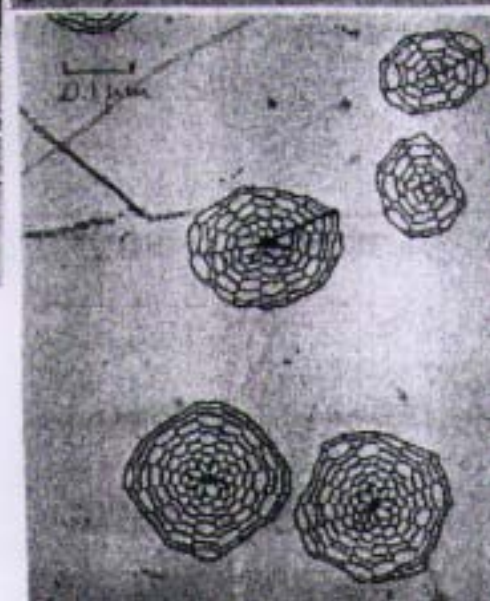
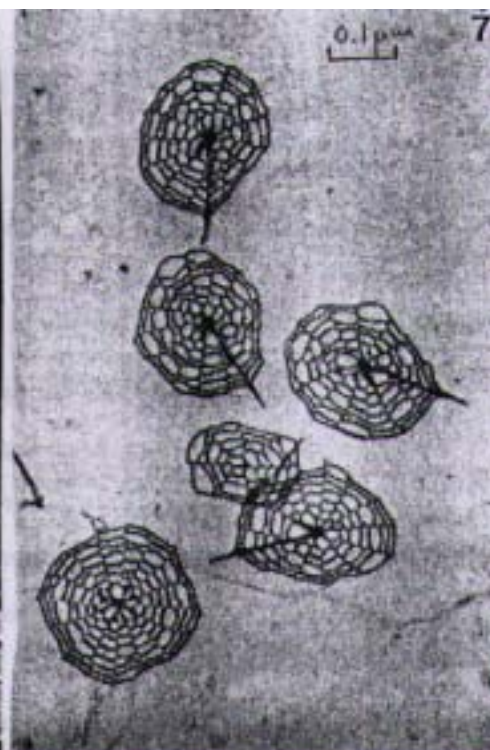


Diversity of picoplanktonic Prasinophytes

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Mamiellales :

Mamiella gilva

In : Moestrup, 1984,
Nord.J. Bot. 4 : 109-121

A controversial taxonomy...

- Prasinophycinées Chadeffaud, 1960
- Prasinophyceae sensu Christensen, 1962
- Prasinophyceae sensu Norris, 1980
- Micromonadophyceae sensu Mattox et Stewart, 1984
- Prasinophyceae sensu Moestrup et Thronsen, 1988
- Prasinophyceae sensu Sym et Pienaar, 1993
- Micromonadophytes in Lecointre et Le Guyader, 2001

To be continued.....

Morphological deviation....

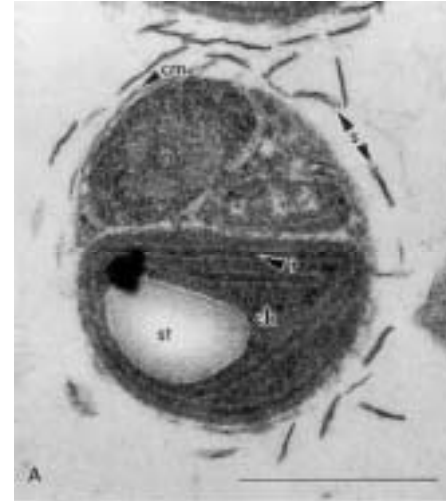
Lost of the scales



Micromonas pusilla

Mamiellales

Lost of the flagella



Bathycoccus prasinos

Lost of both of them!!!



Ostreococcus tauri

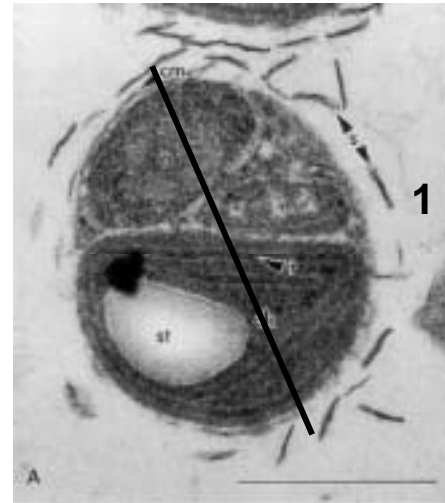
Champions for their small size...

1 - 3 μm



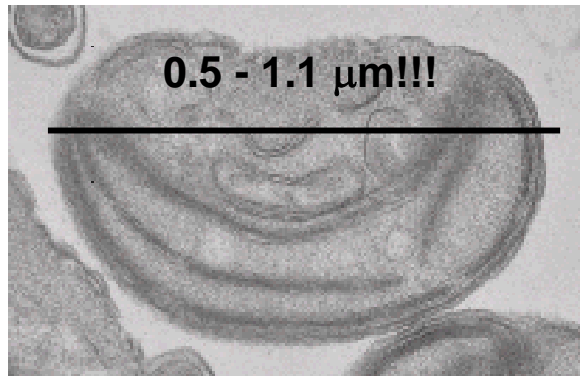
Micromonas pusilla

1 - 2.5 μm



Bathycoccus prasinus

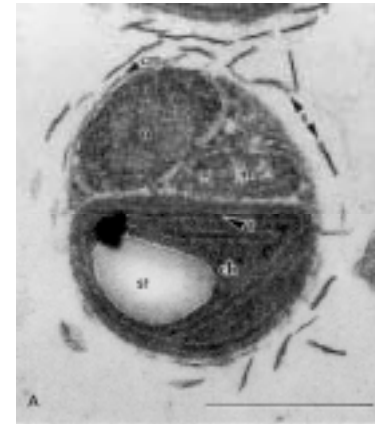
0.5 - 1.1 μm !!!



