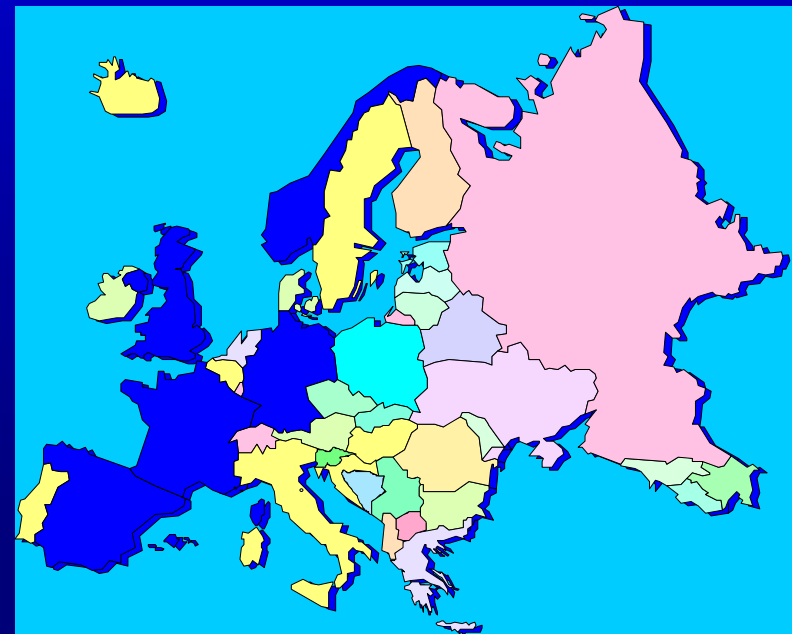


PICODIV



- **Five partners**

- France (Roscoff)
- UK (U of Warwick)
- Germany (AWI Bremerhaven)
- Spain (ICM Barcelona)
- Norway (U of Oslo)





