

## A new species of *Putzeysia* Sullioti, 1889 (Gastropoda Eucyclidae) from the Ionian Sea (Italy)

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### ABSTRACT

A new species of the genus *Putzeysia* Sullioti, 1889 (Gastropoda Eucyclidae) is here described from the infralittoral rocky bottoms of Catania: *P. rickyi* n. sp. Empty shells have been found in a shell grit collected at the base of a prehistoric lava escarpment at low depth. The new species is placed in *Putzeysia* on the basis of morphological characters. In the Mediterranean Sea this genus is represented by a single species, *P. wiseri* (Calcara, 1842), also known for other Lusitanic and North-eastern European localities. A comparison with close similar congeneric species allowed to distinguish differences on both shell and environment of the new species.

### KEY WORDS

Gastropoda; Eucyclidae; *Putzeysia*; Ionian Sea; Sicily.

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### INTRODUCTION

The genus *Putzeysia* Sullioti, 1889, whose systematic position was discussed in Guidastrì et al. (1984), belongs to Eucyclidae (Marshall, 2020) and includes four extant species: the most known bathyal *P. wiseri*, from Mediterranean Sea, Lusitanian and Northern Atlantic regions, and three other only recently described species, i.e. *P. cillisi* Segers, Swinnen et De Prins, 2009, from Madeira, *P. franziskae* Engl et Rolán, 2009 and *P. juttae* Engl et Rolán, 2009 both from Canary islands. Only one fossil species is currently known of this genus, *P. clathrata* (Aradas, 1847), type species of the genus (Sullioti, 1889), but it is considered as synonym of the extant Mediterranean species (Marshall, 2021), erroneously in our opinion.

During ARA divers along the shoreline of Catania, at the depth of 38 meters, three shells of the genus *Putzeysia* have been found inside few kilos of shell grit collected in August 2021 by the first Author at the base of a prehistoric lava escarpment.

This finding has been considered surprising because of the low bathymetry, unusual for the Mediterranean species. Further studies on this material revealed significant morphological differences with the Mediterranean congener. Compared to the other extra-Mediterranean species, which show analogies concerning the bathymetric distribution, the shell of the newly found species revealed greater difference than in *P. wiseri*. Under these circumstances, the Sicilian species is here described as new.

### MATERIAL AND METHODS

About 3 kg of shell grit were manually collected and placed inside a sack-shaped net which retains a fraction greater than 1mm inside. Sediments were regularly washed with fresh water added with sodium hypochlorite in low concentrations, dried and sieved. Then, shell specimens were picked out from the >1/2/3 mm fractions. Specimens were examined and measured under a stereomicroscope,

and photographed with a Canon EOS 700D camera with a Tamron 60mm lens, in multifocal shots. Photographs were processed with the combineZM software. Subsequently, images were converted to black and white and the balance of lights and shadows was modified to obtain more contrasted images which highlight the morphological characteristics of the shells. The specimens were also examined uncoated under a LMU Tescan Vega Scanning Electron Microscope in Low Vacuum modality, to investigate its micromorphology.

ACRONYMS. NC: Andrea Nappo malacological collection (Cagliari, Italy). MSNC: Museo di Storia Naturale di Comiso, Italy. CR: Agatino Reitano malacological collection (Tremestieri Etneo, Catania, Italy). CS: Danilo Scuderi malacological collection (Piano Tavola, Belpasso, Italy).

## RESULTS

### *Systematics*

Classis GASTROPODA Cuvier, 1795  
 Subclassis VETIGASTROPODA Salvini-Plawen, 1980  
 Ordo SEGUENZIIDA Haszprunar, 1986  
 Superfamilia SEGUENZIOIDEA Verrill, 1884  
 Familia EUCYCLIDAE Koken, 1896  
 Genus *Putzeysia* Sullioti, 1889  
 Type species: *Trochus clathratus* Aradas, 1847

#### *Putzeysia rickyi* n. sp.

<https://zoobank.org:act:2ADA5CF8-5CD0-4F6D-8022-B0C4B15798D5>

MATERIAL EXAMINED. Holotype, Catania, Sicily, Italy, 23.VIII.2021, legit A. Reitano, shell grit at the base of a lava escarpment 38 meters depth, MSCN 4853. Paratype A, same data of the holotype (CS). Paratype B, same data of the holotype (CR).

