



The unknown bathyal of the Canaries:
new species and new records of deep-sea Mollusca

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Shells of *Spirolaxis lamellifer* (Rehder, 1935), *Orbitesella pruinosa* n. sp., *Graphis gracilis* (Monterosato, 1874), *Odostomia madeirensis* Peñas, Rolán & Swinnen, 2014, *Liostomia canaliculata* n. sp., *Ringicula pirulina* Locard, 1897, *Colpodaspis pusilla* M. Sars, 1870.

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The unknown bathyal of the Canaries: new species and new records of deep-sea Mollusca

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ABSTRACT

A set of seven dredge hauls, between 195-215 m and 655-660 m deep on the NW slope of Gran Canaria (Canary Islands, Spain), recovered 15 000 specimens belonging to 295 species of molluscs. Of these, 254 are identified at the species level. Only 47 species, totalling 867 specimens, were live collected, which amounts to 84% of the species and 94% of the specimens represented only by shells. The dredges DW 133 (shallowest) and DW 130 (deepest) hold the highest number of species and abundance, representing about 90% of the material. Fifty-one species are new records for Canarian waters; of these, 23 are new for Spanish waters overall and three are the first reference in eastern Atlantic waters. Another 13 species, in the genera *Mikro* Warén, 1996, *Discaclis* Moolenbeek & Warén, 1987, *Mucronalia* A. Adams, 1860, *Marginella* Lamarck, 1799, *Dentimargo* Cossmann, 1899, *Prunum* Herrmannsen, 1852, *Microvoluta* Angas, 1877, *Spirotropis* G.O. Sars, 1878, *Gymnobela* Verrill, 1884, *Mitromorpha* Carpenter, 1865, *Orbitestella* Iredale, 1917 and *Liostomia* G.O. Sars, 1878, are described as new, most of them from the deepest haul at 655-660 m. *Anatoma richardi* (Dautzenberg & Fischer, 1896) is restored as valid species and the identification of Canarian specimens as *Anatoma tenuis* (Jeffreys, 1877) is disputed. *Ancistrobasis lavaleyei* Hoffman & Freiwald, 2017 is synonymized with *A. reticulata* (Philippi, 1844). *Pleurotomella megalembryon* (Dautzenberg & Fischer, 1896), type species of *Azorilla* Nordsieck, 1968, is assigned to *Teretia* Norman, 1888; *Teretia strongyla* (Dall, 1927) is synonymized with *T. megalembryon*, and *Azorilla* with *Teretia*. *Pleurotoma teres* Reeve, 1844 is selected under ICZN Art. 70.3.2 as type species of *Teres* Bucquoy, Dautzenberg & Dollfus 1883 and of its substitute name *Teretia*, discarding therefore *Pleurotoma anceps* Eichwald, 1830.

KEY WORDS

Canary Islands,
species richness,
discovery rate,
Mollusca,
bathyal,
new records,
new synonymies,
new combinations,
new species.

RÉSUMÉ

Le bathyal inconnu des Canaries : nouvelles espèces et nouvelles signalisations de mollusques profonds.

Une série de sept dragages, situés entre 195-215 m et 655-660 m de profondeur sur le versant nord-ouest de Gran Canaria (îles Canaries, Espagne), a fourni 15 000 spécimens appartenant à 295 espèces de mollusques. Parmi ceux-ci, 254 sont identifiés au niveau spécifique. Seules 47 espèces, totalisant 867 spécimens, ont été capturées vivantes, ce qui équivaut à 84 % des espèces et 94 % des spécimens représentés uniquement par des coquilles. Les dragues DW 133 (la moins profonde) et DW 130 (la plus profonde) contiennent le plus grand nombre d'espèces et de spécimens, représentant environ 90 % du matériel. Cinquante et une espèces sont de nouvelles signalisations pour les eaux canariennes; 23 d'entre elles sont nouvelles pour l'ensemble des eaux espagnoles et trois sont citées pour la première fois dans l'Atlantique oriental. Treize autres espèces, appartenant aux genres *Mikro* Warén, 1996, *Discaelis* Moolenbeek & Warén, 1987, *Mucronalia* A. Adams, 1860, *Marginella* Lamarck, 1799, *Dentimargo* Cossmann, 1899, *Prunum* Herrmannsen, 1852, *Microvoluta* Angas, 1877, *Spirotropis* G.O. Sars, 1878, *Gymnobela* Verrill, 1884, *Mitromorpha* Carpenter, 1865, *Orbitestella* Iredale, 1917 et *Liotomia* G.O. Sars, 1878, sont décrites comme nouvelles, la plupart d'entre elles provenant du site le plus profond à 655-660 m. *Anatoma richardi* (Dautzenberg & H. Fischer, 1896) est rétablie comme espèce valide et l'identification des spécimens des Canaries comme *Anatoma tenuis* (Jeffreys, 1877) est contestée. *Ancistrobasis lavaleyei* Hoffman & Freiwald, 2017 est mise en synonymie d'*A. reticulata* (Philippi, 1844). *Pleurotomella megalembryon* (Dautzenberg & H. Fischer, 1896), espèce type d'*Azorilla* Nordsieck, 1968, est attribué à *Teretia* Norman, 1888; *Teretia strongyla* (Dall, 1927) est placée en synonymie de *T. megalembryon* et *Azorilla*, de *Teretia*. *Pleurotoma teres* Reeve, 1844 est sélectionné aux termes de l'Art. 70.3.2 du CINZ en tant qu'espèce type de *Teres* Bucquoy, Dautzenberg & Dollfus 1883 et de son substitut, *Teretia*, écartant donc *Pleurotoma anceps* Eichwald, 1830.

MOTS CLÉS

Îles Canaries, richesse spécifique, taux de découverte, mollusques, bathyal, signalisations nouvelles, synonymies nouvelles, combinaisons nouvelles, espèces nouvelles.

INTRODUCTION

The waters surrounding the Canary Islands are believed to be the most promising of all Spanish waters in terms of new discoveries in the benthic fauna (Gofas *et al.* 2017), taking into account that recent exploration of the benthos still yields new species or new records. Of the 127 species of molluscs currently listed as endemic of the archipelago, nearly half were described in this century and only six had been described prior to 1979.

This may be still more so in the bathyal zone, where exploration is technically demanding and requires the intervention of properly equipped research vessels. Here we report on the Mollusca from a suite of samples on the north-western slope of Gran Canaria, collected at the beginning of the SEAMOUNT 2 campaign, aimed to the Central North Atlantic seamounts south of the Azores.

A BRIEF HISTORY OF THE EXPLORATION OF THE DEEP CIRCUMCANARIAN BENTHOS

The first insight into the deep-water benthos around the Canaries was an isolated station of the H.M.S. “Challenger” in 1873 (sta. 85, west of La Palma in 1125 fathoms [= 2057 m] in which only 20 species were collected (Smith 1885; Watson 1886). Six of them were described as new and seven remained unidentified. The expedition of the French vessel “Talisman” in 1883, aimed to a systematic sampling

from the Bay of Biscay to Morocco and Mauritania, made several dredgings in Canarian waters (Fig. 1) and provided the first significant contribution. All the zoological groups were studied and published monographs (for molluscs, Locard 1897-1898) were for more than a century the basic reference for the deep benthos of this region. In 1968, the British R.R.S. “Discovery” carried out a campaign in North West Africa to study the upwelling area (National Institute of Oceanography, 1968), and carried out several dredging operations in Canarian waters under the supervision of malacologist John Allen. However, little of the material has been systematically studied (for example, cumaceans by Corbera *et al.* 2001), and for molluscs, there are only isolated records in reports with a broader scope (Bouchet & Warén 1980, 1985, 1986, 1993; Allen & Morgan 1981). At the end of the 20th century, the largest sampling effort carried out in the area was undoubtedly the Dutch CANCAP project, with several campaigns of the vessel “Tydeman”, with some 1360 operations carried out deeper than 200 meters (van der Land 1987). The published results cover hydrozoans (Medel & Vervoort 1998, 2000; Ansin Agis *et al.* 2001; Vervoort 2006), brachiopods (Logan 1983; 1988), crustaceans (Holthuis 1984) and a few families of molluscs (De Boer 1985; Moolenbeek & Warén 1987; van der Linden 1995, 1998; Goud & Neefs 1996; Hoenselaar & Goud 1998; van Aartsen *et al.* 1998; 2000; Dijkstra & Goud 2002; Verhecken 2007). In addition to this, there were numerous campaigns, mainly in deep water, made in the 1990s by the research vessel “Taliarte” of the Canarian Institute of Marine

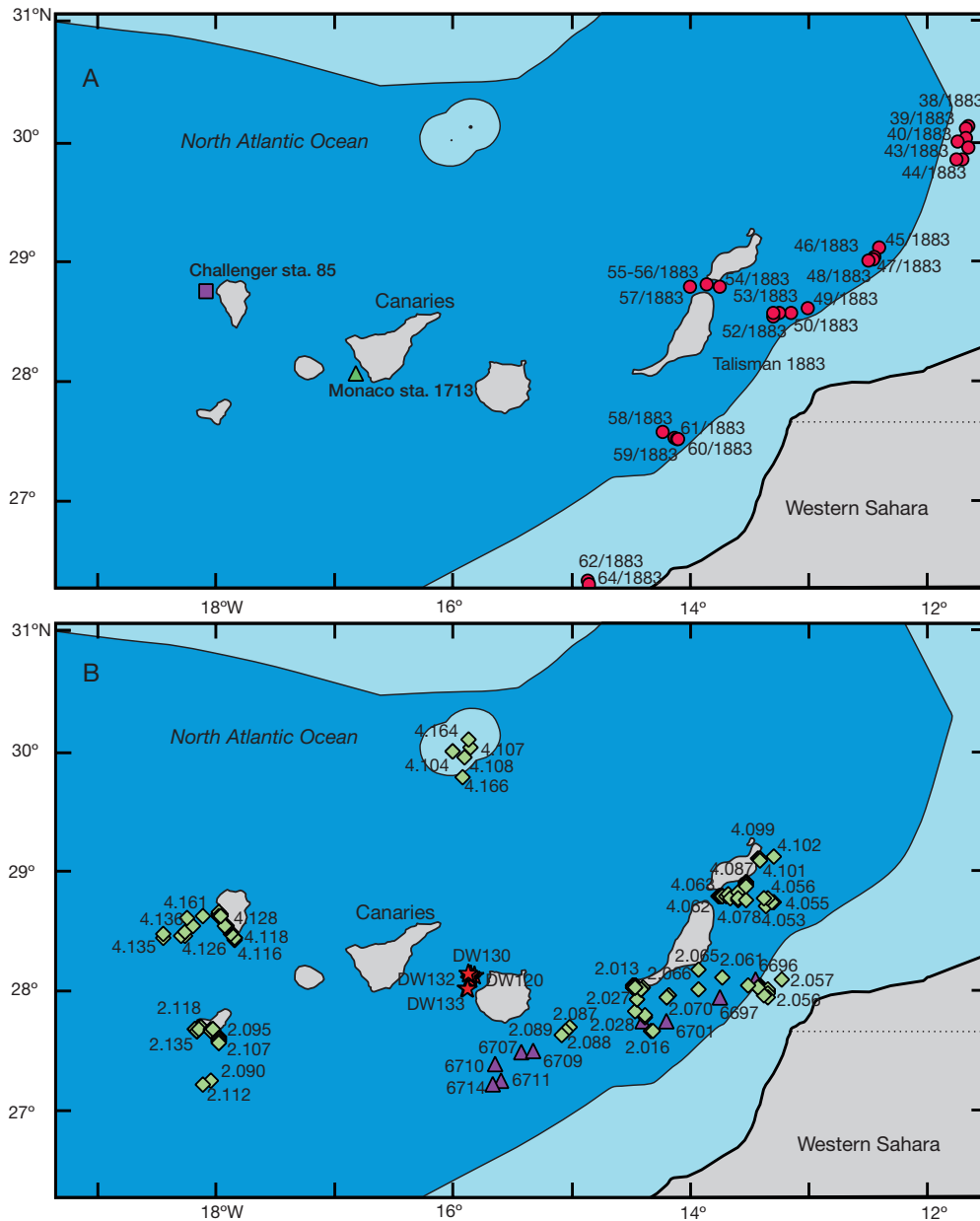


FIG. 1. — Historical sampling of deep-sea benthos in Western Sahara: **A**, XIXth century, stations of the *Challenger* (square), of the *Prince of Monaco* (triangle) and of the *Talisman* (diamonds); **B**, XXth century, R. R.S “Discovery” (triangles), CANCAP (diamonds) and SEAMOUNT 2 (stars) expeditions. In deep blue, the Canaries EEZ according to the Spanish position (i.e., considering the *Islas Selvagens* as uninhabited islets, without the right to a 200 miles EEZ).

Sciences (ICCM) of the Cabildo Insular of Gran Canaria. From this material, there is a comprehensive report on the decapod crustaceans (González Pérez 1995), but for molluscs we could only trace the isolated description of a marginellid species (Pérez-Dionis *et al.* 2009).

In this century, the INDEMARES project, intended to document offshore prospective marine protected areas for the EU’s Natura 2000 network, targeted two deep-water areas, one to the southeast of Fuerteventura and Lanzarote and the other on Banco de la Concepción seamount (Almón *et al.* 2014a, b) but so far virtually nothing has filtered of the results

and only those general accounts were published, recording only three molluscan species.

Those cumulated efforts have so far resulted in documenting 195 molluscan species living normally below 500 m (the “DeepSea” context in the World Register of Marine Species, Glover *et al.* 2017), of which ten are spurious and seven are not known outside Canarian jurisdictional waters (Gofas *et al.* 2017, supplementary material). Still, the SEAMOUNT 2 sampling is the only source for Gran Canaria and the islands of Tenerife and Gomera remain virtually unsampled in the deep sea.

TABLE 1. — Operations in Gran Canaria during cruise SEAMOUNT 2. For each haul, the first line refers to the coordinates and depth at which the dredge has touched the bottom, the second line to the coordinates and depth at the time of turning. Those dredges marked with (*) contain very scanty material.

Haul	Time	Coordinates	Depth	Shipboard observations
DW 120	21.03 h 21.23 h	28°07.83'N, 15°50.00'W 28°08.29'N, 15°49.44'W	240 m 300 m	Volcanic and bioclastic sand, slightly muddy, with few live specimens. Presence of <i>Hyalinoecia</i> Malmgren, 1867
DW 126	17.51 h 18.02 h	28°07.59'N, 15°52.05'W 28°07.66'N, 15°52.02'W	345 m 345 m	Rocky bottom with slightly muddy bioclastic sand. Abundant fauna of sponges, gorgonians and hydrozoans
DW 128	08.40 h 08.51 h	28°08.26'N, 15°51.99'W 28°08.47'N, 15°51.66'W	470 m 485 m	Muddy sand with abundant siliceous sponges and other fauna. Presence of stylasterids
* DW 129	10.19 h 10.29 h	28°08.32'N, 15°51.94'W 28°08.51'N, 15°51.61'W	480 m 480 m	Abundant siliceous sponges; a crinoid of family Bourgueticrinidae Loriol, 1882
DW 130	14.00 h 14.10 h	28°08.95'N, 15°53.11'W 28°09.06'N, 15°52.92'W	660 m 655 m	Abundant dead coral, mostly <i>Lophelia pertusa</i> (Linnaeus, 1758), and bioclastic sand; few living animals and sponges
* DW 132	19.34 h 19.43 h	28°01.41'N, 15°54.02'W 28°01.63'N, 15°53.94'W	350 m 350 m	Slightly sandy mud with shell debris; mostly infaunal animals: <i>Abra</i> Lamarck, 1818, scaphopods, sipunculid
DW 133	21.01 h 21.11 h	28°01.25'N, 15°53.52'W 28°01.54'N, 15°53.46'W	215 m 195 m	Bioclastic sand and gravel

MATERIAL AND METHODS

The SEAMOUNT 2 Oceanographic Campaign was held in January-February 1993 aboard R/V *Le Suroît*, with the second author as chief scientist and with the main objective of collecting information on larval dispersal capacity for colonization and speciation in the main underwater mountains of the Middle North Atlantic.

During the campaign a total of 129 benthic samples were collected, of which 94 were obtained by Warén dredge (DW). The samples from off NW of Gran Canaria (Fig. 1; Table 1), representing a total of 10 dredges in a depth range between 195 m and 680 m, are studied herein.

These samples were sieved on board in sea water on a column of 10, 5, 3 and 0.5 mm, sorted down to the higher zoological groups (phylum or class), and preserved for later identification and taxonomic work. Unsorted sediment samples were also preserved for subsequent separation in the laboratory of the finer fractions between 5 and 0.5 mm. The resulting mollusc material, including the types of new species, is deposited in Muséum national d'Histoire naturelle (MNHN).

The results of individual hauls were very uneven in terms of abundance and quality of the material, with the Warén dredge giving better results on rough bottoms than the epibenthic sled (which got lost in DE125). Dredge hauls that collected adequate material in terms of abundance are DW126 (in 345 m), DW128 (470-485 m), DW130 (655-660 m) and DW 133 (195-215 m).

The samples used in this work were mostly preserved dry, except for some specimens fixed in ethanol when separated on board. Most of the material consists of shells, the proportion of live specimens being very low. The samples were fully separated at the species level, individually labelled and preserved in non-acidic glass tubes. Empty shells (hereafter, sh.) and live-taken specimens (hereafter, spm.) are listed separately.

The identification of the material was made using publications covering a large area of the North Atlantic, as well as comparative material (mainly from the Alboran Sea) preserved at the University of Málaga. In this list of references, the regional volumes on molluscs of Canaries (Hernández *et al.* 2011), Madeira (Segers *et al.* 2009) and Cabo Verde (Rolán 2005) stand out. Other important works are a series of monographs on deep-sea gastropods from the North-West Atlantic (Bouchet & Warén 1980; 1985; 1986; 1993; Warén 1989a; 1991; 1992; 1993; 1996) and deep-sea bivalves (Sanders & Allen 1973; 1977; Allen & Morgan 1981; Warén 1989b; Salas 1996) in addition to the works on CANCAP Molluscs (De Boer 1985; Moolenbeek & Warén 1987; van der Linden 1995, 1998; Goud & Neefs 1996; Hoenselaar & Goud 1998; van Aartsen *et al.* 1998, 2000; Dijkstra & Goud 2002; Verhecken 2007).

The validity of the names used and their currently accepted familial placement was contrasted with the World Register of Marine Species (WoRMS Editorial Board 2018) using the “Match Taxa” tool therein.

The type of larval development was assessed from the characteristics of the protoconch, as detailed by Jablonski & Lutz (1980). A multispiral protoconch with differentiated protoconch I and protoconch II is taken as indicating planktotrophic development and this also indicates a considerable potential for dispersal at the larval stage. Conversely, a comparatively large, paucispiral protoconch without a differentiated protoconch II is taken as indicative of a non-planktotrophic larval stage, with a limited potential for dispersal.

ABBREVIATIONS

sh.	shell;
spm.	live collected specimen;
v.	valve.

SYSTEMATIC PART

A total of about 15 000 specimens belonging to 295 species have been identified. Of these, 254 species, totalling 14 052 individuals, have been either identified at the species level or recognized as undescribed. Unidentified specimens at the species level include juveniles or specimens in poor condition which do not allow to observe diagnostic characters, and some which belong to genera or families whose taxonomy is problematic (Cocculiniformia Haszprunar, 1987, Eulimidae Philippi, 1853 for example).

Only 47 species, totalling 867 specimens, are represented by at least one specimen collected alive, which amounts to 84% of the species and 94% of the specimens represented only by shells.

The dredges DW 133 (shallowest) and DW 130 (deepest) are the ones with the highest number of species and abundance, representing about 90% of the total material.

Confronting the results of this study with the Spanish List of Marine Species recorded in Canary Island waters (Gofas *et al.* 2017) revealed 51 species as new records for Canarian waters. Of these, 23 are new records for Spanish waters overall and three are first references in eastern Atlantic waters. This count of new records do not include species already known from the Canary Islands under another name, for which we provide revised identifications. Surprisingly, only 11 of the species found in our material species (3.7% of the total) are listed as Canarian endemics in the checklist.

Another thirteen species seem new to science, most of them from the deepest dredge haul in 660 meters.

Hereafter we describe the species which are considered as new, provide taxonomic notes on some previously recorded species which we believe to have been misidentified or misplaced generically, and list all the newly recorded species.

Class GASTROPODA Cuvier, 1795
Subclass COCCULINIFORMIA Haszprunar, 1987
Family BATHYSCIADIIDAE
Dautzenberg & H. Fischer, 1900

Genus *Bathysciadium* Dautzenberg & H. Fischer, 1899

TYPE SPECIES. — *Bathysciadium conicum* Dautzenberg & H. Fischer, 1899, by monotypy.

Bathysciadium costulatum (Locard, 1898)
(Fig. 2A, B)

MATERIAL EXAMINED. — 31 sh., DW130.

