MAR estimates[1]

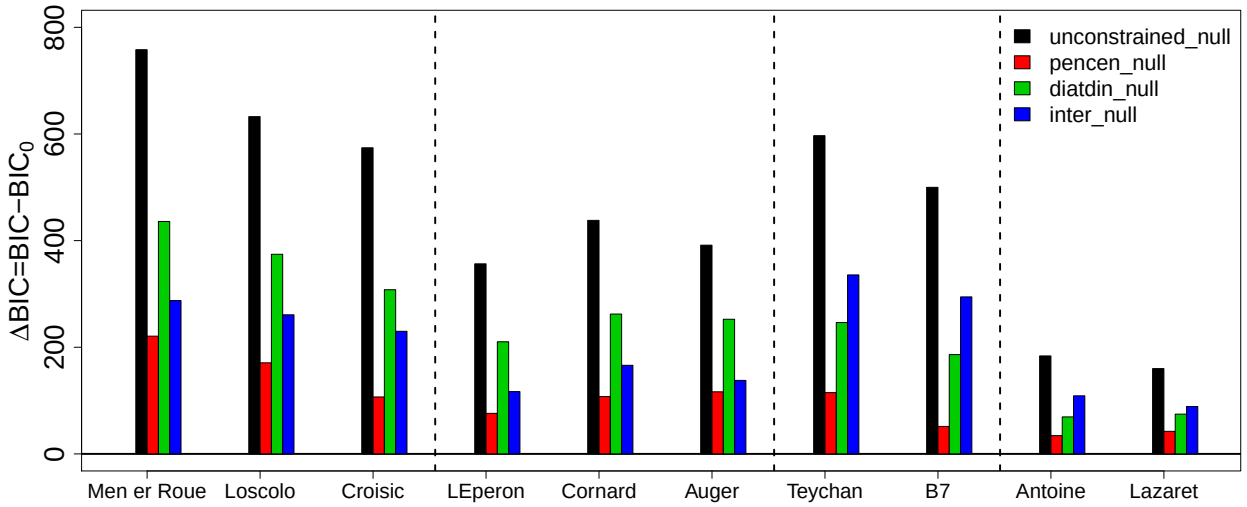

Figure 1: Comparison of BIC with different interaction matrices, compared to the null model (diagonal interaction matrix), for four different sites separated by dashed lines (Brittany, Marennes-Oléron, Arcachon Mediterranean Sea) and 10 different subsites. As model structures (length of the times series taken into account) are different between sites and subsites, groups of bars should not be compared.

[1] We should note that NEE does not like barplot...

