

{rokbox title=|Survey area and sampling locations :: Image: Authors|
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Hilmar Hinz, Olga Reñones, Adam Gouraguine, Andrew F. Johnson, **Joan Moranta**, 2019.

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Abstract: The nursery function of coastal habitats is one of the most frequently mentioned and recognized ecosystem services in the valuation of coastal ecosystems. Despite its importance our understanding of the precise habitat parameters and mechanisms that make a habitat important as a nursery area is still limited for many species. The study aimed to establish the importance of different algae morphotypes in providing shelter and food for juvenile coastal fish during the main settlement peaks, in early spring and late summer, in littoral rocky reef systems in the Northwestern Mediterranean. The results of our study showed strong seasonal differences in algae cover, composition and height between the two sampling periods. Overall, during spring the algae were well developed, while in late summer, both density and height, of most algae decreased considerably. Equally, prey biomass, in form of suitable sized invertebrate fauna associated to the algae, decreased. Accordingly, the shelter and food for the fish settling in this habitat during late summer were less abundant, indicating a mismatch between the observed presence of juvenile fish and optimal habitat conditions. Differences in prey densities were detected between algae morphotypes, with structurally more complex algae, such as *Cystoseira spp.* and *Halopteris spp.* consistently containing more prey, independent of season, compared to simpler structured morphotypes such as Dictoytales. The study furthermore related juvenile fish density to habitats dominated by different algae morphotypes. Out of the three-study species (

Diplodus vulgaris

,
Symphodus ocellatus

,
Coris julis

) only

S. ocellatus

showed a significant association with an algae habitat.

S. ocellatus

related positively to habitats dominated by Dictoytales which provided the highest cover during late summer but had the lowest prey densities. A strong association of this species with

Cystoseira

, as reported by other studies, could not be confirmed.

Cystoseira

was abundant within the study area but in a state of dieback, showing loss and reduced height of foliage, typical for the time of year within the study area. It is therefore likely that algae-fish associations are context-dependent and that several algae species may fulfil similar functions. We also discovered that prey biomass did not appear to have an important effect on juvenile abundances. Nevertheless, the availability of prey may influence juvenile fish condition, growth performance and ultimately long-term survival. We therefore suggest that future studies on habitat quality should also include, besides abundance, indicators related to the condition and growth of juveniles.

Keywords: Juvenile fish, Match/mismatch theory, Benthic prey, Habitat complexity, *Cystoseira*, Macroalgae, Labridae, Nursery areas, Dictyoptales, Rocky reefs