Chlorophyll

FL3-Height

10⁰
10¹
10²
10³

Synechococcus

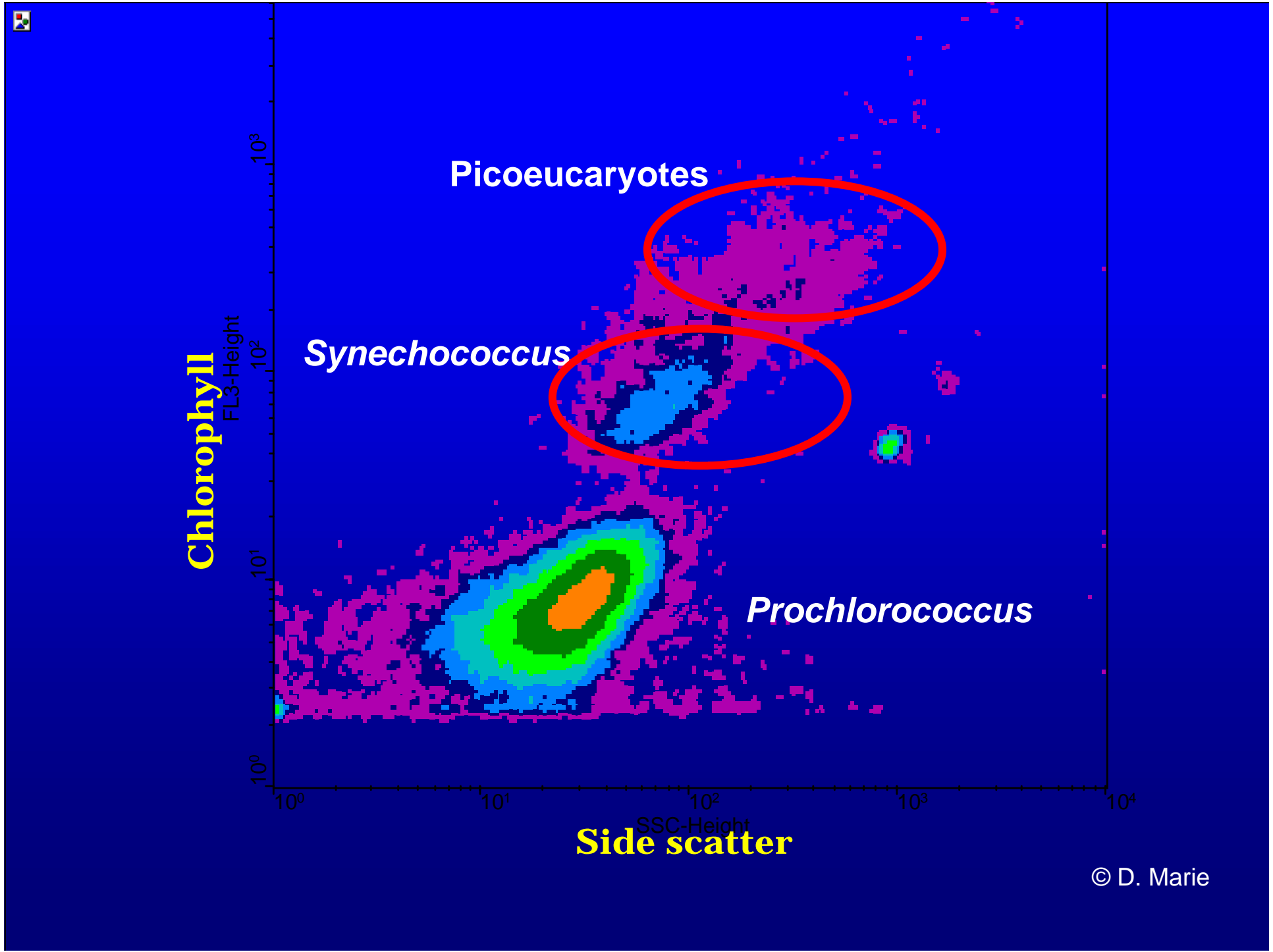
Picoeucaryotes

Prochlorococcus

SSC-Height
Side scatter

10⁰ 10¹ 10² 10³ 10⁴

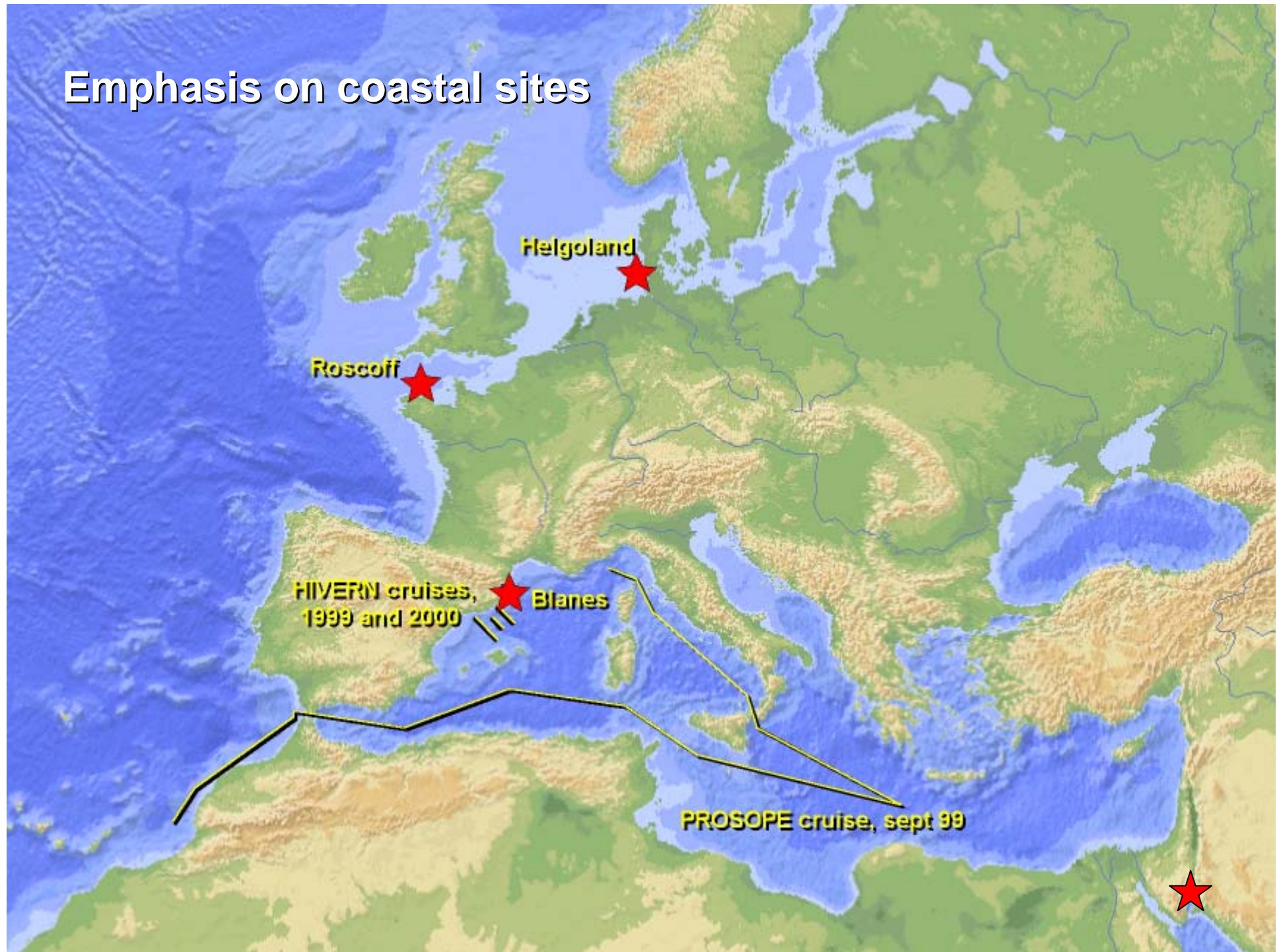
© D. Marie



Strategy

- 1 - Obtain data on picoplankton diversity from cultures and clone libraries
- 2 - Follow annual change in diversity by combination of classical and molecular techniques

Emphasis on coastal sites



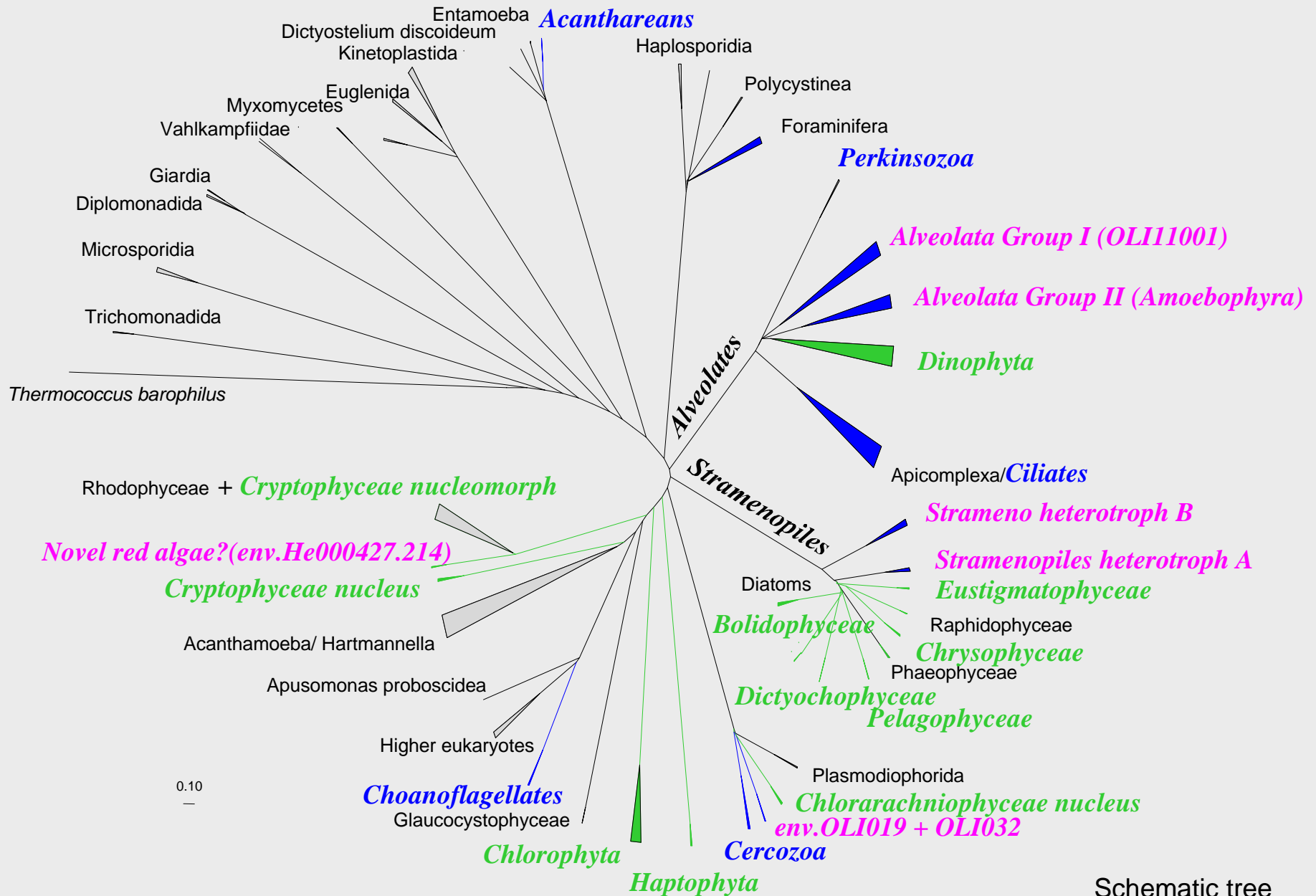
Diversity

- Natural samples
 - Clone libraries 18S, 16S
 - DGGE
 - SSCP
- Cultures
 - Flow cytometry
 - Electron microscopy
 - Pigment analysis by HPLC
 - rDNA sequences

