Supplementary Information for **Strong self-regulation and widespread facilitative interactions between groups of phytoplankton** - Picoche, C. & Barraquand F.

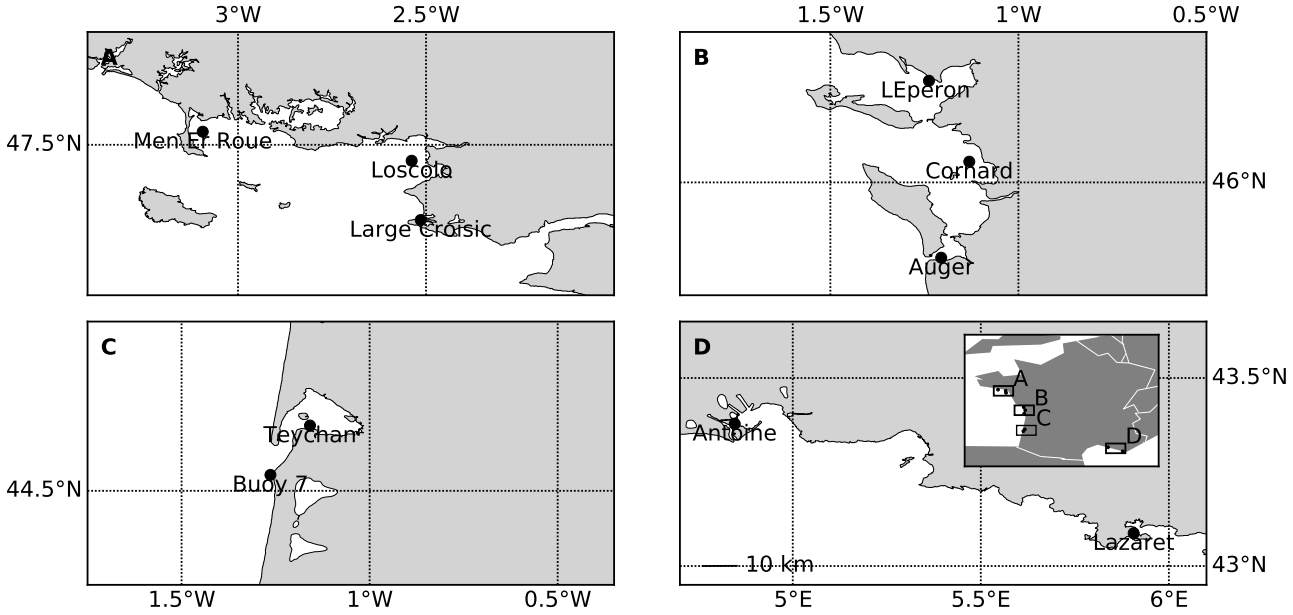

Figure 1: Map of the studied sites

Code	Taxa
AST	Asterionella+Asterionellopsis+Asteroplanus
CHA	Chaetoceros
CRY	Cryptophytes
DIT	Ditylum
EUG	Euglenophytes
GUI	Guinardia
GYM	Gymnodinium+Gyrodinium
LEP	Leptocylindrus
NIT	Nitzschia+Hantzschia
PLE	Pleurosigma+Gyrosigma
PRO	Prorocentrum
PRP	Protoperidinium+Archaeperidinium+Peridinium
PSE	Pseudo-nitzschia
RHI	Rhizosolenia+Neocalyptrella
SCR	Scrippsiella+Ensiculifera+Pentapharsodinium+Bysmatrum
SKE	Skeletonema
THL	Thalassionema+Lioloma
THP	Thalassiosira+Porosira

Table 1: Name and composition of the phytoplanktonic groups used in the paper, based on[1]

Name of site	Location	Region	Number of points?[1]	Temperature	Salin
Men Er Roue	47°32'5" N / 3°5'37" W	Brittany	503	3.8-22.2 (14.4 +/- 3.7)	20.1-38 (33.
Loscolo	47°27'27" N / 2°32'18" W	Brittany	463	5.7-22.4 (14.9 +/- 4.0)	14.0-36.8 (32
Croisic	47°18'0" N / 2°30'51" W	Brittany	500	4.8-28.9 (14.7 +/- 3.9)	14.7-37.6 (31
L'Eperon	46°16'13" N / 1°14'16" W	Oléron	460	3.0-26.0 (15.3 +/- 4.8)	13.0-36.6 (32
Cornard	46°3'19" N / 1°7'50" W	Oléron	491	3.1-29.2 (15.6 +/- 4.8)	19.0-38.1 (32
Auger	45°47'59" N / 1°12"19" W	Oléron	524	3.0-24.5 (15.4 +/- 4.4)	23.9-36.0 (32
Buoy7	44°32'32" N / 1°15'49" W	Arcachon	311	7.2-23.9 (15.2 +/- 3.8)	31.8-36.1 (34
Teychan	44°40'25" N / 1°9'31" W	Arcachon	494	5.5-25.2 (15.5 +/- 4.6)	20.6-35.8 (32
Antoine	43°22'41" N / 4°50'45" E	Mediterranean Sea	539	4.6-30.0 (16.8 +/- 5.1)	26.8-38.9 (32
Lazaret	43°5'14" N / 5°54'23" E	Mediterranean Sea	512	8.7-29.2 (17.4 +/- 4.2)	21.6-39.6 (35

