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Three-dimensional distribution of small pelagic fish larvae (*Sardinops sagax* and *Engraulis mordax*) in a tidal-mixing front and surrounding waters (Gulf of California)

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Engraulis mordax and Sardinops sagax spawn in the highly productive midriff archipelago region of the Gulf of California, where intense tidal mixing produces a sharp thermal front. We analyzed the three-dimensional larval distribution of both species around the front from data obtained in February 2007 with opening–closing nets (505 mm) in 50 m strata from the surface to 200 m depth. Engraulis mordax preflexion larvae and S. sagax preflexion and flexion larvae were on the warm side of the front in the upper 100 m of the water column, mostly in the .168C mixed layer. However, S. sagax preflexion and flexion larvae tended to be absent from the stations of maximum abundance of E. mordax. The geostrophic jet associated with the front functioned as a boundary by hindering larval advection to the cold side. The wide distribution of E. mordax flexion larvae throughout the area (found down to 150 m) resulted from the species spawning in several regions. The spawning areas and the optimal conditions for E. mordax larvae had a wider range than those for S. sagax. Larval three-dimensional distribution in other ecosystems might differ as function of the species spawning interaction and the evolution of the physical system.

Palabras clave: Tendencias espaciales, Body growth, Three-dimensional distribution, Engraulis mordax and Sardinops sagax

larvae

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