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

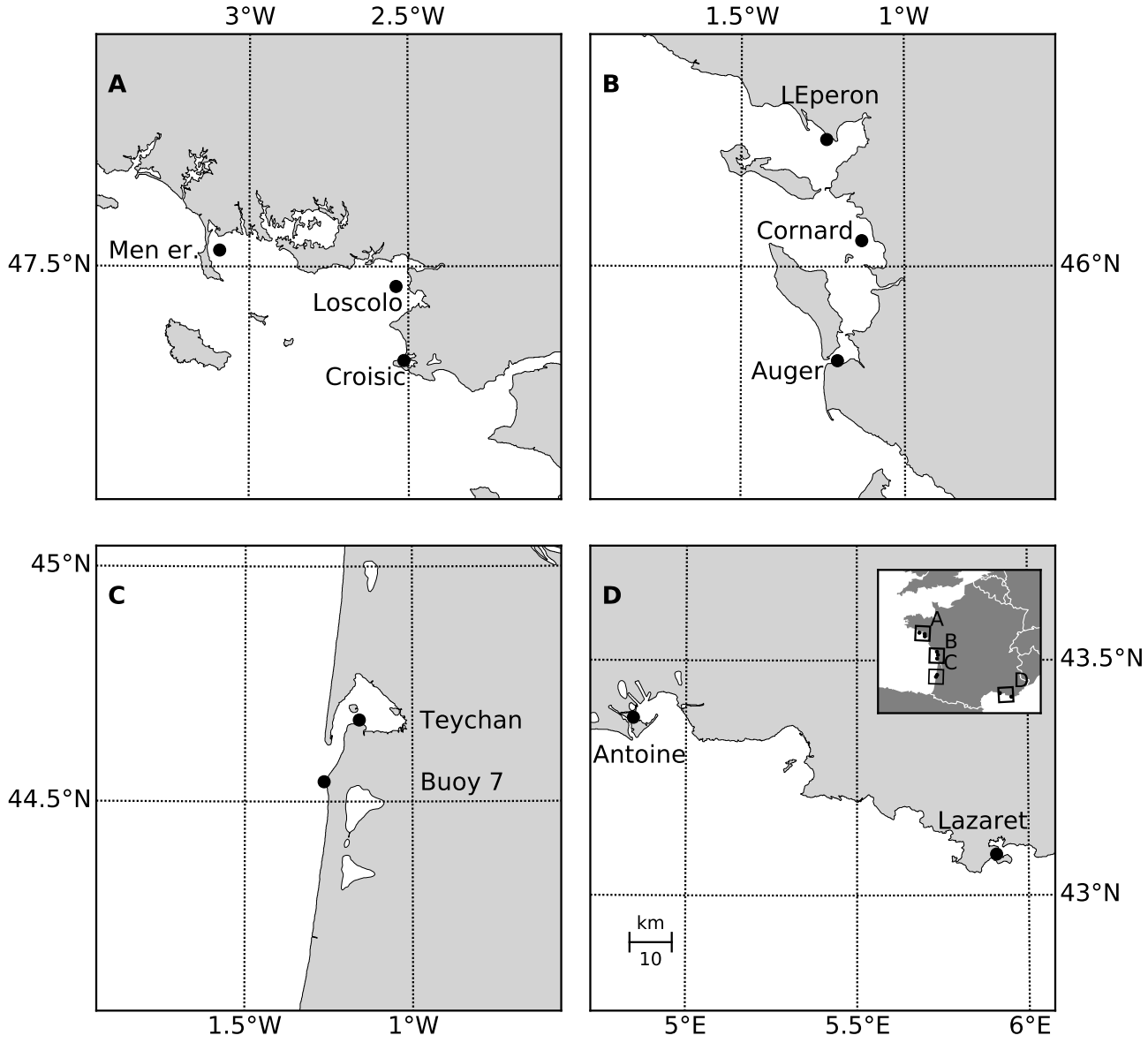

Figure 1: **Location of each study site in their region**: Brittany (A), Oléron (B), Arcachon (C) and the Mediterranean Sea (D). The common scale of the panels in given in the left corner of D.