Ostreococcus tauri

Direct observations of natural samples by electronic microscopy

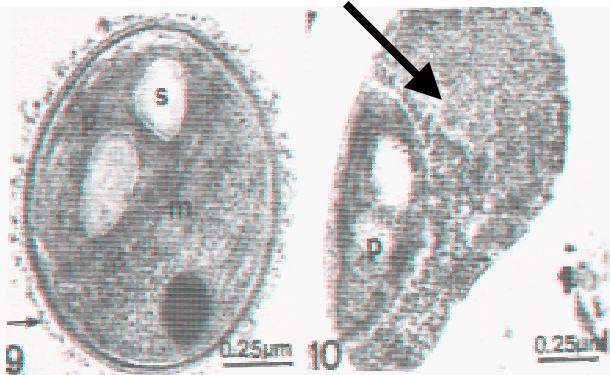
Micromonas-like



Bathycoccus-like

Western North Atlantic Ocean
(Johnson et Sieburth 1982)

Ostreococcus-like



Lagoon
(Andreoli et al. 1989)

Chlorella-like



Western North Pacific Ocean
(Takahashi et Hori 1984)

Celtic Sea
(Joint et pipe 1984)

Table 5. Estimates of the contributions of algal classes and cyanobacteria to chlorophyll a in the four study areas

Class	Seawater samples*											
	Group A			Group B			Group C			20 m	Group D	
Stations	T1	T2	T3	T4	T6	T7	T9	T10	T11A	T11B	T12	T13
Dinoflagellates	20	18	6	9	9	10	2	0	3	4	7	8
Cryptophytes	0	0	0	0	0	0	0	0	3	1	1	0
Prasinophytes	4	2	0	5	5	3	6	6	10	0	7	4
Other greens	31	79	40	20	7	21	0	66	12	12±	9	9
Diatoms	9	0	1	2	3	6	14	15	13	5	5	4
Prymnesiophytes	43	14	30	36	16	33	45	52	21	7	11	12
Prochlorophytes	0	0	2	19	11	21	7	0	9	5	9	8
Cyanobacteria	1	0	1	27	35	12	4	2	1	32	23	17
Total† (%)	108	113	80	118	86	106	78	141	72	65	72	62

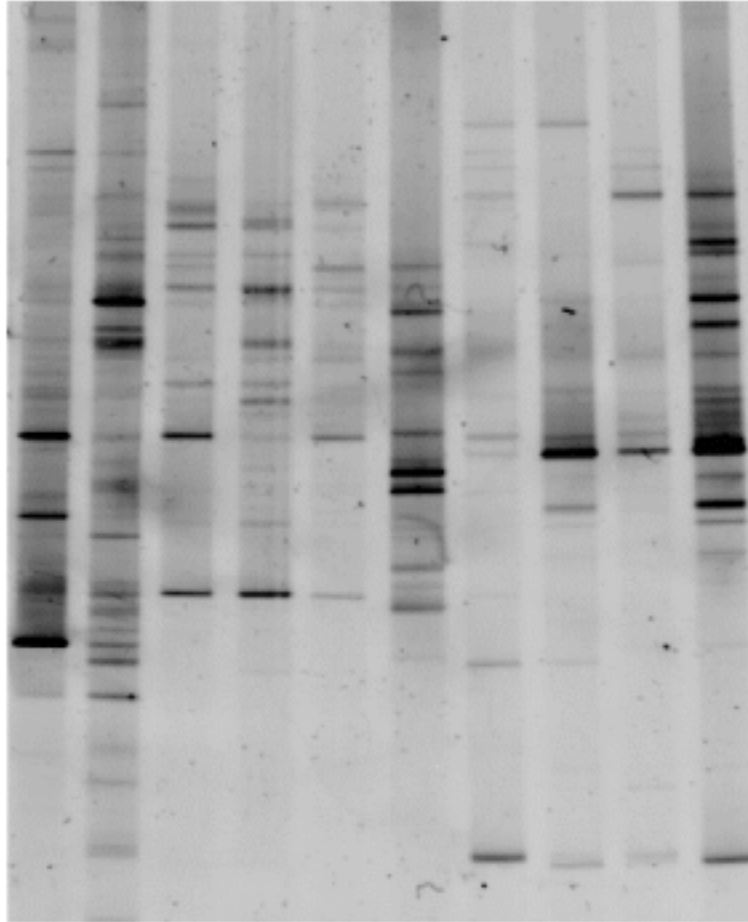
* A, equator at 150°E; B, equator between 143°E and 148°E; C, off the coast of Papua New Guinea; D, Coral Sea.

Western equatorial Pacific
(Everitt et al. 1990)