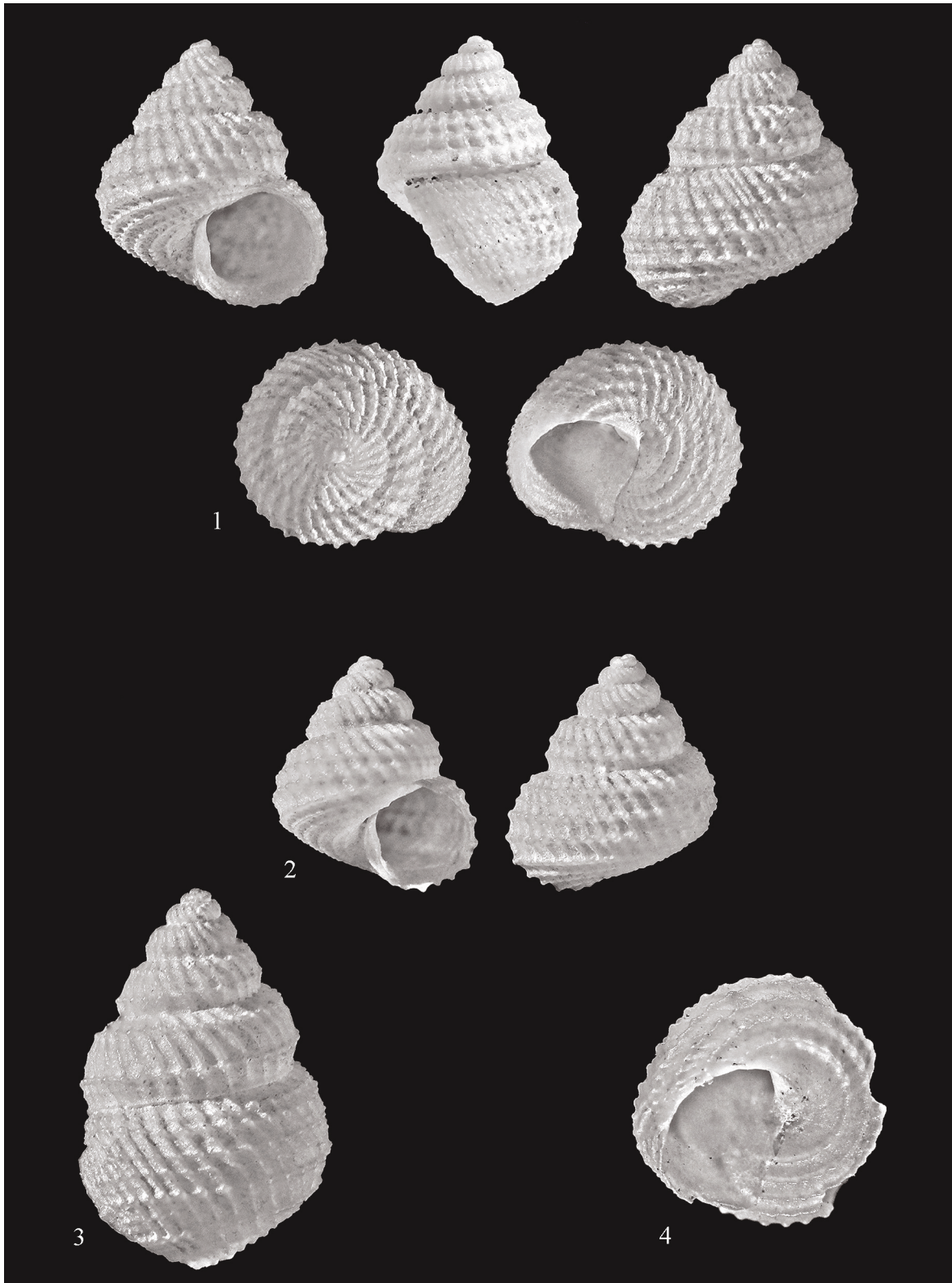
DESCRIPTION OF HOLOTYPE. Shell turbinoid (height 4 mm, width 3.2 mm) thin, globose, with 5.5 spiral whorls, the last one rounded representing more than 45% of the total height. Protoconch tilted up, with about 1.25 whorls, a diameter of 410µm and a nucleus of about 210µm. Under strong magnification the protoconch appears partially scarificated, but delicate papillae are visible on its sides. The opening has the edge slightly folded outwards. From the first whorl of the teleoconch numerous, delicate, irregular and discontinuous spiral lines start: diverging in the abapical area, downwards below. Teleoconch whorls

