

The marine Mollusca of the Bay of Algeciras, Spain,
with general notes on *Mitrella*, Marginellidae and Turridae

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ABSTRACT

An annotated check-list of the marine Mollusca of the Bay of Algeciras, mainly based on shells washed ashore at or near Getares (S. of Algeciras) and collected by the first two authors, is presented. Apart from references to illustrations in the literature, many original figures are given for the less well-known species. Additional data from the literature are mentioned. Some zoogeographical notes are presented.

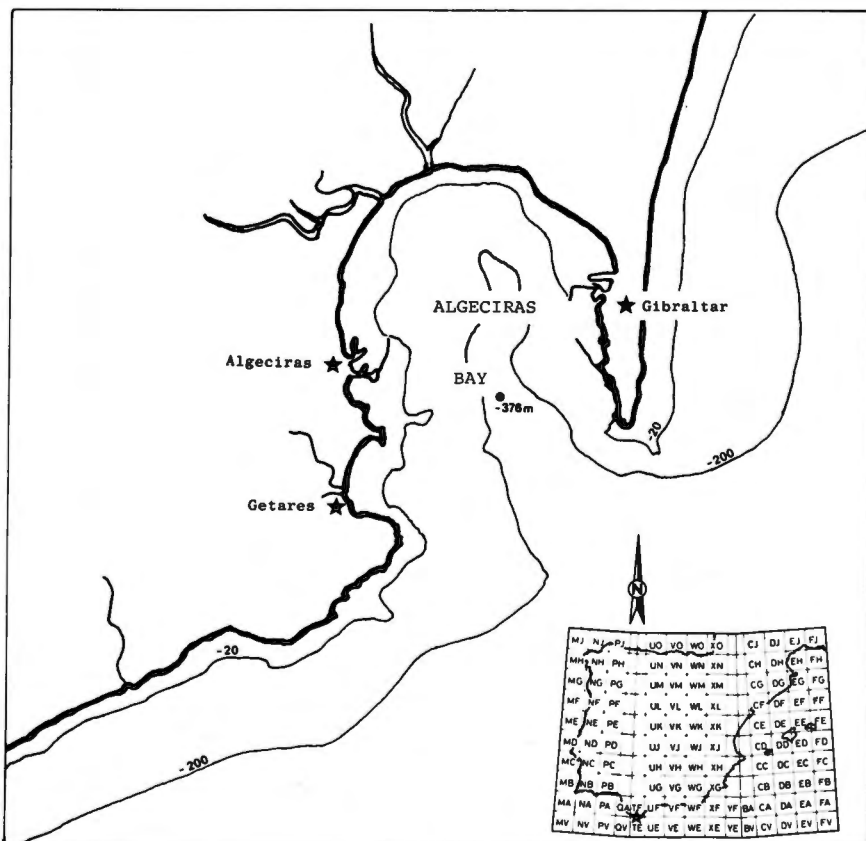
In addition to the main text there are general notes on the genus *Mitrella* (Gastropoda, Prosobranchia, Buccinacea), on the family Marginellidae (Gastropoda, Prosobranchia, Volutacea), and on the family Turridae (Gastropoda, Prosobranchia, Conacea).

The following new species names are introduced for Gastropoda, Prosobranchia: *Alvania altenai* spec. nov. and *Hydrobia joossei* spec. nov. (Rissoacea); *Aclis verduini* nom. nov. (Eulimacea); *Mitrella bruggeni* spec. nov. (Buccinacea); *Gibberula jansseni* spec. nov. and *Cypraeolina vanhareni* spec. nov. (Volutacea); *Mitrolumna wilhelminae* spec. nov. (Conacea). One new name is given in the Bivalvia, Heterodonta: *Parvicardium vroomi* nom. nov. (Cardiacea).

1. INTRODUCTION

The Bay of Algeciras, near Gibraltar in southern Spain, is of special zoogeographical importance, being situated where the Mediterranean, the Mauretanian and the Lusitanian areas come together. Its eastern border is formed by the Rock of Gibraltar, whereas more or less sandy beaches demarcate its northern and western limits; the city of Algeciras is situated along the western border (map 1). The central part of the bay is over 300 m deep. It has been suggested (Van Aartsen, 1975) that the currents in the adjoining Strait of Gibraltar might provide an explanation for the fact that occasionally deep water species are found washed ashore in the area.

During the last few years the first two authors have visited the beaches near and north of Getares and collected several litres of shell-grit in the littoral zone. By sorting out this material the existence of a rich molluscan fauna could be established. In the present paper all the species which could be recorded in this way are listed, as well as a few additional



Map. 1. The Bay of Algeciras.

ones from the Bay of Algeciras, which could be studied in other collections. Short notes concerning systematical position, nomenclature and distribution are given for many species. There are references to figures in recent, easily available literature for most of the species mentioned in the text. Apart from that, original photographs are presented for many species, illustrating complete specimens or showing the sculpture of the embryonic whorls (of gastropod shells). Usually the figured specimens are from Getares. However, if better preserved, conspecific material of another locality was available, this has been used for the illustrations.

General remarks concerning the nominal taxa in the genus *Mitrella* Risso, 1826, and in the family Marginellidae Fleming, 1828, as well as on the generic and subgeneric classification of various species of the family Turridae Swainson, 1840, are given as addenda to the main text.

Additional data from the literature on the marine Mollusca of the Bay of Algeciras are commented upon and the zoogeographical implications of the species composition in the area are summarily discussed.

During our investigations we frequently encountered invalid names and incorrectly cited authorship or date of publication. Therefore, we have tried to locate the original publications in order to be able to give the correct date of publication for every nominal taxon. In this respect it should be recalled that books have often been published in parts, and frequently also in the course of several years. As regards authorship we have abandoned the use of indications like "Seguenza in Aradas & Benoit", if it could not be proved that e.g. Seguenza did more than (perhaps) suggest the name in question. On the other hand "Gmelin in L., 1791" is cited as Gmelin, 1791, because Linnaeus did not write the text of the 13th edition of the "Systema Naturae".

We are fully aware of the fact that our dealing with the subject is far from exhaustive. The present paper aims to be only one more step, most certainly not the final one, towards a better knowledge of the marine molluscan fauna of southern Spain and adjacent areas; much remains to be done. The limited scope of this paper prevents us from discussing in detail many outstanding problems.

ACKNOWLEDGEMENTS

The present paper could not have been written without the kind help of many malacologists. We would like to thank them all here most cordially. We owe a special debt of gratitude to the mollusc curators of many museums, viz. Dr. P. Bouchet (Paris), Dr. J. van Goethem (Brussels), H. K. Mienis (Jerusalem), Dr. J. Rosewater (Washington D.C.), Dr. G. Testa (Monaco), and Mrs. K. Way (London). Many thanks are also due to Messrs. H. Strack (Rotterdam) and P. Kaas (Den Haag), who identified the Polyplacophora, as well as to Mr. A. W. Janssen (Leiden), who identified the Vermetidae.

We gratefully acknowledge here that Mr. J. H. W. Krom (RMNH, Leiden) made all the SEM photographs illustrating the present paper (and several more). Because of his activity our paper most certainly gained in usefulness. Our thanks are also due to Mr. G. J. van Zonneveld (Leiden), who made the other photographs.

Finally we want to express our particular thanks to Ir. A. Verduin (Leiden), who drew our attention to the rich beaches of the Bay of Algeciras.

2. SYSTEMATICAL, ANNOTATED CHECK-LIST, BASED ON SPECIMENS STUDIED BY THE AUTHORS

The following list is based on Piani's (1980) "Catalogo" as far as the sequence of the species is concerned. The names of the species frequently differ from those used by Piani. There are various reasons for these differences, which cannot always be discussed in detail within the scope of the present paper.

Family names are not generally enumerated; these have only been shown when necessary in connection with a discussion on the family level.

A number preceding a species name in our list indicates that the species in question has been recorded by the first and/or the second author from between Algeciras and Getares; there are one or more specimens of these species in at least one of the two private collections of these authors. The numbers refer to the illustrations on the plates. It should be emphasized, however, that a species is illustrated only if there is an indication of the length (L) or breadth (B) of the figured specimen at the right side of the heading; the dimensions are in mm. If the embryonic whorls are also figured, the magnification is indicated in brackets, again at the right side of the heading. An asterisk with the L or B indicates that the figure of the species in question is made from a specimen which has not been collected near the Bay of Algeciras. A few species not known from the bay are figured for comparison; these figures have the same number as those of the primary species, with only a letter added behind. All specimens figured are in RMNH, except for some type specimens belonging to other institutes.

The following abbreviations are used for collections:

AD, J. J. van Aartsen, Dieren, The Netherlands; BMNH, British Museum (Natural History), London, U.K.; CS, F. Carrozza, Soiana, Italy; HA, H. J. Hoenselaar, Alkmaar, The Netherlands; HUI, Hebrew University, Jerusalem, Israel; IRSN, Institut Royal des Sciences Naturelles, Brussels, Belgium; MK, H. P. M. G. Menkhorst, Krimpen a.d. IJssel, The Netherlands; MNHN, Muséum National d'Histoire Naturelle, Paris, France; MOM, Musée Océanographique, Monaco; RMNH, Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands; USNM, United States National Museum, Washington D.C., U.S.A.; VL, A. Verduin, Leiden, The Netherlands. The famous collection of J. G. Jeffreys is in USNM. The BDD collection and the collection of A. Locard are in MNHN, whereas Ph. Dautzenberg's private collection is kept in IRSN.

The international U.T.M. (Universal Transverse Mercator) grid code (10 x 10 km squares) is given with the localities mentioned in the text.

Some books or serial publications are frequently referred to in the following text because they contain many valuable figures of the species dealt with. The following abbreviations are used here:

AG, Angelo, G. D., & S. Gargiullo, 1978.
BDD, Bucquoy, E., Ph. Dautzenberg & G. Dollfus, 1882-1898.
FG, Fretter, V., & A. Graham, 1976-1982.
GAVL, Grandfils Accino, R., & R. Vega Luz, 1982.
GI, Sabelli, B., & G. Spada, 1977-1982.
GM, Ghisotti, F., & G. C. Melone, 1969-1975.
RM, Rolan Mosquera, E., 1983.
S, Ghisotti, F., 1964-1978.
ST, Angioy, K., & M. Angioy, 1978-1981.

Classis GASTROPODA

001 *Schismope cingulata* (O. G. Costa, 1861)

B* 0.7

GM1: 14, fig. 02.30 (*Woodwardia cingulata*).

Schismope Jeffreys, 1856 (type species: *Scissurella striatula* Philippi, 1844) has priority over *Woodwardia* Crosse & Fischer, 1861.

This well-known very small species is distributed throughout the Mediterranean.

The specimen figured is from France, department of Var, St. Tropez, UTM LN09.

002 *Haliotis tuberculata lamellosa* Lamarck, 1822 B 57.4

GM1: 11, fig. 01.00; S: 01Ba 1 (*Haliotis lamellosa*); BDD: pl. 52 figs. 1-7; AG: 78.

There seems to be no general agreement whether the Mediterranean form is to be regarded as a separate species, a subspecies or a simple variety. Although typical specimens of the Mediterranean *lamellosa* and the Atlantic *tuberculata* can be separated rather easily by the fold-like ribs on the surface of the former, many intermediate forms seem to occur.

003 *Emarginula solidula* O. G. Costa, 1829 L 3.8

GM1: 18, fig. 03.01.

Although distributed throughout the western Mediterranean, this species is usually not at all common. In our material it is, surprisingly, the only *Emarginula* species, found in more than 20 specimens.

004 *Diodora graeca* (L., 1758)

D. apertura (Montagu, 1803)

GM1: 25, fig. 04.00; BDD: pl. 53 figs. 4-10; AG: 79; RM: 70 (*D. reticulata*).

A well-known and common species, both Mediterranean and Atlantic.

005 *Diodora gibberula* (Lamarck, 1822)

GM1: 27, fig. 04.02; BDD: pl. 54 figs. 1-4; AG: 80; RM: 69.

Differs from *D. graeca* in its finer and narrower sculpture. In the Atlantic the species is much rarer than *D. graeca*. *D. gibberula* is even not mentioned in FG.

006 *Diodora* spec. L 17.5

We have only one specimen, which resembles a big *D. gibberula*.

007 *Fissurella nubecula* (L., 1758)

GM1: 28, fig. 05.00; BDD: pl. 53 figs. 11-14; AG: 80; RM: 72.

Differs from the *Diodora* species by the absence of reticulate sculpture; only axial ribs are present, which are often reddish.

008 *Acmaea virginea* (Müller, 1776)

Lottia unicolor Forbes, 1844

GM2: 40, fig. 07.10; FG1: 20, fig. 15; RM: 73.

Either uniform rose or with pink or brown radial colour-lines on a rose background.

Patella L., 1758

The identification of the polymorphous *Patella* species on shell-characters alone is very difficult, as has been demonstrated by Christiaens (1973a, 1973b, 1974, 1983). We refer to Grandfils Accino & Vega Luz (1982) and Christiaens (1983) for notes concerning the species found by us.

Apart from *Patella nigra* (Da Costa, 1771) [= *P. safiana* Lamarck, 1819], all *Patella* species mentioned by these authors from the coast of Malaga were also found by us in the bay of Algeciras.

009 *Patella caerulea* L., 1758

GAVL: 8, photo 2, 3, 4, 5 and 6; GM2: 34, figs. 1-5; AG: 80.

010 *Patella ferruginea* Gmelin, 1791

GAVL: 8, photo 1; GM2: 39, fig. 06.32; AG: 81.

011 *Patella intermedia* Murray, 1857

P. vulgata var. *intermedia* Jeffreys, 1865

GAVL: 8, photo 11 (*P. vulgata*) (see Christiaens, 1983).

012 *Patella rustica* L., 1758

P. lusitanica Gmelin, 1791

GAVL: 8, photo 7; GM2: 38, fig. 06.30; AG: 82.

013 *Patella ulyssiponensis* Gmelin, 1791

P. aspera Lamarck, 1819

GAVL: 8, photo 8-10; GM2: 36, fig. 06.11; AG: 81.

014 *Monodonta articulata* Lamarck, 1822

GM5: 154, 155, figs. 1-8; BDD: 404, pl. 49 figs. 1-6; AG: 84.

Rather variable, usually without noticeable sculpture or only with spiral grooves. Mainly distributed in the Mediterranean, although also known from the Portuguese coast.

015 *Monodonta lineata* (Da Costa, 1778)

FG2: 61, 62, 63, fig. 43; BDD: pl. 49 figs. 8, 9 (*Trochus crassus*); RM: 83.

An Atlantic species, with coloured streaks on the shell instead of dots as in *M. articulata*. Recorded from Tangier by Monterosato (1884: 44).

016 *Jujubinus exasperatus* (Pennant, 1777)

GM5: 166-169, fig. 12.20; BDD: 362, pl. 43 figs. 1-7; FG2: 64-66, fig. 45; AG: 84; RM: 86.

Well-known and rather variable species, with four granular spirals and a suprasutural band which is generally rather pronounced.

017 *Jujubinus montagui* (Wood, 1828)

B 4.1

GM5: 177-178, fig. 12.23; FG2: 69-71, figs. 50, 51; RM: 87.

With five slightly granular spirals and a suprasutural band which is hardly pronounced. Usually dredged from somewhat deeper water.

018 *Jujubinus striatus* (L., 1758)

GM5: 170-173, fig. 12.21; BDD: 365, pl. 43 figs. 8-17; FG2: 67-69, figs. 47-49; AG: 86 (*Jujubinus depictus*); RM: 88.

With seven or more non-granular, rather close spirals; no suprasutural band whatsoever. A very variable species; many subspecies have been described.

019 *Jujubinus ruscurianus* (Weinkauff, 1868)

B 4.3

Curini Galletti, 1982: 149, tav. 1 figs. 1-7.

A small species, clearly different from the one mentioned above, but similar because of the (nearly) smooth spirals (four to six) and weakly pronounced suprasutural band. The specimens are usually cyrtoconoid; see Curini Galletti & Palazzi (1980) and Curini Galletti (1982). In addition we have specimens from Fuengirola, three Algerian localities and Tangier.

020 *Gibbula racketti* (Payraudeau, 1826)

GM4: 94, fig. 11.15; BDD: 388, pl. 47 figs. 19-25; AG: 87.

It is still not clear whether this is a separate species or only a (Mediterranean) form of the Atlantic *G. tumida* (Montagu, 1803). We provisionally consider the different form of the whorls as well as the relatively large umbilicus sufficiently different to discriminate the two forms.

021 *Gibbula turbinoides* (Deshayes, 1835)

GM4: 92, fig. 11.11; BDD: 396, pl. 47 figs. 26-30; AG: 88.

A nicely coloured species (brown, red or violet) with rather evenly rounded whorls.

022 *Gibbula fanulum* (Gmelin, 1791)

GM4: 115, fig. 11.60; BDD: 370, pl. 44 figs. 12-16; AG: 88.

Characterized by a peripheral sulcus. All over the Mediterranean, but not very common.

023 *Gibbula guttadauri* (Philippi, 1836)

GM4: 116, fig. 11.61; AG: 88 (*G. guttadauroi* [emend.]).

Characterized by strongly prosocline, raised growth lines and three spiral keels. Usually obtained from somewhat deeper water.

024 *Gibbula philberti* (Recluz, 1843)

Trochus villicus Philippi, 1844

GM4: 112, 113, fig. 11.52; AG: 87.

A fairly common and rather variable species with a characteristic sculpture of raised spirals which alternate in strength.

025 *Gibbula richardi* (Payraudeau, 1826)

GM4: 110, fig. 11.50; BDD: 399, pl. 47 figs. 6-12; AG: 89.

Rather smooth surface, somewhat resembling a *Monodonta* except for the wide umbilicus. Fairly common throughout the Mediterranean.

026 *Gibbula varia* (L., 1758)

GM4: 111, fig. 11.51; BDD: 385, pl. 46 figs. 6-11, 14.

Also relatively smooth but with a great number of fine spiral ribs.

027 *Gibbula divaricata* (L., 1758)

GM4: 100, fig. 11.24; BDD: 390, pl. 46 figs. 15-22; AG: 89.

Easy to distinguish from most other *Gibbula* species because there is no umbilicus. In contrast to *G. rarilineata* (Michaud, 1829) the last whorl is not sharply keeled, but more or less evenly rounded. Several varieties have been described.

028 *Gibbula drepanensis* (Brugnone, 1873)

B 3.5

GM4: 95, fig. 11.16; Verduin, 1979b: 29, fig. 2; BDD: 398, pl. 50 figs. 25, 26.

This small and insufficiently known species is reported from a number of localities in the western Mediterranean.

029 *Gibbula tingitana* Pallary, 1902

B 3.5

GM4: 138, fig. 11.83; Verduin, 1979a: 3, fig. 2.

A rather rare species, known from Algeciras, Fuengirola, Palermo, and Algeria and Morocco. We do not follow Verduin (1979a) in considering the recent form a subspecies of the Pliocene *G. ditropis* (Wood, 1848).

030 *Calliostoma conulum* (L., 1758)

GM3: 59, fig. 10.00; BDD: 349, pl. 42 figs. 1-3; AG: 90; RM: 94.

Only some juveniles have been found in our material.

031 *Calliostoma zizyphinum* (L., 1758)

GM3: 60, fig. 10.01; BDD: 345, pl. 41 figs. 1, 2, 4, 5; AG: 90.

Somewhat broader and less conical than *C. conulum*. Shell covered with clearly developed spiral grooves.

032 *Calliostoma gubbiolii* Nofroni, 1984

Nofroni, 1984: 4, 5 figs.

This species, closely related to *C. granulatum* (Von Born, 1778), has been described recently from the Mediterranean coast of southern Spain. Nofroni (1984: 3) suggests that

C. gubbiolii may also occur along the Portuguese coast. We can confirm this by four specimens, live-collected by R. W. Bruins at Praia da Luz in 1980 and 1982, respectively. One specimen was kindly donated to one of us (VA 17474); the other three specimens are in the Bruins collection (no. 2376).

Just as Nofroni, we thought to detect a certain similarity to *C. lithocolletum* Dautzenberg, 1927, which, however, turned out to be quite different as can be seen from the holotype (MOM) which we figure here for comparison (fig. 032a; L 23.0 mm).

