

A new start in *Pyramidula* (Gastropoda Pulmonata: Pyramidulidae)

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In Europe, the genus *Pyramidula* is much more diverse than generally accepted. The type species, *P. rupestris*, is wide-spread, but only regionally common. *P. jaenensis* might be its sister species. In Britain, the most widely distributed and most common continental species, i.e. *P. pusilla*, is replaced by *P. umbilicata*; these two taxa could also be considered conspecific subspecies, however. In the NE. Mediterranean area, *P. cephalonica* and *P. chorismenostoma*, are either sister species, or the latter taxon is based on a conspicuous mutant of the former one.

Key words: Gastropoda, Pulmonata, Pyramidulidae, *Pyramidula*, taxonomy, nomenclature.

Snails belonging to the genus *Pyramidula* Fitzinger, 1833, are typical inhabitants of limestone rocks (Klemm, 1951). The species are characterized conchologically by conical to domed, yellowish grey to dark brownish shells with very convex, rather inconspicuously sculptured whorls and a simple aperture. In one species the shell is scalariform, which is unique in the non-marine European malacofauna. The shells are inconspicuous, because they are only a few millimeters in width. Nevertheless, it cannot easily be understood why so many nominal taxa introduced in the past were synonymized later on, and why nearly all European *Pyramidula* taxa were generally considered until now, forms of only a single species, viz. *P. rupestris* (Draparnaud, 1801). Only Ortiz de Zárate Rocandio & Ortiz de Zárate López (1961) reported *P. jaenensis* (Clessin, 1882) (figs. 1, 2) as a separate species, and Mylonas (1982) argued that *P. chorismenostoma* (Westerlund & Blanc, 1879) (fig. 13) is specifically distinct from *P. rupestris*.

While studying shells of *Pyramidula*, up to three, at one site in Greece even four, separate forms could be distinguished within a sample taken at a single locality, suggesting the sympatric occurrence of that many species. Their shells differ in well-known characters, like size, general shape, protoconch shape, umbilical width, sculpture and colour.

There are many samples of *Pyramidula* in most private or institutional, non-marine molluscan collections. Instead of studying all this material, we present our results here on the basis of only a limited material, kept in the Nationaal Natuurhistorisch Museum, Leiden (abbreviated NNM), and in the private collections of R. A. Bank, J. C. A. Eikenboom, W. J. M. Maassen, H. P. M. G. Menkhorst, and Th. E. J. Ripken. Because some common to very common European species are involved, next to some rare ones, we consider this approach useful. Waiting for a more complete picture to emerge, especially with regard to the anatomical characters and the more detailed distributional patterns, might lead to much delay and an increasing confusion in the literature. Recently, the name *P. pusilla* (Vallot, 1801) has been used already (Bank, 1988; Cossignani & Cossignani, 1995), in anticipation of the publication of the results of our investigations, without providing sufficient background information.

This paper aims at characterizing at least the most common European *Pyramidula* species and presenting the basis for a stable nomenclature. Some lecto- or neotypes are designated to serve that goal. A far more detailed analysis is in progress. The species are listed alphabetically.

Pyramidula cephalonica (Westerlund, 1898) (fig. 10)

Patula (*Pyramidula*) *rupestris cephalonica* Westerlund, 1898: 156 (Greece, Kefallinia [= Cephalonia isl.], "Cephalonia, San Gerasimo"). Lectotype (design. nov.): Colln. C. A. Westerlund, no. 326; Naturhistoriska Museet, Göteborg (fig. 10).

Shell.- Shell (low) conical, with the proto- en teleoconch whorls regularly increasing in width, clearly broader than high. Aperture relatively small. Umbilicus wide open, varying in width from c. 1/3 of the total shell width to clearly broader. Teleoconch with (very) prominent growth-lines, in well preserved specimens these may have the character of riblets. Yellowish brown. Height up to 1.8 mm; width up to 2.6 mm.

Distribution.- Shells that are typical in umbilical width, sculpture and colour are known from N. Dalmatia southwards to Greece and Turkey.