with axial ribs: 20 on the first whorl, 27 on the penultimate, about 38 on the last whorl, which are prosclyne and narrower than the interspaces. At the beginning of the penultimate turn a sub-sutural cord appears; at about halfway of the same whorl the basal cord turns away from the suture making it appear canalculated and deeper. On the last whorl, in an apertural view, 5 spiral cords are present (the subsutural one smaller and close to the next one), which become 8 in the last half of the whorl, close to aperture. They cross over the axial ribs, forming nodules at the intersections. Below the end of the spire, 5 nodulous cords run down to the base, crossed by thin axial ribs forming smooth nodules. Aperture rounded, peristome sharp, slightly serrated due to the end of the spiral cords. There are not internal nodules. Umbilicus narrow. The columella is straight, with a faint fold and an everted border. Colour milky white. Periostracum not present (Figs. 5–7).

VARIABILITY. Paratype A (height 3.6 mm, width 3.2 mm) represents specimen not full grown. It has 23 axial ribs on the penultimate whorl and generally presents the same features of the holotype, but related to its size (Figs. 2, 8–10).

The paratype B (height 5.4 mm, width 3.9 mm) has a more elongated shape (Fig. 3). It is a gerontic and freak specimen. Theleoconch whorls with axial ribs: 25 on the first whorl, 30 on the penultimate, not definable on the last whorl because the shell was damaged. In fact, at about 1.5 whorls, there is a repaired break, starting from which only two spiral cords appear. At the beginning of the penultimate whorl, a very thin cord appears, which at the end of the penultimate whorl is divided into two. At the same point another cord appears at the base, close to the suture. On the last whorl, in an apertural view, 7 cords are present, two of which are more prominent. These prominent cords give to the shell a pagoda-like shape. They cross over the thin cords, forming very weak nodules at the crossing points. Therefore, on the whole shell, except the last whorl, the axial sculpture is prevalent, giving it a different architecture than the holotype. There are only 3 nodulous cords down to the base, crossed over by thin axial ribs forming very smooth nodules. The area close to umbilicus is smooth. Aperture rounded, peristome slightly thick. There are not internal nodules. Umbilicus narrowed. Nine spiral cords are present close to the end of the last whorl (Fig. 4).

ETYMOLOGY. The species is named in memory of Riccardo (Ricky) Mangano (2018–2021), grandson of the first Author.



Figures 1–4. *Putzeysia rickyi* n. sp. Fig. 1: holotype, from different views, height 4 mm, width 3.2 mm (MSCN 4853).  
Fig. 2: paratype A: height 3.6 mm, width 3.2 mm (CS). Figs. 3, 4: paratype B: height 5.4 mm, width 3.9 mm (CR).

**BIOLOGY AND DISTRIBUTION.** *Putzeysia rickyi* n. sp. come from a thanatocenosis represented by typical species of the photophilic algae (AP) biocenosis (sensu Pérès & Picard, 1964): *Tricolia pullus* (Linnaeus, 1758), *Jujubinus* spp., *Clanculus* spp.; coastal detritic (DC) biocenosis: *Tellina donacina* Linnaeus, 1758, *Turritella turbona* Monterosato, 1877; and muddy detritic bottom (DE) biocenosis: *Plagiocardium papillosum* (Poli, 1795), *Bolma rugosa* (Linnaeus, 1767), *Calyptraea chinensis* (Linnaeus, 1758).

