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Trophic positions of micronektonic organisms in the Mozambique Channel: new information from stable isotopes

by

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ABSTRACT

In the open-sea ecosystems, micronekton are small crustaceans, fishes, and cephalopods which inhabit the vast oceanic habitat bounded by the continental slopes. The majority of micronektonic organisms perform large diel vertical migrations, from depths below 500 m during the day to the surface layers at night, and their aggregating behaviour is strongly impacted by mesoscale features. They are an important food source for top predators such as tunas, seabirds and marine mammals, and they feed mostly on zooplankton. Then, they constitute a strong trophic link between zooplankton and top predators playing an important role in the transfer of energy from low to upper trophic levels in the open-sea pelagic food chains. In spite of their importance, the role of micronekton in the trophic functioning of pelagic ecosystems is poorly documented. Investigations on micronekton will then provide basic elements for an ecosystem approach to tuna fisheries management. In this work, we examined the stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotopic composition of tissue samples of micronektonic species from the Mozambique Channel. Micronektonic organisms overall encompassed a narrow range of isotopic niches, with large overlaps among species. But structures were also evidenced with groups of organisms that can be clustered according to their isotopic signatures: crustaceans had the lowest $\delta^{15}N$ signatures, while cephalopods as flying squids (Ommastrephids : *Sthenoteuthis oualaniensis*) displayed $\delta^{15}N$ signatures close to large fish predators such as yellowfin tunas (*Thunnus albacares*). Mesopelagic fish had intermediate signatures but were segregated in several groups. These results are discussed in terms of size structure and vertical distribution (habitat).