

Description of a new species of *Glycymeris* (Bivalvia: Arcoidea) from Madeira, Selvagens and Canary Islands

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After revision of the Glycymerididae in the collection of the National Museum of Natural history, a new species, *Glycymeris vanhengstumi* is described here. It occurs off the coast of Madeira, the Selvagens and the Canary Islands.

Introduction

The Cancap and Mauritania expeditions to the Canary islands, the Selvagens, Madeira, the Azores, the Cape Verde islands, Morocco and Mauritania (1976-1988) procured many new facts on geographical and bathymetrical distribution of mainly marine invertebrates (van der Land, 1987), and among the collected samples many new species have been described. Only a limited number of species of the Glycymerididae was recognized. *Glycymeris scripta* (Born, 1780) was found in the coastal waters of Mauritania, *Glycymeris vovan* Lamy, 1912, in Morocco, Mauritania and the Canary Islands and *Glycymeris formosa* (Reeve, 1843) in the Cape Verde Islands. A fourth species occurring in the east of the Macaronesian archipelago was preliminarily named *Glycymeris* cf. *pilosa* (Linné, 1767) after one of its closest relatives. Identifications were made with the help of the more recent literature, principally: Lamy (1912), Nickles (1950), Gómez Rodríguez & Pérez Sánchez (1997) and Ardovini & Cosignani (2004), and compared with the collections of *Naturalis*.

Glycymeris pilosa (L.) is known to be distributed throughout all of the Mediterranean and the Atlantic coasts of Morocco and Portugal (Poutiers, 1996: 420). The northern limit of its recent distribution seems to be the Ria de Arosa in the north of Spain as one specimen, obviously belonging to *G. pilosa*, was collected from the south side of Ria de Arosa, in Rio Ulla, south of Tallos at a depth of 1 m, in 1964 during a fieldwork trip by the 'Rijksmuseum voor Natuurlijke Historie' (as the National Museum of Natural history was then called). Gómez Rodríguez & Pérez Sánchez (1997) use *Glycymeris glycymeris* (Linné, 1758) for its small relative that we here describe as new. A revision of the Glycymerididae of the northeast Atlantic Ocean and the Mediterranean Sea, is in preparation (Goud et al. research in progress).

Abbreviations used: NMW = National Museums of Wales, Cardiff; RMNH = National Museum of Natural History, Leiden; AD = J.J. van Aartsen, Dieren; BVH = Bart

van Heugten, Oosterhout; GG = Guus Gulden, Mijnsheerenland; colln = collection; juv. = juvenile(s); st. = station, v. = valve(s), sp. = specimen(s), H = height, L = length, SD = semi-diameter.

Family **Glycymerididae** Newton, 1916

Glycymeris da Costa, 1778

Type species.— *Arca glycymeris* Linné, 1758 (by absolute tautonymy:). See ICZN Opinion 1414 (1986).

***Glycymeris (Glycymeris) vanhengstumi* spec. nov.**

(figs 1, 1a, 2, 2a, 3, 3a, 3b, 4, 4a, 5, 5a, 6, 7)

Pectunculus siculus; MacAndrew, 1850 [Madeira]; Watson, 1891: 371 [Canaries] (*non* Reeve, 1843 = *Glycymeris bimaculata* (Poli, 1795)).

Pectunculus glycymeris; MacAndrew, 1852: 103 [Canary Islands], 107 [Madeira: Funchal roads and/or Porto Santo bay]; Watson, 1898: 302 [Madeira Archipelago: Funchal, Labra, Ponta de São Lourenço, Porto Santo] inclusive colln Rev. R.T. Lowe (received in 1874) and colln Mr. J. Yate Johnson.