The shell grit was found at the base of an escarpment generated by lavas of “Ognina” dated between 15,000 ka and 3930±60a (Branca et al., 2011). The presence in the site of the findings of only recent lavas substrate since at least 15,000 ka and the absence of detrital accumulation from deeper depths, furthermore corroborated by the shell composition above reported and typically derived from coastal extant biocenosis, exclude the possibility that materials of the new species may be considered as derived from more ancient contexts, as fossil or pseudo-fossil specimens. Therefore it can be assumed that *Putzeysia rickyi* n. sp. lives on rocky photophilic bottoms. The species is known only from type locality.

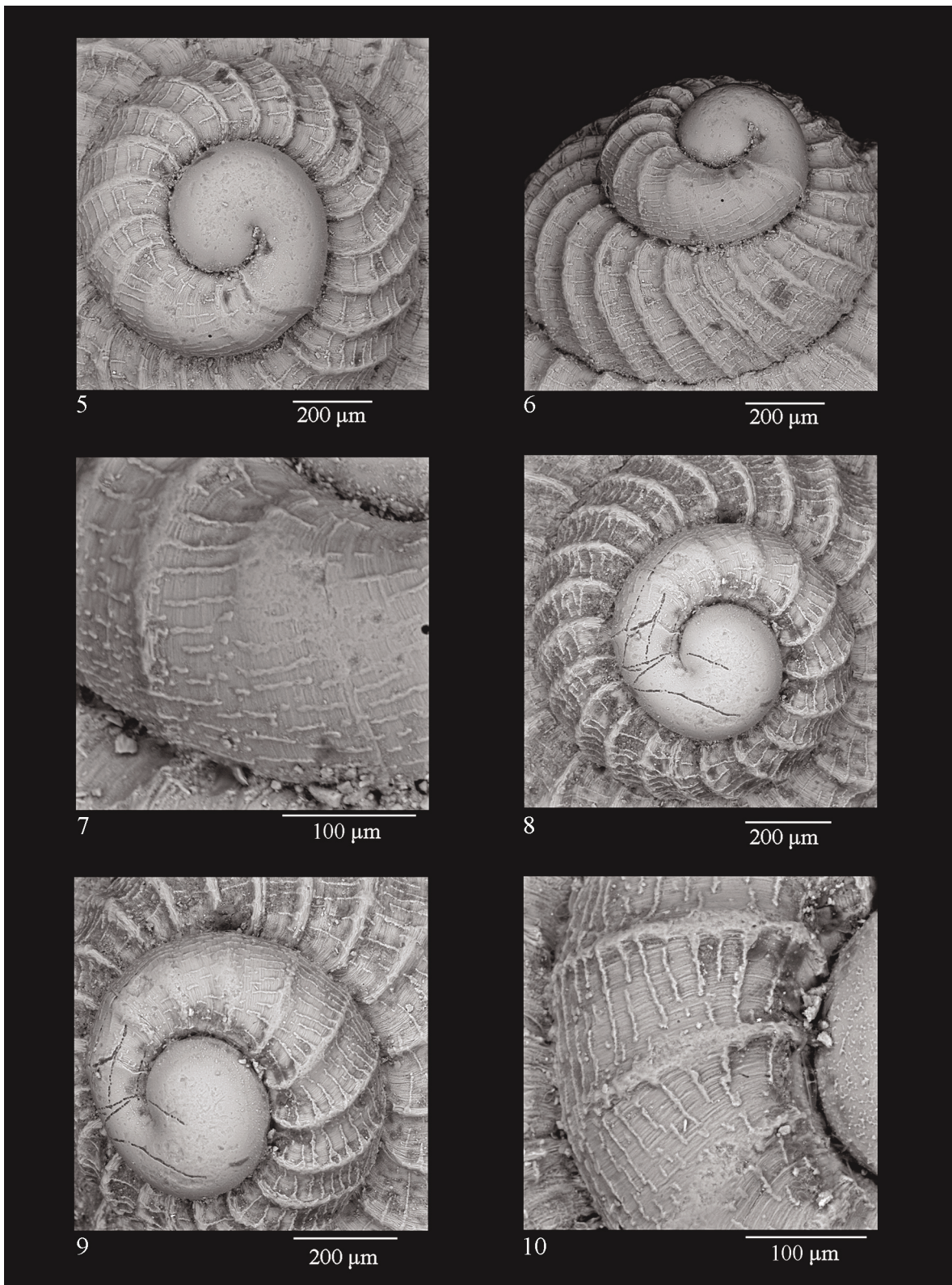
**REMARKS.** *Putzeysia rickyi* n. sp. differs from *P. wiseri* for the different shell shape, more rounded in the latter (Figs. 11–13). Moreover, the new species has an higher number of axial prosocline ribs on the first teleoconch whorl (20–25 V.S. 15–18 in *P. wiseri*) and a lower number of spiral cords on the penultimate whorl (3 V.S. 4–6 in *P. wiseri*). On the last whorl, in apertural view, in the new species there are 5–7 spiral cords V.S. 6–7 in *P. wiseri*, which could become double. Therefore *P. wiseri* shows generally many more nodules at the crossing points. Furthermore, in contrast to *P. wiseri*, *P. rickyi* n. sp. has a thinner shell and does not show any traces of notches inside the aperture. Protoconchs of species of *Putzeysia* are all almost swollen, with only very small papillae on the surface. In *P. rickyi* is of the same type, with only light differences: the nucleus is slightly bigger and papillae are limited to the lateral sides, but this latter could be due to the abrasion of the few specimens found.

