

Description of *Granulina lapernai* spec. nov. (Gastropoda, Marginellidae) from the Mediterranean Sea

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Based on shell characters, a new taxon belonging to the subfamily Granulininae Covert & Covert, 1995, is here described from the Mediterranean Sea as *Granulina lapernai* spec. nov. All material originates from a restricted area near the Strait of Messina. This new species, represented by 26 specimens, including six subadults, was compared with type material of *Granulina guttula* La Perna, 1999, and of *Gibberulina occulta* Monterosato, 1869.

Key words: Gastropoda, Marginellidae, *Granulina lapernai* spec. nov., taxonomy, Mediterranean Sea.

INTRODUCTION

The genus *Granulina* Jousseaume, 1888, includes a group of small *Marginella*-shaped marine gastropods, recently moved back to the family Marginellidae Fleming, 1828, from the family Cystiscidae Stimpson, 1865 (La Perna, 1999; Boyer & Rolán, 2004; see below for taxonomic hierarchy). It is a speciose genus and in the Mediterranean Sea is represented

by 11 species according to both WoRMS (World Register of Marine Species, available at <http://www.marinespecies.org>) and CLEMAM (available at <http://www.somali.asso.fr/clemam>) websites. In the course of sample sorting carried out on sediments collected off the coast of Scilla (Strait of Messina, Italy), several unidentified specimens belonging to *Granulina* were found which could not be allocated morphologically to any of the species currently known from the Mediterranean basin. Therefore we propose the new species *Granulina lapernai* spec. nov. Extensive research in the literature and comparisons with other species, particularly with *Granulina mediterranea* Landau, La Perna & Marquet, 2006 (nomen novum for *Granulina guttula* La Perna, 1999) and *Granulina occulta* (Monterosato, 1869), support the novelty of the taxon that is here described.

MATERIALS AND METHODS

We examined: 26 specimens of *G. lapernai* spec. nov. (see below for type material); the holotype and 18 paratypes of *Granulina guttula* La Perna, 1999; 185 specimens of *G. mediterranea* from the type locality, CS-PM collection; 5

syntypes of *Gibberulina occulta* Monterosato, 1869 from the type locality (MCZR N°17212). All the material examined consists of empty shells only. The morphometric and descriptive terminologies adopted are according to Gofas (1992), Coover & Coover (1995), La Perna (1999), Landau et al. (2006) and Silva et al. (2011). La Perna (1999) considered combinations of the following characters as diagnostic: shell shape and outline, parietal callus, labial denticulation, columellar folds, rostrations (anterior and posterior), position of maximum diameter related to shell length, length/diameter ratio.

Abbreviations: CS-PM, private collection Carlo Smriglio-Paolo Mariottini (Roma, Italy); D, diameter; H, height; MCZR, Museum of Zoology of Rome (section collections of Malacology); MZB, Museum of Zoology Bologna (collection of the Laboratory of Malacology, University of Bologna); SEM, Scanning Electron Microscopy.

SYSTEMATICS

Family Marginellidae Fleming, 1828

Subfamily Granulininae Coover & Coover, 1995

Granulina Jousseume, 1888.

Type species (monotypy): *Marginella isseli* Nevill & Nevill, 1875, non Sowerby, 1846. Type material illustrated by Bouchet & Danrigal (1982:20, fig. 57).

Granulina lapernai spec. nov. (Figs 5a-6b,10-12)

Type material. — 26 specimens (including 6 subadults) without soft parts, dredged at a depth of 45 m, from coralligenous bottom off the coast of Scilla, Calabria, Strait of Messina, Mediterranean Sea, Italy, 38.26°N, 15.719°E. The holotype (MZB N°49666) and paratype A (MZB N°49667) are stored at MZB; paratypes B-Y are stored in the private collection CS-PM (Rome, Italy).

Description. — Shell small, ovate, moderately elongated, maximum diameter slightly posterior to shell mid-height; spire immersed, last whorl enveloping previous ones; posterior rostration poorly defined, rounded, more evident in some individuals; anterior rostration pronounced, elongated,