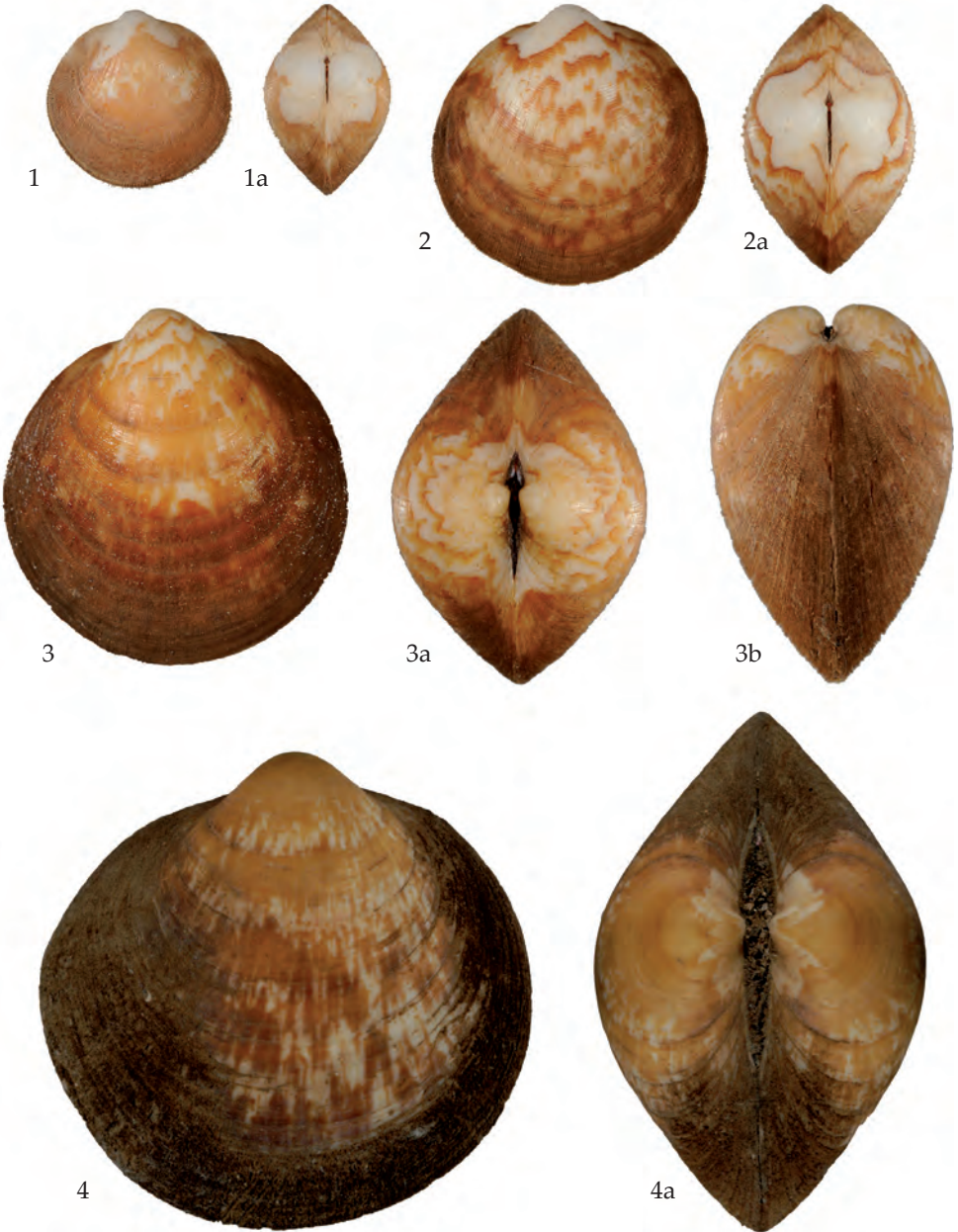
Pectunculus glycymeris Linneü; Nobre, 1889: 8 [Desertas; Funchal; Dragagem no Caniçal].

Pectunculus glycymeris (L.); Nobre, 1937: 79 [Madeira].

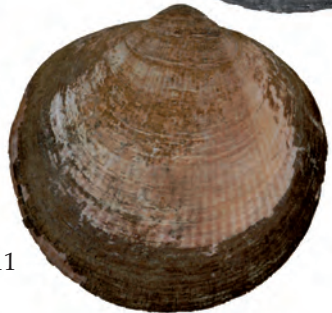
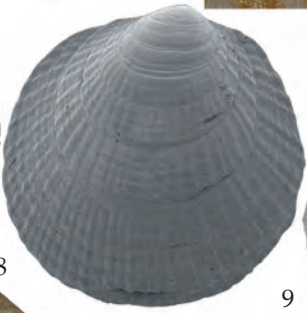
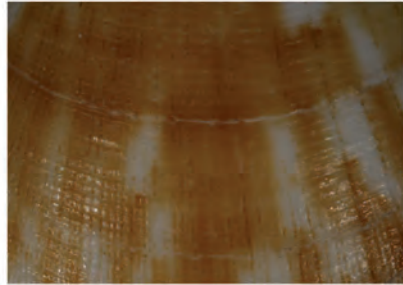
Glycymeris glycymeris (Linné, 1758); Gómez Rodríguez & Pérez Sánchez, 1997: 130; Beck, Metzger & Freiwald, 2005: 97.