Anyway, the new species cannot be compared with the congeneric *P. wiseri* for its different environment preferences, as well as for its very different bathymetric distribution. In fact, the latter species lives on coral or muddy bottoms between 150 and 3000 m depth, but it is more frequent in association

with deep-sea corals in the range between 500 and 2000 m, where it could be considered a cold-water species relict living in association with deep water corals, as *Lophelia*, *Madrepora*, *Desmophyllym*, *Caryophyllia*, and others, in Mediterranean, Lusitanian and Northeastern Atlantic (Jeffreys, 1880, 1883; Glibert, 1962; Ghisotti et al., 1971; Di Geronimo et al., 1973; Guidastrì et al., 1984; Janssen, 1989; Smriglio et al., 1989; Poppe et al., 1991; Giannuzzi-Savelli et al., 1994; Palazzi et al., 1996; Ardovini et al., 1999; Ratmeyer et al., 2004; Portalatina, 2008; Mastrototaro et al., 2010; Taviani et al., 2011; Rosso et al., 2010; Scaperrotta et al., 2010; Cossignani et al., 2011; Sysoev, 2014; Negri et al., 2016; Taviani et al., 2017; Nasto et al., 2018). Only Seguenza (1876b) has reported *P. wiseri* in lower waters, about 150–200 meters, from the coralligenous bottoms of the Messina strait: notwithstanding the peculiar environment present due to the notorious currents situation in the strait, this latter data should be confirmed by more recent findings. Calcara (1842, 1845) previously described *P. wiseri* on the basis of specimens collected among fossiliferous sediments of Messina and, few years later the first description, Philippi (1844) described two fossil species from the same geographic area: *Trochus crispulus* and *Trochus gemmulatus*. Aradas (1847) reported both these latter species from the outcrops of Gravittelli, near Messina. The description and drawing given by Philippi suggest that *T. crispulus* is a synonym of *P. wiseri*, but leave the taxon *T. gemmulatus* to uncertain interpretation (Guidastrì et al., 1984; Coan et al., 2017).

Among the Quaternary sediments with deep sea faunal assemblages of central and southern Italy *P. wiseri* is widespread (Seguenza G., 1876a; Greco et al., 1974; Di Geronimo, 1979; Di Geronimo & Li Gioi, 1980; Guidastrì et al., 1984; Di Geronimo & Bellagamba, 1985; Micali et al., 1985; Rindone et al., 1989; Bonfitto et al., 1994; Barrier et al., 1996; Vazzana, 1996; Di Geronimo & La Perna, 1997a; Di Geronimo et al., 1997b; Bertolaso et al., 2000; Di Geronimo et al., 2005).

Two species from Canary islands were previously reported as *P. wiseri* (Engl, 2005), but subsequently they were described as new (Engl & Rolán, 2009): *P. franziskae* Engl et Rolán, 2009 and *P. juttæ* Engl et Rolán, 2009. They show more affinities with *P. rickyi* n.sp. because of the low bathymetric distribution similar to that of *P. rickyi*, but they have only rough morphological affinities with this latter species.