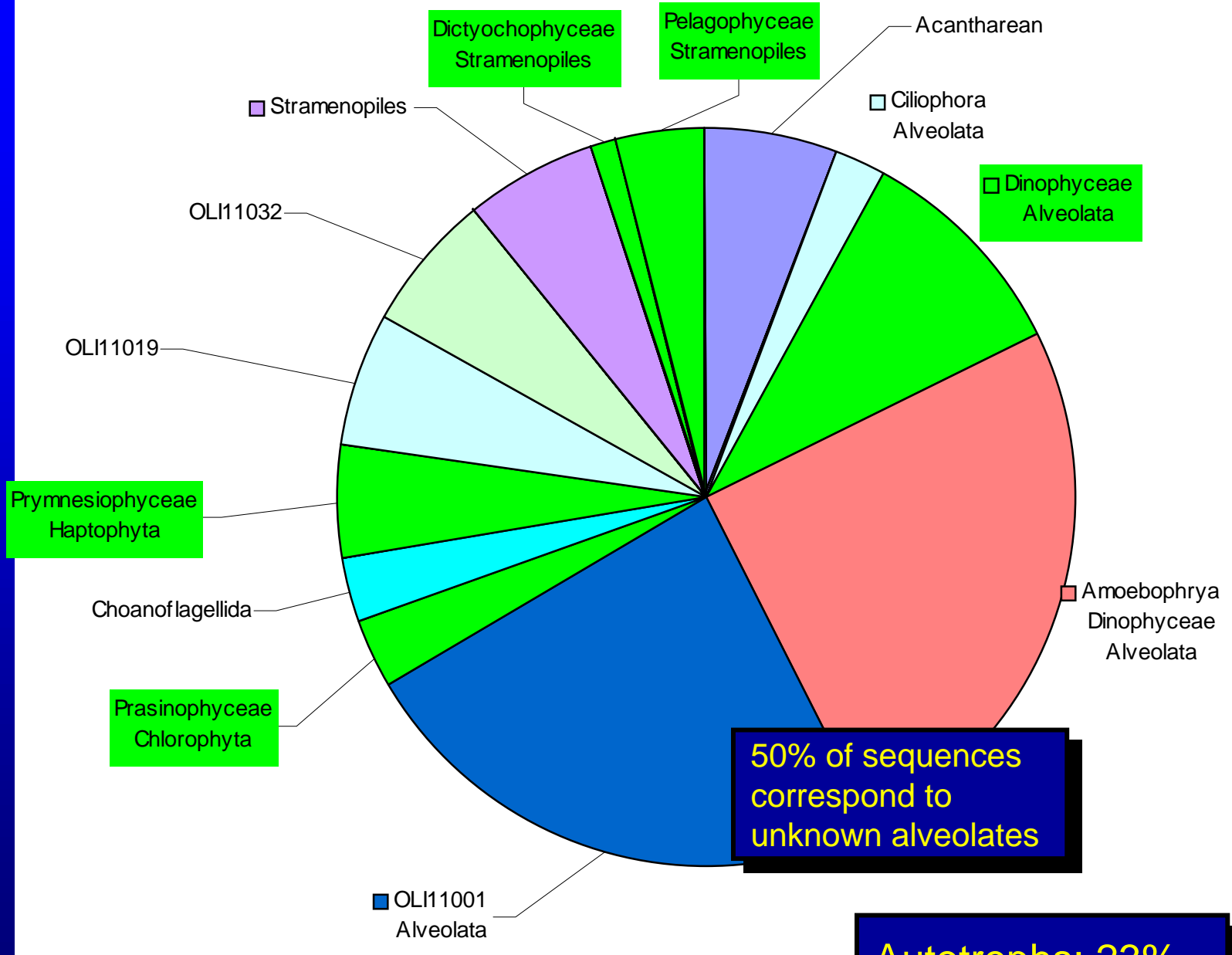
Diversity

- Clone libraries (18S, 16S): 46
- Sequences (partial 18S, 16S): 1234
- Cultures: 145

