

IN SITU AND EXPERIMENTAL STUDY OF TROPHIC RELATIONSHIPS AND DIVERSITY OF MACRO-INVERTEBRATES ASSOCIATED WITH DEAD *POSIDONIA OCEANICA* LITTER

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Posidonia oceanica meadows are highly productive ecosystems in Mediterranean coastal waters. A variable but generally important part of this primary production forms *P. oceanica* dead leaves litter which can accumulate in the meadow or be exported outside, to sandy patches, deep systems or even terrestrial places. This exported detritus litter has very poor nutritional qualities, but it supports a wide assemblage of micro and macro-invertebrates. Even if partial information is available for a few species, trophic relationships between these macro-invertebrates and carbon transfers are still poorly known in this ecosystem.

In this context, this research project will fill in this gap. We will use several traditional tools to determine accurately these trophic links: gut content analysis, bulk stable isotope analysis, fatty acid composition, and a much more innovative and far less used technique which is compound specific stable isotope analysis (CSIA). These are recognized as powerful tools in coastal trophic ecology.

In order to try to improve the use of fatty acid composition in trophic ecology, we'll also conduct a laboratory experiment. We'll try to find fatty acid tracers of some potential food sources that are transferred through more than one trophic level because this could provide a very innovative way to use fatty acids in Mediterranean trophic ecology.

We'll also try to determine how some ecological factors affect the trophic relationships between the leaf litter macro-invertebrates, and so we'll take our samples at every season, at sites presenting different litter fragmentation, composition and constancy characteristics.

Resource pulses may have strong effects on ecosystems in which they happen. Even if *P. oceanica* leaf litter ecosystem often faces that kind of event, no study ever tried to determine the impact of detritus pulses on leaf litter macro-invertebrates or on trophic links between them. We'll conduct an *in situ* experiment to try to assess the impact of a litter pulse on the litter macro-invertebrates assemblage.

In conclusion, this research project will provide important information on macro-invertebrate trophic structure and on *P. oceanica* leaf litter ecosystem, which could play a central role in carbon cycle and recycling in the Mediterranean sea.