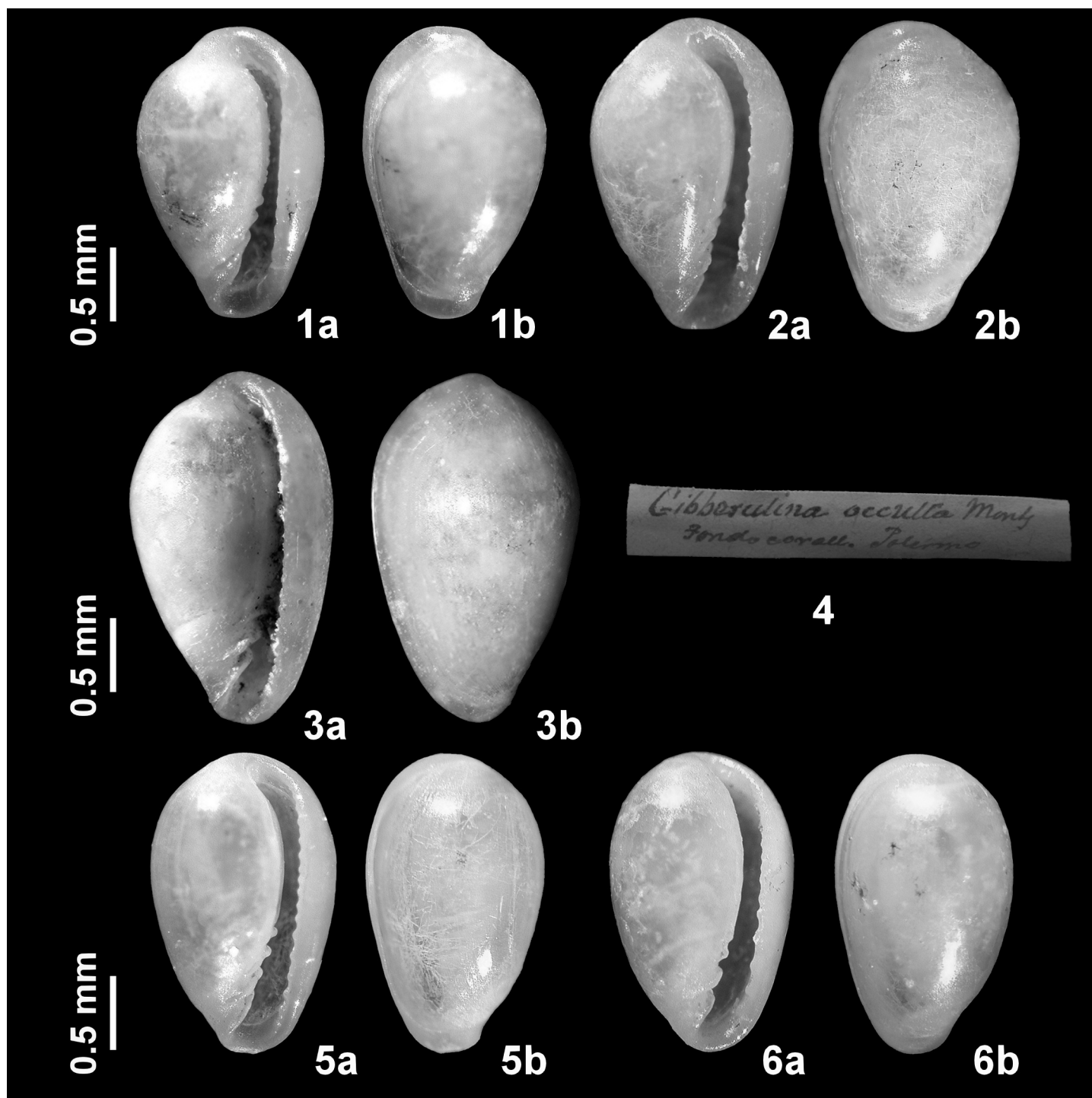
centrally located on axis of shell coiling. Aperture narrow, elongated, slightly wider anteriorly, with a rather smooth alteration in the steepness of the shell profile. Lip thick, with well defined internal denticles, irregular in strength and spacing. Labial varix strong. Four columellar plications inside aperture, the lowermost two more evident. Parietal callus narrow, not well defined. Shell surface smooth, shiny; color vitreous white. Animal unknown. Dimensions of holotype: 1.9 mm (H) × 1.3 mm (D); paratype A: 1.8 mm (H) × 1.3 mm (D).

