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Late Miocene marine ostracodes from the Azores, North Atlantic

Ricardo P. Meireles, Elsa Gliozzi, Costanza Faranda, António Frias Martins & Sérgio Ávila

Located in the southern part of the northern Atlantic Ocean (36°55' to 39°45' N, 24°45' to 31°17' W), nine oceanic islands form the isolated archipelago of the Azores about 1500 km off the coastal of Portugal. Nowadays, the pattern of the sea surface currents in the North Atlantic is dominated by the Gulf current that flows and has a direction pattern of west to the east, from the American coasts to Europe (Johnson & Stevens 2000; Rogerson et. al. 2004).

The purpose of this work is to document the ostracod species that were present during Late Miocene time in the Azores and trace some palaeoecological and palaeobiogeographical scenarios. The outcrops studied are scattered along the south coastal areas of Santa Maria (Fig. 1). The Malbusca section yielded ostracod material from the lower part. The base of the section (where exposed) is formed by volcanic conglomerates and lavas belonging to the underlying Anjos Complex. The top of the section is erosive and covered by basalt flows.

A total of 3 samples were analysed from the Upper Miocene, Malbusca section. The ages of the sequences are based on strontium-isotope stratigraphy (Kirby et al. 2007). The samples were processed in the Sedimentology Laboratory of the University of Azores using conventional techniques for the study of fossil ostracods. The hand-picked specimens were photographed using the scanning electron microscope (SEM) at the Biology Department of University of Azores. The material is made up mainly by carapaces, more rarely by loose valves. Therefore, internal details are not usually available to help the taxonomic identification. For the nomenclature of suprageneric taxa, we adopted a new revised proposal of Liebau (2005). Ostracod specimens studied in this work are housed in the fossil collection of the Department of Biology of the University of the Azores (São Miguel Island).

The ostracod assemblage from the Miocene of the Malbusca outcrop was found to be of low diversity. A total of specimens recovered, representing 6 families, 10 genera, 13 species include new species and one undetermined taxon (Fig. 2). *Loxoconcha* (3 species) and *Hermanites* (2 species) were the most diverse genera.

The species were: *Xestoleberis paisi* Nascimento, 1989, *Loxoconcha stellisfera* Müller, 1894, *Loxoconcha rhomboidea* (Fischer, 1855) *Callistocythere oertli* Nascimento, 1989, *Leptocythere azorica* Meireles & Gliozzi sp. nov., *Hermanites memo-*

rans Moos subsp. *vitreus* Moos, 1966, *Hermanites dameriacensis* Keij, 1958, *Aurila* (*Euarila*) *larieyensis* Moyes, 1961, *Hemicythere* sp. 1, *Neonesidea rochae* Nascimento, 1989, *Paracypris* sp. 1, *Heliocythere magnei* (Keij, 1953), and, gen. et sp. indet.

The majority of these are ornamented and typical of epi-neritic (~30–40 m depth) and probable in warmer water conditions, represented by the genera *Xestoleberis*, *Loxoconcha*, *Callistocythere*, *Leptocythere*, *Hermanites*, *Aurila*, *Heliocythere*, *Hemicythere*, *Neonesidea* and *Paracypris*.

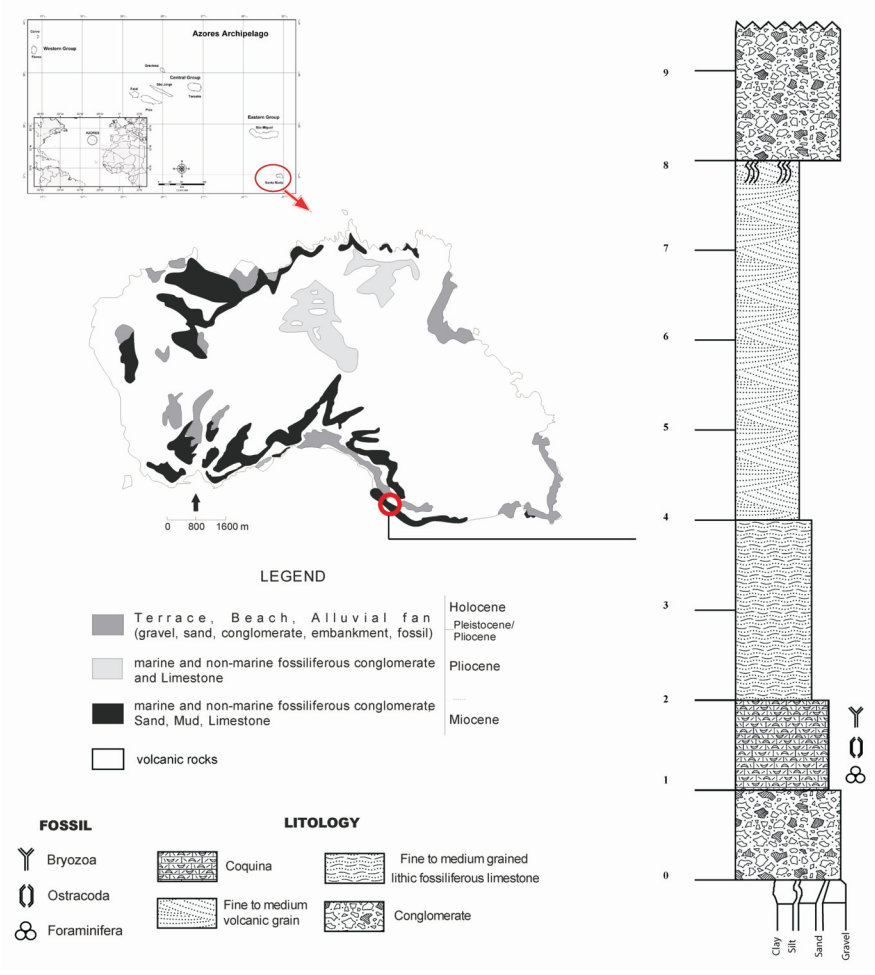

Fig. 1: Location map of the study area. Sedimentological map modified by Serralheiro et al. (1987). Lithostratigraphy Malbusca section.