Notes.- See with *P. chorismenostoma*.

Pyramidula chorismenostoma (Westerlund & Blanc, 1879) (fig. 13)

Helix (*Patula*) *rupestris chorismenostoma* Westerlund & Blanc, 1879: 32, pl. 1 fig. 9 (Greece: [1] Kikladhes, island Siros, "St. Georges" [= Ag. Georgios, = Kinion]; [2] Voiotia, "Mont Macolessos" (near Ritsona).

Shell.- Full-grown shells can easily be distinguished by their scalarid form, which is unique among European land snails. The initial 1½-3 apical whorls are regularly coiled and contact each other; the following ones are increasingly wide apart. Teleoconch with (very) prominent growth lines. The shells are light to dark corneous brown. Width up to 2.2 mm; height up to 3.1 mm.

Very small, juvenile specimens are similar to *P. cephalonica*, but can be distinguished by the very short parietal contact zone between the aperture and the penultimate whorl. In shell sculpture and dimensions (diameter of the whorls) *P. cephalonica* and *P. chorismenostoma* are conspicuously similar (see also the notes).

Distribution.- This species is only known from roughly the southern two thirds of Greece, including the island of Crete and the Aegean islands.

Notes.- We have not studied syntypes of this very characteristic, unequivocally described and figured species.

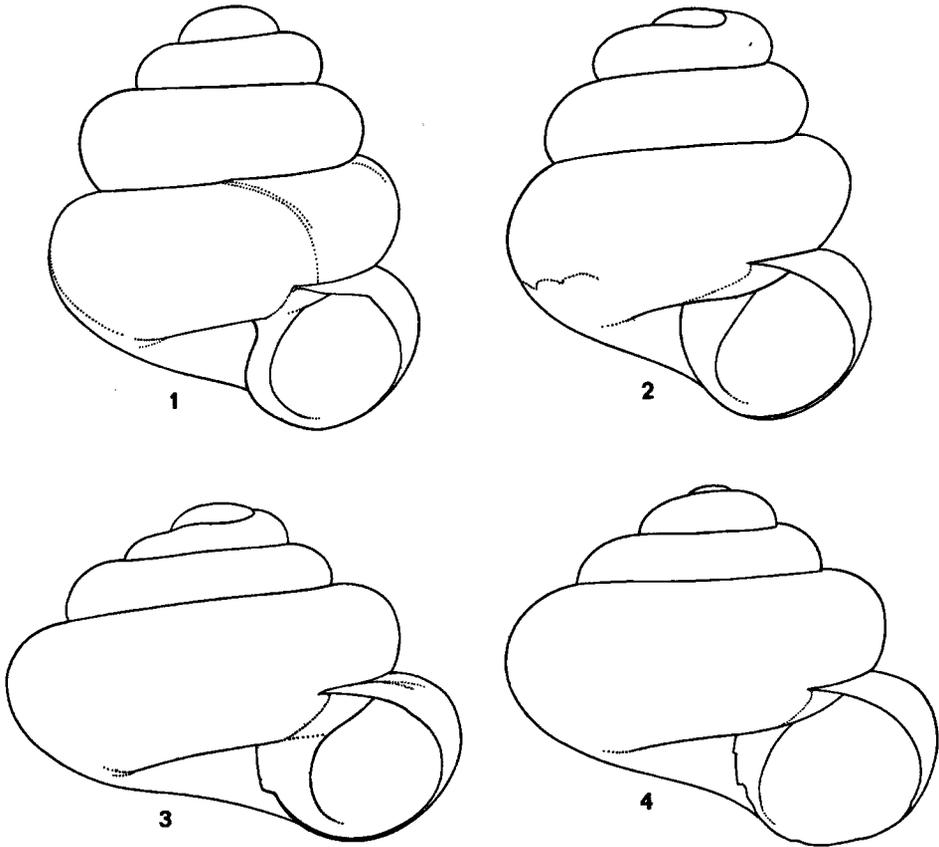
Apart from the distinctive mode of coiling of the whorls, there are no characters by which *P. chorismenostoma* and *P. cephalonica* can easily be distinguished. The two taxa are most probably sister species at least.