Holotype and paratypes.— **Madeira archipelago**, *Madeira*, NMW.1955.158.15402/2 sp., 8 juv. sp., 2 v. & 15406/1 juv. sp., 8 juv. v., ex. Colln Watson (Melvill Tomlin Colln); *SE of Madeira*, RMNH. 11255/many juv., dry, st. 1.025: 32°42'N 16°45'W, -78 m, 9.iii.1976; RMNH. 11257/5 v. & 10 juv., dry, 1.057: 32°43'N 16°43'W, -100-122 m, 12.iii.1976; RMNH.11223, **holotype**, (fig. 3) & RMNH.11224/3 v., 6 sp. (figs 1-2) & 2 juv. v. (fig. 6), 1 sp. colln GG, a70/dry, st. 1.081, *Madeira, off S coast*, 32°38'N 16°49'W, -90-102 m, muddy sand, shells & some clay, 15.iii.1976; RMNH.11226/1 juv. sp., dry; st. 1.085: *S of Madeira*, 32°38'N 16°51'W, -150 m, 15.iii.1976; RMNH.11228/1 sp., a70, st. 1.D80: *S coast of Madeira, near Ponta da Atalaia*, 32°39'N 16°49'W, -0-22 m, coarse sand, 15.iii.1976; *S of Porto Santo*, RMNH.11265/2 v. & 10 juv., dry; st. 3.015: 33° 02' N 16° 21' W, -20 m, 15.x.1978; RMNH.11266/1 sp., (fig. 7) dry, st. 3.039: *S of Madeira*, 32°31'N 16°31'W, -55 m, 18.x.1978; *W coast of Deserta Grande*, RMNH.11269/1 sp. & 1 v., dry, 3.D04: 32°31'N 16°31'W, to -15 m, 18.x.1978.

Other material examined.— **Selvagens archipelago**: RMNH.11267/4 juv. sp. & 4 juv. v., dry, st. 3.065: *SW of Selvagem Grande*, 30°08'N 15°53'W, -100 m, 21.x.1978; RMNH.11268/3 v. & 4 juv. v., dry, st. 3.087: *S of Selvagem Pequena*, 30°01'N 16°01'W, -322 m, 22.x.1978; **Canary Islands**, 2 sp. Colln BVH; *S of Fuerteventura, Punta de Jandía*: RMNH.11259/1 v. & 10 juv., dry, st. 2.003: 28°03'N 14°29'W, -140-200 m, 23.viii.1977; RMNH.11229/2 v., 3 sp., 4 juv. & many juv. v., dry, st. 2.033: 28°10'N 14°01'W, -60 m, 26.viii.1977; RMNH.11230/1 sp., a70, st. 2.034: 28°10'N 14°02'W, -90 m, 26.viii.1977; RMNH.11231/7 sp. + 4 juv. sp., a70, 11232/1 sp., dry, st. 2.035: 28°10'N 14°02'W, -45-80 m, 26.viii.1977; *SE of Fuerteventura, Punta de Gran Tarajal*: RMNH.110566/1 v., 1 sp. & 4 juv., dry, st. 2.043: 28°11'N 13°59'W, -47 m, 27.viii.1977; RMNH.11233/4 v., 4 sp. & 2 juv., dry, st. 2.044: 28°11'N 14°00'W, -49 m, 27.viii.1977; RMNH.11235/ 3 sp., a70, 11234/8 v. & 14 juv. v. dry, st. 2.048: 28°14'N 13°51'W, -100 m, sandy bottom, 27.viii.1977; RMNH.11236/7 sp., a70, 11201/1 v., dry, st. 2.050: 28°12'N 13°52'W, to -70 m, sandy bottom, 27.viii.1977; RMNH.11264/7 v. & 3 juv., dry, st. 2.064: 28°11'N 13°57'W, -77 m, 29.viii.1977; *S of Lanzarote*, RMNH.11237/2 v. & 1 juv., st. 4.002: 28°50'N 13°49'W, -36 m, 14.v.1980; RMNH.11271/1 sp. & many juv., dry, st. 4.010: 28°50'N 13°51'W, -36-47 m, 14.v.1980; RMNH.11272/2 v. & 5 juv. v., dry, st. 4.014: 28°51'N 13°52'W, -46-64 m, 14.v.1980; RMNH.11273/3 juv., dry, st. 4.016: 28°49'N 13°49'W, -36 m, 15.v.1980; RMNH.11238/2 sp., a70, st. 4.018: 28°48'N 13°50'W, -37-40 m, coarse sand & calcareous algae, 15.v.1980; RMNH.11239/2 v. & 3 juv., dry, st. 4.027: 28°49'N 13°47'W, -27-30 m, 15.v.1980; RMNH. 11240-11241, 35868/1 sp, 2 v., 1 juv. sp.



