

Colonization of a new habitat by copepods: An *in situ* experiment

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Colonization of new habitats by a biological community is conspicuous and this dynamic process is one of the architectural forces of the biogeographical distribution we know today. Within the meiofauna (<1mm), copepods (Crustacea) have successfully adapted to nearly every ecosystem and their colonization power of permanent habitats is therefore well-established. However, few studies tackled the colonization of new naturally occurring provisional habitats, which are of ecological interest since they are rich in organic material, structurally complex and devoted of native fauna.

Hence, the present study investigated the copepod colonization of provisional macrophytodetritus (mainly composed of senescent leaves and drift macroalgae) accumulated on bare sand patches inside a Mediterranean *Posidonia oceanica* seagrass meadow. General motive of colonization such as food and shelter are well-defined. However, little is known regarding the mode of the colonization and source pool of the associated colonists. Here, an *in situ* experiment was deployed in order to understand the mode of copepod's colonization to fauna deprived macrophytodetritus. The objectives were: (1) assessing the adjacent colonist's source pool (i.e. sediment, water column or *P. oceanica* canopy), (2) investigating the speed of settlement and (3) quantifying the species composition of the colonizing copepods.

In summary: (1) species from every source pool actively colonized the macrophytodetritus through the water column and through the sediment-macrophytodetritus interface. (2) The initial settlement occurred within the first 24 hours. (3) The species composition showed to be different than the source's composition. After 24h, the composition was similar to 45% of the *P. oceanica*, 28% of the water column and 25% of the sediments. After 96h, the composition was similar to 24% of the *P. oceanica*, 13% of the water column and 10% of the sediments. Indicating an evolution towards a macrophytodetritus copepod specific community composed of a mixture of the adjacent habitats first colonizers.