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A NEW GENUS OF SPELEOPHRIID COPEPOD (COPEPODA: MISOPHRIOIDA: SPELEOPHRIIDAE) FROM A CENOTE IN THE YUCATAN, MEXICO

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INTRODUCTION

The family Speleophriidae currently accommodates eight genera and 19 species of misophrioid copepods. Seven of these genera and 17 of the species occur exclusively in anchialine habitats. BOXSHALL & JAUME (2000) examined the biogeography of the speleophriids known at the time and inferred that the extreme disjunct distribution pattern exhibited by the family resulted from a dispersal and colonization episode that took place prior to the closure of the Tethys Sea. Subsequent discoveries of new species of *Speleophria* Boxshall & Iliffe, 1986 from Croatia (KRŠINIĆ, 2008) and from Australia prompted KARANOVIC & EBERHARD (2009) to question the validity of this interpretation. Here we report the discovery of a new genus and species of speleophriid from a cenote in Mexico and examine its relationships with the existing genera.

MATERIALS AND METHODS

The new genus was collected in 2004 from Cenote Carwash (location: 20°16'26" N; 87°29'11"W) near Tulum, Quintana Roo, Mexico. They were collected using a plankton net, in the downstream drain passage, at or below the halocline at depths of 19–23 m. More information about this cenote can be found in SUÁREZ-MORALES *et al*. (1996).

In order to determine the relationships of the new genus, we carried out a comprehensive phylogenetic analysis of the family, using PAUP version 4.0b10. The matrix comprised 56 characters and 19 taxa including the misophriid *Fosshageniella glabra* Jaume & Boxshall, 1997, which was used as outgroup for the analysis. A heuristic search was performed and all characters were treated as unordered.

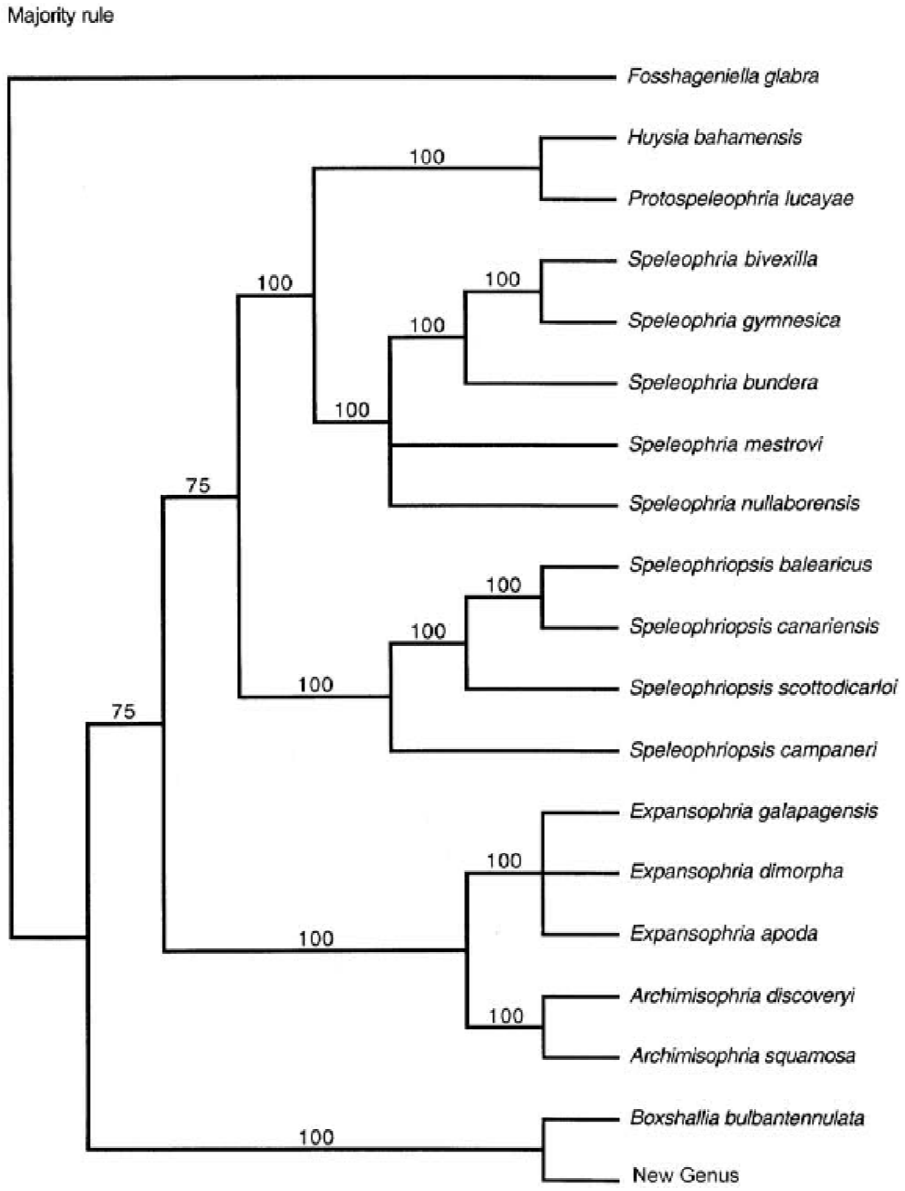

Fig. 1. Phylogenetic relationships between genera and species of the family Speleophriidae, as estimated by majority rule tree (numbers on branches are bootstrap values).

RESULTS AND DISCUSSION

The new genus is characterised by the lack of a posterior extension of the dorsal cephalic shield, so the first pedigerous somite is exposed in both sexes. The urosome of the female comprises the fifth pedigerous somite, a large genital double-somite, and three free abdominal somites. Each of the free somites is capable of extreme telescoping within the preceding somites and extensive hyaline frills are present on these somites. The 6-segmented urosome of the male is not modified to allow such marked telescoping of the somites.

The adult female antennule is 27-segmented. In the adult male the antennule has a complex double geniculation and there are segmental fusions distal to the primary geniculation. The first segment of the antennule possesses a conspicuous lateral swelling in both sexes. The first swimming leg has a 2-segmented endopod

and 3-segmented exopod. Both rami of legs 2 to 4 are 3-segmented, but the setation of all legs is relatively reduced. The fifth legs of both sexes are uniramous and are located adjacent to the ventral midline. The distal segment, representing the exopod, carries two apical setal elements in the female compared to four in the male.

The phylogenetic analysis provides substantial support for the existing generic-level classification of the family. It recovered four main lineages (Fig. 1) within the Speleophriidae. The most basal lineage comprised the new genus from Mexico and the monotypic genus *Boxshallia* Huys, 1988 known from Lanzarote in the Canary Islands. The next lineage comprised the two deep-sea hyperbenthic species of *Archimisophria* Boxshall, 1983, plus the species of *Expansophria* Boxshall & Iliffe, 1987, known from anchialine habitats in Lanzarote, the Galapagos, Sardinia (in the Mediterranean) and Palau. The species of the genus *Speleophriopsis* Jaume & Boxshall, 1996 formed the next branch, which was sister to the final lineage consisting of three genera, *Speleophria*, *Huysia* Jaume & Boxshall, 1998 and *Protospeleophria* Jaume & Boxshall, 1998.

The new genus is most closely related to *Boxshallia*, with which it shares the distinctive lateral swelling on the first segment of the antennule in both sexes.

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