Eukaryotic picoplankton



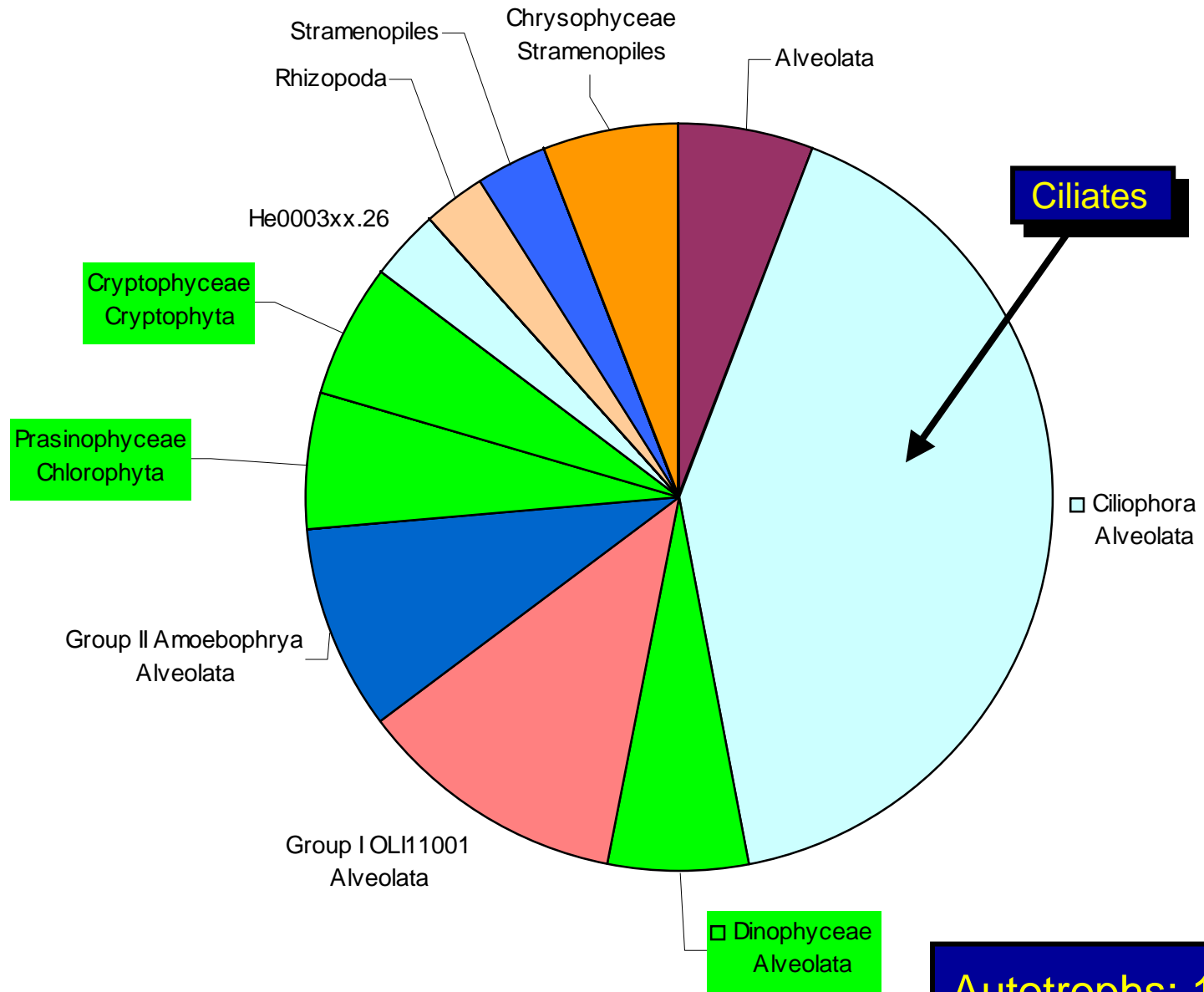
Oligotrophic: OLIPAC



50% of sequences correspond to unknown alveolates

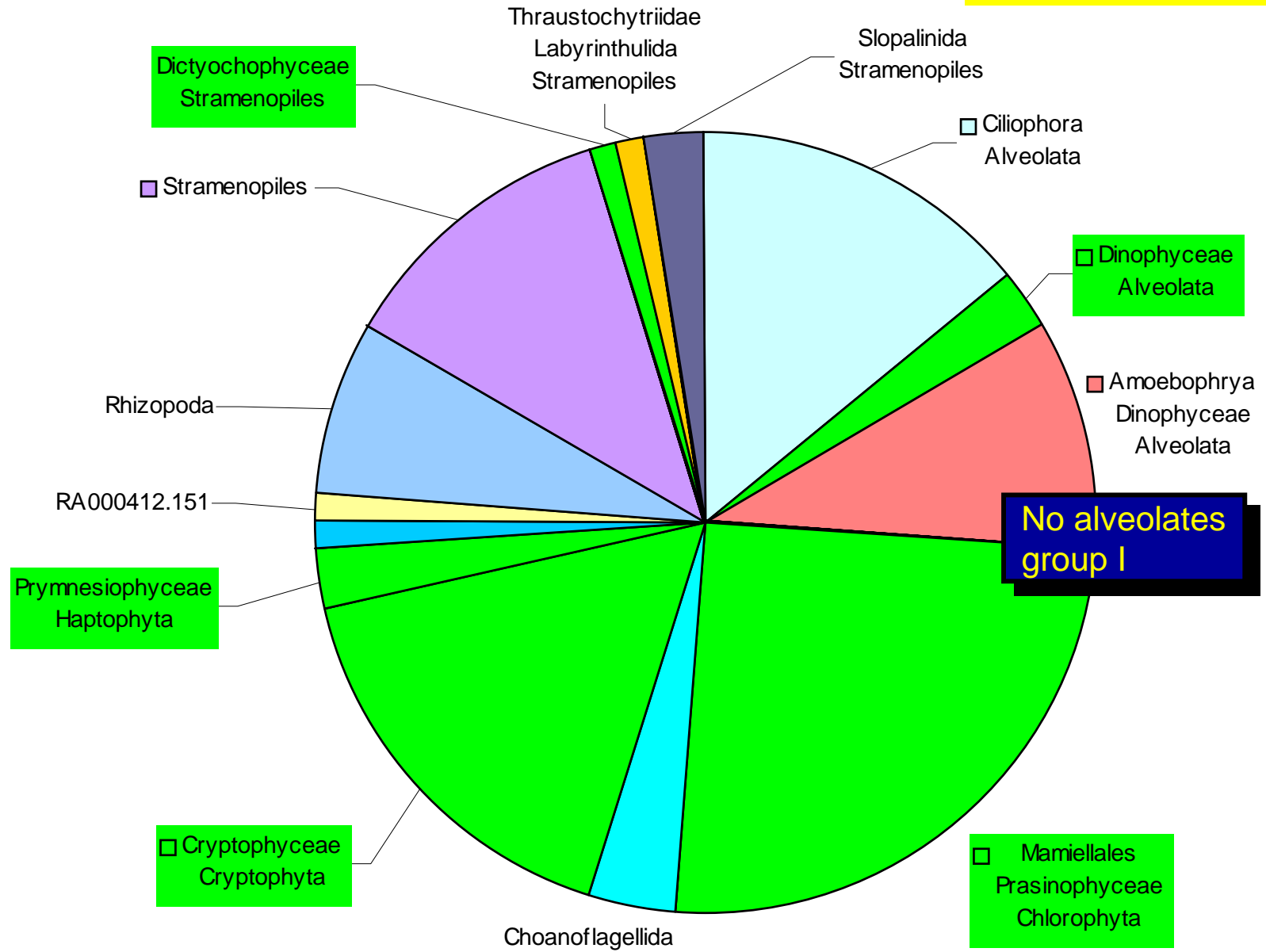
Autotrophs: 23%

Coastal: North Sea: March 2000



Autotrophs: 18%

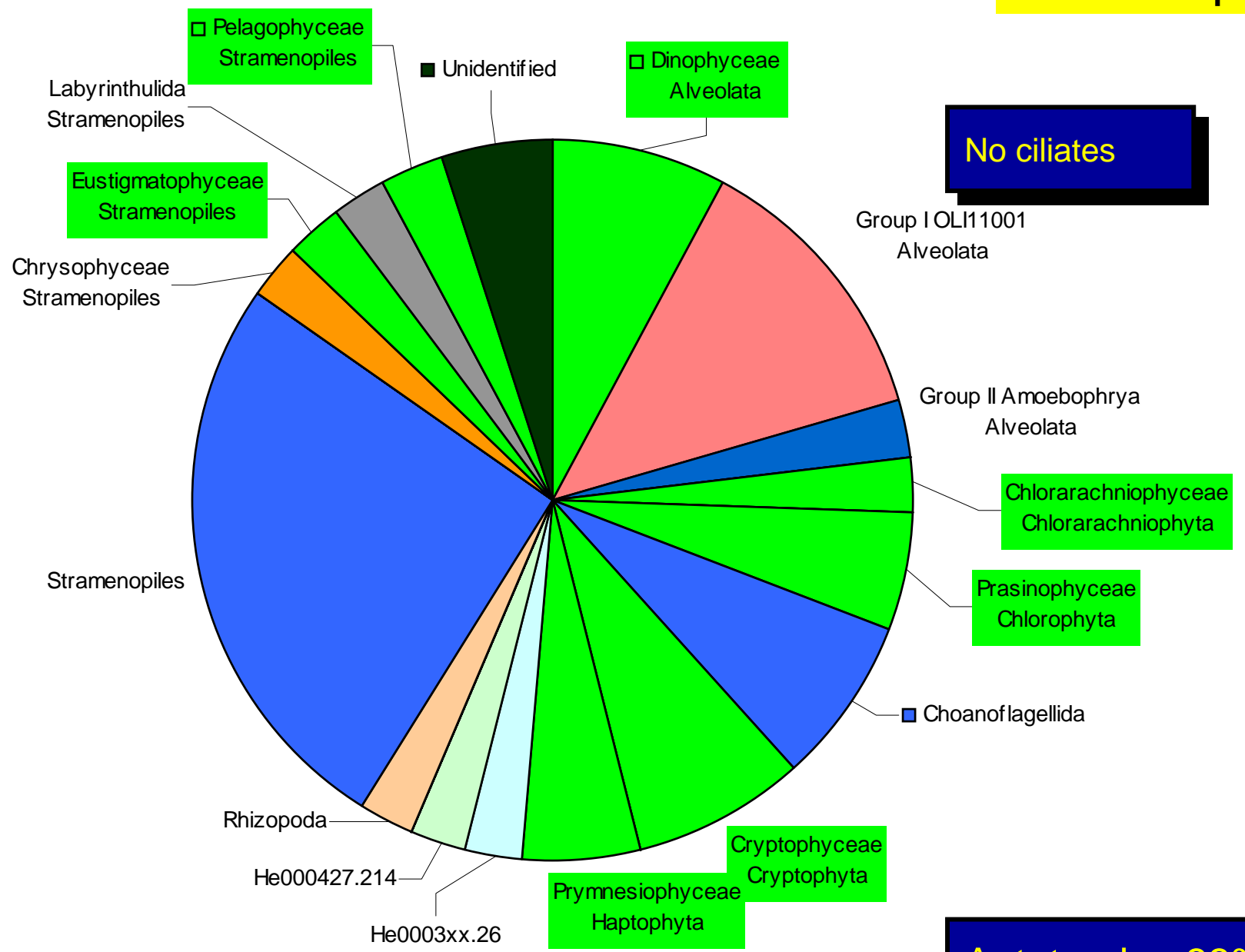
