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Contribution to the knowledge of the genus *Vestalenula* Rossetti & Martens, 1998 (Crustacea, Ostracoda, Darwinulidae), with the description of a new species, *V. carinata* n. sp., from the island of Florianópolis, Brazil

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Abstract

The genus *Vestalenula* is the most species rich in the putative ancient asexual ostracod Family Darwinulidae. Several new Recent species were described from various continents, mostly based on carapace shape and structure. These species were found in a variety of aquatic and (semi-) terrestrial habitats, including springs, streams, interstitial waters, leaf litter in forests and in splash zones of waterfalls. Here, we describe *V. carinata* n. sp. from moist leaf litter, collected from the Brazilian island of Florianópolis. The species belongs to the *danielopoli*-lineage within the genus because of its elongated internal tooth in the left valve and elongated external keel on the right valve. It can be distinguished from all other species in this group by its size, its L/H ratio and the relative length of the keel. The relationship of this new species to the enigmatic, putative marine species *Semidarwinula terraenuxforma* Choe, 1988, is discussed. An identification key to species of the genus is provided.

Key words: taxonomy, morphology, Darwinulidae, ancient asexuals

Introduction

A recent assessment of freshwater animal diversity showed that there are approximately 2000 living species of freshwater ostracods, of which only about 30 belong to the Family Darwinulidae (Martens *et al.* 2008). Due to this low extant diversity, darwinulids were for a long time regarded as a less important group within the Ostracoda. This view, however, started to change in the 1990s, when interest developed in the reproductive mode of these ostracods. Butlin and Griffiths (1993) and Judson and Normark (1996) proposed that darwinulid ostracods could have survived as obligate parthenogens through a long and successful evolutionary history. According to Martens *et al.* (2003), there is no evidence for sexual populations in darwinulids for any post-Triassic (c. 208 Myr ago) fossil records. Such a hypothesis challenges evolutionary theories that postulate that parthenogenetic lineages are doomed to early extinction (e.g. Maynard Smith 1978, 1998). This acceptance of darwinulid ostracods as potential ancient asexuals, along with the taxonomic revision of the family by Rossetti and Martens (1998), which has led to the recognition of five extant genera (*Darwinula*, *Alicenula*, *Vestalenula*, *Penthesilenula* and *Microdarwinula*), triggered a series of papers about this group (Rossetti & Martens 1999, Martens & Rossetti 2002, Pinto *et al.* 2003, Smith *et al.* 2006, Artheau 2007, Rossetti *et al.* 2011). The genus *Isabenula* was recently described in the family by Rossetti *et al.* (2011).

Several recent studies contributed to knowledge of the ecology of the Darwinulidae. Van Doninck *et al.* (2003a) investigated the tolerance of four darwinulid species to salinity and temperature variations under