

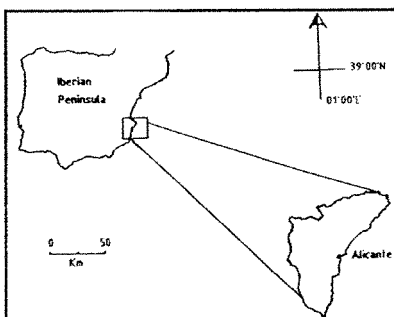
BOTTOM TRAWLING FISHING EFFECTS OVER *POSIDONIA OCEANICA* SEAGRASS MEADOWS AND SEAGRASS-ASSOCIATED FAUNA : PRELIMINARY RESULTS

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Posidonia oceanica is an endemic mediterranean seagrass which is widely distributed along the infralitoral bottoms. It forms extensive meadows with great ecological importance (BOUDOURESQUE & MEINESZ, 1982). One of the most important is its capacity of increasing the habitat complexity in relation to surrounding unvegetated bottoms. In the Iberian Southeast, the bottom trawling fishing affects greatly the *Posidonia* meadows and their associated communities. At the moment, it is not well known the effect of this perturbation on the marine benthos (JONES, 1992). However, many papers have studied the effects of habitat complexity on the tropical seagrass-associated macrofauna community structure. This paper is a preliminary study to look for relationship between changes in the *Posidonia* meadows features and the community structure of seagrass-associated vagil fauna (fish and macroinvertebrates).



Study Site : El Campello (Alicante, SE Spain). The seagrass meadow is irregularly affected from trawl fishing and grown between 1-24 m deep on sand-muddy bottoms.

Sampling was carried out in summer of 1992, in two stations (-16 m deep): an unperturbed and a frequently trawling perturbed station.

- **Fish:** The fish assemblage was sampled by visual census on 750 m². Eight censuses were done in each station (HARMELIN-VIVIEN *et al.*, 1985). The linear coverture of the seagrass meadow was measured on each sample.

- **Macroinvertebrate:** The crustacean community was sampled by suction bombs in a 0.125 cm² quadrat (VADON, 1981). Twelve samples were taken in each station. The shoots density and litter necromass (detritus) were measured on each sample. All the individuals of Decapoda, Amphipoda and Isopoda were identified to species level.

ANOVA was applied to compare the variables between stations. CCA (Canonical Correspondence Analysis) was applied to fauna abundance in relation to features of seagrass meadows (TER BRAAK, 1988).

The figure 1 shows the result of ANOVA for the seagrass meadows features and the total faunal abundance in relation to the two stations. The vegetal litter has increased in the perturbed station, while the unperturbed station has a great coverture. Their changes would take importance over the seagrass-associated fauna.

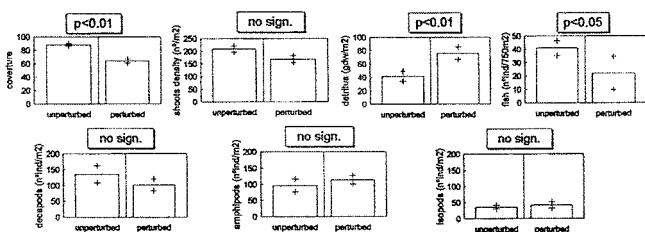


Table 1 shows the correlation between the community structure and the environmental factors. The seagrass meadow's coverture has an important weight over the fish assemblage. Samples from perturbed and unperturbed station are segregated in the ordination diagram. The unperturbed station is related to the "coverture" variable.

TABLE 2

Fish	Linear Coverture	
	Shoots density	Detritus necromass
	0.59	
Decapoda	0.54	0.64
Amphipoda	ns	0.68
Isopoda	ns	0.6

Decapods, amphipods and isopods are correlated with detritus variable and only decapods are correlated with shoots density. In the ordination diagram, the unperturbed station is associated with the shoots density variable and the perturbed station with the detritus variable. The modification of ecological characteristics of *Posidonia oceanica* seagrass meadows by trawl fishing -reduction of seagrass complexity and increase of litter necromass- could be detected in two ecological scales (fish and macroinvertebrates) by changes on seagrass-associated epifaunal community structure.

REFERENCES

- BOUDOURESQUE C.F. & MEINESZ A., 1982. Découverte de l'herbier de posidonie. Cahier Parc Nation. Port-Cros 4 : 79.
- HARMELIN-VIVIEN M.L., HARMELIN J.G., CHAUVET C., DUVAL C., GALZIN R., LEJEUNE P., BARNEBE G., BLANC F., CHEVALIER R., DUCLERC J., LASSERE G., 1985. Evaluation visuelle des peuplements et populations de poissons : problèmes et méthodes. *Terre Vie*, 40 : 467-539.
- JONES, J.B., 1992. Environmental impact of trawling on the seabed : A review. *N.Z.J. Mar. freshwat. res.* 26(1) : 59-67.
- TER BRAAK C.J.F., 1988. CANOCO. A FORTRAN program for canonical community ordination by (partial) (detrended) (canonical) correspondence analysis, principal components analysis and redundancy analysis (version 2.1). Agricultural Mathematics Group. Wageningen, The Netherlands.
- VADON C., 1981. Les Brachyours des herbiers de Posidonies dans la région de Villefranche-sur-mer : biologie, écologie et variations quantitatives des populations. Thèse doctorale. Université Pierre et Marie Curie, 235 p.

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