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Effect of substrate and seagrass habitat complexity on detritus colonization and decomposition in a Mediterranean coastal lagoon (Thau Lagoon, France): a focus on amphipod community

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In the Mediterranean Sea, *Zostera noltei* (Hornemann, 1832) meadows constitute an important part of the intertidal shallow ecosystems in estuaries, bays and lagoons. Most of the primary production of these ecosystems is not directly used but is channelled to higher trophic levels as detritus. Acting as a faunal magnet, the seagrass detritus hosts an abundant community of mesograzers that use it as food source and shelter. Despite the important role of detritus quality and the surrounding environment, in term of habitat complexity, in shaping the associated mesograzer community, our understanding of their effects remains limited. We assessed the importance of changes in substrate and habitat complexity in structuring the amphipods community associated with natural and artificial seagrass detritus in three different *Z. noltei* density meadows (high, medium and low density).

Detritus decomposition, expressed as loss in detritus weight, and colonization were analyzed in Thau Lagoon (South France). 30 litterbags filled with a known amount of natural and artificial seagrass detritus were deployed in April 2018 and retrieved after 22 days. Mesograzers were separated from the detritus and amphipods were then counted and identified.

Results revealed no differences in seagrass decomposition during the experiment. A total of more than 2,800 amphipods were found in the samples. We identified 11 different species: *Amphitoe ramondi*, *Aora gracilis*, *Dexamine spinosa*, *Erichthonius argenteus*, *Gammarella fucicola*, *Gammarus insensibilis*, *G. subtypicus*, *Microdeutopus anomalus*, *M. gryllotalpa*, *Monocorophium insidiosum* and *Phtisica marina*. Both the natural and the artificial substrate were colonized by the same species with, in general, no differences in number. Half of the species identified showed significant differences related to the complexity of the habitat with higher values in the high density condition.

Despite the short duration of the experiment, the consistency in the results provides new information about the importance of substrate and habitat complexity in shaping complex communities. Results showed how the habitat complexity, in this particular case seagrass density, is far more relevant than the substrate type in structuring detritus amphipods community.