



Two new *Byrathis* species (Copepoda: Calanoida) from the deep South Atlantic and Southern Ocean and first description of an adult male

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Abstract

Two new species, *Byrathis divae* **sp. nov.** and *B. penicillatus* **sp. nov.**, are described from females collected in the deep waters and at abyssal depths above the sea bed, and are the first representatives of the genus recorded from the South Atlantic. Species of *Byrathis* Markhaseva & Ferrari, 2005 are divided into 2 groups. The first group, which includes both new species, contains medium sized copepods (from 2.1 to 4.9 mm) with a nude genital double somite, maxillule proximal basal endite with 3 setae, maxillule exopod with 6 or more setae, and maxilla endopod with 3 worm-like and 5 brush-like sensory setae. The second group contains small species (less than 1.4 mm) that share the surface ornamentation of the genital double somite, maxillule proximal basal endite with 2 setae, maxillule exopod with 5 setae or less, and maxilla endopod with 5 worm-like plus 3 brush-like sensory setae. For the first time an adult *Byrathis* male is described after *Byrathis arnei* Schulz, 2006 from the Southern Ocean. Among males of Clausocalanoidea that possess sensory setae on maxilla and maxilliped, the *Byrathis* male is well defined by symmetric antennules (ancestral segments XXII–XXIII fused on both sides) and poorly expressed P5 coxa and basis asymmetry, with both exopods 3-segmented and the right leg uniramous.

Key words: Clausocalanoidea, Diaixidae, calanoids, taxonomy, benthopelagic, zoogeography

Introduction

The near-bottom calanoid copepod fauna from the deep-sea habitats is still poorly known, but our knowledge of the biodiversity of this habitat slowly increases with the increasing number of benthopelagic collections (Bradford-Grieve 2004 and references therein). Each new deep-sea expedition adds new information on the diversity of the near-bottom calanoid copepods, e.g. in recent DIVA cruises rich calanoid collections were obtained by an epibenthic sledge (Brenke, 2005). Processing of these samples is still in progress and, while numerous new species and genera have already been described (Markhaseva *et al.* 2008; Markhaseva & Schulz 2009, 2010), a great number of new taxa still awaits description. Studied samples contain deep water benthopelagic calanoid genera, all of which are usually low in abundance. New findings in the South Atlantic are registered for ten near-bottom genera: *Paramisophria* T. Scott, 1897, *Lamiantennula* Markhaseva & Schulz, 2006, *Alrhabdus* Grice, 1973, *Bradyetes* Farran, 1905, *Pseudotharybis* T. Scott, 1909, *Parkius* Ferrari & Markhaseva, 1996, *Omorius* Markhaseva & Ferrari, 2005, *Brodskius* Markhaseva & Ferrari, 2005, *Sensiava* Markhaseva & Schulz, 2006 and among these also the genus *Byrathis*.

Recent studies of the benthopelagic copepod fauna showed that the deep-water calanoid genus *Byrathis* is widespread. Members of this genus were found in the vicinity of the sea bed at depths between 1535 and 3022 m in the western North Atlantic and North Pacific, and in the Arctic and Southern oceans (Grice & Hulsemann 1970; Markhaseva 1998; Markhaseva & Ferrari 2005; Schulz 2006). Herein are given first records from the South Atlantic, and at the same time from the greatest depths registered for the genus (5415m). Two new species of *Byrathis* are found in the collections of the German expeditions DIVA–I, DIVA–II and DIVA–III (Latitudinal Gradients of