REMARK

New record for the Canaries, this species was reported from Galicia Bank by Hoffmann *et al.* (2018), under the name *Lepetella ionica* F. Nordsieck, 1973. Warén (1997) figured a syntype on which the radial lines formed by the periostracum are still visible, and reported this species to live on squid beaks deposited on the sea bottom.

Subclass VETIGASTROPODA Salvini-Plawen, 1980
Family PSEUDOCOCCULINIDAE Hickman, 1983

Genus *Copulabyssia* Haszprunar, 1988

TYPE SPECIES. — *Cocculina corrugata* Jeffreys, 1883 by original designation.

Copulabyssia corrugata (Jeffreys, 1883)
(Fig. 2C, D)

MATERIAL EXAMINED. — 5 sh., DW130.

REMARK

Originally described from the Hebrides-Faroe Channel, new record for the Canaries.

Family FISSURELLIDAE J. Fleming, 1822

Genus *Profundisepta* McLean & Geiger, 1998

TYPE SPECIES. — *Puncturella profundus* Jeffreys, 1877, by original designation.

Profundisepta profundus (Jeffreys, 1877)
(Fig. 2E, F)

MATERIAL EXAMINED. — 370 sh., DW130.

REMARK

Originally described from western Portugal, this species has also been reported in the Western Atlantic (Dall 1927) and is a new to Spanish waters.

Genus *Fissurisepta* Seguenza, 1863

TYPE SPECIES. — *Fissurisepta papillosa* Seguenza, 1863, by subsequent designation.

Fissurisepta granulosa Jeffreys, 1883
(Fig. 2G, H)

MATERIAL EXAMINED. — 4 sh., DW130.

REMARK

Originally described from western Portugal, new record for the Canaries.

Family SCISSURELLIDAE Gray, 1847

Genus *Satondella* Bandel, 1998

TYPE SPECIES. — *Satondella minuta* Bandel, 1998, by original designation.

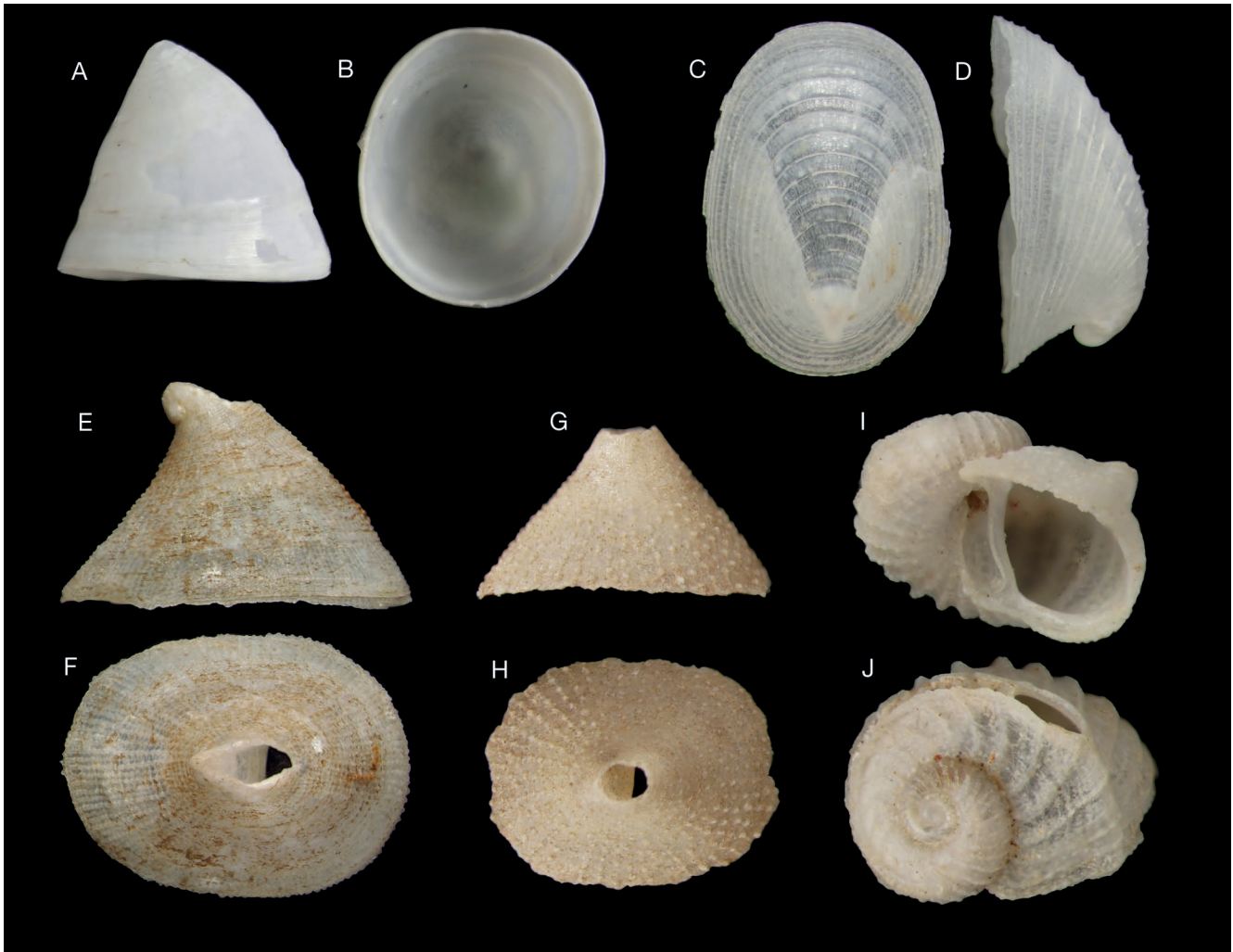


FIG. 2. — **A, B**, *Bathysciadium costulatum* (Locard, 1898), shell from DW130 (2.3 mm length); new to Spanish waters; **C, D**, *Copulabyssia corrugata* (Jeffreys, 1883), shell from DW130 (1.6 mm length); new to the Canaries; **E, F**, *Profundisepta profundi* (Jeffreys, 1877), shell from DW130 (3.6 mm length); new to Spanish waters; **G, H**, *Fissurisepta granulosa* Jeffreys, 1883, shell from DW130 (2.3 mm length); new to the Canaries; **I-J**, *Satondella danieli* Segers, Swinnen & Abreu, 2009, shell from DW130 (1.8 mm maximum diameter); new to Spanish waters.

Satondella danieli

Segers, Swinnen & Abreu, 2009
(Fig. 2I, J)

MATERIAL EXAMINED. — 3 sh., DW133; 23 sh., DW130.

REMARK

Originally described from Madeira, new to Spanish waters.

Genus *Anatoma* Woodward, 1859

TYPE SPECIES. — *Scissurella crispata* J. Fleming, 1828, by monotypy.

Anatoma aspera (Philippi, 1844)

MATERIAL EXAMINED. — 10 sh., DW120; 8 sh., DW126; 80 sh., DW130; 5 spm.; 129 sh., DW133.

Anatoma eximia (Seguenza, 1880)

MATERIAL EXAMINED. — 49 sh., DW120; 2 sh., DW130; 21 spm. and 142 sh., DW133.

Anatoma richardi (Dautzenberg & H. Fischer, 1896)
(Fig. 3A-D)

MATERIAL EXAMINED. — 115 sh., DW130.

REMARKS

Geiger (2012: 1108 and distribution map) reported *Anatoma tenuis* (Jeffreys, 1877) from three localities in the Canaries, ranging from 450 to 900 m, without illustrating these lots. We found in our material three species of *Anatoma*, viz. *Anatoma aspera*, *A. eximia* and the species resembling *A. tenuis* here illustrated (Fig. 3A-D). Whereas for the first two we agree with Geiger's (2012) identifications, there are issues regarding the last one.

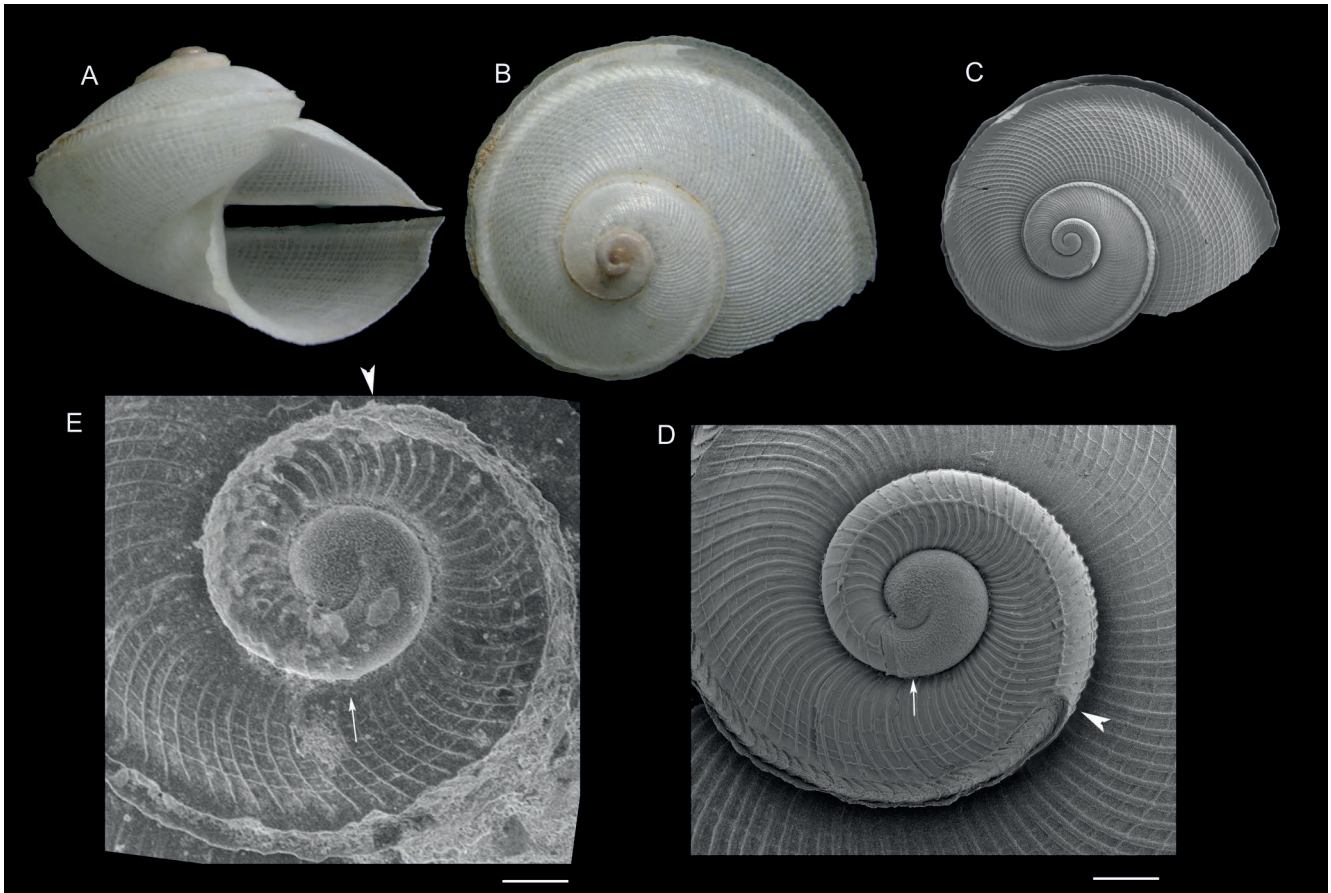


FIG. 3. — *Anatoma richardi* (Dautzenberg & H. Fischer, 1896): **A, B**, shell from DW130 (3.7 mm diameter); **C**, scanning electron micrograph of another shell from the same locality (2.8 mm); **D**, protoconch and first teleoconch whorl of the same shell; **E**, protoconch and first teleoconch whorl of the lectotype of *Scissurella tenuis* Jeffreys, 1877 (USNM 181649,1). Scale bars: 100 μ m. **Small arrows**: protoconch/teleoconch limit; **large arrowheads**: to the beginning of the selenizone (end of teleoconch I). (E, reproduced with the permission of the National Museum of Natural History, Smithsonian Institution, <https://www.nmnh.si.edu/>).

Our specimens have the suture of the last whorl either attached to the abapical keel of the selenizone, or dropping at some distance below this keel (leaving exposed a part of the previous whorl below the keel of the selenizone called “sutsel” by Geiger), with all transitional constructions. This questions the taxonomic value of this character, given by Geiger as a diagnostic of *A. tenuis* vs *A. tenuisculpta* (Seguenza, 1880). The latter species, originally described as a fossil from the Pliocene of southern Italy, is briefly compared to *A. tenuis* by Geiger (2012: 1106, 1116), and stated to differ, in addition to the sutsel in having a “longer teleoconch I (0.75 vs 0.5 whorl)” and “a wider umbilicus”. Nonetheless in the description provided for *A. tenuisculpta*, teleoconch I is reported to be 0.5-0.85 whorl so that this difference from *A. tenuis* is not diagnostic. Our own Canarian specimens have about 0.75 whorl of teleoconch I (Fig. 3E). A further feature of the early teleoconch of both *A. tenuisculpta* as understood by Geiger (2012) and our specimens, is the presence of a single spiral cord on the outer third of teleoconch I, abutting on the beginning of the selenizone (Fig. 3D). This feature is found also on other species (e.g. *A. aspera*) and is stable on all the specimens we examined, but the lectotype of *Scissurella tenuis* shows only

strong, arched axial ribs fading before reaching the suture, no spiral cord (Fig. 3E) and the teleoconch I extends hardly more than 0.5 whorl.

Our specimens are most likely conspecific with those reported by Geiger around the Canaries, Azores and Cape Verde Islands in the upper bathyal (310-1340 m), and the same species is also known to us from Galicia Bank off the NW Iberian Peninsula, but these may not be correctly identified as *Anatoma tenuis*, which has an abyssal type locality south of Greenland and has a discrepant morphology of the early teleoconch.

The fossil neotype of *A. tenuisculpta* has the last whorl considerably narrower and dropping more distinctly down from the suture, than in any of the Recent specimens here discussed. The specimens from Norway illustrated by Geiger as *A. tenuisculpta* have a much flatter spire and do not show essential difference with the Canarian specimens, apart from size and a somewhat less expanded last whorl. Conversely, *Scissurella richardi* Dautzenberg & H. Fischer, 1896, described from 1300-1396 m off the Azores is certainly the same. For the time being, we find premature to assume the synonymy of *Anatoma richardi* with either *A. tenuis* or *A. tenuisculpta* and propose to use the former name for the Recent Macaronesian species.

Family SKENEIDAE W. Clark, 1851

Genus *Mikro* Warén, 1996

TYPE SPECIES. — *Mikro globulus* Warén, 1996, by original designation.

Mikro oviceps n. sp.
(Fig. 4A-H)

[urn:lsid:zoobank.org:act:D9DA7056-2000-417A-92C5-AEE1AF757354](https://doi.org/10.2307/23072307)

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34255.
Paratypes. 24 sh., MNHN-IM-2000-34256, all from SEAMOUNT 2, DW 130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — From the Latin meaning “egghead”, referring to the shape of the protoconch.

DESCRIPTION

Shell minute, globular in shape, with a moderately high, somewhat cyrtoconoid spire and a distinct umbilicus. Protoconch proportionally very large, egg shaped with no sign of coiling, with a maximum diameter of 270 µm, separated from the teleoconch by a distinct scar; protoconch surface with a microscopically pitted texture seen only at high magnification under the SEM. Teleoconch of about 1 ¾ whorl. Spire whorls with a weak spiral cordlet running along the suture, a very distinct adapical shoulder delimited by a sharp keel, channelled between the suture and the keel and slightly convex below it. Surface mostly smooth except for growth lines, a cluster of 4-6 spiral cordlets below the periphery of the last whorl, and another cluster of three stronger spiral cords surrounding the umbilicus. Aperture with a somewhat rhomboidal shape, with the adapical part definitely angled. Outer lip rather thick but simple, ortho-cline; parietal area without any callosity, columellar edge of the aperture increasing in thickness abapically. Umbilicus open, deep and relatively broad, inside with axial growth lines of a very rough texture, and with an additional spiral cord situated deep inside and abutting into the abapical part of the columella.

Colour opaque white, with a somewhat pearly aspect, the protoconch slightly yellowish. Maximum diameter up to 0.8 mm (holotype 0.84 mm height × 0.80 mm diameter).

REMARKS

The generic assignment of this species is tentative; shared characters with the type species *Mikro globulus* Warén, 1996 are the minute size, the protoconch with a rough but not distinctly sculptured surface, the presence of a distinct adapical keel at a short distance from the suture, and of a distinct spiral ridge inside the umbilicus. *Lopheliella* Hoffmann, van Heugten & Lavaleye, 2008 is similar in shape but has a distinct honeycomb sculpture on the protoconch which is not seen

here; *Lopheliella* also either lacks an internal ridge inside the umbilicus or has it very close to its edge, not far inside as in *Mikro globulus*. *Lopheliella* species are also considerably larger, with an adult size of 2 to 3 mm.

Mikro oviceps n. sp. is unique in having a protoconch which shows no sign of coiling, contrary to *M. globulus* and *M. hattonensis* Hoffman, van Heugten & Lavaleye, 2010 which were also collected in the same dredge haul.

Mikro globulus (Fig. 4I-L) is similar in size but has a higher spire, not cyrtoconoid. It lacks the clusters of spirals on the periphery and the abapical part of the last whorl; the subsutural shoulder disappears on the later whorls, and the umbilicus is narrower with only one periumbilical ridge, and no spirals inside. *Mikro hattonensis* (Fig. 4M-P) is more similar to *M. oviceps* n. sp. in outline, but also lacks the spirals on the last whorl and is more broadly umbilicate. Both *M. globulus* and *M. hattonensis* have a protoconch as usual in Vetigastropoda i.e. coiled with hardly more than half a whorl (Fig. 4L, P). Both also have been found in the same sample as *M. oviceps* n. sp. and are new records for Spanish waters (see below).

Mikro globulus Warén, 1996
(Fig. 4I-L)

MATERIAL EXAMINED. — 14 sh., DW130.

REMARKS

New to Spanish waters. Compared to the paratypes from off Iceland illustrated in Warén (1996), our specimens are larger (1.5 mm vs 1 mm), with flatter whorls. Nevertheless the subsutural keel, very conspicuous at the beginning of the teleoconch and fading out later, and the narrow umbilicus bound by a deeply set spiral ridge, are similar. Considering that many other species (e.g. *Rugulina fragilis* (G. O. Sars, 1878), *Ancistrobasis reticulata* (Philippi, 1844), *Cantrainea* spp., *Larsenia scalaroides* Warén, 1989, among others) are shared with the assemblage described by Warén (1996), we tentatively consider them conspecific.

Mikro hattonensis
Hoffman, van Heugten & Lavaleye, 2010
(Fig. 4M-P)

MATERIAL EXAMINED. — 22 sh., DW130.

REMARKS

New to Spanish waters. The figured specimens conform quite exactly with the original description of this species, from a depth of 796 m at 58°N in the northern Atlantic, including the shagreened microsculpture in the subsutural ramp and the umbilicus, bound by a narrow cord and also with a single cord inside. Another of our specimens has two cords inside the umbilicus.

