

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



Mascart Thibaud ¹, Lepoint Gilles ², Borges Alberto Vieira ³, Darchambeau François ³, Dauby Patrick ² & De Troch Marleen ¹

¹ Marine Biology, Ghent University, Krijgslaan 281-S8, B-9000 Gent (Belgium)

² Laboratory of Oceanology, University of Liège, Allée du 6 août B6, B-4000 Liège (Belgium)

³ Chemical Oceanography Unit, University of Liège, Allée du 6 août B5, B-4000 Liège (Belgium)

E-mail: Thibaud.Mascart@UGent.be

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 macrophytodebris 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 macrophytodebris (Fig.1)



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

Acknowledgement

The authors wish to thank the staff of the Stareso field station for their support during the sampling campaign. This work was part of the master thesis of the first author, to obtain the degree in Marine and lacustrine sciences, Ghent University (2010). This study was conducted within the frame of FNRS research project FRFC 2.4511.09 (ULiège). Additional support was provided by the Ghent University (BOF-GOA 01GZ0705). M. de Troch is a Postdoctoral Fellow of the Research Foundation - Flanders (FWO).

Results

Structural diversity

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

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

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

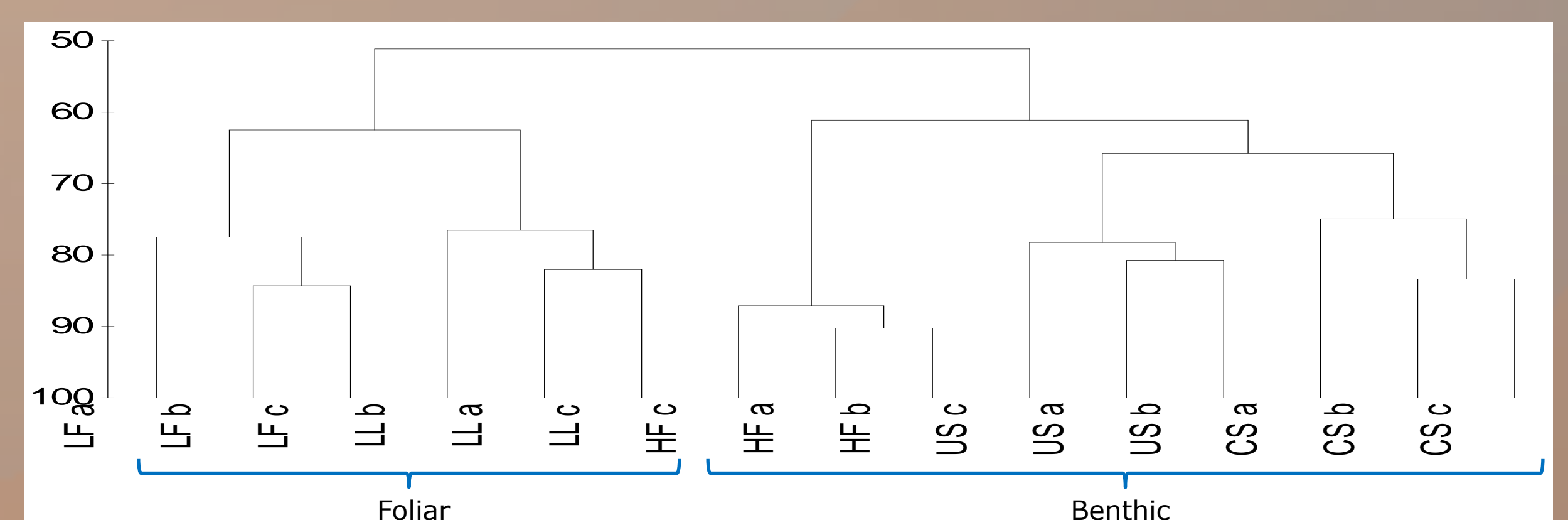


Fig.2: Bray-Curtis similarity cluster analysis per habitat sample for harpacticoid copepods

Harpacticoid copepod family composition (Fig.3)

Benthic community:

- Less diverse
- Tisbidae dominant

Epiphytal community:

- More diverse
- Thalestridae dominant

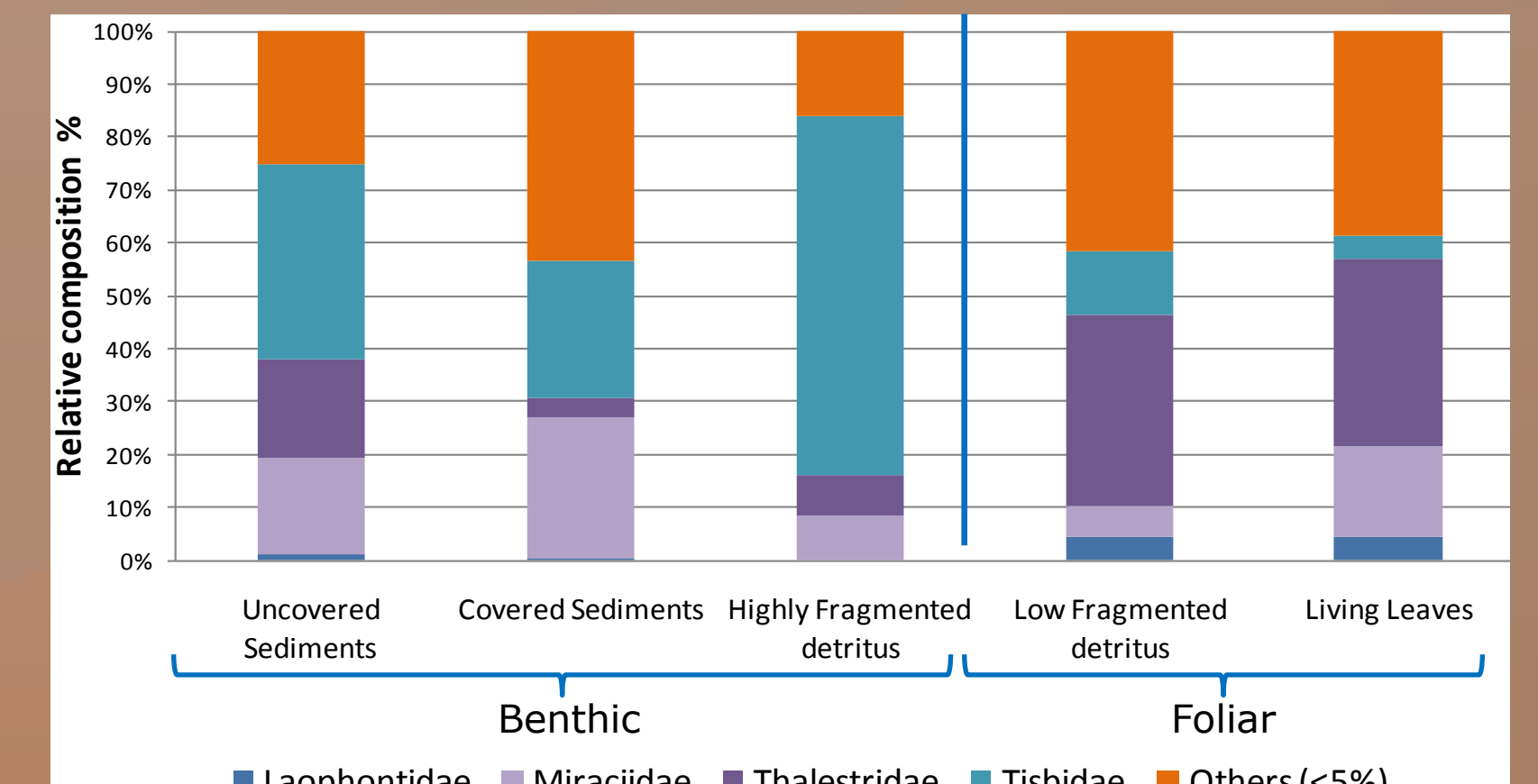


Fig.3: Relative composition of the harpacticoid copepod families

Functional diversity

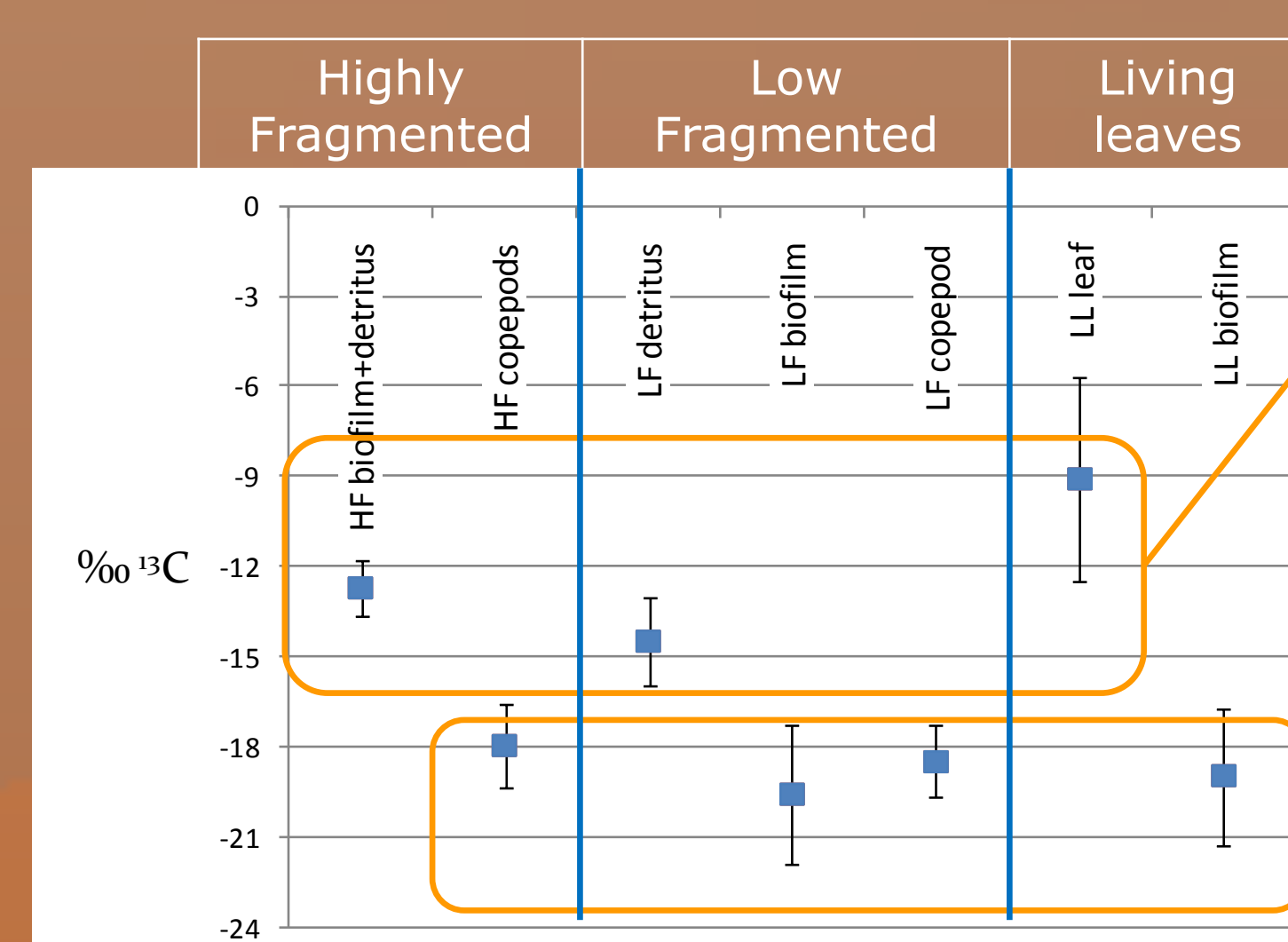


Fig.4: $\delta^{13}\text{C}$ values of the epiphytal habitat components

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

$\delta^{13}\text{C}$ values of harpacticoid copepods slightly higher than 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.