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 samples[1]	Temperature (°C)	Salinity (g/L)
Men Er Roue	47°32' N / 3°5' W	Brittany	503	14.4 +/- 3.7	33.5 +/- 1.9
Loscolo	47°27' N / 2°32' W	Brittany	463	14.9 +/- 4.0	32.0 +/- 3.0
Croisic	47°18' N / 2°30' W	Brittany	500	14.7 +/- 3.9	31.8 +/- 3.1
L'Eperon	46°16' N / 1°14' W	Oléron	460	15.3 +/- 4.8	32.1 +/- 3.2
Cornard	46°3' N / 1°7' W	Oléron	491	15.6 +/- 4.8	32.7 +/- 2.4
Auger	45°47' N / 1°12' W	Oléron	524	15.4 +/- 4.4	32.7 +/- 1.8
Buoy 7	44°32' N / 1°15' W	Arcachon	311	15.2 +/- 3.8	34.7 +/- 0.7
Teychan	44°40' N / 1°9' W	Arcachon	494	15.5 +/- 4.6	32.5 +/- 1.9
Antoine	43°22' N / 4°50' E	Mediterranean Sea	539	16.8 +/- 5.1	32.3 +/- 3.9
Lazaret	43°5' N / 5°54' E	Mediterranean Sea	512	17.4 +/- 4.2	35.9 +/- 2.4

Table 2: **Summary of the study site characteristics**, including hhe mean and standard deviation of the two main environmental parameters (temperature and salinity).

[1]From 1996, without linear interpolation

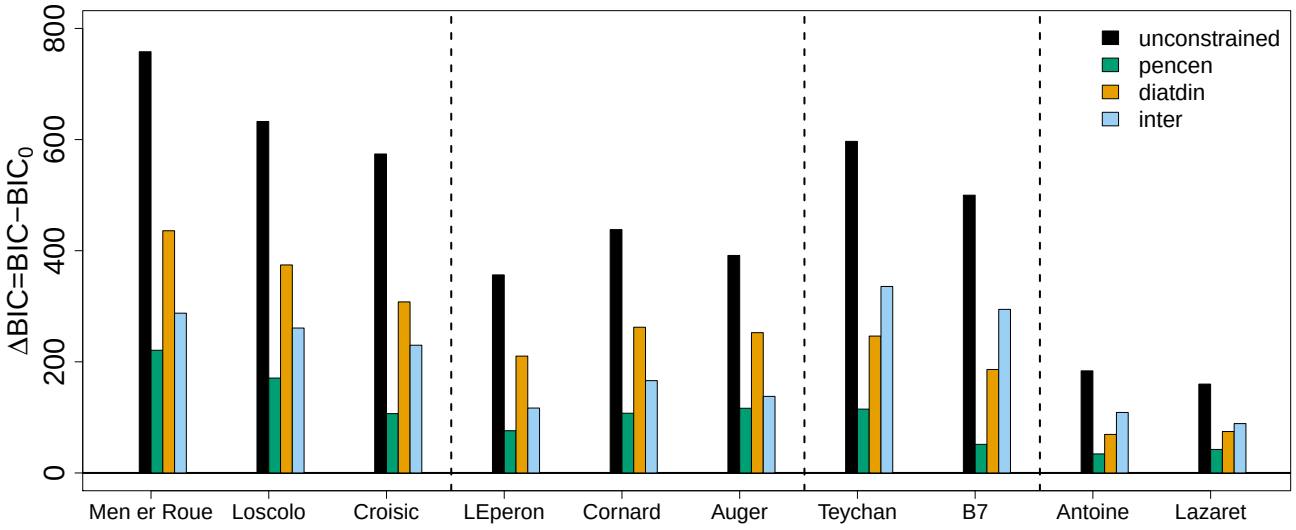

Figure 2: **Comparison of the BIC of different interaction models**, compared to the null model (diagonal interaction matrix, allowing only intragroup interactions), for 10 sites in 4 different regions, separated by dashed lines (Brittany, Oléron, Arcachon and the Mediterranean Sea). Different interaction matrices may allow interactions between all 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 regions, groups of bars should not be compared.