We did not (yet) find the species at Algeciras, but because of its distribution, we wish to draw attention to it here. (Too late we noticed that we incorrectly listed this species with a separate number!)

033 *Clanculus cruciatus* (L., 1758)

GM5: 194-195, fig. 13.10; S: 03Af02; BDD: pl. 50 figs. 5-12; AG: 91.

With five to seven granular spiral ribs on the whorls.

034 *Clanculus jussieui* (Payraudeau, 1826)

GM5: 196-197, fig. 13.12; S: 03Af03; BDD: pl. 50 figs. 13-20; AG: 92.

Whorls nearly smooth or with spiral grooves only.

035 *Astraea rugosa* (L., 1767)

BDD: 332, pl. 38 figs. 1-11; AG: 92.

A very characteristic shell. The species is distributed all over the Mediterranean.

SKENEIDAE Thiele, 1929

The generic assignment of the group of species classified with *Skenea*, *Cyclostrema*, *Ganasa*, *Lisospira* or some other "genus", is far from settled. In general we agree with Høisaeter (1968), who introduced *Dikoleps* for both *Margarita pusilla* Jeffreys, 1847 (type species) and *Trochus cutlerianus* Clark, 1849. Most of the remaining species which are dealt with here, were placed in *Skenea* Fleming, 1825 (type species: *Helix serpuloides* Montagu, 1808).

We are not convinced that *Dikoleps* should be placed in the Trochidae, as Høisaeter (1968) did. For the moment we prefer to classify our species in two genera, viz. *Skenea* and *Dikoleps*, which we consider closely related. Some recent authors have used the name *Tubiola* A. Adams, 1863, for a group of these species; we do not use this name, which, following Thiele (1929: 60), we consider imperfectly defined.

036 *Skenea serpuloides* (Montagu, 1808)

B* 1.4

FG2: 81-83, figs. 60, 61; Carrozza, 1975: 186, fig. 1; RM: 99.

The upper part of this discoidal shell is practically smooth; some spiral grooves can be observed on the base. Some more conspicuous simple spirals can be seen inside the large umbilicus.

The specimen figured is from Italy, Sicily, Messina, UTM WC42.

037 *Skenea catenoides* (Monterosato, 1877)

B* 1.0

Monterosato, 1877a: 417, fig.

This less well-known species can be separated from *S. serpuloides* by the whole surface being finely but clearly spirally striate. On the base three or four spirals are more marked; sometimes they are ornamented with transparent "pearls".

The specimen figured is from France, department of Var, St. Tropez, UTM LN09.

038 *Skenea exilissima* (Philippi, 1844)

B 1.1

No good figure or description available.

The rather rare shell is very characteristic because it has axial as well as spiral sculpture. Three different but apparently closely related taxa have been described from the Mediterranean, viz. *Delphinula exilissima* Philippi, 1844, *Cyclostrema dautzenbergianum* Ancey, 1898, and *Cyclostrema subalveolatum* Fekih & Gougerot, 1974. We provisionally consider all three taxa synonymous.

039 *Dikoleps pusilla* (Jeffreys, 1847)

B 0.9

FG2: 84, 85, figs. 62, 63; RM: 101. Both as *Skenea nitens* Philippi, 1844.

040 *Dikoleps pruinosa* (Chaster, 1896)

B 0.9

Chaster, 1896: 3, pl. 1 fig. 2.

Described and up to now only known from Tangier.

041 *Dikoleps nitens* (Philippi, 1844)

B 0.9

Philippi, 1844a: 146, pl. 25 fig. 4.

D. pusilla and *D. nitens* are both smooth, except for the base. *D. pusilla* has a relatively small umbilicus with several spiral ribs inside, but the base is smooth, whereas *D. nitens* has a more open umbilicus with several spiral lines around it. *D. pusilla* occurs in both the Atlantic and Mediterranean, whereas we know *D. nitens* only from the Mediterranean.

D. pruinosa is most similar to *D. nitens*, as far as shell-form is concerned, but the whole surface is covered with raised growth lines which gives the shell a "frosted" appearance.

042 *Dikoleps cutleriana* (Clark, 1849)

B* 1.0

FG2: 86-88, figs. 64-66; RM: 100.

Somewhat bigger than the foregoing three species and covered with spiral grooves all over the shell.

The specimen figured is from SE. Corsica, off Solenzara, UTM NM33.

043 *Tricolia pullus* (L., 1758)

Ziegelmeier, 1966: 31, Taf. 5 Fig. 1; Parenzan, 1977: 12, tab. 2; Gofas, 1982: 187, figs. 5-13; AG: 93.

The eastern Atlantic and Mediterranean *Tricolia* species have recently been reviewed by Gofas (1982), who points out the difficulty to separate this species from the next one, at least in the westernmost part of the Mediterranean.

044 *Tricolia tenuis* (Michaud, 1829)

Parenzan, 1977: 12, tab. 2 last row; Gofas, 1982: 191, figs. 14-19; AG: 94.

Usually this species can be separated from *T. pullus* by its more slender shape and its less convex whorls.

045 *Tricolia nordsiecki* (Talavera, 1978)

L 0.9

Nordsieck & Talavera, 1979: 46, pl. 6 fig. 5; Gofas, 1982: 206, figs. 65-70.

Originally described by Talavera (1978: 122, fig. 1) as *Skenea trochoides nordsiecki*. With Gofas we consider this very small form a species of *Tricolia*. Characteristically the colour-pattern includes only uniformly dark brown markings on a whitish background.

046 *Smaragdia viridis* (L., 1758)

La Conchiglia 5 (49) [1973]: 12, fig. 1014; AG: 94.

Unmistakable because of its form and, usually, the lightgreen colour.

047 *Littorina rudis* (Maton, 1797)

FG5: 272, fig. 210.

The systematics of the European *Littorina* species is still far from settled (see Fretter & Graham, 1980). We have used the name *L. rudis* for a species which is rather common throughout Europe and which has formerly (? erroneously) been called *L. saxatilis* (Olivier, 1792). Usually this species has a pronounced spiral sculpture.

048 *Littorina punctata* (Gmelin, 1791)

L. syriaca Philippi, 1847

La Conchiglia 5 (49) [1973]: 11, fig. 1011; AG: 95.

The sculpture consists of spirally incised lines, in which character this species differs from the next one, which it resembles in form.

049 *Littorina neritoides* (L., 1758)

La Conchiglia 5 (49) [1973]: 11, fig. 1010; Bouchet et al., 1979: 126, pl. 5 fig. 14; FG5: 263, fig. 206; AG: 95; RM: 109.

More slender than most of the other European *Littorina* species and with a smooth surface.

050 *Hydrobia glyca* (Servain, 1880)

L 3.2

Boeters, 1980: 62, fig. 1.

Boeters (1980) has recently discussed this practically unknown taxon. Our material, identified by Boeters, extends the known range of the species to the south-east.

051 *Hydrobia joessei* spec. nov.

L* 1.9 (x70)

Shell very small and slender, corneous, usually diaphanous, with c. five, rather convex, not very rapidly increasing whorls. Suture simple, in front view forming an angle of about

15° with the horizontal. Last whorl occupying only slightly more than half the total height of the shell. Aperture oval, somewhat higher than broad, its height is c. one-third of the total height of the shell. Outer lip sharp, neither thickened nor denticulate inside. Inner lip united with the outer lip, only slightly covering the body-whorl. Columella concave and smooth. Growth lines clearly prosocline.

The shells are 1.5-2.4 mm high and 0.8-1.0 mm broad.

Hydrobia joessei differs from most of the European *Hydrobia* s.l. species by its very small size and its slender shape.

This species is present in the Jeffreys' collection in Washington (USNM 182899), labelled "Rissoa elongata Jeffr. sp. n. / C. Breton (leg. de Folin)". The name *Rissoa elongata*, however, has not been published for this species; it has been used for other species. We consider these Jeffreys specimens paratypes too.

Hydrobia joessei is known from Capbreton (France) southwards along the Atlantic coasts of Spain and Portugal to as far as the Bay of Algeciras and Tangier (Morocco). It is possible that *H. joessei* is the species from Tangier (Oued el H'alk) which Pallary (1902: 20; 1920: 52) identified as *Hydrobia gracilis* Morelet, 1880. However, Morelet (1880: 66, 67) gives the dimensions of his species as 3 x 1 mm, which is much larger than *H. joessei*. Moreover, his specimen(s) "provient d'une source d'eau vive, près de Casa Blanca (Beaumier)". We do not think it likely, that *H. gracilis* Morelet can be found in a marine environment, as suggested by Pallary and Monterosato (1917: 15), so that we are doubtful as regards the identification by Pallary. In any case, *H. joessei* is much smaller than *H. gracilis* and clearly has prosocline growth lines, whereas Morelet states "sans aucune apparence de stries". We are convinced that *H. joessei* and *H. gracilis* are different species.

According to Boeters (in litt., 1984), who has seen our specimens, *H. joessei* is similar to *Peringia minoricensis* Paladilhe, 1875, but also differs in being much smaller.

H. joessei is named in honour of Prof. Dr. J. Joesse, one of the former presidents of the Nederlandse Malacologische Vereniging.

Material. - Holotype (fig. 51): Spain, province of Santander, Laredo, UTM VP60 (RMNH 55665). Paratypes: Type locality (AD 3898/>25, BMNH/2, MK/>25, MNHN/2, RMNH 55675/5, USNM/2); Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (AD 9961/3, MK/2); Portugal, province of Algarve, Alvor, UTM NB30 (AD 16112/>25, MK/25, RMNH 55676/5); Idem, Lagos, UTM NB20 (AD 4249/>25); Morocco, Tangier, UTM TE46 (AD 9989/3); France, province of Landes, Capbreton, UTM XP23 (USNM 182899).

052 *Truncatella subcylindrica* (L., 1767)

Cyclostoma truncatula Draparnaud, 1801; *T. costulata* Risso, 1826; *T. laevigata* Risso, 1826; *T. montagui* Lowe, 1829; *T. hammersmithi* (Charpentier, 1827)

FG3: 138, fig. 122; AG: 97 (*T. hammersmithi*); RM: 121.

We consider the smooth form and the ribbed form to belong to one species only. Monterosato (1906: 130) gives an extensive discussion of the genus *Truncatella* in Europe.

053 *Paludinella littorina* (Della Chiaje, 1828)

L 2.1

Rissoa littorea Forbes & Hanley, 1850

FG3: 148, fig. 129.

Like Jeffreys (1869: 101) and Monterosato (1906: 129) we consider the Atlantic *P. littorea* and the Mediterranean *P. littorina* to be the same species.

054 *Tornus subcarinatus* (Montagu, 1803)

B 2.1

FG4: 229-231, figs. 191, 192; AG: 106; RM: 123.

A small, but characteristic and well-known species.

055 *Megalomphalus azonus* (Brusina, 1865)

L* 1.5 (x 70)

GI03: fig. 1; Thiele, 1929: 239, fig. 246.

We consider the shells figured as *Macromphalina depressa* (Seguenza, 1874) by Ghisotti (1978: 161, tav. 1 figs. 2, 3, 162, fig. 6) the most gerontic stage of this species. Whether Ghisotti (1978: 161, tav. 1 fig. 1) really figured *M. azonus* seems somewhat doubtful.

The specimen figured is from Italy, province of Livorno, Isola di Giannutri, UTM PM 78.

056 *Circulus striatus* (Philippi, 1836)

FG4: 227-229, fig. 190; AG: 93; RM: 124.

A white, discoidal shell with strong spirals on the upper side; usually the base is smooth. All spirals are equal in strength. Known as a fossil since the Miocene. Locard (1889) published three new *Circulus* species which we consider to be no more than varieties of *C. striatus*.

057 *Circulus* cf. *tricarinatus* (Wood, 1848)

B 3.2

The name of this species is unclear. It is similar to *C. striatus*, but usually has three very conspicuous spiral carinae. Between the upper suture and the first carina, as well as between this and the second one, a spiral sculpture can be detected, as that in *C. striatus*. The base of the shell is smooth, except for several spiral ribs inside the umbilicus.

Several fossil *Circulus* species have been described (see Janssen, 1967: 125-127). We are not convinced, however, that all the different carinated forms should really be considered different species. Especially the Belgian, Miocene *C. hennei* Glibert, 1952, as figured by Janssen (1967: Taf. 3 Fig. 4a, b) looks very much like the British, Pliocene *C. tricarinatus* (Wood, 1848). Nordsieck (1968: 32) probably records this same species as "*C. tricarinata* (Smith)". However, we agree with Adam & Knudsen (1969: 17) in considering *Circulus smithi* Bush, 1897 [= *Cyclostrema tricarinata* Smith, 1871, not *Adeorbis tricarinatus* Wood, 1848] a different species.

Monterosato (1873: 3, 4) writes about this species as a variety of *C. striatus*; from his text it may be concluded that Jeffreys obtained a specimen in the bay of Tangier.

C. cf. tricarinatus (Wood) must be rather rare because, apart from the Algeiras material, we have seen specimens only from Moneglia (Italy), Isola della Corrente (Sicily) and Ria de Arosa (Spain). The species is also mentioned by Terreni (1981: 18, no. 58), s. n. "*tricarinatus* (Smith)", from the island Capraia, Italy. The few specimens we have seen are rather variable.

058 *Skeneopsis planorbis* (O. Fabricius, 1780)

B 1.5

Gofas, 1983: 227, fig. 1, 228, figs. 2, 3; RM: 125.

As mentioned by Gofas this species is either uniformly brown, or whitish, or provided with a series of dark spots on a lighter background.

059 *Skeneopsis sultanarum* Gofas, 1983

B 1.5 (x70)

Gofas, 1983: 229, 230, figs. 5, 6.

This species was described after material from Tangier. We know it only from Algeciras, where it is not exceptionally rare. *S. sultanarum* differs from *S. planorbis* in its fine spiral striae; usually *S. sultanarum* is also slightly bigger and more depressed, as well as lighter in colour.

“*Skeneopsis*” *pellucida* (Monterosato, 1874)

Gofas, 1983: 233, fig. 8.

With Gofas we consider the generic placement of this species not settled.
We studied 14 specimens in HA.

060 *Omalogyra atomus* (Philippi, 1841)

B* 0.8

FG4: 221, 222, figs. 185, 186; Gaglini et al., 1978: 209, fig. 1; RM: 126.

Either uniformly brown (typical), with dark spots (var. *maculata* Dautzenberg & Durouchoux, 1914) or with three darker spiral bands (var. *fasciata* Monterosato, 1877).

The specimen figured is from France, department of Bouches du Rhône, Sausset les Pins, UTM FJ60.

061 *Ammonicera rota* (Forbes & Hanley, 1850)

B* 0.8

FG4: 223, 224, fig. 187 (bottom left!); Gaglini et al., 1978: 212, fig. 4; RM: 128.

In the same year Fretter & Graham (1978b) considered *A. rota* and *A. fischeriana* (Monterosato, 1869) to be synonymous, whereas Gaglini et al. (1978) considered these taxa different species. The last opinion is also held by BDD. We have studied BDD material, which is badly preserved and discoloured. Nevertheless it can be concluded that smaller forms, uniformly coloured (either brown or yellowish white), with rather well developed axial ribs, are usually called *A. rota*, whereas the somewhat larger form, with only slight axial ribs (or thickened growth lines) on the younger whorls and brownish coloured lines on the three spiral carinae, is thought to be *A. fischeriana*. Most of our material is conform with the first type. Whether or not these two are different species, is still not clear. It should be emphasized that both forms have exactly the same growth-rate.

The specimen figured is from SE. Corsica, off Solenzara, UTM NM33.

062 *Ammonicera fischeriana* (Monterosato, 1869)

B* 0.8

Gaglini et al., 1978: 213, fig. 5; RM: 127.

The specimen figured is from Italy, province of Livorno, Antignano, UTM PP01.

063 *Rissoella diaphana* (Alder, 1848)

L 1.2

Rissoa glabra auct.

FG4: 216-218, figs. 181, 182; RM: 129.

This glassy-transparent shell is well-known as *R. diaphana*. Recent authors, like Piani (1980) use the name *glabra* (Brown, 1827), although Jeffreys (1867: 58) already wrote: "... *Rissoa glabra* of Brown, which is evidently an *Odostomia* (probably *O. rissoides*), having a slight plication at the base". We consider *R. glabra* Brown a nomen dubium.

064 *Rissoella opalina* (Jeffreys, 1848)

L 1.3

FG4: 219, 220, fig. 183; not AG: 106; RM: 130.

This species is rose-brown and can thus be separated from the related *R. inflata* (Locard, 1892), which is transparent or milky white in dead shells.

Rissoella inflata (Locard, 1892)

Carrozza, 1976: 167, fig. 8.

Although frequently attributed to Monterosato, this species was described for the first time by Locard (1892: 181), as *Jeffreysia inflata*.

One specimen in HA.

065 *Coriandria fulgida* (J. Adams, 1797)

L 0.8

FG4: 214-216, figs. 179, 180 (*Cingulopsis fulgida*); RM: 130.

For this species Fretter & Patil (1958) have introduced the genus *Cingulopsis*, based on anatomical characters. On the other hand Monterosato (1884: 74) proposed the genus *Microsetia* for the species *Rissoa cossurae* Calcara, 1841, *Rissoa micrometrica* Aradas & Benoit, 1876, *Helix fulgidus* J. Adams, 1797, *Microsetia coelata* Monterosato, 1884, *Microsetia pumila* Monterosato, 1884 [= *Rissoa (Cingula) micrometrica* BDD, 1884, not Aradas & Benoit, 1876] and *Setia ochroleuca* Brusina, 1869. The first species of this group was designated as type species by Crosse (1885a). Except for the last species all are very much alike and seem to form a natural group, albeit doubtfully rissoid. As the name *Microsetia* turned out to be preoccupied (by Stephens, 1829), Tomlin (1917) introduced the nomen novum *Coriandria* "for the shell I described as *Microsetia durbanensis*" [Tomlin, 1916]. Therefore, *Coriandria* is not necessarily identical with *Microsetia* Monterosato, 1884, as suggested by e.g. Thiele (1912: 160) and Coan (1964: 171). It seems probable, however, that all species mentioned above belong to a single genus, which should be called *Coriandria*. In contrast to what is suggested by Ponder & Yoo (1980: 5) we do not classify these species with the genus *Eatonina* Thiele, 1912.

066 *Barleeia unifasciata* (Montagu, 1803)

L 3.1

Turbo ruber J. Adams, 1797, non Von Salis, 1793FG4: 212-214, figs. 176, 177; AG: 105 (*Barleia rubra*).

Most unfortunately Adams' well-known name *Barleeia rubra* is preoccupied and should be replaced by *B. unifasciata*.

BDD (1884: 315, 316, pl. 32 figs. 21, 22) gave appreciable larger dimensions than did FG, viz., L 2.8-3.0 mm, B 1.5-1.6 mm. Our specimens, mostly uniformly brown to brown-red, do reach these dimensions as a maximum.

067 *Barleeia compacta* (Jeffreys, 1884)

L 3.4

Originally described as *Hydrobia compacta* from Tangier.

All our specimens (over fifty) except one, are at least 3.5 mm high and are uniformly white to yellowish, with a rather angular periphery, i.e. much more angular than in specimens of *B. unifasciata*. Our specimens are also identical with Jeffreys' types (BMNH 85.11.5 1891-1894). We are convinced that *Barleeia gougeti* var. *cerea* Monterosato, 1895 ("couleur de cire blanche") is a synonym. The synonymy of *Hydrobia compacta* and *Barleeia gougeti* (Michaud, 1829), as suggested by Monterosato (1895: 79), is uncertain and, therefore, we prefer to use Jeffreys' name.

It should be noted that there is at least one more Mediterranean species of *Barleeia*, which is found at Sfax (Tunisia) and which may be the one figured by Spada et al. (1973: tav. 3 fig. 6) as *Eulima piriformis*. Whether this species is identical with *B. minuscula* Monterosato, 1889, from the Atlantic coast of Morocco, cannot be checked because the type(s) of Monterosato is (are) not available for study at the moment.

