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From the epipelagic zone to the abyss: Trophic positions at two seamounts in the subtropical and tropical Eastern Atlantic - Part I Zooplankton and micronekton

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ABSTRACT

Specific mechanisms, driving trophic interactions within the pelagic community may be highly variable in different seamount systems. This study investigated the trophic structure of zooplankton and micronekton above and around Ampère and Senghor, two shallow seamounts in the subtropical and tropical Eastern Atlantic, and over the adjacent abyssal plains. For the identification of food sources and trophic positions stable isotope ratios ($\delta^{13}C$ and $\delta^{15}N$) were used. $\delta^{13}C$ ranged from -24.7 ‰ to -15.4 ‰ and $\delta^{15}N$ covered a total range of 0.9-13.8 ‰. Based on epipelagic particulate organic matter, zooplankton and micronekton usually occupied the 1^{st}-3^{rd} trophic level, including herbivorous, omnivorous and carnivorous taxa. $\delta^{13}C$ and $\delta^{15}N$ values were generally lower in zooplankton and micronekton of the subtropical waters as compared to the tropical region, due to the differing nutrient availability and phytoplankton communities. Correlations between $\delta^{13}C$ and $\delta^{15}N$ values of particulate organic matter, zooplankton, micronekton and benthopelagic fishes suggest a linear food chain based on a single energy source from primary production for Ampère Seamount, but no evidence was found for an autochthonus seamount production as compared to the open ocean reference site. Between Senghor Seamount and the open ocean $\delta^{13}C$ signatures indicate that hydrodynamic effects at seamounts may modify the energy supply at times, but evidence for a seamount effect on the trophic structure of the pelagic communities was weak, which supports the assumption that seamount communities rely to a large extent on advected food sources.