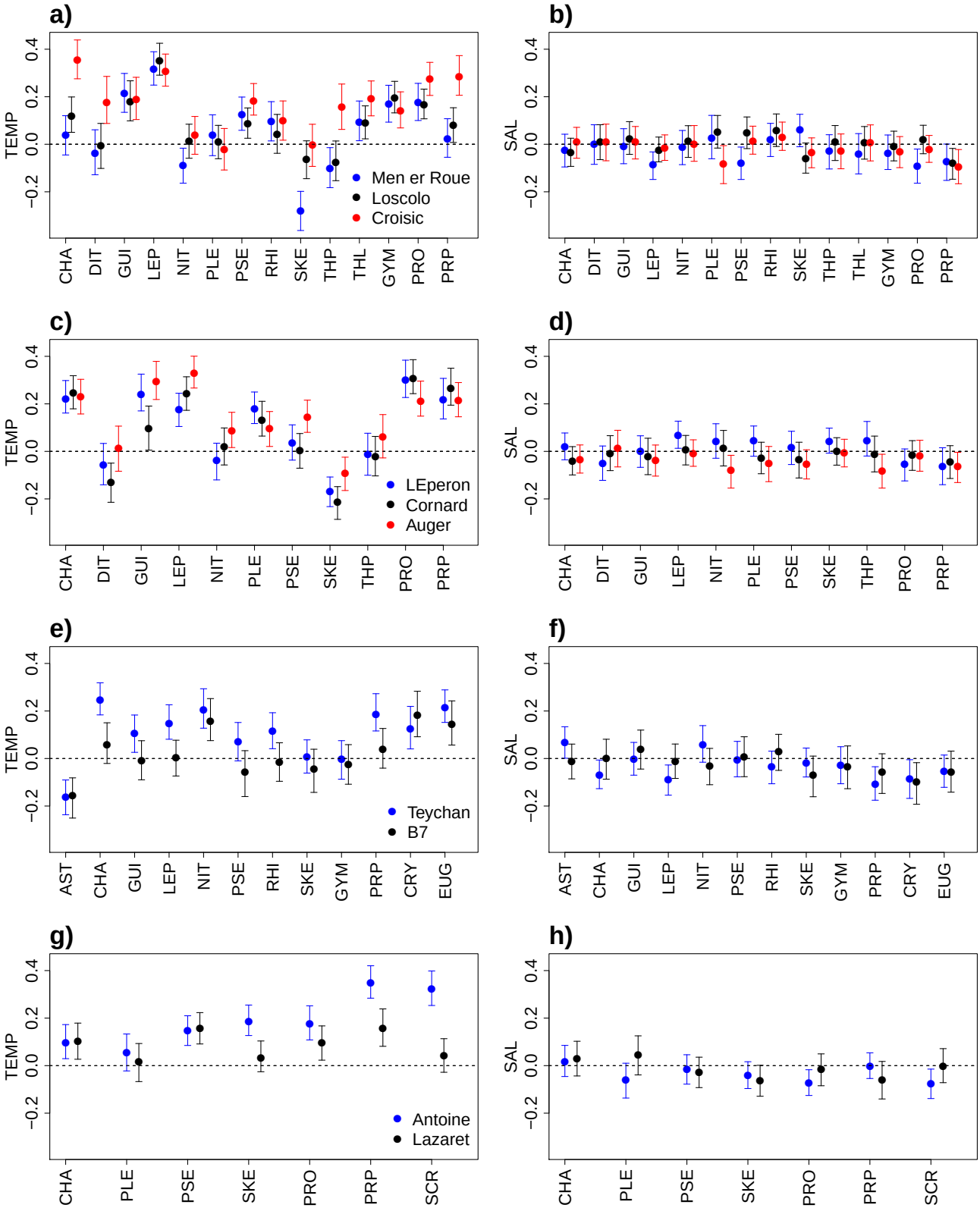

Figure 3: **Effect of environmental variables (temperature, TEMP or salinity, SAL) on phytoplankton group** in Brittany (a, b), Oléron (c, d), Arcachon (e, f) and in the Mediterranean Sea (g, h). Each color corresponds to a different site. Error bars correspond to the 95% confidence interval around the estimated coefficient. All variables were normalized before estimation.