Table 2: Attempt of summary for our locations ; should we add the species for each region ?

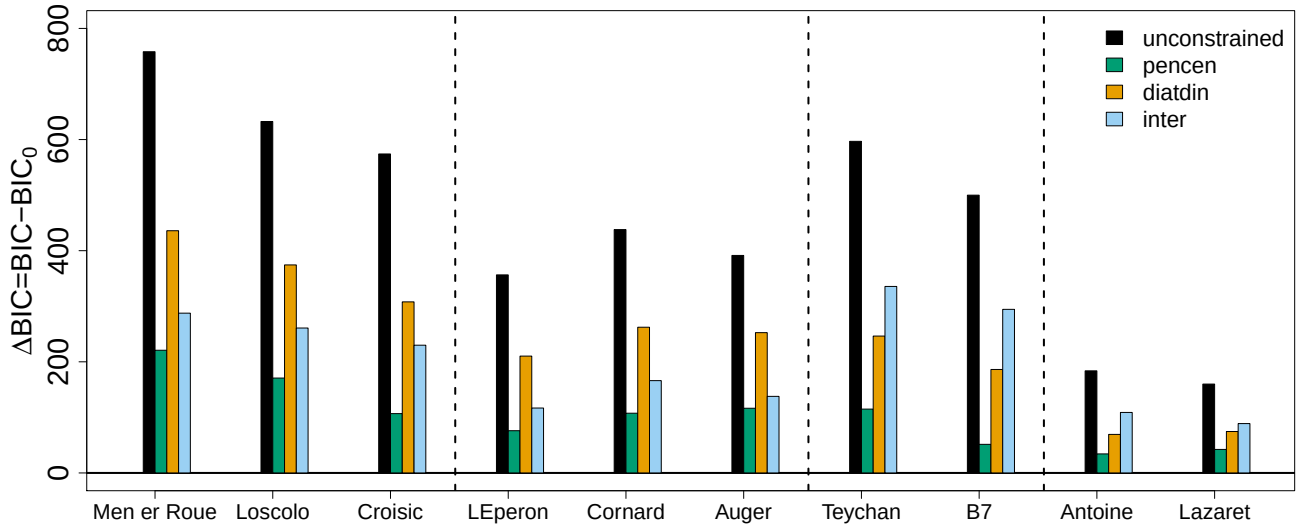

Figure 2: Comparison of BIC with different interaction matrices, compared to the null model (diagonal interaction matrix, allowing only intragroup interactions), for four different sites separated by dashed lines (Brittany, Oléron, Arcachon and Mediterranean Sea) and 10 different subsites. Different interaction matrices may allow all interactions between taxa (unconstrained), only interactions within pennate diatoms, centric diatoms, dinoflagellates, or other phytoplanktonic taxa (pencen), only interactions within diatoms, dinoflagellates or other taxa (diatdin), or only interactions between taxa belonging to these different groups. As model structures (length of the times series taken into account) are different between sites and subsites, groups of bars should not be compared.