DGGE

ME1 ANT12 ANT37 NA11 NA37
⊕ >5 ⊕ <1.6 >1.6 ⊕ <1.6 >1.6 ⊕ <2 >2 ⊕ <2 >2



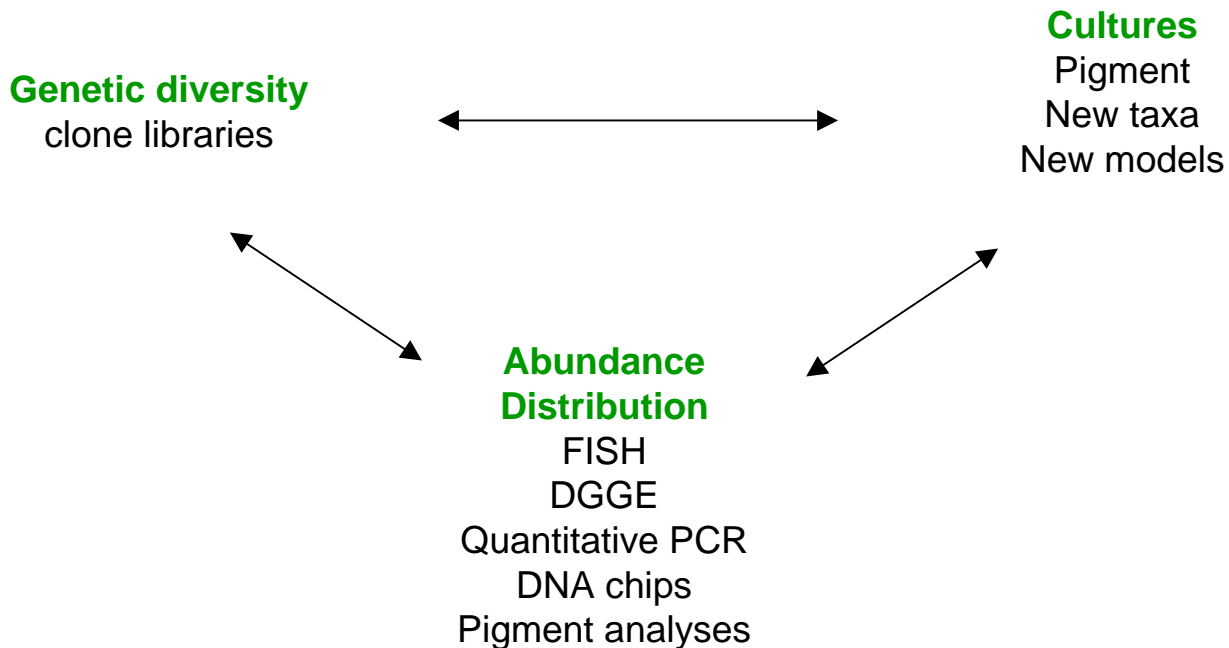
Díez et al. 2001

→ Dominance of a tiny Prasinophyte in very different oceanic waters