Figures 5–10. *Putzeysia rickyi* n. sp. Figs. 5–7: protoconch of the holotype and teleoconch details (MSCN 4853).  
Figs. 8–10, protoconch of the paratype A and teleoconch detail (CS).

Differences between the holotype of *P. rickyi* n. sp. and the two Macaronesian species are here summarized in Table 1.

As could be argued by Table 1, *P. rickyi* n. sp. differs from *P. franziskae* and *P. juttæ* for the more rounded shell, the larger protoconch and because the two last species have the same H/LW ratio. Sculpture of the whorls is different. The disjoint extra-Mediterranean distribution of the last three taxa, in any case, justifies the separation at a specific level.

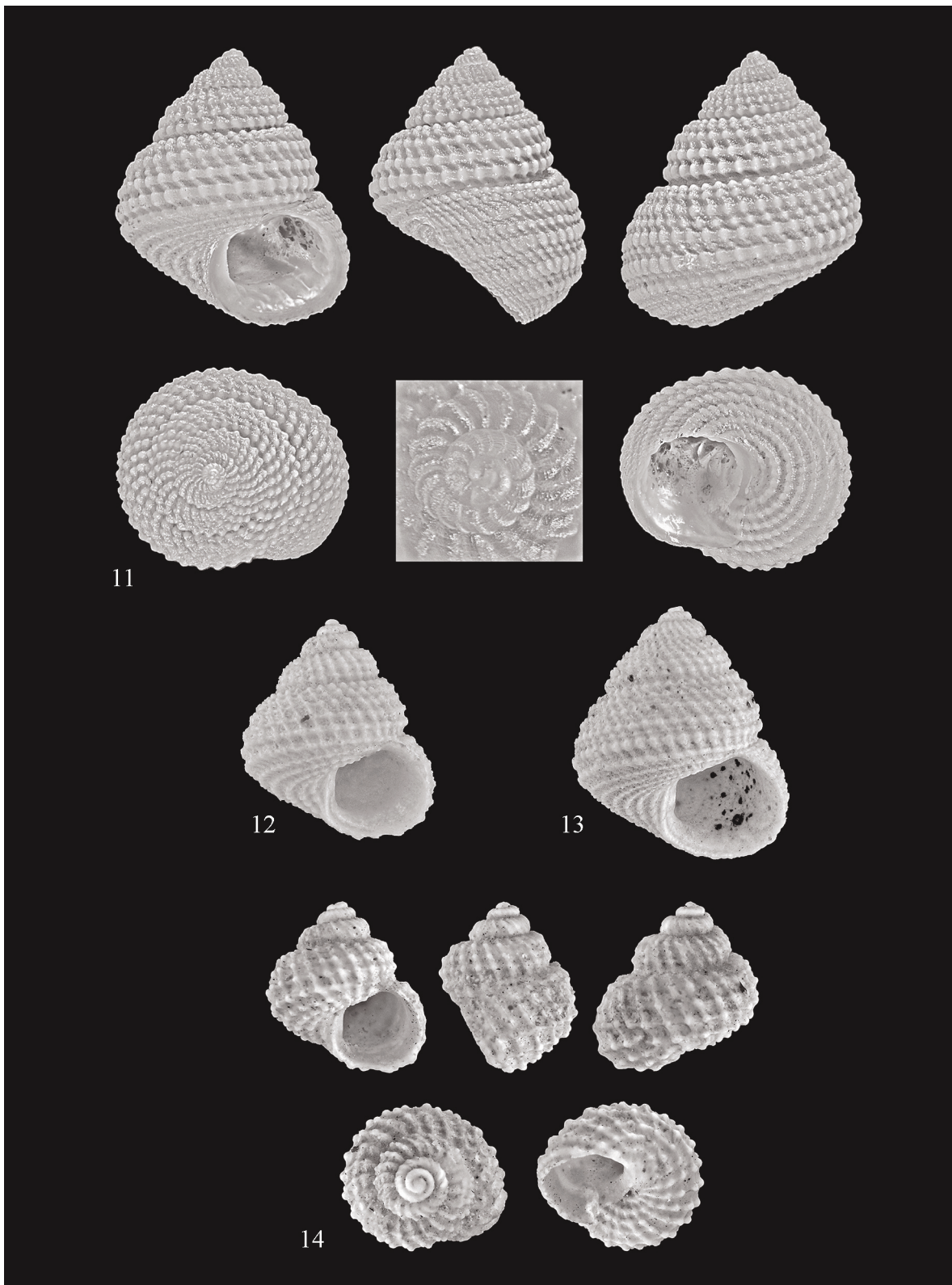
*Putzeysia cillisi* Segers, Swinnen et De Prins, 2009, only known from Madeira, is not comparable with any of the species mentioned so far, because it is more similar to the fossil species *P. clathrata* (Aradas, 1847) (Fig. 14) described from Gravitelli (Messina) (Guidastri et al., 1984; Segers et al., 2009) and reported only for a few Pleistocene bathyal sections of Sicily and Calabria (Aradas, 1847, Seguenza 1876a; Micali et al., 1985; Vazzana, 1996). *P. rickyi* n. sp. has apparently similarities with *Trochus (Zizyphinus) profugus* De Gregorio, 1889, considered by Monterosato (1914) and Guidastri et al. (1984), a