Coastal: Channel : April 2000

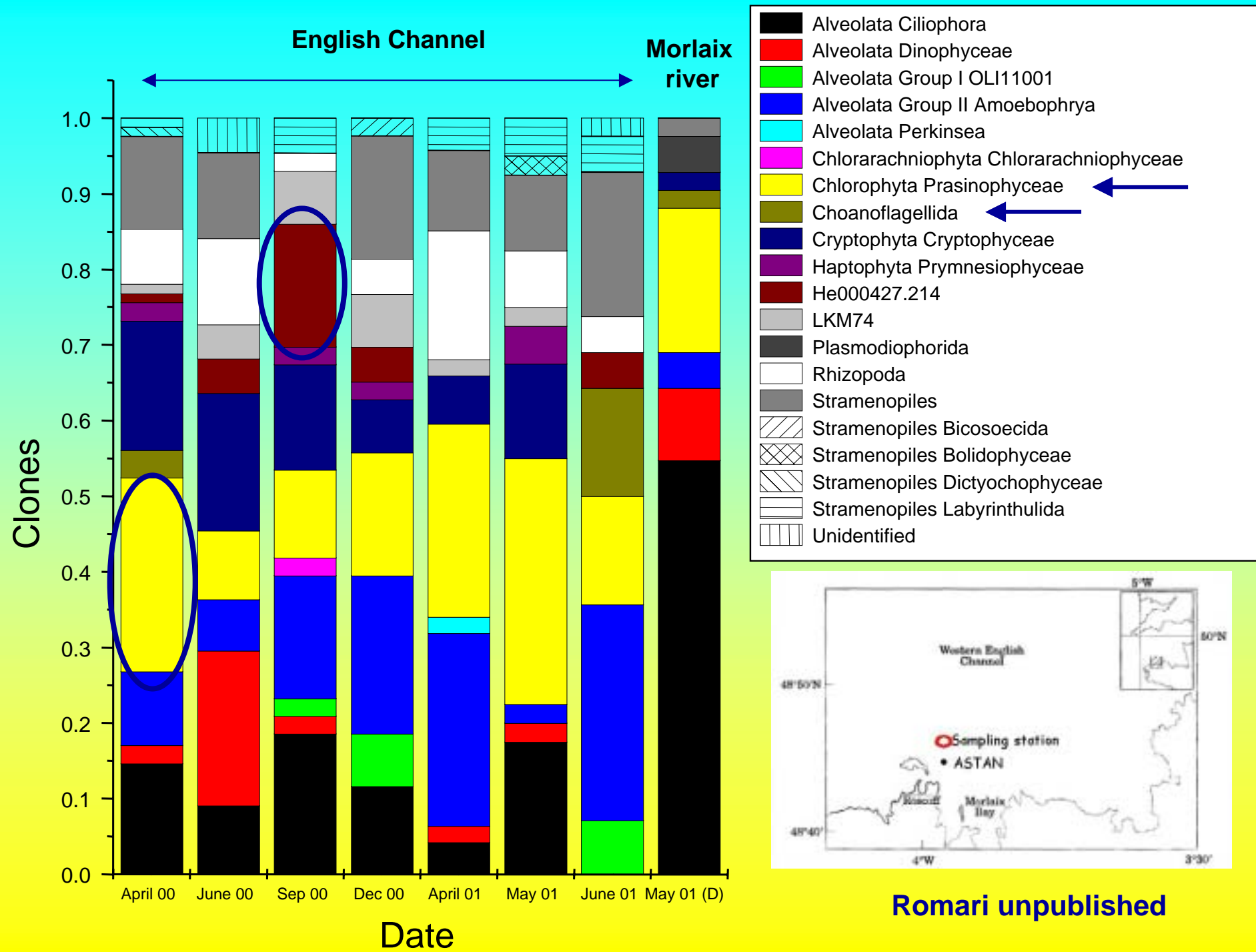


No alveolates group I

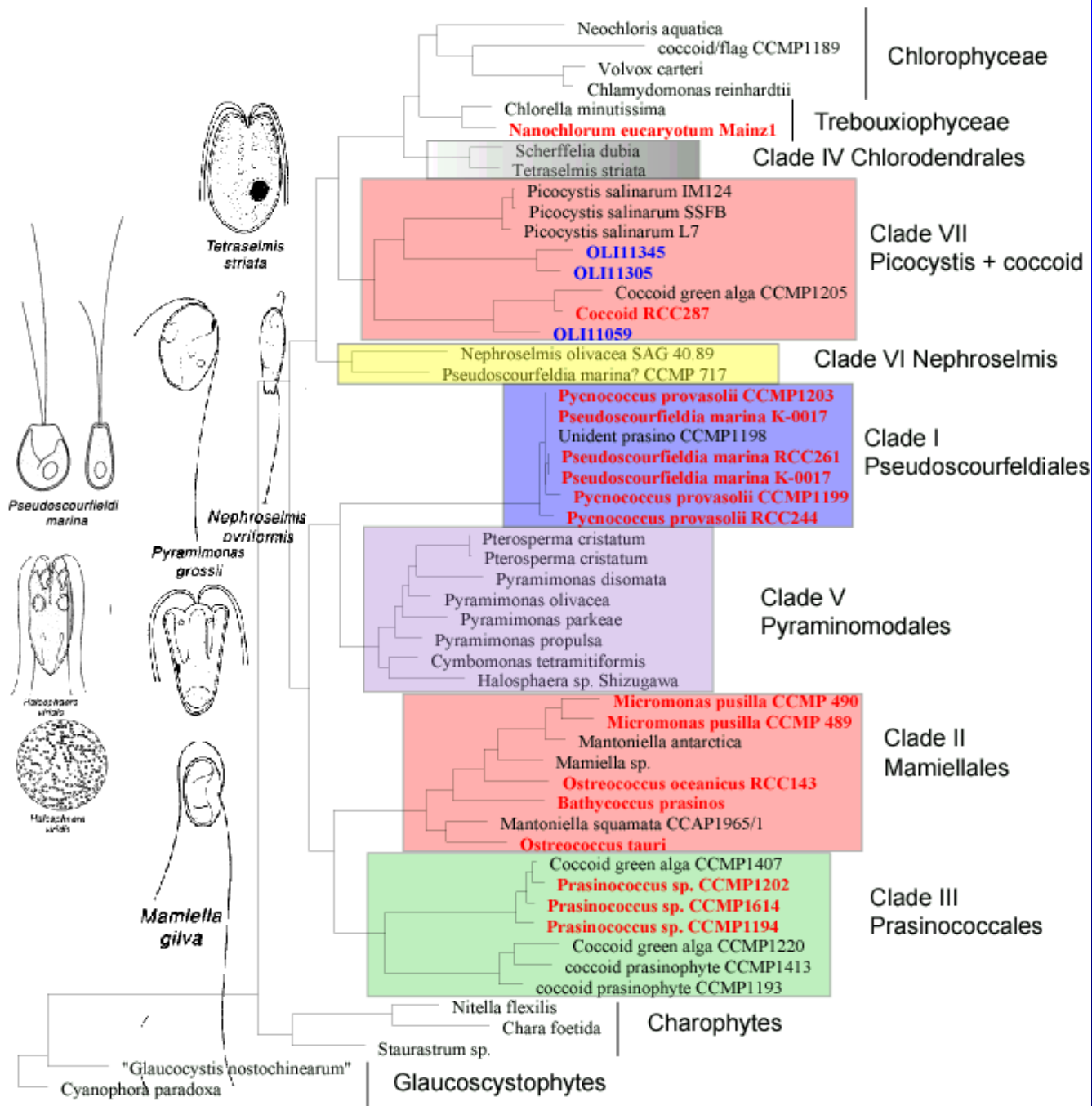
Autotrophs: 48 %

Coastal: Med Sea : Sept 2000





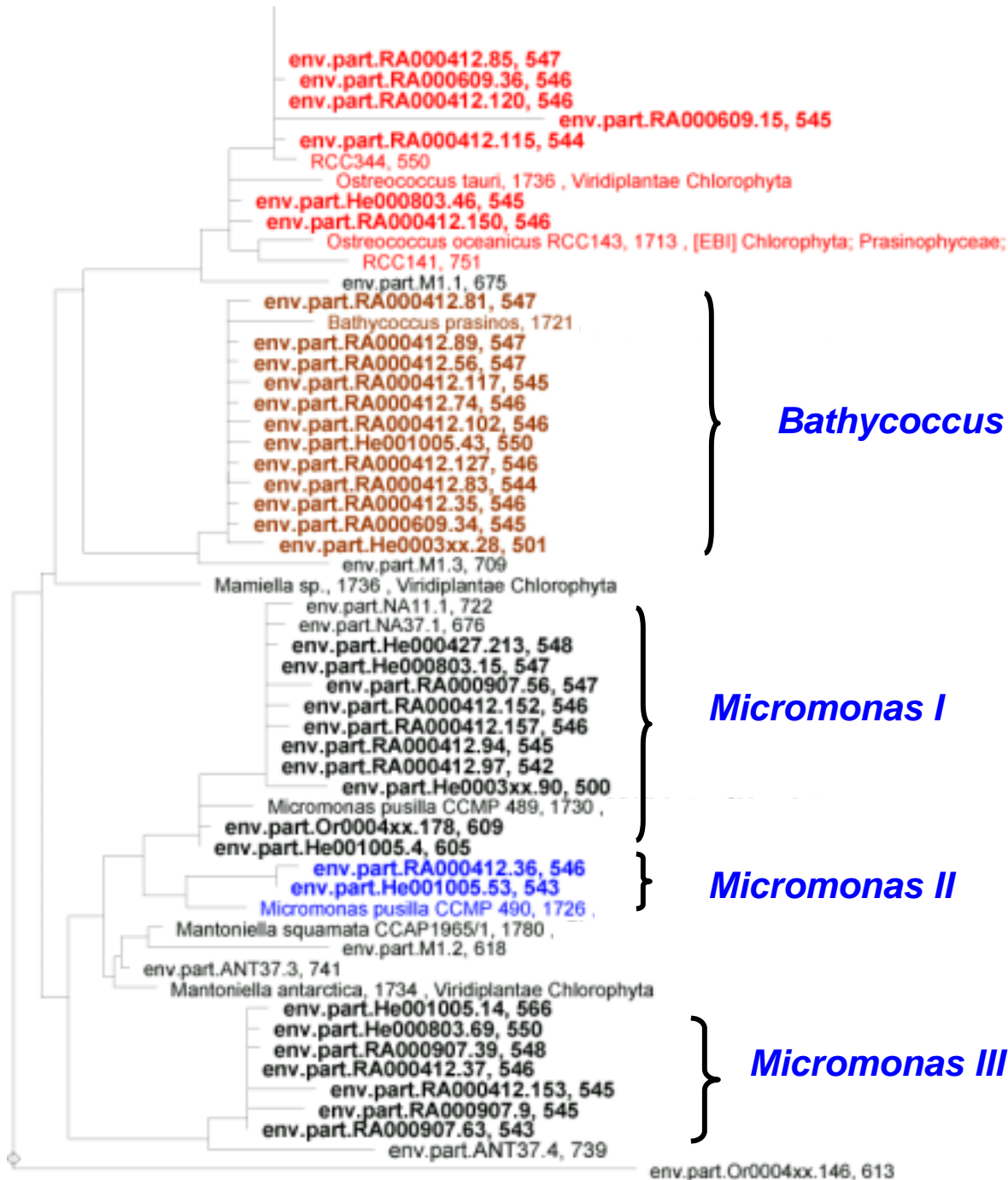
Romari unpublished



Prasinophyceae

Mamiellales





Ostreococcus

Bathycoccus

