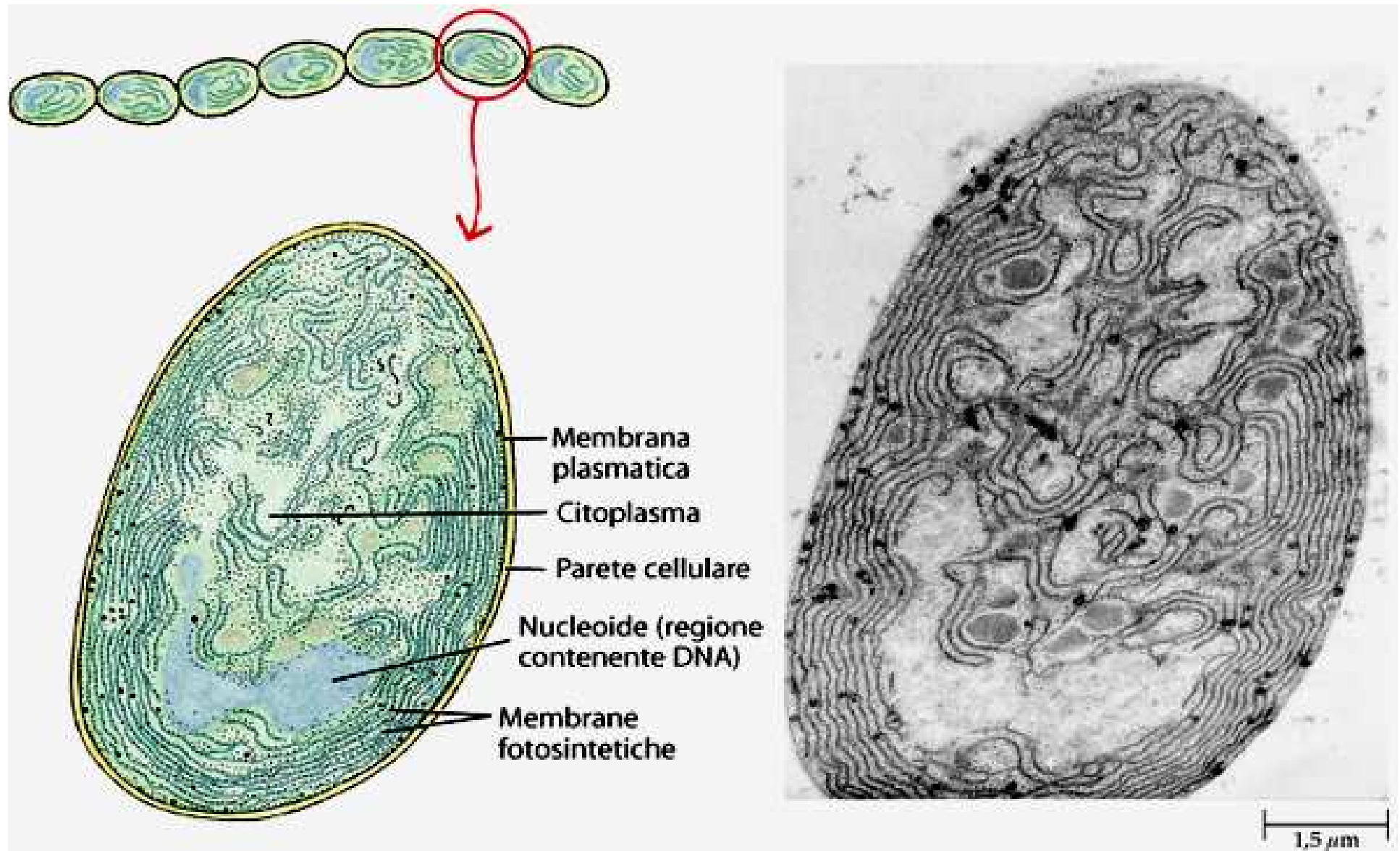