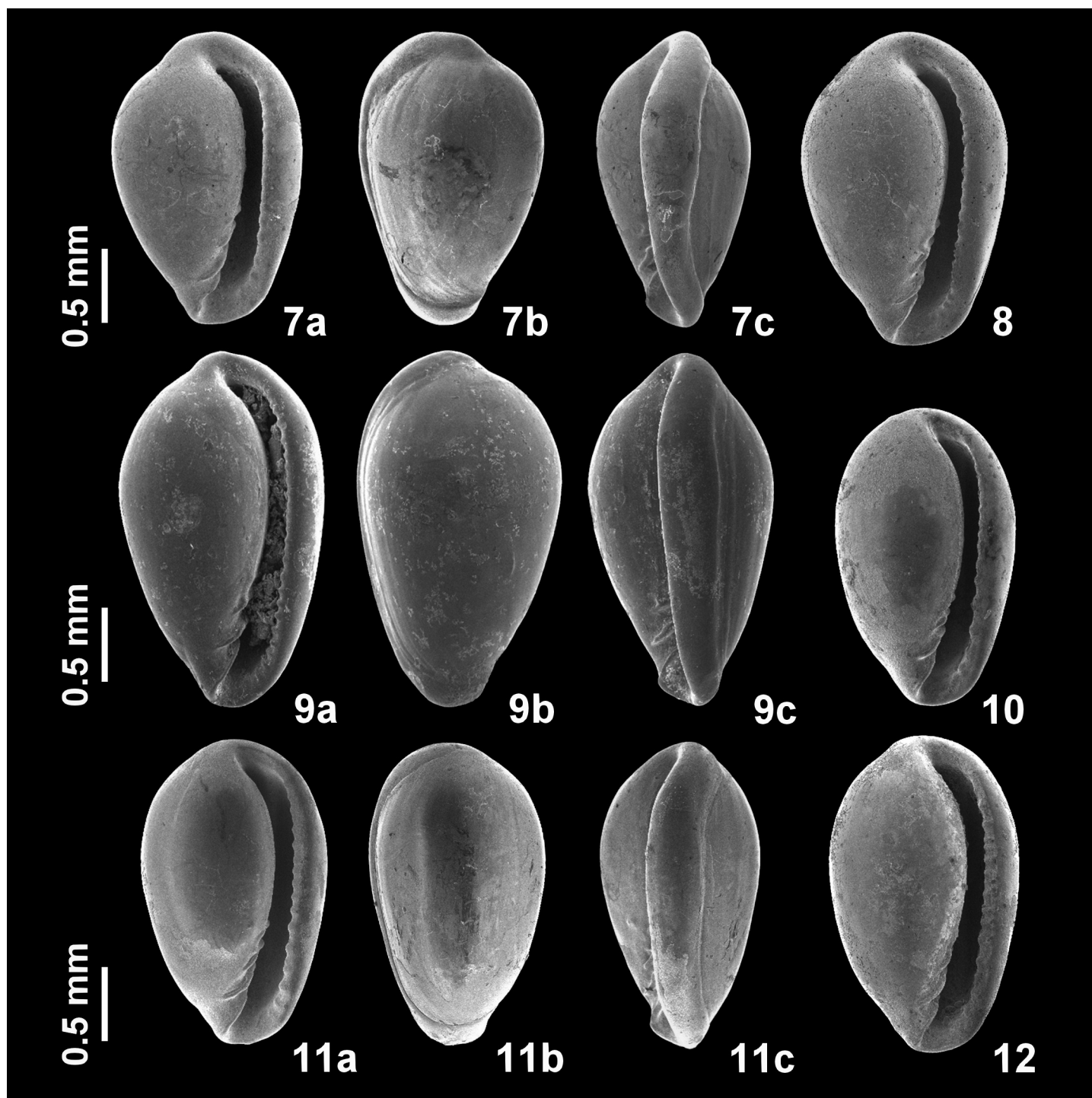
Distribution. — Known only from type locality (Scilla, Calabria) and Punta del Faro (Messina, Sicily), Strait of Messina.

Etymology. — Named after Rafael La Perna, who has greatly contributed to the knowledge of the genus *Granulina*.

Remarks. — *Granulina lapernai* spec. nov. has previously been figured as *G. guttula* by Giannuzzi-Savelli et al. (2003: 280, fig. 723) and Scaperrotta et al. (2012: 87). In addition to a comparison with the Recent species with a Lusitanic distribution, *G. lapernai* spec. nov. was compared with *Granulina mediterranea* Landau, La Perna & Marquet, 2006 (nomen novum for *Granulina guttula* La Perna, 1999), which appears to be morphologically close to the new species. Observation of the type material of *G. mediterranea* has confirmed the distinctness of the two taxa (Figs 1a-2b, 7a-8). An additional comparison was carried out on a lot of 185 topotypical specimens of *G. mediterranea*, which corroborated the morphological differences between the two species. Although *G. lapernai* spec. nov. superficially resembles *G. mediterranea*, it differs by being more slender and elongate, distinctly egg-

