

A REVISION OF THE SPECIES OF *BOLMA* RISSO, 1826 (Gastropoda: Turbinidae)

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ABSTRACT

All Australian and New Zealand fossil taxa and all world living taxa are revised in the genus *Bolma* Risso (= *Oobolma* Sacco, = *Ormastraliium* Sacco, = *Tylastraliium* Sacco, = *Pseudastraliium* Schepman, = *Incilaster* Finlay, = *Galeoastraea* Habe, = *Hirasazaea* Habe). The genus is contrasted with related genera using shell and radular characters, and all recognised taxa in *Bolma* are diagnosed and figured. New taxa named are *Bolma anacanthos* n. sp., Oligocene, Victoria; *B. austroconica* n. sp., Oligocene, Victoria; *B. flindersi darraghi* n. subsp., Upper Eocene, Victoria; *B. kermadecensis* n. sp., Recent, Kermadec Islands; *B. somaliensis* n.sp., Recent, East Africa; and *B. tamikoana flava* n. subsp., Recent, Malagasy Republic. *Senobolma* Okutani, 1964 is ranked as a subgenus of *Bolma* Risso. Living taxa newly recorded from Australia are *B. guttata millegranosa* (Kuroda & Habe), *B. guttata* subsp?, *B. henica* (Watson), and *B. tamikoana tamikoana* (Shikama).

INTRODUCTION

The gastropod genera related to *Astraea* Röding (*Bolma* Risso, *Astraliium* Link, *Guildfordia* Gray, *Lithopoma* Gray, *Pomaulax* Gray, etc.) have smooth surfaces or finely to coarsely gemmate sculpture, a very low to very prominent row (or rows) of peripheral spines that in many species are situated on a weak to marked peripheral angulation, and heavy calcareous opercula that place them in the family Turbinidae. They are often included in a separate subfamily *Astraeinae* (= *Bolmidae* Delpy, 1942, p. 181) but several typical turbinids have granular sculpture (e.g., *Modelia granosa* (Martyn), New Zealand; *Euninella gruneri* (Philippi), South and south Western Australia) and some species of *Turbo* Linné have a row of peripheral spines (e.g., *Turbo* (*Batillus*) *cornutus* (Solander in Lightfoot), in which peripheral spines may be absent or small to very large). The opercula of most "Astraeinae" are oval, whereas most Turbininae have circular opercula. The opercula of species of *Bolma* are oval, circular or intermediate in shape. Apart from the enigmatic Triassic genus *Rothpletzella* Bohm, 1895, (Knight *et al.* 1960, p.1264, fig. 170, 1) both the "subfamilies" Turbininae and Astraeinae are known earliest in Upper Cretaceous rocks (Knight *et al.* 1960). In the absence of any distinguishing shell characters other than that many members have a peripheral angulation, and of any difference in stratigraphic range, and because of the intergrading opercula features, we do not recognise a subfamily for the genera related to *Astraea*.