Mamiellales

Micromonas I

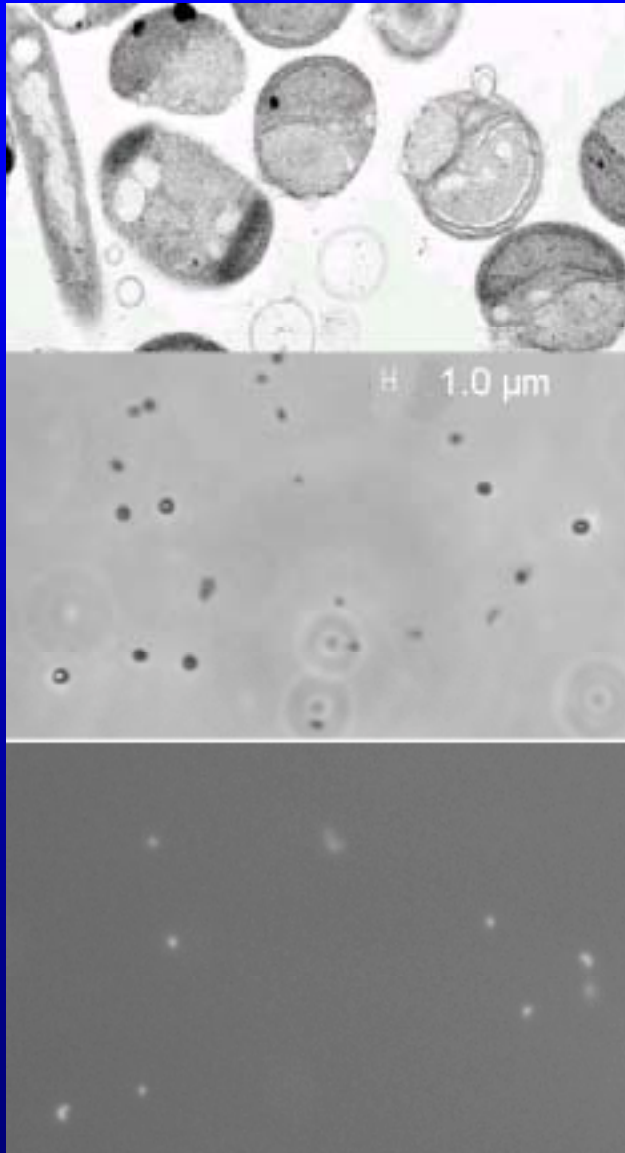
Micromonas II

Micromonas III

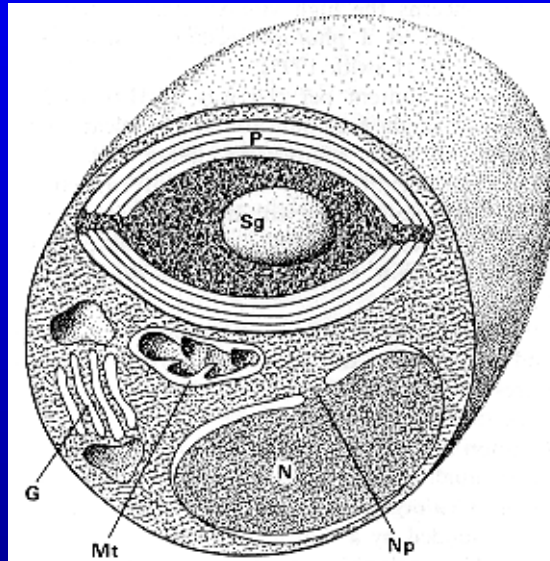
Apparently, there are only a few species present in coastal waters:

- *Ostreococcus*
- *Bathycoccus*
- *Micromonas* (three species ?)

Ostreococcus spp.