[1]From 1996, without linear interpolation

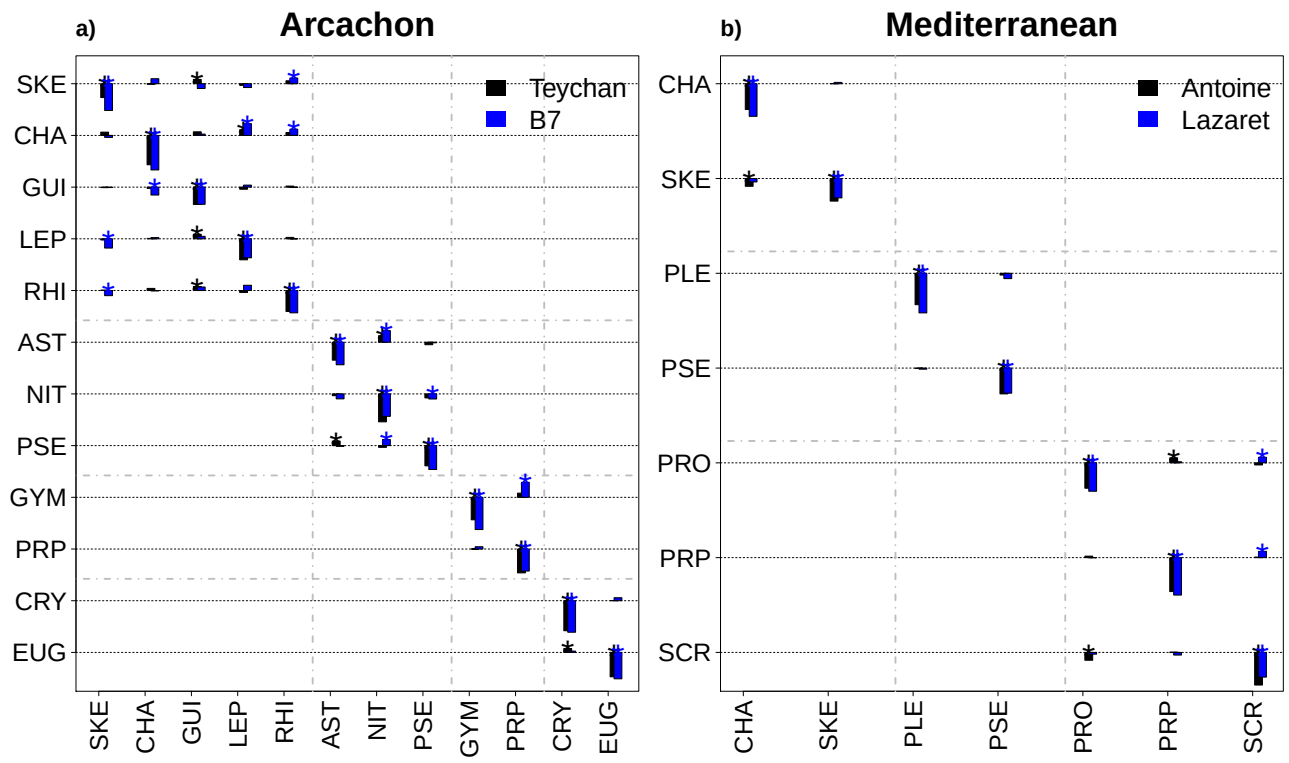

Figure 3: Interaction matrices estimated in Arcachon (a) and in the Mediterranean Sea (b). Only interactions between clades (pennate and centric diatoms, dinoflagellates, other planktonic taxa) are allowed. The figure should be read as taxon i having effect e_{ji} on taxon j. The scale for the coefficient values is given at the bottom left of panel a). 95% significance of coefficients was determined by bootstrapping and is marked by asterisks (*). The identity matrix was subtracted to the interaction matrix ($\mathbf{B}$–$\mathbf{I}$) in order to make effects on growth rates comparable. Composition of planktonic groups is given in Table 1.

