



Article

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***Calliixina chalmasii* (Brocchi, 1883) comb. nov. (Decapoda: Axiidea: Callianassidae: Eucalliicinae), a ghost shrimp from the Middle Miocene of Europe, with reappraisal of the fossil record of Eucalliicinae**

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Abstract

A detailed study of chelipeds of two Middle Miocene burrowing ghost shrimp taxa, *Callianassa chalmasii* Brocchi, 1883, and *Callianassa rakosiensis* Lörenthey, 1897, based on isolated propodi revealed that they are conspecific—the latter species is based on the minor cheliped of the former species. Material coming from several roughly coeval localities of Austria (early 'Badenian'), Hungary (late 'Badenian') and Slovakia (early 'Sarmatian') provided sufficient data for redescription of *C. chalmasii* and its reassignment to the genus *Calliixina* (subfamily Eucalliicinae). As such it is the first recognized representative of the genus in the fossil record. It is argued that for the Eucalliicinae, the following features are diagnostic: a square P1 manus usually converging distally, the presence of a ridge on the lateral surface at the base of fixed finger, and a relatively short fixed finger, often with a triangular tooth. For reliable generic assignment within the Eucalliicinae both chelipeds (propodi), major and minor, should be present.

Key words: Ghost shrimp, Callianassidae, Eucalliicinae, *Calliixina chalmasii* **comb. nov.**, Middle Miocene

Introduction

Callianassidae Dana, 1852 is a distinct family of fossorial heterochelous shrimps predominantly inhabiting shallow intertidal and subtidal marine environments, mainly in the tropics and subtropics (Dworschak 2000, 2005b). Today callianassids represent important components of marine and estuarine environments and are considered as true ecosystem engineers (Berkenbusch & Rowden 2003; Berkenbusch *et al.* 2007). They are among the most commonly found decapods in the fossil record; however, because of the delicate structure of most cuticular surfaces, only chelipeds, which are usually heavily calcified, are likely to be preserved (Bishop & Williams 2005). Many extant callianassid genera currently recognized (see De Grave *et al.* 2009 for comprehensive listing) are based mainly on morphology of weakly calcified parts, which have very poor fossilization potential. Thus, the fossil material usually lacks the diagnostic characters used for extant taxa. The taxonomic importance of chelipeds (first pereopods) in modern taxa was recognized by Manning & Felder (1991). They pointed out that some characters occurring on the merus (usually in combination with other features of hard part morphology) can be used for generic assignment. The present contribution builds on this basis and develops it further by arguing that at least in some genera the morphology of propodi also can be of significant taxonomic importance.

More than 150 fossil species have been described under the collective taxon “*Callianassa*” (Schweitzer *et al.* 2010). No attention has been paid to many callianassid species since their first description, and most of the fossil species of “*Callianassa*” should be considered different from *Callianassa* *sensu* Manning & Felder (1991) or Ngoc-Ho (2003). Rather, fossil “*Callianassa*” represents a heterogeneous mixture of several independent genera.

Callianassa chalmasii Brocchi, 1883 was described by Brocchi (1883) from the upper 'Badenian' (lower Serravallian) strata of Rákos (Budapest area, Hungary). In 1897 Lörenthey described another species as *Callianassa rakosiensis* from the same locality. Veiga Ferreira (1961) described *Callianassa espichelensis* Veiga Ferreira, 1961 from the Miocene (Tortonian) of Portugal. Müller (1984) considered *C. espichelensis* to be a junior