



Surface distribution of benthic foraminifera on a cold-water coral mound, Porcupine Seabight

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The discovery of up to 300 m high carbonate mound structures, which occur in water depths between 500 to 1200 m along the European continental margin, were intensively studied during the past years. The settlement of cool-water corals (*Lophelia pertusa* and *Madrepora oculata*) on the mounds offers several ecological niches to benthic foraminifera. The major aim of this study was to differentiate between distinct facies areas on top and the closer vicinity of Propeller Mound in the Porcupine Seabight (W off Ireland). The determination of benthic foraminiferal assemblages was performed using Imbrie Kipp's factor analysis with VARIMAX rotation. The distribution of these assemblages was then related to distinct environmental processes.

A total of 11 surface sediments samples from different locations were examined, covering three facies of Propeller Mound: (1) the Fossil Coral Framework facies (FCF facies) on top of the mound, (2) the Dropstone and Sand facies (DS facies) along the mound foot, and (3) the Mud facies in off-mound areas. Hydrographic parameters show that the deeper areas around 900 m water depth are associated with the core of oxygen-depleted Mediterranean Outflow Water (MOW). However, the endobenthic assemblage (*Uvigerina mediterranea*, *Cassidulina laevigata*, *Uvigerina auberiana*, *Thurammina papillata* *Uvigerina peregrina* and *Melonis barleeanum*), dominant within sediments of the Mud facies, does not show any clear correlation to temperature and salinity, but probably to lower dissolved oxygen values within the sediment under the influence of MOW.

Particulate organic matter on the mound is strongly affected by intense currents on which suspension feeders like *Sigmoilopsis schlumbergeri*, *Gyroidinoides neosoldanii*, *Cibicidoides wuellerstorfi*, *Hyalinea balthica*, *Discanomalina coronata*, *Plan-*

ulina ariminensis, *Siphotextularia cf. wairoana*, as well as detritus feeders like *Melonis barleeanum* and *Uvigerina mediterranea* profit. High absolute abundances of generally >1000 ind/g indicate that organic carbon is not a limiting factor. Values <1000 ind/g appear predominantly in samples with abundant dropstones on the sediment surface. Strong currents, sediment winnowing and erosion probably results into unfavourable colonising conditions for some benthic foraminifera. The endobenthic assemblage *Tri-farina angulosa*, *Melonis barleeanum*, *Bulimina marginata*, *Pullenia quinqueloba* and *Cassidulina laevigata* may reflect a group adapted to the environmental stress of the DS facies.

The assemblage mainly consisting of elevated epibenthic species in sediments on Propeller Mound profits from the availability of substrates. The high diversity on the mound is the result of the possibility to settle within one of the three ecological niches of the FCF facies: (1) within the sediment, (2) on the sediment within the coral framework where currents are reduced, and (3) on elevated substrates (living coral patches and fossil coral framework) where currents are strong.