The role of meiofauna in energy transfer in a Mediterranean seagrass bed (Calvi, Corsica)

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Introduction

Seagrass beds are complex coastal ecosystems that serve as feeding and nursery grounds for numerous marine organisms. In addition to the functional role of the living plants and associated biofilm, there is also a complex community occurring in the detritus accumulations of *Posidonia oceanica* meadows that is far less studied.

The present study focussed on meiofauna in this litter fraction, with a special emphasis on the structural and functional diversity of harpacticoid copepods (Crustacea, Copepoda).

Two **central research questions** were put forward:

(1) Does the quality of this macrophytodetritus influence the meiofauna community composition?

(2) Do harpacticoid copepods feed on seagrass detritus or on other carbon sources in the biofilm?

Methods

In the Bay of Calvi (NW Corsica), meiofauna samples were taken at a depth of 10 m by SCUBA diving.

Harpacticoid copepod communities of the endemic Mediterranean seagrass, *Posidonia oceanica*, were sampled in five different habitats characterized by different levels of degradation of the macrophytodetritus (Fig.1)

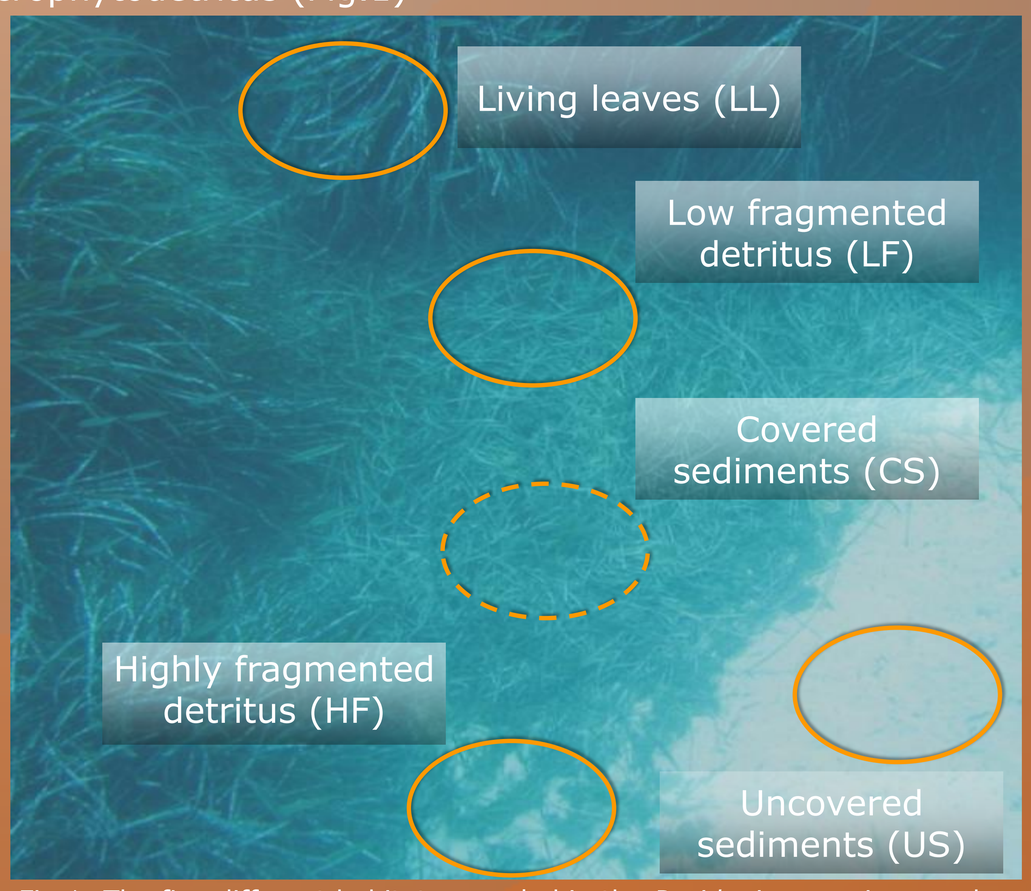

Fig.1: The five different habitats sampled in the *Posidonia oceanica* meadow

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Results

Structural diversity

Based on a cluster analyse, two harpacticoid copepod family communities were distinguished (Fig.2):

(1) a **benthic community**, living in the sediment or on highly fragmented macrophytodetritus

(2) a **foliar, epiphytal community** associated with seagrass leaves and low fragmented macrophytodetritus leaves.

