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## Phylogenetic relationships of the family Sphaeromatidae Latreille, 1825 (Crustacea: Peracarida: Isopoda) within Sphaeromatoidea based on 18S-rDNA molecular data

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### Abstract

Based on 18S-rDNA sequences of 97 isopods including 18 Sphaeromatoidea, we show Sphaeromatidae, Valvifera, Serolidae, and Ancinidae is a well supported clade. The within clade relationships of these taxa are not as definitively demonstrated because taxon sampling for some groups is still limited. In our analyses the Sphaeromatidae are shown to be unequivocally monophyletic. This is contrary to the morphology-based analysis by A. Brandt and G. Poore in 2003, which included only five Sphaeromatidae and found the family to be paraphyletic. The Ancinidae are also upheld, and the Valvifera is the sister taxon to Serolidae. Surprisingly *Plakarthrium* (Plakarthriidae) is nested within the Sphaeromatidae in most analyses. We point out short-comings in our sampling and suggest areas which would benefit from better sampling. We also review the long and convoluted nomenclatural history of the Sphaeromatoidea, Sphaeromatoidea, and Sphaeromatidae.

**Key words:** Isopoda, Sphaeromatoidea, Sphaeromatoidea, Sphaeromatidae, Ancinidae, Tecticipitidae, 18S-rDNA, phylogeny

### Introduction

This contribution assesses the proposed monophyly of the Sphaeromatoidea Latreille, 1825 (Brandt & Poore 2003) and the paraphyly of the Sphaeromatidae and their relationship to the other suborders and superfamilies within the Isopoda with 18S-rDNA sequence data. We summarize the long history of the group's defining characteristics and also provide a chronological summary of nomenclature for the Sphaeromatidae, Sphaeromatoidea, and Sphaeromatoidea.

The Sphaeromatidae Latreille, 1825 is the largest family of free-living marine Isopoda with 100 genera (and many more undescribed) and more than 690 species (Schotte *et al.* 2008 onwards). Sphaeromatids are mostly small (3–10 mm, very few achieve 2 cm, e.g. *Ceratocephalus* Woodward, 1877, *Calcipila* Harrison & Holdich, 1984 and some *Exosphaeroma* Stebbing, 1900), often cryptic isopods. They are among the most frequently encountered of marine isopods on intertidal shores and shallow depths, reaching their greatest diversity in the southwestern Pacific (e.g. Australia and New Zealand with more than 263 species, or 37% of all named species; see Poore, Lew Ton & Bruce 2002; Poore 2005; Poore & Bruce 2009). Few genera and species extend beyond 100 m depth (Bruce 1994). Their morphology is hugely diverse (Fig. 1), ranging from the simple smooth-bodied ‘pill-bug’ forms to those with