



## A new subfamily, *Vulcanocalliacinae* n.subfam., for *Vulcanocalliax arutyunovi* n.gen., n.sp. from a mud volcano in the Gulf of Cádiz (Crustacea, Decapoda, Callianassidae)

PETER C. DWORSCHAK<sup>1,3</sup> & MARINA R. CUNHA<sup>2</sup>

<sup>1</sup>Dritte Zoologische Abteilung, Naturhistorisches Museum, Burgring 7, A 1010 Wien, Austria.

E-mail: Peter.Dworschak@nhm-wien.ac.at

<sup>2</sup>CESAM (Centro de Estudos do Ambiente e do Mar), Departamento de Biologia, Universidade de Aveiro, Campus de Santiago, 3810-193 Aveiro, Portugal. E-mail: mcunha@bio.ua.pt

<sup>3</sup>Corresponding author

### Abstract

A new ghost shrimp, *Vulcanocalliax arutyunovi* n.gen. n.sp., is described and accommodated in the new subfamily Vulcanocalliacinae. This subfamily shares with the Bathycalliacinae Sakai & Türkay, 1999 the presence of epipods on the third maxilliped and the first four pairs of pereopods, but differs by the absence of cardiac sulci and a dorsomedian carina. This is the second record of a thalassinidean crustacean from deep-sea chemoautotrophic communities.

**Key words:** Callianassidae, Vulcanocalliacinae, *Vulcanocalliax*, new subfamily, new genus, new species, Gulf of Cádiz, mud volcanoes, deep water

### Introduction

Productive ecosystems associated with cold seeps are sustained by the release of methane-rich fluids of thermogenic and/or biogenic origin and by sulphide production via sulphate reduction in the sediment, which are used as the main sources of energy for free-living and endosymbiotic microbial production (Olu *et al.*, 1997). In a comprehensive review of cold seep communities, Sibuet & Olu (1998) mentioned 24 known locations from the Atlantic, the Eastern and Western Pacific Oceans and the Mediterranean Sea. Since then, cold seep occurrence has proved to be a widespread phenomenon and many other locations have been discovered both in active and passive margins. Mud volcanoes are seepage-related geomorphological features and provide strong indication of fluid venting (Ivanov *et al.*, 1998). The most extensive area of active mud volcanism known from the European margins was recently discovered in the Gulf of Cádiz (southern Iberian and northern Moroccan margins, west of Gibraltar Strait) and has been intensively investigated within the framework of the UNESCO/IOC Training-Through-Research (TTR) Programme (e.g. Kenyon *et al.*, 2000; Pinheiro *et al.*, 2003; Van Rensbergen *et al.*, 2005; Stadnitskaia *et al.*, 2006).

The Gulf of Cádiz contains over 30 mud volcanoes at depths between 200 and 4000 m, with varying degrees of methane expulsion activity. Since 1999 an exploratory biological program has been carried out during yearly TTR cruises. Decapods were found to be common inhabitants of mud volcanoes: pandalid shrimps, galatheids and large crabs [e.g. *Paromola cuvieri* (Risso, 1816)] were often sighted during deep-towed video observations but seldom found in benthic samples. Up to now, eleven decapod species have been collected but, except for the xanthid crab *Monodaeus couchi* (Couch, 1851) that occurs in several mud volcanoes, most records are based on single specimens. In Captain Arutyunov mud volcano, one of the most active sites, an unusual member of the Callianassidae has been found.