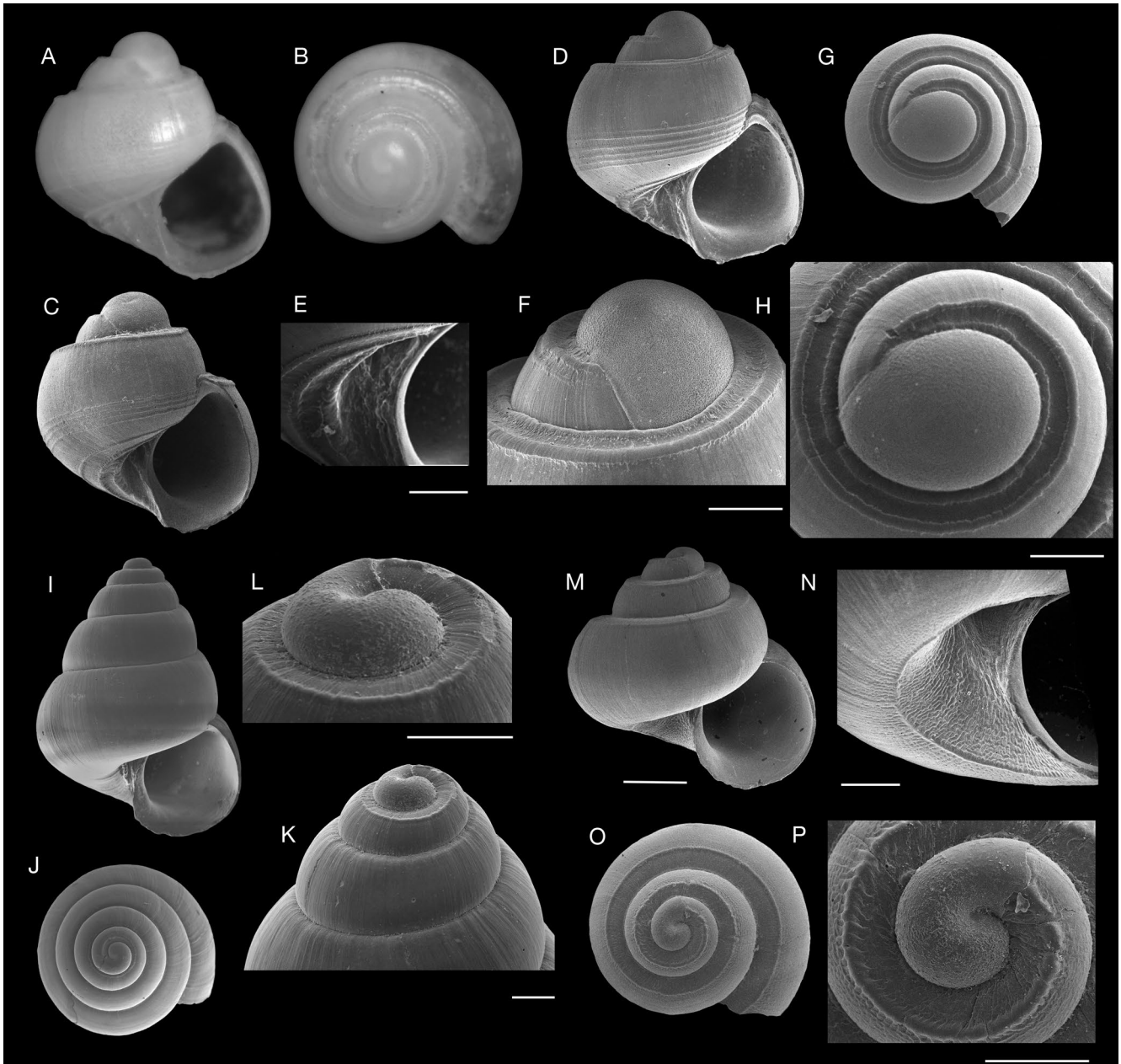


FIG. 4. — **A-H**, *Mikro oviceps* n. sp.: **A, B**, holotype (sh.) from DW130 (diameter 0.8 mm); **C**, paratype (sh.), same locality (diameter 0.70 mm); **D**, paratype (sh.), same locality (diameter 0.76 mm); **E**, detail of the umbilicus, same specimen; **F**, protoconch, same specimen; **G**, paratype, (sh.) in apical view, same locality (diameter 0.67 mm); **H**, protoconch, same specimen; **I-L**, *Mikro globulus* Warén, 1996: **I**, shell from DW130 (height 1.50 mm); **J**, apical view of another shell, same locality (diameter 0.84 mm); **K-L**, protoconch and early teleoconch whorls of another shell, same locality; **M-P**, *Mikro hattonensis* Hoffman, van Heugten & Lavaleye, 2010, **M**, shell from DW130 (diameter 0.78 mm); **N**, detail of the umbilicus, same specimen; **O**, apical view of another shell, same locality (diameter 0.65 mm); **P**, detail of protoconch and first teleoconch whorl, same specimen. Scale bars: 100 µm.

Genus *Seamountiella*
Rubio, Gofas & Rolán, 2019

TYPE SPECIES. — *Tinostoma azoricum* Dautzenberg & H. Fischer, 1896, by original designation.

Seamountiella azorica
(Dautzenberg & Fischer, 1896)

MATERIAL EXAMINED. — 55 sh., DW130.

REMARK

Originally described from the Azores, new record for the Canaries. This species, originally believed to belong in the family Tornidae Sacco, 1896, was shown to be a Vetigastropod by Rubio, Gofas & Rolán (2019).

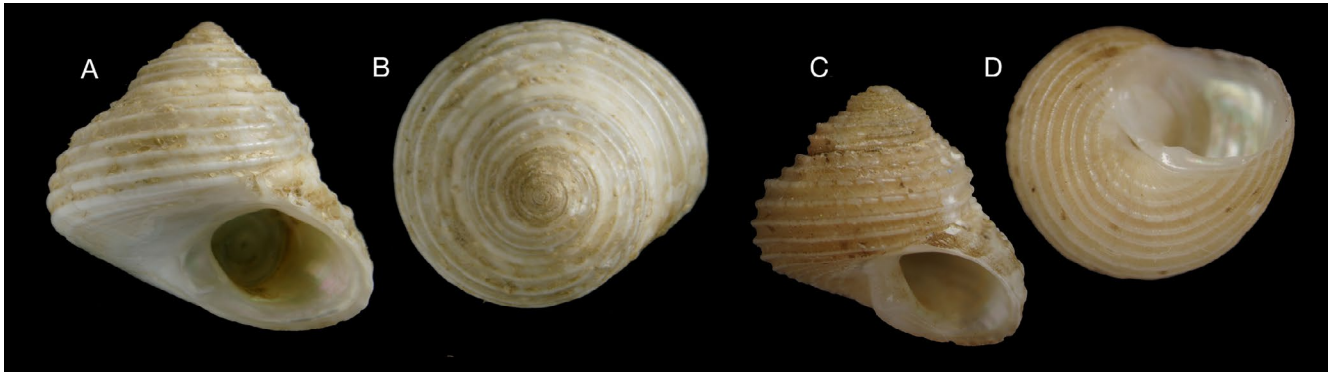


FIG. 5. — **A, B**, *Cantrainea peloritana* (Cantraine, 1835), specimen from DW129 (diameter 15.5 mm); new to the Canaries; **C, D**, *Cantrainea globuloides* (Dautzenberg & H. Fischer, 1896), shell from DW130 (diameter 5.0 mm); new to the Canaries.

Family COLONIIDAE Cossmann, 1917

Genus *Cantrainea* Jeffreys, 1883

TYPE SPECIES. — *Turbo peloritanus* Cantraine, 1835, by monotypy.

Cantrainea peloritana (Cantraine, 1835)
(Fig. 5A, B)

MATERIAL EXAMINED. — 1 sh., DW128; 1 spm and 2 sh. DW129.

REMARK
New record for the Canaries.

Cantrainea globuloides
(Dautzenberg & H. Fischer, 1896)
(Fig. 5C, D)

MATERIAL EXAMINED. — 27 sh., DW130.

REMARK
The two European *Cantrainea* species were found in the transect, but not together in the same haul. New record for the Canaries.

Family SEGUENZIIDAE Verrill, 1884

Genus *Ancistrobasis* Dall, 1889

TYPE SPECIES. — *Basilissa costulata* R. B. Watson, 1879, by monotypy.

Ancistrobasis reticulata (Philippi, 1844)
(Fig. 6)

Solarium reticulatum Philippi, 1844: 149; pl. 25, fig. 6.

Ancistrobasis lavaleyei Hoffman & Freiwald, 2017: 63, n. syn.

MATERIAL EXAMINED. — 24 sh., DW130,

REMARKS

New record for the Canaries. This species, originally described from Plio-Pleistocene strata in the valley of the Lamato river, in southernmost Calabria, Italy, has been reported in Recent NE Atlantic material by Warén & Bouchet (1990) from Galicia Bank, in 985-100 m, and Warén (1991) from south of Iceland, in 970 m. It is actually quite well represented in our own material from Galicia Bank and from the Meteor and Atlantis seamounts, but the record here represents the southernmost known occurrence in the eastern Atlantic. The Western Atlantic *A. costulata* (Watson, 1879) described from off Culebra I., 390 fathoms, may be the same species but this has not been assessed.

Hoffman & Freiwald (2017) described *Ancistrobasis lavaleyei* based on a juvenile shell (1.43 × 1.89 mm) of *A. reticulata* collected on Coral Patch Seamount (34°58.00'N, 11°57.30'W, 1050 m) and included as a paratype an eroded shell from Galicia Bank. They mentioned that *A. reticulata* “is much larger, up to 10 mm; it has more than 10 spiral ribs that form a reticulated structure with nodes; and it lacks the angular outline on the first whorl.” *Ancistrobasis reticulata* does have an angular first whorl of teleoconch (Fig. 6C herein and Warén 1991: fig. 1A) and the number of spirals gradually increases from one on the first whorl to about ten on specimens approaching full size about 10 mm. Based on the Canarian specimens and on additional material collected by the SEAMOUNT 2 expedition on the Meteor group of seamounts, we cannot see any grounds for distinguishing more than one species of recent *Ancistrobasis* in the North Atlantic, and treat *A. lavaleyei* as a synonym of *A. reticulata*.

Family EUCYCLIDAE Koken, 1896

Genus *Toroidia* Hoffman & Freiwald, 2018

TYPE SPECIES. — *Toroidia merianae* Hoffman and & Freiwald, 2018 by original designation.

Toroidia toroides(Hoffman, van Heugten & Lavaleye, 2011)
(Fig. 7A)

MATERIAL EXAMINED. — 18 sh., DW130.

REMARKS

This is the first report of this species after its original description from off NW Morocco in 529 m. It was diagnosed by the occurrence of a spiral sculpture whereas the interspaces between ribs are smooth in the similar *Margarites laminarum* (Jeffreys, 1883), described from off Portugal and reported from Ampère Seamount (Beck *et al.* 2006). The original generic placement in *Margarites* was not tenable, and the new genus *Toroidia* was established by Hoffman & Freiwald (2018), but the family placement is tentative in the absence of data on the soft parts. New to Spanish waters.

Family PENDROMIDAE Warén, 1991

Genus *Rugulina* Palazzi, 1988

TYPE SPECIES. — *Daronia monterosatoi* van Aartsen & Bogi, 1986, by original designation.

Rugulina fragilis (G. O. Sars, 1878)
(Fig. 7B)

MATERIAL EXAMINED. — 2 sh., DW130.

REMARK

Originally described from Norway, new record for the Canaries.

Superfamily SEGUENZIOIDEA Verrill, 1884
Family uncertainGenus *Anekes* Bouchet & Warén, 1979

TYPE SPECIES. — *Anekes undulisculpta* Bouchet & Warén, 1979, by original designation.

Anekes paucistriata Warén, 1992
(Fig. 7C, D)

MATERIAL EXAMINED. — 1 sh., DW133; 22 sh., DW126; 40 sh., DW130.

REMARK

Originally described from off SW Portugal, new to Spanish waters.

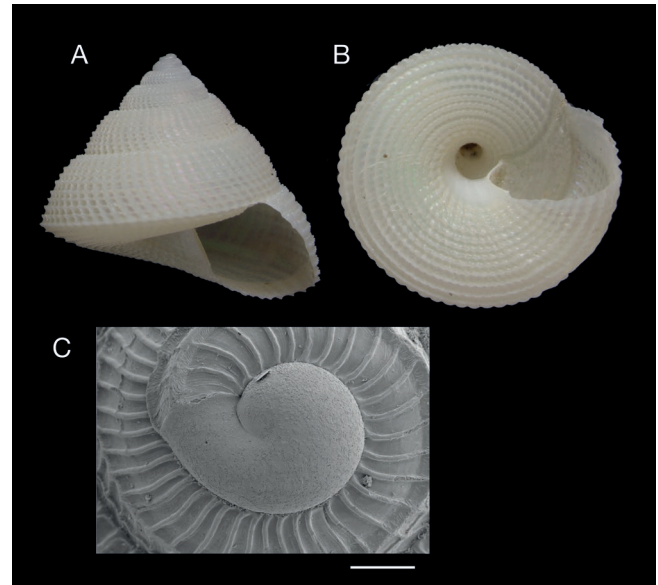


FIG. 6. — **A, B.** *Ancistrobasis reticulata* (Philippi, 1844), shell from DW130 (diameter 6.2 mm); **C.** protoconch of another shell, same locality. Scale bar: 100 μ m.

Genus *Lissotesta* Iredale, 1915

TYPE SPECIES. — *Cyclostrema micra* Tenison-Woods, 1877, by original designation.

Lissotesta gittenbergeri
(van Aartsen & Bogi, 1988)
(Fig. 7E-G)

MATERIAL EXAMINED. — 5 sh., DW133; 14 sh., DW126; 44 sh., DW130.

REMARK

Originally described from a depth of 200 m in the Tyrrhenian Sea; new record for the Canaries.

Genus *Palazzia* Warén, 1991

TYPE SPECIES. — *Omalogyra ausonia* Palazzi, 1988, by original designation.

Palazzia ausonia (Palazzi, 1988)

MATERIAL EXAMINED. — 1 sh., DW130.

REMARK

Originally described from the Tyrrhenian Sea in 500 m depth, subsequently reported from off Iceland and Norway (Warén, 1991); new record for the Canaries.

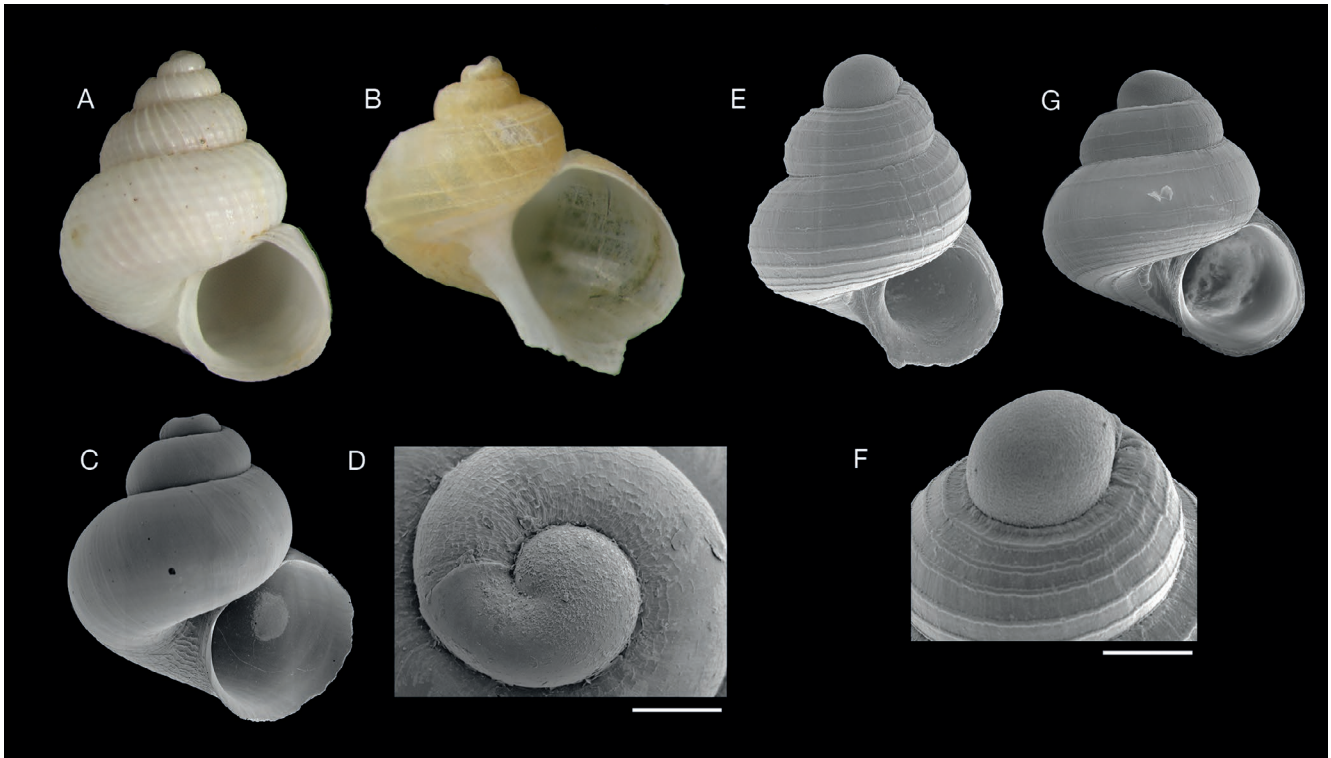


FIG. 7. — **A**, *Toroidia toroides* (Hoffman, van Heugten & Lavaleye, 2011), shell from DW130 (height 2.6 mm); **B**, *Rugulina fragilis* (G. O. Sars, 1878), shell from DW130 (diameter 1.5 mm); **C**, **D**, *Anekes paucistriata* Warén, 1992: **C**, scanning electron micrograph of a shell from DW130 (height 1.3 mm); **D**, detail of the protoconch of another shell, same locality; **E**–**G**, *Lissotesta gittenbergeri* (van Aartsen & Bogi, 1988): **E**, **G**, scanning electron micrograph of shells from DW130 (height 0.67 mm and 0.62 mm); **F**, detail of the protoconch.

Family RISSOIDAE Gray, 1847

Genus *Benthonellania* Lozouet, 1990

TYPE SPECIES. — *Benthonellania gofasi* Lozouet, 1990, by original designation.

Benthonellania agastachys Bouchet & Warén, 1993
(Fig. 8A–D)

MATERIAL EXAMINED. — 84 sh., DW130.

REMARK

Hernández *et al.* (2011) reported *Benthonellania oligostigma* Bouchet & Warén, 1993 from the Canaries, and illustrated a specimen (from the private collection of Winfried Engl, Germany) collected in 330 m depth off Fuerteventura. However *B. oligostigma*, originally described from off Madeira in 990 m depth, has a much more conical, not cyrtocooid spire, has about half as many axial ribs as the species found in the Canaries, does not have a thickened outer lip and has a much more blurry spiral sculpture. Conversely, both our specimens and that illustrated by Hernández *et al.* adjust to *Benthonellania agastachys*, described from a single juvenile specimen collected in 500 m between Fuerteventura and

Cape Juby, Morocco (actually in Moroccan waters but very close to the divide). *Benthonellania agastachys* was abundant in DW130 and a fully adult shell, with well-developed outer lip, is here figured.

Family ELACHISINIDAE Ponder, 1985

Genus *Laeviphitus* van Aartsen, Bogi & Giusti, 1989

TYPE SPECIES. — *Laeviphitus verduini* van Aartsen, Bogi & Giusti, 1989, by original designation.

Laeviphitus verduini
van Aartsen, Bogi & Giusti, 1989
(Fig. 8E, F)

MATERIAL EXAMINED. — 1 sh., DW133.

REMARK

This species is readily recognized by its protoconch with an unusual reticulate sculpture. Originally described from 320–440 m in the Tyrrhenian Sea, new to Spanish waters.

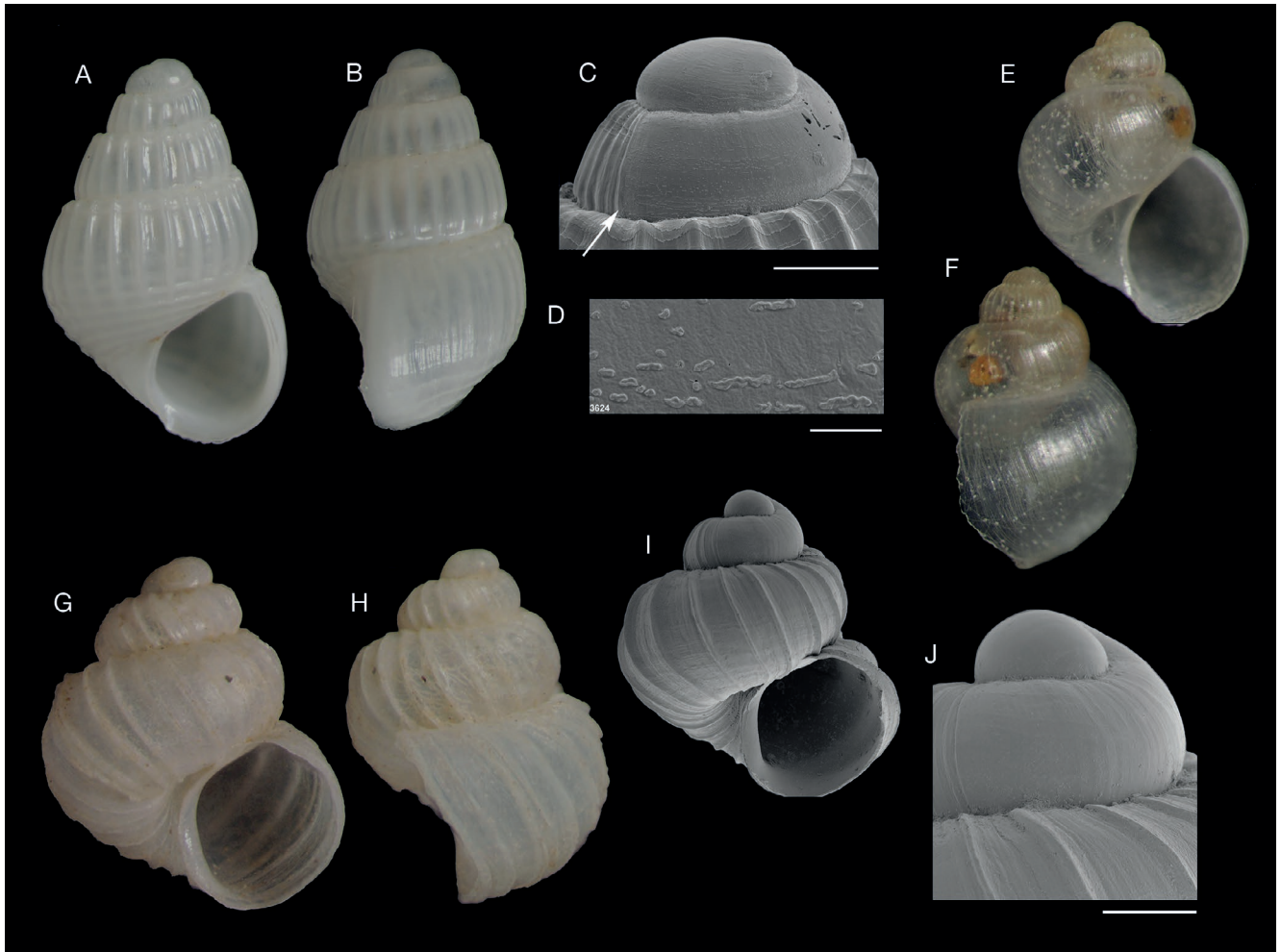


FIG. 8. — **A-D**, *Benthonellania agastachys* Bouchet & Warén, 1993: **A, B**, shell from DW130 (height 2.5 mm); **C**, scanning electron micrograph of the protoconch in lateral view, the arrow points to the limit with teleoconch; **D**, detail of the microsculpture of the protoconch; **E, F**, *Laeviphitus verduini* van Aartsen, Bogi & Giusti, 1989, shell from DW133 (height 1.6 mm); new to Spanish waters; **G-J**, *Larsenia scalaroides* Warén, 1989: **G, H**, shell from DW130 (2.0 mm height); new to Spanish waters; **I**, SEM micrograph of a juvenile shell from DW130 (height 1.4 mm); **J**, protoconch. Scale bars: C, J, 200 μ m; D, 20 μ m.