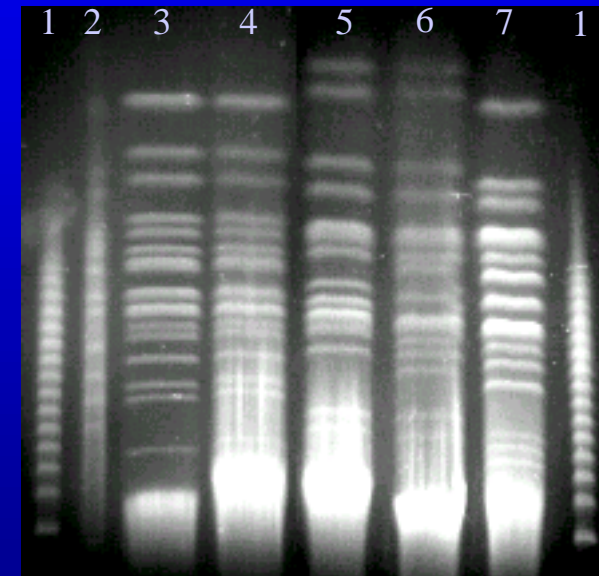
Smallest eucaryote: 0.8 µm



Nine strains available:

- Thau lagoon
- Mediterranean Sea
- English Channel
- Atlantic Ocean
- Red Sea

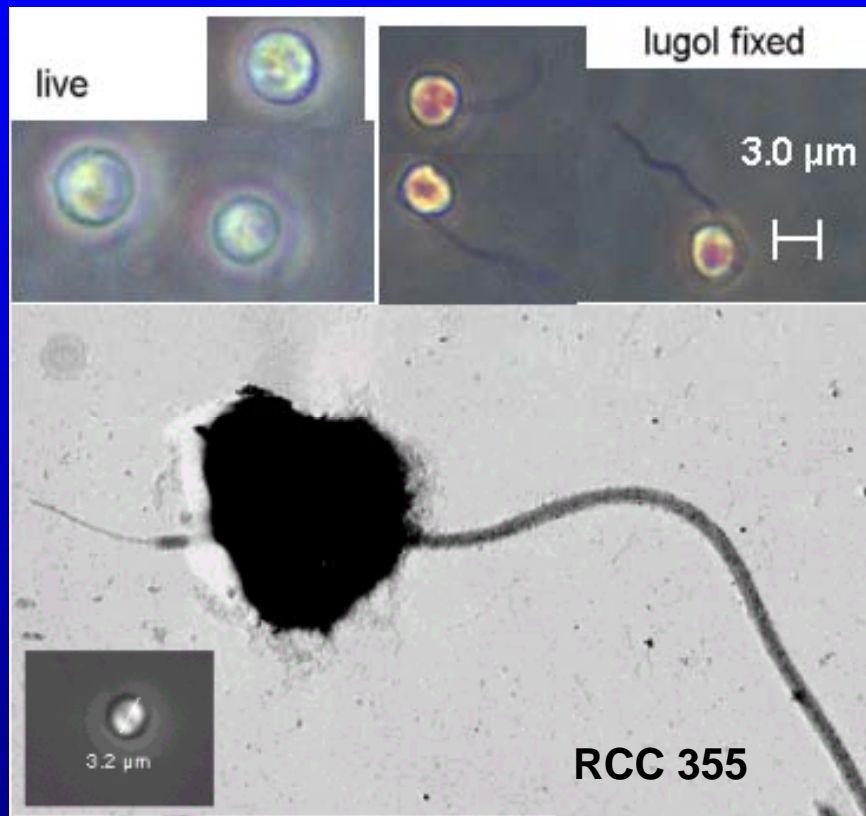
PFGE Chromosomes



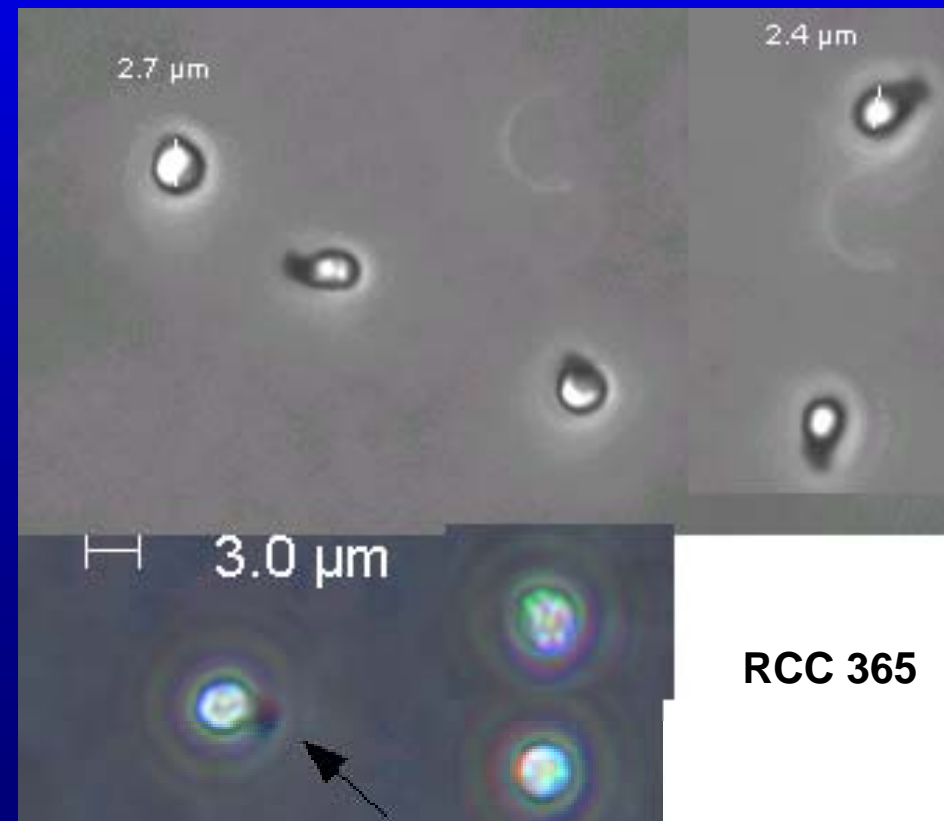
- 1 : λ concatémérisé
- 2 : *S. cerevisiae*
- 3 : *O. tauri* souche 1995 (Thau)
- 4 : *O. tauri* souche 2000 (Thau)
- 5 : RCC 141 (Atlantique)
- 6 : RCC 143 (Atlantique)
- 7 : RCC 371 (Méditerranée)

