{rokbox title=|Areas and locations mentioned in the text :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-atlantic-vs-mediterranean-deep-scattering-layers-iberian-peninsula-pena-et-al-2024-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-atlantic-vs-mediterranean-deep-scattering-layers-iberian-peninsula-pena-et-al-2024.jpg{/rokbox}

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Abstract: Deep scattering layers (DSLs) play an important role in pelagic food webs, and are inhabited by the world's most abundant invertebrates. Recent research has begun to reveal latitudinal, longitudinal and bathymetric patterns that overturn the original belief in homogeneous horizontal layers. The Strait of Gibraltar represents one of the most important oceanic gateways in the world and is a key place in the exchange of water masses between the Mediterranean and the Atlantic, but its pelagic ecosystem is poorly known. Its changing bathymetry and associated water currents, both at the surface and in deeper waters, result in a very dynamic environment prone to influence the organisms that inhabit it. Further, the permanent upwelling area in the Alboran Sea and the numerous mud volcanoes that spread around the Gulf of Cadiz are known to provide nutrient remineralization deep in the water column. This study extends knowledge on the spatial dynamics of DSLs layers around the Iberian Peninsula by analysing migrant and non-migrant organisms along a path between the eutrophic upwelling area on the Northwest-Atlantic coast of the Iberian peninsula and the oligotrophic Mediterranean sea on the east side. Four distinct zones were encountered (Atlantic waters, Gulf of Cadiz, Alboran Sea and Mediterranean waters). A 7–8 months time lag with primary production was found for surface and migrant layers that are closely linked to surface dynamics, although upwelling diversity is reflected in their distribution patterns. Patchiness in migrant species west of the Iberian peninsula could be related to intermittent pulses of chlorophyll as well as to eddies developed in the Gulf of Cadiz. On the other hand, non-migratory layers are hardly connected with surface dynamics and are more influenced by deeper processes such as deep currents, intermediate nepheloid layers or water masses boundaries. This study provides further insight into the environmental variables relevant in the interaction between physical and biological processes in the mesopelagic realm. It emphasizes clear differences in the way migrant and non-migrant organisms are linked to the seascape, and presents areas with very distinct distributions and proportions between the two groups. All the above should be taken into account when making global assumptions about mesopelagic species as well as when planning surveys with scattered stations employing tools such as net or optic samplings.

Keywords: Gibraltar strait, Acoustics, Mesopelagic, Currents, Temperature, Salinity, Oxygen, Spiciness, Nutrients, Nepheloid layers, Mediterranean outflow