with a triphasic life history
- Pit plugs, Golgi-ER/mitochondria association
- carpogonia terminal or lateral, bearing an apical extension, the trichogyne, to which the spermatangia attach

