

## Lectotype designation for *Putzeysia clathrata* (Aradas, 1847) (Gastropoda Eucyclidae) and its systematic position

Agatino Reitano<sup>1,2,\*</sup>, Danilo Scuderi<sup>3</sup> & Alberto Villari<sup>2,4</sup>

<sup>1</sup>Museo di Storia Naturale di Comiso, Via degli Studi 9, 97013 Comiso, Italy; e-mail: [tinohawk@yahoo.it](mailto:tinohawk@yahoo.it)

<sup>2</sup>External collaborator of Museo della Fauna del Dipartimento di Scienze Veterinarie dell'Università di Messina, Italy

<sup>3</sup>Via Mauro de Mauro 15B, Piano Tavola, 95032 Belpasso, Catania, Italy; e-mail: [stiliger38@gmail.com](mailto:stiliger38@gmail.com)

<sup>4</sup>Via Villa Contino 30, 98124 Messina, Italy; e-mail: [villarialberto48@gmail.com](mailto:villarialberto48@gmail.com)

\*Corresponding author

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### ABSTRACT

In the present work we discuss the validity of *Putzeysia clathrata* (Aradas, 1847) (Gastropoda Eucyclidae) currently considered synonym of *P. wiseri* (Calcara, 1842), despite being the type species of the genus *Putzeysia* Sullioti, 1889. Reported as a fossil for the Early Pleistocene of Sicily and Calabria, it is here redescribed for the first time and, at the same time, its taxonomic position is discussed.

### KEY WORDS

Gastropoda; Eucyclidae; *Putzeysia*; Pleistocene; Sicily.

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### INTRODUCTION

The fossil *Putzeysia clathrata* (Aradas, 1847) (Gastropoda Eucyclidae), from the Early Pleistocene of Sicily and Calabria (Aradas, 1847, Seguenza 1876; Guidastrì et al., 1984; Micali & Villari, 1989 and 1991; Vazzana, 1996), is typetaxon of the genus *Putzeysia* Sullioti, 1889 in the family Eucyclidae (see the sheet in WoRMS: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=138596>). The first image of *P. clathrata* appears in Guidastrì et al. (1984), which show one of the five syntypes present in MNHM with Aradas' autographic label, even they did not officially designated it as lectotype. The systematic position of the genus was widely discussed in Guidastrì et al. (1984), which includes five extant species and two fossil. The most representative and known is the bathyal *P. wiseri*, widespread in the Mediterranean, Lusitanian and Northern Atlantic waters, and four other recently described species, i.e. *P. cillisi*

Segers, Swinnen et De Prins, 2009, from Madeira, *P. franziskae* Engl et Rolán, 2009, *P. juttæ* Engl et Rolán, 2009 both from Canary islands and *P. rickyi* Reitano et Scuderi, 2021 from Eastern Sicily. According to WoRMS the original description of *P. clathrata* is not documented and the name should be currently considered a synonym of *P. wiseri* (Calcara, 1842) (see sheet in WoRMS: <https://www.marinespecies.org/aphia.php?p=taxdetails&id=1023120>). In a recent paper in which the new extant species *P. rickyi* is described, Reitano & Scuderi (2021) considered erroneous this last taxonomical position by WoRMS. Another fossil species reported as *P. cfr. clathrata* from bathyal late Miocene sediments of Baetic Cordillera (Spain) (Barrier et al., 1991), represents the oldest record and can be considered a probable ancestor within the genus.

Being in possession of a lot of topotypical material from Gravitelli, as well as a large number of specimens from Salice, we avoided studying the

material kept in the Milan collections, proceeding in the same way in a redescription based on adult specimens in excellent conditions.

In the present paper the validity of *P. clathrata* is definitely discussed after the study of the original description (Aradas, 1847) and the type material present in the Aradas collection housed in MNHM, with important discussions on typetaxon status. The study of the abundant fossil material collected, among which topotypic specimens, supported the redescription of the species and its intraspecific variability as well as comparisons to other congeners.

## MATERIAL AND METHODS

A lot of syntypes of “*Trochus clathratus*” housed in MNHM was traced and photographed with SEM. Fossil material was collected in the villages of Gravitelli, which is the type locality, and Salice, near Messina, from Early Pleistocene deposits. 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. A particularly large shell, in a better state of conservation, was also examined uncoated under a LMU Tescan Vega Scanning Electron Microscope in Low Vacuum modality, to investigate its micro-morphology.