Pyramidula jaenensis (Clessin, 1882) (figs. 1, 2)

Helix (*Patula*) *jaenensis* Clessin, 1882: 187, pl. 4 fig. 3 (Spain, "Jaen").

Pyramidula rupestris var. *jaenensis*; Pilsbry, 1935: 185, pl. 25 figs. 4, 5 (= Clessin, 1882: pl. 4 fig. 3).

Pyramidula jaenensis; Ortiz de Zárate Rocandio & Ortiz de Zárate López, 1961: 189, fig. 10.



Figs. 1-4. *Pyramidula* spec. 1, 2, *P. jaenensis* (Clessin, 1882); 3, 4, *P. pusilla* (Vallot, 1801). 1, 3, Portugal, Beira Litoral, 15 km S. of Coimbra, Ruínas de Conimbriga (H. J. Hopman leg.); 2, 4, Spain, Malaga, 0.5 km S. of Ventas de Zafarraya, 840 m alt. (Th. E. J. Ripken leg.). Material in Nationaal Natuurhistorisch Museum, Leiden. W. C. G. Gertenaar del.

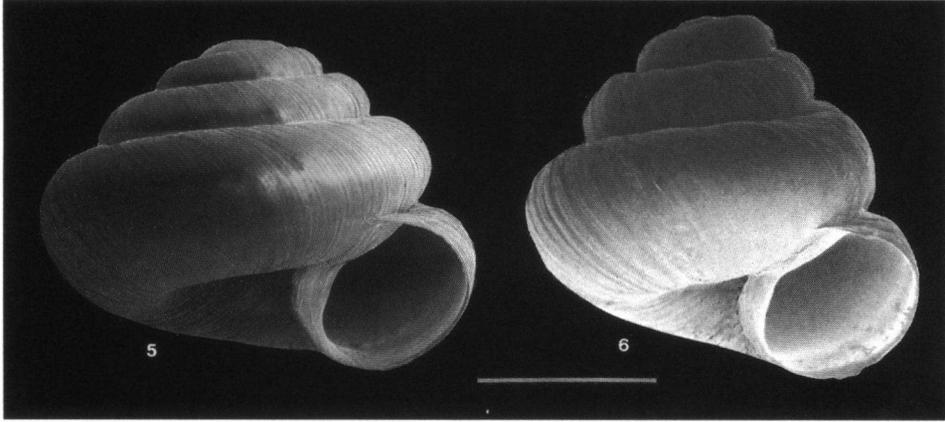
Shell.- Shell high conical, with convex sides, clearly higher than broad. Umbilicus narrow, measuring less than $1/4$ of the total width. Teleoconch with more or less obsolete growth lines and some irregular more prominent radial ridges. Dark corneous brown. Width up to 2.2 mm; height up to 2.7 mm.

Full-grown shells can easily be recognized by the nearly sub-cylindrical shape. Only certain forms of *P. rupestris* are also higher than broad (see the notes).

Distribution.- This species is known from southern Spain and southern Portugal.

Notes.- The original description and illustration, in combination with the locality mentioned, leave no doubt as regards the identity of this nominal taxon.

P. jaenensis is often found together with *P. pusilla* (figs. 1-4). The systematic relationships with the allopatric *P. rupestris*, in shell characters the most similar *Pyramidula* species, are still unclear.



Figs. 5-6. *Pyramidula* spec. 5, *P. pusilla* (Vallot, 1801), neotype, France, Côte-d'Or, 'fontaine Ste. Anne' near Dijon (Muséum d'Histoire Naturelle, Ville de Dijon, 210.996.MO.1); 6, *P. rupestris* (Draparnaud, 1801), lectotype of *Helix hierosolymitana* Bourguignat, 1852, Israel, Jerusalem (Muséum d'Histoire Naturelle, Genève). Scale bar 1 mm.

