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Zullobalanus santamariaensis sp. nov., a new late Miocene barnacle species of the family Archaeobalanidae (Cirripedia: Thoracica), from the Azores

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Abstract

A new species of Archaeobalanidae barnacle is described from the late Miocene and early Pliocene of Santa Maria Island (Azores). Samples were collected primarily from outcrops at Malbusca and "Pedra-que-Pica". *Zullobalanus santamariaensis* **sp. nov.** is endemic to the Azores archipelago and until the discovery of this material, the genus was known only from the Southern Hemisphere. For such a long-range distribution we assume a combination of planktotrophic larval development, sea-surface oceanic currents and transport by cetaceans. This study endorses the elevation of the subgenus *Zullobalanus* to generic level.

Key words: Balanomorpha, Archaeobalanidae, *Zullobalanus*, Azores, Miocene

Introduction

The Azores archipelago is located in the central North Atlantic Ocean and consists of nine volcanic islands. Of these, Santa Maria (lat. 37º 23' N; long. 24º 45' W), which has rocks dated as having been formed 8.12 million years ago (Abdel-Monem *et al.* 1975; Feraud *et al.* 1980), is the only island with a marine fossil record.

Although palaeontological research in the Azores began in the second half of the 19th century, scientific reports on the subject are rare until the turn of the 20th century (Callapez & Soares 2000; García-Talavera 1990; Madeira *et al.* 2007). In 2000, researchers from the Department of Biology of the University of the Azores visited the fossil outcrops of Santa Maria Island and found well preserved marine fossil assemblages of late-Miocene/upper-Pliocene and Pleistocene age (Ávila *et al.* 2002; Ávila *et al.* 2007; Ávila *et al.* 2008a; Ávila *et al.* 2008b; Ávila *et al.* 2009a; Ávila *et al.* 2009b; Ávila *et al*. 2010; Kirby *et al.* 2007; Janssen *et al.* 2008; Kroh *et al*. 2008). Since 2002, the Marine PalaeoBiogeography Working Group of the University of the Azores has organized "*Palaeontology in Atlantic Islands*", a series of international workshops held on Santa Maria Island to study the geology and geomorphology of the island, the petrology and geochemistry of magmatic rocks, the volcanostratigraphy, the palaeontology, the palaeoecology and the palaeobiogeography of invertebrates within these strata (i.e. bryozoans, foraminifera, molluscs, echinoderms and crustaceans – although the latter did not include fossil barnacles). Over the last 150 years at least 12 expeditions to the Azores have described the recent barnacle fauna (Southward 1998) but apart from brief mention of *Balanus*

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