ACRONYMS. Museo Civico di Milano, Italy (MNHM); Museo di Storia Naturale di Comiso (MSNC); Alberto Villari malacological collection (AVC); sh.: shell/s.

## RESULTS

### *Systematic Palaeontology*

Classis GASTROPODA Cuvier, 1795

Subclassis VETIGASTROPODA Salvini-Plawen, 1980

Order SEGUENZIIIDA Haszprunar, 1986

Superfamily SEGUENZIOIDEA Verrill, 1884

Family EUCYCLIDAE Koken, 1896

Genus *Putzeysia* Sullioti, 1889

Type species: *Trochus clathratus* Aradas, 1847

***Putzeysia clathrata* (Aradas, 1847)**

*Trochus clathratus* - Aradas, 1847: 78-79, Gravitelli, Messina

*Gemmula clathrata* - Seguenza, 1876: 184, Messina

*Putzeysia clathrata* - Guidastri et al., 1984: 134-135, Gravitelli, Messina

*Putzeysia clathrata* - Micali & Villari, 1989: 79, Salice, Messina

*Putzeysia clathrata* - Micali & Villari, 1991: 351, Salice, Messina

*Putzeysia clathrata* - Vazzana, 1996: 148, Vallone Catrica, Reggio Calabria

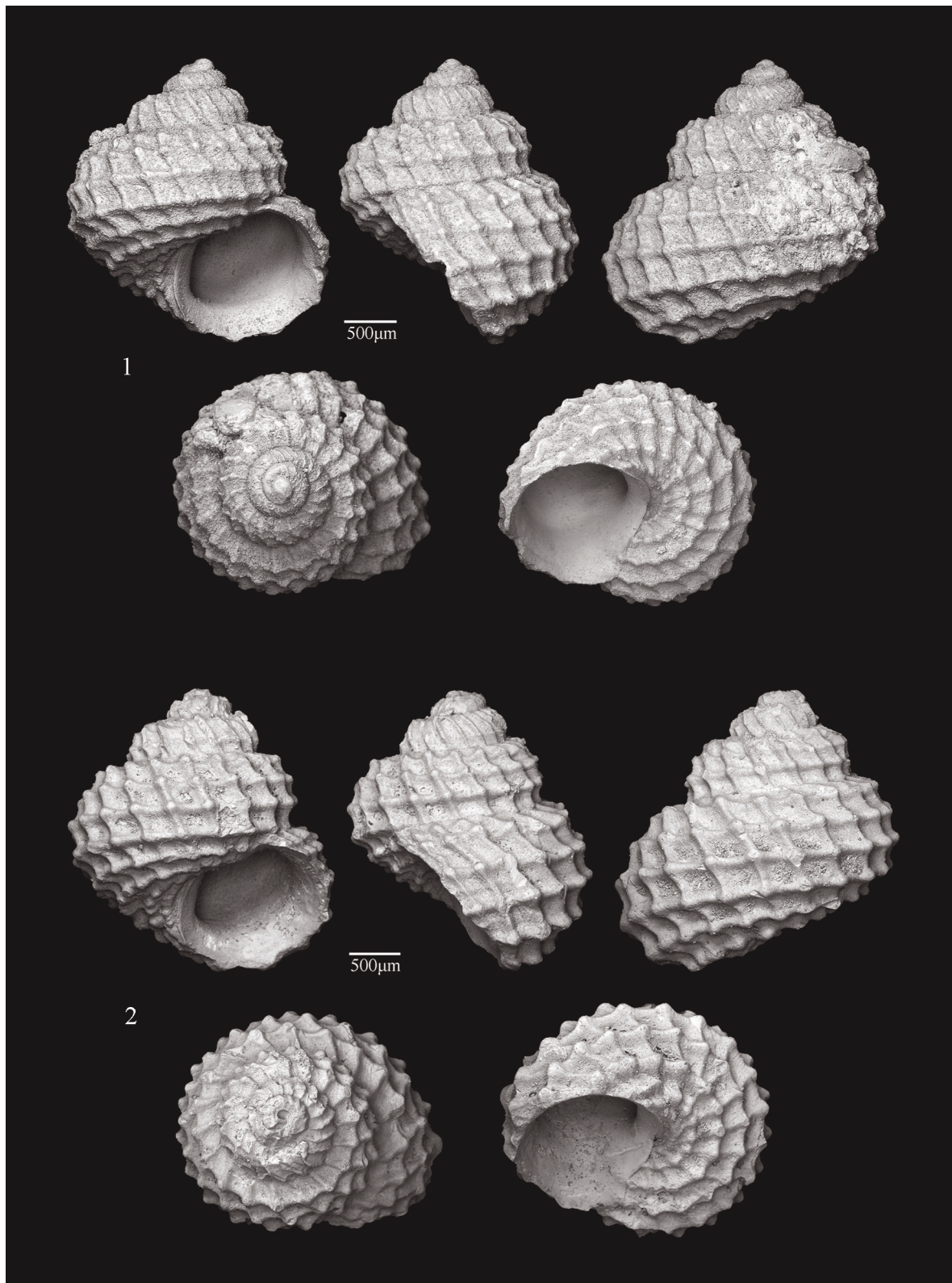
*Putzeysia* cfr. *clathrata* - Barrier et al., 1991: 10, fig. 4: 2 (not Aradas, 1847)