068 *Nodulus contortus* (Jeffreys, 1856)

L 1.4 (x 120, x 600)

BDD: 311, 312, pl. 37 figs. 14-18; Warén, 1980: 22, pl. 4 figs. 8, 9.

It should be noted that Jeffreys' type specimens are finely spirally striated; the smooth form was separated by Monterosato (1884) as *Nodulus intortus*. This is conform BDD (p. 311), whereas further on (p. 312) these authors change to "Var. ex forma 1, *intorta* (Monts). A surface striée (pl. XXXVII, fig. 17)", which is not correct. We consider *N. intortus* a form of *N. contortus*.

RISSOIDAE Gray, 1847

Several European taxa belonging to this family have been critically reviewed by Verduin (1976a, 1982b, 1983, 1984), Van Aartsen & Verduin (1978), and Van Aartsen (1982-1983). A lot of work still remains to be done, however. A summarary study of all rissoid genera and their interrelationships is being carried out by Dr. Ponder (Sydney). Although not yet published, we were fortunate enough to be able to consult Dr. Ponder's manuscript. It is evident from this unpublished work that the use of many (sub)genera, which has become a fashion in European malacology, is totally unfounded. We have therefore used a very conservative nomenclature, leaving it to future research what the (sub)generic placement of all the species should be. Some remarks, however, are in order.

Setia H. & A. Adams, 1852; as regards this group we follow the views expressed by Van Aartsen & Verduin (1978: 28).

Folinia Crosse, 1868, with the type species *Rissoa insignis* De Folin, 1867, belongs to the Rissoinidae and thus cannot be used for *Turbo crassus* Kanmacher, 1798 [= *T. costata* Adams, 1797, not Von Salis, 1793]; we classify the latter species with *Manzonina* Brusina, 1870.

Putilla A. Adams, 1867, turns out not to be a rissoid at all. It should be placed in the Skeneidae and thus cannot be used for the small smooth species formerly known as *Setia*.

Merelina Iredale, 1915, occupies an isolated position in the Rissoidae; the name cannot be used for the group of species also known as *Alcidiella* Cossmann, 1921.

Very broadly speaking we have classified with *Rissoa* the species which are rather thin-shelled, with practically only axial sculpture. The smooth or faintly spirally striated species, without thickened outer lip, are considered to belong to *Cingula* and the thicker, more robust species, with frequently axial as well as spiral sculpture, are classified with *Alvania*.

069 *Cingula cingillus* (Montagu, 1803)

L 3.1

FG4: 154, 155, fig. 131, 132; AG: 99; RM: 136.

Jeffreys (1867: 49) and FG4 (p. 154) suggest that this species may be *Turbo trifasciatus* Adams, 1800. However, the original description and especially the figure (Adams, 1800: 2, tab. 1 figs. 12, 13) make it much more probable that Adams' species was either *Eulima glabra* (Da Costa, 1778) or *Eulima bilineata* Alder, 1848; the dimensions indicated for fig. 13 are 6x1.4 mm. Therefore we use Montagu's name for this Atlantic species, which is not known with any certainty from the Mediterranean.

The next ten species have been reviewed recently by Verduin (1984) and we therefore restrict ourselves to the citation of the relevant figures.

070 *Cingula pulcherrima* (Jeffreys, 1848)

Verduin, 1984: 38, figs. 5, 36, 55.

071 *Cingula amabilis* Locard, 1886

Verduin, 1984: 39, figs. 6, 37, 56.

072 *Cingula aartseni* Verduin, 1984

(x120)

Verduin, 1984: 45, figs. 8, 39, 58.

073 *Cingula sliki* Verduin, 1984

Verduin, 1984: 47, figs. 11, 42, 61.

074. *Cingula semistriata* (Montagu, 1808)

Verduin, 1984: 48, figs. 12, 43, 62.

075 *Cingula turriculata* (Monterosato, 1884)

Verduin, 1984: 53, figs. 16, 47, 66.

076 *Cingula fusca* (Philippi, 1841)

Van Aartsen & Verduin, 1978: 31, figs. 2-4; Verduin, 1984: 53, fig. 17.

This is a problematical species; we are not quite sure of the identification.

077 *Cingula alleryana* (Aradas & Benoit, 1874)

Verduin, 1984: 54, figs. 18, 48, 67; AG: 97 (*Putilla ambigua*).

078 *Cingula bruggeni* Verduin, 1984

L 1.0 (x 120)

Verduin, 1984: 56, figs. 20, 69.

079 *Cingula intersecta* (Wood, 1857)

L 1.3

Rissoa obtusa Cantraine, 1842, not Brown, 1841; *Rissoa soluta* auct., not Philippi, 1844; *Rissoa alderi* auct., not Jeffreys, 1858; *Putilla cantrainei* Nordsieck, 1972

Verduin, 1984: 58, figs. 23, 72; Carrozza, 1976: 166, fig. 5 (*Putilla obtusa*); RM: 132 (*Putilla alderi*).

The correct name for this rather common European species has been discussed by Verduin (1984).

Cingula lacourti Verduin, 1984

Verduin, 1984: 56, figs. 21, 70.

This species is only known from Tarifa and Getares. Numerous specimens are reported by Verduin (1984: 57). It is rather surprising that this species is not represented in our own material.

080 *Plagyostila asturiana* P. Fischer, 1872

L 2.4

Carrozza, 1977: 177, tav. 1 fig. 1; AG: 98; RM: 136.

In the Mediterranean this very characteristic species is known from Spain (Fuengirola) and the North African coast (Oran, Algeria) (Pallary, 1900: 324).

The generic name should be spelled *Plagyostila* according to the original publication (Fischer in Fischer, De Folin & Périer, 1872: 50). *Plagiostyla* Fischer, 1871, which is frequently used, is a nomen nudum.

081 *Onoba moreleti* Dautzenberg, 1889

L 2.2 (x 120)

Dautzenberg (1889: pl. III fig. 7a, b) originally described *O. moreleti* from a depth of 1287 m, dredged near Pico, Azores. It was a surprise to find several specimens of this species, which has never been reported from the European coasts in our material. It is somewhat like *Onoba aculeus* (Gould, 1841) but has a different protoconch and the number of spirals (about eight on the penultimate whorl) is only about half of that in *O. aculeus*. Our specimens correspond exactly with the type in MOM. This species is also known from Graziosa, Canary Islands (collection M. C. Fehr-de Wal).

Onoba aculeus (Gould, 1841)

FG4: 168, figs. 141A-C.

Only two specimens are known to us (CS).

082 *Peringiella nitida* (BDD, 1884)

L 2.6

Not *Rissoa nitida* Defrance, 1827; not Grateloup, 1838

AG: 98.

The species figured by Spada et al. (1973: 59, fig. 7) looks more like a *Hydrobia* and does not at all resemble *Peringiella nitida*.

The name for this species is problematical. It has been recorded as "*R[issoa] glabrata*, ... Var. 1, ... *Cingula nitida*, Brus.", "*P[eringiella] nitida*, Brus. ms. (*Cingula*)", and "*P. nitida*, Brus. ms. (*Cingula*) e var. *elongata*", respectively, by Monterosato (1875a: 28; 1878a: 87; 1884: 71), but all these names are nomina nuda. The first valid description was given by BDD (1884: 314) s.n. *Rissoa nitida*. Unfortunately this name is preoccupied. The next available name is *Rissoa nitida* var. *elongata* BDD, 1884, which however, is also preoccupied, e.g. by Philippi, 1836, Grateloup, 1838, and Piette, 1857. This taxon was renamed *Cingula elegans* by Locard (1892: 177).

As there exists already a *Rissoa elegans* Grateloup, 1838, as well as a *Rissoa elegans* A. Adams, 1851, and recalling that older authors frequently used *Rissoa* as a genus name for species which are now regarded to belong to different rissoid genera, we do not know whether the name *Peringiella elegans* (Locard, 1892) can stand. In the meantime we prefer the well-known name given by BDD.

083 *Peringiella epidaurica* (Brusina, 1866) L 1.5

No recent figure exists of this little known species, which is very similar to the preceding one. It is smaller and more slender. We do not believe this taxon to be identical with *Rissoa balteata* Manzoni, 1868, which we consider a *Peringiella* from the Canary Islands.

084 *Pisinna glabrata* (Von Mühlfeld, 1824) L 1.6 (x 120)

Rissoa punctulum Philippi, 1836; *Rissoa sabulum* Cantraine, 1842

Spada et al., 1973: 59, tav. 1 fig. 8.

This very small, mostly dark-brown species is distributed all over the Mediterranean.

085 *Rissoa dolium* Nyst, 1845 L 1.9

Verduin (1976a: 30, pl. 1 fig. 3) has discussed this as well as a number of related species belonging to the subgenus *Turboella* Gray, 1847 [type species: *Rissoa parva* (Da Costa, 1778)]. It is a well-known Mediterranean species.

086 *Rissoa guerini* Récluz, 1843 L* 4.6 (x 75)

Rissoa costulata Alder, 1844; *Rissoa subcostulata* Schwartz, 1864

FG4: 203, 204, fig. 173; Spada et al., 1973: 61, tav. 1 fig. 4; AG: 103; RM: 151.

A very variable species, occurring along the Atlantic coast of Europe as well as throughout the Mediterranean. It has a "fine" apex in the terminology of Verduin (1976a). Its sibling-partner with "coarse" apex is *Rissoa lia* (Monterosato, 1884).

The specimen figured is from Italy, province of Savona, Laignueglia, UTM MP37.

087 *Rissoa inconspicua* Alder, 1844 L 1.6

Rissoa maculata Brown, 1844

FG4: 198-200, fig. 170.

Also distributed all along the European coasts. Verduin (1976a: 30-34) did not see any reason to separate the more finely-ribbed Mediterranean form as *R. prismatica* (Monterosato, 1890).

088 *Rissoa labiosa* (Montagu, 1803)

AG: 104 (*R. membranacea fragilis*).

Verduin (1982b: 146-161, figs. 17-40) has extensively discussed this species and its variability throughout its European localities.

This is the only species of the (sub)genus *Rissostomia* Sars, 1878, in our material.

089 *Rissoa lia* (Monterosato, 1884)

L 5.1 (x75)

AG: 102.

Described as *Apicularia lia* by Monterosato (1884: 139) and subsequently more extensively by BDD as *Rissoa lia*. It is poorly figured by BDD (1884: pl. 32 figs. 8-10). The figure by Spada et al. (1973: 61, tav. 2 fig. 8) is unrecognizable. The species is very variable, as most rissoids are, but usually looks like *R. guerini* from which it can be separated by its (much) coarser apex. The species is by no means rare and occurs at least throughout the western Mediterranean.

090 *Rissoa diversa* (Nordsieck, 1972)

Rissoa pulchella Philippi, 1836, not Risso, 1826
Turboella diversa Nordsieck, 1972

Rissoa diversa (Nordsieck, 1972) is a secondary homonym of *Rissoa punctura* var. *diversa* Jeffreys, 1867. However, because the latter taxon belongs to the genus *Alvania*, there is no need to introduce a nomen novum (ICZN Art. 59).

Verduin (1976a: 42-44, pl. 5) has discussed and figured this species extensively under the preoccupied name *Rissoa pulchella* Philippi, 1836.

091 *Rissoa radiata* Philippi, 1836

L 2.4 (x37.5)

We follow Verduin (1976a: 34-38, pl. 2 and pl. 3 figs. 1-3) who extensively discussed and figured this species. We did not find its sibling-partner, *Rissoa munda* Monterosato, 1884, the most westerly locality of which seems to be Puerta de Pollensa, Mallorca.

092 *Rissoa similis* (Scacchi, 1836)

Spada et al., 1973: 61, tav. 2 fig. 3 (*Apicularia similis*).

This is probably the most variable (and most common) Mediterranean *Rissoa*. Usually it is easily recognized by its sculpture of spiral rows of pit-marks, which are similar to those in *R. guerini*, but coarser. The number of ribs is higher than that in *R. guerini*.

093 *Rissoa variabilis* Von Mühlfeld, 1824

BDD: pl. 31 figs. 1-10; AG: 103.

This species is easily recognized and has never presented any problems.

094 *Rissoa violacea* Desmarest, 1814

BDD: pl. 34 figs. 18-22; AG: 103.

Rissoa monodonta Philippi, 1836

Verduin, 1983: 62, figs. 2a-b, 3; AG: 104.

As discussed by Verduin (1983: 61, 62), the author of this species is Philippi (1836), and not Bivona (1832).

One specimen in HA.

095 *Manzonina crassa* (Kanmacher, 1798) L 2.7 (x 55)

Van Aartsen (1983b: 4, 5) has mentioned already that Mediterranean specimens are usually smaller than Atlantic ones. Our specimens clearly belong to the Atlantic form. See p. 18 for the generic assignment.

Alvania Risso, 1826 s.l.

The European species of this genus have recently been reviewed by Van Aartsen (1982b-f-1983a-b), to which we may refer here. Some species of this genus have also been figured very well by Bogi et al. (1983a). Below we will comment on two species which were dealt with by Gofas & Warén (1982); for the other species we only mention the name.

096 *Alvania montagui* (Payraudeau, 1826)

097 *Alvania lineata* Risso, 1826

098 *Alvania cancellata* (Da Costa, 1778)

099 *Alvania altenai* spec. nov. L 1.5 (x 120)

Shell small and relatively slender, with about 1½ embryonic and 2½ to 3 teleoconch whorls, which are rather convex and shouldered adapically. There are four spirals on the initial whorls; the last whorl has three to four additional spirals. Many (15-20) longitudinal ribs cross the spirals; slight knobs are seen at the crossing points. The embryonic whorls are as figured in fig. 99. Suture clearly visible, not very much inclined. Last whorl occupying about two-thirds of the total height of the shell. Aperture slightly oval, its longer axis, in the direction of the spire, equals about 0.4 of the total height of the shell. Outer lip curved and opisthocline, thickened outside by a strengthened rib; inside smooth. Inner lip united with the outer lip.

The shells are 1.5-1.9 mm high and 0.85-1.0 mm broad.

According to the form of the outer lip this species could be classified with the subgenus *Actonia* Monterosato, 1884.

Alvania altenai is somewhat similar to *A. fischeri* (Jeffreys, 1884), but differs from it not only by being smaller and more slender, but also by having quite different embryonic whorls (see fig. 100) and by showing four instead of three spiral ribs.

Rissoa (Alvinia) conspicua Monterosato in Pallary (1900) may be this species, as Pallary (1900: 324) writes "Voisine de *R. fischeri* Jeffreys, mais distincte". Neither Monterosato nor Pallary ever described or figured the species, however, and so *R. conspicua* Monterosato as well as *R. conspicua* Pallary are nomina nuda.

A. altenai is a rare species, maybe occurring in rather deep waters. It is known from Getares, Tanger and N. Corsica only.

The species is named in honour of the late Dr. C. O. van Regteren Altena, well-known Dutch malacologist and former president of the Nederlandse Malacologische Vereniging.

Material. - Holotype: Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (RMNH 55666). Paratypes: Type locality (AD 9840/1, MK/6); Morocco, Tangier, UTM TE46 (AD 12408/1); Corsica, off Cap Corse, at 120 m depth, UTM NN37 (colln. Bogi, Livorno, Italy/1).

100 *Alvania fischeri* (Jeffreys, 1884) L 2.4 (x 70)

The similar *Alvania weinkauffi* (Schwarz, in Weinkauff, 1868) is figured for comparison after a specimen from El Djemila, Algeria, UTM DA97 (fig. 100a; L* 3.1 mm; x 70).

101 *Alvania subareolata* Monterosato, 1869 L 2.6 (x 120)

102 *Alvania scabra* (Philippi, 1844) L 2.1 (x 120)

103 *Alvania parvula* (Jeffreys, 1884) L 1.9 (x 120)

Rather plentiful (see Van Aartsen, 1975: 91).

104 *Alvania vermaasi* Van Aartsen, 1975 L 2.1 (x 120)

We disagree with Gofas & Warén (1982: 6) that this species should be considered synonymous with *Rissoa (Arsenia) imperspicua* as figured by Pallary (1920: pl. 1 figs. 28, 29). *R. imperspicua* was not described; the nominal taxon was based on only a poor photograph, which is not satisfactory for recognition of the species in question. It is even doubtful whether there are any axial ribs, let alone how many. Very vaguely some spirals are discernible at the base of the shell. The length given by Pallary [2.8 mm (according to the line of natural size); 2.3 mm (after the magnification-factor indicated)] is far larger than that of any of the specimens of *A. vermaasi* we have seen. Moreover the proportions of the shell(s) figured by Pallary are different, viz. ratio breadth: length 0.56, whereas the average value for *A. vermaasi* is 0.60. Of course, the protoconch and its sculpture are not visible at all on Pallary's photographs. Moreover, none of the specimens studied by Gofas & Warén are from the type locality Casablanca, nor were any identified by Monterosato or Pallary. *Alvania imperspicua* is based on material from Monterosato found at Casablanca and Pallary (1920: 50) does not mention any other locality, so that the identification of material from Tangier by Gofas & Warén is not well founded. Pallary's photographs might represent a form of *A. parvula*, *A. rudis* (Philippi, 1844), or even some other species as well. We therefore consider *Rissoa imperspicua* Pallary, 1920, a nomen dubium.

105 *Alvania carinata* (Da Costa, 1778) L 3.4

106 *Alvania tenera* (Philippi, 1844) L 1.7

We are nor sure whether this very characteristic species really belongs to *Alvania*. However, it does not fit better into any other genus.

107 *Alvania lactea* (Michaud, 1832)

In our material the form with fewer, coarser ribs, known as forma *dajerleini* Monterosato, 1889, is the only one present. However, contrary to what is implied by Spada & Maldonado Quiles (1974: 55, tav. 1 fig. 2) this form is not exclusively Atlantic but occurs at a number of Mediterranean localities as well. We therefore agree with Van Aartsen (1982d: 16) that this is only one of many "forms" of the rather well known *Alvania lactea*.

108 *Alvania cimex* (L., 1758)109 *Alvania rudis* (Philippi, 1844) L 4.0110 *Alvania spinosa* (Monterosato, 1890) L 2.7

Discussed by Van Aartsen (1976).

The similar *Alvania pagodula* (BDD, 1884) is figured for comparison (fig. 110a; L* 2.8 mm; x120) after a specimen from France, department of Bouches-du-Rhône, Sausset-les-Pins, UTM FJ60.

111 *Alvania zylensis* Gofas & Warén, 1982 L 1.6 (x120)

Contrary to what is indicated by Gofas & Warén (1982: 6), *Alvania deliciosa* var. *multicostata*, as described and figured by Van Aartsen & Fehr-de Wal (1973), is not *A. vermaasi*, but the full-grown stage of their own *Alvania zylensis*, as could be ascertained from a study of the type specimens of both taxa.

112 *Rissoina bruguierei* (Payraudeau, 1826)

BDD: pl. 34 figs. 1-5.

This well-known snail is the only autochthonous species of the genus *Rissoina* in the Mediterranean. A Red Sea immigrant along the Israelian coast, *Rissoina bertholleti* (Issel, 1869), has recently been found as a second representative.

113 *Mesalia mesal* (Deshayes, 1843) L 28.0 (x30)

Di Geronimo, 1974: 11; GI9: fig. 9. Both as *M. brevisalis* (Lamarck, 1822).

As shown by Marche Marchad (1981: 42, 48, figs. 1-4), *M. brevisalis* is a different species. However, the specimen figured as *M. brevisalis* by Spada & Maldonado Quiles (1974: 69, tav. 1 fig. 3) belongs to *Mesalia mesal* (Deshayes). Marche Marchad (1981) obviously did not know *Mesalia imbricata* Pallary, 1900; we also did not recognize this species. *Mesalia pulchella* Pallary, 1902, is most probably a form of *Cerithidium submammillatum* (Rayneval & Ponzi, 1854), as suggested by Van Aartsen & Verduin (1982b: 130).

114 *Turritella communis* Risso, 1826

Di Geronimo, 1974: 11; GI9: fig. 8a, b; RM: 167.

The protoconch is the main difference with the next species. As shown by Verduin (1977: 92), *Turritella communis* has the "fine" apex.