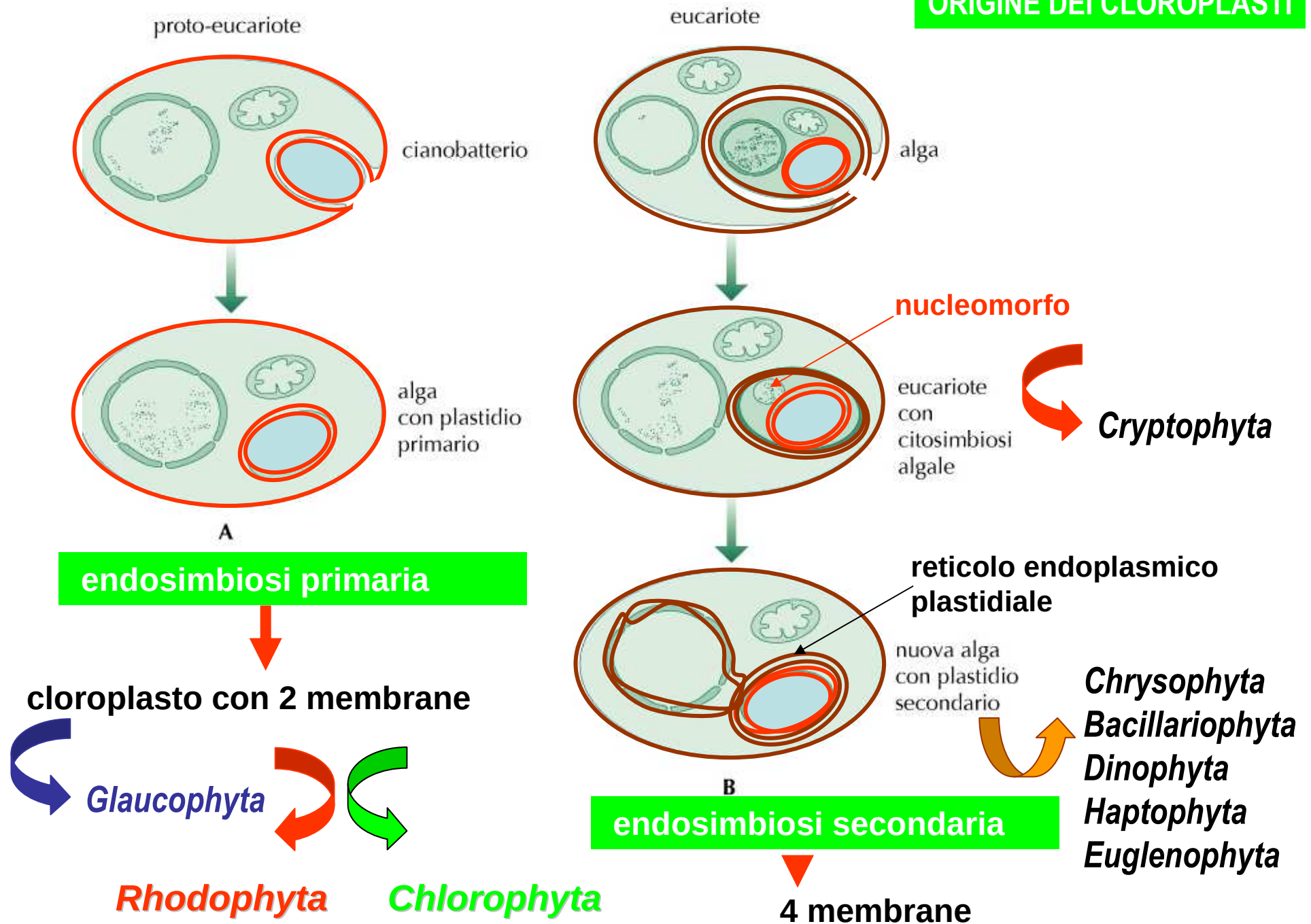