Exotic classes

Dictyochophyceae



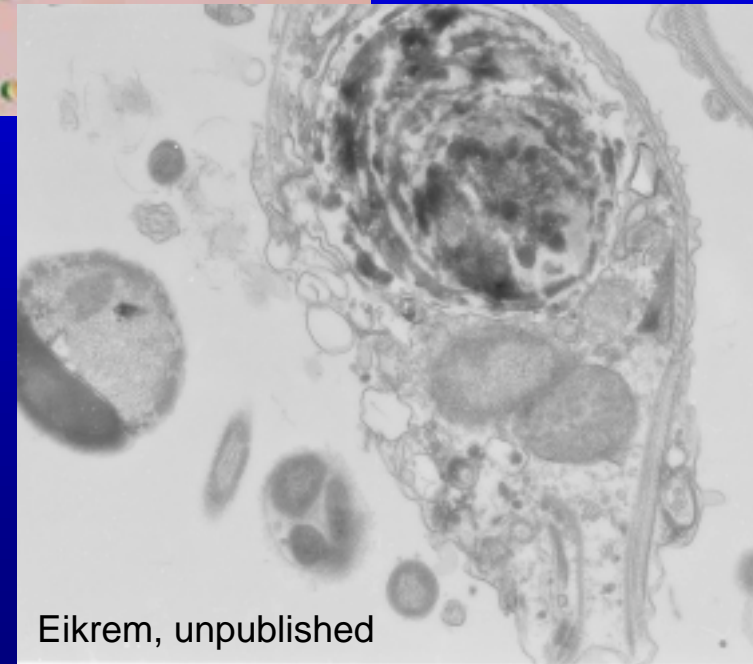
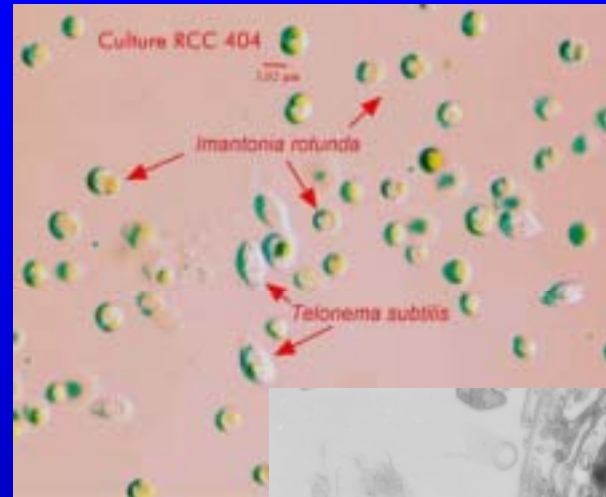
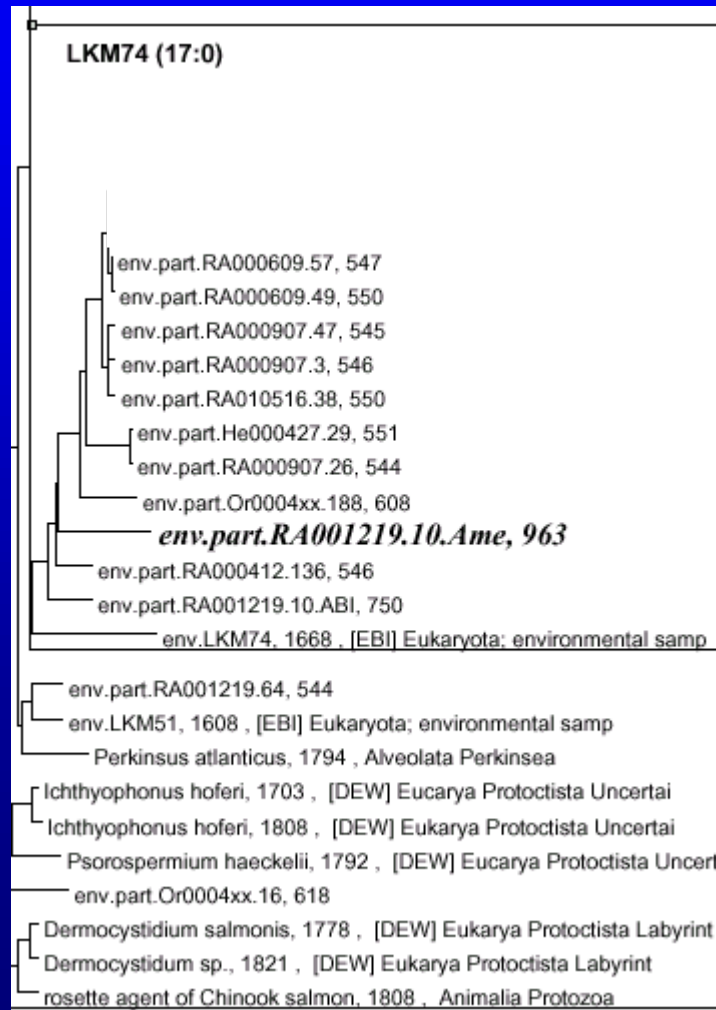
Chlorarachniophyceae



Le Gall, Romari, Eikrem unpublished

Heterotrophic eukaryotes

LKM74 group: obtained from the environment

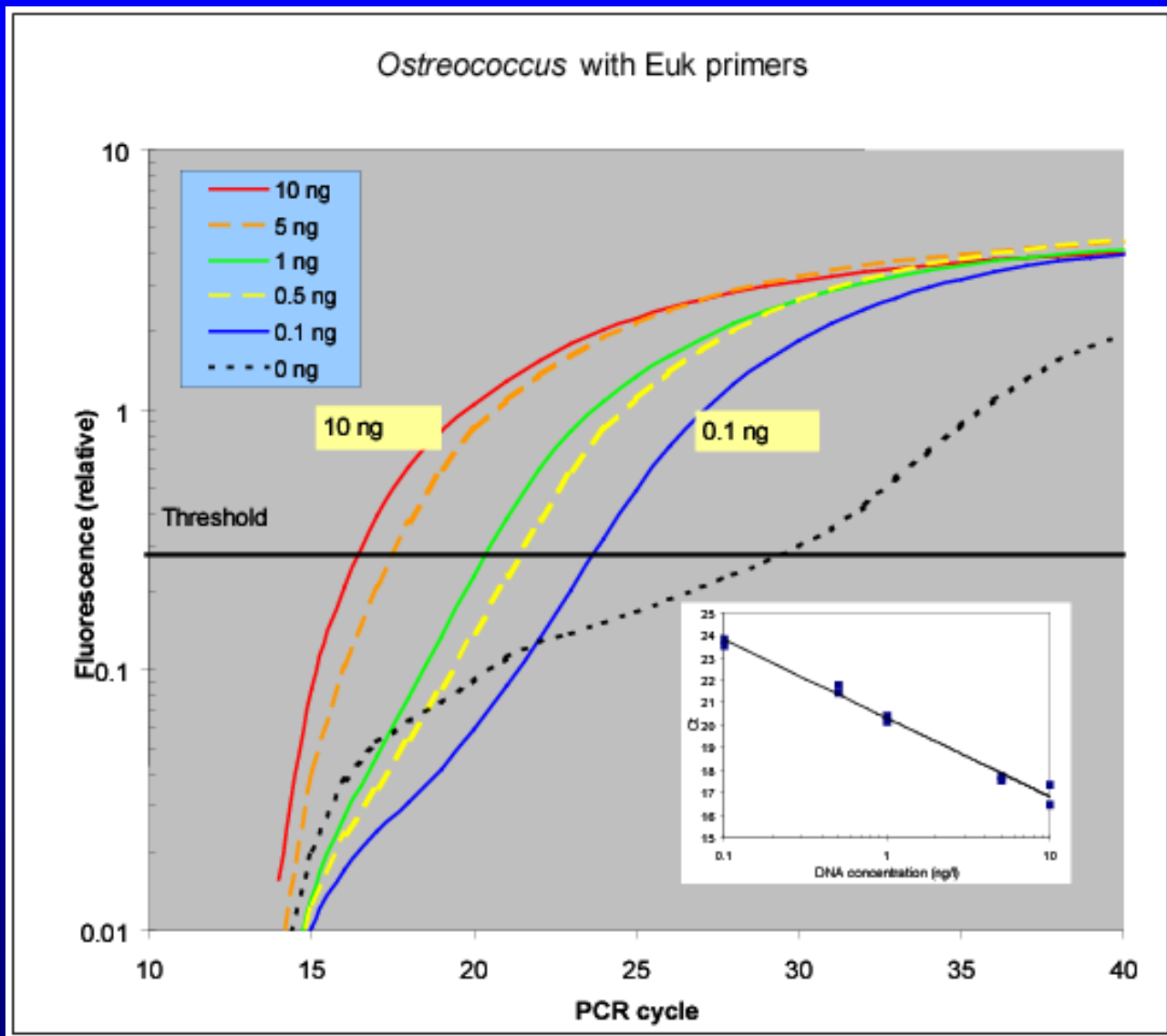


***Telonema subtilis* is probably a cultured representative of LKM74 group**

Abundance

- FISH
- Quantitative PCR
- DNA chips

Quantitative PCR



Perspectives

- Novel groups: morphology, metabolism:
 - phagotrophy
 - osmotrophy ?
 - parasitism?
- Role of eukaryotes in heterotrophic processes in the ocean