Family VANIKORIDAE Gray, 1840

Genus *Larsenia* Warén, 1989

TYPE SPECIES. — *Larsenia scalaroides* Warén, 1989, by original designation.

Larsenia scalaroides Warén, 1989
(Fig. 8G-J).

MATERIAL EXAMINED. — 100 sh., DW130.

REMARKS

The occurrence of this species, originally described from off SW Iceland in 260-300 m, is surprising, but we could not see any substantial difference in the specimens collected off NW Gran Canaria. There are other shared species such as

Ancistrobasis reticulata, *Rugulina fragilis* and others. New to Spanish waters.

Family EULIMIDAE Philippi, 1853

Genus *Mucronalia* A. Adams, 1860

TYPE SPECIES. — *Mucronalia bicincta* A. Adams, 1860, by monotypy.

Mucronalia pingucula n. sp.
(Fig. 9D-F)

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TYPE MATERIAL. — **Holotype**. Spm., MNHN-IM-2000-34259. **Paratype**. 1 shell, MNHN-IM-2000-34260, from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — An adjective formed from the Latin diminutive of *pinguis* which means fat, plump alluding to the profile of the shell.

DESCRIPTION

Shell small, spindle-shaped, translucent white with a brownish, styliform protoconch of two whorls. Teleoconch of a little more than three whorls, the first one markedly enlarged with respect to the protoconch and ascending over it so as to conceal partly the last protoconch whorl, the second one inflated, the third one elongate, forming more than 70% of the total shell height, slightly convex. Suture closely appressed, distinct, the suture internally visible by transparency but fuzzy. Sculpture of fairly evident growth lines. Base attenuated, imperforate; aperture elongate, the outer lip simple, forming a regular arch in side view, inner lip forming a thin, regular callus along the parietal area, then slightly bulging along the columellar area; basal part of the aperture slightly receding. Dimensions of holotype: 3.3 mm height × 1.3 mm diameter; of paratype: 3.4 × 1.3 mm.

REMARKS

Bouchet & Warén (1986: 448-449) reported a species of *Mucronalia* in Portuguese waters from one specimen (broken), and assigned it to *Mucronalia mammillata* Dall, 1927, described from deep water off southeastern United States. They further synonymized *M. suava* Dall, 1927, described in the same paper. The specimen figured by Bouchet & Warén was stated to be a “paratype of *M. mammillata*”, but this contradicts Dall’s (1927) statement of a single specimen; this specimen was probably added to the United States National Museum (USNM) collection posteriorly to the description (Ellen Strong, pers. comm. 2018) and has no type status, although it agrees well with the holotype (Fig. 9A). Dall (1927) described *M. mammillata* as having a single protoconch whorl, and *M. suava* (Fig. 9B, C) as having two, but the difference in protoconch whorl count is not obvious on the actual specimens. *Mucronalia mammillata* is larger than *M. pinguicula* n. sp. (holotype 3.7 mm, figured specimen in Bouchet & Warén (1986), 5.1 × 1.6 mm according to scale bar) and has a definitely more slender last teleoconch whorl. *Mucronalia suava* is also larger, and the spire angle is much less increased at the transition from protoconch to teleoconch. Our conclusion is that three different species are involved. The holotype of *M. pinguicula* n. sp. was live-collected and is presumed to be full-grown as deduced from the sturdy outer lip with a well rounded, not thinning, edge.

We agree with Bouchet & Warén (1986) that the resemblance of the abovementioned species with the type species of *Mucronalia*, the Japanese *M. bicincta* A. Adams, 1860, based on the abrupt change of spire angle from protoconch to teleoconch, may be superficial but that introducing a new genus is not advisable at the present state of knowledge.

Genus *Pelseneeria* Koehler & Vaney, 1908

TYPE SPECIES. — *Pelseneeria profunda* Koehler & Vaney, 1908, by subsequent designation.

Pelseneeria striata Bouchet & Warén, 1986
(Fig. 9G-I)

MATERIAL EXAMINED. — 1 sh., DW130.

REMARK

Originally described from a depth of 275 m off the Azores, ectoparasitic on the sea urchin *Trigonocardis albida* (A. Agassiz). New to Spanish waters.

Genus *Aclis* Lovén, 1846

TYPE SPECIES. — *Alvania supranitida* S. V. Wood, 1842, by monotypy.

Aclis attenuans Jeffreys, 1883
(Fig. 10A-F)

MATERIAL EXAMINED. — 6 sh., SEAMOUNT 2, DW130. — 7 sh., Alboran Sea, Djibouti Banks, 36°21.08'N, 03°58.58'E/36°21.06'N, 3°58.07'E, 349-365 m, Spanish Institute of Oceanography cruise DP0409, haul BT04. — 1 sh., Gulf of Cadiz, Gazul mud volcano, 36°33.6'N 6° 56.3'W/36°33.7'N, 6°56.3' W, 428 m, cruise INDE-MARES CHICA 0610, haul DA11.

REMARKS

Bouchet & Warén (1986) recognized three similar species in deep water of the Atlanto-Mediterranean area: *Aclis walleri* Jeffreys, 1867 described from off Shetland (140 m), *Aclis attenuans* Jeffreys, 1883 described from off Crete (70-120 fathoms = 128-219 m) and *Aclis sarsi* Dautzenberg & H. Fischer, 1912 described from off Norway (440 m). The Mediterranean *A. attenuans* differs from the Atlantic *A. walleri* in being smooth, without the axial riblets of *A. walleri*, in having a smaller (2-3 mm vs 4-5 mm high) and broader shell. *Aclis sarsi* differs from both in having only one protoconch whorl instead of more than two in the other two species.

Bouchet & Warén further reported a single shell from the Canaries as probably representing a new species, but refrained from describing it as the specimen was not in good enough condition. It was stated as having “the same kind of apical whorls as *A. sarsi* but the shape is similar to *A. attenuans*”. The SEAMOUNT 2 material contains additional shells of the same Canarian species but this (including the specimen figured by Bouchet & Warén) has a little more than two protoconch whorls and is therefore similar to *Aclis attenuans* and does not have the paucispiral protoconch of *Aclis sarsi*. Admittedly, the Canarian specimens are slightly larger (3.7 mm instead of usually less than 3 mm for Mediterranean specimens) and the protoconch is also slightly larger in proportion, but are here taken as a range extension of *Aclis attenuans* and new record to Canary Islands waters.

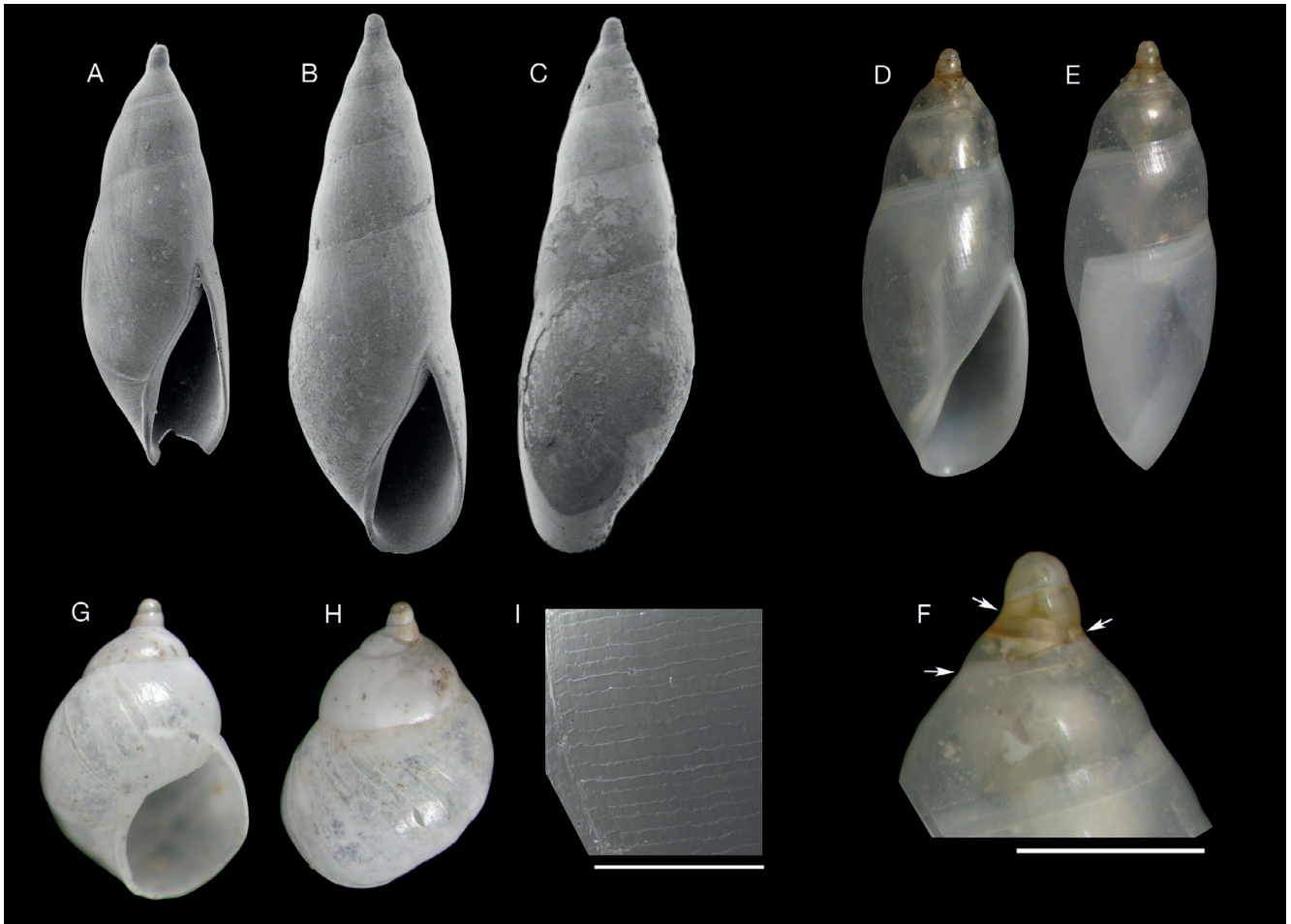


FIG. 9. — **A**, *Mucronalia mammillata* Dall, 1927, holotype (sh.) USNM 108040 (height 3.7 mm); **B**, **C**, *Mucronalia suavis* Dall, 1927, holotype (sh.) USNM 108392 (height 4.75 mm); **D-F**, *Mucronalia pinguicula* n. sp.: **D**, **E**, holotype (sh.) from DW130 (height 3.3 mm); **F**, protoconch and early teleoconch whorls of the holotype, the arrows points to the suture of the first teleoconch whorl, between which the false suture can be seen by transparency; **G**, **H**, *Pelseeneria striata* Bouchet & Warén, 1986; **G**, **H**, shell from DW130 (height 1.8 mm), new to Spanish waters; **I**, scanning electron micrograph of the microsculpture of the same specimen. Scale bars: **F**, 500 μ m; **I**, 100 μ m. A-C, reproduced with the permission of the National Museum of Natural History, Smithsonian Institution (<https://www.nmnh.si.edu/>).

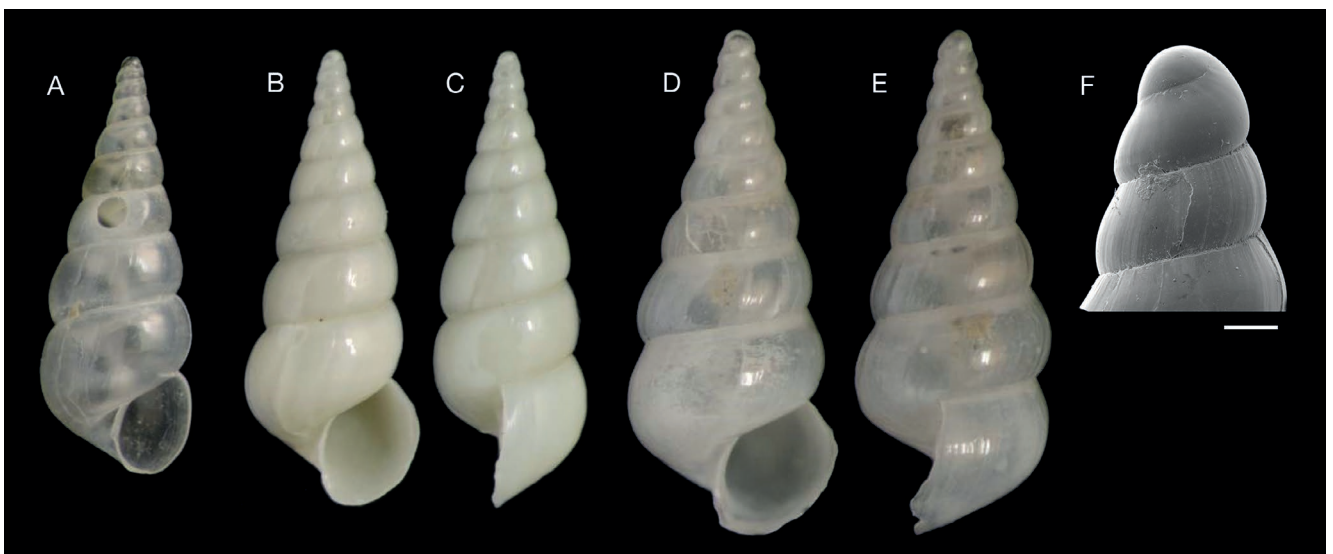


FIG. 10. — **A**, *Aclis attenuans* Jeffreys, 1883, shell from Alboran Sea, Djibouti Banks, 349-365 m (height 2.8 mm); **B**, **C**, shell from the Gulf of Cadiz (height 3.0 mm); **D-F**, shell from DW130 (height 3.7 mm); scanning electron micrograph of the protoconch (**F**). Scale bar: 100 μ m.

Genus *Discaclis* Moolenbeek & Warén, 1987

TYPE SPECIES. — *Discaclis canariensis* Moolenbeek & Warén, 1987, by original designation.

Discaclis canariensis Moolenbeek & Waren, 1987
(Fig. 11A-C)

MATERIAL EXAMINED. — 1 sh., DW133.

Discaclis lamellata n. sp.
(Fig. 11D-J)

[urn:lsid:zoobank.org:act:E31801E2-E7D1-4E48-BDEF-5CCE831C057A](https://doi.org/10.21203/rs.3.rs-1000000)

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34257.

Paratypes. 16 sh., MNHN-IM-2000-34258 from SEAMOUNT 2, DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — An adjective formed from the Latin *lamella*, a small blade, alluding to the lamellae inside the umbilicus.

DESCRIPTION

Shell very small, with a low spire and a blunt, protruding apex and with a deep and rather wide umbilicus. Larval shell globular, smooth and glossy, consisting of about 1 ¼ whorls with diameter 320 to 330 µm, demarcated from teleoconch by a distinct scar (difficult to see in optical microscopy due to transparency, conspicuous under SEM). Teleoconch of 1 ¼ whorl in specimens about 0.9 mm in diameter, up to 2 ¼ whorls in the largest specimens, with a narrow subsutural keel running very close to the suture and giving it a channelled aspect, with another blunt keel delimiting the abapical area around the umbilicus. Sculpture of numerous indistinct growth lines and, on the subsutural keel, of microscopic spiral striae. Within the umbilicus, 7-8 raised lamellae corresponding to earlier positions of outer lip. Aperture distinctly opisthocline, strongly expanded and flaring, especially in lower part prolonging the columellar edge. Outer lip not thickened. Maximum diameter (including the flaring lip) 0.9 to 1.3 mm (holotype 0.75 mm height × 1.0 mm diameter).

REMARKS

Discaclis lamellata n. sp. differs from the only species of the genus known so far, *D. canariensis* (Fig. 11A-C), in being twice as high with the same diameter, in having a considerably narrower umbilicus, and in having raised lamellae inside the umbilicus, which represent former stages of growth of the apertural lip. *Discaclis canariensis* is a shallow-water species with a type locality at 125 m and a record as shallow as 12 m in a submarine cave (Martínez *et al.* 2005). The specimen from Madeira figured by Segers *et al.* (2009: pl. 14, fig. 5) is more similar to *Discaclis lamellata* n. sp. (albeit larger, 1.5 mm) than to *Discaclis canariensis*; it is stated to originate

from only 30 m depth but the authors suspect that it could be “of subfossil origin”. It is possibly a third, different species, or alternatively *Discaclis lamellata* n. sp. is not a deep-sea species but the shells collected here have been transported downslope.

Family EPITONIIDAE Berry, 1910 (1812)

Genus *Epitonium* Röding, 1798

TYPE SPECIES. — *Turbo scalaris* Linnaeus, 1758, by subsequent designation.

Epitonium polacia (Dall, 1889)
(Fig. 12A-E)

MATERIAL EXAMINED. — 17 sh., DW130.

REMARKS

The holotype, collected in 229 fathoms between Florida and Cuba, was figured by Clench & Turner (1952: 316) and measures 7 mm. New to Spanish waters and to the eastern Atlantic. The specific name is of unknown meaning and therefore treated as grammatically invariant.

Epitonium nanum (Jeffreys, 1884)
(Fig. 12H)

MATERIAL EXAMINED. — 1 sh., DW130.

REMARKS

The lectotype, collected in 985 m in the northern part of Bay of Biscay, was figured by Bouchet & Warén (1986: 520). This species was so far only known from the type locality and from the Azores. It is easily distinguished from *E. pseudonanum* Bouchet & Warén, 1986, which also occurs around the Canaries but in shallower water, by its definite umbilicus, the finer and more flexuous ribs and the absence of spiral grooves between these. New to Spanish waters.

Genus *Opaliopsis* Thiele, 1928

TYPE SPECIES. — *Scala elata* Thiele, 1925, by original designation.

Opaliopsis opalina (Dall, 1927)
(Fig. 12F, G)

MATERIAL EXAMINED. — 1 sh., DW130.