TYPE MATERIAL. A lot of 5 syntypes (MNHM i 26782), all from Gravitelli, Messina, with hand-write label of Aradas (Fig. 19). Syntype 4 of the lot is here selected as lectotype (Figs. 1, 7, 8, 9); syntypes 1 (Figs. 2, 10), 2 (Figs. 3, 11), 3 (Figs. 4, 12) and 5 (not figured) are here selected as paralectotypes 1, 2, 3 and 4.

MATERIAL EXAMINED. Gravitelli (ME), plio-pleistocenic sandy-marl at the base of pillars of the highway viaduct of Gravitelli, 12 shs in AVC. Salice, Messina, “contrada Coilare”, plio-pleistocenic sand, 31 shs in MSNC and 6 shs in AVC.

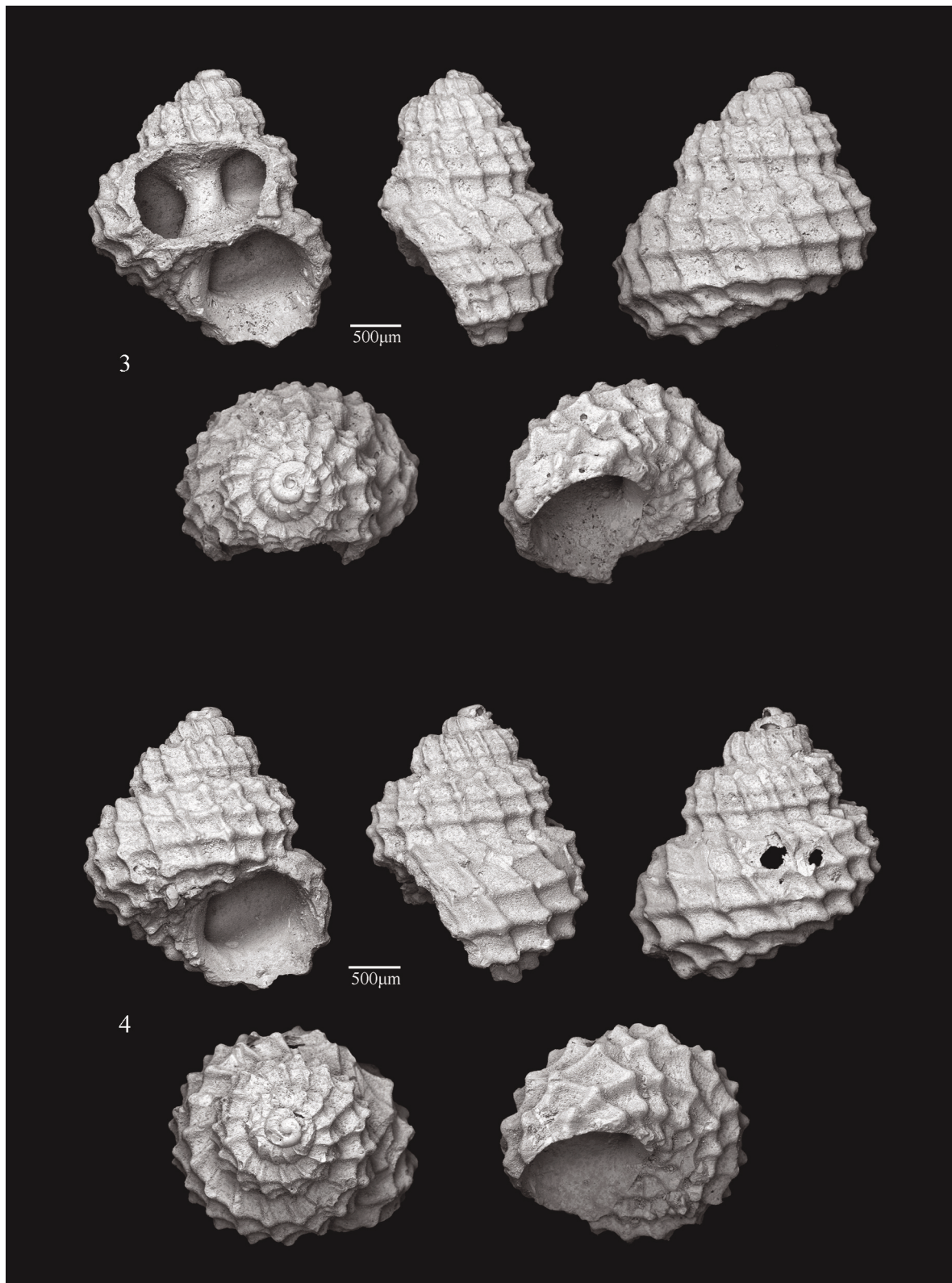
ORIGINAL DESCRIPTION. “*T. testa orbiculato-conoidea, imperforata, solida, anfractibus convexis ad suturas planulatis, et subcanaliculatis, lineis longitudinalibus transversisque, elevatis, aequidistantibus grosse clathratis, et in angulis sectionum subtuberculatis; apertura suborbiculari, labro subincrassato*”.