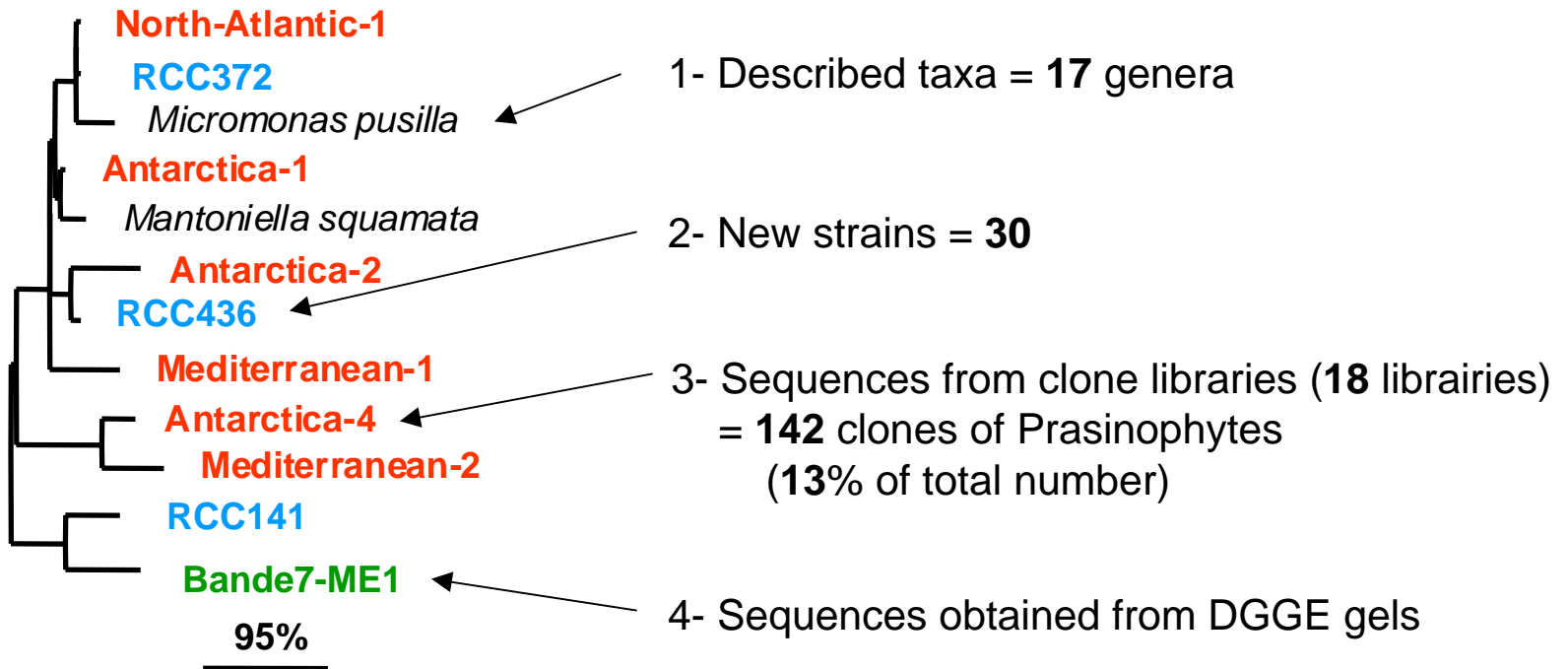
PICODIV

European Project EVK3-CT-1999-00021

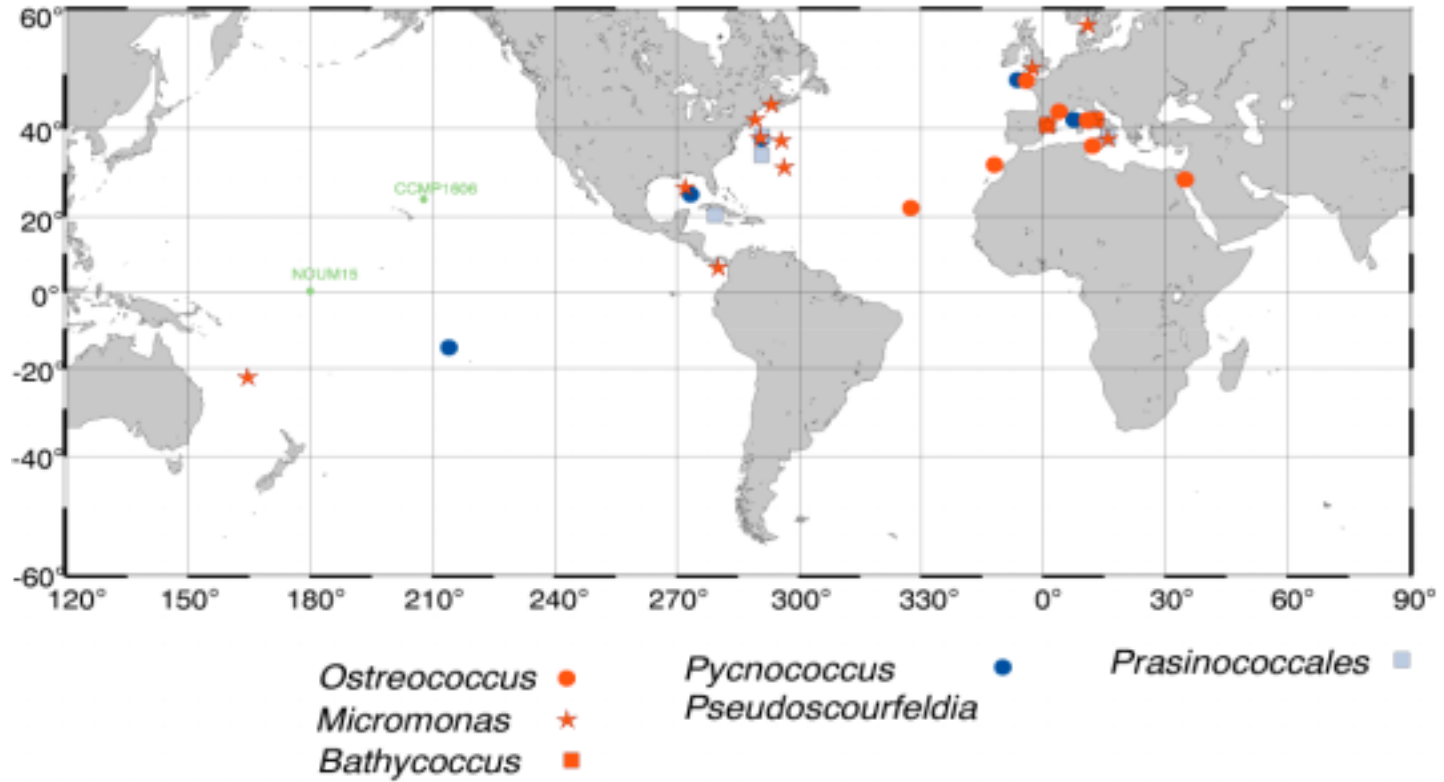
Monitoring the diversity of photosynthetic picoplankton in marine waters



