
Assessing the biostratigraphic and palaeo(bio)geographic potential of Mesozoic Trigoniida (Bivalvia)

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Abstract

The order Trigoniida is a major clade in the Bivalvia, dating back to the Silurian and surviving with a single relic genus, *Neotrigonia*, in Australian waters today. During the Mesozoic, Trigoniida were cosmopolitan, highly diversified and abundant, particularly in shallow marine environments. Out of 2250 marine nominal species-level taxa currently contained in our database, approximately 150 are Palaeozoic, 1850 are Mesozoic (Triassic: 400; Jurassic: 800; Cretaceous: 650) and only 30 are Cenozoic. Slightly more than 200 names are as yet unassigned, or are nomina nuda. We assess spatial and stratigraphic distributions of trigoniid families and superfamilies during the Mesozoic and identify patterns of evolution and expansion. At present, distribution is based on type localities only. However, given that the majority of species-level taxa occur at a single locality, or in a single country or region, we assume that global patterns are readily captured. Our data document the rapid expansion of Trigoniida in the Triassic and the turnover related to the Triassic-Jurassic extinction. Furthermore, increasing provincialism at family level during the Jurassic and Early Cretaceous, as well as the gradual demise of several clades during the Late Cretaceous are evident. We conclude that Mesozoic Trigoniida can be useful index fossils down to stage level, and their expansion dynamics map the availability and connectivity of siliciclastics-dominated shelf areas.

Keywords: Bivalvia, palaeogeography, Triassic, Jurassic, Triassic, biostratigraphy

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