REDESCRIPTION BASED ON THE LECTOTYPE. Shell turbinoid height 2.7 mm, width 2.44 mm rather solid, globose, with 4.1 spiral whorls, the last one rounded representing more than 53% of the total height. The first teleoconch whorl is sculptured only by 13 axial pliculae, with sharp fine microsculpture of granules between them. The other teleoconch whorls exhibit almost regular spaced, prosocline



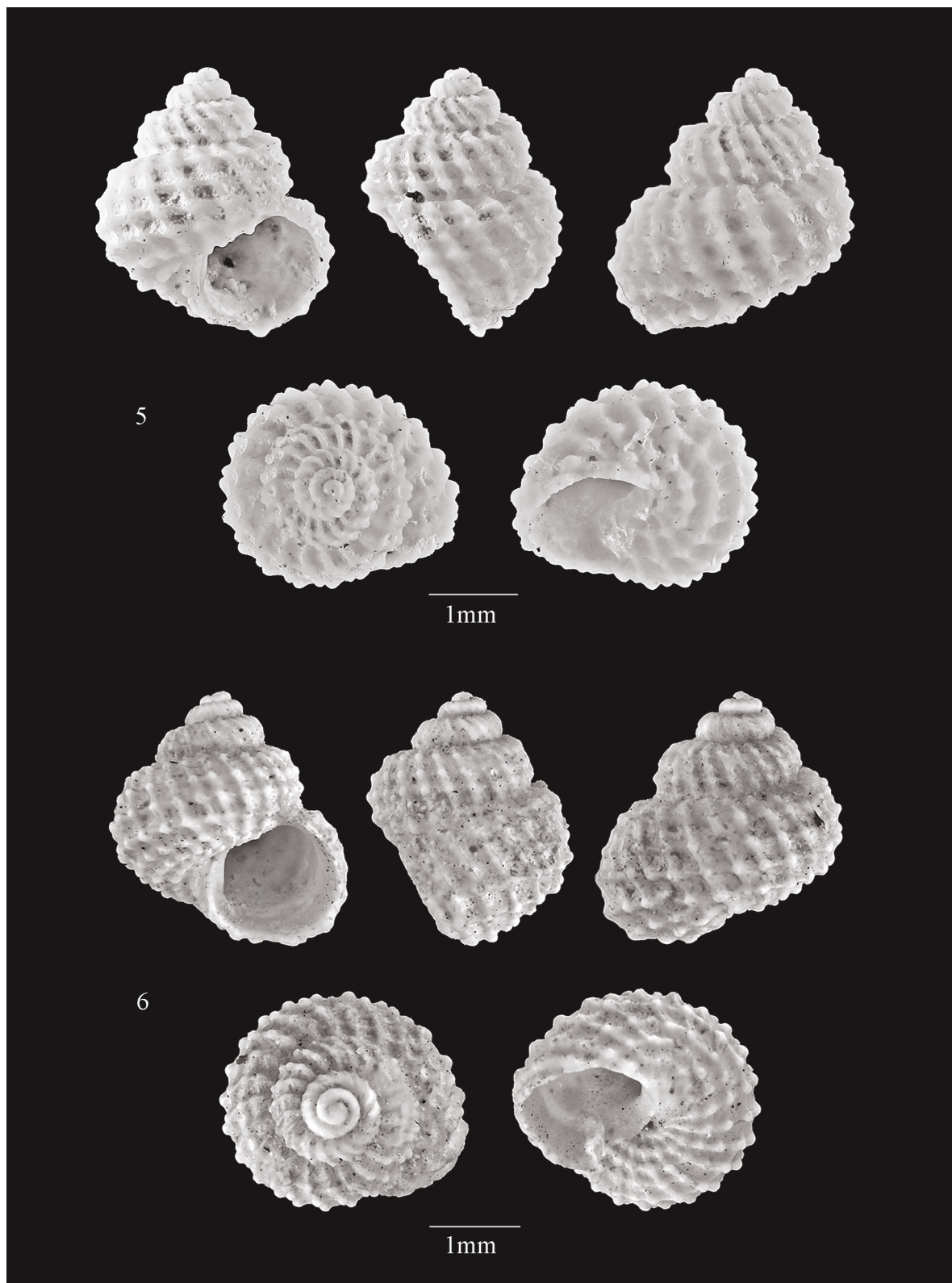
Figures 1, 2. *Putzeysia clathrata* (MNHM i 26782), Gravitelli, Messina (Italy).  
Fig. 1: Lectotype. Fig. 2: Paralectotype 1.