synonym of *Danilia horrida* (Da Costa O.G., 1861) = *Danilia otaviana* (Cantraine) = *Danilia tinei* (Calcara, 1839), but only the examination of original material labelled by De Gregorio could confirm these assessments. Libassi (1859) reports the presence of *T. crispulus* from the Pleistocene of Monte Pellegrino (Monterosato, 1872; 1877). The description he gives of his records, together with the reported assemblage of molluscs and their paleobathymetry, suggests instead that not *P. wiseri*, but another species is involved: probably it is not a full grown specimen of *Danilia tinei* (Calcara, 1839) (Monterosato, 1881) or something related to it. Aradas & Benoit (1870) report the finding of *T. crispulus* along the sandy coast of Trapani; the fact that this latter could be the same species described by Philippi seems more than unlikely.

Finally, another taxon should be debated: the description of *Margarites cancellata ionica* by F. Nordsieck (1973) from the abyssal Ionian Sea is attributed to young specimens and fragments of adult shells of *P. wiseri* by Vatova (1974) and cannot be compared with *P. rickyi* n. sp.

Species	<i>P. rickyi</i> n. sp.	<i>P. franziskae</i>	<i>P. juttæ</i>
Shell thickness	Thin	Solid	Solid
Height of the shell	4 mm	3.5 mm	3.8 mm
Ratio H/LW	45.00%	60.00%	60.00%
Protoconch nucleus	210µm	110µm	160µm
Protoconch diameter	410µm	290µm	270µm
Assial ribs on the first whorl	20	12	16
Assial ribs on the penultimate whorl	27	14–16	17–18
Assial ribs on the last whorl	38	30	24–26
Spiral cords on the penultimate whorl in apertural view	3	3	3
Spiral cords on the last whorl in apertural view	5	5	5
Nodulous cords of the base	5	5	4
Nodules ornamentation inside the aperture	none	5–7	6–7
Umbilicus	narrow	none	narrow

Table 1. Comparison of shell characters between *P. rickyi* n. sp. and two Macaronesian species.



Figures 11–13. *Putzeysia wiseri*. Fig. 11: shell and protoconch details: height 6.5 mm, Capraia Island, dredged at 500 m (NC). Fig. 12: *P. wiseri* shell: height 4.2 mm, Early Pleistocene of Punta Lazzi, Capo Milazzo (Messina) (CR). Fig. 13: *P. wiseri* shell: height 5.4 mm, Early Pleistocene of Salice (Messina) (CR). Fig. 14: *P. clathrata* shell, Early Pleistocene of Salice (Messina).

Another final note should be added to the comparison of the new species with the recently described *Vetulonia giacobbei* Renda & Micali, 2016. Notwithstanding the latter is a species of Seguenzioidea, the external shell appearance could vaguely recalls that of the new species, but it is flatter and has only three teleoconch whorls, almost rounded and with a deep suture. Moreover the protoconch is bigger, almost globose, the axial ribs are weak and more numerous and a wide umbilicus is present.

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