Photographs: fig. 5, J. Goud, Leiden; fig. 6, by courtesy of Dr. Y. Finet, Genève.

Pyramidula pusilla (Vallot, 1801) (figs. 3-5, 9, 12)

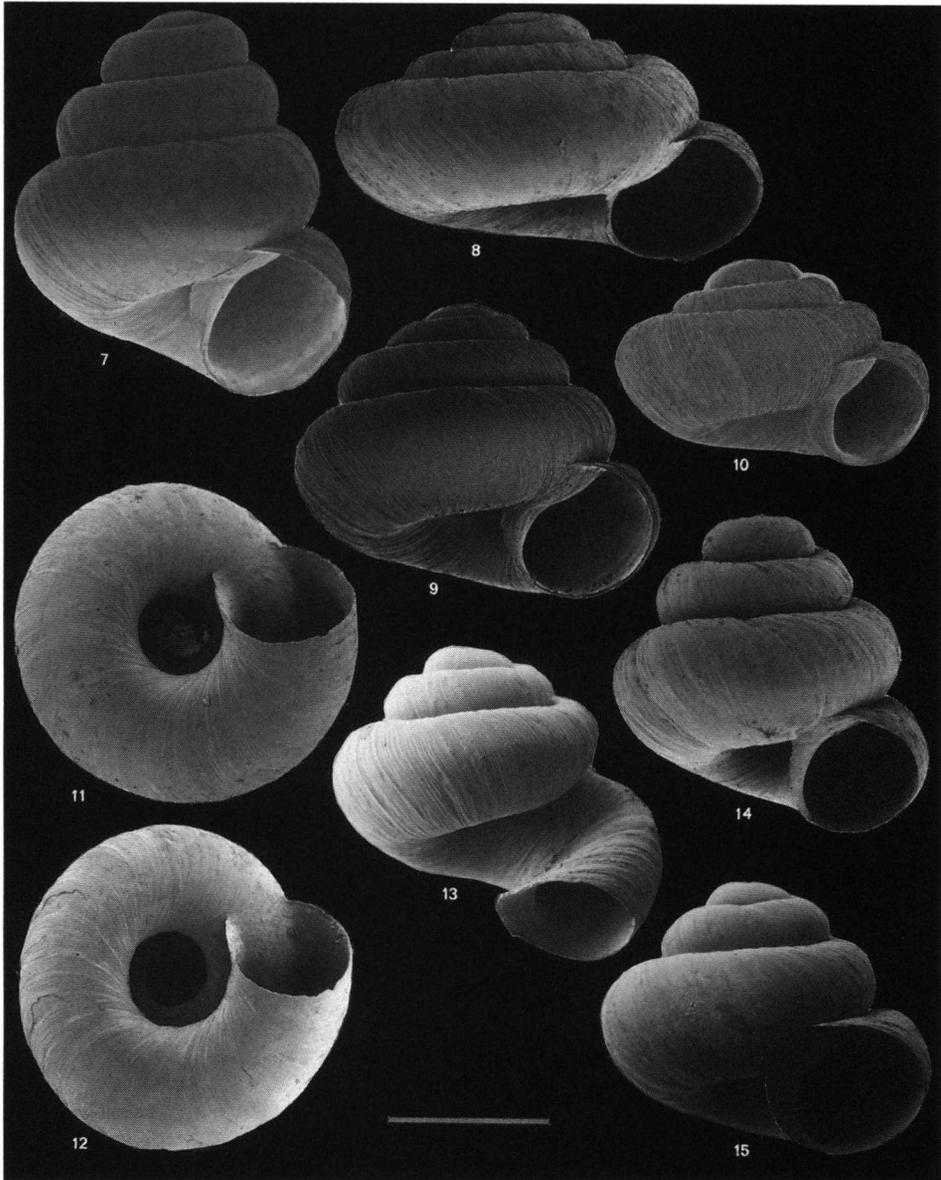
Helix pusilla Vallot, 1801: 5 ('ce pays' [p. 4] = department Côte-d'Or). Neotype (design. nov.): France, department Côte-d'Or, "fontaine Ste Anne" near Dijon; Muséum d'Histoire Naturelle, Ville de Dijon, no. 210.996 MO. 1 (fig. 5).

