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## Three new species of *Ammonicera* from the Eastern Pacific coast of North America, with redescriptions and comments on other species of Omalogyridae (Gastropoda, Heterobranchia)

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### Abstract

The family Omalogyridae comprises some of the smallest known marine snails. Like all micromolluscs, they have been historically neglected and are underrepresented in faunistic surveys. Based on a few focused studies of the family, 15 valid omalogyrid species were previously recognised in the Indian and Pacific Oceans. To these, we add 3 new species based on a morphological analysis of material in the dry collection of the Natural History Museum of Los Angeles County, applying light and scanning electron microscopies. The new species, *Ammonicera mcleani*, *A. mexicana* and *A. sleursi*, are the first omalogyrid species described from the Eastern Pacific coast of North America. Redescriptions of the Australian omalogyrids *Ammonicera sucina* (Laseron, 1954) and *Omalogyra liliputia* (Laseron, 1954) are also presented, detailing for the first time ultrastructural aspects of their shell morphology. Additionally, we present here the first record of *Ammonicera binodosa* Sleurs, 1985b in Sri Lanka, introduce the new combination *Ammonicera vangoethemi* (Sleurs, 1985c) for *Omalogyra vangoethemi*, and formally remove *Transomalogyra* Palazzi & Gaglini, 1979 from Omalogyridae by fixing its type species as *Homalogryra densicostata* Jeffreys, 1884. Finally, we present lists, geographic records and a bibliography of all currently recognised omalogyrid species in the Indian, Pacific and Antarctic Oceans, as well as an update to a previously published compilation of the Atlantic and Mediterranean representatives of the family.

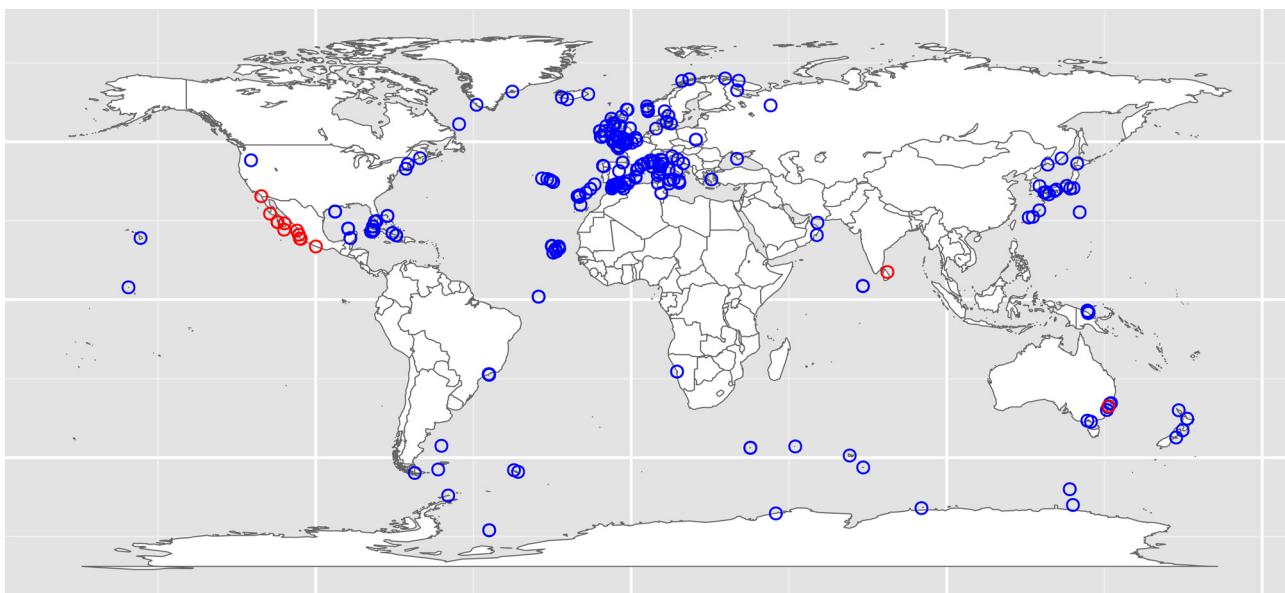
**Key words:** *Omalogyra*, *Transomalogyra*, *Helisalia*, biodiversity, systematics, micromolluscs

