



Vertical Distribution and Microhabitat of Benthic Foraminifera in Nazare Canyon: Relation to Physical Disturbance

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Submarine canyons are dynamic environments that transport sediment from land and shallow marine settings to the deep sea. This physical activity is reflected in the sedimentary regime. For instance, the upper and middle Nazare canyon experience high sedimentation rates (up to 10mm/yr) and suspended particle loads (1-10mg/l). In addition, the sedimentary regime alternates from the erosional upper and middle canyon to the depositional lower canyon. Organisms living in these extreme and unstable environments must adapt to prevailing conditions, and thus the presence of highly specialised faunal assemblages may be anticipated.

The influence of physical disturbance on the ecosystem was studied by determining the vertical species distribution of “living” (rose Bengal stained) foraminifera mostly up to 10cm depth in the sediment. Detailed quantitative analyses were carried out on several stations ranging from 150m to 5000m water depth. In addition, some reference samples were taken on the adjacent shelf and slope.

The microhabitat structure of the benthic foraminifera is clearly influenced by the physical characteristics of the canyon. The highly disturbed upper and middle canyon axes appear nearly barren or exhibit a close to monospecific (*Technitella melo*) assemblage despite the high organic carbon load. In contrast, on the canyon walls or on the isolated terraces where fine grained sediment can accumulate, microhabitat deepens and greater numbers of living foraminifera are found. In addition, on these stations more typical deep infaunal species are present, such as *Chilostomella oolina*, *Nonion barleeaanum* and *Globobulimina* spp. The lower canyon fan is sparsely populated

and foraminifera found are mainly on the surface sediments. The fan assemblage is dominated by arborescent species. The reference stations on the slope and shelf have moderate foraminiferal abundances in comparison to some canyon stations. The microhabitat is shallow and the living foraminifera are found in the top centimetre. This difference between canyon and open slope may be controlled by lower organic carbon concentration in the latter environment.