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On Mesozoic laetmogonid sea cucumbers (Echinodermata: Holothuroidea: Elasipodida)*

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Abstract

A comparative systematic survey of fossil Mesozoic laetmogonid sea cucumbers (Elasipodida) and their relatives is presented. A re-examination of the fossil record shows that only 13 fossil taxa can be recognised as belonging to this group. Four further known 'laetmogonid' taxa can be regarded as *incertae sedis*. An analysis of the results supports the following taxonomic changes. Palaeocaudinidae Boczarowski, 2001 represents a junior synonym of the Laetmogonidae Ekman, 1926. The subfamily Staurocaudininae Boczarowski, 1997 is restricted to the type species of *Staurocaudina*. The new family Palaeolaetmogonidae comprises probable stem group members of the Laetmogonidae. Three new species (*Palaeocaudina rugia*, *Priscolaetmogone oloughlini*, *Palaeolaetmogone frankwiesei*) are described from Late Cretaceous sediments of Europe. Two new genera (*Palaeolaetmogone*, *Priscolaetmogone*) are erected. The geographic distribution and phylogenetic relationships of Mesozoic and Cenozoic laetmogonid holothurians are analysed and discussed.

Key words: Europe, India, Triassic, Jurassic, Cretaceous, systematics, Elasipodida, Holothuroidea, Echinodermata, new genus, new taxa

Introduction

Macroinvertebrate communities of the deep sea are characterised by high biodiversity (*e.g.*, Belyaev 1966; Hessler & Sanders 1967; Zenkevič 1970; Wolff 1977; Grassle 1989; Rex *et al.* 1993). This includes various groups of the Holothuroidea, like the Myriotrochidae (Apodida), Synallactidae (Aspidochirotida), Deimatidae, Elpidiidae, Psychropotidae and Laetmogonidae (all Elasipodida) confined to bathyal, abyssal and hadal depths (*e.g.*, Agatep 1967; Hansen 1956, 1967, 1975; Gebruk 1990; Lambert & Boutillier 2011).

Modern laetmogonid sea cucumbers (Figs. 1–2) were first recorded from the "Challenger" expedition of 1872–76 (Théel 1879, 1882) and were later reported from nearly all marine deep-water environments (*e.g.*, Sluiter 1901; Mitsukuri 1912; Hansen 1975; Pawson 1978, 1983; Madsen & Hansen 1994; Thandar 1998, 1999; Rogacheva *et al.* 2009; Solís-Marín *et al.* 2009; Massin & Hendrickx 2011).

Members of this family are medium-sized with an elongate, more or less cylindrical gelatinous body and well-defined diagnostic wheels. Up to the present, 6 genera with around 17 modern species

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