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HCS186 - Ecological niche and patterns of distribution of munida (*Pleuroconodes monodon*) off Peru, and overlapping with anchovy (*Engraulis ringens*) between 1999 – 2006

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Regular monitoring of the distribution, abundance and catch of anchovy (*Engraulis ringens*) has been conducted over the last 50 years in Peru. These parameters vary over several time scales, in particular low frequency cycles of abundance (El Viejo, La Vieja), inter-annual variability (El Niño, La Niña) and seasonal variability. Although observations are not as extensive as for anchovy, the crustacean munida *Pleuroncodes monodon* (range of distribution 7°S - 43°S) is also an important component of the Peruvian ecosystem. Large amounts of munida were occasionally reported during the last 50 years, mainly in the southern part of Peru. Older reports indicate that munida was an important prey item of the diet of apex predators such as tunas during the 1930's and 1940's. Munida has become highly abundant along the Peruvian coast, since the 1997-1998 El Niño event. Acoustic estimates indicate that munida biomass ranged between 0.6 and 3.4 $x10^6$ t from 1998 to 2005. This large amount of munida is mostly restricted to coastal areas and has for a large impact on ecosystem function and trophic dynamics. Munida is now a very important prey for seabirds, mammals and coastal predatory fish including anchovy, that predates on munida's zoea. Also, munida can forage on eggs and larvae of fish, and thus be a predator of the early stages of some of its own predators. Despite its ecological importance, knowledge on munida patterns of distribution and ecological niche is scarce in Peru. Most published works on munida come from Chile where this organism is basically benthic (e.g. Gallardo et al., 1992). In contrast, munida is primarily pelagic in Peru

In this work, using a series of 22 acoustic surveys performed along the Peruvian coast from 1999 – 2006, we describe horizontal and vertical distributions of munida and associated ecological niche based on oceanographic parameters using spatial analyses and a generalized additive modelling (GAM) approach. As anchovy and munida were the two dominant small pelagic organisms during this period we also studied possible interactions between them and estimated the vertical and horizontal overlap between these two species.

Results indicate that munida distribution is strongly related to the cold coastal waters and ranges vertically between the oxycline and the surface. High horizontal overlapping exists between anchovy and munida (Fig. 1), although munida is more restricted to the coastal zone than anchovy. In the vertical plane, overlapping depends on the diel period. During daytime anchovy schools are distributed above the layer (or swarm) of munida with occasional overlapping. During the night anchovy and munida are dispersed and share the same vertical layer. The role of munida in the ecosystem is discussed with special consideration to potential competition for space, and food between anchovy and munida.

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