Figs 1-4, *Glycymeris vanhengstumi* nov. spec.; 1, 1a, paratype RMNH.11224.1, type-locality, 14.6 x 15.1mm; 2, 2a, paratype RMNH.11224.2, type-locality, 22.7 x 23.2 mm; 3, 3a, 3b, holotype RMNH.11223, 28.1 x 27.1 x 18.1 mm; 4, 4a, paratype, NMW.1955.158.15402, Melvill-Tomlin colln, ex. Watson, southeast of Madeira, 47.6 x 49.4 x 30.5 mm.



& 7 juv. v., dry, st. 4.029: 28°48'N 13°48'W, -30-31 m, 15.v.1980; RMNH.11275/many juv., dry, st. 4.038: 28°48'N 13°46'W, -82 m, 16.v.1980; RMNH.11276/10 juv., dry, st. 4.041: 28°48'N 13°46'W, -120 m, 16.v.1980; RMNH.35869 /1 specimen, dry, st. 4.068: 28°55'N 13°33'W, -74-95 m, 20.v.1980; RMNH.11242/3 v. & 1 juv. sp., dry, st. 4.069: 28°55'N 13°32'W, -109-116 m, 20.v.1980; *SE of Lanzarote*: RMNH.11243/1 sp., dry, st. 4.071: 28°55'N 13°33'W, -70-80 m, 20.v.1980; *E of Lanzarote*: RMNH. 11280/5 v. & 6 juv. v., dry, st. 4.090: 29°08'N 13°25'W, -65 m, 22.v.1980; RMNH.11244/1 sp. & 1 valve, dry, st. 4.091: 29°08'N 13°25'W, -55-82 m, 22.v.1980; RMNH.11245/1 sp., a70, st. 4.093: 29°08'N 13°25'W, -100-130 m, 22.v.1980; *SW of Palma*: RMNH.35871/2 sp., dry, st. 4.148: 28°39'N 17°58'W, -60-80 m, 3.vi.1980; RMNH.11284/1 v., dry, st. 4.157: 28°39'N 17°59'W, -250-200 m, 4.vi.1980.

Type locality.— Off the south coast of Madeira, 32°38'N 16°49'W, depth 90-102 m, muddy sand, shells and some clay, (collected by van Veen grab), 15.iii.1976.

Diagnosis.— The species is characterised by a small and rounded or slightly acute shell. The shell surface consist of a regular reticulate micro sculpture below the umbones and a sculpture of dense radiating grooves towards the margins, covered largely with a dense periostracum. Above the hinge a low ligamental area is present without chevrons on the shell surface; with a internal resilium of 2-3 conchioline sheets.

Description.— Shell small (adult specimens 27.6 × 27.7 × 18.1 mm, n = 20; average deviation resp. 7.79/7.67/4.76), not exceeding 50 mm in length, circular to sub-circular, thick and inflated, barely inequilateral, with opisthogyr apex; posterior shell margin slightly acute, the anterior perfectly rounded; umbones quite convex and projecting clearly above the hinge line; surface of the shell towards the margin, with a sculpture of fine, straight, radial secondary ribs, c. 9 - 12 per (internal) rib and very fine growth lines; below the umbones the micro sculpture shows a regular reticulate pattern due to equally strong radiating ribs and growth lines; a velvety, dense periostracum at least present along the margins, sometimes covering large parts of the shell; margins conspicuously scalloped with fine internal ribs, not projecting beyond the edge. Colour of the exterior is off-white to cream with smaller to larger reddish-brown streaks and blotches; commonly with characteristic fine brown spots around the umbones; interior white, with occasional some brown, mainly near the anterior. The usually white interior occasionally shows some brown colour between the posterior and the mid. Above the hinge there is a low ligamental area which is asymmetrical (distances of anterior side to apex : posterior side to apex = 1 : 4), without chevrons on the calcareous shell surface, covered with 2-3 chevron-shaped conchioline sheets (in adult specimens); the hinge is moderately arcuate, in adult specimens both anterior and posterior with 11 teeth.