Shell.- Shell low conical, clearly broader than high. Umbilicus measuring c. 1/4 (in NW. Spain locally c. 1/3) of the total width. Apical whorls regularly coiled, gradually increasing in width. Teleoconch whorls with very fine (sometimes more obsolete), narrowly spaced, growth lines. Dark corneous brown. Width up to 2.95 mm; height up to 2.25 mm.

Distribution.- This is by far the most common and wide-spread European *Pyramidula* species. It is known to us from the entire Mediterranean area, and western and central Europe.

Notes.- Drouet (1867: 41) referred to this species as *Helix rupestris* and listed *H. pusilla*, described by Vallot (1801), as a synonym; he reported that the species is common near Dijon.

In the Muséum National d'Histoire Naturelle, Paris, material once belonging to Vallot could not be found, and data on a collection of Vallot could not be traced. Therefore, Mr. J. Goud and Mr. Th. E. J. Ripken tried to locate syntypes of *P. pusilla* in the Muséum d'Histoire Naturelle, Ville de Dijon. According to the Dijon city archives, Jean Nicolas Vallot (1771-1860) was a medical doctor in Dijon. Material of his molluscan collection, supposed that it ever existed, might have been donated to the museum in Dijon. This was confirmed by Mrs. M. Prost, the museum curator, who most kindly assisted in trying to find Vallot material. Maybe because the museum suffered from a fire during the First World War and from inaccurate bombing of the railway station nearby during the Second, these efforts did not result in the discovery



Figs. 7-15. *Pyramidula* spec. 7, 11, 14, 15, *P. rupestris* (Draparnaud, 1801). 7, lectotype (design. nov.), France (Naturhistorisches Museum, Vienna, Draparnaud-Typen xxvi 97a); 11, France, Hautes Alpes, Combe de Queyras, right slope, 1100 m alt. (E. Gittenberger leg.; NNM); 14, Greece, Sterea Ellas, Fokis, 17 km SW. of Amfissa (E. Gittenberger leg.; NNM); 15, Israel, Wadi Der Jassin W. of Jerusalem (L. A. W. Vennans leg.; NNM). 8, *P. umbilicata* (Montagu, 1803), U. K., Cumbria, between Penrith and Kendal, Shap (A. D. J. Meeuse leg.; NNM). 9, 12, *P. pusilla* (Vallot, 1801). 9, with the neotype, France, Côte-d'Or, 'fontaine Ste. Anne' near Dijon (Muséum d'Histoire Naturelle, Ville de Dijon); 12, locality, see 11. 13, *P. chorismenostoma* (Westerlund & Blanc, 1879, Greece, Peloponnisos, Arkadhia, 8 km W. of Leonidhion, 500 m alt. (E. Gittenberger leg.; NNM). 10, *P. cephalonica*, lectotype (design. nov.), Greece, Kefallinia (= Cephalonia), 'San Gerasimo' (Naturhistoriska Museet, Göteborg, Colln. C. A. Westerlund). Scale bar 1 mm. Photographs: fig. 7, by courtesy of Dr. E. Wawra, Vienna; figs. 8-15, J. Goud, Leiden.

of any unequivocal Vallot material. However, an old sample with many well preserved specimens of *Pyramidula* was found, labelled: "Hélice des Rochers / H. Rupestris. Drap. (1801) / de la fontaine Ste Anne / sous les pierres des murs / env. de Dijon 1849". It is unclear to whom this material originally belonged. It might even have been Vallot; it was collected far after the description of *Helix pusilla*, but also far before Vallot's death in 1860, at the considerable age of 88. From this sample the neotype was selected.

