



ECCO 2019 -TURIN- June 12-14

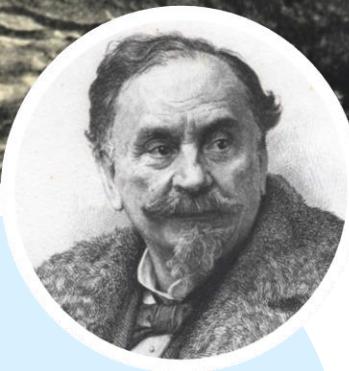
Gourvil Priscillia

Diversity in the Roscoff Culture Collection



CNRS • SORBONNE UNIVERSITÉ
Station Biologique
de Roscoff



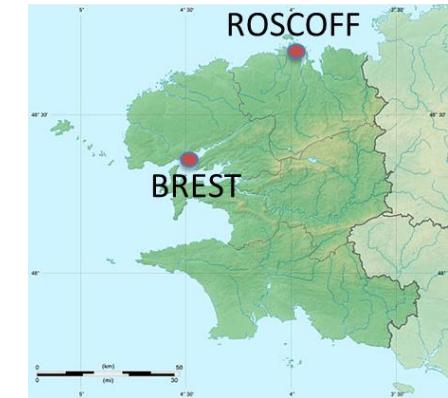


The biological station of Roscoff is the direct heiress of the "Laboratory of Experimental Zoology", founded in 1872 by Henri de Lacaze-Duthiers, of the Sorbonne



CNRS • SORBONNE UNIVERSITÉ
**Station Biologique
de Roscoff**

350 personnel - 3 research units
Marine biology : viruses to vertebrates



- ★ Diversity
- ★ Ecology
- ★ Physiology
- ★ Structural Biology
- ★ Genomics
- ★ Developmental Biology

- Observatory
- Teaching
- Core services





Biodiversity



Ecosystems
Species
Genetic





Roscoff Culture Collection (RCC)



- Set up in 1998 from research collection
- Core service of Roscoff Biological Station
- Part of Marine Biological Resource Centre

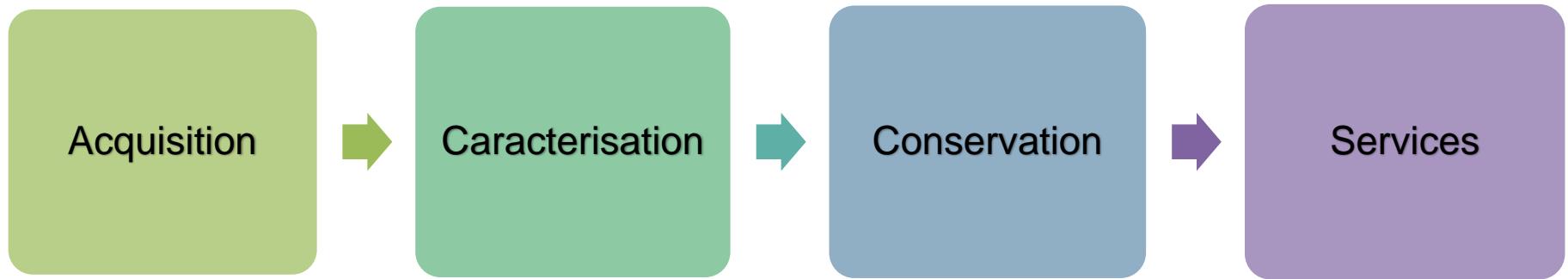
ca. 6000 strains :

- marine microalgae
- cyanobacteria
- bacteria
- parasites
- microalgal viruses
- macroalgae

- Affiliated to World Federation of Culture Collections (WFCC) & European Culture Collection Organisation (ECCO)



Roscoff Culture Collection (RCC)