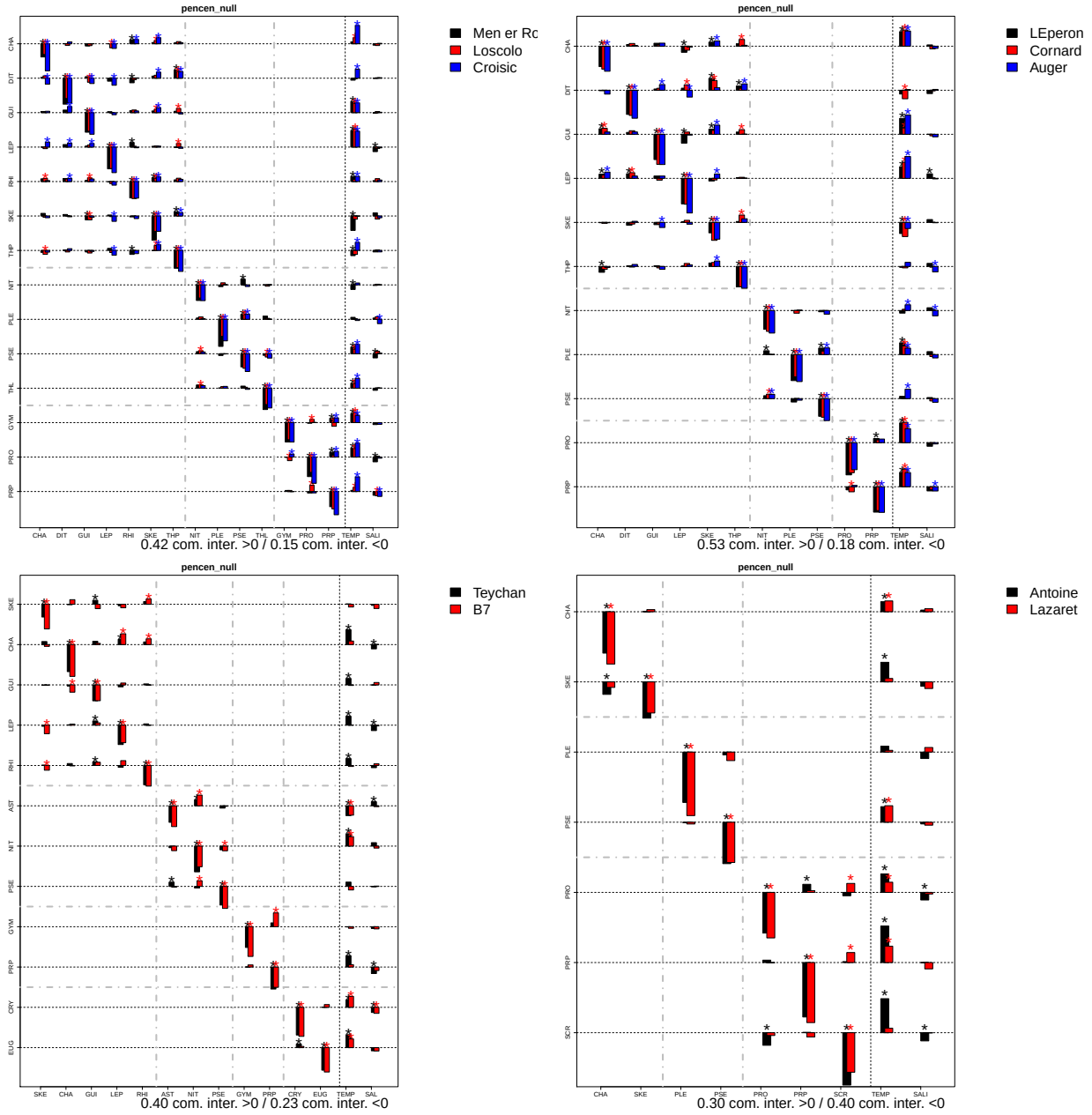

Figure 2: Coefficients of the pennate vs. centric MAR model for species which are present at the 10 sampling subsites, using temperature and salinity as covariates. The ratio of positive and negative interactions which have the same signs for all subsites in one site (not considering diagonal values, that is intragroup interactions) is shown below each graph. [We will change he design (removing title and text under the x-axis+increasing font) if we keep this figure but I'm letting that here for now. Should we keep this "type" of graph? Can't think of a more clever way to show evtg right now.]

Matrix 'meta-analysis'

We can use several metrics to describe the different matrices whose parameters we have estimated. In addition to choosing the metric(s), we should wonder which matrix we should use (all graphs shown here were computed on unconstrained matrix at first but I think it should be the pencen one because of the results in BIC).

- eigenvalues is the simplest (and should be linked with % of positive/negatives values)

	Unconstrained (eig)	% positive	Pennate/centric (eig)	% positive
Men er Roue	0.57	57	0.52	57
Loscolo	0.53	56	0.42	50
Croisic	0.65	52	0.50	49
L'Eperon	0.58	59	0.44	53
Cornard	0.49	51	0.46	47
Auger	0.57	55	0.51	55
Teychan	0.59	55	0.46	45
B7	0.64	50	0.57	38
Antoine	0.55	47	0.55	30
Lazaret	0.64	37	0.61	24

Table 1: Maximum eigenvalue and proportion of strictly positive interactions (compared to non-0 values) in the interaction matrices estimated in different sites, with a full matrix or a matrix only allowing interactions among pennate and centric diatoms, not between

