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An ecological study of live (rose Bengal stained) benthic foraminifera from the Portuguese margin canyons

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Submarine canyons are dynamic environments transporting vast quantities of sediment, together with organic carbon and nutrients, from the shallow seas towards the abyss. The downslope transport of material and the associated turbidity currents can scour and erode the sea floor, redistributing sediment to distal locations. This study aims to investigate and compare live (rose Bengal stained) foraminiferal populations from two canyons, Nazaré and Lisbon-Setúbal, to further our ecological understanding of these unique and active environments.

The Nazaré and Lisbon-Setúbal canyons have comparable oceanographic settings, including narrow shelf, summer upwelling regime and exposure to south-westerly storms in winter. However, while the Lisbon-Setúbal canyons are fed by the rivers Sado and Tagus, the Nazaré canyon has no direct river influence. Despite this, Nazaré has the more active sedimentary regime. The quality and origin of the bulk organic carbon also differ in these two canyons, Nazaré being more enriched in terrigenous material.

Bathymetric distribution and microhabitat of living (rose Bengal stained) foraminifera were investigated in surface sediment cores from 150 to 5000 m depth from both canyon systems, in association with sedimentological and geochemical characteristics.

The more active nature of the Nazaré canyon was clearly reflected in poorly developed foraminiferal populations along the Nazaré canyon axis, as compared to more abundant fauna with better-developed microhabitats in the Lisbon canyon. However, on the upper canyon terraces of Nazaré, away from the zone of active sediment transport, the

fauna was similar in composition and numbers to that found in the Lisbon-Setúbal canyon. The findings imply some degree of homogeneity of benthic foraminiferal assemblages within canyons on this margin, punctuated by anomalous zones of sparse population associated with active sedimentary regimes.