La cellula dei procarioti fotosintetici ossigenici: i cianobatteri

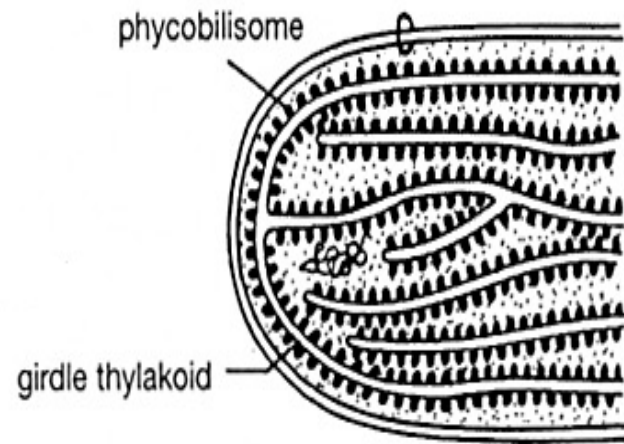


ORIGINE DEI CLOROPLASTI



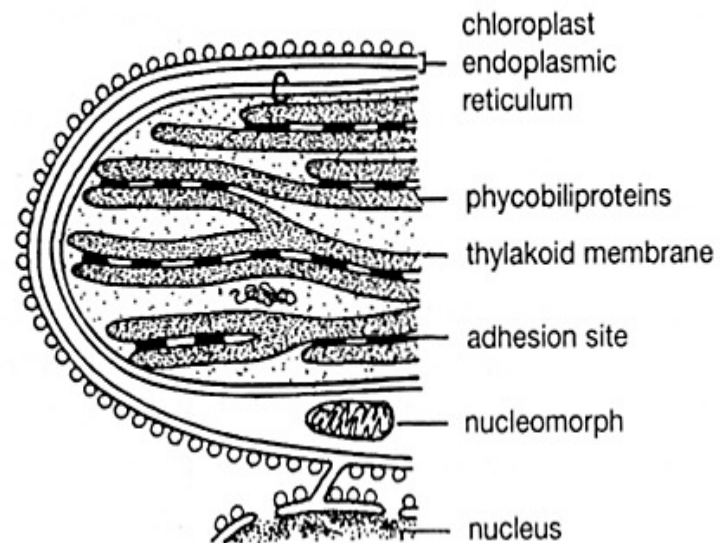
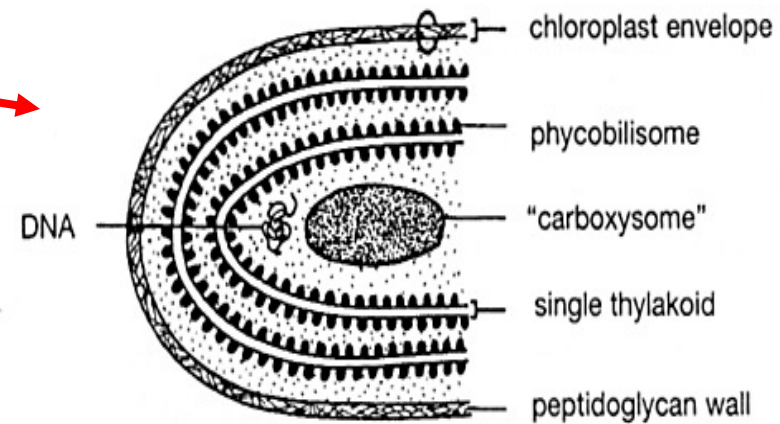
ORIGINE DEI CLOROPLASTI