REMARKS

This species was described under three different names from the same area off Fernandina (Florida); Clench & Turner (1952: 337-338), acting as First Revisers, selected *opalina*

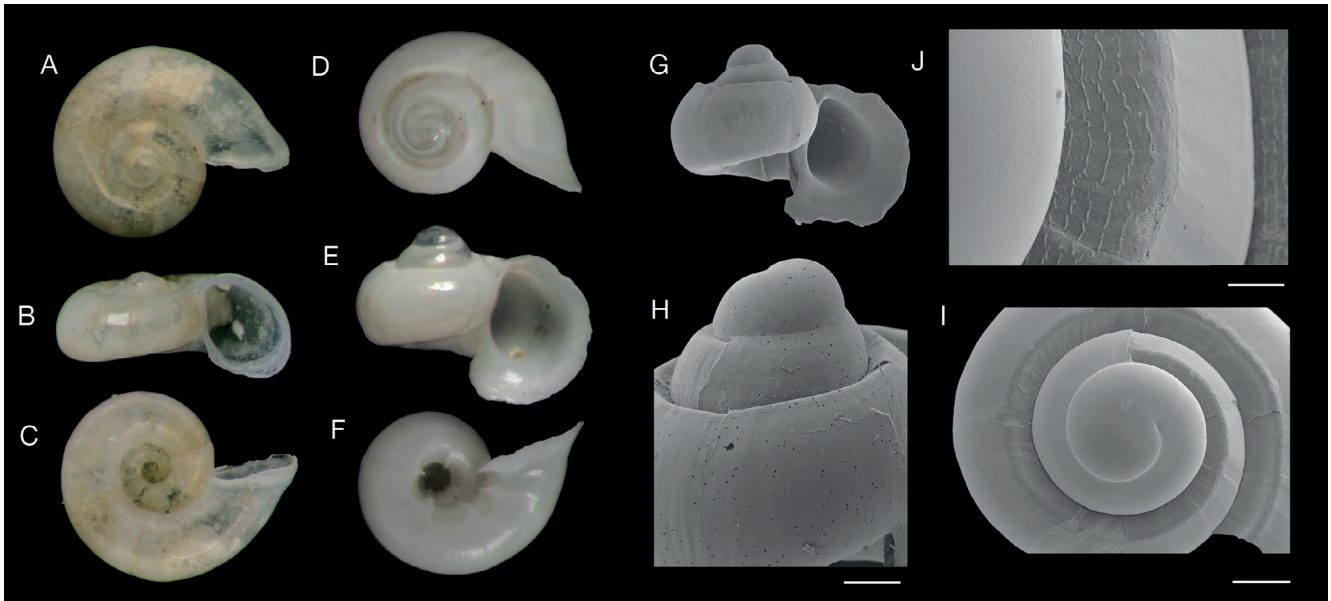


FIG. 11. — **A-C**, *Discaclis canariensis* Moolenbeek & Warén, 1987, shell from DW133 (diameter 1.2 mm); **D-J**, *Discaclis lamellata* n. sp.: **D-F**, holotype (sh.) from DW130 (diameter 1.0 mm); **G**, paratype (sh.), same locality (diameter 0.95 mm); **H**, protoconch of another paratype; **I**, protoconch of another paratype in apical view; **J**, microsculpture on the shoulder, same shell as I. Scale bars: H, I, 100 μ m; J, 20 μ m.

as the valid name and figured all the type specimens. Our specimen (5.9 mm) is similar in size to the holotype of *Epi-tonium dromia* Dall, 1927 (5.8 mm) but smaller than the holotype of *E. opalinum* (10.6 mm). This is the type species of *Nystiella* Clench & Turner, 1952, which Bouchet & Warén (1986) treated as a junior synonym of *Opaliopsis* Thiele, 1928. This species was also reported from Brazil by Andrade *et al.* 2011. New to Spanish waters and to the eastern Atlantic.

Genus *Narrimania* Taviani, 1984

TYPE SPECIES. — *Cerithiopsis concinna* Sykes, 1925, by original designation.

Narrimania concinna (Sykes, 1925) (Fig. 12 I-K)

MATERIAL EXAMINED. — 6 sh. and 1 juvenile spm., DW130.

REMARKS

This species was known so far only from the Mediterranean Sea but, taking into account its protoconch indicating planktotrophic development, is to be expected also in the nearby Atlantic. Bouchet & Warén (1986) noted the similarity with the western Atlantic *N. azelotes* (Dall, 1927) but did not reach a decision on whether they are conspecific. Pimenta *et al.* (2018) reported both species from Brazil, but their specimens identified as *N. azelotes* (including the holotype) match the syntype of *N. concinna* from Sicily Channel figured by Taviani (1984: fig. 2a, b) and again by

Bouchet & Warén (1986: figs 1135, 1154) for the number and pattern of spiral cords, with two prominent cords on the middle part of the whorl and an indication of a third one on the subsutural ramp. Admittedly, a large specimen (7.4 mm) from Sicily Channel figured by Taviani (1984: fig. 3) and again by Bouchet & Warén (1986: fig. 1153) has an additional fourth cord on the subsutural ramp but is still quite different from the shells identified as *N. concinna* by Pimenta *et al.* (2018: fig. 11) which show four small and evenly distributed cords and could represent an additional species. Specimens are so far too few to understand intraspecific variability and make a final decision of the possible synonymy of *N. azelotes* with *N. concinna*. New to Spanish waters.

Family HALOCERATIDAE Warén & Bouchet, 1991

Genus *Haloceras* Dall, 1889

TYPE SPECIES. — *Cithna cingulata* Verrill, 1884, by monotypy.

Haloceras laxum (Jeffreys, 1885)

MATERIAL EXAMINED. — 4 sh., DW130.

REMARK

Originally described from off western Portugal, new record for the Canaries.

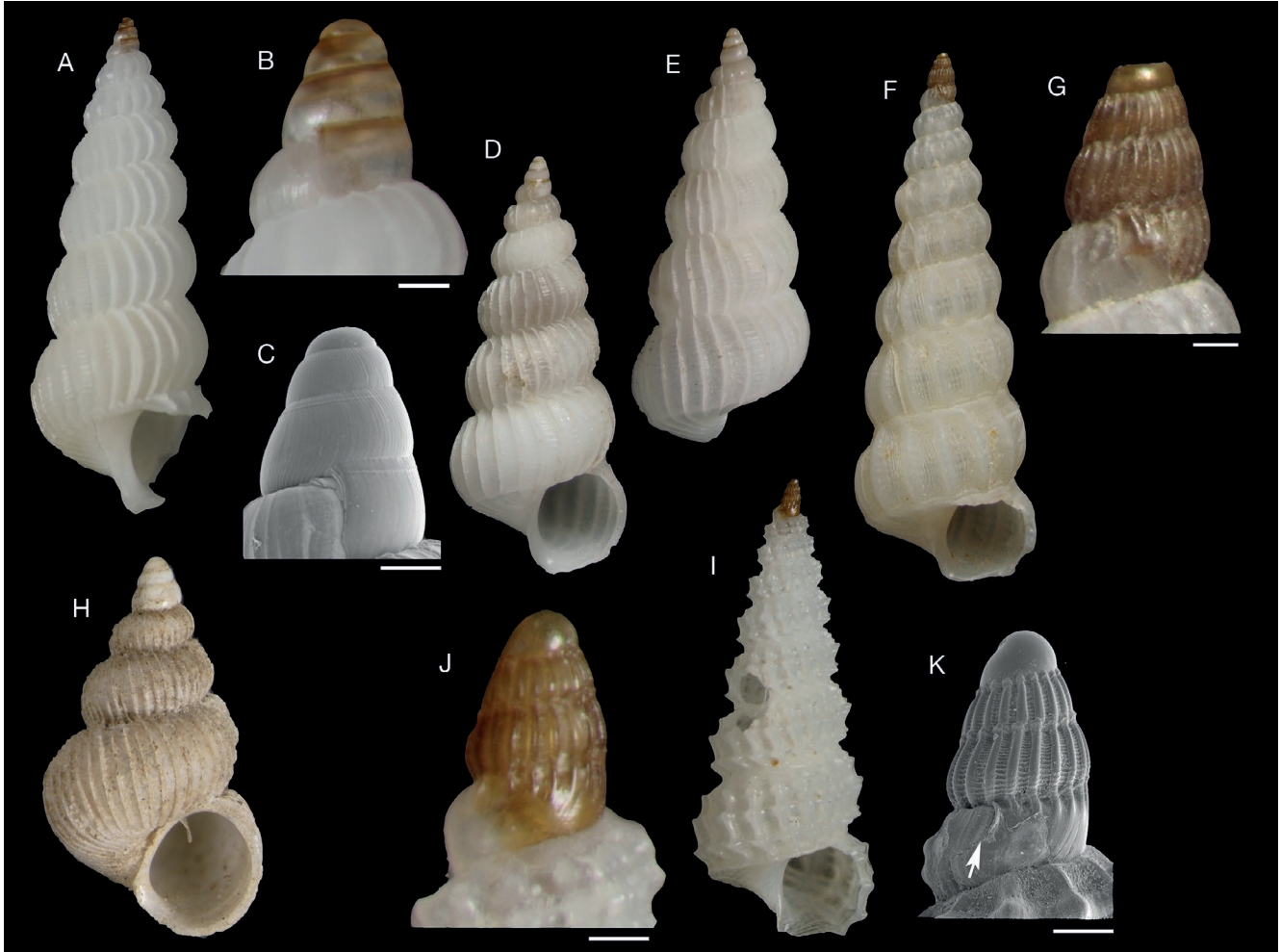


FIG. 12. — **A-E**, *Epitonium polacia* (Dall, 1889): **A**, shell from DW130 (4.9 mm height); new to the eastern Atlantic; **B**, protoconch of the same shell; **C**, scanning electron micrograph of the same protoconch; **D, E**, shell from DW130 (4.3 mm height); **F, G**, *Opaliopsis opalina* (Dall, 1927): **F**, shell from DW130 (5.9 mm height); new to the eastern Atlantic; **G**, protoconch of the same shell; **H-K**, *Epitonium nanum* (Jeffreys, 1884), shell from DW130 (2.9 mm height); new to Spanish waters; **I**, *Narrimania concinna* (Sykes, 1925), shell from DW130 (4.6 mm height); new to Spanish waters; **J**, protoconch of the same specimen; **K**, scanning electron micrograph of the protoconch of a juvenile, live taken specimen, same locality; the arrow points to the protoconch-teleoconch limit. Scale bars: 100 μ m.

Family MURICIDAE Rafinesque, 1815

Genus *Babelomurex* Coen, 1922

TYPE SPECIES. — *Fusus babelis* Réquien, 1848, by original designation.

Babelomurex atlantidis Oliverio & Gofas, 2006
(Fig. 13A)

MATERIAL EXAMINED. — 1 sh., DW133.

REMARK

Originally described from the central North Atlantic sea-mounts. New to Spanish waters.

Genus *Trophonopsis* Bucquoy & Dautzenberg, 1882

TYPE SPECIES. — *Murex muricatus* Montagu, 1803, by original designation.

Trophonopsis barvicensis (Johnston, 1825)
(Fig. 13B-D)

MATERIAL EXAMINED. — 1 sh., DW128; 12 sh., DW130.

REMARKS

The occurrence of this species, originally described from British waters, had so far been ascertained as far south as the Alboran Sea (Gofas *et al.* 2014). New record for the Canaries.

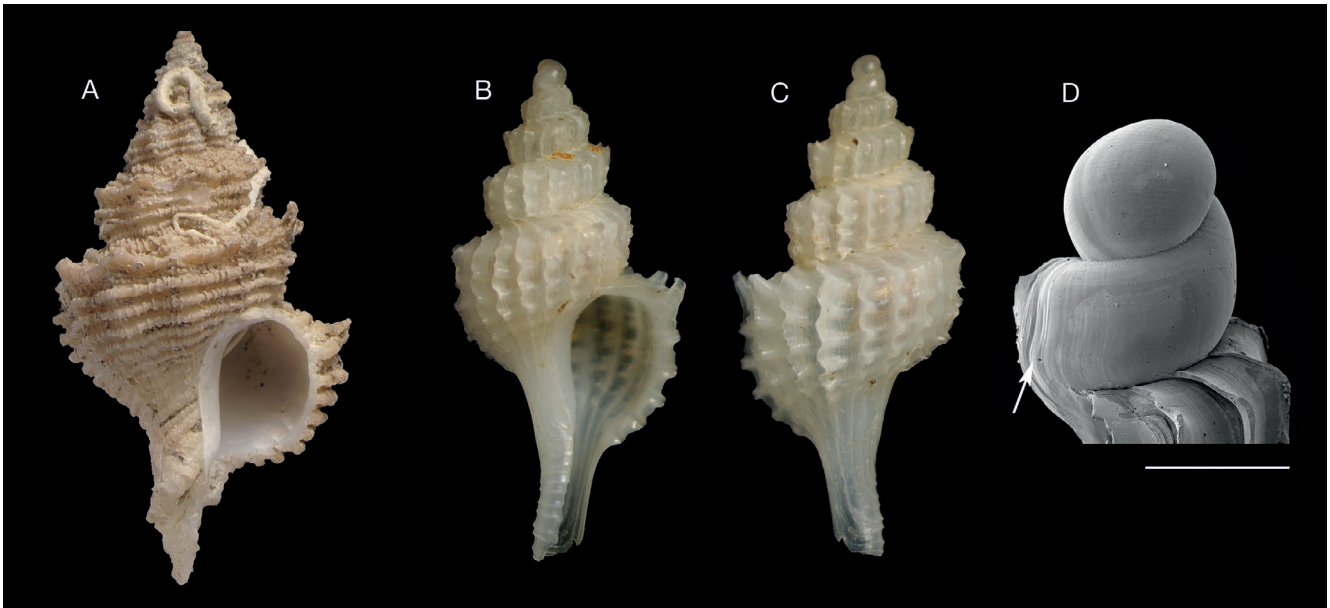


FIG. 13. — **A**, *Babelomurex atlantidis* Oliverio & Gofas, 2006, shell from DW133 (20.1 mm); new to Spanish waters; **B, C**, *Trophonopsis barvicensis* (Johnston, 1825), shell from DW130 (height 9.7 mm); new to the Canaries; **D**, *Trophonopsis barvicensis*, scanning electron micrograph of the protoconch of another shell, same locality. Scale bar: 500 μ m, arrow points to the protoconch-teleoconch limit.

Family MARGINELLIDAE J. Fleming, 1828

Genus *Marginella* Lamarck, 1799

TYPE SPECIES. — *Voluta glabella* Linnaeus, 1758, by monotypy.

Marginella carmenae n. sp. (Figs 14A-F; 15)

urn:lsid:zoobank.org:act:6BE37985-54C1-4964-895B-B3435F50348A

TYPE MATERIAL. — **Holotype**. spm., MNHN-IM-2000-34261 from SEAMOUNT 2 DW128.

Paratypes. 2 spm., MNHN-IM-2000-34262 from the type locality. — 1 spm., MNHN-IM-2000-34497 from SEAMOUNT 2, DW126.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.26'N, 15°51.99'W/28°08.47'N, 15°51.66'W, 470-485 m.

ETYMOLOGY. — Dedicated to the second author's wife Carmen.

OTHER MATERIAL EXAMINED. — 2 adult sh. and 1 juvenile, DW126; 1 adult spm., DW129; 3 immature spm, 9 sh. in early postlarval stage, DW130.

DESCRIPTION

Shell medium-sized, consisting of 4 ½ whorls, greyish white, very solid, smooth and glossy, with a moderately elevated spire. Apex blunt and rounded, protoconch about 2 mm in diameter, consisting of approximately 1 ¾ whorl, not delimited from the teleoconch. Spire whorls very slightly convex, with a thin suture. Last whorl representing more than 80% of total height. Aperture elongate, narrow, parallel-sided except at the adapical end where it tapers. Outer lip smooth

inside, bordered externally by a broad, well delimited, evenly thickened labial varix, very slightly receding at its adapical end, forming there a moderately pronounced shoulder against the penultimate whorl. There are four columellar plaits, stout with a flattened crest, decreasing in size towards the abapical part of the columella, occupying two-thirds of the aperture length. No columellar callus.

Animal (Fig. 15) colourless, with a broad and short foot extending flat when crawling, reaching about the same length as the shell longitudinally and about 120% of the shell breadth transversally; the propodium with a broad transverse flap and, behind this, an opaque white glandular area visible by transparency. Head bifid as usual in marginellids, with long, slender and tapering tentacles, lacking eyes but presenting a distinct bulge on each side, at the base of the tentacles where eyes should normally be situated. Siphon large, extending anteriorly about one-third of shell length. Dimensions of holotype: 16.7 height \times 8.2 mm diameter; of paratypes, 14.1 \times 7.6 mm, 14.2 \times 7.5 mm, 14.3 \times 7.5 mm.

REMARKS

Large species of the family Marginellidae, widely represented in tropical eastern Atlantic waters, are placed in the genera *Marginella* Lamarck, 1799, *Glabella* Swainson, 1840, *Dentimargo* Cossmann, 1899, *Prunum* Herrmannsen, 1852 and *Volvarina* Hinds, 1844 (Cossignani 2006). The first of these genera includes species with a prominent spire and a relatively wide opening without a pronounced labial denticle and without axial sculpture.

The majority of *Marginella* species (illustrated in Cossignani, 2006) live in shallow water, with a generally characteristic colour pattern. Only *Marginella glabella* (Linnaeus, 1758),

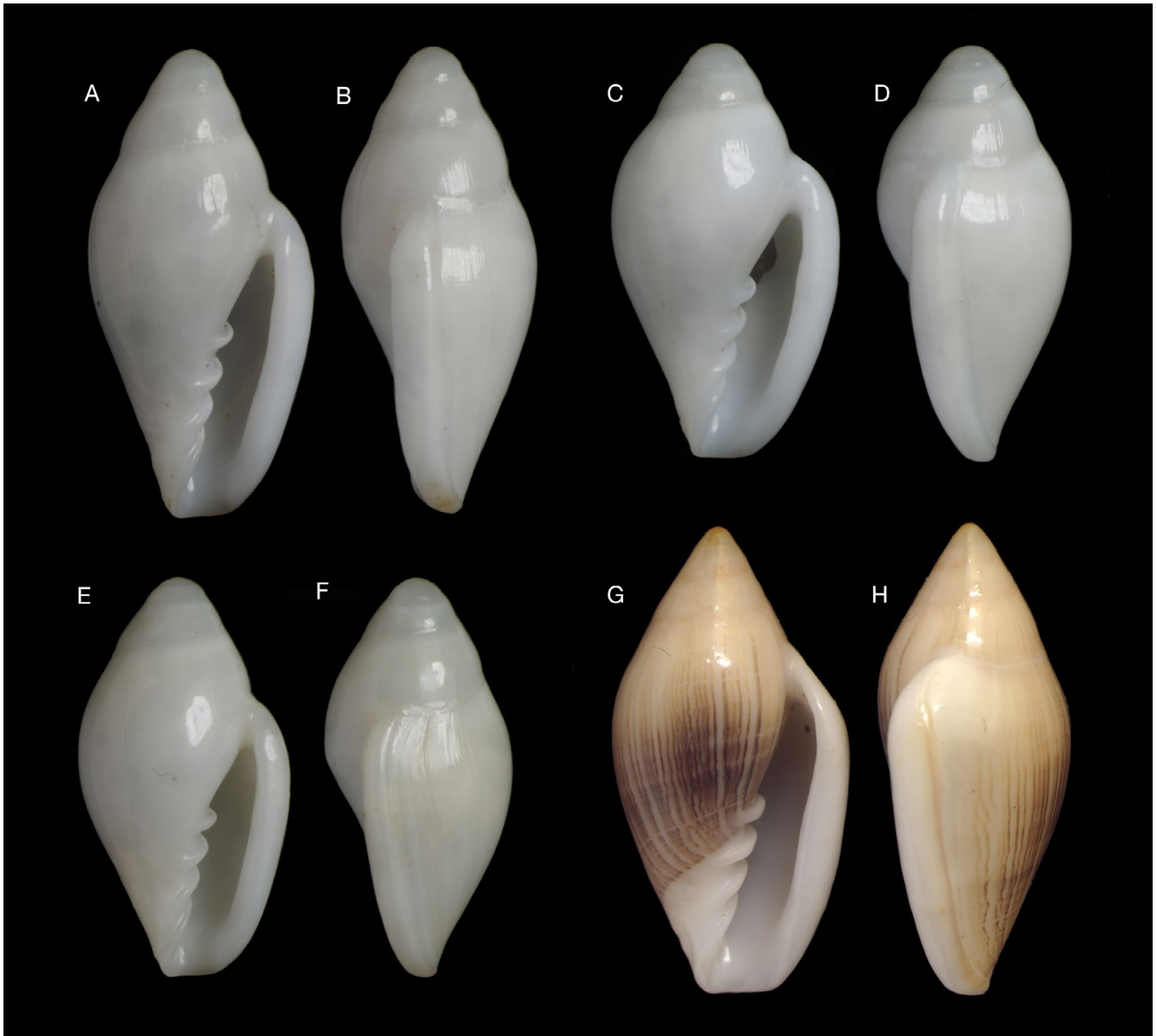


FIG. 14. — **A-F**, *Marginella carmenae* n. sp.: **A, B**, holotype from DW128 (16.7 mm); **C, D**, paratype, same locality (14.7 mm); **E, F**, paratype, same locality (14.0 mm); **G, H**, *Marginella belcheri* Hinds, 1844, specimen from off Mauritania, Atlor sta. 49, 20°00'N, 17°44'W, 200 m, R/V *Cornide de Saavedra* (Museo Nacional de Ciencias naturales, Madrid) (17.8 mm).

Marginella senegalensis Clover, 1990, *Marginella marocana* Locard, 1897, *Marginella subturrita* P. Fischer, 1883 and *Marginella gustavoï* Espinosa, Ortea & Moro, 2013 have been cited in Canarian waters or nearby. The first two are from shallow water and very different from the species found in our material (Cossignani 2006: 115, 127). *Marginella marocana* and *M. subturrita* belong to a group of deep water species illustrated in Bouchet & Warén (1985: 274-275), of relatively large size (20-30 mm). *Marginella carmenae* n. sp. (Fig. 14 A-F) is clearly differentiated by the shape of the lip of uniform thickness (swollen in the central part and thinning at the ends in *M. marocana*) and by the elongated, parallel-sided aperture (very wide, almost oval in *M. subturrita*). A further difference is that in *M. marocana* the abapical columellar plait

is continued as a ridge to the abapical end of the shell whereas it fades out at a short distance in *Marginella carmenae* n. sp. *Marginella gustavoï*, the only species so far with a Canarian deep-water type locality, has a still more globose apex, a shorter and stouter spire and considerably thinner outer lip and columellar plait, with a very broad aperture.