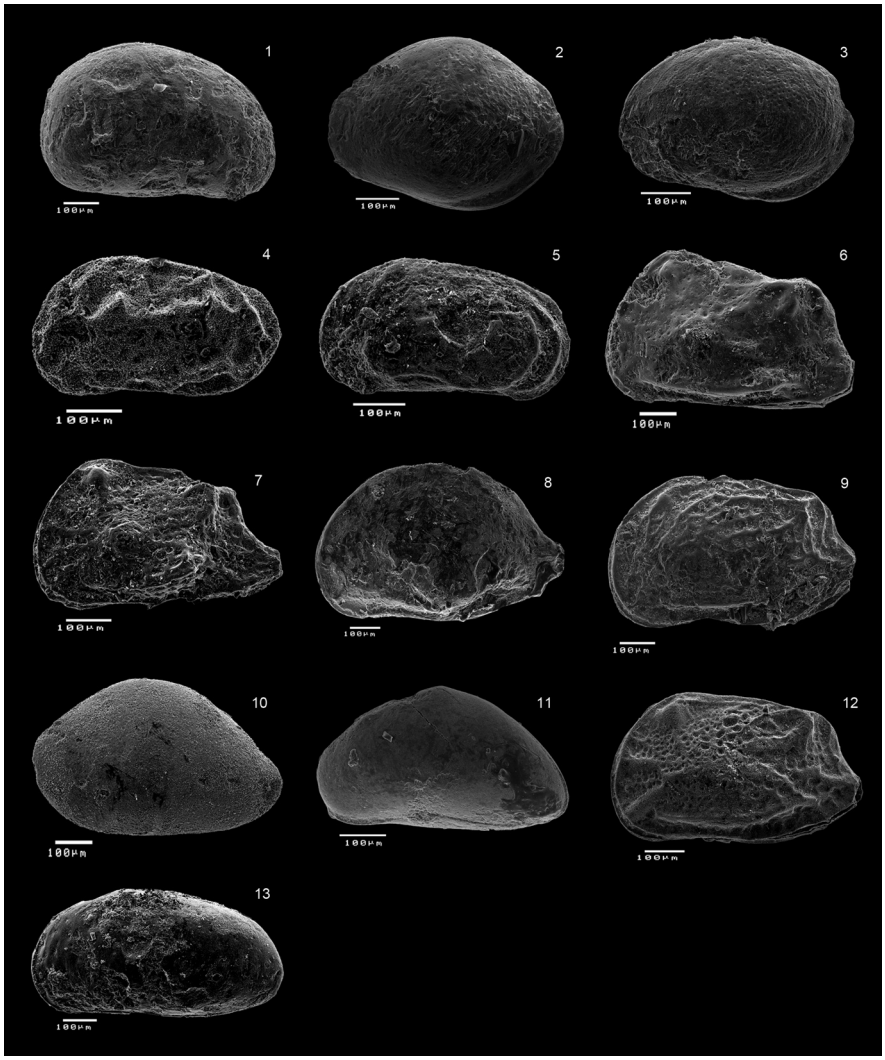

Fig. 2: 1) *Xestoleberis paisi* Nascimento, 1989; 2) *Loxoconcha stellisfera* Müller, 1894; 3) *Loxoconcha rhomboidea* (Fischer, 1855); 4) *Callistocythere oertlli* Nascimento, 1989; 5) *Leptocythere azorica* Meireles & Gliozzi sp. nov.; 6) *Hermanites memorans* Moos subsp. *vitreus* Moos, 1966; 7) *Hermanites dameriacensis* Keij, 1958; 8) *Aurila* (*Euarila*) *larieyensis* Moyes, 1961; 9) *Hemicythere* sp. 1; 10) *Neonesidea rochae* Nascimento, 1989; 11) *Paracypris* sp. 1; 12) *Heliocythere magnei* (Keij, 1953); 13) gen. et sp. indet.

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Authors addresses:

Ricardo P. Meireles

Departamento de Biologia, Universidade dos Açores, Ponta Delgada, and Centro do CiBio da Universidade dos Açores, Ponta Delgada, and Centro do IMAR da Universidade dos Açores, Horta, and MPB - Marine PalaeoBiogeography Working Group, University of Azores, Portugal

ricomeireles@gmail.com

Elsa Gliozzi & Costanza Faranda

Dipartimento di Scienze Geologiche, Università Roma Tre, Italy

António Frias Martins & Sérgio Ávila

Departamento de Biologia, Universidade dos Açores, Ponta Delgada, and Centro do CiBio da Universidade dos Açores, Ponta Delgada, and MPB - Marine PalaeoBiogeography Working Group, University of Azores, Portugal