RCC : Ecosystems Diversity



97% of marine strains

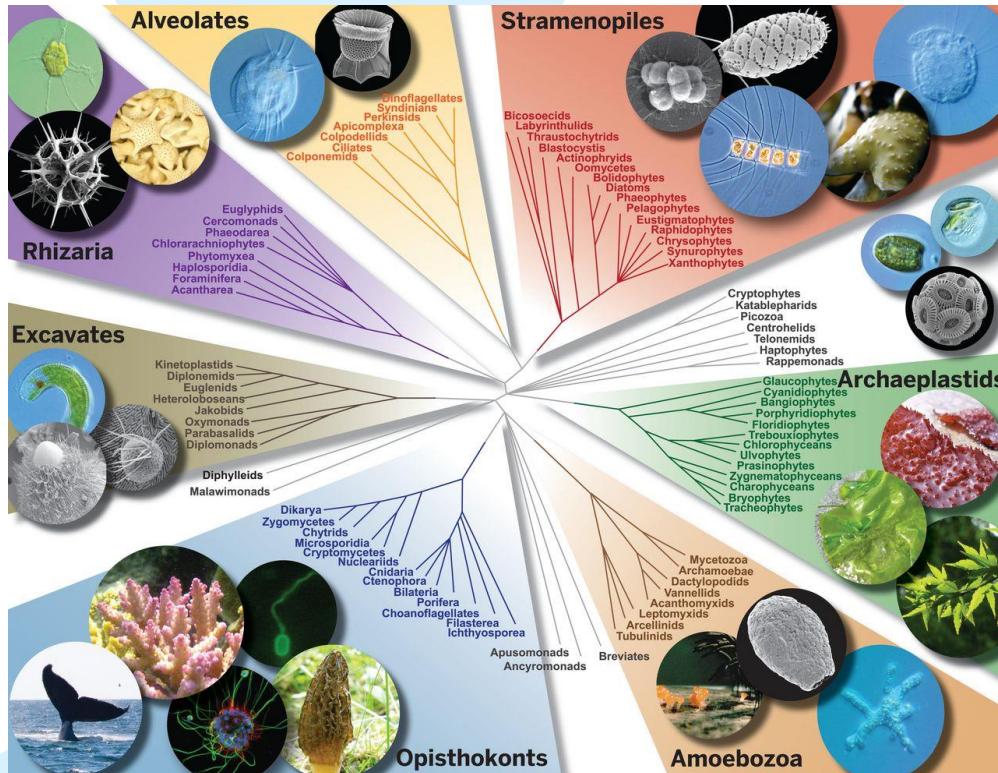
From all main ocean basins : tropics to poles

Open ocean, coastal, littoral environments

Planktonic / benthic / symbionts
(mutualistic / parasitic)



Phytoplankton



Photosynthetic microorganisms

Key role in biogeochemical cycles

Base of the marine food chain

High taxonomic diversity

Conservation

Phytoplankton- Conservation



Monospecific

Mostly clonal

Non-axenic

Maintained in small volume (10-30ml)

Weekly transfer (800 strains/week)