From the platform of NW Africa, comparable species would be *M. adamkusi* Bozzetti, 1994, which differs by being smaller (10 mm), with a prominent colour pattern and with a swelling in the upper third of the lip that could justify its assignment to *Dentimargo*. *Marginella belcheri* Hinds, 1844 (Fig. 14G, H) is larger (18-20 mm) with a different colour pattern, has a much more pointed apex and the outer lip is thinning out at the adapical end (Goud & Neefs 1996).

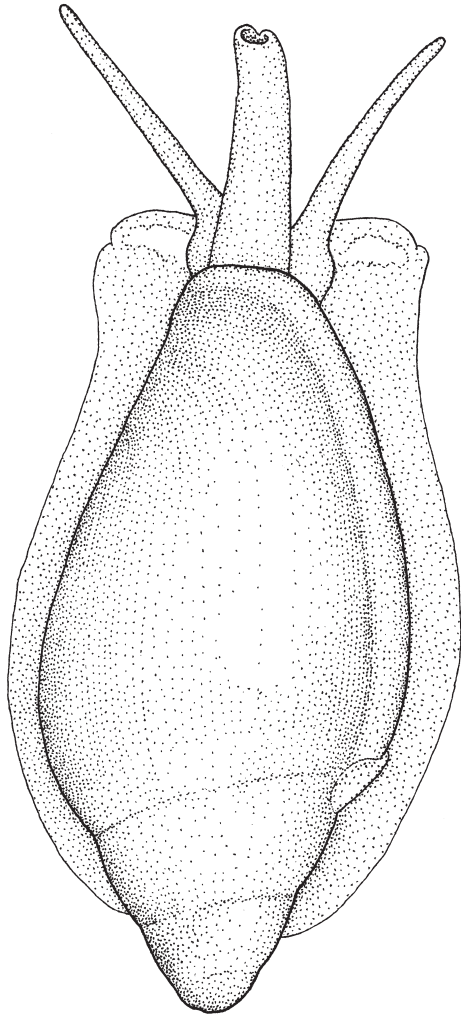


FIG. 15. — *Marginella carmenae* n. sp., shipboard drawing of a living paratype from DW126 (shell 14.3 mm).

In *M. carmenae* n. sp., no definite limit could be seen between protoconch and teleoconch, neither on the live taken specimens nor on more or less worn shells. The approximate limit is taken where growth lines start to be apparent on the shell surface.

Marginella pulex n. sp.
(Fig. 16A-D)

[urn:lsid:zoobank.org:act:68B6C64B-B86B-45A0-B842-EC26FD77F8AE](https://doi.org/10.3896/BI.2019.68B6C64B-B86B-45A0-B842-EC26FD77F8AE)

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34263.
Paratypes. 1 adult spm., 5 immature spm. and 6 sh., MNHN-IM-2000-34264, all from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — From the Latin *pulex*, a flea, alluding to the size and gloss of the shell recalling that of a flea; used as a noun in apposition.

OTHER MATERIAL EXAMINED. — 259 sh., SEAMOUNT 2 DW130.

DESCRIPTION

Shell very small, consisting of 3 ½ whorls, whitish, translucent, smooth and glossy, with a moderately elevated spire. Apex blunt and rounded, protoconch 0.7 mm in diameter, consisting of 1 ½ whorl, delimited from teleoconch by a tenuous line. Spire whorls very slightly convex, with a thin suture and an internal false suture visible by transparency. Last whorl representing about 85% of total height. Aperture elongate, rather broad, parallel-sided except in the adapical part where it narrows very slightly. Outer lip smooth inside, bordered externally by thin labial varix, very slightly receding at its adapical end, forming there a hardly pronounced shoulder against the penultimate whorl. Abapical end bluntly pointed at the termination of the columella; there are four columellar plaits, equivalent in size, occupying slightly more than half of the aperture length. No columellar callus. Size up to 3.3 mm high (holotype 3.2 mm high × 1.8 mm diameter).

REMARKS

This species bears a certain resemblance, regarding profile and shape of the aperture, to *Marginella colomborum* (Bozzetti, 1995) described from Josephine bank, an isolated seamount located NW of Madeira, but *M. pulex* n. sp. is much smaller (2-3 mm compared to 10 mm) with a still thinner varix. Taking into account the large number of specimens, the thin outer lip is regarded as a diagnostic character state, not as an indication that the specimens are juveniles.

Genus *Dentimargo* Cossmann, 1899

TYPE SPECIES. — *Marginella dentifera* Lamarck, 1803, by original designation.

Dentimargo crassidens n. sp.
(Fig. 17A-E)

[urn:lsid:zoobank.org:act:30097341-98F6-40FC-A68B-69B7BCB348C1](https://doi.org/10.3896/BI.2019.68B6C64B-B86B-45A0-B842-EC26FD77F8AE)

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34265.
Paratypes. 3 adult sh. and 1 immature spm., MNHN-IM-2000-34266, SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — From the Latin adjective *crassus*, thick, and *dens*, a tooth, alluding to the thick labial denticle.

OTHER MATERIAL EXAMINED. — 1 sh., DW128. — 47 sh. (12 immature and 35 in early postlarval stage), DW130.

DESCRIPTION

Shell small, dirty white, very solid, smooth, consisting of 4 ½ whorls with an elevated but blunt spire; protoconch 1.4 mm in diameter, consisting of about 1 ¾ whorl, slightly brownish in colour, delimited from teleoconch by a tenuous but definite line. Spire whorls very slightly convex, with a



FIG. 16. — *Marginella pulex* n. sp.: **A, B**, holotype from SEAMOUNT 2 DW130 (3.2 mm); **C, D**, paratype, same locality (3.3 mm).

thin but distinct suture. Last whorl representing about 80% of total height. Aperture elongate, narrow, parallel-sided except for a very prominent and broad denticle situated on the inner side of the outer lip, at its upper ¼ adapically. Outer lip bordered externally by a broad thickened labial varix, slightly receding at its adapical end, forming there a distinct shoulder against the penultimate whorl. There are four columellar plaits, stout with a flattened crest, decreasing in size towards the abapical part of the columella. No columellar callus. Dimensions of holotype: 10.0 mm height × 4.7 mm diameter.

REMARKS

There are four North-East Atlantic species currently assigned to the genus *Dentimargo*, diagnosed by having a strong denticle on the adapical part of the outer lip: *D. hesperia* (Sykes, 1905), *D. bojadorensis* (Thiele, 1925), *D. auratus* Espinosa, Ortea & Moro, 2014 and *D. giovannii* Pérez-Dionis, Espinosa & Ortea, 2014, the latter with a type locality in the Canary Islands (Espinosa *et al.* 2014). The first was described from deep water off SW Spain and is the most similar, but it is smaller (7–8 mm), stouter, with a distinctly broader aperture, columellar plaits with a more acute crest, and the outer lip is not so thickened. The figure in Sykes (1905) shows a more pointed anterior end and a still less prominent labial denticle than the syntype pictured in Bouchet & Warén (1985), but in any case Sykes described the aperture as “broad”.

Dentimargo bojadorensis was described from a depth of 146 m off the mainland African coast. It is smaller, more fusiform without a distinct shoulder at the insertion of the outer lip, which narrows considerably at its adapical termination. The inner labial denticle is also different, situated towards the upper ⅓ of the aperture and more elongate, plait-like.

Dentimargo giovannii, described from the bathyal level (607 m) near Isla de Lobos between Fuerteventura and Lanzarote, and *D. auratus*, described from shallow water (20 m) off Cape Blanco, Mauritania, are both distinguished

by their extremely high spire, with the insertion of the outer lip situated about mid-height of the shell (near the upper third in *Dentimargo crassidens* n. sp.) and also by the characteristically pointed shape of the abapical end (see Espinosa *et al.* 2014).

Genus *Prunum* Herrmannsen, 1852

TYPE SPECIES. — *Voluta prunum* Gmelin, 1791, by monotypy.

Prunum similerato n. sp.
(Fig. 18A–D)

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TYPE MATERIAL. — **Holotype.** sh., MNHN-IM-2000-34267. **Paratypes.** 6 sh., MNHN-IM-2000-34268, SEAMOUNT 2 DW126; 1 sh., MNHN-IM-2000-34279, DW129.

TYPE LOCALITY. — Off NW Gran Canaria, 28°07.59'N, 15°52.05'W/28°07.66'N, 15°52.02'W, 345 m.

ETYMOLOGY. — The name alludes to the outline which recalls some species of the genus *Erato*.

DESCRIPTION

Shell small, consisting of nearly 4 whorls, yellowish to greyish white and opaque in dead shells, smooth, with a rather low spire. Apex blunt and rounded, protoconch about 1 mm in diameter, consisting of 1 ¼ whorl, delimited from teleoconch by a tenuous line. Spire whorls hardly convex, with a thin suture. Last whorl representing about 90% of total height. Aperture elongate, narrow and parallel-sided. Outer lip smooth inside, bordered externally by thin labial varix, slightly receding at its adapical end, forming there a broadly rounded shoulder against the penultimate whorl. There are four columellar plaits

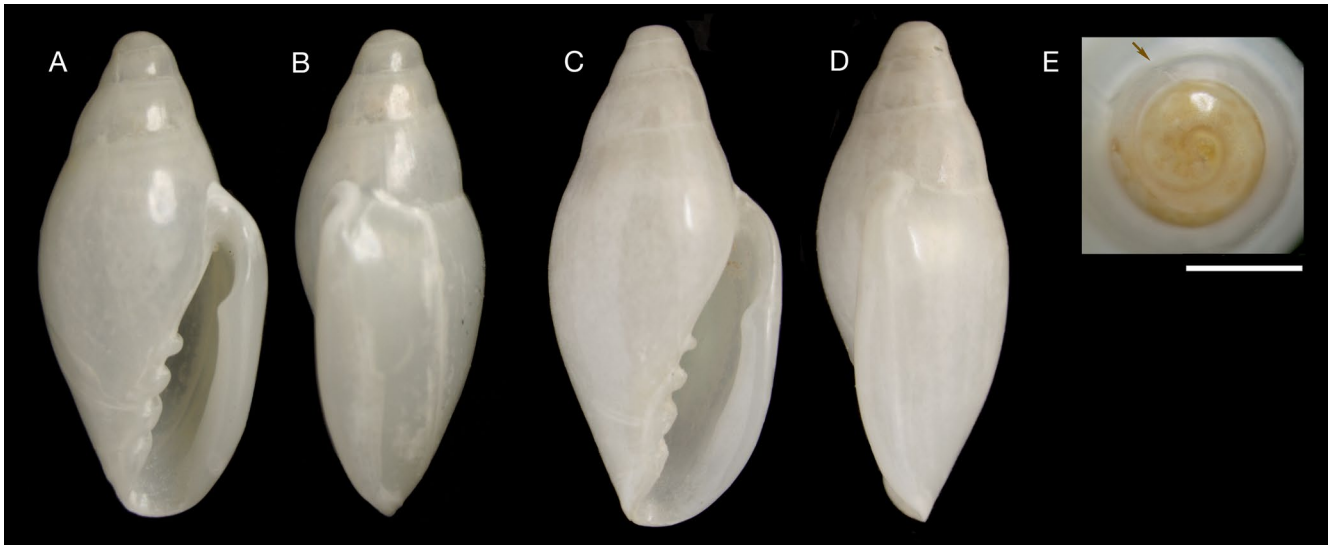


FIG. 17. — *Dentimargo crassidens* n. sp.: **A, B**, holotype from DW130 (10.0 mm); **C, D**, paratype, same locality (10.2 mm); **E**, protoconch of an immature paratype in apical view, same locality, the arrow points to the protoconch/teleoconch limit. Scale bar: 1 mm.



FIG. 18. — *Prunum similerato* n. sp., **A, B**, holotype (sh.) from DW126 (height 6.9 mm); **C, D**, paratype (sh.) from DW129 (7.3 mm).

occupying less than half of the aperture length, the adapical one relatively thin, the other three stout with a flattened crest. A broad and thin columellar callus covering the part of the last whorl adjacent to the aperture. Dimensions of holotype: 6.9 mm height \times 4.15 mm diameter, of figured paratype 7.3 \times 4.5 mm.

REMARKS

Only worn shells were collected, so that this species may live shallower and shells have been transported down the steep slope.

This species, with a very embracing last whorl, is tentatively assigned to *Prunum*, as it shares with other (mostly Caribbean: see Cossignani 2006: 196-206) species the stout, ovoid outline with a conspicuous and tapering last whorl, and the smooth inner part of the outer lip. Admittedly, the separation between the genera *Prunum* and *Volvarina* Hinds, 1844

is not clear-cut and currently follows a rather arbitrary criterion where the large species with a strong callus are placed in *Prunum*, the slender species with a thin callus in *Volvarina*, leaving in between many ambiguously placed species like the one considered here.

Several species of *Prunum* (summarized in Espinosa *et al.* 2014) have been described from the Canaries, namely *P. estefaniae* Pérez-Dionis, Ortea & Espinosa, 2009, *P. nataliae* Pérez-Dionis, Ortea & Espinosa, 2009, *P. javii* Espinosa, Ortea & Moro, 2013, *P. montseae* Espinosa, Ortea & Moro, 2014, *P. pacotalaverai* Espinosa, Ortea & Moro, 2014 and the fossil (of unspecified Plio-Pleistocene age) *P. clarae* Contreras, 1994, but all of them are littoral species previously confounded with *Prunum olivaeforme* (Kiener, 1834) or others from the West African mainland.

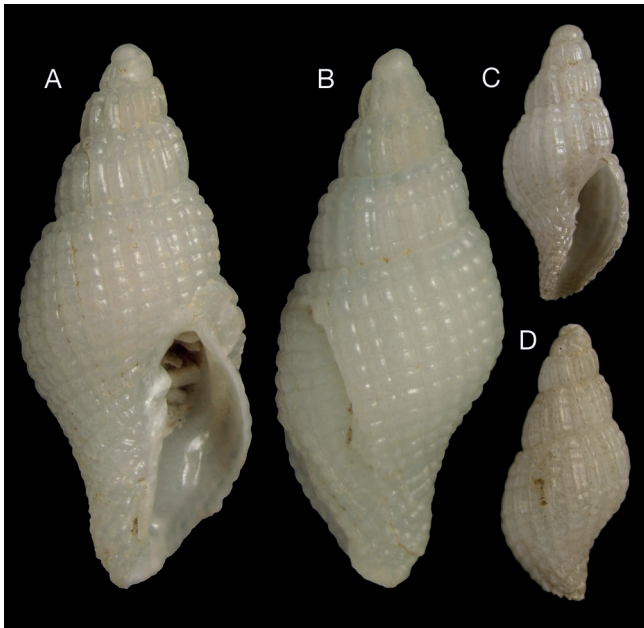


FIG. 19. — **A, B**, *Microvoluta tessellata* n. sp., holotype from DW130 (6.7 mm); **C, D**, paratype, same locality (4.2 mm).

Family VOLUMITRIDAE Gray, 1854

Genus *Microvoluta* Angas, 1877

TYPE SPECIES. — *Microvoluta australis* Angas, 1877, by monotypy.

Microvoluta tessellata n. sp.
(Fig. 19A-D)

urn:lsid:zoobank.org:act:95B5784F-1A18-47C8-9F21-2FEE7417F752

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34269.
Paratypes. 5 immature sh., MNHN-IM-2000-34270, all from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — From the Latin *tessella*, a piece of mosaic, alluding to the sculpture.

DESCRIPTION

Shell whitish, consisting of 4.5 quite convex whorls, with a well marked, almost channelled suture; protoconch of one globular smooth whorl; teleoconch with oblique axial ribs of which 24 on the last whorl; spiral sculpture of rather deep grooves, rather obsolete on the first whorl and becoming more accentuated on the last whorl; grooves regularly spaced and forming granules at their intersections with the axial ribs. Aperture rather wide, somewhat arched. Three columellar folds, bulging into the aperture, occupying more than $\frac{3}{4}$ of the apertural height, the remaining area in the adapical part of the columella somewhat concave; the adapical columellar fold is most developed and the abapical one is very slight;

outer lip thin, siphonal canal short. Dimensions of holotype: 6.7 mm height \times 2.8 mm diameter.

REMARKS

This species resembles in many respects *Microvoluta superstes* Bouchet & Warén, 1985, described from Gorringe Bank, off SW Portugal, but is less slender, more fusiform with the whorls not definitely shouldered as in *M. superstes*. Spiral sculpture is evenly developed over all the surface of the teleoconch, contrary to *M. superstes* which has smooth ribs in the median part of the whorls in most specimens. All shells are empty. A preliminary sorting of a large material from Ampère seamount, Josephine seamount and the Meteor group of seamounts collected during the SEAMOUNT 1 and SEAMOUNT 2 cruises revealed several undescribed congeneric species which are currently under study, with a differentiation between banks which may parallel that of *Trituba* Jousseaume, 1884, as described by Gofas (2003). Because no animal is available, the generic placement is only tentative.

Family DRILLIIDAE Olsson, 1964

Genus *Spirotropis* G. O. Sars, 1878

TYPE SPECIES. — *Pleurotoma carinata* Bivona, 1838, by monotypy.

Spirotropis guancha n. sp.
(Fig. 20D-F)

urn:lsid:zoobank.org:act:3CA92AAD-586D-47F5-9AD7-D00450C50F6E

TYPE MATERIAL. — **Holotype**. spm., MNHN-IM-2000-34271 and 1 paratype (sh.) from SEAMOUNT 2 DW128.

Paratypes. 1 sh., MNHN-IM-2000-34272 from DW126. — 1 spm., MNHN-IM-2000-34273 from DW130.

TYPE LOCALITY. — Off NW Gran Canaria, 28°08.26'N, 15°51.99'W/28°08.47'N, 15°51.66'W, 470-485 m.

ETYMOLOGY. — An adjective derived from the name of the aboriginal people of Canary Islands, the Guanches.

DESCRIPTION

Shell medium-sized, biconical with a tall and turreted spire, and the last whorl a little more than half of the total height. Protoconch of 1.5 whorls, globose, with the last half-whorl ornamented by a few flexuous incremental lines, separated from the teleoconch by an indistinct line. Teleoconch of about 7 regularly increasing whorls; teleoconch whorls distinctly shouldered, with a distinct subsutural rim, then a concave subsutural ramp between this and the shoulder. Shoulder bearing a series of axially elongate knobs (about 15 on penultimate whorl, becoming attenuated on the last whorl where approaching the outer lip). Labial notch well developed and deep, situated at the termination of the subsutural ramp, as is usual in the genus. Siphonal canal short and wide. Colour opaque white, without gloss. Dimensions of holotype, 16.2 mm height \times 6.4 mm diameter, of paratypes, 10.7 \times 4.3 to 20.1 \times 7.6 mm.

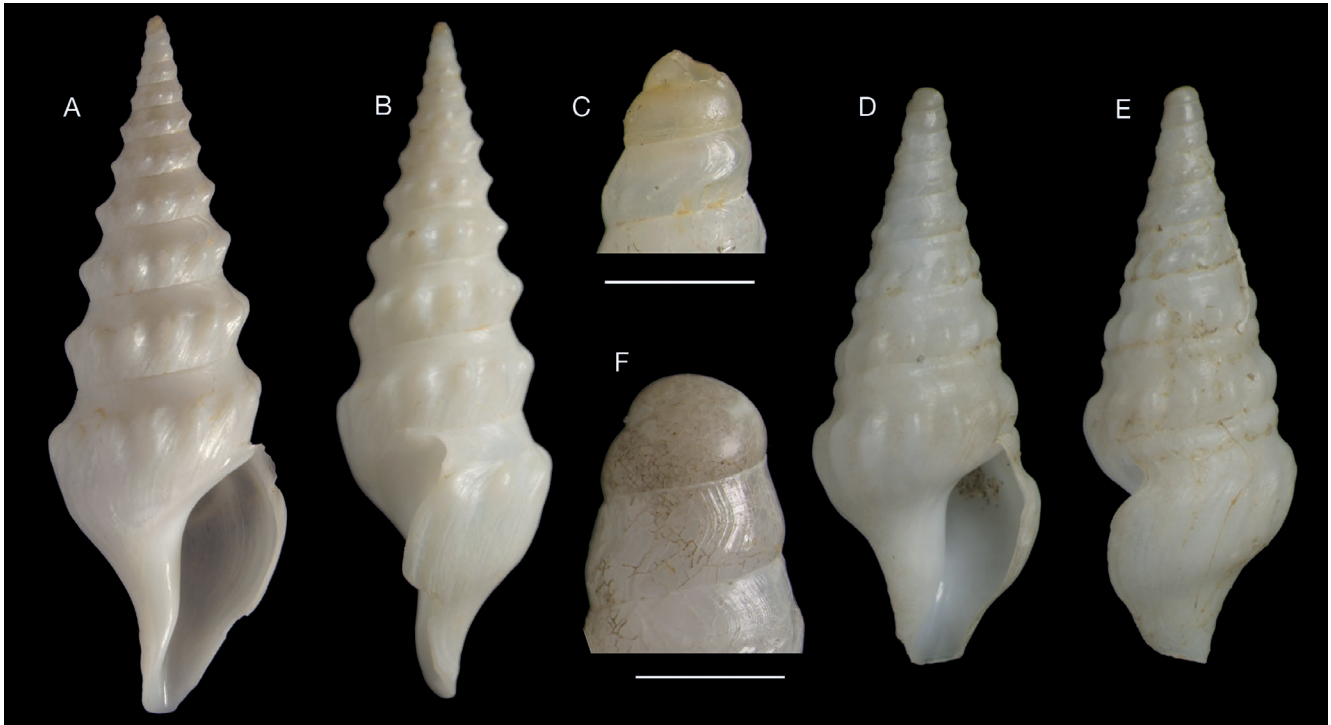


FIG. 20. — **A, B**, *Spirotropis centimata* (Dall, 1889), shell from off Cap Ghir, Morocco, "Talisman" 1883 sta. 43-44 (28.7 mm); **C**, protoconch of the same specimen; **D-F**, *Spirotropis guancha* n. sp., holotype from DW128 (spm., 16.2 mm); **F**, protoconch of the holotype. Scale bars: 1 mm.

