Fish farm impacts on *Posidonia oceanica* meadows: interest of the microbenthic loop

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Introduction:

Posidonia oceanica, the seagrass endemic to the Mediterranean Sea, is a valuable tool to assess the environmental quality in coastal zones. However, only few studies have attempted to use characteristics of its sediment compartment as an indicator of environmental perturbations. In this study, the impact of a fish farm on the microbenthic loop (organic matter-OM, bacteria, microphytobenthos and meiofauna) of *P. oceanica* meadows is described.

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

Material and methods:

-**Sampling sites** (Calvi Bay, Corsica, Fig.1)**:** *P. oceanica* meadows situated in front of the research station STARESO (control site) and the fish farm of Calvi at a depth of 22 m, in March and June 2008.

-**Sampling strategy:** 3 sediment cores were used to quantify each part of the microbenthic loop. They were divided in 5 (0-1, 1-2, 2-5, 5-10 and 10-15 cm).

Results:

Differences between both sites according to sediment depth (Fig.2) are only significant for few slices. This is probably caused by the high spatial heterogeneity at small scale in *P. oceanica* meadows and by the small number of replicates. However, global biomasses of OM and bacteria (Fig.3) are higher at the fish farm than in STARESO in March, surely because of the excess of food for fishes or faeces.

This difference also exists considering biomasses together (Fig.3, right).

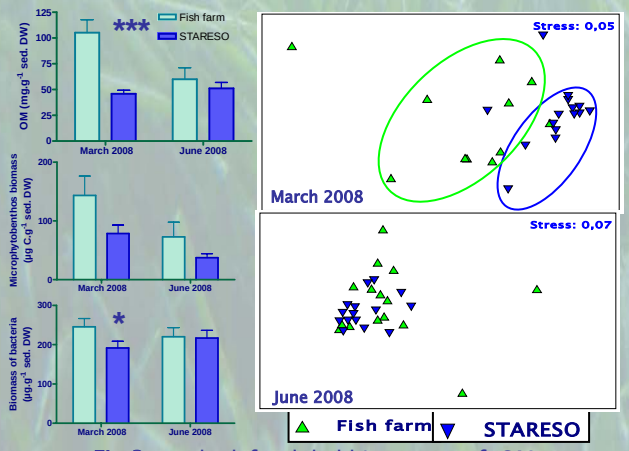

Fig.3: on the left, global biomasses of OM, microphytobenthos and bacteria in March and June 2008 (*= p<0,05, ***=p<0,001). Right: MDS based on a similarity analysis realised taking biomasses together.

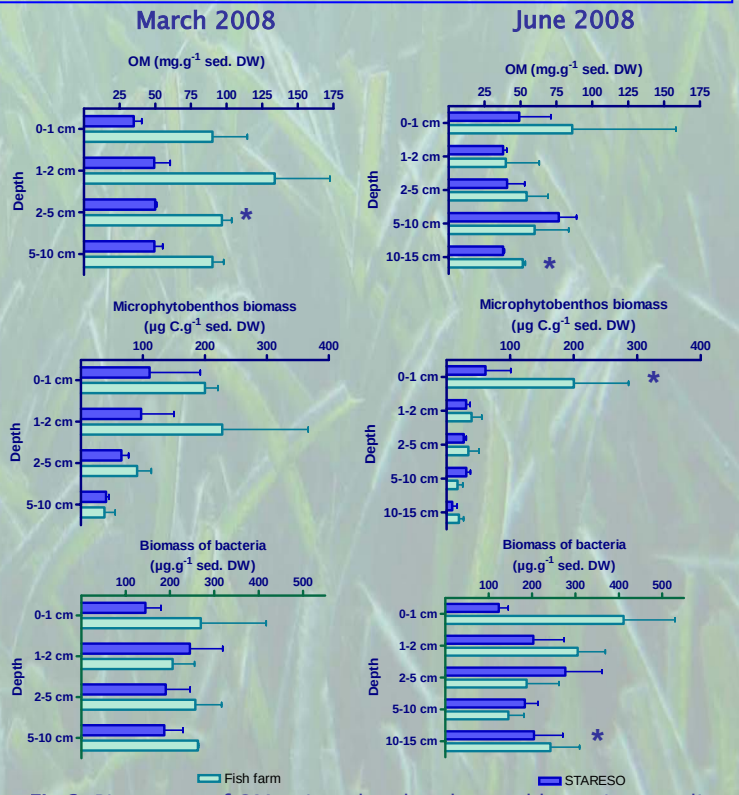

Fig.2: Biomasses of OM, microphytobenthos and bacteria according to sediment depth, in March and June 2008 (*=p<0,05).

Conclusions:

The microbenthic loop seems to be a useful tool to assess the impact of a fish farm when every compartments (OM, bacteria, microphytobenthos, meiofauna?) are taken together into account (Fig.3). However, a seasonal difference, which needs further investigations, is pointed out.

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