or cryopreserved

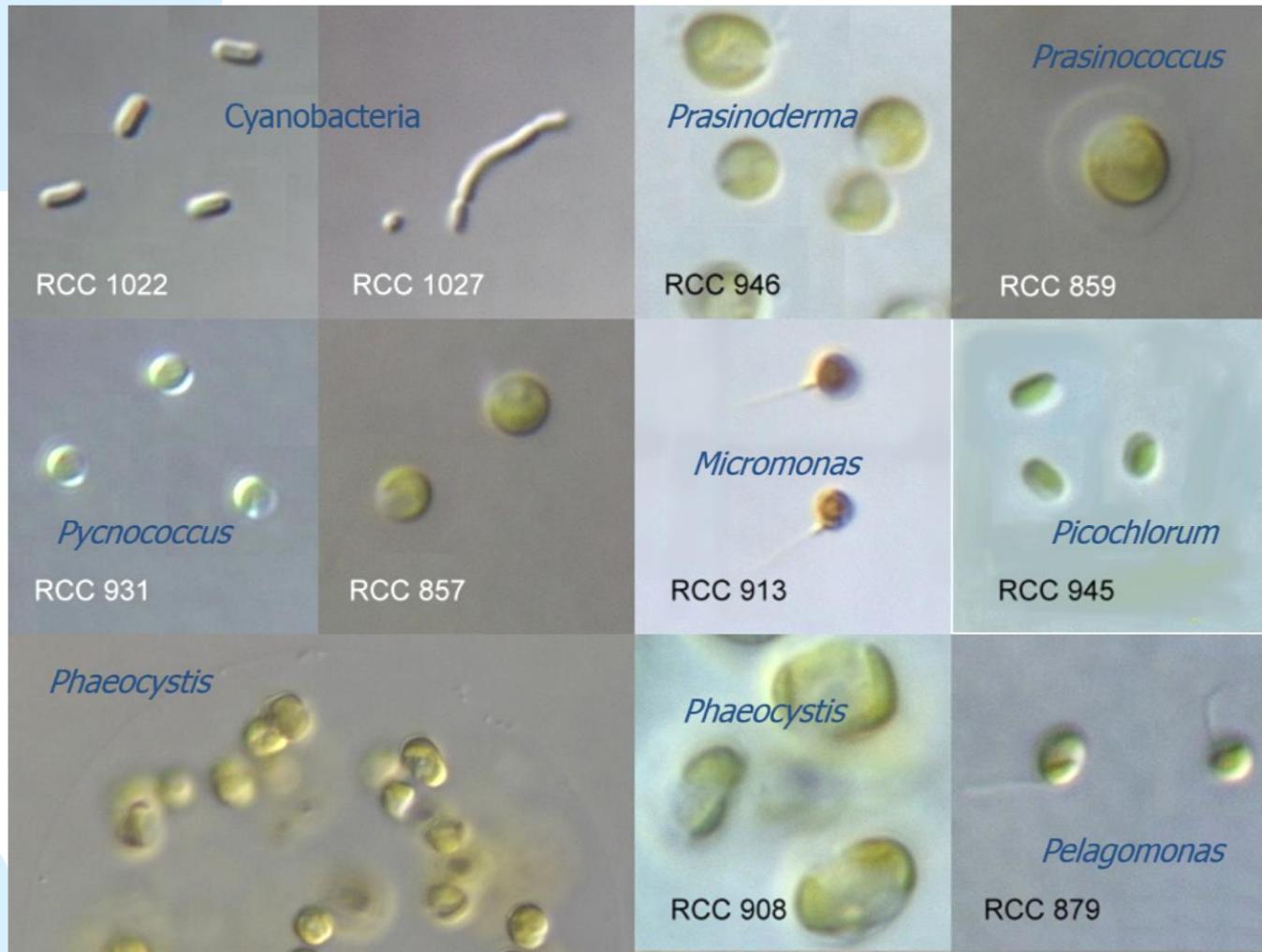
Quality control by microscopy or cytometry



1st step to study microorganism



Picoplankton





Arctic Cruises

2009 and 2016



Understand the dynamics of the phytoplankton spring bloom and determine its role in the Arctic Ocean