REMARKS

Spirotropis guancha n. sp. most resembles *S. centimata* (Dall, 1889), originally described from SE United States and subsequently reported from the Azores and from off western Morocco (Bouchet & Warén 1980). *Spirotropis guancha* n. sp. has a globose and smooth, whitish, paucispiral protoconch denoting non-planktotrophic development whereas *S. centimata* has a conical, yellowish protoconch of c. 2.5 whorls, with a suprasutural keel, denoting a planktotrophic development. The thick subsutural rim of *S. guancha* n. sp. is not seen in *S. centimata*, which also has much more prominent knobs along the shoulder. The aperture of *S. guancha* n. sp. is wider, the siphonal canal is shorter and broader than in *S. centimata*. We figure for comparison (Fig. 20A-C) a specimen of the latter species collected off SW Morocco by R/V *Talisman*.

Family RAPHITOMIDAE Bellardi, 1875

Genus *Gymnobela* Verrill, 1884

TYPE SPECIES. — *Gymnobela engonia* Verrill, 1884, subsequent designation by Cossmann, 1896: 63.

Gymnobela multilirata n. sp.
(Fig. 21A-E)

[urn:lsid:zoobank.org:act:3B5B70FF-0A68-4463-9076-1306DEBC2C7E](https://doi.org/10.3897/zoo.13062019.34274)

TYPE MATERIAL. — Holotype. sh., MNHN-IM-2000-34274 .

Paratypes. 10 sh., MNHN-IM-2000-34275 from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off W Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — An adjective formed from the Latin *lima*, a furrow, based on the sculpture with numerous spiral furrows.

OTHER MATERIAL EXAMINED. — 66 sh., SEAMOUNT 2 DW130.

DESCRIPTION

Shell small, whitish, consisting of a little more than three convex, definitely shouldered whorls, with a well marked suture; protoconch (visible part 550 µm high, 400 µm diameter) protruding and somewhat pointed apically, formed of a little more than one whorl, nearly smooth on the initial part but mostly covered by minute, irregular granules which are loosely aligned spirally. Protoconch/teleoconch limit very definite along an orthocline line. Teleoconch with elevated spiral cords, of which 4-5 on the spire whorls and 19-21 on the last whorl; cords narrower than the interspaces, one along the suture, the strongest one on the shoulder and the 2-3 abapical ones decreasing slightly in size; on the last half-whorl, an additional cord between the suture and the shoulder. The entire teleoconch covered by axial wrinkles which are much finer than the cords and override them. Aperture oval-elongate, somewhat truncated adapically at the shoulder of last whorl; outer lip simple, siphonal canal short and very broad. Dimensions of the holotype: 2.2 mm height × 1.15 mm diameter, paratypes up to 2.7 × 1.5 mm.

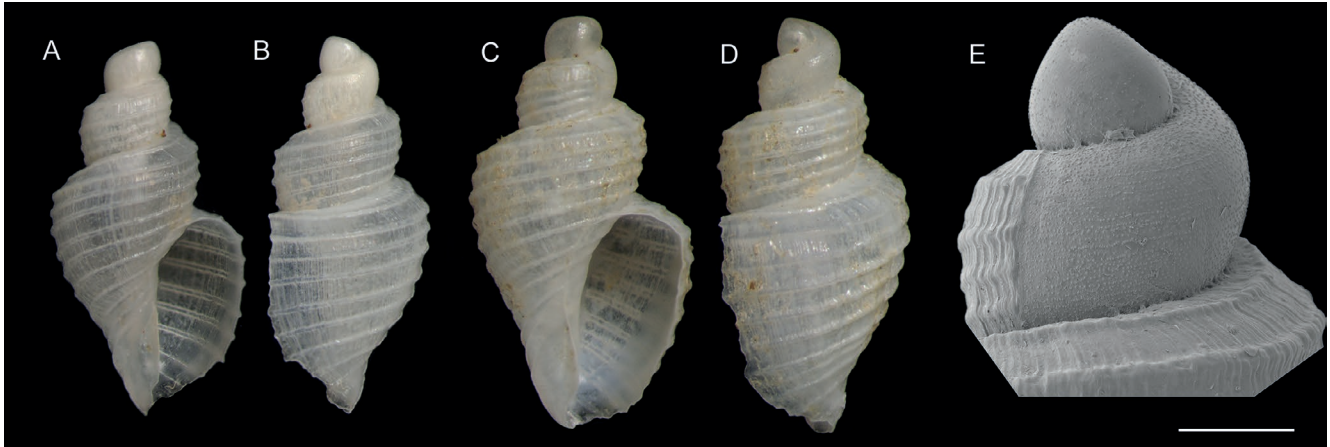


FIG. 21. — **A, B**, *Gymnobela multilirata* n. sp., holotype from DW130 (height 2.2 mm); **C, D**, paratype, same locality (height 2.7 mm); **E**, protoconch of another paratype, same locality. Scale bar: 200 µm.

REMARKS

“*Gymnobela*” *multilirata* n. sp., does not resemble closely any Atlantic species known to us, and even the generic and familial placement is tentative. It is guided by the overall resemblance with species like e.g. *Gymnobela subaraneosa* (Dautzenberg & H. Fischer, 1896) or *G. lamyi* (Dautzenberg, 1925) (see Bouchet & Warén 1980: 52) which also have a definite shoulder and a sculpture of widely separated spiral cords. Another superficially similar species is *Nepotilla amoena* (G. O. Sars, 1878) (see Bouchet & Warén 1980: 75, 76) but the latter has fewer and much stronger spirals and a much narrower canal and abapical part. The paucispiral protoconch of *G. multilirata* n. sp. is typical of a species with non-planktotrophic larval development but does not give a definite clue, although the profile of the protoconch and its definite, orthocone edge resembles the cancellariid *Pseudobabylonella minima* (Reeve, 1856) (see Verhecken 2007: 351). However, teleoconch characters including the lack of folds on the columella and the elongate, tapering last whorl (usually blunt and short in cancellariids) do not support a placement in the latter family. Despite the uncertainty on its position, we consider this species as distinctive and abundant so as to be named.

Gymnobela abyssorum (Locard, 1897)
(Fig. 22A, B)

MATERIAL EXAMINED. — 1 sh., DW120.

REMARK

A quite common species known so far from the northern part of the Bay of Biscay to the Ibero-Moroccan Gulf (Bouchet & Warén 1980) and in the Mediterranean Sea, but not the Azores. New record for the Canaries.

Genus *Kurtziella* Dall, 1918

TYPE SPECIES. — *Pleurotoma cerinum* Kurtz & Simpson, 1851, by original designation.

Kurtziella serga (Dall, 1881)
(Fig. 22C-E)

MATERIAL EXAMINED. — 1 sh., DW128; 1 sh., DW129; 2 spm. and 6 sh., DW 130.

REMARK

A widespread, amphiatlantic species. New record for the Canaries.

Genus *Famelica* Bouchet & Warén, 1980

TYPE SPECIES. — *Pleurotoma catharinae* Verrill & S. Smith, 1884, by original designation.

Famelica monotropis
(Dautzenberg & H. Fischer, 1896)
(Fig. 22F, G)

MATERIAL EXAMINED. — 3 sh., DW130.

REMARK

So far only known from the holotype and three more shells collected in 1360-1600 m off the Azores. New to Spanish waters.

Genus *Neopleurotomoides* Shuto, 1971

TYPE SPECIES. — *Clathurella rufopicata* Schepman, 1913, by original designation.

Neopleurotomoides callebryon
(Dautzenberg & H. Fischer, 1896)
(Fig. 22H-J)

MATERIAL EXAMINED. — 6 sh., DW130.

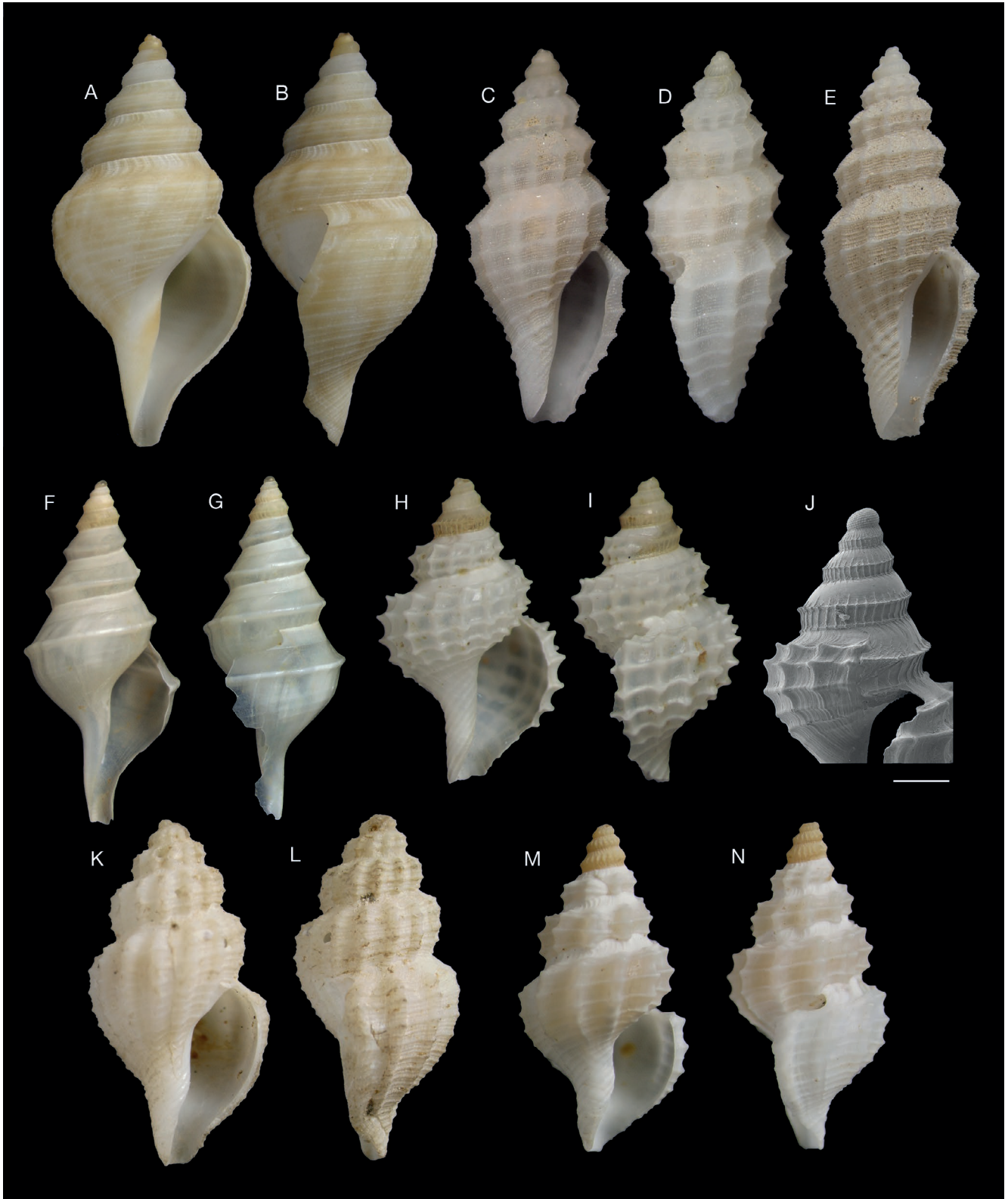


FIG. 22. — **A, B**, *Gymnobela abyssorum* (Locard, 1897), shell from DW120 (10.5 mm); new to the Canaries; **C, D**, *Kurtziella serga* (Dall, 1881), shell from DW130 (7.7 mm); new to the Canaries; **E**, *Kurtziella serga*, shell from DW129 (8.8 mm); **F, G**, *Famelica monotropis* (Dautzenberg & H. Fischer, 1896), shell from DW130 (5.7 mm); new to Spanish waters; **H-I**, *Neopleurotomoides callembrion* (Dautzenberg & H. Fischer, 1896), shell from DW130 (2.3 mm); new to Spanish waters; **J**, *Neopleurotomoides callembrion*, scanning electron micrograph of the protoconch of another shell from DW130; **K-L**, *Pleurotomella demosia* (Dautzenberg & H. Fischer, 1896), shell from DW126 (8.7 mm); new to the Canaries; **M-N**, *Pleurotomella eurybrocha* (Dautzenberg & H. Fischer, 1896), shell from DW130 (3.8 mm); new to the Canaries. Scale bar: J, 500 μ m, all measurements refer to shell height.

REMARK

An amphiatlantic species recorded from off Fernandina (Florida), the Azores and off western Portugal (Bouchet & Warén 1980). New to Spanish waters.

Genus *Pleurotomella* Verrill, 1872

TYPE SPECIES. — *Pleurotomella packardii* Verrill, 1872, by original designation.

Pleurotomella demosia
(Dautzenberg & H. Fischer, 1896)
(Fig. 22K, L)

MATERIAL EXAMINED. — 1 sh., DW126.

REMARK

Originally described from the Azores in 1300 m, new record for the Canaries.

Pleurotomella eurybrocha
(Dautzenberg & H. Fischer, 1896)
(Fig. 22M, N)

MATERIAL EXAMINED. — 5 sh., DW130.

REMARK

Originally described from the Azores in 1300 m, new record for the Canaries.

Genus *Teretia* Norman, 1888

Teretia Norman, 1888: 8.

Azorilla Nordsieck, 1968: 184, n. syn.

TYPE SPECIES. — *Pleurotoma teres* Reeve, 1844, see discussion below.

REMARKS

Teretia was proposed as an emendation of *Teres* Bucquoy, Dautzenberg & Dollfus, 1883 (preoccupied by *Teres* Boettger, 1878, a clausilid land-snail), and later used as a substitute name. Bucquoy, Dautzenberg and Dollfus fixed *Pleurotoma anceps* Eichwald, 1830, as the type species of *Teres*, but they used the name *P. anceps* for a Recent Mediterranean species and listed “*Pleurotoma teres* Forbes (non Reeve)” in its synonymy. *Pleurotoma teres* Reeve, 1844, was established for the Recent species, and Forbes is generally considered to have properly applied Reeve’s name, whereas *P. anceps* Eichwald, 1830, is a distinct Miocene species from eastern Europe (Janssen 1984; Bałuk 2003; Brunetti & Vecchi 2003). The name *Teres* Bucquoy, Dautzenberg & Dollfus, 1883 is therefore based on a misidentified type species and a type species should be fixed

under ICZN Art. 70.3.2. Hereby we select *Pleurotoma teres* Reeve, 1844 as type species of *Teres* Bucquoy, Dautzenberg & Dollfus, 1883 and its substitute *Teretia* Norman, 1888.

Horro & Rolán (2017) assigned to *Teretia* several species, among which *Teretia strongyla* (Dall, 1927) and called attention on the peculiar microsculpture of granules which is diagnostic of this genus. *Pleurotomella megalembryon*, the type species of *Azorilla* Nordsieck, 1968 (Fig. 23A-F), has this microsculpture and has a protoconch very similar to that of the type species of *Teretia* (Fig. 23G, H). *Pleurotomella megalembryon* is perceived as congeneric with *Teretia strongyla* and consequently we consider *Azorilla* a subjective junior synonym of *Teretia*. Bouchet & Warén (1980) already noted that “*P. megalembryon* has a sculpture which recalls that of *Teretia teres*”. The details of the protoconch sculpture, in both cases with spiral rows of cross-shaped nodules on protoconch 1 and a typical raphitome sculpture on protoconch 2, are also shared (see Fig. 23 E, H).

Teretia megalembryon
(Dautzenberg & H. Fischer, 1896) n. comb.
(Fig. 23A-F)

Pleurotoma megalembryon Dautzenberg & H. Fischer, 1896: 420, pl. 17 fig. 14.

Mangilia sericifila var. *strongyla* Dall, 1927: 29, n. syn.

MATERIAL EXAMINED. — 8 sh., DW130.

REMARKS

Apart from being slightly larger, we cannot see any species-specific difference between the syntype of *Teretia strongyla* figured by Horro & Rolán (2017: 147), the Azorean type specimen of *Pleurotomella megalembryon* figured by Dautzenberg & H. Fischer (1896) and our material and therefore consider these as synonyms. This is therefore another amphiatlantic species, recorded from off Georgia (Dall 1927), the Azores (Dautzenberg & Fischer 1896) and the northern part of Bay of Biscay (Bouchet & Warén 1980), and new to Spanish waters.

Teretia teres (Reeve, 1844)
(Fig. 23G-H)

MATERIAL EXAMINED. — 4 sh., DW133; 3 sh., DW128; 7 sh., DW130; 1 juvenile spm, Alboran Sea, Djibouti Banks, 36°21.08'N, 3°58.58'E / 36°21.06'N, 3°58.07'E, 349-365 m, Spanish Institute of Oceanography cruise DP0409, haul BT04.

Family MITROMORPHIDAE T. L. Casey, 1904
Genus *Mitromorpha* Carpenter, 1865

TYPE SPECIES. — *Daphnella filosa* Carpenter, 1864, by monotypy.

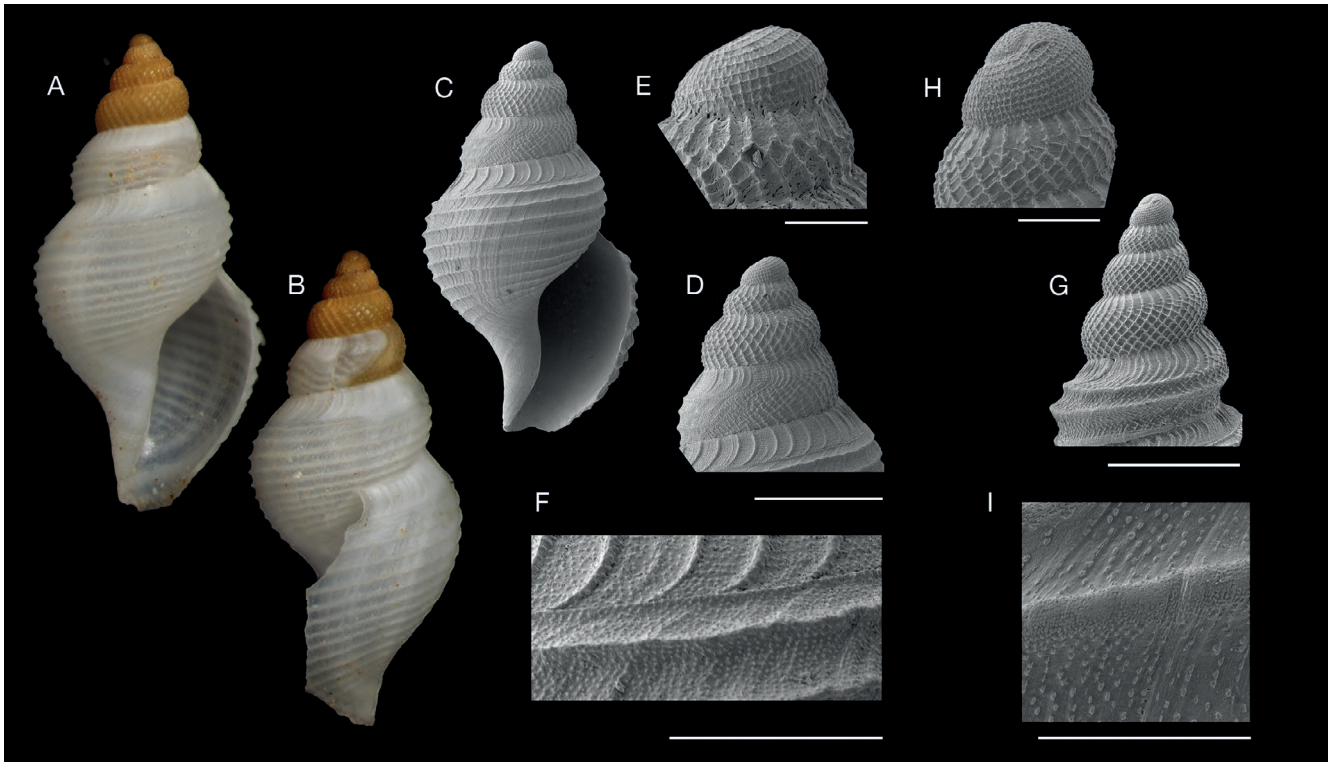


FIG. 23. — **A-F**, *Teretia megalembryon* (Dautzenberg & H. Fischer, 1896) n. comb.: **A, B**, shell from DW 130 (height 2.8 mm); **C**, SEM micrograph of another specimen, same locality (height 2.1 mm); **D, E**, protoconch and detail of protoconch **I**, same specimen; **F**, detail of microsculpture on the shoulder, same specimen; **G-I**, *Teretia teres* (Reeve, 1844): **G**, protoconch of a specimen from Djibouti Banks, Alboran Sea; **H**, detail of protoconch **I**; **I**, detail of microsculpture on the shoulder, same specimen. Scale bars: A-C, E, F, I, 100 μ m; D, G, 500 μ m.

