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The potential role of habitat-forming seaweeds in modeling benthic ecosystem properties.

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ABSTRACT

Canopy-forming seaweeds provide specific habitats with key ecological properties and are facing severe declines worldwide with unforeseeable consequences for ecosystem processes. Investigating the loss of such natural habitats in order to develop management strategies for conservation is a major challenge in marine ecological research. This study investigated the shallow rocky bottoms of the southern Bay of Biscay at two sampling times with a view to identifying the effect of canopy seaweed availability on the taxonomic and functional properties of invertebrate multivariate structure, abundance, density, diversity and evenness. The multivariate taxonomic and functional structure of assemblages changed significantly according to canopy availability in terms of taxa and functional groups abundance, but no substantial change was observed in composition. Biogenic habitat simplification resulted in a decrease in total invertebrate abundance and in taxonomic and functional density and diversity, whilst no effects were observed in taxonomic and functional evenness. Loss of canopy involved an impoverishment of the whole community particularly for epiphytic colonial sessile suspension-feeders, but it also extended to non-epiphytic forms. Our results emphasize the importance of canopy decline as a major driver of changes in benthic ecosystem properties and highlight that biogenic space provided by canopy is a limiting resource for the development of rocky subtidal invertebrates.

KEY WORDS: Habitat loss, biogenic space, canopy algae, invertebrates, function, climate change.

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