More than 1000 strains added

RCC5246

**A**

RCC5251

**B**

RCC5261

**C**

RCC5264

**D**

RCC5269

**E**

RCC5270

**F**

RCC5284

**G**

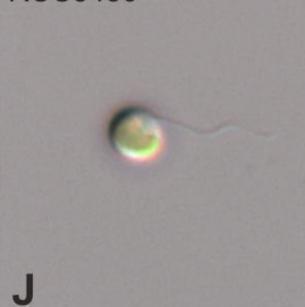
RCC5305

**H**

RCC5418

**I**

RCC5450

**J**

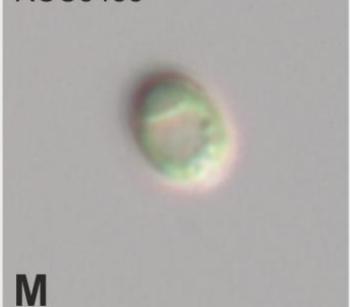
RCC5453

**K**

RCC5486

**L**

RCC5488

**M**

RCC5513

**N**

RCC5518

**O**

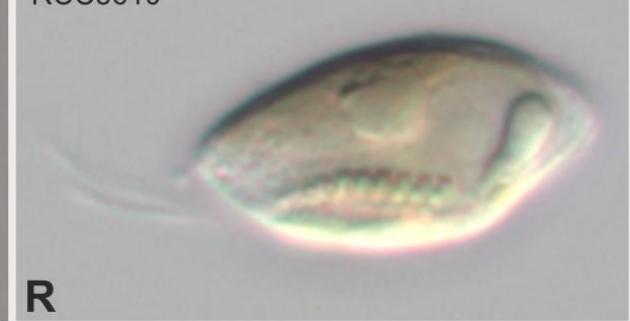
RCC5522

**P**

RCC5525

**Q**

RCC5610

**R**



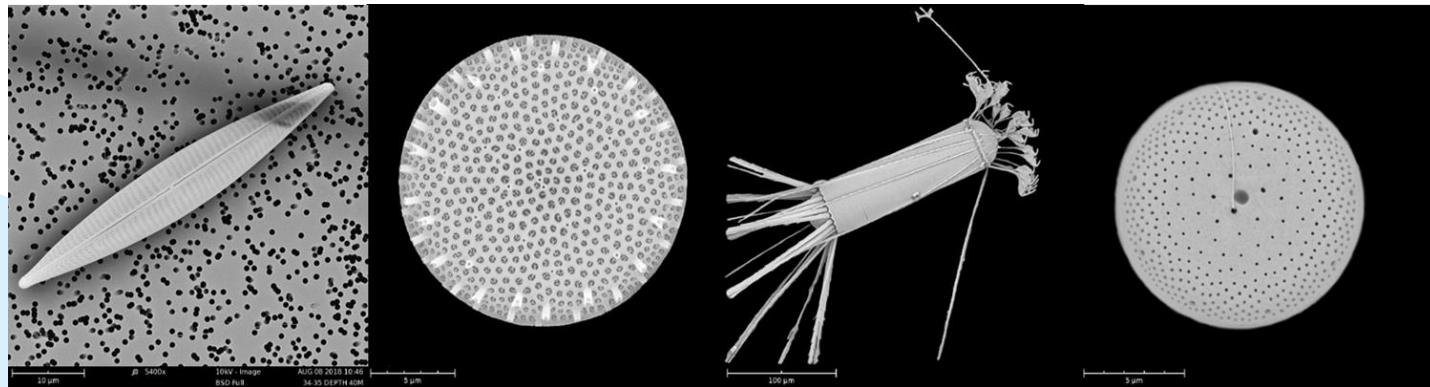
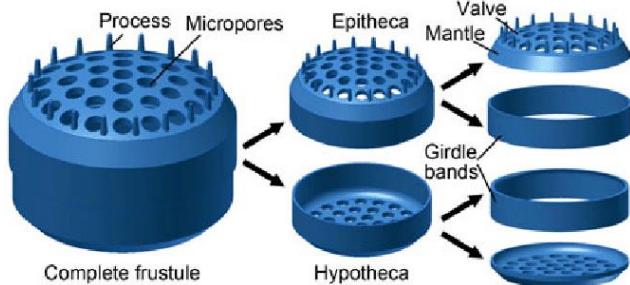
Diatoms