Cyanobacteria



Rhodophyta

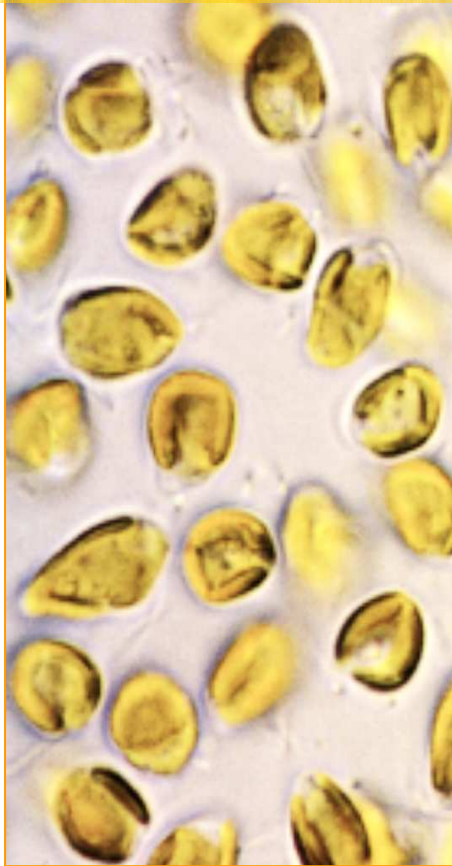
Glaucophyta



Cryptophyta

Haptophyta

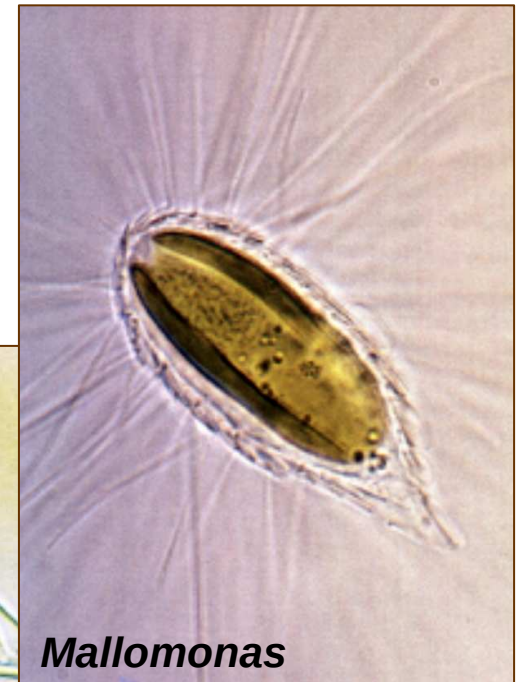
- cloroplasti 1-2 con 4 membrane
- tilacoidi appaiati a tre
- pirenoide

