

ORIGINAL ARTICLE

Crustacean decapod assemblages associated with fragmented *Posidonia oceanica* meadows in the Alboran Sea (Western Mediterranean Sea): composition, temporal dynamics and influence of meadow structure

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Abstract

The decapod assemblage associated with a *Posidonia oceanica* meadow located near its western limit of biogeographic distribution was studied over an annual cycle. Fauna samples were taken seasonally over a year (five replicates per season) in two sites located 7 km apart, using a non-destructive sampling method (airlift sampler) for the seagrass. The dominant species of the assemblage, *Pisidia longimana*, *Pilumnus hirtellus* and *Athanas nitescens*, were associated with the protective rhizome stratum, which is mainly used as a nursery. The correlations between decapod assemblage structure and some phenological parameters of the seagrass shoots and wave height were negative or null, which reflects that species associated with the rhizome had a higher importance than those associated with the leaf stratum. The abundance and composition of the decapod assemblage as well as the ecological indexes displayed a seasonality trend with maximum values in summer-autumn and minimum in winter-spring, which were related to the seawater temperature and the recruitment periods of the dominant species. The spatial differences found in the structure and dynamics of the assemblages may be due to variations in the recruitment of the dominant species, probably as a result of the influence of local factors (e.g. temperature, currents) and the high dispersal ability of decapods, together with the patchy configuration and the surrounding habitats. The studied meadows are fragmented and are integrated within a mosaic of habitats (*Cymodocea nodosa* patches, algal meadows, rocky and sandy bottoms), which promotes the movement of individuals and species among them, maintaining a high species richness and evenness.

Introduction

Posidonia oceanica (Linnaeus) Delile is the most abundant of the four indigenous Mediterranean seagrasses and forms the most extensive beds, with a total area in the Mediterranean Sea ranging between 25,000 and 45,000 km² (Luque & Templado 2004). The architecture of *Po. oceanica* beds, with different strata and microhabitats (leaves, rhizomes and interspersed soft sediments),

supports different biotic assemblages (Pérès & Picard 1964; Kikuchi & Pérès 1977; Kikuchi 1980) and, in addition, offers shelter and acts as a nursery area for many animals, including some species of commercial importance (Gillanders 2006). Mixed photophilous and sciaphilic assemblages, including crustacean decapods, co-exist (Luque & Templado 2004; García Raso *et al.* 2006). Grazer species such as those belonging to the genus *Hypopolite* are associated with the upper, well-lit strata