Largest class of silicifying organisms on the planet

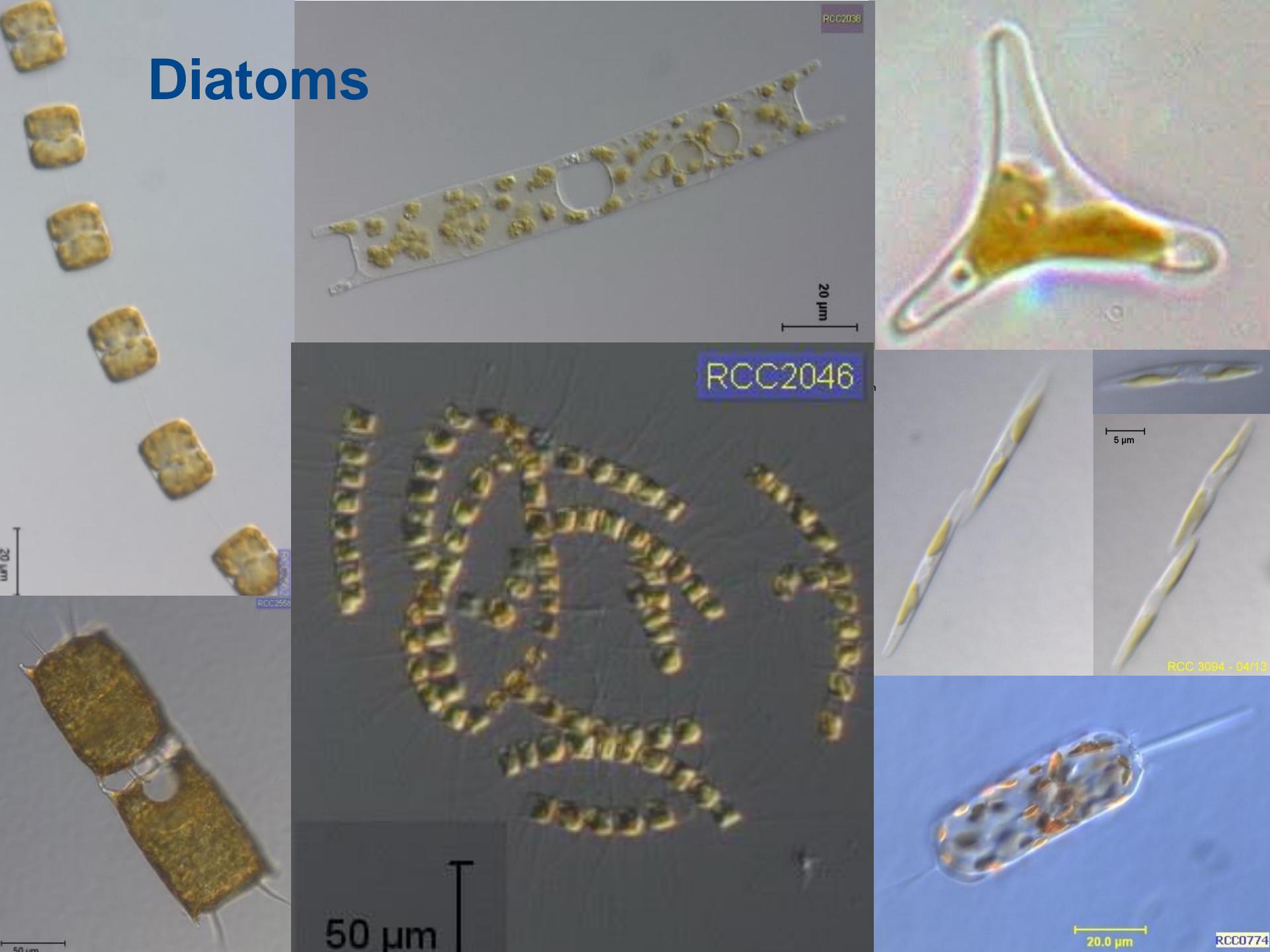
Produce bipartite glass cell walls

20% of global carbon fixation
40% of marine primary productivity

Produce lipids



Diatoms





Coccolithophore

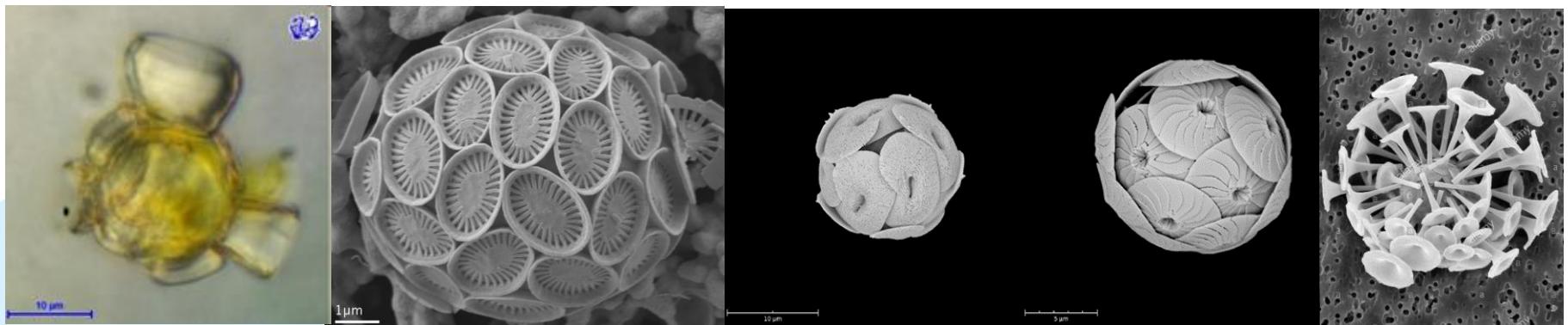
Key roles in the global carbon cycle

Producing calcite platelets (coccoliths)

