

## S2-12

### The role of seagrass-associated resources in an estuarine benthic food web

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Key word: seagrass estuary food web stable isotopes benthos

Benthos have a key role in marine food webs by linking primary production to higher trophic levels, enhancing energy and nutrient transfer between the sediments and the pelagic zone. In seagrass ecosystems trophic relations are complex due to large resource variability. This study focuses on the benthic food web in a *Zostera noltii* seagrass habitat (Mira Estuary, Portugal). We examined resource utilization of the most abundant macroand meiobenthic taxa at genus, species or family level in the seagrass beds and their adjacent unvegetated sediments, using natural stable carbon and nitrogen isotope analysis. Stable isotope mixing models were used to estimate the proportional contribution of resources to the diet of those organisms. In total we analyzed 19 macrobenthic species among which crustaceans, insects, bivalves, gastropods, polychaetes and oligochaetes, and 24 meiobenthic species belonging to 16 nematode genera and 4 copepod families.

Based on the stable isotope ratios and the predicted diet contributions, microphyto-benthos was a main resource for most macroand meiobenthos, with intermediate carbon isotope signatures, whereas SPOM contributed predominantly for selected macrobenthic (polychaetes, insect larvae) and few meiobenthic species. There is evidence for ultimate utilization of seagrass-associated carbon, i.e. seagrass detritus and epiphytes, in and adjacent to the seagrass beds, demonstrating that it extends well beyond the vegetated areas. In contrast, fresh seagrass was utilized by only few macro-invertebrates; i.e. the crab *Carcinus maenas*, the isopods *Idoteidae*, and the gastropods *Trochidae* and *Hydrobiidae*. An important contribution of chemoautotrophic bacteria was shown, through symbiosis with lucinid bivalves or as a resource for the nematodes *Terschellingia* and the copepods *Cletodidae*. The trophic levels (four and three) for macroand meiobenthos were distinct based on stable nitrogen isotope signatures. Predatory feeding mode was suggested for the deposit-feeding nematodes *Comesomatidae*, demonstrating that traditional feeding type classifications based on nematode morphology can be misleading.

The importance of seagrass to the benthic food web is evident, considering not only the direct trophic link, via seagrass detritus utilization, but also its indirect contribution, via

enhancing particulate matter sedimentation and epiphytic microalgae settlement, which also contribute substantially to the benthic food web.