115 *Turritella turbona* Monterosato, 1877

L* 41.6

T. mediterranea Monterosato, 1890; *T. triplicata* auct., non Brocchi, 1814.

GI9: fig. 6a-c; Di Geronimo, 1974; 12. Both as *T. mediterranea*.

Somewhat less slender than the preceding species, usually with fewer but more pronounced spirals, and with a "coarse" apex.

In our material we did not find the largest *Turritella* of Europe, *Turritella monterosatoi* Kobelt, 1888, which can be found in the nets of fishermen along the southern Spanish coast (Fuengirola, Marbella, etc.) and which may reach a length of 90 mm (see GI9: fig. 7a, b).

The specimen figured is from Portugal, province of Algarve, Quarteira, UTM NB70.

116 *Philippia hybrida* (L., 1758)

Melone, 1974: 28, tav. 1 figs. 1-3; RM: 170.

This is the only Mediterranean species of the genus *Philippia*. It resembles *Architectonica mediterranea* (Monterosato, 1872); both species are smooth, but *P. hybrida* has a much smaller umbilicus.

117 *Petalocochus intortus* (Lamarck, 1818)

Janssen, 1984: 150, pl. 7 fig. 2a, b, pl. 48 fig. 10a, b.

A detailed description of this species as well as of the next one is given by Janssen (1984). The maximum diameter of the tube is about 3½ mm.

118 *Serpulorbis arenarius* (L., 1758)

AG: 111; Janssen, 1984: 151, pl. 7 fig. 1a, b, pl. 48 fig. 11a, b.

Differs from the preceding species by its much larger maximum tube diameter, which is up to 15 mm.

119 *Caecum trachea* (Montagu, 1803)

L 2.7 (x67.5)

(?) *C. imperforatum* (Kanmacher, 1798)

Van Aartsen, 1977a: 15, figs. 22, 23; RM: 173.

The only European *Caecum* species with ring-like sculpture and a fine longitudinal microstructure.

120 *Caecum clarkii* Carpenter, 1858

L* 2.0 (x67.5)

Van Aartsen & Fehr-de Wal (1975: 84, fig. 1) and Van Aartsen (1977a: 14, figs. 16, 17) have critically revised this species. Recent records (e.g.: Hoeksema, 1981: 66; 1982: 1239; Stiva, 1983a; 1983b) show that *C. clarkii* occurs as far north as northern Brittany along the Atlantic coast. The septum somewhat looks like that of *C. trachea*, but the tube of *C. clarkii* does not show a longitudinal microsculpture and has a smaller diameter.

The specimen figured is from Italy, Sicily, Messina, UTM WC42.

121 *Caecum subannulatum* De Folin, 1870 L* 2.1 (x67.5)

Van Aartsen, 1977a: 10, fig. 4.

Apart from many typical specimens, a few individuals were found with a much more protruding septum, but similar in all other respects (see Van Aartsen, 1977a: 10, fig. 6). We still think that these specimens should be separated as var. *incompta* Monterosato, 1884. They are not identical with *Caecum armoricum* De Folin, 1869, which we now consider a good (Atlantic) species, as demonstrated by Van Aartsen & Hoenselaar (1984).

Surprisingly, we did not find *Caecum auriculatum* De Folin, 1868, which occurs together with *C. subannulatum* in many Mediterranean localities. Photographs of both *C. auriculatum* from France, department of Var, St. Tropez, UTM LN09 (fig. 121a; L* 2.3 mm; x67.5) and *C. armoricum* from France, department of Morbihan, Penthièvre, UTM VT 86 (fig. 121b; L* 2.3 mm; x67.5) are given for comparison.

The specimen figured is from Italy, Isola delle Correnti, UTM WA05.

122 *Bittium lacteum simplex* (Jeffreys, 1867)

B. lacteum hanleyanum Monterosato, 1889

Verduin, 1976b: 139, fig. 4 (*B. lacteum hanleyanum*).

Verduin (1982a: 102, 103) has demonstrated that the name *simplex* should be used for this subspecies, which occurs along the Atlantic coasts of Europe and along the coast of Morocco, as well as in the extreme West of the Mediterranean (Verduin, 1976b: 138). It can be separated from the other *Bittium* species mentioned below by its "coarse" apex.

123 *Bittium latreillei* (Payraudeau, 1826)

Verduin, 1976b: 136, fig. 2; RM: 175.

Can always be distinguished from the next two species by the way the second abapical spiral develops, as shown and depicted by Verduin. Usually this species is also larger, more conical and has flatter whorls.

124 *Bittium jadertinum* (Brusina, 1865)

Verduin, 1982a: 117, figs. 3c, 4c-f, 6c.

Although originally thought to be restricted to the Mediterranean, Verduin (1982a) has shown that this species also occurs along the European Atlantic coasts. Very difficult to distinguish from *B. reticulatum*; *Bittium jadertinum* is smaller, up to only 8 mm, with only very few varices (up to three, occasionally five) and there are usually less than 1.6 whorls between the uppermost varix and the aperture.

125 *Bittium reticulatum* (Da Costa, 1778)

Verduin, 1982a: 117, figs. 6d-e, 10c; 118, figs. 13e, 17b, 19b, 21c-e, 22b, 26-28.

The many illustrations, cited above, make it clear that this species is extremely variable. It may usually be separated from *B. jadertinum* by being somewhat larger, up to 12 mm, with usually many varices (up to 20), and by having more than 1.8 whorls between the

uppermost varix and the aperture. Also the second spiral from above has somewhat shifted upwards, so that the spirals are not equidistant, as they are in *B. jadertinum*.

126 *Bittium scabrum* (Olivi, 1792)

Verduin, 1982a: 119, figs. 20c-e; 21 c, f, g; 24b, c; 29; 30.

Our specimens are most like Verduin's fig. 21g, in which the most adapical spiral is clearly present but less developed as compared to the other spirals.

127 *Cerithidium submammillatum* (Rayneval & Ponzi, 1854) L 4.3 (x85)

Van Aartsen & Verduin (1982b: 130, fig. 1) and Terreni (1981: 55, tav. 2 fig. 11) give figures of the typical form. In our material we have encountered nearly exclusively the form *pulchella* (Pallary, 1902), which is white with brown top-whorls and usually does not show traces of axial ribs or varices.

128 *Cerithium lividulum* Risso, 1826, s.l.

C. rupestre auct., not Risso, 1826

BDD, 1884: pl. 23 figs. 1-8; Terreni, 1981: 55, tav. 2 fig. 12; AG: 114.

As Arnaud (1978: 133) has found that the real *C. rupestre* Risso, 1826, is not the Mediterranean species usually cited by this name, we use *lividulum* for the species with a "coarse" apex (see Verduin, 1977: 92). This does not imply that there is only one such species in European waters but rather testifies to our scanty knowledge of this whole group.

129 *Cerithium vulgatum* (Bruguière, 1792) s.l.

BDD, 1884: pl. 22 figs. 1, 2; AG: 113.

As mentioned already, the classification of the European *Cerithium* species is still uncertain. We use the name *C. vulgatum* for all forms with a "fine" apex (see Verduin, 1977: 92). In this way even very young shells of only 1-2 mm can be classified.

130 *Cerithiopsis tubercularis* auct.

L 4.2 (x60)

FG7: 366-368, fig. 257; Spada et al., 1973: 61, fig. 13; AG: 114.

The most common of all the *Cerithiopsis* species, occurring along the Atlantic coast as well as throughout the Mediterranean. It should be noted, however, that the systematics of the Cerithiopsidae still have to be worked out. Many different species occur in the Mediterranean. For the Atlantic species and those from Madeira see Watson (1885).

Marshall (1978) has published a review of the Cerithiopsidae of New Zealand. This work certainly forms also a good basis for a study of the European species. Unfortunately, in selecting a lectotype for *C. tubercularis* (Montagu, 1803), the type species of the genus *Cerithiopsis* Forbes & Hanley, 1851, from among the syntypes of Montagu, Marshall took a specimen which most probably belongs to the species so far known as *C. barleei* Jeffreys, 1867. Marshall himself (1978: 83) already remarks "The protoconch of the lectotype of *C. tubercularis* is exactly like those figured and described by Rodriguez Babio & Thiriot-Quévieux (1974: 536, pl. 3 F) and Richter & Thorson (1975: 130, pl. 4 figs. 24, 25) as

C. barleei Jeffreys, 1867." The reference to Richter & Thorson must be an error, however, because the figs. 24 and 25 are called *C. tubercularis* (Montagu) by the authors and, moreover, do not correspond at all with the other figure (3F) nor with Marshall's own description. Nevertheless it seems that the most common European *Cerithiopsis* species, which has been known for many years as *C. tubercularis* (Montagu, 1803) should change its name, whereas the much more rare *C. barleei* should be called *C. tubercularis*. A valid name for the species *C. tubercularis* auct. is not selected from among the already existing names, because we feel this should be done in the context of a revision of all the European species, a work which is presently undertaken by Dr. Ph. Bouchet in Paris.

131 *Cerithiopsis jeffreysi* Watson, 1885 L* 4.3 (x60)

C. pulchella Jeffreys, 1858, not C. B. Adams, 1850

Not *C. jeffreysi* sensu Spada et al., 1973: 61, tav. 2 fig. 17.

FG7: 372, fig. 262; Warén, 1980: pl. 4 fig. 15, not fig. 14 (!); RM: 181.

Characterized by a lattice-like sculpture. Much more rare than *C. tubercularis*; we have found only one specimen.

Monterosato (1884: 124) and Marshall (1895c: 38) suggest that this species is the same as *Cerithium concatenatus* Conti, 1864, whereas Fekih & Gougerot (1974: 207, obs. no. 19) expressly deny this identification and regard Conti's species as a variety of *Cerithiopsis bilineata* (Hoernes, 1848).

As the original publication is difficult to obtain, we reproduce the description by Conti (1864: 51) here: "(31). *Cerithium*. Conchiglia cilindracea pupoide, giri sette granosi, bocca quadrata, canale poco prolungato leggermente ricurvo, columella incavata, anfratti piani, ciascuno con tre giri di rugosità granose moniliformi, delle quali una più piccola alla sutura che divide gli anfratti, le due nel mezzo più grandi riunite in una sola; all' ultimo giro quattro serie di granosità doppie, alla base altre due più piccole. Lungh. mil. 4, largh. mil. 1 *C. Concatenatus*." From this description the species cannot be recognized but it seems at least to be neither *C. pulchella* nor a form of *C. bilineata*.

The specimen figured is from Tunisia, Nabeul, UTM PF53.

132 *Cerithiopsis minima* (Brusina, 1865)

No recent figure available. We use this name for a small pupiform shell which is much like the next species apart from being (dark) brown, with a somewhat blunter, clear-white protoconch.

133 *Cerithiopsis nana* Jeffreys, 1867 L 3.0 (x60)

Warén, 1980: pl. 4 fig. 16.

Also pupiform, like *C. minima*, but with a somewhat sharper protoconch (apex), which is light corneous to light brown instead of white. Jeffreys (1867: 266, 267) suggests that this may be the male of *C. tubercularis*. In our experience *C. nana* is not sufficiently frequently found together with that species to make this suggestion probable.

134 *Cerithiopsis tiara* Monterosato, 1874 L 3.5 (x80)

Nordsieck, 1976a: 18.

Differs from the preceding species by the presence of two smooth spirals, rather close to each other, on the periphery of the last whorl, instead of only one, somewhat broader spiral. Two spirals also occur in *C. diadema* Monterosato, 1874, which is much more slender, with much smaller and more numerous protoconch whorls. The relatively bulky protoconch of *C. tiara* shows a number of curved axial ribs but no spiral sculpture.

135 *Metaxia metaxa* (Delle Chiaje, 1828) L* 5.1 (x60)

FG7: 370, fig. 260; Spada et al., 1973: 61, tav. 2 fig. 16; AG: 115 (*C. angustissima*).

This most slender species is easily recognized by its four (instead of three) spiral ribs on the whorls. Several other names, e.g. *angustissima* (Forbes, 1844), *rugulosa* Sowerby, 1855, *crosseanum* Tiberi, 1863, *subcylindricum* Brusina, 1865, and *benoitiana* Monterosato, 1869, have been interpreted as either synonyms or different species. We merely conclude that we found only one species of this "group" in our material which corresponds with specimens from other Mediterranean localities and for which we use the oldest available name.

The shell "brought from Algiers by Mr. Hanley", described by Sowerby (1855: 879, pl. 184 fig. 237*) as "*Cerithium rugulosum* C. B. Adams, 1850" cannot be recognized, but Monterosato (1884: 125) has seen Hanley's type specimen and considered it identical with *Cerithium crosseanum* Tiberi, 1863 [= *subcylindricum* Brusina, 1865].

The genus *Metaxia* is regarded as a group of dextral triphorids and placed in the Triphoridae by Marshall (1977).

The specimen figured is from France, department of Bouches-du-Rhône, Sausset-les-Pins, UTM FJ60.

136 *Triphora perversa* (L., 1758) s.l.

Bouchet & Guillemot, 1978: 347, fig. 5; AG: 114.

Bouchet & Guillemot have shown that there are many more European *Triphora* species than only *T. perversa*. The Mediterranean species will be worked out by Bouchet. We use the name *perversa* in a broad sense, just because our specimens are relatively large and probably do not belong to any of the four Atlantic species.

137 *Cirsotrema cochlea* (Sowerby, 1844)

Franchini, 1975b: 16, 17; Albanesi et al., 1979: 4; AG: 115.

This rare and very characteristic species cannot be confused with any other.

138 *Epitonium commune* (Lamarck, 1822) L 16.2

Franchini, 1975c: 12, 13; Albanesi et al., 1979: 8; AG: 116; RM: 186.

The most common *Epitonium*, hence its name. It is difficult to separate from the (northern) Atlantic *Epitonium clathrus* (L., 1758) which, however, is usually white, whereas *E. commune* is variegated with brown blotches on a whitish background.

139 *Epitonium lamellosum* (Lamarck, 1822) L 12.0

E. commutatum (Monterosato, 1877)

S: 11Ad01; Franchini, 1975c: 12, 13; Albanesi et al., 1979: 7; AG: 116.

Looks much like *E. clathrus* but has one clearly developed spiral rib at the base of the shell, which is absent in *E. clathrus*.

140 *Epitonium pulchellum* (A. Bivona, 1832) L 8.0

Franchini, 1975d: 6; Albanesi et al., 1979: 7; AG: 116; RM: 187.

Smaller and with many more ribs than the preceding species.

141 *Opalia crenata* (L., 1758) L 20.8

S: 11Ab01; Franchini, 1975a: 11; Albanesi et al., 1979: 5; AG: 115.

Easily recognized by the pitted surface.

142 *Cima minima* (Jeffreys, 1858)

Van Aartsen, 1981b: 119, fig. 2; FG7: 409, fig. 294.

Originally described as *Odostomia minima*, this shell should be placed in the genus *Cima* Chaster, 1896, of the family Aclididae G. O. Sars, 1878 (Van Aartsen, 1981b; Warén, in FG7).

143 *Graphis albida* (Kanmacher, 1798) L* 1.9

G. unicus (Montagu, 1803)

Albanesi et al., 1981: 16; FG7: 404, 405, figs. 289, 290; RM: 191.

Another species of the Aclididae, with reticulate sculpture which is rather unusual in this family. Consequently there is still some doubt about the taxonomic position of this European species.

The specimen figured is from France, department of Var, Plage de l'Estagnol, 7 km WSW. of le Lavandou, UTM KN77.

144 *Aclis verduini* nom. nov. L 1.8 (x 120)

Pherusa carinata Chaster, 1896, not *Aclis carinata* Smith, 1871.

Chaster (1896: 3, pl. 1 fig. 3) described and figured this practically unknown species from Tangier, after "a single specimen from shore drift". We are not aware of additional records in the literature. Four not very well preserved specimens were found in our Algeciras material, one of which is figured.

Because we are convinced that this species should be placed in *Aclis*, we propose the new name *Aclis verduini* for *A. carinata* (Chaster, 1896), not Smith, 1871. This name is given in honour of our colleague Ir. A. Verduin, who has contributed substantially to the knowledge of the marine European Mollusca.

Pherusina gulsonae (Clark, 1850)

Carrozza, 1977: 176, tav. 1 fig. 2.

We consider *Pherusina* Norman, 1888 [= *Menippe* Jeffreys, 1867, not Haan, 1835;

= *Pherusa* Jeffreys, 1869, not Oken, 1807] a genus instead of a subgenus of *Aclis* Lovén, 1846.

One specimen in HA.

EULIMIDAE H. & A. Adams, 1853

The genera and species of this difficult family are being worked out by Warén. Part of Warén's conclusions have been published by Fretter & Graham (FG7: 411-430) which should be consulted for additional data.

The four species which we found in our material were identified (with some doubt) as follows.

145 *Melanella intermedia* (Cantraine, 1835)

Spada et al. (1973: 63, tav. 3 fig. 2) figure a shell, which we are inclined to think belongs to this species. It is smaller and more slender than the next one.

146 *Melanella alba* (Da Costa, 1778)

M. polita auct., not L.?

FG7: 415, fig. 298A; Spada et al., 1973: 63, tav. 3 fig. 1 (*Eulima polita*); Carrozza, 1977: 177, tav. 1 fig. 6b (*Eulima polita*); RM: 195.

Our specimens are of the "littoral type" known as var. *boscii* Payraudeau, 1826, which is somewhat smaller and less slender than the form from deeper water.

147 *Vitreolina philippii* (Rayneval & Ponzi, 1854)

Eulima incurva auct., not Renier; *Balcis devians* (Monterosato, 1884)

FG7: 421, fig. 302; Spada et al., 1973: 63, tav. 3 fig. 4; AG: 118; RM: 197 (*E. devians*).

One of the commonest Eulimidae, relatively small and with regularly curved spire.

Note. - The shell figured by Spada et al. (1973: 63, tav. 3 fig. 3) as "*Eulima praecurta* Pallary" is certainly not that species, but the well-known *Parvioris microstoma* (Brusina, 1869), known as *Eulima microstoma*, but placed in the new genus *Parvioris* by Warén (1981: 151).

148 *Vitreolina petitiana* (Brusina, 1869)

FG7: 424, fig. 304.

A relatively broad species. Rather rare.

149 *Fossarus ambiguus* (L., 1758)

L* 1.4 (x120)

GI3: fig. 2; Terreni, 1981: 57, tav. 3 fig. 1; AG: 119.

A very characteristic species. In some specimens all the spirals are equally sized and so the shells acquire a quite different aspect; this form was described by Brusina (1865: 29) as *Stomatia kutschigi*, which we regard as a form of *F. ambiguus*.

The specimen figured is from Spain, province of Alicante, Calpe, UTM BC48.

150 *Calyptrea chinensis* (L., 1758)

GI3: figs. 5a, 5b; FG6: 314, fig. 229; AG: 120; RM: 201.

Patella-like, but with a large septum inside and a clearly formed spiral protoconch on the top of the shell, as figured in FG6: 316, fig. 231.

151 *Aporrhais pespelicani* (L., 1758)

GI5: figs. 4a, 4b; AG: 121; RM: 203.

With more robust and less clearly separated digitations than the similar *A. serresiana* (Michaud, 1828) [= *A. macandreae* (Jeffreys, 1867)].

152 *Lamellaria perspicua* (L., 1758)

GI10: fig. 2; FG6: 319, fig. 232; AG: 122; RM: 205.

A very thin and smooth, rather small shell.

153 *Trivia monacha* (Da Costa, 1778)

Lucas, 1973: 4, figs. 1, 2, 3; GI10: fig. 6; FG6: 328, fig. 238; AG: 122; RM: 208.

Coarsely ribbed, with three brown blotches on a pink background.

154 *Trivia pulex* (Gray, 1828)

Lucas, 1973: 9, figs. 2, 3; GI10: fig. 5; AG: 123.

More finely ribbed, smaller than the preceding species and uniform rosa.

NATICIDAE Gray, 1840

Recent reviews of the European Naticidae have been published by Schirò (1977-1978) and Sabelli & Spada (GI4, 8 and 16). The genera *Naticarius* and *Payraudeautia* contain gastropods with a calcareous operculum, whereas the snails of the genus *Lunatia* have corneous opercula. There are no correlated differences in the shells of all species involved. However, for the species dealt with in the present paper we can say that those without funiculi in the umbilicus belong to *Lunatia*, whereas the other species have one (*Naticarius*) or two (*Payraudeautia*) funiculi in the umbilicus.