Major contributors to deep-sea carbonate sediments

Well-documented fossil record dating back to the Triassic

Studying global climate change-ocean acidity

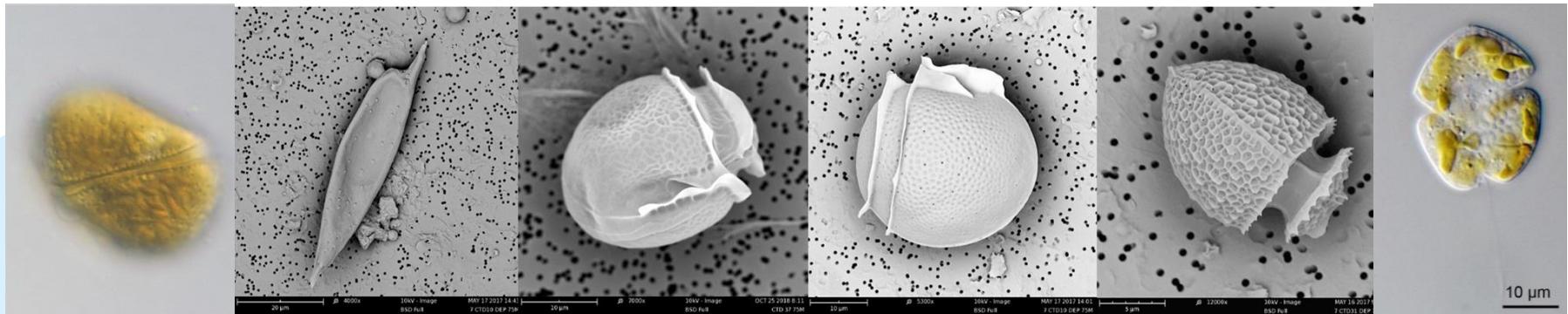


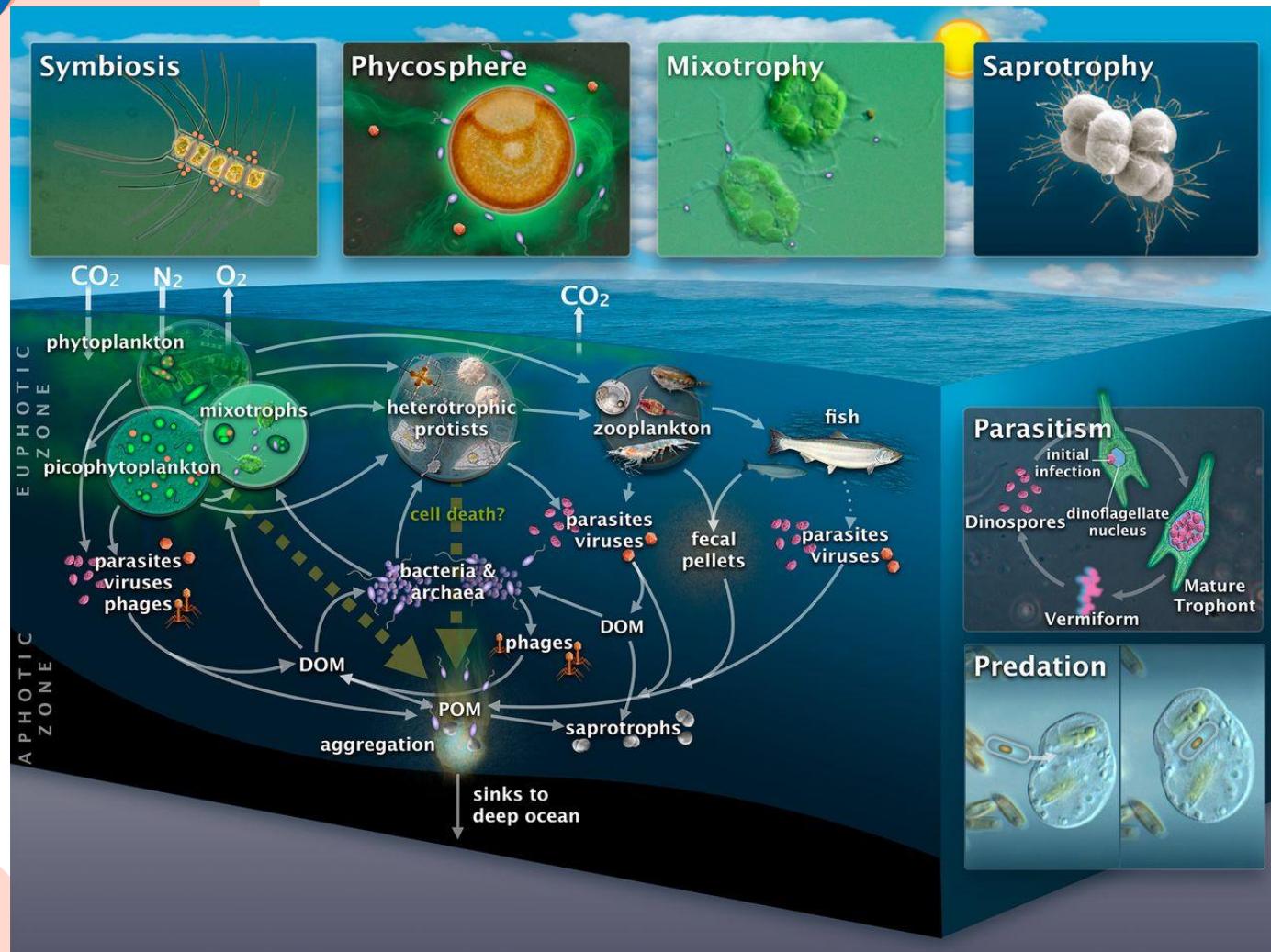


Dinoflagellates

Flagellate
golden-brown plastids
relatively large nucleus that
contains visible chromosomes

Cellulose plate
Bioluminescent
Mixotrophic/Phagotrophy
Endosymbiotics (coral reef)
Cyst



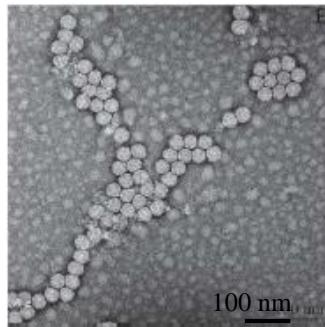




Viruses @ RCC

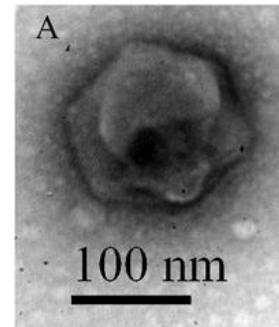
- First culture collection that distributes marine viruses
- Mostly phytoplankton viruses (isolated off Roscoff)
 - diatom viruses: *Bacillarnavirus* (4 clonal strains)
 - prasinophyte viruses : *Prasnovirus* (45 clonal strains)

Guinardia virus



35 nm \varnothing
9 kb ssRNA genome

Micromonas virus



130 nm \varnothing
190 kb dsDNA genome

- More to come : nanodiatom viruses, cyanobacteria viruses, bacteria viruses ... currently characterized



Parasitism

initial infection

Dinospores

dinoflagellate nucleus

Vermiform

Mature Trophont

- STATION BIOLOGIQUE DE ROSCOFF • PRÉSENTATION

Unicellular eukaryotic parasites of dinoflagellates

Host: *Alexandrium minutum* (toxic dinoflagellate)

Spain

France

France

A

B

C

Dinomyces spp. (Fungi, chytrid)

Parvilucifera spp. (Perkinsozoa)

Amoebophrya spp. (dinoflagellate, Syndiniales)

Generalist Ectoparasite Necrotrophic

Generalist Endoparasite Necrotrophic

Specialist Endoparasite Biotrophic

Top 10 in the ocean!!!