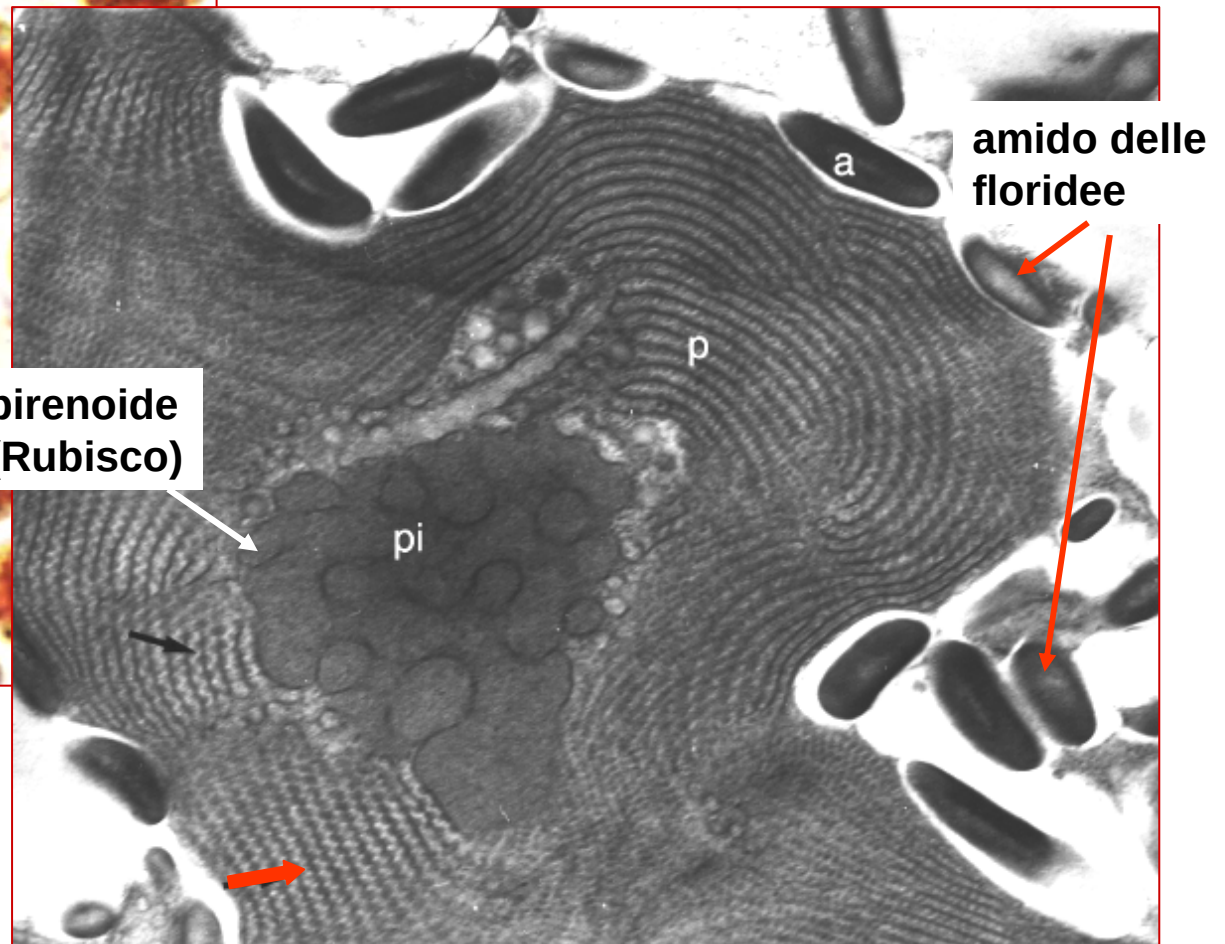
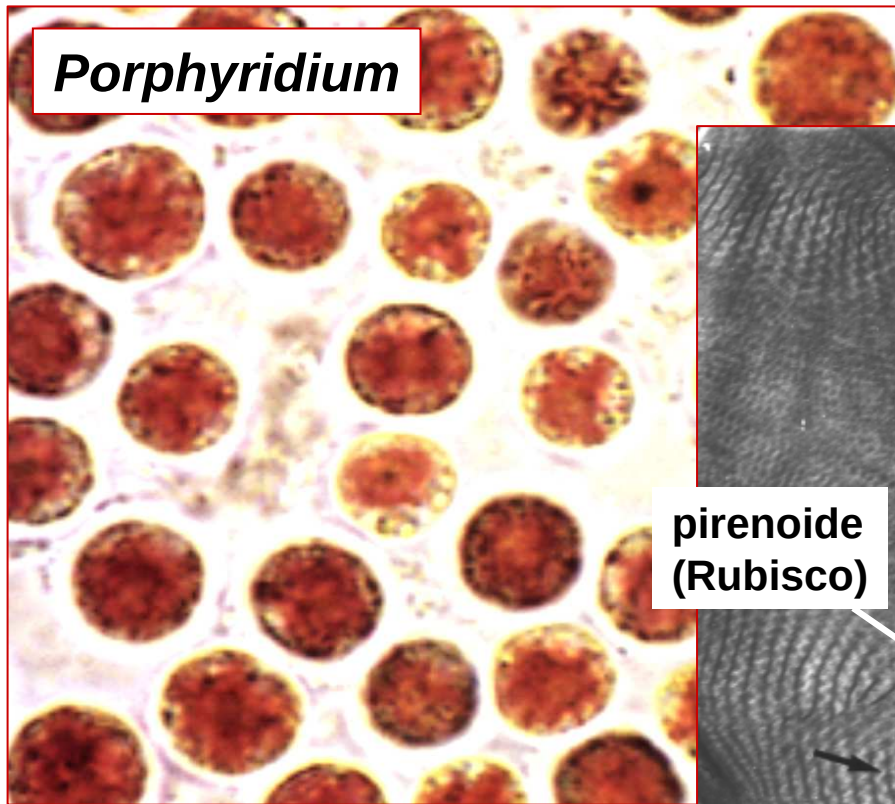


