

{rokbox title=|Hierarchical clustering of the sampled stations considering the abundance of the dominant taxa in the epipelagic layer (0–200 m) after fourth root transformation and a resemblance of Bray-Curtis similarity, segregating the north from the south by the frontal stations (FS) :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-diel-vertical-distribution-cabanellas-2025-thumb-et-al.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-diel-vertical-distribution-cabanellas-2025-et-al.jpg{/rokbox}

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[Diel vertical distribution of copepods during spring in the Northeast Atlantic Ocean](#)

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Abstract: Vertical migration is a rather complex behavior by which multiple species of different sizes move from the meso- and bathy-pelagic zones, where they reside during day to avoid predators, to the epipelagic zone for feeding. Understanding this behavior of zooplankton organisms is key to assess their role in the active transport of carbon in the oceans. The present study disentangles the diel vertical distribution of zooplankton community (mainly copepods) during spring in the Northeast Atlantic Ocean. To address that, 10 stations down to 1900 m depth were sampled using an opening-closing MOCNESS during day- and nighttime. Additionally, we also sampled the epipelagic strata (0–200 m) for microzooplankton (50–200 μm) as well as the mesozooplankton community ($>200 \mu\text{m}$). A total of 15 zooplankton groups were found ($>85\%$ were copepods), and more than 250 species of copepods were identified. The results showed a latitudinal decreasing gradient northward in the number of genera and species, and an increasing gradient in their abundances. A frontal system was observed in the epipelagic layer between 45° and 47°N promoting sharp differences among the northern and southern communities. In this frontal zone, small copepod nauplii and copepodites were rather abundant, being *Paracalanus parvus* the dominant copepod. In the most northern region, we found *Calanus finmarchicus* and a high abundance of *Oithona* spp, while in the southern region *C. helgolandicus*, *Nannocalanus minor* and *Mecynocera clausi* were dominant. A decreasing trend of copepod abundance was observed with depth, segregating the upper 700 m from below. Using the 50 dominant copepod species, five different groups were distinguished in their vertical distributions: (1) the non-migrant epipelagic copepods, (2) copepod migrating from mid-waters to the epipelagic zone at night, (3) copepods abundant in the epipelagic layer but performing reverse migration, (4) the strong migrants moving from the meso- and bathypelagic zones to the epipelagic zone at night, and (5) those just moving into the twilight zone. Our findings highlight the complexity of the diel vertical migration pattern of copepods during spring and their relevant role in the deep-sea of the North Atlantic Ocean.

Keywords: zooplankton, copepod community, diel vertical migration, latitudinal variability, mesopelagic, bathypelagic, North Atlantic Ocean.