155 *Naticarius hebraeus* (Martyn, 1784)

N. maculatus Von Salis, 1793

Schirò, 1978b: 4; GI16: fig. 2; AG: 129.

156 *Naticarius vittatus* (Gmelin, 1791)

L 11.2

N. intricatoides Hidalgo, 1873

Schirò, 1978c: 4; GI16: fig. 6; AG: 129.

Much smaller than *N. hebraeus*.

157 *Payraudeautia intricata* (Donovan, 1804)

L 10.6

Schirò, 1978a: 9; GI16: figs. 8a, 8b; AG: 128.

With two funiculi in the umbilicus. The work by Donovan appeared in many parts between 1799 and 1804, and it is at present not exactly known to which year certain descriptions should be attributed. This is especially problematical while trying to determine priority between the species of Donovan and those of Montagu whose monograph appeared in 1803.

158 *Lunatia catena* (Da Costa, 1778)

Schirò, 1977a: 5; GI4: fig. 2; FG6: 339, fig. 243; AG: 127; RM: 213.

A well-known European species.

159 *Lunatia fusca* (Blainville, 1825)

L 22.6

L. sordida (Philippi, 1844)

Schirò, 1977a: 5; GI4: fig. 3; FG6: 342, fig. 246; AG: 128; RM: 214.

Mainly a Mediterranean species, although it has been recorded from the Atlantic as well.

160 *Lunatia macilenta* (Philippi, 1844)

L 16.0

Schirò, 1977b: 17; GI4: figs. 5a, 5b; AG: 128.

This is not the rather rare *Natica rizzae* Philippi, 1844, as suggested by Sabelli & Spada (GI4). In fact *N. rizzae*, figured by Schirò (1977b: 17) as "*Lunatia rizzai*" should be placed in the genus *Natica* (because of its calcareous operculum) according to Piani (1981b: 15).

Tectonatica filosa (Philippi, 1845) [= *T. flammulata* (Requien, 1848)] was not found in our material. It occurs on the neighbouring Mediterranean coast and is therefore figured too, after a specimen from Spain, province of Cádiz, Sotogrande, UTM QA91 (fig. 160a; L* 16.3 mm).

161 *Cymatium cutaceum* (L., 1767)

S: 20Cb03; GI11: fig. 7; Saunders, 1980: 5, 8, fig. 4; AG: 131; FG6: 354, fig. 254; RM: 220.

A well-known Mediterranean species which has been reported from the British Channel Islands too, though very rarely.

162 *Charonia rubicunda* (Perry, 1811)Franchini, 1974: 8 (*C. nodifera*); GI20: fig. 1; FG6: 356, fig. 255 (*C. lampas*); AG: 132 (*C. nodifera*); RM: 221.

We have followed Kilijs (1973: 58), who showed that *C. rubicunda* is very widely distributed, i.e. occurring in the Mediterranean, along the African coasts and eastward from there as far as New Zealand and Japan. Along the Atlantic European coast *C. rubicunda* occurs as far north as the Channel Islands.

163 *Phyllonotus trunculus* (L., 1758)

GI2: fig. 3 (*Hexaplex trunculus*); AG: 134.

One of the more common Mediterranean species.

164 *Muricopsis cristata* (Brocchi, 1814)

L 18.2

M. blainvillei (Payraudeau, 1828)

GI2: figs. 7a-d; AG: 136.

We have little doubt that the fossil *M. cristata* and the recent *M. blainvillei* are the same. Some of the different forms have been depicted by Sabelli & Spada (GI2).

165 *Ocenebra erinaceus* (L., 1758)

GI12: figs. 1a-c; Terreni, 1981: 59, tav. 4 fig. 5; AG: 137; RM: 227.

We agree with Sabelli & Spada (GI12), who synonymized several nominal taxa with this variable, common species.

166 *Ocenebrina aciculata* (Lamarck, 1822)

L 15.6

O. corallina (Scacchi, 1836)

GI12: fig. 4; RM: 228.

A relatively small species without the varix-like ribs of other *Ocenebra* and *Ocenebrina* species.

167 *Ocenebrina edwardsi* (Payraudeau, 1826)

L 14.3

GI12: figs. 2a-d; AG: 136; RM: 229.

A variable species. Several "species" have been based on its various forms, which should be critically revised.

168 *Thais haemastoma* (L., 1758)

GI13: figs. 8a, 8b; AG: 138; RM: 232.

Common in the Mediterranean.

169 *Buccinulum corneum* (L., 1758)

Frouk & De Casa, 1977: 17; Terreni, 1981: tav. 5 fig. 1; AG: 141.

B. corneum is almost smooth and has no axial ribs; therefore it cannot be confused with other species. It is also known as *Euthria cornea*. *B. corneum* is the type species of *Buccinulum* Deshayes, 1830.

170 *Cantharus dorbignyi* (Payraudeau, 1826)

L 13.6

BDD, 1882: pl. 3 figs. 4, 5 (*Pisania d'Orbigny*); AG: 141.

Chauvetia Monterosato, 1884

Nordsieck (1976b) has given a review of this genus. In our opinion this review far from settles the question how a species should be (conchologically) delimited in this difficult group. In our material we have found only three different species, two of which are easily recognizable, whereas the third belongs to the more complicated group of *C. minima* (Montagu, 1803). It seems questionable whether such "species" as e.g. *turritellata* (Deshayes, 1835), *submamillata* (BDD, 1882) and *linearis* (?) are separate species indeed, as Nordsieck suggests, or only forms of *C. minima*.

171 *Chauvetia lefebvrei* (Maravigna, 1840)

L 8.1

C. folineae (Philippi, 1844)

Nordsieck (1976b: 5) gives a good photograph of this species, which is the type of the subgenus *Folineaea* Monterosato, 1884. The axial and spiral ribs are almost as prominent as in *C. pellisphocae* (Reeve, 1844), but they are different from those of the next species.

172 *Chauvetia minima* (Montagu, 1803)

Nordsieck, 1976b: 6; RM: 243.

See the general discussion of this genus. In this species the axial ribs predominate. Type of the section (subgenus?) *Donovaniella* Nordsieck, 1968.

173 *Chauvetia pellisphocae* (Reeve, 1844)

L 11.9

Pallary, 1920: pl. 1 fig. 9; RM: 242 (*C. lefebvrei*).

Nordsieck (1976b: 4, no. 12) gives only a drawing of a shell; we doubt whether the depicted specimen belongs to this species. The photograph given by Pallary is very good and characteristic. This West African species, which is not found in the Mediterranean proper, is much like *C. lefebvrei* but somewhat larger and more slender.

174 *Pisania striata* (Gmelin, 1791)

P. maculosa (Lamarck, 1822)

BDD, 1882: pl. 3 figs. 2, 3; AG: 141.

A common Mediterranean species with spiral sculpture only. Commonly found in the littoral zone.

175 *Columbella rustica* (L., 1758)

AG: 140.

Ruggieri (1977: 173) figures a normal as well as a teratological specimen. Rather variable as far as the relative height of the spire and the shape are concerned. Several varieties have been described.

Mitrella Risso, 1826

See chapter 5 (p. 76) for general notes concerning the genus *Mitrella* and an annotated check-list of nominal taxa.

176 *Mitrella broderipi* (Sowerby, 1844) L 7.6 (x45)

C. hidalgoi Monterosato, 1889, sensu Pallary, 1902

Schirò, 1979: 8 (*Mitrella hidalgoi*); GI19: figs. 8a, 8b (*Pyrene dichroa*).

The smallest of the European species known to us. Rather common at Algeciras and neighbouring localities. Some specimens are purely white (?var. *albida* Monterosato, 1889).

The lectotype (see p. 77) is figured as well (fig. 176a, L 6.2 mm).

177 *Mitrella gervillei* (Payraudeau, 1826) L 13.4 (x45)

Schirò, 1978d: 9, GI19: figs. 3a, 3b; AG: 140.

All our specimens are decollate; they have 10 or more teeth on the inside of the outer lip and relatively flat whorls.

The protoconch which we think belongs to *M. gervillei* was found separately and is only tentatively assigned to this species; it is found at many localities throughout the Mediterranean, however, and so we consider it probable that this is indeed this species.

178 *Mitrella bruggeni* spec. nov. [see p. 78] L 11.1 (x45)

M. broderipi auct., not Sowerby, 1844

179 *Mitrella scripta* (L., 1758) L 14.4 (x45)

Schirò, 1978d: 9; GI19: fig. 1; AG: 140.

Relatively slender, with 7-8 teeth on the inside of the outer lip, of which the first or second from above is the strongest.

180 *Mitrella minor* (Scacchi, 1836) L 10.5 (x45)

Schirò, 1979: 7; GI19: fig. 9; RM: 248.

Clearly recognizable by the conspicuous canal.

Nassarius Duméril, 1806

The classification of the species of *Nassarius* Duméril, 1806, s.l., is rather satisfactory at present. Taking into account the corrections by Cernohorsky (1977) we have encountered no special problems, the more so as the species found in our material were either the more common Mediterranean ones or forms like *Aciculina tingitana* (Pallary), which are easily recognized. On purely conchological grounds we consider *Hinia* Gray, 1847, a subgenus of *Nassarius*.

181 *Nassarius corniculus* (Olivi, 1792)

GI6: figs. 3a, 3b; AG: 143.

Frequently found in localities with slightly reduced salinity.

182 *Nassarius mutabilis* (L., 1758)

GI6: fig. 1; AG: 142.

One of the largest species of this genus in Europe.

183 *Nassarius cuvierii* (Payraudeau, 1826)

N. costulata Renier, 1804: invalid name (Opinion 316 [1954]); *N. ferussaci* (Payraudeau, 1826) Cernohorsky, 1977: 4; GI7: fig. 4a-c; Terreni, 1981: tav. 5 fig. 4; AG: 144.

The most common *Nassarius* species in Europe. Many varieties have been described. As Cernohorsky (1977: 3) has pointed out the right name to be used for this taxon is the one given here.

184 *Nassarius incrassatus* (Ström, 1768)

GI15: fig. 7; AG: 144; RM: 251.

We do not agree with Von Martens (1868: 528), as cited by Cernohorsky (1977: 4), as to the possible identity of this species with *Nassarius pygmaeus* Lamarck, 1822. Both species can always be separated by the parietal callus, which is sharply delimited in *N. pygmaeus* and much more vaguely bordered in *N. incrassatus*.

This species and the next one are included in the separate genus *Hinia* Gray, 1847, by some authors (see above).

185 *Nassarius pygmaeus* (Lamarck, 1822)

GI15: fig. 8; RM: 252.

See the notes with the preceding species.

186 *Nassarius reticulatus* (L., 1758)

GI7: fig. 3; AG: 143; RM: 253.

This well-known European species also lives in brackish water, where the shells have fewer axial ribs and are usually referred to as *N. mamillatus* Risso, 1826.

187 *Naytiopsis granum* (Lamarck, 1822)

L 12.4

GI6: fig. 2; AG: 142.

A slender species with a smooth and shiny shell. Known in appreciable numbers only from our area and neighbouring localities.

188 *Aciculina tingitana* (Pallary, 1901)

L 10.1 (x30)

Cernohorsky, 1977: 4; GI15: fig. 4.

This very remarkable species, which is a characteristic element near Algeciras, was found in appreciable numbers. Most shells are more slender than the one figured in GI15.

189 *Cyclope donovania* Risso, 1826

C. pellucida Risso, 1826

GI7: figs. 1a, 1b (*C. pellucida*); AG: 143.

According to BDD (1882: 61) *C. donovania* and *C. pellucida* are synonyms. Monterosato (1875a: 41) considers *C. donovania* a variety of *C. pellucida*, whereas Locard (1892: 73) records both taxa as separate species. Arnaud (1978: 115, 128) has shown

that there is no material of these taxa in the Risso collection. It seems most probable that BDD were right. In our experience there is only one small (6 mm) species of *Cyclope* in the Mediterranean, together with one larger species (12 mm), which is the type of the genus *Cyclope*, viz. *C. neritoidea* Risso, 1826 [= *Buccinum neriteum* L., 1767]. We use the name *C. donovania* (not *donovani*) for the smaller of the two Mediterranean *Cyclope* species only because of page priority over *C. pellucida*.

190 *Fusinus pulchellus* (Philippi, 1844)

L 19.6

Franchini & Zanca, 1977: 12; GI18: fig. 9; AG: 145.

The figure given by Terreni, 1981: 61, tav. 5 fig. 7, is only doubtfully attributable to this species.

The spiral sculpture is more coarse (with less spiral ribs) and the shell is smaller than in *F. rostratus* (Olivi); it is light orange-brown, with a white colour-band on the two strongest spirals on each whorl. Still, we are not quite convinced that it is really a different species, next to the larger, uniformly coloured, *F. rostratus*. In addition it seems that *F. pulchellus* is more littoral in its distribution than the other species.

191 *Fusinus rostratus* (Olivi, 1792)

Franchini & Zanca, 1977: 12; GI18: figs. 8a, b; Terreni, 1981: 61, tav. 5 figs. 5, 6; AG: 145.

A rather common species of somewhat deeper water. Many teratological shells have been recorded (e.g. Lucas, 1974a: 18, 19). *Fusus bengasiensis* Sturany (1896: 8, Taf. 1 Fig. 1, 2) is usually considered conspecific.

192 *Cancellaria cancellata* (L., 1767)

L 24.8

La Conchiglia 11 (124, 125) [1979]: 9, fig. 9; AG: 148.

The only Atlantic-Lusitanian species with which *C. cancellata* can be confused, is *C. similis* Sowerby, 1833, which we did not find in the present material, but which is known from neighbouring localities along the Spanish coast. The differences between both species, viz. the finer and more numerous spirals in the somewhat smaller *C. similis*, have been discussed by Pallary (1900: 260), who gives the following distribution for *C. similis*: "se trouve sur toute la côte, depuis le Sénégal jusqu'à Alger".

C. cancellata occurs throughout the Mediterranean, although sparingly. Some bleached specimens have been found at Carmel Beach, Haifa, Israel, by Van Aartsen, indicating the possible presence of this species even along the Israeli coast.

MARGINELLIDAE Fleming, 1828

See chapter 6 (p. 82) for general notes concerning the Marginellidae and an annotated check-list of nominal taxa from along the coasts of Europe.

193 *Gibberula caelata* (Monterosato, 1877)

L 4.5

Most specimens are uniformly reddish-brown. See also p. 83.

- 194 *Gibberula epigrus* (Reeve, 1865) L 5.6

See p. 84.

- 195 *Gibberula miliaria* (L., 1758) L 5.2

Most specimens belong to a form of c. 5 x 3.5 mm, which is rather cylindrical, with clearly developed teeth on the inside of the (thickened) outer lip. Many of these specimens also show two interrupted brown spiral bands on a much paler background; these are precisely the colour-marks of *Gibberula secreta* Monterosato, 1889. See also p. 87.

- 196 *Gibberula oryza* (Lamarck, 1822) L 5.7

See p. 86.

- 197 *Gibberula philippii* (Monterosato, 1878) L 3.0

See p. 87.

- 198 *Gibberula jansseni* spec. nov. L 2.3

Shell small, more or less cylindrical and rather slender, colourless and vitreous, with about two, inexactly determinable whorls; sutures not visible. Last whorl occupying 0.9 of the total height of the shell. Aperture straight, rather narrow, somewhat wider below than above; its breadth is about 0.15-0.20 that of the total breadth of the shell. Outer lip thickened and somewhat reflexed, finely but clearly denticulate inside. The columella has five clearly discernible folds, the most adapically of which are very small; as in all *Gibberula* species, the two lowest folds are by far the largest ones. In some specimens there is a sixth columellar fold.

The shells are 2.2-2.6 mm high and 1.2-1.5 mm broad.

Gibberula jansseni spec. nov. differs from *G. turgidula* (Locard & Caziot, 1900) by (1) a more slender and cylindrical general shape, (2) a lower number of visible whorls, and (3) at least five instead of only four folds on the inner lip. The other *Gibberula* species are even more clearly different.

G. jansseni is only known from Getares.

The species is named in honour of Mr. A. W. Janssen, who introduced the second author to a fascinating branch of natural history.

Material. - Holotype: Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (RMNH 55667). Paratypes: Type locality (AD 17624A/2, BMNH/2, MK/16, MNHN/2, RMNH 55677/3, USNM/2).

- 199 *Cypraeolina clandestina* (Brocchi, 1814) L 2.0

See p. 84.

- 200 *Cypraeolina vanhareni* spec. nov. L 1.5

? *Marginella guanacha* sensu Chaster, 1896, not d'Orbigny, 1839

Shell very small, involute, slender ovate in general shape; colourless and vitreous. Whorls not determinable, sutures not discernible. Aperture forming a regular slit, about

equally wide throughout its length; its breadth is about 0.15 that of the total breadth of the shell. Outer lip regularly curved outside and inside; somewhat thickened inside and usually clearly denticulate. Inner lip with four, clearly developed folds, the lower two of which are much bigger than the upper two. The shell has vague, more or less regular, radial folds.

The shells are 1.5-1.8 mm high and 0.9-1.2 mm broad.

Cypraeolina vanhareni spec. nov. differs from both *C. guanacha* (d'Orbigny, 1839) and *C. occulta* (Monterosato, 1869) by the vague "sculpture" of the surface of the shell. It differs from *C. occulta* also by being about half as large as that species, which has an apertural slit broadening adapically. *C. guanacha* is less slender than *C. vanhareni* and has a more straight outer lip and a narrower aperture.

The species is named in honour of Mr. H. van Haren, to whom the first author is much indebted for his indefatigable help and guidance during his first years in malacology.

C. vanhareni is only known from Getares.

Material. - Holotype: Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (RMNH 55668). Paratypes: Type locality (AD 9881/28, 17616/10 with one sinistral specimen, BMNH/2, MK/>25, MNHN/2, RMNH 55678/5, USNM/2).

201 *Mitra cornicula* (L., 1758)

L 14.3

BDD, 1883: pl. 16 fig. 11; La Conchiglia 8 (91, 92) [1976]: 9, fig. 17; AG: 146.

A well-known and rather common shell, which is uniformly brownish to blackish in colour.

202 *Pusia ebenus* (Lamarck, 1811)

L 17.6

Terreni, 1981: 61, tav. 5 fig. 9 (*Mitrolumna olivoidea*); La Conchiglia 8 (91, 92) [1976]: 9, fig. 16; Biraghi, 1981: 17, pl. 6 lower left figure; AG: 146.

Nearly all varieties of this very common and highly polymorphic species show a whitish-yellow spiral colour band on the body-whorl.

203 *Pusia tricolor* (Gmelin, 1791)

Giannuzzi Savelli (1980: 409, figs. 6-8) gives three figures of this rather common Mediterranean species, as well as five figures (figs. 1-5) of the closely related *Pusia savignyi* (Payraudeau, 1826), which we did not find in our material.

204 *Conus ventricosus* Gmelin, 1791

C. mediterraneus Hwass, 1792

Clover, 1978: 17, figs. 40, 41; Terreni, 1981: 61, tav. 5 fig. 11; AG: 153.

The only *Conus* species in the Mediterranean. See Röckel (1981).

TURRIDAE Swainson, 1840

See chapter 7 (p. 88) for general notes concerning the generic and subgeneric classification of various Turridae.

205 *Mitrolumna wilhelminae* spec. nov.

L 7.7 (x75)

Shell not very slender, biconical, with $5\frac{3}{4}$ - $6\frac{1}{4}$ nearly flat whorls (the initial ones often broken away). Sutures not always clearly discernible. Embryonic whorls not sculptured (see fig. 205). Initial teleoconch whorls with three to four prominent spiral ribs and somewhat less conspicuous axial ribs. On the penultimate whorl the sculpture becomes more obsolete, and only (very) vague spirals, c. five above the aperture, are still discernible at the last whorl. Irregular, incised growth-lines are visible in well-preserved specimens. There are red-brown spiral lines all over the shell, c. 15 of which may be counted on the last whorl. The background colour of the shell is yellowish white, sometimes with a lighter zone around the periphery, where vague, widely spaced, vertically elongate, darker blotches may be observed in several specimens. Last whorl occupying c. $\frac{3}{4}$ of the total height of the shell. Aperture narrow and elongate, with parallel lips; its height is slightly more than half the total height of the shell. Outer lip with up to eight plicae inside, the lowest ones being most delicate. Inner lip hardly calloused. Columella straight, with two rather prominent folds.