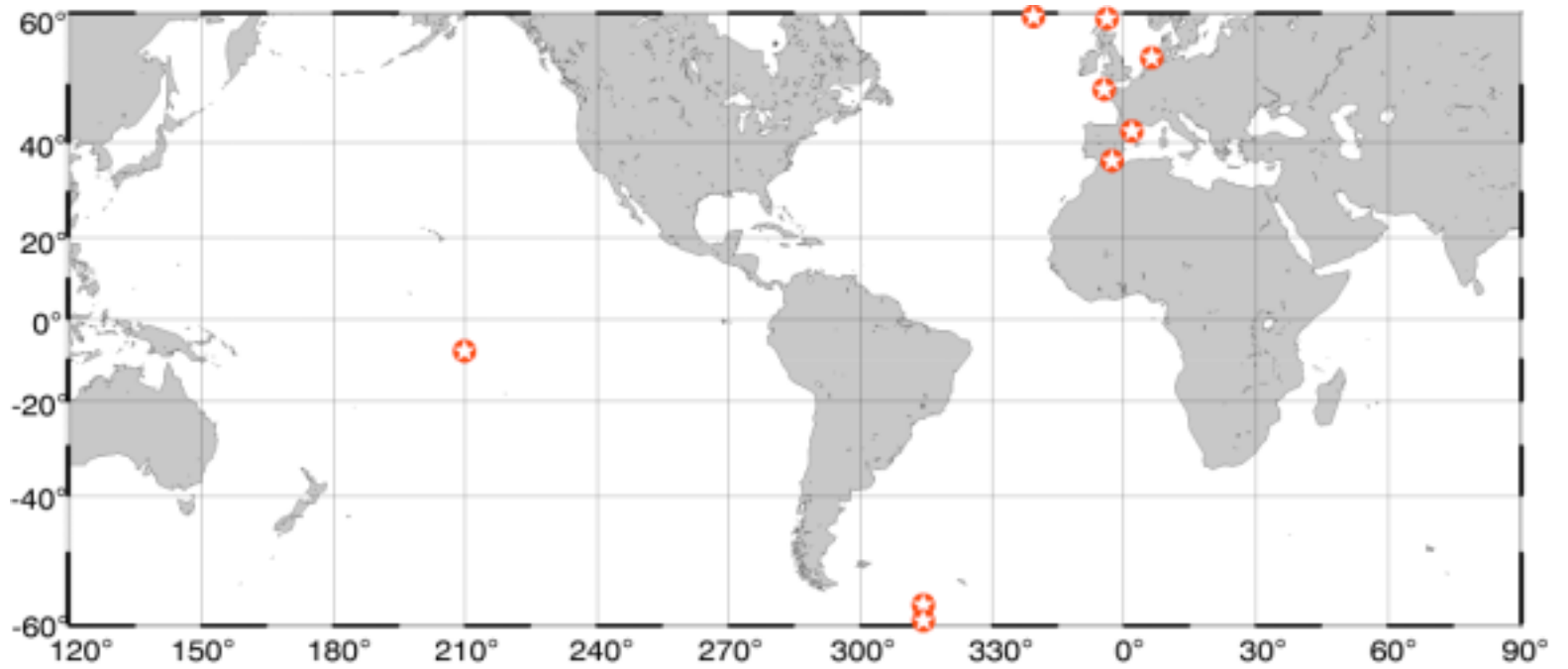
Genetic diversity of Prasinophytes



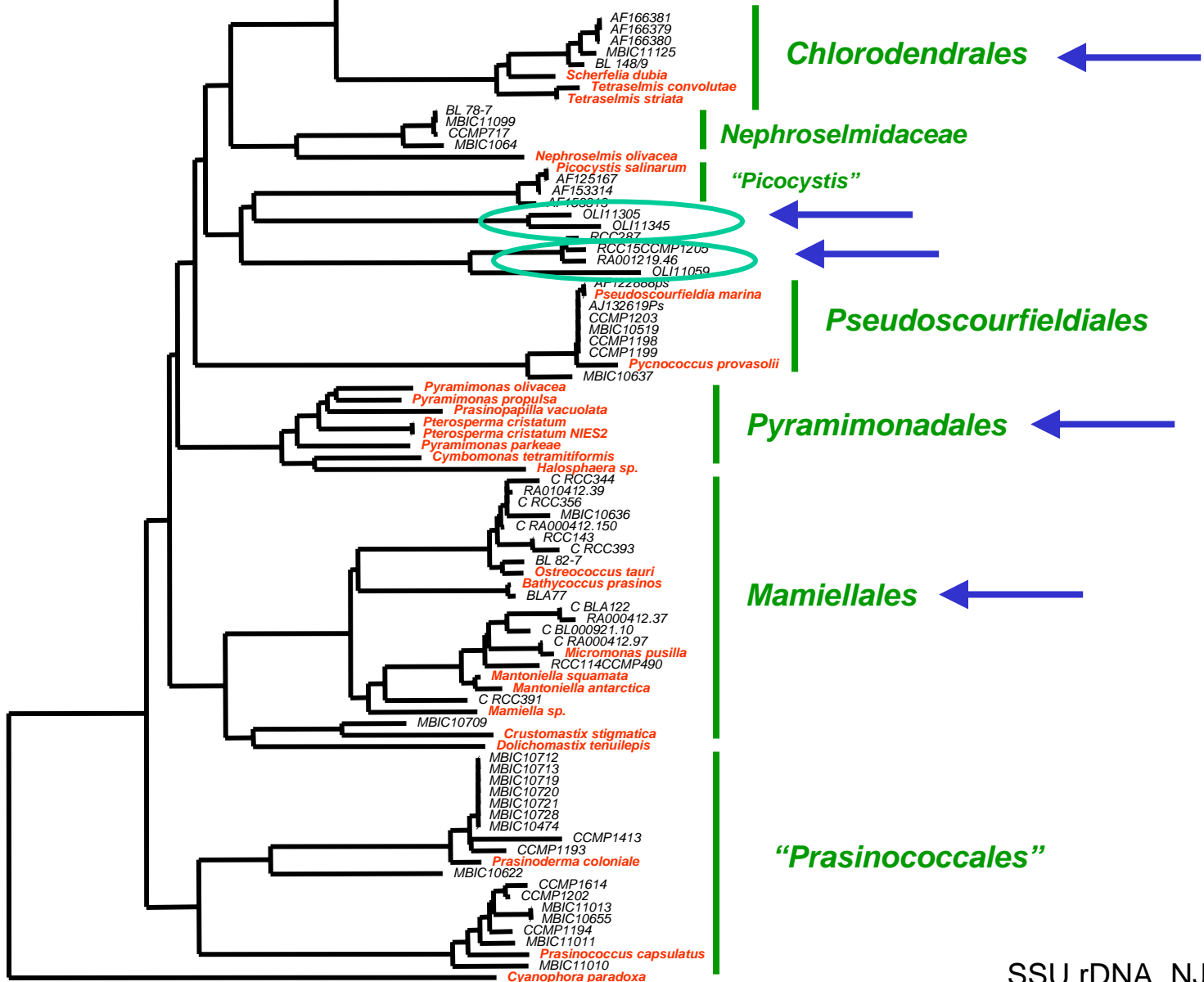
Origin of Prasinophyte cultures



Clone libraries (18)