Prymnesium

Chrysophyta

- cloroplasto singolo con 4 membrane
- tilacoidi a tre in lamelle
- lamella periferica





Rhodophyta

- *cloroplasto con 2 membrane*
- *tilacoidi singoli con ficobilisomi*
- *alcune specie con pirenoide*

singolo o molti lenticolari

Cryptophyta

- cloroplasti 1-2 con 4 membrane
- tilacoidi appaiati a 2 con ficobiliproteine nel lume tilacoidale
- pirenoide

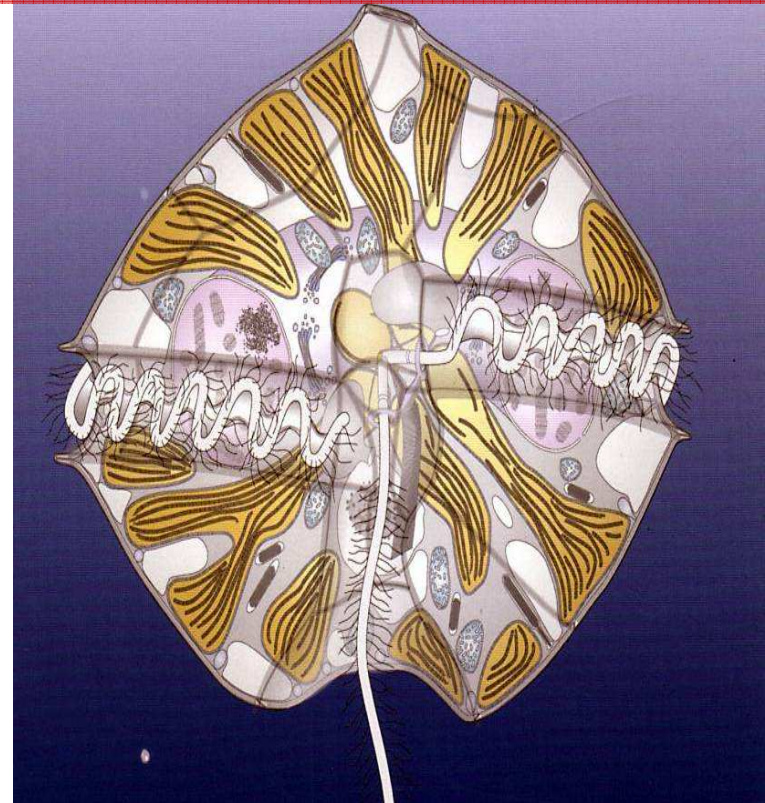


Cryptomonas

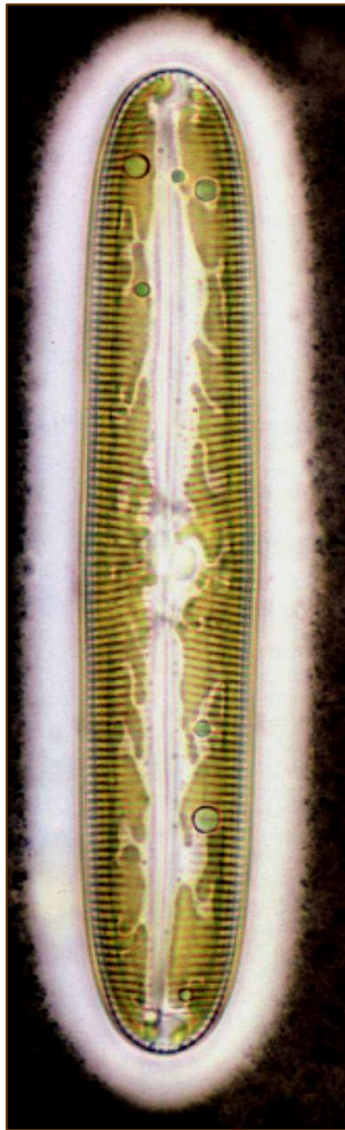


Dinophyta

- cloroplasti da 2 a numerosi con 3-4 membrane
- tilacoidi appaiati a tre
- pirenoide