Figures 3, 4. *Putzeysia clathrata* (MNHM i 26782), Gravitelli, Messina (Italy).  
Fig. 3: Paralectotype 3. Fig. 4: Paralectotype 4.





Figures 5, 6. *Putzeysia clathrata*. Fig. 5: topotype (AVC). Fig. 6: shell, Early Pleistocene from Salice, Messina (Italy) (MSNC).

axial ribs, narrower than the interspaces and extending to the base: 21 on the penultimate, about 22 on the last whorl. After about 1.5 teleoconch whorls three weak cords appears, gradually becoming stronger. On the last whorl another weak cord appear abapically. Upper portion of each whorl flattened, making appear suture canaliculated and almost deep. In apertural view, four regular spaced spiral cords are present in the last whorl, which become five in the last quarter. They cross over the axial ribs forming a prominent tubercle at the intersections, which are less noticeable in tele-whorls preceding the last. Ribs and cords form regular rectangular spaces. The base is convex and bears four spiral cords beneath the peripheral, forming nodules at crossing intersections with the axial ribs. Aperture clearly rounded, with edge slightly folded outwards and peristome markedly oblique, rather thick: seen from aside (Fig. 1, the second from left), the edge appears straight; columella simply, straight. No internal nodules or lirae are visible. Umbilicus narrowly patent, with its edge marked by the fourth basal spiral cord, partly obscured by reflected columella lip.

Protoconch tilted up, with about 1.3 whorls, diameter of 400µm and a nucleus of about 200µm; terminal lip convex, trumpet-like. Under strong magnification the protoconch appears scarificated, due to process of diagenesis, and almost smooth, but traces of a faint sculpture constituted by a regular texture of rough papillae is visible on the adsutural distal portion. This sculpture is clearly visible in a well preserved topotype specimen (Figs. 5, 13, 14, 15, 20) and is constituted by a fine granulations organized in thin spiral rows (Fig. 14).

**VARIABILITY.** On a specimen from Salice (MSNC), four spiral cords start from 1.5 teleoconch whorl, instead of three. On the last whorl they appear irregularly arranged, i.e. the two central ones are closer together than the others. These cords, crossed over ribs, produce rectangular spaces, which are regular but narrower in the central portion of the body whorl. Compared to their total number, few ribs sometimes appear closer together in some specimens. In paralectotypes 2 and 3 and in the topotype specimen of AVC only three basal cords are present instead of four and a less narrow interspace is present between the peripheral and the first basal cord.

