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Three-dimensional distribution of larval fish assemblages across a surface thermal/chlorophyll front in a semienclosed sea

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The oceanographic processes involved in marine fronts and their effects on the plankton are still a challenge in the understanding of marine ecosystems. This study examines the relationship of the three-dimensional distribution of larval fish assemblages (LFAs) with hydrography on a tidal-mixing surface thermal/chlorophyll front in the highly productive midriff archipelago of the Gulf of California during summer (August, 2005). Zooplankton samples were obtained on both sides of the front with an opening-closing net (505 mm) in 50-m strata from the surface to 200 m depth. The Bray-Curtis dissimilarity index defined three strata groups with different LFAs. On the cool side of the front, characterized by high chlorophyll, salinity, and dissolved oxygen, an LFA with the lowest larval abundance (97 larvae/10 m²) and low taxa number (44) was defined. On the warm side of the front, where the lowest concentrations of surface dissolved oxygen and surface chlorophyll were recorded, an LFA was defined on the pycnocline, with the highest mean larval abundance and number of taxa (927 larvae/10 m² and 109 taxa); it was composed of epipelagic, mesopelagic, and demersal species. Also on the warm side of the front, but below the pycnocline, an LFA was observed with medium larval abundance and taxa number (126 larvae/10 m² and 28 taxa), formed by mesopelagic species. This assemblage was absent from the cool area to the northwest of the front, mainly from 150 to 50 m depth, where maximum salinity water from the Northern Gulf was found. We conclude that the surface thermal/chlorophyll front had a profound effect on LFAs distribution in the surface layer, while the southward intrusion of maximum-salinity water from the Northern Gulf bounded the LFAs distribution in the deeper layer under the pycnocline. Therefore, in addition to the surface thermal/chlorophyll front, the hydrographic processes associated with the Gulf's seasonal and thermohaline circulation affect the LFAs threedimensional distribution. Similar relationships may occur in other ocean ecosystems.

Palabras clave: Tendencias espaciales, Specialist, thermal-chlorophyll front, Hábitat de cetáceos, connectivity routes

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