The shells are 5.8-7.7 mm high and 3.1-4.0 mm broad.

M. wilhelminae differs most clearly from *M. olivoidea* (Cantraine, 1835), the type species of *Mitrolumna* BDD, 1883, which has a quite similar protoconch (Cernohorsky, 1975: 232, fig. 59), by the obsolete sculpture of the last whorl and the conspicuous colour-pattern with spiral lines. The lectotype of *M. olivoidea*, selected and figured by Cernohorsky (1975: 231, figs. 55, 56), has c. ten prominent spiral ribs on the last whorl above the aperture; a similar specimen is figured by Sabelli & Spada (GI01: fig. 12a). *M. olivoidea* sensu BDD (1883: pl. 15 figs. 33-35) is another species, also with a prominent sculpture on the last whorl, but with fewer spiral ribs. Its correct name is still uncertain because of difficulties in the interpretation of various nominal taxa. *M. wilhelminae* differs from *M. crenipicta* Dautzenberg, 1889, by being relatively broader, with much less spiral ribs. The holotype of *M. crenipicta* (in MOM, L 5.0 mm; our fig. 205a) appears to be rather faded now. However, the original description and figure (Dautzenberg, 1889: 31, pl. 2 figs. 6a, b) also show the colour-pattern of *M. crenipicta* to be different from that of *M. wilhelminae*.

The species is only known from Getares.

M. wilhelminae is named after the "Pedagogische Academie Koningin Wilhelmina", where the second author, much to his satisfaction, has been employed for many years.

Material. - Holotype (fig. 205): Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (RMNH 55669). Paratypes: Type locality (AD 9937/7, 17627/>25, BMNH/2, MK/>25, MNHN/2, RMNH 55679/10, USNM/2).

206 *Bellaspira septangularis* (Montagu, 1803)

RM: 257.

Haedropleura septangularis (Montagu), is the type species of *Haedropleura* BDD, 1883, which we consider synonymous with *Bellaspira* Conrad, 1868.

The Mediterranean form, as figured by Spada et al. (1973: 63, tav. 3 fig. 8) and in GI1 (fig. 4a, b), is *Bellaspira secalina* (Philippi, 1844), a closely related species.

Our specimens correspond with the Atlantic *B. septangularis*.

207 *Crassopleura maravignae* (Bivona, 1838) L 13.4

GI1: fig. 2; Bogi et al., 1979: 6; AG: 148; RM: 258.

A rather rare, unmistakable species.

208 *Mangelia coarctata* (Forbes, 1840) L 4.4

Hubendick & Warén, 1973: 45, fig. 193; Bogi et al., 1979: 7 (*Cythara costata*).

Differs from *Mangelia costata* Donovan, 1804, by being larger and more slender; uniformly coloured. The number of axial ribs may be as high as 10.

209 *Mangelia costata* (Donovan, 1804)

RM: 242.

Differing from the very similar *M. coarctata* by being smaller, with fewer axial ribs (only seven or eight); the upper part of the shell is dark-brown in typical specimens. We do not exclude the possibility that *M. costata* is the littoral form and *M. coarctata* the deep-water form of a single species.

210 *Mangelia costulata* (Blainville, 1829)

Pleurotoma costulata Blainville, 1829, not *Mangelia costulata* Risso, 1826 [= *Bela nebula* (Montagu, 1803)]

Spada et al., 1973: 65, tav. 4 fig. 4; Bogi et al., 1980a: 17 (*Smithiella costulata* & *S. smithi*); RM: 261 (*M. smithi*).

This species, which can always be recognized easily by its spiral sculpture consisting of many fine cords, is the type species of *Smithiella* Monterosato, 1890, which we consider synonymous with *Mangelia* Risso, 1826.

Mangelia costulata has a rather confusing synonymy. The oldest known name is *Pleurotoma costulata* Blainville, 1829. By placing this species in *Mangelia*, Blainville's name becomes a secondary homonym of *Mangelia costulata* Risso, 1826. However, Arnaud (1978: 113) has shown that Risso's species is the same as *Bela nebula* (Montagu, 1803). We therefore can still use Blainville's oldest name for this well-known European species (ICZN Art. 59).

We consider *Pleurotoma striolatum* Philippi, 1844, and *P. farrani* Thompson, 1845, as well as the fossil (Pliocene) *Raphitoma substriolata* Harmer, 1918 (= *Mangelia altenai* Brakman, 1938) to be this species. Obviously the new name *Mangelia wareni* Piani, 1980, is superfluous.

211 *Mangelia paciniana* (Calcara, 1839)

Bogi et al., 1979: 18; AG: 151. Both as *Cythara paciniana*.

This species has no spiral sculpture, but red-brown spiral lines on a yellowish background.

Powell (1966: 109) has convincingly demonstrated that *Cythara* Schumacher, 1817, is a nomen dubium and should not be used.

212 *Mangelia rugulosa* (Philippi, 1844)

Spada et al., 1973: 63, tav. 3 fig. 9; Bogi et al., 1979: 7 (*Cythara galli*), 8.

For a detailed discussion of this rather variable species see Van Aartsen & Fehr-de Wal (1978: 107, 108). *M. galli* (Bivona, 1838) has priority over *M. rugulosa* (Philippi, 1844). However, we conclude, as did Van Aartsen & Fehr-de Wal, that Bivona's nominal taxon can only be "recognized" by the interpretation of later authors, not based on type material; we consider it a nomen dubium.

213 *Mangiliella caerulans* (Philippi, 1844)

Spada et al., 1973: 63, tav. 3 fig. 12.

Because of its paucispiral protoconch this species belongs to *Mangiliella* BDD, 1883.

214 *Mangiliella multilineolata* (Deshayes, 1835)

Spada et al., 1973: 65, tav. 4 fig. 1; Bogi et al., 1980a: 15; AG: 151.

A common Mediterranean species, usually with more ribs (12-15) than in the preceding species. *M. multilineolata* is the type species, by monotypy, of *Mangiliella* BDD, 1883.

215 *Bela nebula* (Montagu, 1803) s.l.

L 10.7

Spada et al., 1973: 65, tav. 4 fig. 2 (*Bela ginnania*); Bogi et al., 1980a: 15.

Arnaud (1978: 118), having studied a type specimen in the Risso collection, has shown that *B. ginnania* auct. is quite different from the real *Mangelia ginnania* Risso, 1826, which he considers to be *Haedropleura septangularis* (Montagu). Arnaud suggests to use the name *Bela fuscata* (Deshayes, 1835) for *B. ginnania* auct., not Risso. However, because it has not been possible to separate the Atlantic *B. nebula* from the Mediterranean form, we hesitate to follow Arnaud.

216 *Bela laevigata* (Philippi, 1836)

L 11.4

Bogi et al., 1980a: 15.

Specimens with less-pronounced axial ribs and the sutures more adapical than in *B. nebula* have traditionally been called *B. laevigata*. We are not convinced that this taxon is specifically different from *B. nebula*; we only use the name to indicate a recognizable form. As Sykes (1906: 189) noted already, *Pleurotoma laevigata* Philippi, 1836, is preoccupied by *P. laevigata* Sowerby, 1823. In view of all the uncertainties in this genus we do not yet propose a new name, nor do we adopt an already existing name, however.

217 *Raphitoma (R.) linearis* (Montagu, 1803)

Spada et al., 1973: 65, tav. 4 fig. 10; Bogi et al., 1980c: 15, fig. 3; Terreni, 1981: 63, tav. 6 fig. 10; RM: 270.

This is the most common European *Raphitoma*.

218 *Raphitoma (R.) purpurea* (Montagu, 1808) L 12.0

Hubendick & Warén, 1974: 29, fig. 227; RM: 271.

Although several authors cite this species as occurring in the Mediterranean, we do believe that all these citations are based on erroneous identifications. In our opinion *R. purpurea* is an Atlantic species, which does not occur in the Mediterranean. Related forms such as *R. laviae* (Philippi) may have been misidentified as *R. purpurea*.

219 *Raphitoma (Leufroyia) leufroyi* (Michaud, 1828) L 10.5

Spada et al., 1973: 65, tav. 4 fig. 11; AG: 153.

It is doubtful whether the shell figured by Bogi et al. (1980c: 15, fig. 2) belongs to this species, which is recognizable by its dark-brown protoconch with the extreme tip light-yellow. The inside of the outer lip is thickened, but without teeth. We consider the Atlantic form a separate species, provisionally named *Raphitoma (Leufroyia) boothii* (Smith, 1839) (= *Clathurella mirabilis* Locard, 1892), and not a subspecies; this in contrast to Winckworth (1932: 231). The species figured as *R. (L.) leufroyi* (Michaud) by Glibert (1960: pl. 4 fig. 19, pl. 5 fig. 7a, b) is a *Philbertia* after its protoconch.

220 *Philbertia cordieri* (Payraudeau, 1826) L 10.5

Bogi et al., 1980b: 19, fig. 5 (*Raphitoma echinata horrida*); AG: 152 (*R. horrida*).

P. cordieri differs from *Raphitoma echinata* not only in protoconch, but also in the axial ribs, which are less numerous in *P. cordieri* and do not occur in a relatively large zone just below the upper suture. This becomes obvious by comparing Bogi's fig. 4 (*R. echinata*) with his fig. 5 (*P. cordieri*).

In addition the surface of the whorls is quite smooth and glossy in *P. cordieri*, whereas *R. echinata* shows numerous microscopic dots, like the "thin granular film" described by Sorgenfrei (1958: 250, 251) for some other Turridae. This type of sculpture may be of more significance than for the separation of the two species now under discussion only; it was found among other *Raphitoma* species too.

The species figured by Bogi et al. (1980b: 19, fig. 6) as *Raphitoma* sp. looks like *Philbertia horrida* Monterosato, 1884 (= *Clathurella pungens* BDD, 1883, not *Raphitoma pungens* Bellardi, 1848), which is smaller, with one more spiral, but with the same type of protoconch; this might be only a form of *P. cordieri*.

221 *Philbertia philberti* (Michaud, 1829) L 10.0

Bogi et al., 1980b: 19 fig. 8, ? 11; AG: 152 (*R. bicolor*).

A common littoral Mediterranean species, of a dark-brown to light-brown ground-colour with irregular whitish blotches. The shell figured by Bogi et al. as fig. 11 can only doubtfully be identified with this species because its protoconch, as far as can be seen, suggests a *Raphitoma* rather than a *Philbertia* species. Maybe this shell belongs to one of the forms related to *Raphitoma laviae*.

Order BULLOMORPHA Pelseneer, 1906

The variability within the species is particularly great in this order. This is especially true for the Retusidae Thiele, 1926, and probably also for the Ringiculidae Meek, 1862.

The northern representatives of this order have been very well revised by Lemche (1948). The work of this author has been our main guide and we would like to recommend study of this paper. We have followed the nomenclature used by Lemche with only minor modifications. In view of the fact that not all our readers will be able to consult Lemche (1948), we will give a somewhat more extensive list of synonyms.

222 *Acteon tornatilis* (L., 1758)

Fasulo et al., 1982: 8, (& var. *bifasciatus*) 10, fig. 14; AG: 156; RM: 273.

One of the few species with an unmistakable form; nearly always coloured pink.

223 *Retusa mammillata* (Philippi, 1836) L 1.9 (x127)

RM: 278.

Here we do not agree with Lemche (1948: 55) who, after some Danish specimens, suggests that this species may well be synonymous with *R. truncatula* (Bruguière, 1792). Well-preserved shells of the much less common *R. mammillata* can always be recognized by their clearly protruding apex, by the strictly cylindrical contour and, above all, by a sculpture of spirally incised lines instead of the more or less pronounced axial folds of *R. truncatula*. The specimen figured by Lemche (1948: 55, fig. 58) as "*mammillata*"-form might be a malformed *R. truncatula*.

224 *Retusa truncatula* (Bruguière, 1792)

R. truncata (J. Adams, 1800); *R. retusa* (Maton & Rackett, 1807); *R. pellucida* (Brown, 1827); *R. semisulcata* (Philippi, 1836); *R. truncatella* Locard, 1886; *R. carinensis* De Gregorio, 1889

Spada et al., 1973: 67, tav. 5 fig. 2; Terreni, 1981: 63, tav. 6 figs. 12, 13; AG: 159; RM: 274-276.

Some recent authors have used the name *R. retusa* (Maton & Rackett, 1807), although the first two junior synonyms cited above are even placed on the Official Index of Rejected and Invalid Specific Names in Zoology and thus should not be used also for that reason (Opinion 549, 1959).

225 *Retusa umbilicata* (Montagu, 1803)

R. subcylindrica (Brown, 1827); *R. strigella* (Lovén, 1846); *R. nitidula* (Lovén, 1846); *R. crebrisculpta* Monterosato, 1884, fide Marshall (1911: 328)

Spada et al., 1973: 67, tav. 5 fig. 4; RM: 277.

This species is sometimes placed in *Cylichnina* Monterosato, 1884, which may be considered a separate genus or a subgenus of *Retusa*. However, contrary to what has been indicated by Thiele (1929: 389) and by Zilch (1959: 46), the type species of Monterosato's *Cylichnina* is *Cylichna laevisculpta* Granata, 1877 (design. Crosse, 1885a: 141), a species about which next to nothing is known.

The homonym *Bulla umbilicata* Röding, 1798, "is suppressed for the purposes both of the Law of Priority and of the Law of Homonymy" (Opinion 549, 1959).

226 *Ringicula conformis* Monterosato, 1877

Schirò, 1980: 11 & var. *subcostata*, var. *barashi*; Terreni, 1981: 63, tav. 6 fig. 12; Ciccone & Savona, 1982: 31, tav. 2 figs. 1-6; RM: 279 (*R. auriculata*).

Bouchet (1975: 331), citing Lemche (1948: 36), concludes "La notion d'espèce chez les Ringiculidae est une des plus mal définie de tous les Cephalaspidea". We agree with these words and, therefore, we are inclined to follow Ciccone & Savona (1982) rather than Schirò (1980).

R. conformis can be recognized by the presence of two parietal teeth (or folds) and two columellar teeth; in the other species indicated as living in the Mediterranean by Ciccone & Savona (1982), viz. *R. auriculata* (Ménard, 1811) and *R. nitida* Verrill, 1873 [= *R. leptocheila* Brugnone, 1873], there is only one parietal tooth.

227 *Bulla striata* Bruguière, 1792

Bulla columnae Delle Chiaje, 1835

AG: 158.

The only synonym for this well-known Mediterranean species has been used by some authors under the assumption that *Bulla striata* Bruguière was based on exotic material. However, Priolo (1968: 328) has pointed out that this assumption is erroneous.

It should be noted that the second part of Bruguière's Encyclopédie was issued in 1792 and so both *Bulla striata* and *Retusa truncatula* were published in 1792, not 1789.

228 *Atys jeffreysi* (Weinkauff, 1868)

L* 4.7 (x30)

Bulla ovulata Jeffreys, 1856, not Brocchi, 1814

Terreni, 1981: 65, tav. 7 fig. 1 (*Atys brocchii*); Biondi & Di Paco, 1981: 279, tav. 2 fig. 11.

This shell is most similar to *Retusa umbilicata*, but it is bigger and nearly transparent, with clearly visible spirally incised lines.

The specimen figured is from Tunisia, Nabeul, UTM PF53.

229 *Haminaea hydatis* (L., 1758)

Ferro & Russo, 1981: 197, tav. 2 fig. 7; AG: 159; RM: 282.

Fresh specimens are pale green, transparent and smooth, and thus can easily be recognized. Not to be confused with the (much) bigger Atlantic species *Haminaea navicula* (Da Costa, 1778) [= *H. cornea* (Lamarck, 1822)].

The spelling of the name of this genus as well as its authorship and date have been differently interpreted by various authors. The correct name is *Haminaea* Turton & Kingston, 1830, which is cited by Zilch (1959: 41); the same spelling is used by Gray (1847a: 268). The spelling *Haminea*, from Leach's manuscript, given by Gray (1847b: 161), is evidently a misprint (see Jeffreys, 1867: 437). The name is not mentioned by Warén (1983).

230 *Philine catena* (Montagu, 1803)

BDD, 1886: pl. 64 figs. 21, 22; RM: 286.

Only a few obsolete synonyms are known for this species. It is by far the most common littoral species of *Philine*.

231 *Philine scabra* (Müller, 1776)

RM: 288.

The shell looks somewhat like *Philine catena*, but is usually larger and more slender; the sculpture is coarser.

Philine punctata (J. Adams, 1800)

Philine alata (Forbes, 1844)

Lemche (1948: 67 fig. 76) has demonstrated that the authorship of this species should be attributed to J. Adams, 1800, instead of to Clark, 1828, as has been done in the past.

Ten specimens in HA.

232 *Cylichna cylindracea* (Pennant, 1777)

C. cylindrica (Bruguère, 1792); *C. producta* (Brown, 1827); *C. elongata* Locard, 1886

BDD, 1886: pl. 64 figs. 1-3; AG: 157; RM: 291.

Unmistakable and found throughout the Atlantic and the Mediterranean. Not very common. The apex is not perforated as in *Retusa umbilicata*, which is somewhat similar but (much) smaller.

Scaphander lignarius (L., 1758)

AG: 157.

One specimen in HA.

PYRAMIDELLIDAE Gray, 1840

The European representatives of this family are being revised by the senior author. The parts covering the genera *Chrysallida* and *Turbonilla* have been published by Van Aartsen (1977b and 1981a, respectively). The third part, on *Odostomia* and *Ondina* [= *Auriculina* Gray, 1847, not Grateloup, 1838; = *Evalea* auct., not A. Adams, 1860], is now being prepared for publication; we refer also to that publication for more details. The identification of shells of *Odostomia* can best be based on: (1) the form of the embryonic whorls (helicoid, planorboid, or intorted) and (2) the direction of the growth-lines, which are either more or less vertical, or clearly prosocline.

233 *Chrysallida brusinai* (Cossmann, 1921)

Odostomia turbonilloides Brusina, 1869, not Deshayes, 1861

Van Aartsen, 1977b: 60, pl. 1 fig. 7.

234 *Chrysallida decussata* (Montagu, 1803)

Van Aartsen, 1977b: 61, pl. 2 fig. 10; RM: 294.

235 *Chrysallida doliolum* (Philippi, 1844)

Van Aartsen, 1977b: 60, pl. 1 fig. 1.

236 *Chrysallida emaciata* (Brusina, 1866)

Van Aartsen, 1977b: 62, pl. 3 fig. 17a, b.

Chrysallida fenestrata (Jeffreys, 1848)

Van Aartsen, 1981: 65, 82, pl. 1 fig. 1.

One specimen in HA.

237 *Chrysallida indistincta* (Montagu, 1808)

Van Aartsen, 1977b: 61, pl. 2 fig. 14; RM: 297.

238 *Chrysallida intermixta* (Monterosato, 1884)

Van Aartsen, 1977b: 62, pl. 3 fig. 21.

Originally described and figured as *Odostomia jeffreysi* BDD (1883: 170, pl. 20 figs. 8, 9, 10) and renamed *Pyrgulina intermixta* by Monterosato (1884: 87), because of "Non *O. jeffreysiana*, Seg. (vide infra)". *Odostomia jeffreysiana* as mentioned by Monterosato (1875a: 32 and 1878a: 93), however, is a nomen nudum. The first valid introduction of this nominal taxon is as *Trabecula jeffreysiana* Monterosato (1884: 86), where Monterosato adds "Non *Turbonilla jeffreysii* Koch & Wiechmann, 1872". Although *T. jeffreysiana* Monterosato, 1884, and *Odostomia jeffreysi* BDD, 1883, both belong to *Chrysallida*, the names cannot be considered homonyms. Neither can *O. jeffreysi* BDD be considered a homonym of *Turbonilla jeffreysii* Koch & Wiechmann, which is a *Turbonilla* indeed, as observed by BDD (1898: 768).