### Introduction

Characterised by adult shell diameters well within the size range of protozoans, representatives of the family Omalogyridae G.O. Sars, 1878 are arguably the smallest known gastropods (Bieler & Mikkelsen, 1998; Gofas & Warén, 1998; Habe, 1972). Omalogyrids live in shallow marine environments worldwide, commonly dwelling and grazing on algae (Bieler & Mikkelsen, 1998; Fretter, 1948). Two species of the family are known to be hermaphrodites (Baeumler *et al.*, 2008; Simone, 1997), and the two whose mode of development is known hatch as crawling juveniles from egg capsules (Franc, 1948; Fretter, 1948; Gofas, 2011). The living species are grouped in three genera, *Omalogyra* Jeffreys, 1859b, *Ammonicera* Vayssiére, 1893, and *Retrotortina* Chaster, 1896.

Omalogyrids are currently placed in a superfamily of their own within the paraphyletic “lower heterobranch” gastropods (e.g. Bouchet *et al.*, 2005; Haszprunar, 1988; Healy, 1993). However, their exact phylogenetic relationships, in particular the supposed closer relationship to the Architectonicoidae, are still unclear (e.g. supported by Dinapoli & Klussmann-Kolb, 2010, but not by Baeumler *et al.*, 2008).

At the species level, the systematics of the family is also poorly understood because, like most micromolluscs, omalogyrids have been historically neglected and are underrepresented in faunistic surveys. Most omalogyrid species have been described only recently in studies specifically focused on the family (e.g. Rolán, 1992a, b; Sleurs, 1985a, b, c). Similarly, distributional information is available only for areas targeted by such studies and it is nonexistent even for large regions whose malacofauna is generally well-known, such as the Pacific coast of North America (Fig. 8).



**FIGURE 8.** Records of specimens of the family Omalogyridae. Blue and red circles represent literature data and records presented in this paper, respectively. Coordinates were taken from literature sources whenever available, or translated from geographic names using the online services by Claus *et al.* (2014) and GeoNames (2014). Sources of records: Ávila (2003), Ávila & Azevedo (1997), Ávila, Cardigos, *et al.* (2004), Ávila, Santos, *et al.* (2005), Babio & Thiriot-Quiévreux (1974), Backeljau *et al.* (1984), Baeumler *et al.* (2008), Ballesteros *et al.* (1986), Baluk (1975), Beck *et al.* (2006), Bieler & Mikkelsen (1998), Borja (1987), Bosch *et al.* (1995), Bucquoy *et al.* (1882–1886), Bullock (1969), Buzzurro *et al.* (1999), Casellato & Stefanon (2008), Castellanos (1989), Chambers (2008), Chaster (1896), Chernyshev (2003), Cornet & Marche-Marchad (1951), Costa (1861), Dantart *et al.* (1990), Demir (2003), Egorova (1991), Engl (2012), Forbes & Hanley (1850–1853), Fretter (1948), Fretter & Graham (1978), Gaglini (1993), Giribet & Peñas (1997), Gofas (2011), Gofas & Warén (1998), Gordillo *et al.* (2005), Habe (1972), Habe & Tuchiya (1998), Harms (1993), Hasegawa (2000), Healy (1993), Jeffreys (1859a, 1867), Kay & Switzer (1974), Keats *et al.* (1999), Laseron (1954), Lima *et al.* (2011), Luque (1986), Marin & Ros (1987), Martins *et al.* (2009), McLean (2007), Monterosato (1869, 1884), Nordsieck (1972), Olabarria & Chapman (2001), Palazzi (1988), Peñas *et al.* (2006), Philippi (1841), Powell (1940, 1979), Redfern (2001), Revkov & Nikolaenko (2002), Rolán (1992a, b, 2005), Rolán *et al.* (2009), Sars (1878), Sasaki (2008), Segers *et al.* (2009), Simone (1997), Sleurs (1985a, b, c), Streb (1908), Suter (1908), Thorson (1941, 1944), Trigo Trigo & Otero Schmitt (1987), Tunnell *et al.* (2010), Vafiadis (2010, 2013), Vayssiére (1895), Warén (1991), and Zelaya (2005).

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