Mitromorpha alabaster n. sp.
(Fig. 24A, B)

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TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34276, from SEAMOUNT 2 DW129.

TYPE LOCALITY. — Off W Gran Canaria, 28°08.32'N, 15°51.94'W/28°08.51'N, 15°51.61'W, 480 m.

ETYMOLOGY. — From the Latin name of a white, marble like stone, alluding to the colourless shell; used as a noun in apposition.

DESCRIPTION

Shell small, biconical, white; protoconch globose, smooth, of one and a half whorls. Teleoconch of 4 ½ very slightly convex whorls. Sculpture of low axial ribs (about 15 on the penultimate and last whorl), slightly opisthocline, and of very flat spiral cords, much broader than their interspaces (three on first teleoconch whorl, five on penultimate, 17 on last whorl). Under high magnification, whole surface bearing axial wrinkles parallel to the growth lines. Suture shallow. Aperture narrow, outer lip with 4 denticles inside, the adapical one strongest, thickened outside; inner lip plain, with two strong folds near its middle, the adapical one the largest. Dimension of the holotype: 6.4 mm height \times 2.8 mm diameter.



FIG. 24. — **A, B**, *Mitromorpha alabaster* n. sp., holotype from DW129 (Height 6.4 mm).

REMARKS

There are two other described species from the Atlantic with a similar cancellate sculpture. *Mitromorpha buplicata* Dall, 1889 has one more teleoconch whorl (5–6 instead of about 4 ½) at roughly the same size (7 mm). The sculpture is also different, being raised spiral cords separated by broad interspaces, in which additional cordlets appear at the end of the last whorl, whereas in *M. alabaster* n. sp. the spiral cords are flat and much broader than the interspaces. *Mitromorpha dalli* Dautzenberg & H. Fischer, 1896, is twice as large with a similar sized protoconch, which results in a profile with a very much more pointed apex. The latter is so far only known from the holotype (figured in Bouchet & Warén 1980), collected off the Azores at a depth of 1300 m.

Subclass HETEROBRANCHIA
Family ARCHITECTONICIDAE Gray, 1850

Genus *Spirolaxis* Monterosato, 1913

TYPE SPECIES. — *Pseudomalaxis centrifuga* Monterosato, 1890, by monotypy.

Spirolaxis lamellifer (Rehder, 1935)
(Fig. 25A–C)

MATERIAL EXAMINED. — 1 sh., DW120; 2 sh., DW130.

REMARK

An amphiatlantic species, originally described from the Florida Straits in 205 fathoms, so far known also from the Cape Verde Islands and from the western Mediterranean (Gofas *et al.* 2014). New record for the Canaries.

Family ORBITESTELLIDAE Iredale, 1917

Genus *Orbitestella* Iredale, 1917

TYPE SPECIES. — *Cyclostrema bastowi* Gatliff, 1906, by original designation.

Orbitestella pruinosa n. sp.
(Fig. 25D–F)

urn:lsid:zoobank.org:act:340AD666-39F8-4250-842D-443F7546E7E0

TYPE MATERIAL. — Holotype. sh., MNHN-IM-2000-34277, from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off W Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655–660 m.

ETYMOLOGY. — Latin adjective meaning “frosty”, alluding to the texture given to the shell surface by the microsculpture.

DESCRIPTION

Shell minute, depressed, with a flat spire and wide umbilicus. Protoconch of a little less than 1 whorl. Teleoconch with three strong spiral ridges, of which one is adapical, the strongest one is on the periphery, and one is abapical. Microsculpture of irregularly arranged granules, loosely aligned axially, which give the surface a shagreened aspect and are attenuated on the ridges; the last ¼ whorl marked in addition by conspicuous growth lines. Umbilicus broad and wide, delimited by an additional internal ridge. Aperture simple, rounded on the parietal and columellar side, polygonal along the outer lip, reflecting the termination of the ridges. Columellar edge of the aperture reflected outwards and strongly receding where approaching the parietal edge, abutting there on the abapical ridge of the preceding whorl. Dimensions of the holotype: 0.35 mm height × 0.8 mm diameter.

REMARKS

The size, profile, and the characteristic recession of the abapical part of the aperture support the placement of this species in *Orbitestella*. The protoconch is damaged on the only available specimen and could not be observed properly.

This minute species does not resemble closely any other gastropod known to us from the eastern Atlantic. The most similar is *Orbitestella hinemoa* Mestayer, 1919, from off New Zealand, which differs only in having a more even development of the three keels on the last whorl, the peripheral one not so much protruding as in *Orbitestella pruinosa* n. sp. The only other species of *Orbitestella* described from the eastern Atlantic and Mediterranean area is *O. dariae* (Liuzzi & Zucchi Stolfi, 1979), recorded from Madeira by Segers *et al.* (2009). It has a similar outline but an evenly convex abapical part with several flat spiral cords, and a spiral series of prominent knobs on the adapical side; furthermore it lacks the shagreened microsculpture of *O. pruinosa* n. sp. The specimen from a deep-water thanatocenosis off Sardinia, Western Mediterranean, figured as *O. dariae* by Bonfitto *et al.* (1994) is not that species and is so similar to *O. pruinosa* n. sp. that it is possibly the same; their specimen differs from the Canarian one in having definite axial riblets between the spiral ridges, instead of loosely aligned granules.

Family CIMIDAE Warén, 1993

Genus *Graphis* Jeffreys, 1867

TYPE SPECIES. — *Turbo unicus* Montagu, 1803, by monotypy.

Graphis gracilis (Monterosato, 1874)
(Fig. 25G)

MATERIAL EXAMINED. — 1 sh., DW126; 1 sh., DW130.

REMARK

New record for the Canaries.



FIG. 25. — **A-C**, *Spirolaxia lamellifer* (Rehder, 1935), shell from DW120 (diameter 3.7 mm); new to the Canaries; **D-F**, *Orbitestella pruinosa* n. sp., holotype from DW130 (diameter 0.8 mm); **G**, *Graphis gracilis* (Monterosato, 1874), shell from DW130 (height 2.1 mm); **H, I**, *Odostomia madeirensis* Peñas, Rolán & Swinnen, 2014, shell from DW133 (height 2.2 mm); new to Spanish waters; **J, K**, *Liostomia canaliculata* n. sp., holotype from DW130 (height 1 mm); **L, M**, *Ringicula pirulina* Locard, 1897, shell from DW130 (6.4 mm); **N**, *Colpodaspis pusilla* M. Sars, 1870, shell from DW126 (1.4 mm); new to the Canaries.

Family PYRAMIDELLIDAE Gray, 1840

Genus *Odostomia* Fleming, 1813

TYPE SPECIES. — *Turbo plicatus* Montagu, 1803, by subsequent designation.

Odostomia madeirensis
Peñas, Rolán & Swinnen, 2014
(Fig. 25H, I)

MATERIAL EXAMINED. — 37 sh., DW133.

REMARK

Originally described from Madeira, new to Spanish waters.

Genus *Liostomia* G. O. Sars, 1878

TYPE SPECIES. — *Turbonilla clavula* Lovén, 1846; subsequent designation by Monterosato (1884: 95).

Liostomia canaliculata n. sp.
(Fig. 25J, K)

[urn:lsid:zoobank.org:act:156041FB-BB06-4A69-B683-2E03FBEBF626](https://doi.org/10.21203/rs.3.rs-156041FB-BB06-4A69-B683-2E03FBEBF626)

TYPE MATERIAL. — **Holotype**. sh., MNHN-IM-2000-34278, from SEAMOUNT 2 DW130.

TYPE LOCALITY. — Off W Gran Canaria, 28°08.95'N, 15°53.11'W/28°09.06'N, 15°52.92'W, 655-660 m.

ETYMOLOGY. — Latin adjective meaning “channelled”, alluding to the subsutural channel.

DESCRIPTION

Shell minute, globose with a low, markedly stepped spire, and the last whorl occupying more than $\frac{4}{5}$ of the total height. Protoconch *c.* 280 μ m in diameter, with its apex obliquely immersed in the first teleoconch whorl (type B of van Aartsen, 1987), smooth and glossy. Teleoconch of two whorls, shouldered with a very strong keel separated from the suture by a broad channel, smooth except for growth lines which are particularly conspicuous within the subsutural channel. Last whorl with maximum convexity near the periphery, flat between keel and periphery and only slightly convex in the abapical part. Umbilicus broad and conspicuous, delimited by a blunt keel. No columellar tooth. Dimensions of the holotype: 1.0 mm height \times 0.95 mm diameter.

REMARKS

This species does not resemble any known gastropod from the North Atlantic, but is clearly identified as a member of the Pyramidellidae by the heterostrophic protoconch. Among all the pyramidellid genera reported in the area, *Liostomia* was considered because its type species, although quite different in aspect, is also umbilicate, has the protoconch nucleus similarly immersed, lacks a columellar tooth, and has an incipient subsutural keel on the first teleoconch whorl, admittedly not so conspicuous (Høisæter 2014). *Liostomia mamoi* Mifsud, 1993 was described from the Mediterranean and has a height/diameter ratio close to that of *L. canaliculata* n. sp., although lacking the spiral keels.

Family RINGICULIDAE Philippi, 1853

Genus *Ringicula* Deshayes, 1838

TYPE SPECIES. — *Marginella auriculata* Ménard de la Groye, 1811, by subsequent designation.

Ringicula pirulina Locard, 1897
(Fig. 25L, M)

MATERIAL EXAMINED. — 1 sh., DW126; 18 sh., DW130.

REMARK

Originally described from off Morocco, new to Spanish waters.

Family COLPODASPIDIDAE Oskars, Bouchet & Malaquias, 2015

Genus *Colpodaspis* M. Sars, 1870

TYPE SPECIES. — *Colpodaspis pusilla* M. Sars, 1870, by monotypy.

Colpodaspis pusilla M. Sars, 1870
(Fig. 25N)

MATERIAL EXAMINED. — 1 sh. DW126.

REMARK

Originally described from Norway, new record for the Canaries.

Class BIVALVIA Linnaeus, 1758
Subclass PROTOBRANCHIA Pelseneer, 1889
Family SAREPTIDAE Stoliczka, 1870

Genus *Pristigloma* Dall, 1900

TYPE SPECIES. — *Glomus nitens* Jeffreys, 1876, by monotypy.

Pristigloma minima (Seguenza, 1877)
(Fig. 26A, B)

MATERIAL EXAMINED. — 1 spm., 2 sh. and 30 v., DW130.

REMARK

Originally described as a Pliocene fossil from southern Italy, and subsequently reported from Seine seamount (Beck *et al.* 2006); new to Spanish waters.

Family YOLDIIDAE Dall, 1908

Genus *Microgloma* Sanders & Allen, 1973

TYPE SPECIES. — *Microgloma yongei* Sanders & Allen, 1973, by original designation.



FIG. 26. — **A, B**, *Pristigloma minima* (Seguenza, 1877), valve from DW130 (1.7 mm); new to Spanish waters; **C**, *Limopsis angusta* Jeffreys, 1879, specimen from DW126 (height 5.2 mm without barbs); new to the Canaries; **D**, *Limopsis angusta*, inside of a valve, same locality (4.7 mm); **E**, *Lima marioni* P. Fischer, 1882, valve from DW130 (18.0 mm); new to the Canaries; **F**, *Limatula gwyni* (Sykes, 1903), valve from DW120 (5.6 mm); new to the Canaries; **G**, *Limatula laminifera* (E. A. Smith, 1885), valve from DW130 (2.8 mm); new to the Canaries.

Microgloma pusilla (Jeffreys, 1879)

MATERIAL EXAMINED. — 4 v., DW126.

REMARK

Originally described from Bay of Biscay and western Portugal, new record for the Canaries.

Subclass PTERIOMORPHIA Beurlen, 1944
Family LIMOPSIDAE Dall, 1895

Genus *Limopsis* Sassi, 1827

TYPE SPECIES. — *Arca aurita* Brocchi, 1814, by monotypy.

Limopsis angusta Jeffreys, 1879
(Fig. 26C, D)

MATERIAL EXAMINED. — 1 spm, 47 v., DW126.

REMARK

Originally described from off south-western Portugal, new record for the Canaries.

Family LIMIDAE Rafinesque, 1815

Genus *Lima* Bruguière, 1797

TYPE SPECIES. — *Lima alba* Cuvier, 1797, by subsequent monotypy.

Lima marioni P. Fischer, 1882
(Fig. 26E)

MATERIAL EXAMINED. — 7 v., DW130.

REMARK

An amphiatlantic species, reported from Brazil and the Azores (Mikkelsen & Bieler 2005), and from the Bay of Biscay to the Ibero-Moroccan Gulf. Consistently associated with white corals. New record for the Canaries.

Genus *Limatula* S. V. Wood, 1839

TYPE SPECIES. — *Pecten subauriculatus* Montagu, 1808, by subsequent designation.

Limatula gwyni (Sykes, 1903)
(Fig. 26F)

MATERIAL EXAMINED. — 6 v., DW130.

REMARK

Originally described from British waters, new record for the Canaries.

Limatula laminifera (E. A. Smith, 1885)
(Fig. 26G)

MATERIAL EXAMINED. — 2 v., DW130.

REMARK

Originally described from the Caribbean in 390–450 fathoms (713–823 m) and known to us from the seamounts of the central North Atlantic. New record for the Canaries.

Subclass HETERODONTA Neumayr, 1884
Family CRASSATELLIDAE Férussac, 1822

Genus *Crassatina* Kobelt, 1881

TYPE SPECIES. — *Crassatella triquetra* Reeve, 1842, by original designation.

Crassatina marchadi Cosel, 1995
(Fig. 27D–F)

MATERIAL EXAMINED. — 17 sh. and 13 v., DW 133.

REMARK

A species hitherto known only from West Africa (Cosel 1995), new to Spanish waters.

Family LASAEIDAE Gray, 1842

Genus *Scacchia* Philippi, 1844

TYPE SPECIES. — *Tellina elliptica* Philippi, 1844, by subsequent designation.

Scacchia oblonga (Philippi, 1836)

MATERIAL EXAMINED. — 2 v., DW133.

REMARK

Originally described from Sicily, new record for the Canaries.

Family MONTACUTIDAE W. Clark, 1855

Genus *Kurtiella* Gofas & Salas, 2008

TYPE SPECIES. — *Mya bidentata* Montagu, 1803, by original designation.

Kurtiella pellucida (Jeffreys, 1881)
(Fig. 27A–C)

MATERIAL EXAMINED. — 3 v., DW133.

REMARK

Originally described from the Sicily Channel, new record for the Canaries.

Family VERTICORDIIDAE Stoliczka, 1870

Genus *Halicardia* Dall, 1895

TYPE SPECIES. — *Mytilimeria flexuosa* Verrill & Smith, 1881, by monotypy.

Halicardia angulata (Jeffreys, 1882)
(Fig. 27G, H)

MATERIAL EXAMINED. — 2 spm., 5 v., DW13.

REMARK

Originally described from off south-western Portugal and Josephine seamount, new to Spanish waters.



FIG. 27. — **A-C**, *Kurtiella pellucida* (Jeffreys, 1881), left and right valves from DW133 (4.3 and 5.6 mm); new to the Canaries; **D-F**, *Crassatina marchadi* Cosel, 1995, left and right valves from DW 133 (3.0 and 4.3 mm); new to Spanish waters; **G, H**, *Halicardia angulata* (Jeffreys, 1882), specimen from DW130 (3.8 mm); new to Spanish waters; **I**, *Spheniopsis senegalensis* Cosel, 1995, specimen from DW133 (3.6 mm); new to Spanish waters; **J**, *Spheniopsis senegalensis*, inside of a left valve, same locality (4.7 mm).

Family SPHENIOPSIDAE J. Gardner, 1928

Genus *Spheniopsis* Sandberger, 1861

TYPE SPECIES. — *Corbula scalaris* A. Braun, 1851, by monotypy.

Spheniopsis senegalensis Cosel, 1995
(Fig. 27I, J)

MATERIAL EXAMINED. — 1 spm. and 11 v., DW133

REMARK

A species hitherto known only from West Africa (Cosel 1995), new to Spanish waters.

DISCUSSION

The specific richness in this transect (295 species) can be considered very high, since it contains 23% of the 1262 marine mollusc species cited for the Canary Islands in the Spanish List of Marine Species (Gofas *et al.* 2017, hereafter Spanish master list) in only seven samples. This proportion is even higher (26.5%) if only the benthic species (1102 previously cited) are taken into account.

Confronting the results of this study with the master list revealed 51 species as new records for Canarian waters. Of these, 23 are new records for Spanish waters overall and three (*Opaliopsis opalina*, *Epitonium polacia* and *Larsenia scalaroides*) are the first reference in temperate eastern Atlantic waters.

Eleven species collected in our material are, according to the Spanish master list, Canarian endemics. Of these, only three (*Solariella bermejoi* Rolán, Hernández & Déniz, 2005, *Alvania joseae* Hoenselaar & Goud, 1998 and *Brocchinia canariensis* Rolán & Hernández, 2009) are represented by some specimens collected alive. According to the master list, 127 species among the 1262 cited from the Canary Islands are endemic (10%). In the present list, the 11 species (3.7% of the total) recognized as Canarian endemics represent a much lower proportion than expected. On the other hand, if the 13 newly described species are taken into account, the proportion of endemics would be 8% of the total, a figure more in line with the expectations. This is likely to be verified as all the newly described species have paucispiral protoconchs and are therefore prone to have restricted ranges.

The increase provided by the new records (51 species, 4% of the total cited for Canarian waters) is considerable, exceeding, for example, figures for the Alborán platform in Peñas *et al.* (2006) where eight of 655 species were new to science and 39 were new to the Spanish Mediterranean coasts. Adding new records and the new species, over one-fifth of the species collected in this material brought new knowledge regarding large-scale distributions, which means that the inventory of deep waters around the Canaries is not even approaching completion. It is well known that the tropical deep-sea still holds a large fraction of biota to be discovered. Admittedly, these numbers do not match those found in the world's "golden triangle" of biodiversity (e.g. Bouchet *et al.* 2008 recorded 1028 species of molluscs from the New Caledonia Exclusive Economic zone from depths below 100 m, and 601 of these (58.4%) were new to science) but they are still remarkable for being so close to the supposedly well-explored European seas.

Most of the new species and new records in our material are concentrated in the deepest dredge haul DW130 in 655–660 m, and this must be placed in context with hydrological setting around the Canaries (Hernández Guerra *et al.* 2001; Almón *et al.* 2014a, b). The superficial waters (< 600 m depth) correspond to the North Atlantic Central Water (NACW) flowing south following the Canary current, at the eastern boundary of the North Atlantic Subtropical Gyre. The DW130 sample stands out as coming from below 600 m, where it should be situated within a northwards flowing tongue of Antarctic Intermediate Water (AAIW), formed where superficial

waters of Antarctic origin sink as they meet warmer waters of the tropical zone (Machín & Pelegrí 2009). This flow, with a core at around 800 m depth and temperature around 8.3°C, certainly does not explain shared species with the western Atlantic and with Iceland, but two additional elements must be borne in mind. Firstly, the planktotrophic larvae of deep-water species reach superficial layers during their development (Bouchet 1976; Scheltema 1994, Bouchet & Warén 1994) and can therefore enter the North Atlantic Subtropical Gyre. Secondly, the deeper parts of the basin receive a thick layer of the North Atlantic Deep Water (NADW), which is formed in the Norwegian and Greenland Seas and passes into the North Atlantic in the deep channels that separate Scotland, Iceland, and Greenland. NADW is found throughout the Atlantic Ocean below 1500 m, although the flow around the Canaries is reported to be weak. Much has yet to be learned about the fauna affected by those deep and cold water masses, in an area where the deep-sea exploration still relies mostly on the XIXth century "Talisman" expedition.

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