Chlorophyceae-Trebouxiophyceae



0.01

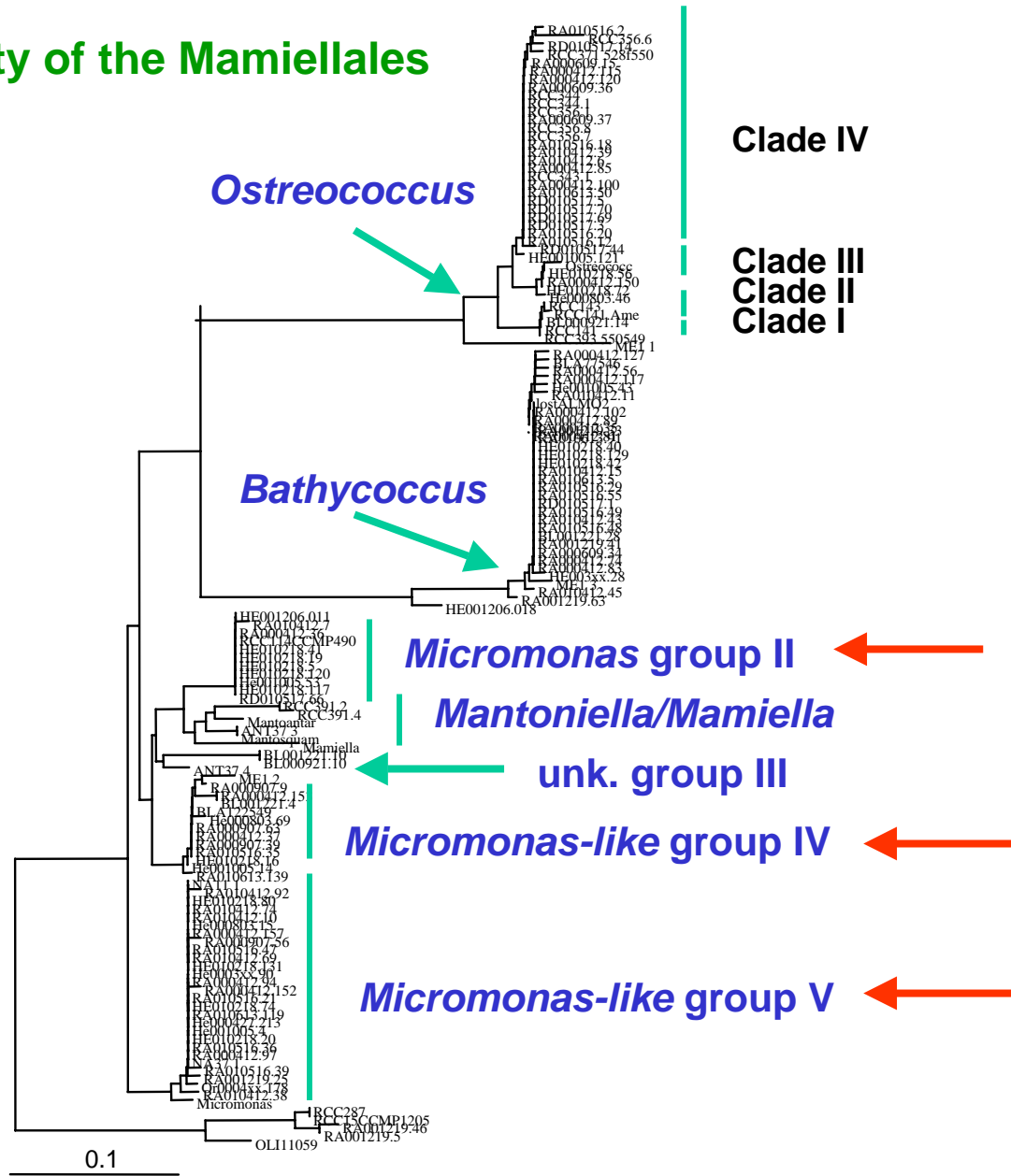
SSU rDNA, NJ

Genetic diversity of Prasinophytes

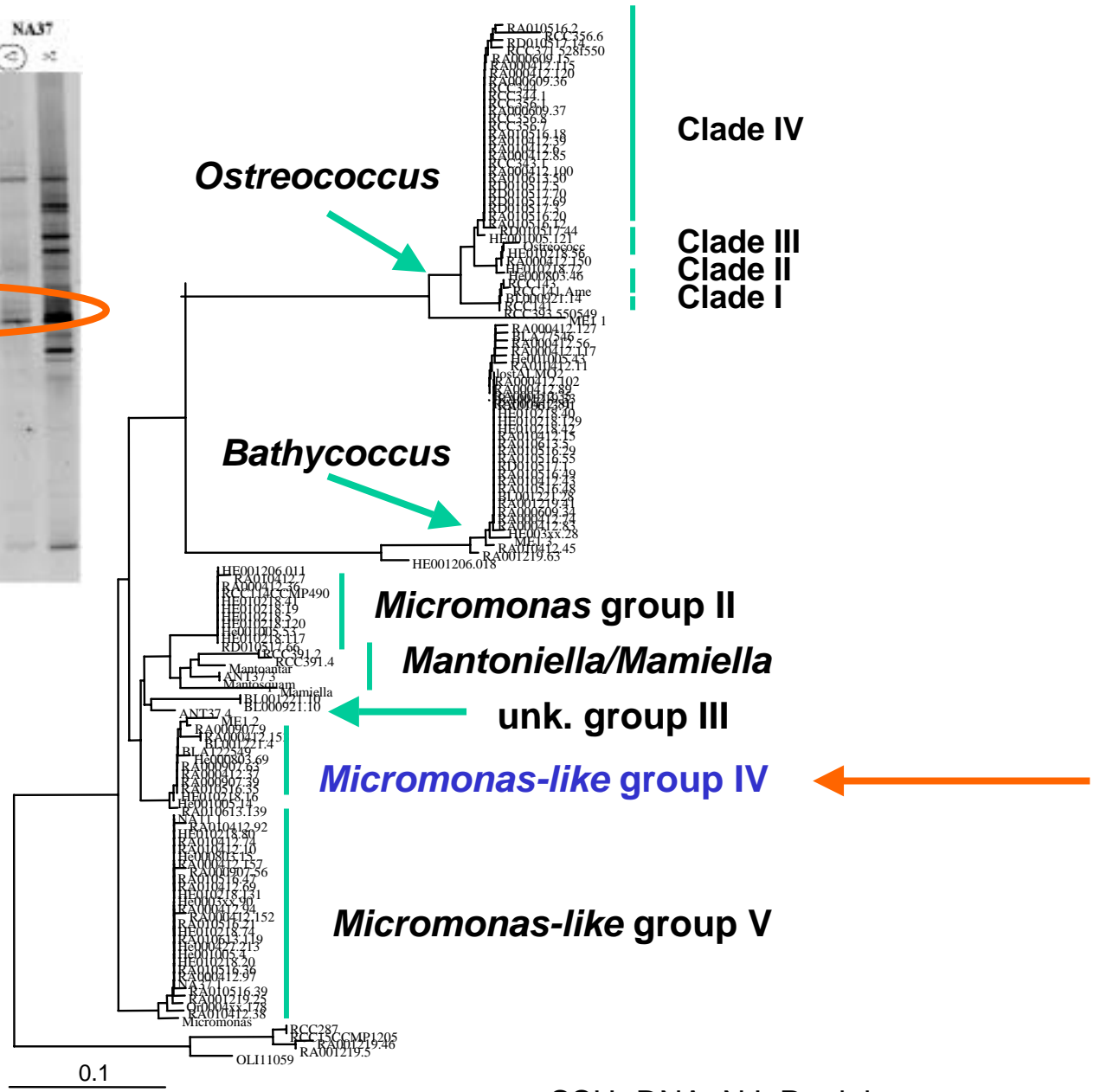
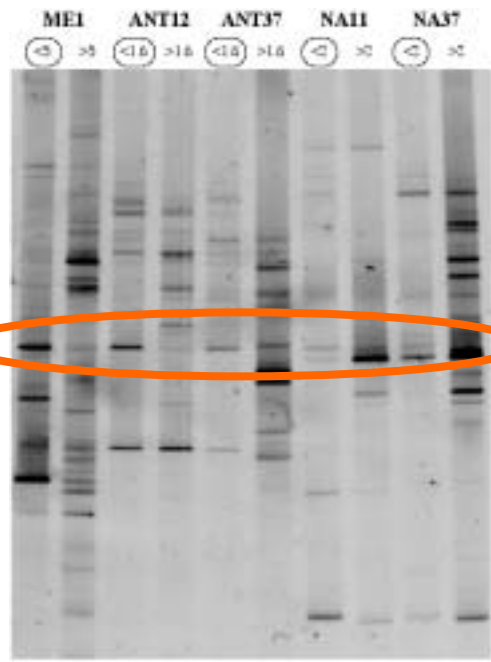
		Reference in clone libraries	Reference in culture
	Mamiellales		
1	<i>Bathycoccus prasinus</i>	BL010320.30	BLA77, 118, 76
2	<i>Ostreococcus tauri</i>	RA000412.150	RCC116
3	<i>Ostreococcus</i> sp. clade II	BL000921.14	RCC141, 143, 393
4	<i>Ostreococcus</i> sp. clade IV	RA010412.39	RCC356, 371, 344, 343
5	<i>Mamiella</i> sp.	Not detected	RCC391
6	<i>Micromonas pusilla</i>	RA000412.36	RCC373, 114, BLA74/8, 105/7
7	Unknown genus (group III)	BL000921.10	Not obtained
8	Unknown genus (group IV)	RA000412.37	RCC434
9	Unknown genus (group V)	RA000412.97	RCC372
10	Unknown genus (group VI)	Not detected	BLA82/7, 70/7
	Chlorodendrales		
11	<i>Scherffelia</i> sp.	BL010625.2	Not obtained
12	Unknown genus	BL010625.1	BLA 148/9
	Pyramimonadales		
13	<i>Pyramimonas</i> sp.	BL010625.18	Not obtained
	Pseudoscourfieldiales		
14	<i>Pseudoscourfieldia/Pycnococcus</i>	Not detected	RCC253, 261, 244
15	Uncharacterized	Not detected	BLA78/7
16	New order	RA001219.46	RCC287, 15



