Supplement 2: Testing “fence” effects.

Title:

Intertidal mussel reefs change the composition and size distribution of diatoms in the biofilm

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We analysed the effects of having a rope or a plastic fence (“fence” effects) around the plots for all response variables by comparing having no fence with having different types of fences in the plots without mussel additions. Thus, we compared the “no mussel additions and no fence” treatment (the unfenced control) with the “bare flat and plastic fence” and “bare flat and rope fence” treatments, respectively. We analysed “fence” effect on species composition based on both biovolume and cell numbers, using permutational multivariate analysis of variance (PERMANOVA) (analysing distance matrices using the adonis2 function in the vegan package vegan package, version 2.5-6; R Core Team, 2020; Oksanen et al. 2019). We analysed “fence” effect on total biovolume, total cell number, average cell size and species richness of the diatom community, as well as organic matter content of the top 5 cm of the sediment; by fitting a linear model (R version 3.6.1). This enabled us to use the summary command to get post-hoc contrasts, comparing the rope and the plastic fence separately against the unfenced control. All models contained the fixed explanatory factor type of fence (plastic net, rope or unfenced control).

There were no significant effects of the ropes or the plastic fence on any of the response variables, compared to the unfenced control. There was no significant difference in diatom species composition between the plots with different types of fence (rope, plastic, or no fence), not for the multivariate analyses based on biovolume or cell numbers (PERMANOVA; biovolume: $F_{2,13}$=1.5, p=0.173; cell number: $F_{2,13}$=1.5, p=0.168). We also did not detect any significant “type of fence” effects on total biovolume, total cell number, average cell size or organic matter content of the top 5 cm of the sediment (Table S2; Fig. S2). There was a significant “type of fence” effect on diatom species richness (Table S2).

However, this effect depended on a difference between the plots with a rope and plastic fence, while none of the types of fences showed a significant different species richness compared to the unfenced control (rope fence vs unfenced control: t=-1.3, p=0.217; plastic fence vs unfenced control: t=1.8, p=0.106; Fig. S2d).

Table S2. Linear model results comparing effects of having different types of fence around the plots: a rope fence, a plastic fence or an unfenced control.

	df	F	p
total numbers of diatom cells	2,13	1.0	0.405
total biovolume of diatoms	2,13	1.2	0.334
average cell size of diatoms	2,13	0.1	0.904
diatom species richness	2,13	4.2	0.039
organic matter content (5 cm)	2,13	0.213	0.811

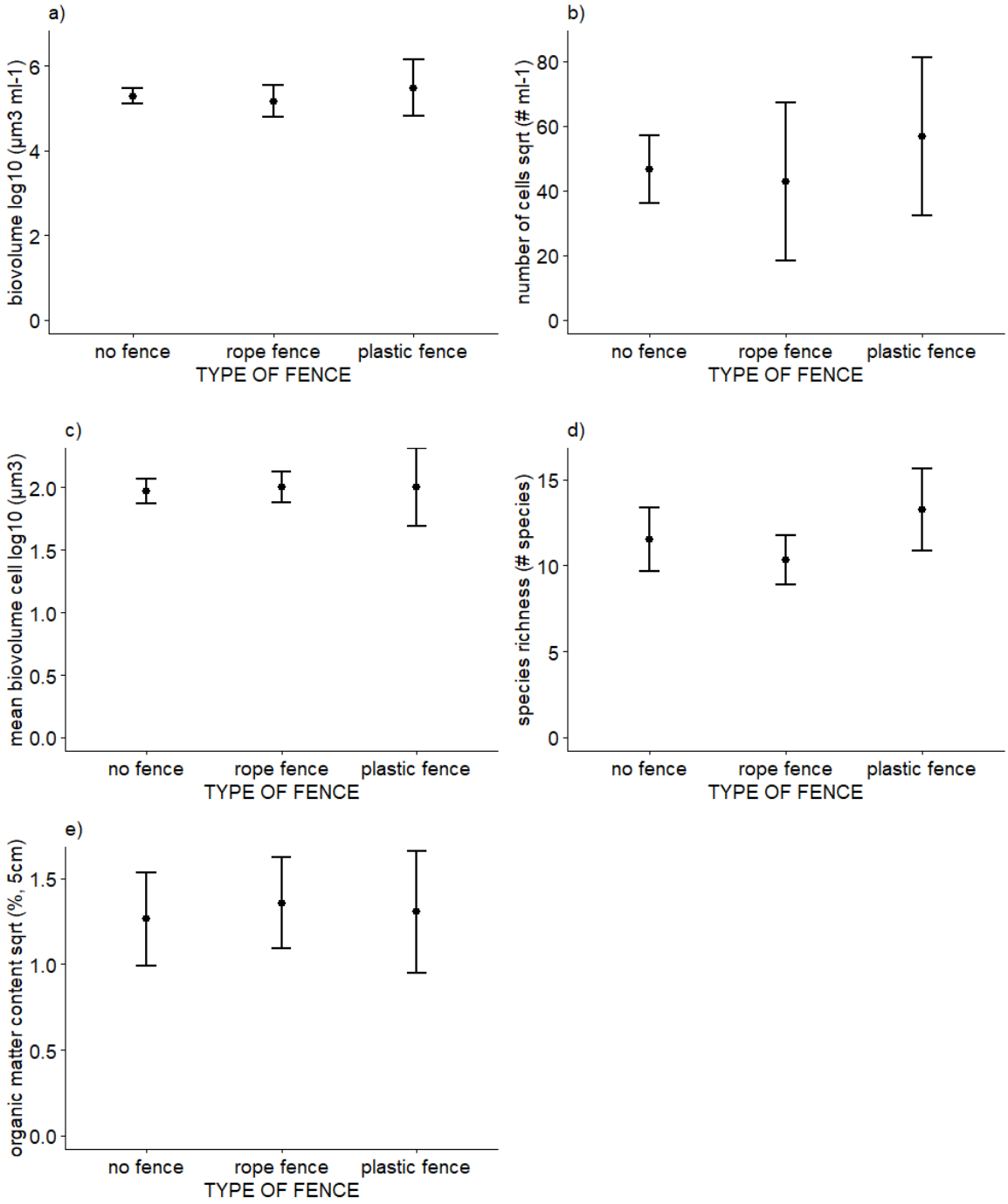

Fig. S2. Procedural experiment effects on properties of the biofilm by adding different types of fencing around the plots ("fence" effects). a) biovolume of diatoms, b) number of diatom cells, c) mean biovolume of the individual cells, d) species richness of the diatom community, and e) the organic matter content of the upper 5 cm of the sediment. Error bars show 0.95 % confidence intervals.