Food web structure and trophodynamics of deep-sea plankton from the Bari canyon and adjacent slope (Southern Adriatic, central Mediterranean)

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Deep-sea zooplankton represents a key-component of deep-sea ecosystems, linking POM to higher trophic levels, through both vertical migrations from the photic zone and being prey of several megafaunal species, including demersal and benthopelagic organisms. Nevertheless, this key-group in deep-sea ecosystems is far to be well known, especially concerning trophic aspects. In this study, we aimed to depict the trophic web structure of deep-sea zooplankton collected in sediment traps from the Bari canyon and adjacent slope from 600 to 1200 m, and its trophodynamics considering a long time-series dataset from March 2010 to October 2012, by means of stable isotope analysis of nitrogen and carbon. Our results evidenced a complex structure for the deep-sea zooplankton food web with taxa organized in three trophic levels from POM-feeders to ultra-specialized carnivores. Changes in the isotopic composition of deep-sea taxa occurred throughout the sampling period, with significant seasonal differences linked to changes in primary production at surface (with a delay of 1-3 months) and to river discharge. Moreover, the study confirms the important role of submarine canyon for deep-sea zooplankton, acting as an efficient conduit for terrestrial organic matter supply.