**REMARKS.** Aradas reports that his species is different from *T. crispulus*, Philippi 1844 mainly on the basis of the number of axial ribs that form regular interspaces and for the presence of a weak tubercle at the crossing point between axial ribs and spiral cords; for the flattened upper portion of the whorls, which forms a canaliculated suture; for having a smaller opening, ribs extending to the base and umbilical chink absent. In the same paper Aradas, compared his new species with a specimen of *T. crispulus* he found in the same locality (Gravitelli). The dimensions he provides are 3½ mm in height and 3 mm in width. All ten specimens he examined, almost of the same size, show no variability.

## DISCUSSION

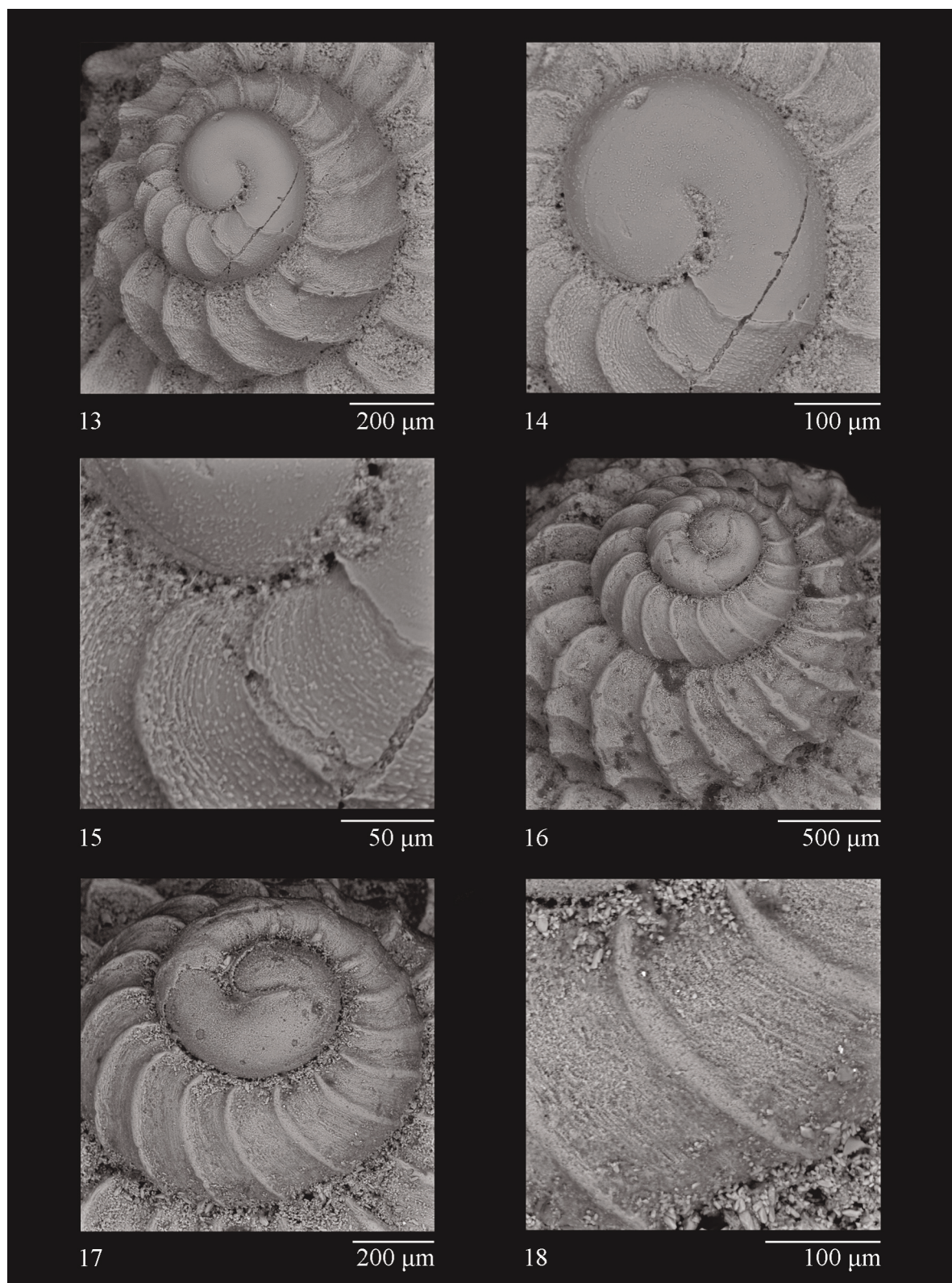
Notwithstanding Guidastri et al. (1984) officially recognize and draw type material of this fossil species, quite surprisingly the sheet of WoRMS asserted erroneously that the description is not documented and the name could be currently considered a synonym of *P. wiseri*. This statement, evidently not supported by real evidences, could lead to taxonomical instability concerning the effective validity of the genus. Really, *P. clathrata* differs from *P. wiseri* for the different shell size (3mm V.S. 6.5 mm), more rounded shape of shell, lower number of axial prosocline ribs on the first teleoconch whorl (13 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*). These different types of sculpture earned the specific name “*clathrata*” which means “crossed, closed with grating” in relation to the large weave formed instead of the very thick one of the latter species. In fact, on the last whorl, in apertural view, *P. clathrata* has 4 spiral cords V.S. 6–7 in *P. wiseri*. Furthermore, ribs in *P. clathrata* are regularly spaced, forming a peculiar tubercle on the crossing point with spiral cords, and do not show intermediate thin cords on the last turn, as in *P. wiseri*. Compared to all other officially described species of the genus, *P. clathrata* bears only axial pliculae on the first tele-whorl. On the basis of these evidences *P. clathrata* is morphologically very well characterized and distinguished. At the same time, it appears regularly described and represented by type materials (currently housed at MNHM). More-