◀ Figs 5-7, *Glycymeris vanhengstumi* nov. spec.; 5, 5a, RMNH.11245, right valve exterior and right valve interior (adductor muscle scars and pallial line indicated), 31.1 × 30.0 mm, Canary Islands, east of Lanzarote (St. 4.093); 6, paratype RMNH.11224.3, micro sculpture of juvenile shell, 6.50 × 6.46 mm, type-locality; 7, paratype RMNH.11226, right valve, 10.7 × 11.6 mm, sculpture on sub-adult, S of Madeira, depth 150 m, St. 1.085; fig. 8, *Glycymeris glycymeris*, juvenile valve, 5.29 mm, AD.3381, micro sculpture, north Spain, Ria d'Arosa, dredged, vii.1962 (leg. G. Cadee); fig. 9, *Glycymeris pilosa*, juvenile valve, 8.78 mm, AD.13161, micro sculpture on juvenile valve, Israel, Haifa bay, 44-85 m, 1974 (leg. A. Barash); fig. 10, *Glycymeris vovan*, right valve, 12.5 × 12.8 mm, AD.30215, sculpture on sub-adult, Canary Islands, La Palmas, xii.2005 (leg. De Klein); fig. 11, *Glycymeris glycymeris*, left valve, 65.6 mm, RMNH.RA.004, north Spain, Ria d'Arosa, Playa de la Lanzada, on the beach, 6.vii.1962; fig. 12, *Glycymeris pilosa*, left valve, 65.3 mm, RMNH.RA.1.846, northern Spain, Ria d'Arosa, south of Tallos, 1 m depth, 6.viii.1964.

Juvenile shells of only a few millimetres are relatively high and somewhat oblique.

Distribution.— Madeira Archipelago: Madeira, Deserta Grande and Porto Santo; Selvagens Archipelago: Selvagem Grande, Selvagem Pequena and Canary Islands: Fuerteventura, Lanzarote and Palma. Live specimens were found between c. 20 and 110 m depth, on coarse-grained sand and shell gravel, less commonly with some mud and clay.

Discussion.— The new species *G. vanhengstumi* is morphologically similar to *G. glycymeris*, especially its sculpture, although the inflation of the valves reminds more of *G. pilosa*. It lives geographically separated on the Macronesian shelf and is, so far only known from Madeira, the Selvagens and the Canary Islands. The shell of the adult stage of *G. vanhengstumi* is less than half the size of that of *G. glycymeris* and *G. pilosa*, and it is more rounded in shape compared to *G. glycymeris*.

The sculpture, particular explicit between the umbo and the area around the semi-diameter, is finer, with equally strong commarginal and radial ribs and a less prominent reticulation as in *G. pilosa* (fig. 9). All three species can most easily be differentiated by the secondary rib count per internal rib, which is best counted along the shell margin. Grooves alternate with the secondary ribs.

Periostracal hairs occur in most glycymerids; they are situated in rows in the radial grooves; in worn-off situations these grooves commonly show small pits as markings of the original periostracum. These rows of pits or rows of periostracal hairs are most easy to count under a magnification of 10 to 15 ×.

With *G. glycymeris* (fig. 11) and *G. pilosa* (fig. 12) we refer to different species in contrast to the Check List of European Marine Mollusca (CLEMAM) were they are considered to be synonymes. In our wider studies on the glycymeris/pilosa complex we noticed that many characters have large variations, but the number of fine radiating secondary ribs (and the corresponding grooves) clearly show a differentiation. Per internal rib, corresponding with each crenulation at the shell margin, we count 4 to 6 secondary

Table 1. Differentiation of adult specimens of *G. glycymeris* (Brittany), *G. pilosa* (Mediterranean) and *G. vanhengstumi* (Madeira). For the measurements, extremes were selected (n = 6).

species	<i>G. glycymeris</i>	<i>G. pilosa</i>	<i>G. vanhengstumi</i>
characters			
posterior side of shell	oblique flattened	convex	slightly flattened to convex
posterior outline	widely rounded, widest below midline	acute above the midline and towards the ventral side, widest at midline	rounded or somewhat acute, widest at midline
valve convexity, measured in pairs (diameter : length)	0.61 - 0.54	0.80 - 0.67	0.72 - 0.62
height : length	1.00 - 0.94	1.08 - 0.94	1.00 - 0.97
umbonal sculpture	reticulate, without primary ribs	primary ribs prominent	reticulate, without primary ribs
secondary rib count per internal rib	12 - 15	4 - 6	9 - 12

ribs (and grooves) in *G. pilosa* and 12-15 in *G. glycymeris*. In agreement with our observations, Van Nieulande and Moerdijk (1999) reported earlier for the fossil European glycymerid fauna the two species: *G. (G.) glycymeris* (Miocene-Pliocene to Recent) and *G. (G.) pilosa* (Miocene to Recent). Their secondary rib count is also 4 to 6 in *G. pilosa* and they report a finer sculpture (which means more secondary ribs) for *G. glycymeris*.

The species *G. vovan* Lamy that also lives in the macronesian area has a completely smooth surface and has no periostracal hairs (fig. 10).

Etymology.— The name *vanhengstumi* is introduced in honour of the late Ronald van Hengstum, director (2003-2007) of the National Museum of Natural History.

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