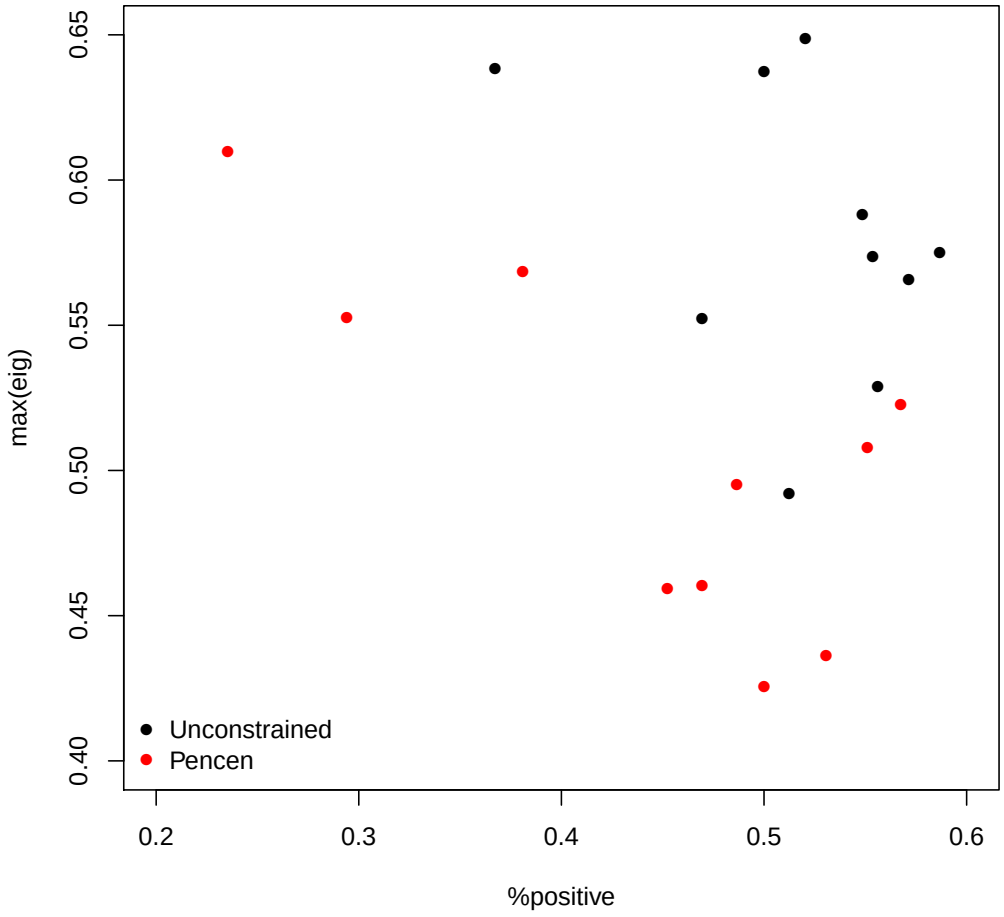

Figure 3: No obvious link between stability and proportion of positive interactions

- connectance

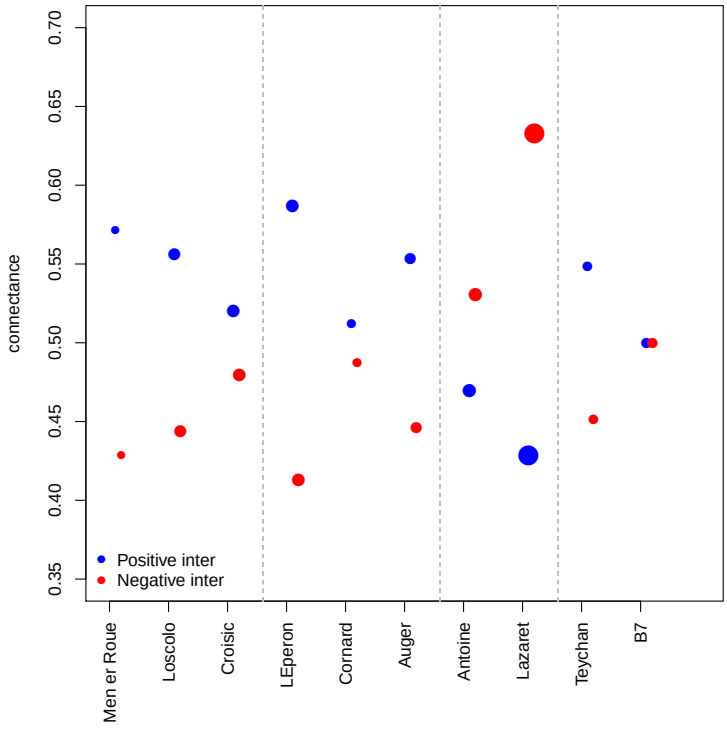

Figure 4: Connectance of the unconstrained interaction matrices estimated in 10 different subsites, differentiating positive and negative interactions

(for the next metrics, we need to consider absolute values and/or only negative and/or only positive interaction values)