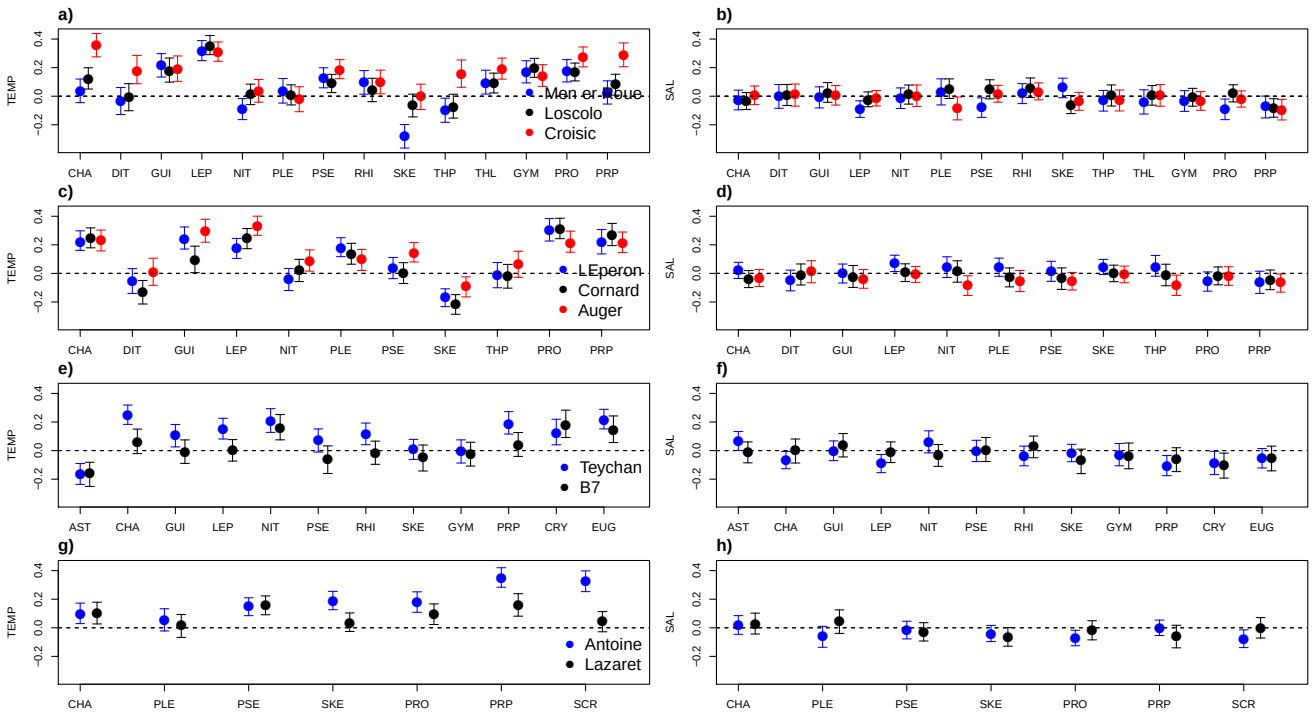

Figure 4: Effect of abiotic variables (temperature, TEMP or salinity, SAL) on phytoplankton group in Brittany (a, b), Oléron (c, d), Arcachon (e, f) and in the Mediterranean Sea (g, h). Each color corresponds to a different site. Error bar corresponds to the 95% confidence interval around the estimated coefficient. All variables were normalized before estimation.