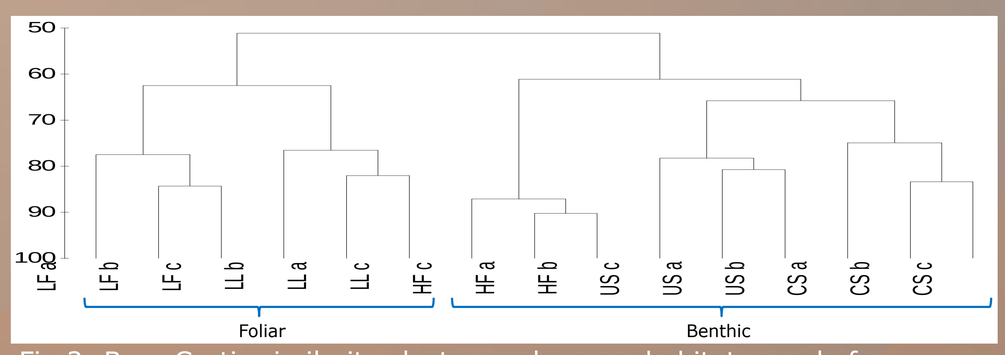

Fig.2: Bray-Curtis similarity cluster analyse per habitat sample for harpacticoid copepods

Harpacticoid copepod family composition (Fig.3)

Benthic community:
- Less diverse
- Tisbidae dominant

Epiphytal community:
- More diverse
- Thalestridae dominant

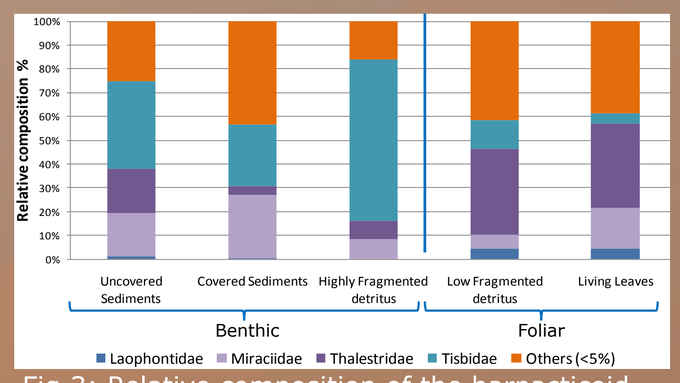

Fig.3: Relative composition of the harpacticoid copepod families

Functional diversity

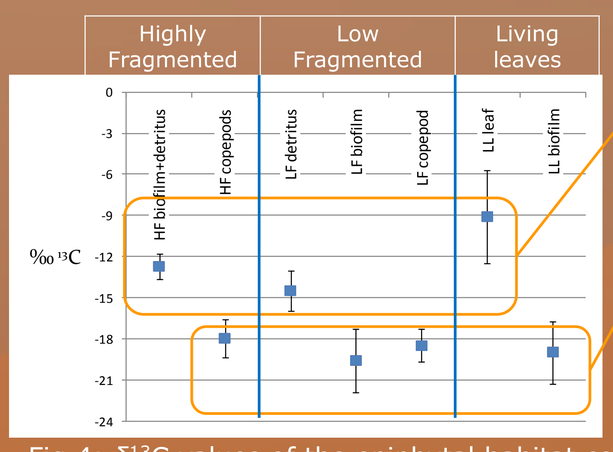

Fig.4: $\delta^{13}C$ values of the epiphytal habitat components

$\delta^{13}C$ values of detritus and living tissue higher then biofilm and harpacticoid copepods

$\delta^{13}C$ values of harpacticoid copepods slightly higher then biofilm values (1‰ – 2 ‰)

Conclusions

Answering the research questions put forward, we can conclude that the quality does influence the community composition of harpacticoid copepods. A clear family community shift was observed.

These differences in composition may also imply a differential functional diversity.

Based on their stable isotope signature, harpacticoid copepods showed to preferably feed on the epiphytal biofilm community composed of bacteria, diatoms, fungi and microalgae.

Since harpacticoid copepods showed to use different sources of carbon, unraveling the contribution of each of them and the role of the degradation level of the detritus for food selectivity is the next step forward.