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Sedimentological study of cold-water coral mounds on Pen Duick Escarpment (Gulf of Cadiz): preliminary results of the MD169 cruise

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Cold-water corals are widely distributed along the Moroccan margin in the Northeast Atlantic Ocean. Within the Gulf of Cadiz mud volcanoes, submarine ridges and steep fault escarpments occur, which favour the settlement of scleractinians and build up coral mounds. One of these sites is the Pen Duick Escarpment, situated in the El Arraiche mud volcano field, 35 km offshore the city of Larache. Pen Duick Escarpment is a 6 km long, SSE-NNW oriented, 80 to 125 m high wall with a southwest-facing slope of 8 to 12°. Up to now, 15 coral mounds were recognized on top of the escarpment with an average estimated elevation of 15 m. Although cold-water corals are a common feature on the adjacent cliffs, mud volcanoes and seafloor, no actual living coral has been observed.

This study is based upon three on-mound gravity cores (Alpha, Beta and Gamma mound) acquired by R/V Marion Dufresne in 2008 (MD169). Each mound was cored at least twice to recover both a core for biogeochemical and microbial studies, and another core for sedimentological purposes, in order to link both processes. The sedimentological cores were analysed using different techniques (medical CT scanning, XRF, U/Th dating, stable isotopes, grain-size analysis) in order to obtain a holistic view on the build-up of a mound. The coring, together with present-day seabed observations, revealed the architectural importance of open coral rubble plates in the role of mound building. These graveyards act not only as sediment trap but also as microhabitat for a wide range of benthic organisms.