Figs 1a-6b. *Granulina* species. **1a, b**, *Granulina mediterranea* Landau, La Perna & Marquet, 2006; *G. guttula*, holotype (1.92 × 1.26 mm), off Ponza Island, eastern Tyrrhenian Sea, 40°52'23N, 12°55'85E, 84 m depth. **2a, b**, *G. guttula*, paratype (2.1 × 1.3 mm), with the holotype. **3a, b**, *Gibberulina occulta* Monterosato, 1869, syntype (2.4 × 1.5 mm). **4**, original label Monterosato collection, MCZR. **5a, b**, *Granulina lapernai* spec. nov., holotype (1.9 × 1.3 mm), off Scilla coast, Calabria, southern Tyrrhenian Sea, 45 m depth. **6a- b**, *Granulina lapernai* spec. nov., paratype A (1.8 × 1.3 mm), off Scilla coast, Calabria, southern Tyrrhenian Sea, 45 m depth.





shaped rather than pear-shaped, much less posteriorly rostrated, with labial teeth thicker and columellar folds more evident and prominent. In addition the two taxa have a slight difference in mean size, *G. lapernai* spec. nov. being smaller than *G. mediterranea* (H = 1.38 and H = 1.48 mm, respectively). It should also be noted that *G. mediterranea* and *G. lapernai* spec. nov. were collected at different depth ranges. The former occurs on the outer shelf, while the latter was found on the inner shelf.

According to its general shape, *G. lapernai* spec. nov. can be grouped with *Granulina elliptica* La Perna, 2000, and *Granulina choffati* La Perna, Landau & Silva, 2003, which are Pliocene species with a similarly elongated elliptic shape. *Granulina lapernai* spec. nov. has been also compared with five syntypes of *Gibberulina occulta* Monterosato, 1869, which we consider the morphologically closest species (Figs 3a-4, 9a-c). SEM photographs demonstrate the differences between these two taxa, *G. occulta* being larger (syntypes mean H = 1.67 mm), less cylindrical and more pyriform in shape, with a maximum diameter distinctly posterior to the shell mid-height, and having a more pronounced posterior rostration, stronger columellar folds and smaller labial denticulations.

The genus *Granulina* seems to be represented by species with a characteristic rapid speciation and a predisposition to colonize environments of the deep shelf and epibathial (La Perna, 1999). Most of the *Granulina* species, both Mediterranean and extra-Mediterranean, show narrowly restricted, mostly endemic, areas of distribution (Gofas, 1992; La Perna, 1999). The distribution of *G. lapernai* spec. nov. as currently known is confined to the Strait of Messina (also including

Figs 7a-12. *Granulina* species, SEM photographs of uncoated type material. **7a-c**, *Granulina mediterranea* Landau, La Perna & Marquet, 2006; *G. guttula*, holotype (1.9 × 1.26 mm), off Ponza Island, eastern Tyrrhenian Sea, 40°52'23N, 12°55'85E, 84 m depth. **8**, *G. guttula*, paratype (2.1 × 1.3 mm), with the holotype. **9a-c**, *Gibberulina occulta* Monterosato, 1869, syntype (2.4 × 1.5 mm). **10**, *Granulina lapernai* spec. nov., paratype A (1.8 mm × 1.3 mm). **11a-c**, *Granulina lapernai* spec. nov., holotype (1.9 × 1.3 mm), off Scilla coast, Calabria, southern Tyrrhenian Sea, 45 m depth. **12**, *Granulina lapernai* spec. nov., paratype B (2.1 × 1.3 mm).

the misidentifications reported by Giannuzzi-Savelli et al. [2003: 280, fig. 723] from Scilla, Calabria and by Scaperrotta et al. [2012: 87] from Punta del Faro, Messina, Sicily). The Messina Strait has been considered a separate Mediterranean biogeographical microsector (Bianchi, 2004), inhabited by rich benthic communities and some particular assemblages that are unknown in other Mediterranean regions (Giacobbe et al., 2007). The high endemism and species richness of *Granulina* can probably be attributed to restricted gene flow and a high rate of speciation, likely connected with a nonplanktotrophic larval development (La Perna, 1999).

There has been a continuous increase in the number of *Granulina* species described as new to science in recent decades. The systematics of the genus now seems to be well documented for the Recent and fossil species of the Mediterranean Sea (Gofas, 1992; Smriglio & Mariottini, 1996, 1999; Smriglio et al., 1998; La Perna, 1999, 2000; Giannuzzi-Savelli et al., 2003; La Perna et al., 2003; Landau et al., 2006; Silva et al., 2011), as well as for the Recent eastern Atlantic (Fernandes, 1987; Gofas & Fernandes, 1988; Fernandes & Rolán, 1991; Gofas, 1992; Pin & Boyer, 1995; Rolán & Fernandes, 1997; Boyer & Rolán, 1999; Smriglio et al., 2000; Boyer, 2001).

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