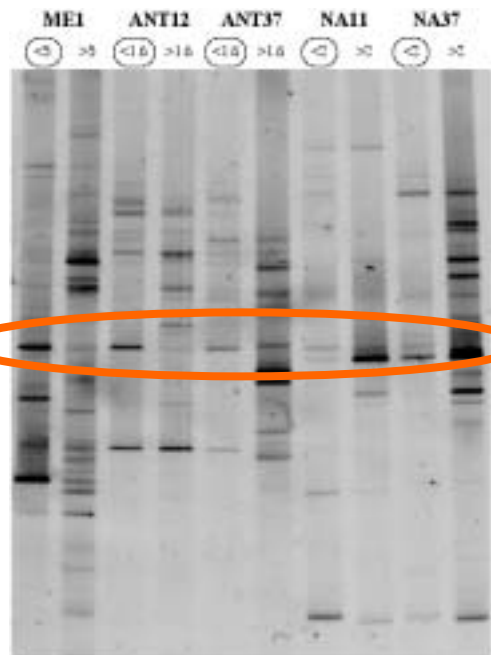
Genetic diversity of the Mamiellales



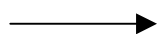
SSU rDNA, NJ, Partial sequences



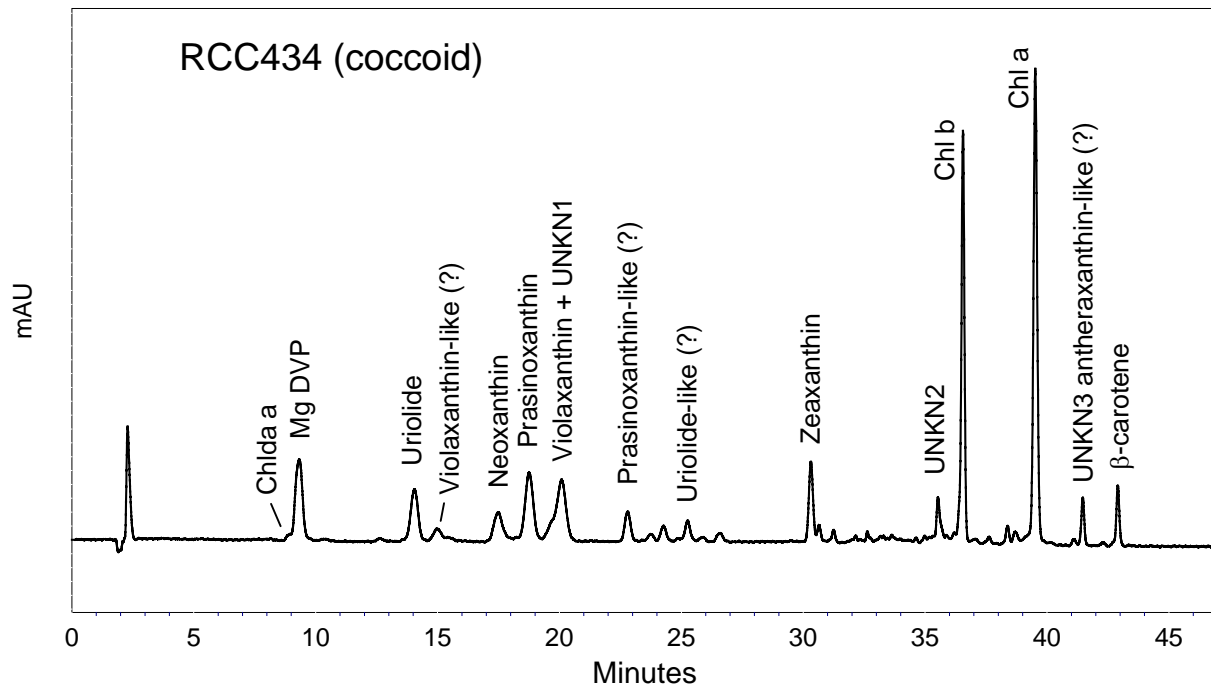
SSU rDNA, NJ, Partial sequences



RCC434 = a very ubiquiste Prasinophytes



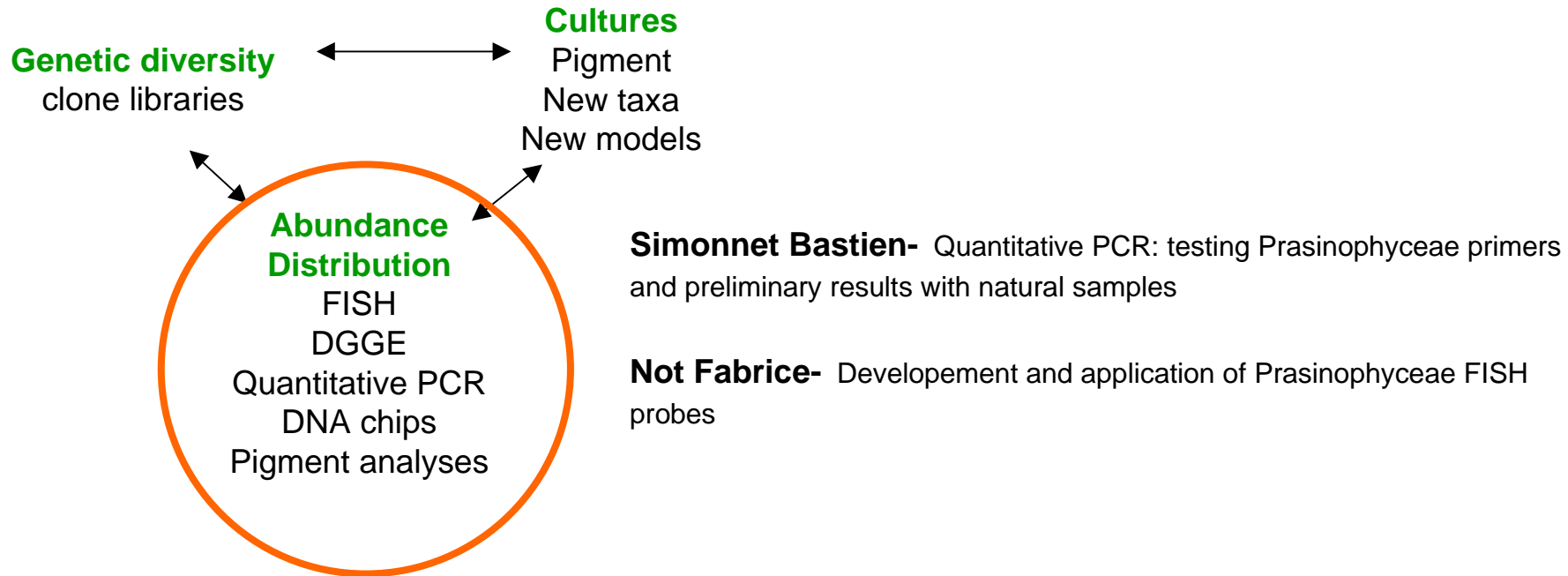
**Micromonas-like species,
Non scaly organism
Alternance of coccoid-flagellates stages ?**



PICODIV

European Project EVK3-CT-1999-00021

Monitoring the diversity of photosynthetic picoplankton in marine waters



Microscopie électronique



Wenche Eikrem
Université d'Oslo

Analyse pigmentaire



Mikel Latasa
ICM, Barcelone

Librairies de clones



Ramon Massana
ICM, Barcelone



Khadidja Romari
SBR, Roscoff