Pyramidula rupestris (Draparnaud, 1801) (figs. 6, 7, 11, 14, 15)

Helix rupestris Draparnaud, 1801: 71 ("France"). Lectotype (design. nov.): Naturhistorisches Museum, Vienna, Draparnaud-Typen xxvi 97a (fig. 7).

Helix hierosolymitana Bourguignat, 1852: 13 (Israel, "...vallis Jehosaphat circa Hierosolymam"). Lectotype (design. nov.): Israel, Jerusalem; Muséum d'Histoire Naturelle, Genève (fig. 6).

Patula rupestris var. *dalmatina* Clessin, 1887: 51 ([1] rocks near the spring of the 'Jedro' [p. 65: = 'Jadro' brooklet near 'Salona'], and [2] in the 'Cettina'-valley near "Almissa"). Topotypes from [2]: Nationaal Natuurhistorisch Museum, Leiden.

Shell.- Shell conical with nearly straight sides, varying from slightly broader than high to clearly higher than broad. Umbilicus narrow, measuring c. 1/4 or less of the total width. Apical whorls somewhat irregularly coiled, with an obliquely bulging part. Teleoconch with irregular, more or less obsolete growth lines. Dark corneous brown. Width up to 2.7 mm; height up to 2.5 mm.

Distribution.- This species is known from the entire Mediterranean area, from Israel in the east to the Iberian Peninsula in the west. In some areas it is rather common, for example in Greece, but often only a few scattered localities are known, as for example from Dalmatia, N. Italy and Morocco.

Notes.- Evidently, Draparnaud (1801) did not describe the most common European *Pyramidula* species, but another wide-spread one, occurring much more locally. After its description, this species remained poorly known, to say the least, for nearly two centuries. As a consequence, also dictated by the identity of both the lectotype of *P. rupestris* (selected from a series five of conspecific specimens) and the neotype of *P. pusilla*, confusion might arise. At least when the latter name is used, however, it becomes obvious that the author in question has accepted the view of a more speciose genus *Pyramidula*.

Maybe, *P. rupestris* as it is interpreted here, should be subdivided into subspecies or even species. For example, the shells from Greece (fig. 14), where *P. rupestris* is rather common and uniform, are relatively small as compared to the lectotype from the Draparnaud collection (fig. 7), and never equally high conical. However, the populations from S. France, from the department Dordogne and from the Pyrenees to the Alps (fig. 11), are very variable, in particular in size and general shape, bridging the gaps between populations from elsewhere. Therefore, for the time being, all these forms are lumped together. They share the characters mentioned in the description above.

P. rupestris has been found occurring sympatrically with *P. cephalonica*, *P. chorismenostoma*, and *P. pusilla*.

Pyramidula umbilicata (Montagu, 1803) (fig. 8)

Helix umbilicata Montagu, 1803: 434, pl. 13 fig. 2 (locus typicus, restr. [Forcart, 1965: 83]: U.K., Wales, Tenby near Pembroke).

Shell.- Shell low conical, much broader than high. Umbilicus measuring c. 1/3 of the total width. Teleoconch with very fine, narrowly spaced growth lines. Greyish brown. Height up to 1.7 mm; width up to 2.9 mm.

Distribution & Notes.- The samples of *Pyramidula* from Great Britain and Ireland studied so far contain relatively large, strongly depressed, greyish brown shells, differing from continental European specimens in these characters. Only from the northwestern coastal part of the Iberian peninsula, from the region of the Picos de Europa, somewhat similar forms with strongly depressed shells with a wide umbilicus are known. Those shells, provisionally classified as extreme forms of *P. pusilla*, are smaller. Maybe *P. umbilicata* should be classified as a subspecies within a polytypic species *P. pusilla*.

ACKNOWLEDGEMENTS

We thank our friends and colleagues who enabled us to study material in their collections, in particular Dr. Y. Finet (Muséum d'Histoire Naturelle, Genève), Dr. T. von Proschwitz (Naturhistoriska Museet, Göteborg), Mrs. M. Prost (Muséum d'Histoire Naturelle, Dijon), and the late Dr. E. Wawra (Naturhistorisches Museum, Wien).

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