Bacillariophyta



Pinnularia

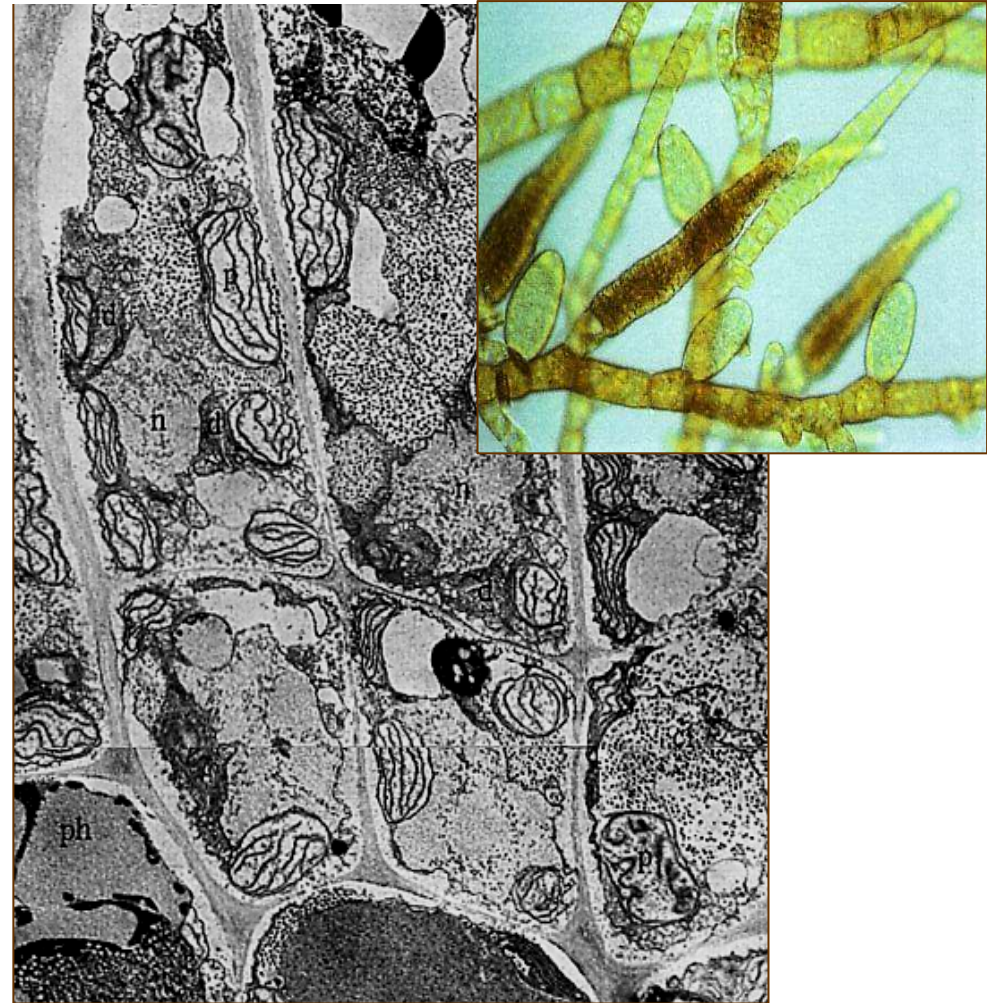
- cloroplasti 1-2 o molti
- uno o più pirenoidi



Stephanodiscus

Phaeophyta

- cloroplasti pochi o numerosi
- alcune specie con uno o più pirenoidi



**Alghe eteroconti: plastidi con 4 membrane (a)
tilacoidi appressati tre a tre in lamelle (b)
lamella periferica (c)
Chl a, Chl c, fucoxantina**



