Shading and alterations of the sediment: *in situ* experiments to mimic impacts of fish farms on a Mediterranean coastal ecosystem

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Introduction:

For about ten years, fish farming has been expanding in the Mediterranean Sea and its impact on the surrounding environment is important. For a better understanding of that problem, *in situ* experiments were led to mimic effects of fish farms on one of the most important coastal Mediterranean ecosystem: the *Posidonia oceanica* meadow.

Fig.1: Sampling site, Calvi Bay, Corsica, France.

Material and methods:

-**Study site** (Calvi Bay, Corsica, Fig.1): *P. oceanica* meadow situated near the research station STARESO.

-**Experimental design** (Fig.2): Control site, Alteration site (sediment coming from under the fish farm of Calvi, Fig. 2a,b), Shading site (Fig. 2c).

-**Duration:** 3 months.

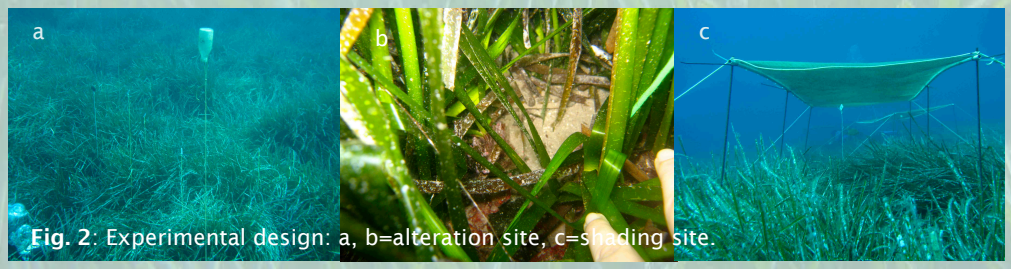

Fig. 2: Experimental design: a, b=alteration site, c=shading site.

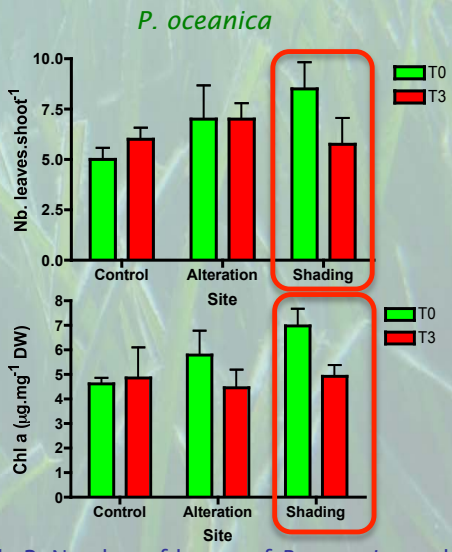

Fig.3: Number of leaves of *P. oceanica* and chlrophyll a content.

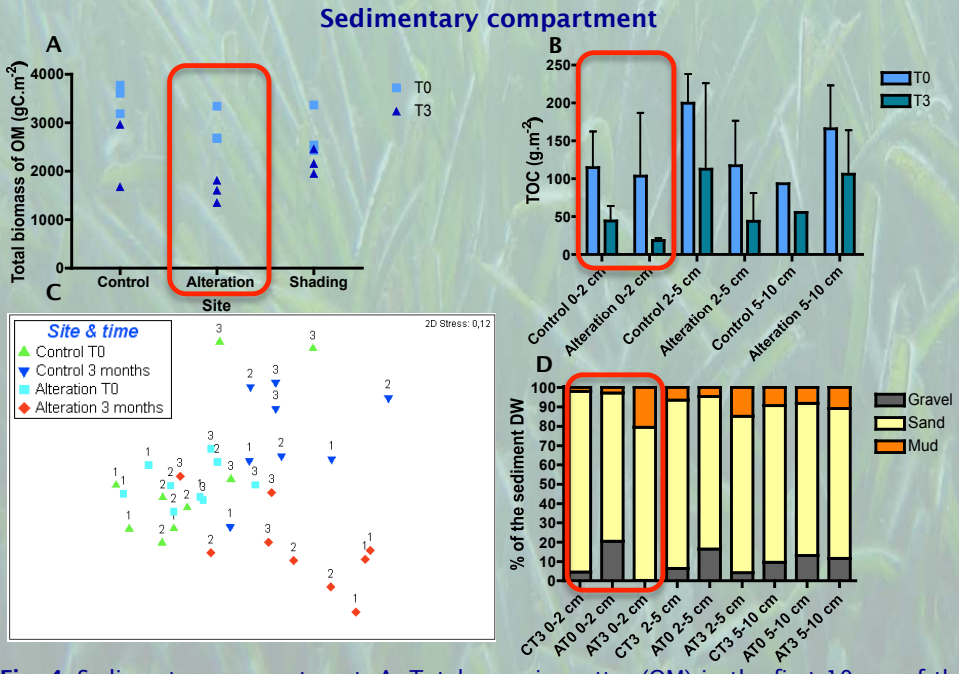

Fig. 4: Sedimentary compartment. A: Total organic matter (OM) in the first 10 cm of the sediment. B: Total organic carbon in the sediment for the layers 0-2 cm, 2-5 cm and 5-10 cm at Control site and Alteration site at T0 & T3. C: Bray-Curtis similarity (Square root transformation) calculated for Control and Alteration site at T0 and T3, using biomasses of total OM, microphytobenthos, rods, cocci, vibrios, filaments and total bacteria, grain size analysis results. D: Grain size analysis of the sediment for the layers 0-2 cm, 2-5 cm and 5-10 cm at Control site (T3) and Alteration site (T0 & T3).

Discussion and conclusions:

These experiments have affected both *P. oceanica* and the sedimentary compartment, as in true fish farms. However, during those 3 months, the plant was mainly affected by the shading, whereas alterations of the sediment have essentially had an impact on parameters of the sedimentary compartment and organisms living in it.

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