Figures 7-12. *Putzeysia clathrata*, protoconch and teleoconch details (MNHM i 26782), Gravitelli, Messina (Italy).  
Figs 7-9: lectotype. Fig. 10: paralectotype 1. Fig. 11: paralectotype 2. Fig. 12: paralectotype 3.





Figures 13-18. *Putzeysia clathrata*. Figs. 13-15: topotype (AVC), protoconch and teleoconch details.  
 Figures 16-18. Shell of Early Pleistocene of Salice (Messina) (MSNC), protoconch and teleoconch details.



Figure 19. Lot of “*Trochus clathratus*” (MNHM i 26782): original label with handwritten of Andrea Aradas, original vial and other recent labels. Figure 20. Topotype (AVC), SEM photographed.



over, as reported by Reitano & Scuderi (2021), the only species in *Putzeysia* really similar to *P. clathrata* for teleoconch sculpture and general shape is *P. cillisi*, recently described from Madeira, but this latter has teleoconch whorls less flattened on the top with a much coarser sculpture and a more flattened protoconch. Its bathymetrical distribution is not very clear on account of data reported in the original description by Segers et al. (2009). In fact, in “Distribution and biotope” they reported *P. cillisi* for depths comprised between 15 and 350 m, but the only indications of collecting depths among type and other materials examined are 75 and 190 m, while no mentions to 15 or 350 m depths are furnished, being materials from the CANCAP expedition, from which probably they derive, not complete with specific depth data. As a consequence, we only suppose that *P. cillisi* could be linked to more shallow biocoenosis, as the recently described *P. rickyi*, while both *P. wiseri* and *P. clathrata* are contemporaneously present in the same Early Pleistocene bathyal sediments of Sicily and Calabria, associated with white corals biocoenosis (Aradas, 1847; Seguenza 1876; Guidastrì et al., 1984; Micali & Villari, 1989; Micali & Villari, 1991; Vazzana, 1996).

A fossil species reported as *P. cfr. clathrata* from late Miocene bathyal sediments with white corals of the Baetic Cordillera (Spain) (Barrier et al., 1991), represents the first fossil record of the genus *Putzeysia*. In this last paper, the shell reported on fig. 4, n. 2, however, has greater similarities with *P. cillisi*: as could be argued from the pictures, it shares with *P. clathrata* a globular and solid shell with flattened whorls on the top, the spiral cords that starts with two cords (a third one would seem to run along the suture), sculpture forming rectangular interspaces between ribs and cords and a low number of axial ribs on the body whorl. Since we have no other data related to this species and since a gap still exist in the fossil records related to *Putzeysia* in the Mediterranean Pliocene, we prefer to consider it as a new undescribed species, different from *P. clathrata* s.s.

Putting together all these facts, *P. clathrata* cannot be considered as merely synonym of *P. wiseri*, but as a different, valid species and, as a consequence, its status as typetaxon of genus *Putzeysia* has never been ascertained as invalid by means of no published data.

A final note should be added to the inappropriate way of working of international authorities which, in recent times, always more frequently take their official taxonomic positions without basing their operations of synonymization on no true officially published papers, generating taxonomical instability and confusions.

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