A

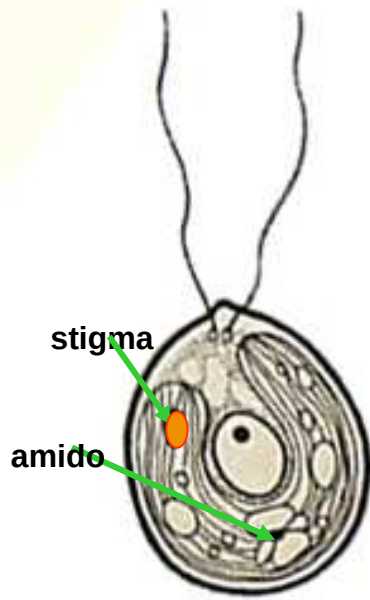


B

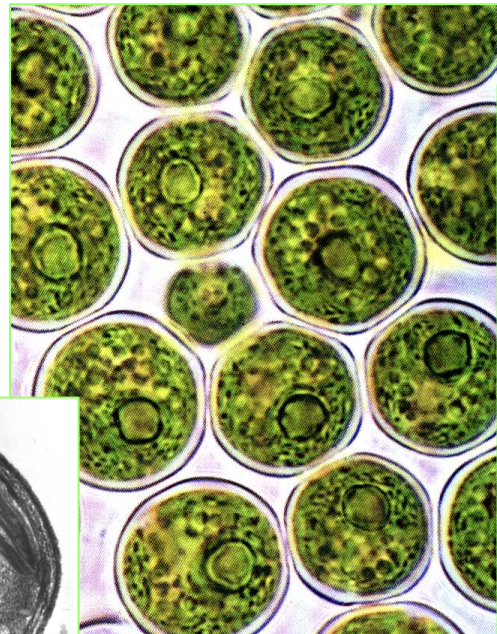
Chlorophyta

- Cloroplasto con 2 membrane
- amido intraplastidiale
- in alcune specie pirenoide e stigma

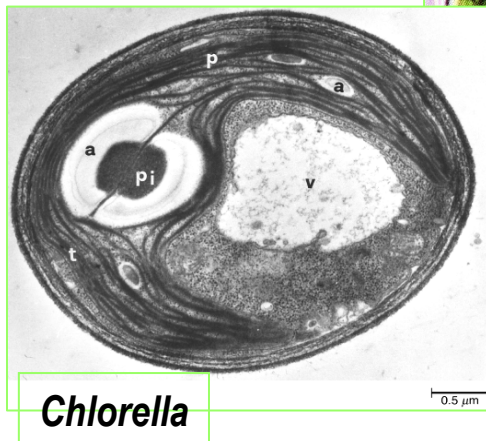
- Cloroplasti da 1 a numerosi
- a coppa, reticolati, anulati, spiralati, lobati, nastriformi, discoidali
- in alcune specie 1 o più pirenoidi e stigma



Chlamydomonas



Chlorococcum



Chlorella

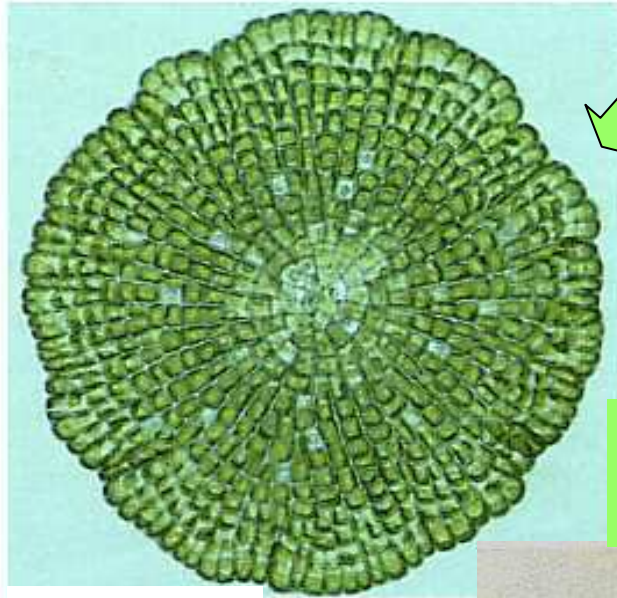


Cladophora



Spyrogira

Charophyceae (Chlorophyta)



Coleochaete

(a)

cloroplasto singolo
con pirenoide

molti cloroplasti discoidali
con grana

Anthocerophyta



Anthoceros

Bryophyta