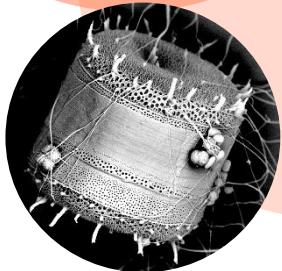
A- *Dinomyces* (5 strains): new genus, new species (Lepelletier et al. 2014a)
B- *Parvilucifera* (> 100 strains, cryopreserved): one new species (Lepelletier et al. 2014b)
C- *Amoebophrya* (>60 strains): all new species (Cai et al. submitted)

cnsr

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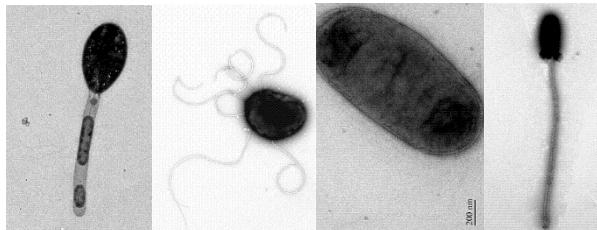
ECCO Meeting • June, 13th 2019

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Heterotrophic bacteria@ RCC

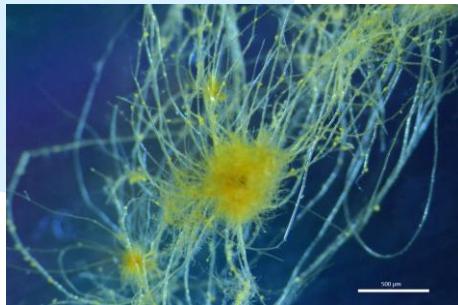
- Currently, 361 strains mostly isolated off Roscoff and from microalgal cultures
- Mostly obtained by dilution-to-extinction
- Mostly distributed into the *Alpha-* (166 strains), *Gammaproteobacteria* (76 strains) and *Flavobacteriia* (34 strains)



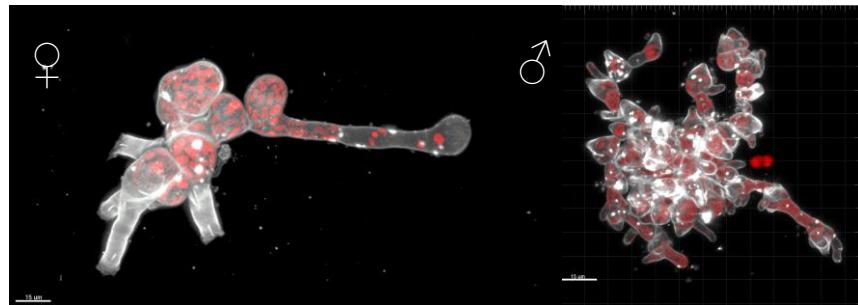
- Most of the new taxa prefer low-nutrient conditions
- Surface of microalgae= reservoir of new bacterial taxa
- More to come: new taxa under description and whole genome sequencing



Macroalgal Culture Collection



Ectocarpus spp.



Female and male gametophytes of *S. latissima*

- Currently in collection: **93 strains of *Ectocarpus* spp. (Ectocarpales, Phaeophyceae).**

Used for first macroalgal full genome sequencing (Cock *et al.* 2010) and to produce parent of genetic map strains (Heesch *et al.* 2010).

- In the future: **more than 4000 gametophytes of *Saccharina latissima* and *Laminaria digitata* (Laminariales, Phaeophyceae)** will be added to the collection.

Mostly from NE Atlantic and North Sea (Brittany, UK, Germany, etc.).



RCC : Quality Management System

QMS based on **NFS96-900** standard



Certification planned by 2020



Services

RCC : Database / Web interface

<http://www.roscocoff-culture-collection.org/>

- Live starter cultures (30ml/1L)
 - Culture media
 - Frozen cell pellets / DNA
 - Cryopreservation of strains
 - Characterisation of strains
- Light / electron microscopy
Genetic barcoding



Thanks for your attention!