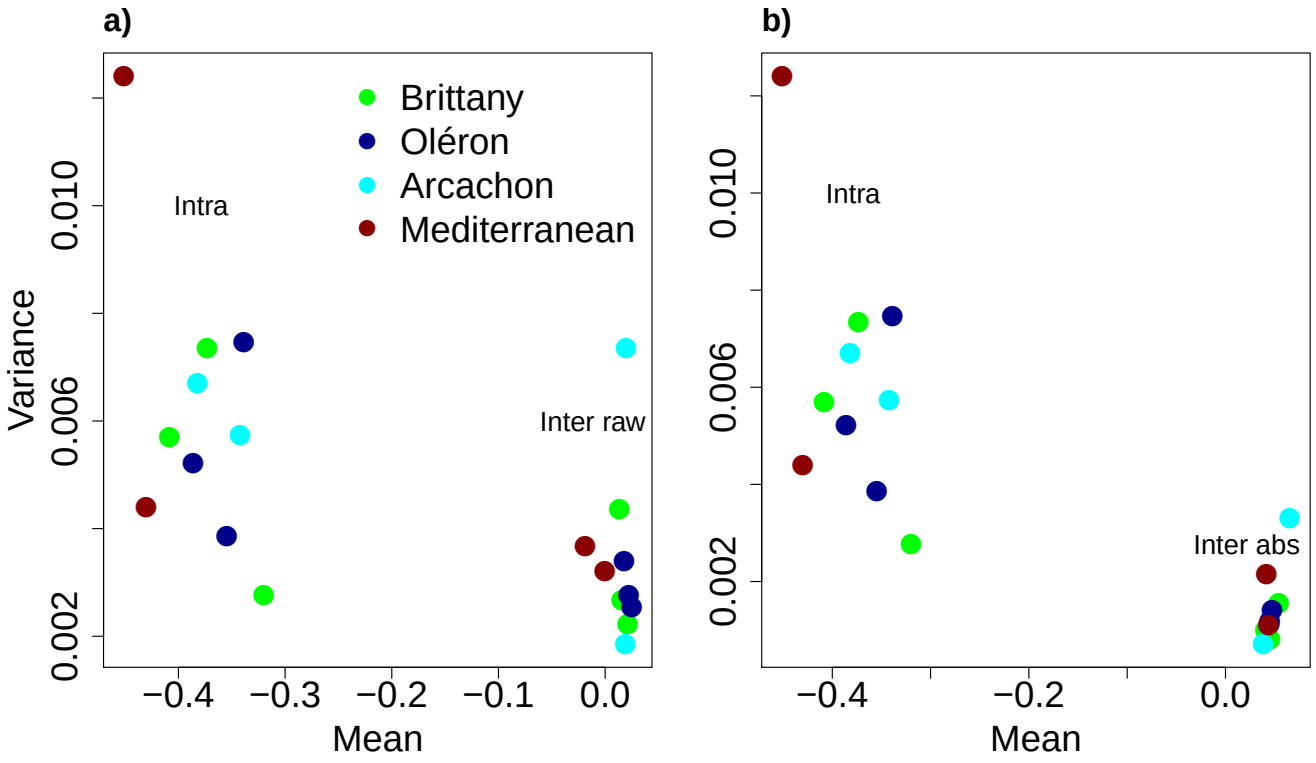

Figure 5: Variance of the coefficient in the interaction matrix (**B**–**I**), as a function of their mean, for 10 sites in 4 regions, with a model allowing interactions only within clads (see above). The mean-variance relation was either computed with raw values of intergroup interactions (a) or absolute values of the intergroup coefficients (b). Intragroup coefficients were not modified.

References for the meta-analysis

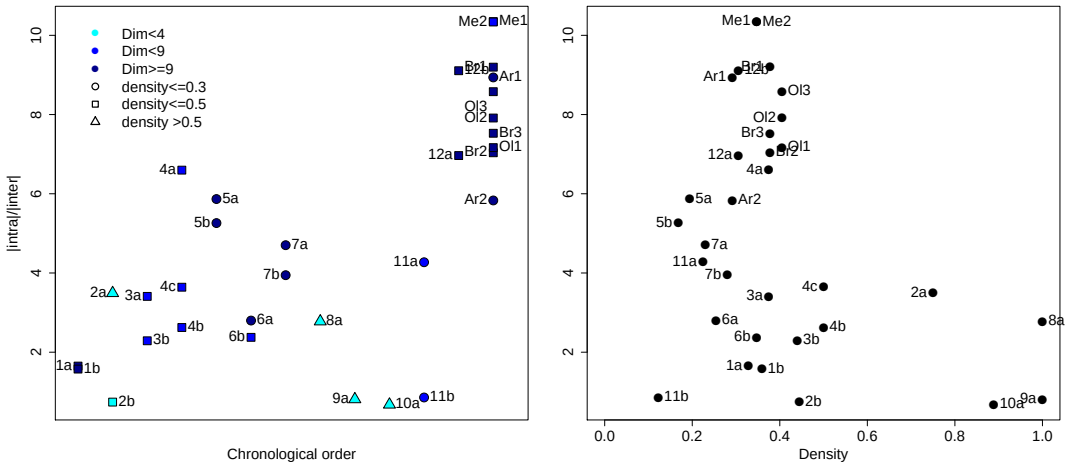

Figure 6: Ratio of intra-to-intergroup interaction strength, when taking into account only the significant values (left), as a function of the density of the interaction matrix B-I (right). [**This graph is not the final one but I'm wondering if we keep it**]

Code on the plot	Ref	Dimension	Type of organisms	System	
1a	[2], conditional least square estimate	9	Zooplankton	Lake	107 point
1b	[2], total least square estimate	9	Zooplankton	Lake	
2a	[3]	2	Phytoplankton	Lake	10
2b	[3]	3	Zooplankton	Lake	
3a	[4]	4	Functional groups of plankton	Lake	18
3b	[4]	5	Taxonomic groups of plankton	Lake	
4a	[5]	4	Plankton	Lake	
4b	[5]	4	Plankton	Lake with high planktivory	
4c	[5]	4	Plankton	Lake with low planktivory	
5a	[6]	14	Plankton	Lake	
5b	[6]	14	Plankton, growing season	Lake	
6a	[7]	13	Plankton	Lake	
6b	[7]	7	Simpler web, plankton	Lake	
7a	[8]	10	Ciliates	Lake	
7b	[8]	10	Phytoplankton	Lake	
8a	[9]	3	Insects	Terrestrial	
9a	[10]	2	Lynx/Hare	Terrestrial	
10a	[11]	3	Fish	Baltic Sea	
11a	[12]	7	Phytoplankton	Coastal site	
11b	[12]	7	Phytoplankton	Offshore site	
12a	[13]	12	Phytoplankton	Outside a bay	
49412b	[13]	12	Phytoplankton	Inside a bay	

Table 3: References used [TO COMPLETE]

References

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