



A new ‘saccamminid’ genus (Rhizaria: Foraminifera), from 4400 m water depth in the Nazaré Canyon (NE Atlantic)

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Abstract

We describe *Bithekammina occulta*, a new monothalamous agglutinated foraminiferan (‘saccamminid’) collected in multicore samples at 4400 m on the terrace of the lower Nazaré Canyon on the Portuguese margin. The test is spherical to oval, up to ~400 µm in length, with a simple circular aperture. The wall has a very smooth surface with a distinct sheen in reflected light. It is <10 µm thick and composed of very fine agglutinated plate-like clay particles and a thin inner organic layer. The most distinctive feature of the new species is that the test is contained within an agglutinated case (‘secondary test’) composed mainly of larger (10–50 µm) quartz grains. The case is equipped with a long, narrow tube that originates near the aperture of the inner test and presumably acts as a channel through which pseudopodia are deployed. Secondary agglutinated structures have been described in a number of foraminifera, but never before in a ‘saccamminid’.

Key words: ‘Saccamminid’, monothalamous foraminifera, Portuguese margin, Nazaré canyon, cyst, secondary agglutinated structure

Introduction

There is a growing appreciation of the importance of monothalamous foraminifera in both coastal (e.g. Habura *et al.* 2008) and deep-water (e.g. Gooday 2002; Gooday 2004; Cedhagen *et al.* 2009) settings. In contrast to multi-chambered foraminifera, these ‘primitive’ forms often have relatively simple tests with ‘soft’ flexible walls. The ‘saccamminids’, which typically have a flask-shaped agglutinated test with a single terminal aperture, constitute one important monothalamous group. ‘Saccamminids’ are particularly common and diverse in the deep sea (Gooday 1986a; Cornelius and Gooday 2004). Here, we describe a new genus and species of saccamminid from the Nazaré canyon on the Portuguese margin. A remarkable feature of this taxon is that the organism is enclosed in an agglutinated case or ‘secondary test’. Secondary agglutinated structures have been described in a number of foraminifera but never, as far as we are aware, in a ‘saccamminid’.

This study is based on material collected as part of HERMES (Hotspot Ecosystem Research on the Margins of European Seas), an integrated project funded by the European Union that terminated in March 2009 and continues as HERMIONE. The main purpose of the HERMES project was to investigate the biodiversity of ‘hotspot’ ecosystems, including submarine canyons, around the European margins (Weaver *et al.* 2004, 2009). The Nazaré Canyon on the Portuguese margin is one of Europe’s largest and most spectacular submarine canyons and a main focus of biological and geological research during HERMES (Tyler *et al.* 2009).

Material and methods

Sampling sites. The Nazaré canyon is located off the southern part of the Portuguese Atlantic coast. The canyon head is located very close to land, but is not associated with a river. The entire system is up to 27 km wide and 94