



Benthic foraminiferal assemblages in the Cap de Creus canyon and adjacent open slope: Potential influence of dense shelf water cascading and open-ocean convection

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The NW Mediterranean Sea is subjected to episodically intense events of dense shelf water cascading (DSWC) and open-ocean convection (OOC) that ventilate the seafloor and also have important consequences on organic matter inputs to the seabed and sediment dynamics. The influence of the massive physico-chemical disturbance driven by these events on deep-sea ecosystems is poorly known, and, to date, no information is available on the response of benthic foraminiferal assemblages. To provide insights on these gaps of knowledge, in April 2009 we investigated the foraminiferal faunas along the major axis of the Cap de Creus canyon (at 1000, 1900 and 2400 m depth) and at two additional stations located on the adjacent open slope (at 1000 and 1900 m). The area under scrutiny was hit by intense DSWC and OOC events in winters 2005 and 2006, and during winter 2009 an intense OOC event occurred, with detectable consequences observed at > 1500 m depth.

Résumé en anglais

We report here foraminiferal faunas characterized by low densities but relatively high levels of biodiversity at 1000-m depth stations. On the contrary, at the deeper depths, very high densities (associated with low organic matter contents) and strong dominance of the disaster species *Uzbekistania charoides* were observed in the > 63 µm fraction.

The comparison of our results - obtained immediately after an OOC event - to those previously described in spring 2004, before DSWC and OOC events, reveals the presence of largely different foraminiferal assemblages in the two periods. Based on a detailed analysis of the ecological traits of the faunas encountered in the two sampling periods, we suggest that either DSWC or OOC can have a role in shaping deep-sea foraminiferal faunas. Moreover, we contend that, at 1000 m depth, the composition of the foraminiferal assemblages in spring 2009 is suggestive of a resilient stage following the major DSWC events in 2005/2006, whereas the low evenness of faunas at ≥ 1900 m depth is, most likely, the result of the OOC event that occurred in winter 2009, a few months before our sampling.

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