- weighted connectance

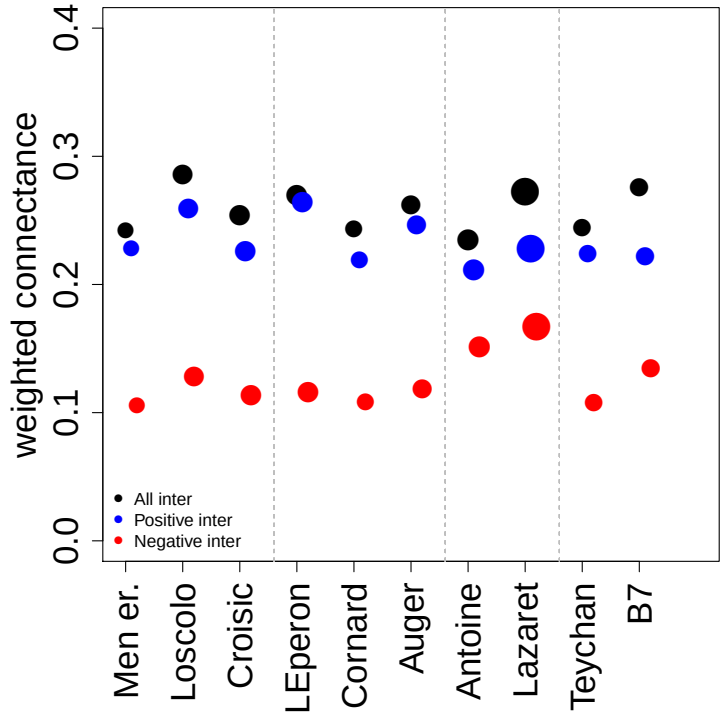

Figure 5: Weighted connectance of the unconstrained interaction matrices estimated in 10 different subsites, differentiating positive and negative interactions

- weighted linkage density (average of vulnerability and generality, see eq. 14 in Bersier et al. [2002])

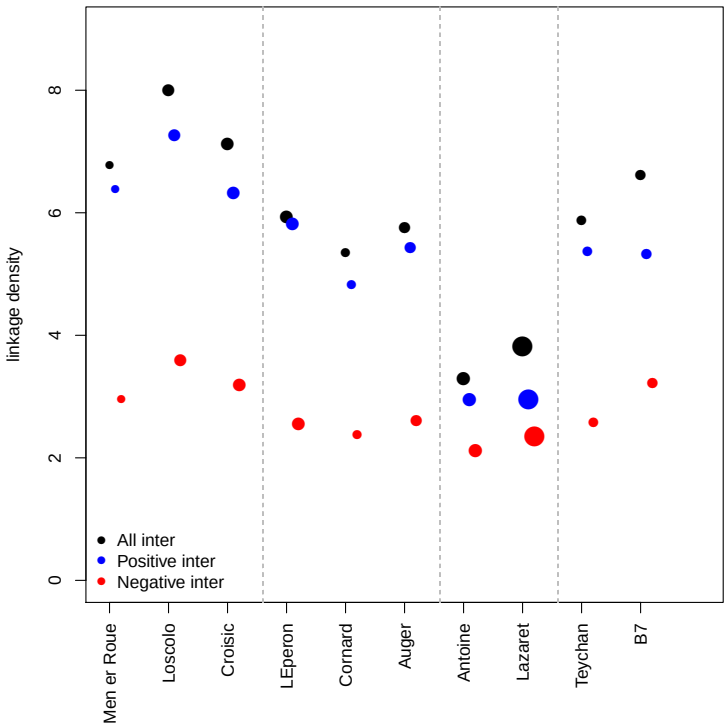

Figure 6: Weighted linkage density of the unconstrained interaction matrices estimated in 10 different subsites, differentiating positive and negative interactions

We also wondered about a possible covariance between intra and inter-competition: should we compute the ratio of average coefficients $(\frac{\bar{b_{ii}}}{\bar{b_{ij}}})^2$ or, for each species/subsite, the ratio between b_{ii} and $\bar{b_{.i}}$or $\bar{b_{i.}}$(depends if we want to see if a strongly self-regulated species also strongly regulated the others, or, on the contrary, tends to be regulated BY the others as well).

Finally, we also wanted to consider the variance between growth rate and intragroup competition (b_{ii} vs. $\bar{c_{i.}}$, or only consider eigenvalues? Would it make sense?)

In addition to averaging, we can consider the standard deviation of intergroup coefficients and environmental effects.

We may want to see for each species the variation of b_{ii} (and others) per site.

References

Louis-Felix Bersier, Carolin Banašek-Richter, and Marie-France Cattin. Quantitative descriptors of food-web matrices. *Ecology*, 83(9):2394–2407, 2002. URL `http://onlinelibrary.wiley.com/doi/10.1890/0012-9658(2002)083[2394:QDOFWM]2.0.CO;2/full`.

[2]In the following, $\bar{x_{ij}}$ is the average value over all indices (species) where $i \neq j$, and $\bar{x_{.j}}$is average value over all rows, with j fixed. The average can be computed on absolute values, raw values, only positive and only negative values (we need to decide).