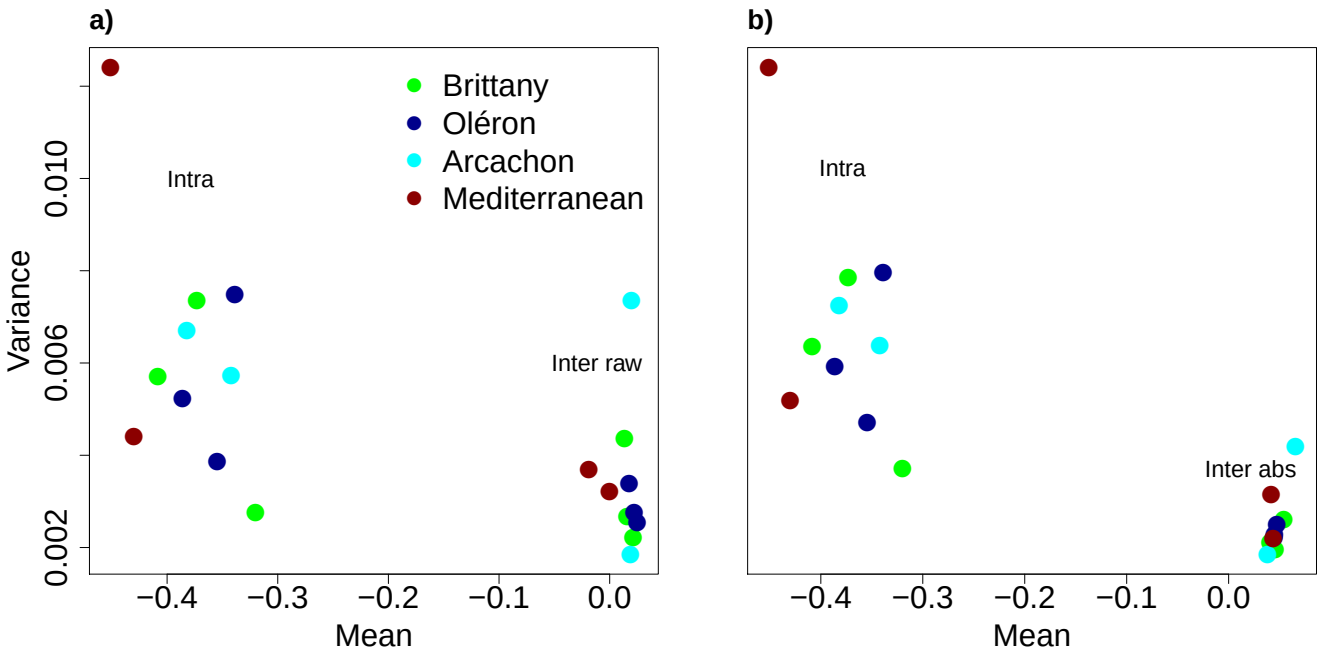

Figure 4: **Relation between mean and variance of the intra- and inter-group interaction coefficients**. Variance of the coefficient in the interaction matrix (**B**–**I**) is a function of their mean, for 10 sites in 4 regions, with a model allowing interactions only within clads (within centric or pennate diatoms, dinoflagellates, or other taxa). 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

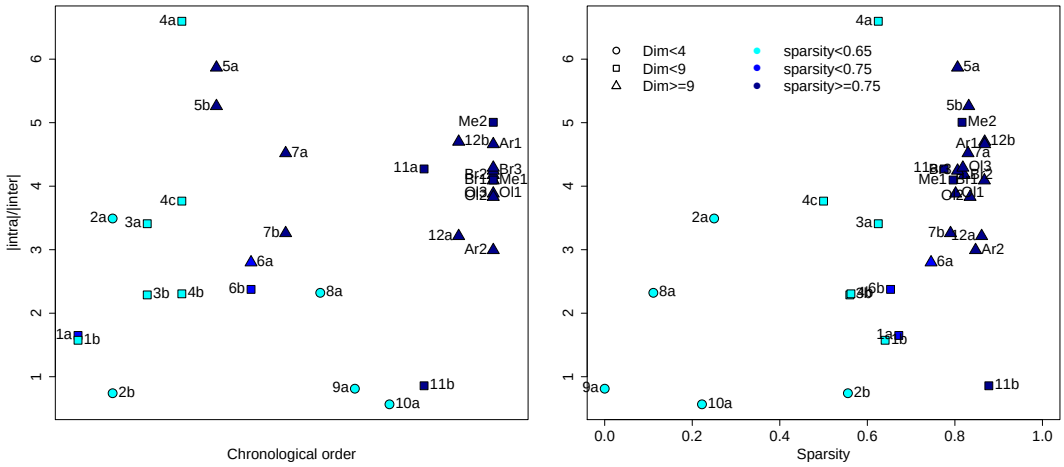

Figure 5: **Ratio of intra-to-intergroup interaction strength in MAR(1) studies.** Only significant values are taken into account and missing values in the matrix are not considered (e.g., not replaced by 0 as they are in the main text). The color of each point is a function of the sparsity of the interaction matrix B-I and the relation between the raio and the sparsity of the matrix is given in the right panel. Corresponding studies are described below in Table 3. ***[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	Approximate size
1a	[2], CLS	9[2]	Zooplankton	Lake	100
1b	[2], TLS	9	Zooplankton	Lake	100
2a	[3]	2	Phytoplankton	Lake	100
2b	[3]	3	Zooplankton	Lake	50
3a	[4]	4	Functional groups of plankton	Lake	300
3b	[4]	5	Taxonomic groups of plankton	Lake	300
4a	[5]	4	Plankton	Lake	100
4b	[5]	4	Plankton	Lake with high planktivory	100
4c	[5]	4	Plankton	Lake with low planktivory	100
5a	[6]	14	Plankton	Lake	300
5b	[6]	14	Plankton, growing season	Lake	200
6a	[7]	13	Plankton	Lake	400
6b	[7]	7	Simpler web, plankton	Lake	400
7a	[8]	10	Ciliates	Lake	300
7b	[8]	10	Phytoplankton	Lake	300
8a	[9]	3	Insects	Terrestrial	50
9a	[10]	2	Lynx/Hare	Terrestrial	100
10a	[11]	3	Fish	Baltic Sea	30
11a	[12]	7	Phytoplankton	Coastal site	1000
11b	[12]	7	Phytoplankton	Offshore site	700
12a	[13]	12	Phytoplankton	Outside a bay	300
49412b	[13]	12	Phytoplankton	Inside a bay	500

Table 3: Studies used in Fig. 4 in main text and Fig. 5 in the Supplementary Information.

References

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[2] Wondering if we're taking into account the last row, which does not interact with others, even itself

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