Both BDD and Monterosato, however, have overlooked *Menestho jeffreysii* A. Bell, 1871, which is also a *Chrysallida*, very similar to *Chrysallida pygmaea* (Grateloup, 1838), so that *Chrysallida jeffreysi* (BDD) becomes a secondary homonym of *Chrysallida jeffreysii* (A. Bell).

We have studied the three syntypes of *O. jeffreysi* BDD, kept in MNHN. In our opinion BDD's specimens of pl. 20 figs. 8, 10, belong to *Chrysallida obtusa* (Brown, 1827). Therefore, we have selected the specimen of pl. 20 fig. 9 as the lectotype of *jeffreysi*, stabilizing the current interpretation of the name. We consider *Odostomia (jeffreysi* var.) *flexicostata* BDD, 1883 [= *Parthenia flexicosta* Locard, 1886], as figured by BDD (1883: pl. 20 fig. 10), a synonym of *Chrysallida obtusa*.

239 *Chrysallida obtusa* (Brown, 1827)

Turbo interstinctus Montagu, 1803, not J. Adams, 1797

Van Aartsen, 1977b: 62, pl. 3 fig. 22; RM: 300.

Chrysallida sigmoidea (Jeffreys, 1884)

Van Aartsen, 1977b: 54, pl. 1 fig. 9.

One specimen in CS and three specimens in HA.

240 *Folinella excavata* (Philippi, 1844)

Van Aartsen, 1977b: 60, pl. 1 fig. 3; AG: 154; RM: 294.

Following Van Aartsen (1984), we consider *Folinella* Dall & Bartsch, 1904 [= *Amoura* De Folin, 1873, not Gray, 1847] a senior synonym of *Ividella* Dall & Bartsch, 1909 [= *Funicularia* Monterosato, 1884, not Lamarck, 1816]. The genus *Miralda* A. Adams, 1864, with which this species is sometimes classified, is quite different, showing rather narrowly spaced, axial ribs and a different (helicoïd) type of protoconch.

241 *Clathrella clathratum* (Philippi, 1844) L* 2.5 (x 60)

Nerita costata Brocchi, 1814, not Gmelin, 1791

Caprotti, 1976: 35, tav. 10 fig. 2; Pinna & Spezia, 1978: tav. 43 figs. 1, 1a (holotype of *Nerita costata* Brocchi, 1814).

Mienis (1973: 87) has shown that the name *Fossarus costatus* (Brocchi) cannot be used for this species.

In our opinion this species does not belong to the prosobranch genus *Fossarus*, but should be classified with the Pyramidellidae, viz. with *Clathrella* Récluz, 1864 (type species, orig. design.: *Nerita costata* Brocchi). We cannot accept the placement in *Phasianema* Wood, 1842, which has been proposed by Thiele (1929: 233) and by Wenz (1940: 849). Contrary to what is mentioned by these authors the type species of *Phasianema* is *P. sulcata* Wood, 1842 (by monotypy; see Wood, 1842: 535, pl. 5 fig. 15). *P. sulcata* is a Pliocene species from the North Sea basin, which is not closely related to *C. costata* Brocchi (see also Glibert, 1958: pl. 2 fig. 12).

The two species of *Phasianema* that we could study, viz. *P. sulcata* Wood, 1842, and *P. zelandica* Bloklander, 1949, both have simple spiral ribs and only faintly thickened, prosocline growth-lines. In both species there is a slight fold on the columella. In our material the embryonic whorls were not preserved sufficiently to enable a conclusion concerning the occurrence of heterostrophy to be drawn.

Recent as well as fossil specimens of *Clathrella clathratum* show spiral ribs, as well as about equally strong, prosocline, longitudinal ribs, forming a rather coarse network. There is no indication of a tooth or fold on the columella and the embryonic whorls are heterostrophic of the "intorted" type, as in *Chrysallida*, *Folinella* and some other pyramidellid genera.

The specimen of *C. clathratum* figured is from Italy, province of Livorno, Castiglioncello, UTM PP10.

242 *Eulimella ventricosa* (Forbes, 1844) L* 3.5 (x 120)

Caldara et al., 1981: 157, tav. 2 fig. 3.

This species differs from the well-known *Eulimella acicula* (Philippi, 1836) in its more convex whorls, which are totally smooth, and by its planorboid protoconch, whose axis makes an angle of about 135° with the main shell axis. The shell figured by Spada et al. (1973: tav. 5 fig. 9) apparently is misidentified.

The specimen figured is from Norway, Trondheimfjord, Sletvik.

243 *Anisocyclus nitidissima* (Montagu, 1803) L* 2.3 (x 120)

Following Gougerot & Feki (1978) we use the genus name *Anisocyclus* Monterosato, 1880 [= *Aciculina* Deshayes, 1861, not H. & A. Adams, 1853] with *Aciculina scalarina*

Deshayes, 1861, as its type species (by monotypy). Gougerot & Feki (1978: 90, 91) have convincingly demonstrated that *Ebala* Leach in Gray, 1847, should be considered a synonym of *Turbonilla* Risso, 1826, and cannot be used for this or related species.

The surface of the shell shows a microscopical spiral sculpture, distinguishing this species from the much more common *A. pointeli* (De Folin).

The specimen figured is from Portugal, province of Algarve, Alvor, UTM NB30.

244 *Anisocyclus pointeli* (De Folin, 1868) L* 2.3 (x 120)

Odostomia nitidissima var. *pura* Monterosato, 1874

This species looks very much like *A. nitidissima*. The whorls are usually somewhat flattened in the middle, however, and the surface is entirely smooth. The shells figured by Carrozza (1977: 179, fig. 3) under this name cannot be recognized with certainty. The species is rather variable (see Gougerot & Feki, 1980).

The specimen figured is from Italy, province of Livorno, Gulf of Baratti, UTM PN26.

245 *Anisocyclus* spec. L 3.5 (x 120)

Several specimens were found which look like *A. pointeli* in every respect except that they are much larger. Similar specimens were reported by Gougerot & Feki (1980: 32), who identified them with the variety *turgida* Monterosato (1878) of *A. pointeli*. However, we hesitate to follow these authors, because the difference in size seems to be excessive and, moreover, no intermediates are known to us. On the other hand, the variability in *Anisocyclus*, as in most Pyramidellidae, is rather great and should be studied in depth.

246 *Odostomia acuta* Jeffreys, 1848 L 1.7 (x 90)

Warén, 1980: pl. 6 figs. 23, 24.

Embryonic whorls helicoid. Growth-lines \pm vertical.

The figure published by Terreni (1981: tav. 7 fig. 12) does only doubtfully illustrate this species.

247 *Odostomia striolata* Forbes & Hanley, 1850 L 2.5

Odostomia monterosatoi BDD, 1883

Embryonic whorls planorboid. Growth-lines clearly prosocline.

Having studied type specimens from both the Alder and the BDD collection, we conclude that *O. monterosatoi* is not a separate species but is identical with *O. striolata*. *O. monterosatoi* is not a *Noemiamea* species, similar to *N. dolioliformis*, as stated by Nordsieck (1972: 106).

O. striolata cannot be a variety of *O. turrita*, as has been suggested by Jeffreys (1867: 136), because the protoconchs are different. The spiral striae are not a reliable character as they also occur in certain specimens of *O. turrita*, whereas they may be absent in *O. striolata*.

248 *Odostomia turrita* Hanley, 1844 L 2.0

Embryonic whorls helicoid. Growth-lines clearly prosocline.

Mediterranean specimens are rather small, as are the specimens from Algeciras. At

more northern Atlantic localities usually larger specimens are found; we consider all these to belong to one species only.

249 *Odostomia kromi* spec. nov.

L 1.9 (x 135)

Shell small, slender, more or less cylindrical, white and somewhat diaphanous, with $4\frac{1}{2}$ slightly to moderately convex, gradually enlarging, teleoconch whorls. Embryonic whorls intorted, with their axis at 135° with the teleoconch axis; their number cannot be determined exactly, because the first protoconch whorl is (partly) hidden in the first teleoconch whorl. Suture simple, not much inclined. Umbilicus closed. Last whorl occupying about 0.6 of the total height of the shell. Aperture oval, somewhat higher than broad; the height is 0.4 of the total height of the shell. Outer lip sharp, neither thickened nor denticulate inside. Inner lip united with the outer lip, sharply delimited from the body-whorl. Columella concave, with a prominent central tooth. Growth-lines vertical to slightly prosocline.

The shells are 1.6-1.95 mm high and 0.75-0.9 mm broad in Getares. Specimens from N. Africa remain smaller and are slightly more slender, reaching 1.65 mm in height and 0.7 mm in breadth.

O. kromi is a rather variable species, which in most of its forms resembles *O. plicata* (Montagu, 1803). In the latter species, however, the embryonic whorls are helicoid, with their axis at 90° with the teleoconch axis; the entire protoconch can be clearly seen from the outside.

O. aff. plicata, mentioned by Janssen (1981: 36) from the Holocene of Standdaarbuiten, is very similar to *O. kromi*, but its protoconch is more exposed, the form of the whorls is different and there is always a more or less open umbilicus.

The sample in USNM (no. 132748) labelled *Odostomia pulchella*, which Jeffreys obtained from Joly, contains four shells, the three smaller of which clearly belong to *O. kromi*, whereas the biggest specimen is different. The name *O. pulchella* Jeffreys, however, is a nomen nudum.

As can be concluded from the localities mentioned below, *O. kromi* is known from all over the Mediterranean. We did not find it in southern Portugal, nor on the coast of northern Spain.

O. kromi is named after Mr. J. H. W. Krom, junior assistant in the RMNH molluscan department, to acknowledge his preparing of the SEM photographs illustrating the present paper.

Material. - Holotype (fig. 249): Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE 89 (RMNH 55670). Paratypes: Type locality (AD 9932/2, 17580/21, BMNH/2, MK/>25, MNHN/2, RMNH 55680/8, USNM/2); Morocco, Tangier, UTM TE46 (AD 12441/5); Algeria, Alger, UTM EA38 (USNM 132748/3), El Djemila, UTM DA97 (AD 10600/22), and Sidi Ferruch, UTM EA18 (AD 11081/3); Tunisia, Sidi Daoud, UTM PF69 (AD 9583/46); Spain, Cadaques, UTM EG28 (AD 12926/1), Ibiza, Playa es Cavallet, UTM CD60 (AD 4753/3), and Ibiza, Cala Torrent, UTM CD51 (AD 4632A/11); France, Sausset les Pins, UTM FJ60 (AD 11654/71), Etang de Lapalme, UTM EH05 (AD 12773/2), and Corsica, Porto Pollo, UTM MM81 (AD 13777/16); Yugoslavia, Biograd, UTM WJ36 (AD 2354/34), Murter, UTM WJ45 (AD 17185/63), and Poreč, UTM UL80 (AD 1495/5).

250 *Odostomia plicata* (Montagu, 1803)

L 1.7

Embryonic whorls helicoid. Growth-lines \pm vertical.

This is the type species of *Odostomia* Fleming, 1813.

251 *Odostomia (Auristomia) erjaveciana* Brusina, 1869 L* 2.4

Embryonic whorls intorted. Growth-lines \pm vertical.

Differs from the other *Odostomia* species dealt with here by having no real tooth on the columella but only an insignificant fold. The aperture is relatively large.

The specimen figured is from Italy, province of Udine, Grado, UTM UL76.

252 *Odostomia eulimoides* Hanley, 1844 L* 3.8 (x 70)

O. ambigua Nordsieck, 1972

Embryonic whorls intorted. Growth-lines clearly prosocline.

Nordsieck (1972: 111) identified this species with *Turbo pallida* Montagu, 1803. This author also states that *T. pallida* Montagu is preoccupied by *T. pallida* Donovan, 1800, and, therefore, uses the name *Odostomia ambigua* (Maton & Rackett, 1807). However, as Jeffreys stated already (1867: 126), *Turbo pallida* Montagu cannot be identified with any certainty. We consider *T. pallida* Montagu a nomen dubium. As Maton & Rackett (1807: 132) based their *Voluta ambigua* on the *T. pallida* of Montagu, the name *V. ambigua* must also be considered a nomen dubium. The next available name for the species in question is *O. eulimoides* Hanley, 1844. *O. eulimoides* is one of the more common European Pyramidellidae.

The specimen figured is from Portugal, province of Algarve, Alvor, UTM NB30.

253 *Odostomia lukisii* Jeffreys, 1859 L 1.7 (x 90)

Warén, 1980: pl. 6 figs. 25, 26.

Embryonic whorls intorted. Growth-lines \pm vertical.

With exceedingly flat top whorls and a shiny, ivory-white shell surface.

254 *Odostomia scalaris* MacGillivray, 1843 L 2.0

Embryonic whorls intorted. Growth-lines \pm vertical.

255 *Odostomia nivosa* (Montagu, 1803) L 1.6

Embryonic whorls intorted. Growth-lines \pm vertical.

With one or two spiral ribs around the periphery of the last whorl. A small species not known from the Mediterranean proper.

256 *Ondina warreni scandens* (Monterosato, 1884) L* 2.4 (x 70)

With fine spiral striae throughout and a very thin shell, as in all *Ondina* species. This species should be placed in *Ondina* Folin, 1870, as discussed by Van Aartsen (1984: 134) and not in *Evalea* A. Adams, 1860.

The specimen figured is from Spain, Ibiza, Cavallet, UTM CD60.

257 *Ondina* spec. L 2.8

The European *Ondina* species can be divided into two groups. The first group contains shells with a distinct spiral sculpture. The second group encompasses shells which are completely smooth. The present species belongs to the second group and is similar to

O. dilucida (Monterosato, 1884), *O. diaphana* (Jeffreys, 1848), *O. crystallina* Locard, 1892, and *O. perezi* (Dautzenberg & Fischer, 1925). This group has to be studied in detail before definite identifications will be possible.

258 *Turbonilla acuta* (Donovan, 1804) [sensu Smith, 1974]

Van Aartsen, 1981a: 73, pl. 3 fig. 16.

259 *Turbonilla innovata* Monterosato, 1884 L 3.2 (x 105)

Van Aartsen, 1981a: 71, pl. 5 fig. 26.

260 *Turbonilla lactea* (L., 1758) L 5.6 (x 70)

Van Aartsen, 1981a: 75, pl. 3 fig. 14.

261 *Turbonilla pusilla* (Philippi, 1844)

Van Aartsen, 1981a: 71, pl. 4 fig. 25.

262 *Turbonilla striatula* (L., 1758)

Van Aartsen, 1981a: 66, pl. 1 fig. 4.

263 *Leucophytia bidentata* (Montagu, 1808)

Spada et al., 1973: 67, tav. 5 fig. 16.

Only two teeth on the columellar side of the inner lip; usually white and opaque.

264 *Ovatella myosotis* (Draparnaud, 1801)

Terreni, 1981: 65, tav. 7 fig. 16; AG: 164; RM: 356.

Three or more teeth on the columellar side of the inner lip; usually corneous and transparent.

265 *Siphonaria pectinata* (L., 1758)

S. algesirae (Quoy & Gaimard, 1834)

Nicolay, 1980: 11; RM: 362.

This species has the shape of a *Patella*, but the muscle-scar has its opening on the side instead of in the front.

266 *Williamia gussonii* (O. G. Costa, 1829) L 6.0 (x 75)

Very similar to the well-known *Acmaea virginea* (Müller, 1776), but the spiral embryonic whorls are clearly visible in *W. gussonii* and are absent in *A. virginea*.

Classis SCAPHOPODA

267 *Dentalium vulgare* Da Costa, 1778

S: 86Aa02; Caprotti, 1979: tav. 9 figs. 1-7.

268 *Dentalium inaequicostatum* Dautzenberg, 1891

D. alternans BDD, 1891, not Chenu, 1842

S: 86Aa03; Caprotti, 1979: tav. 7 figs. 1-7 (*D. mutabile inaequicostatum*).

Caprotti (1979: 232, 233) considers this to be a recent subspecies of the (Miocene) fossil *D. mutabile* Hoernes, 1856. Not to be confused with the strictly Atlantic *D. novemcostatum* Lamarck, 1818.

Classis POLYPLACOPHORA

Hundreds of loose valves could be studied.

269 *Lepidopleurus cajetanus* (Poli, 1791)

Malatesta, 1962: 146, figs. 1, 2; S: 87Aa01; Bogi et al., 1980d: 14, figs. in right row, 16, left fig.

Loose valves are easily recognized by the strong concentric ribs on lateral areas and end valves.

270 *Leptochiton cancellatus* (Sowerby, 1840)

Malatesta, 1962: 147, figs. 3, 4.

Only two intermediate valves of this small species were found. They are evenly rounded and rather elevated; the central areas are very finely granulated in narrowly spaced longitudinal rows.

271 *Leptochiton algesirensis* (Capellini, 1859)

Lepidopleurus granoliratus Carpenter in Pilsbry, 1892

Malatesta, 1962: 151, figs. 7, 8; Bogi et al., 1980d: 14, 15, figs. in left row, 16, central fig. (*Lepidopleurus algesirensis*).

A rather common littoral to sublittoral species. Loose valves are glossy and bright white.

272 *Callochiton septemvalvis* (Montagu, 1803)

Chiton laevis Montagu, 1803, not Pennant, 1777; *Chiton achatinus* Brown, 1832

Malatesta, 1962: 158, fig. 15; Bogi et al., 1981: 3, 4, central fig., 6, figs. in central row (*Callochiton achatinus*).

Several loose valves, all belonging to the subspecies *euplaeae* (O. G. Costa, 1829), always recognizable by the multislit insertion plates of the intermediate valves, which are mostly of a fine rose-red colour, and by a few short longitudinal sulci on the pleural areas.

273 *Lepidochitona cinerea* (L., 1767)

Chiton marginatus Pennant, 1777. Not *Chiton cinereus* Poli, 1791 [= *L. corrugata* (Reeve, 1848)]

Malatesta, 1962: 155, figs. 11, 12; Bogi et al., 1980d: 17, right fig., 18, figs. in right row.

Valves finely, quincuncially granulated, colour variable; shades of greyish brown predominating.

274 *Lepidochitona corrugata* (Reeve, 1848)

Chiton cinereus Poli, 1791, not L., 1767; ?*Chiton caprearum* Scacchi, 1836

Malatesta, 1962: 157, figs. 13, 14; S: 88Ae01; Bogi et al., 1981: 3, 4, left fig., 6, figs. in left row (*Middendorffia caprearum*).

A very common littoral to supralittoral species. The valves are coarsely, quincuncially granulated, the head valve with weak radial folds.

Only known from the Mediterranean.

275 *Ischnochiton rissoi* (Payraudeau, 1826)

Malatesta, 1962: 160, figs. 16, 17; Bogi et al., 1980d: 16, 17, central fig., 18, figs. in central row.

Valves mostly variegated with purplish red; sculpture of the valves divaricate.

Only known from the Mediterranean.

276 *Chiton (Rhyssoplax) olivaceus* Spengler, 1797

Malatesta, 1962: 161, figs. 18, 19; S: 88Ea01; Bogi et al., 1981: 4, 5, upper left and lower fig., 7, figs. in left row.

Only known from the Mediterranean.

277 *Chiton (Rhyssoplax) corallinus* (Risso, 1826)

Chiton rubicundus O. G. Costa, 1829; *Chiton pulchellus* Philippi, 1844, not Gray, 1828

Malatesta, 1962: 163, figs. 20, 21; S: 88Ea02; Bogi et al., 1981: 3, 4, right fig., 6, figs. in right row.

Only known from the Mediterranean.

278 *Chiton (Rhyssoplax) phaseolinus* Monterosato, 1879

Sabelli, 1973: 244, figs. 1-6.

Loose valves of the three Mediterranean *Chiton (Rhyssoplax)* species are hard to distinguish. *C. olivaceus* grows considerably larger than the others, but young specimens are much like *C. corallinus*. The latter is mostly of a reddish or roseate colour, while *C. phaseolinus* generally shows all shades of green, sometimes marbled with brown. *C. corallinus* is higher arched and decidedly carinate; *C. phaseolinus*, on the contrary, is lowly arched, the back rounded. The longitudinal sulci on the pleural areas are shorter and less numerous in *C. phaseolinus*, only the outer 3-4 reaching the front margin. Juveniles of *C. olivaceus* may be distinguished by relatively heavier shells and deeper, closer sulci.

