

Spatial distribution and migrating behavior of mesopelagic species in the southern Bay of Biscay

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Mesopelagic species play a key role as a link between pelagic and demersal-benthic habitats. However, little effort has been made to describe them in many areas, including the Bay of Biscay (BoB). In this work, we present acoustic recordings of deep scattering layers (DSL) in the Cantabrian Sea (southern BoB) carried out in February, April, July and November 2015 with an EK60 echosounder (18, 38, 70, 120, and 200 kHz). We describe the distribution and migration patterns of mesopelagic species and compare the different scenarios encountered each season. Ground-truthing was based on fishing hauls performed by depth strata with a Multinet (9 nets; 500µm mesh-size). Samples were digitalized on board with a camera, and the images analysed after the survey. Acoustic groups were split with a mask based on acoustic models. Particular effort was made to correctly classify krill using the full Stochastic Distorted Wave Born Approximation model (SDWBA); comparisons with the simplified model will be shown. Swimbladder size was also estimated for mesopelagic fishes using a new methodology, and compared with direct measurements from net samples. Migrating myctophidae were visible at all seasons, but at different depths. Krill was recorded mainly forming swarms in the epipelagic zone, but also in low densities at higher depths. Finally, the bristlemouth *Cyclothone braueri* formed the characteristic static DSL although deeper (500 to 700 m) and weaker than in the Mediterranean Sea and other areas.

Keywords: deep scattering layers (DSL), mesopelagic, krill *Meganyctiphanes norvegica*, *Mauroliccus muelleri*, myctophidae, *Cyclothone braueri*, Bay of Biscay, ecosystem processes, pelagic habitat characterization, animal behavior

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