

{rokbox title=|Merluccius merluccius :: Foto: Lucía Rueda (COB-IEO)|
thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-gadoids-body-condition-rueda-et-al-2015-thumb.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-gadoids-body-condition-rueda-et-al-2015.jpg|/rokbox}

Lucía Rueda, Enric Massutí, Diego Alvarez-Berastegui and Manuel Hidalgo, 2015. [Effect of intra-specific competition, surface chlorophyll and fishing on spatial variation of gadoid's body condition.](#)

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Abstract: Fish condition indices can be used as biological indicators of the health of individuals and are influenced by numerous external and internal drivers. Like most essential biological traits, they are very sensitive to the spatial heterogeneity occurring in marine ecosystems, which appears at many observational scales. This brings out different ecological processes that can only be revealed either regionally or locally. The scale-dependent spatial variability concerns not only environmental factors, but also anthropogenic activities such as fishing. Understanding these relationships is crucial for improving the spatial management of marine resources, because fish condition considerably affects the sustainability of populations. We explore the influence of density-dependent (intra-specific competition) and density-independent variables (surface chlorophyll *a* concentration and fishing impact) on fish condition of three species of harvested gadoids (*Merluccius merluccius*, *Phycis blennoides*

and

Micromesistius poutassou

) of the benthopelagic communities off the Balearic Islands (western Mediterranean). This area is characterized by high spatial heterogeneity in the environmental processes and fishing impact. Results show contrasting responses in body condition to the investigated covariates, with species-specific and ontogenetic differences sensitive to the spatial scale of analysis. Some of these responses occur at regional level, while others are more sensitive to local variation. Intra-specific competition shows a very clear effect, which depends on the ontogeny, identifying aggregation areas for recruits and limitation of resources for older individuals. Surface chlorophyll *a* has always a species-specific regional effect, despite gadoids have a more benthic behavior. Fishing effort displays a heterogeneous impact on fish condition. While spatially contrasting effects are observed at local scale, non- linear regional patterns occur, with positive effects of fishing pressure at intermediate levels. Models analyzing the influence of external drivers in essential fish biological traits such as body condition should consider the spatial variation in responses, especially in highly heterogeneous areas where anthropogenic activities occur. Failing to do so may hide local ecological processes that can be crucial for the persistence of fish populations, which is of paramount relevance for the regional assessment and spatial management of marine exploited resources.

Keywords: environmental drivers, fish condition, fishing, habitat heterogeneity, local and regional effects, *Merluccius merluccius*, *Micromesistius poutassou*, ontogeny, *Phycis blennoides*, spatial scale, varying-coefficient models, western Mediterranean