279 *Acanthochitona fascicularis* (L., 1767)

Chiton discrepans auct., not Brown, 1827; *Acanthochites communis* Risso, 1826

Malatesta, 1962: 166, figs. 24, 25; Bogi et al., 1981: 4, 5, central fig., 7, figs. in central row (*Acanthochitona communis*).

According to the frequency of loose valves in shell grit this is by far the most common chiton in the present area. It is easily distinguished by the small, much crowded, round granulae on the latero-pleural areas and end valves, whilst in *A. crinita* the granules are larger, more distant, and drop-shaped.

280 *Acanthochitona crinita* (Pennant, 1777)

Chiton fascicularis mult., auct., not L., 1767

Malatesta, 1962: 164, figs. 22, 23; Bogi et al., 1981: 4, 5, right fig., 7, figs. in right row (*Acanthochiton fascicularis*).

Less frequent than the preceding species.

Classis BIVALVIA

For the Bivalvia we have used the arrangement suggested by Bowden & Heppell (1966, 1968) as far as applicable; unfortunately this very important work has not been completed. Many of the species treated here have been figured by Tebble (1966) and by Angioy & Angioy (1978-1983).

281 *Nucula nitidosa* Winckworth, 1930

Tebble, 1966: 27, pl. 1 figs. b, d (*N. turgida* Leckenby & Marshall); Bogi et al., 1982a: 7, figs. 1, 2; AG: 167 (*N. nitida* Sowerby).

Tebble (1966: 24) has shown how the closely related species *N. nitidosa* and *N. nucleus* (L., 1758) can be separated after the shell-form. Bowden & Heppell (1966: 109, note 3) have shown that both the names *N. nitida* and *N. turgida*, by which this species has long been known, are preoccupied and that Winckworth's name should be used.

282 *Nucula nucleus* (L., 1758)

Tebble, 1966: 25, pl. 1 fig. e; Bogi et al., 1982a: 7, figs. 3, 4; AG: 166.

Most specimens we found in our material belong to *N. nitidosa*, whereas *N. nucleus* is much more rare.

283 *Nuculana pella* (L., 1767)

Bogi et al., 1982b: 11, fig. 2; AG: 167.

A well-known and unmistakable shell.

284 *Arca noae* L., 1758

Caprotti, 1976: 19, tav. 2 fig. 2; Bogi et al., 1983b: 11, figs. 1-3; AG: 168.

A characteristic Mediterranean species.

285 *Barbatia barbata* (L., 1758)

Bogi et al., 1983b: 11 figs. 7-9; AG: 169.

Well-known and not to be confused with any other species.

286 *Arcopsis (Galactella) lactea* (L., 1758)

Tebble, 1966: 13, text-figs. 2A, B; Bouchet et al., 1979: 129, pl. 6 fig. 11; Bogi et al., 1983b: 14; AG: 171.

Following Bowden & Heppell (1966: 113, note 14) we use the generic name *Arcopsis* and not *Striarca*.

287 *Glycymeris bimaculata* (Poli, 1795)

AG: 172.

A thick-shelled species, nearly circular in shape. The ligamental area is broad and covered with symmetrical grooves.

288 *Glycymeris violascens* (Lamarck, 1819)

AG: 172.

Less solid than the preceding species. Much more common and usually not circular but rather irregularly rhomboidal. The ligamental area is relatively small.

289 *Mytilaster minimus* (Poli, 1795)

AG: 173.

Much smaller than full-grown and relatively more swollen than young *Mytilus edulis* (L., 1758). This species is very common throughout the Mediterranean.

290 *Perna picta* (Von Born, 1780)

Barsotti, 1973a: 8, 9; AG: 173.

A West-African species, which also occurs along the Mediterranean coast of SE. Spain and Algeria. The valves are completely covered with orange-brown v-marks on a lighter background.

291 *Gregariella subclavata* (Libassi, 1859)

Palazzi, 1981: 257, figs. 1-3.

As Palazzi has demonstrated, this species may be synonymous with *Lithodomus semigranatus* Reeve, 1858. The name given by Libassi is certainly applicable to this species of *Gregariella*, which is of much lighter colour, with a less conspicuous periostracum, than the much more common *G. petagnae* (Scacchi, 1832).

292 *Rhomboidella prideauxi* (Leach, 1815)

B (max.) 2.5

Modiola rhombea Berkeley, 1827

Tebble, 1966: 38, fig. 19B; 49, fig. 23; Carrozza, 1975: 191, fig. 4.

Contrary to Bowden & Heppell (1966: 103) we consider *Rhomboidella* a genus instead of a subgenus of *Crenella* Brown, 1827, because of its quite different form as well as its different dentition. We do not believe that *Solamen* Iredale, 1924, as defined by Thiele (1934: 798) "Schale eiförmig, mit schwacher Skulptur und glattem Rande" is

appropriate for this species, although used by recent authors. Its prodissoconch does not show radial ribs, but only spiral (or concentric) riblets; it is not smooth and even very young individuals can be separated from "*Crenella*" *pellucida* (Jeffreys, 1859), as re-described by Van Aartsen & Carrozza (1981).

293 *Modiolus barbatus* (L., 1758)

Tebble, 1966: 40, fig. 21 B, pl. 3 fig. f; Bouchet et al., 1979: 131, pl. 7 fig. 8; AG: 174.

Smaller than the big Atlantic *Modiolus modiolus* (L., 1758); with prominent periostracal "hairs", which distinguishes *M. barbatus* from *M. adriaticus* Lamarck, 1819.

294 *Modiolus phaseolinus* (Philippi, 1844)

Tebble, 1966: 45, fig. 22, pl. 1 fig. i.

Much smaller than *M. barbatus* and with only a few periostracal "hairs". As Tebble (1966) mentions, the "hinge line with a small crenulate area beneath the beaks" serves to distinguish this species from other *Modiolus* species.

295 *Pinna* spec.

Barsotti (1974) gives an account of the different (Mediterranean) *Pinna* species. Our material consists of fragments only and could not be identified with certainty.

296 *Pecten jacobaeus* (L., 1758)

Caprotti, 1976: 23, tav. 4 fig. 1; Lucas, 1980b: 8; AG: 179.

One of the two large species of *Pecten* in Europe. *P. jacobaeus* can be separated from the Atlantic *P. maximus* (L., 1758) by the squarish cross-section of the ribs in *P. jacobaeus*; the ribs of *P. maximus* are evenly rounded in cross-section.

297 *Chlamys flexuosa* (Poli, 1795)

Caprotti, 1976: 23, tav. 4 fig. 11; Lucas, 1980a: 5; AG: 178.

Lucas in particular has clearly illustrated this rather common Mediterranean species.

298 *Chlamys multistriata* (Poli, 1795)

Lucas, 1979: 5.

A rather slender species, similar to *C. varia* but with (many) more ribs of unequal size.

C. multistriata as well as *C. varia* are usually included in *Chlamys* s.s., whereas *C. flexuosa* is placed in *Flexopecten*.

299 *Chlamys varia* (L., 1758)

Tebble, 1966: pl. 5 figs. f, g; Bouchet et al., 1979: 137, pl. 10 fig. 2; Lucas, 1979: 5; AG: 177.

Less slender than *C. multistriata*, with fewer ribs of equal size.

300 *Spondylus gaederopus* L., 1758

Lucas, 1978: 8; AG: 180.

301 *Pododesmus* spec.

The single valve found is not preserved well enough to be identified with certainty. It might belong to *P. patelliformis* (L., 1767) or, less probable, to *P. squama* (Gmelin, 1791).

302 *Anomia ephippium* L., 1758

Tebble, 1966: 35, 36, fig. 18A; pl. 2 fig. g; Bouchet et al., 1979: 131, pl. 7 fig. 6; AG: 180.

The three muscle scars distinguish this species from those of the related genus *Pododesmus*, which possesses only two, more or less confluent muscle scars.

303 *Lima lima* (L., 1758)

Barsotti, 1975: 5; Lucas, 1980d: 7; AG: 181.

Type species of the genus *Lima*. Immediately recognizable by its pronounced radial ribs.

304 *Lima hians* (Gmelin, 1791)

Tebble, 1966: 65, pl. 11 fig. n; Barsotti, 1975: 6; Bouchet et al., 1979: 131, pl. 7 fig. 7; Lucas, 1980d: 7; AG: 181.

Thin and relatively flat, and thus distinguishable from *L. exilis* (Wood, 1839), which is somewhat bigger and much more inflated. Placed in the subgenus *Limaria* Link, 1807, as discussed by Bowden & Heppell (1966: 120, note 37).

305 *Lima exilis* (S. V. Wood, 1839)

Martino, 1973: 12; Barsotti, 1975: 6; Lucas, 1980d: 7; AG: 181. All as *Lima inflata* (Chemnitz, 1784).

The name "*Pecten inflatus* etc." as given by Chemnitz, is not available. The present species is *Lima inflata* Lamarck, 1807, not Gmelin, 1791. We follow Van Regteren Altena et al. (1969: 24) using the name *L. exilis*, given by Wood to a fossil specimen of this species.

306 *Limatula subauriculata* (Montagu, 1808)

L* 2.7

Tebble, 1966: 67, figs. 28a, b; Barsotti, 1975: 4; Lucas, 1980c: 7.

A small and relatively rare species. Tebble (1966) gives the differences with *L. gwyni* Sykes, 1903 [= *L. elliptica* Jeffreys, 1864, not Whiteaves, 1861; = *L. sulcata* Brown, 1827, not Lamarck, 1819], which is a larger species.

The specimen figured is from Monaco, Monte Carlo, UTM LP74.

307 *Ostrea* spec.

Our material does not contain clearly identifiable specimens of this genus.

308 *Ctena decussata* (O. G. Costa, 1829)

C. reticulata Poli, 1795, not L., 1758

Barsotti, 1973b: 14.

Barsotti (1973b) has convincingly demonstrated that *Clathroconcha istriensis* Coen, 1934, was based on a young individual of the present species and thus is not a species of the Galeommatacea.

309 *Loripes lacteus* (L., 1758)

L. lucinalis (Lamarck, 1818); *L. leucoma* Turton, 1822; *L. desmaresti* (Payraudeau, 1826)

Tebble, 1966: 75, fig. 31, A; Bouchet et al., 1979: 129, pl. 6 fig. 7; AG: 183.

Some authors have suggested, that the name *Tellina lacteus* L., 1758, may not apply to this very common, widespread and rather variable species. Because we do not know of definite proof of this opinion, we prefer to use the best known name for this species.

310 *Lucinella divaricata* (L., 1758)

Tebble, 1966: 77, fig. 32; Biagi, 1975: 163, tav. 2 fig. 5; Bouchet et al., 1979: 129, pl. 6 fig. 9; AG: 183.

Following Bowden & Heppell (1968: 262, note 80) we use the generic name *Lucinella* Monterosato, 1883, instead of the more widely used *Divaricella* Martens, 1880.

311 *Myrtea spinifera* (Montagu, 1803)

Tebble, 1966: 76, pl. 7 fig. e; Caprotti, 1976: 27, tav. 6 fig. 4; AG: 183.

312 *Lucinoma borealis* (L., 1767)

Tebble, 1966: 75, fig. 31, B; Bouchet et al., 1979: 131, pl. 7 fig. 5 (not fig. 3); Terreni, 1981: 89, tav. 9 fig. 1.

With fine concentric lamellae.

313 *Thyasira flexuosa* (Montagu, 1803)

Tebble, 1966: 16, fig. 5; Bouchet et al., 1979: 129, pl. 6 fig. 8.

314 *Ungulina cuneata* (Spengler, 1782)

B 24.0

U. rubra Roissy, 1805

Spada & Maldonado Quiles, 1974: 69, tav. 1 fig. 10; AG: 184.

Blackish-brown on the outside and pink to red on the inside. A typical West African species, not occurring in the Mediterranean proper.

315 *Diplodonta rotundata* (Montagu, 1803)

Tebble, 1966: 78, fig. 33; Bouchet et al., 1979: 131, pl. 7 fig. 3 (not fig. 5); AG: 184.

316 *Chama gryphoides* L., 1758

Caprotti, 1976: 25, tav. 5 figs. 10, 11; AG: 184.

The left valve is (usually) fastened to the substrate; in this respect this species differs from the next one.

317 *Pseudochama gryphina* (Lamarck, 1819)

Caprotti, 1976: 25, tav. 5 fig. 9; AG: 185.

This species much resembles the preceding one, but here the right valve is fastened to the substrate.

GALEOMMATACEA and CYAMIACEA

Both superfamilies are reckoned to the most difficult groups of the Bivalvia. The shells are usually small and thin, and the hinge is only moderately to scarcely developed. Many species have been described from European waters. As one of us (V. A.) will revise these groups in the near future, we restrict ourselves to some remarks only. The species found represented in our material belong to the better-known ones of the group.

318 *Lasaea rubra* (Montagu, 1803)

Tebble, 1966: 84, 23, figs. 13, A-C; Bouchet et al., 1979: 127, pl. 5 fig. 6.

Usually vivid pink to reddish and, therefore, the only conspicuously coloured species of the group. Care should be taken, however, because non-coloured, slightly yellowish-brown specimens do occur. These have been called var. *pallida* Jeffreys, 1864 (from British waters) and they have also been described as *Kellia danili* [not *daliniana*] Brusina, 1865 (from the Adriatic), as could be ascertained from a sample labelled as such in the Jeffreys collection (USNM 170625), given to Jeffreys by Brusina himself. We use the well-known name *L. rubra* for this species as we are not (yet) convinced that it is the same as *Lasaea adansoni* (Gmelin, 1791).

319 *Scacchia elliptica* (Scacchi, 1833)

B 9.4

Janssen & Van der Slik, 1971: 46, pl. 24 figs. 68a-c, pl. 26 fig. 68d.

A well-known Mediterranean species. Two cardinal teeth in the left valve and one in the right valve; no lateral teeth. Strictly speaking the generally used name *Scacchia elliptica* should be replaced because the species was introduced as *Tellina elliptica*, which is a primary homonym of *Tellina elliptica* Brocchi, 1814. *Scacchia oblonga* (Philippi, 1836) might be a suitable alternative. We have refrained from using this latter name, however, because *elliptica* is in general use and might well be conserved for this species.

320 *Hemilepton nitidum* (Turton, 1822)

B* 2.3

Lepton prismaticum Monterosato, 1878 (nomen nudum); *Lepton (nitidum var.) levis* Jeffreys, 1881; *Erycina (Semierycina) prismatica* Cossmann & Peyrot, 1911

Tebble, 1966: 85, fig. 38b; Janssen & Van der Slik, 1971: 47, pl. 24 figs. 70a, b, pl. 25 figs. 70c, d.

Either with irregular pit-marks or smooth (var. *levis* Jeffreys, 1881). We follow Glibert & Van de Poel (1967: 65) in considering *Hemilepton* Cossmann & Peyrot, 1911 (type species: *Lepton longifossula* Cossmann, 1896) and *Semierycina* Cossmann & Peyrot, 1911 (type species: "*Lepton prismaticum* Monterosato") synonymous.

Cossmann & Peyrot (1911: 169, fig. 104) described *Semierycina* as follows "S.-G. *Semierycina* Monterosato (in litt. 1911). - Coquille sub-équilatéral, à test très mince et de

taille très petite; bord palléal peu arqué; surface lisse et brillante; charnière peu étendue, étroitement échancrée au milieu, à lamelles latérales très rapprochées, l'antérieure seule est double; une dent cardinale seulement sur chaque valve. Impressions musculaires arrondies, symétriques, à mi-hauteur; ligne palléale peu écartée du bord (G.-T.: *Lepton prismaticum* Monteros. Viv.)” The hinges of both valves are figured.

It is clear that the description of the (sub)genus *Semierycina* coincides with the description of “*Lepton prismaticum* Monteros.” *Lepton prismaticum* Monterosato (1878a: 68) is a nomen nudum and, therefore, the species should be cited as *Erycina* (*Semierycina*) *prismatica* Cossmann & Peyrot, 1911.

We could not study the types of Cossmann & Peyrot. However, a sample labelled “*Lepton prismaticum*/Sicily/Monterosato” was found, USNM 199499. Jeffreys has added “=nitidum”. All six valves in this sample are *H. nitidum*. The specimen described and figured by Coen (1933: 181, note 193, tav. 10 fig. 87 bis) as *Lepton prismaticum* [HUU 20844, ex Coen 5198, leg. Monterosato] turned out to be *H. nitidum* (with broken hinge) too.

Furthermore Marshall (1914: 183), discussing “*L[epton] nitidum* Turt. ... var. *laevis* Jeff.”, notes: “The latter variety is an unpunctured form of the type, and also *L. prismaticum* of Monterosato”.

The confusion has probably arisen because both Jeffreys and Monterosato (at least until about 1880) believed that *H. nitidum* is invariably punctured, although Turton (1822: 63) described the species as smooth and explicitly states “without punctures”. The description of “*Semierycina prismaticum* (Monterosato, 1884)”, given by Nord-sieck (1969: 86, no. 50.10) certainly does not apply to the species under discussion.

The specimen of *H. nitidum* figured is from Spain, province of Tarragona, San Carlos de la Rapita, UTM BF90.

321 *Galeomma turtoni* Turton, 1825

B 6.4

Tebble, 1966: 88, 82, fig. 36A; Terreni, 1981: 89, tav. 9 fig. 6; AG: 187; Warén, 1983: pl. 9 figs. 5-8.

One of the few species with clear, though fine, sculpture on the outside of the widely gaping valves. Although many authors have attributed this species to Sowerby, who was the editor of the journal in which the species was described, the description was by Turton as was recently ascertained by Warén (1983).

322 *Kellia suborbicularis* (Montagu, 1803)

Tebble, 1966: 83, 84, fig. 37; Janssen & Van der Slik, 1971: 47, pl. 22 figs. 71a-d, pl. 26 figs. 71c, d; Biaggi, 1975: 163, tav. 2 fig. 2.

This species is quite similar to *Hemilepton nitidum*, but it is much more swollen, usually bigger and the hinge shows a posterior lateral tooth in each valve besides the cardinal teeth which are similar to those in *H. nitidum*.

K. suborbicularis is the type species of *Kellia* Turton, 1822 (design. Récluz, 1844).

323 *Bornia geoffroyi* (Payraudeau, 1826)

B 12.5, 9.0

B. complanata Philippi, 1836

No readily identifiable recent figure of this uncommon species exists. It is similar to *Lepton squamosum* (Montagu, 1803) in having rather flat valves, the outside of which is

covered by regular pit-marks or punctures, but the hinge is different, showing a well-developed resilium, and the valves are much less symmetrical.

324 *Bornia sebetia* (O. G. Costa, 1829)

B 5.6

Erycina corbuloides Philippi, 1836

AG: 186.

The form of this common Mediterranean species is broadly triangular and rather symmetrical; the outside of the valves is perfectly smooth. Type species of *Bornia* Philippi, 1836.

325 *Pseudopythina macandrewi* (P. Fischer, 1867)

B 10.3

P. setosa auct., not Dunker, 1864

Maldonado Quiles, 1973: 215, tav. 1 figs. 2a, b; Bouchet et al., 1979: 129, pl. 6 fig. 13.

This Lusitanian species was originally described as *Kellia macandrewi* from "Nord de l'Espagne; bassin d'Arcachon (Gironde)", i.e. from the Atlantic coast of Europe. Maldonado Quiles (1973) described it from Fuengirola (southeast Spanish coast), whereas Monterosato (1884: 17) mentions it only from "Gibilterra (Hidalgo)". Hidalgo (1917: 574) still mentions Gibraltar as the only Mediterranean locality. Evidently *P. macandrewi* only scarcely penetrates into the Mediterranean.

The confusion of this species with *Coralliophaga setosa* Dunker in Grube, 1864, originates with Jeffreys (1881: 693) who, erroneously, synonymized *Scintilla recondita* P. Fischer, 1872, *Kellia macandrewi* P. Fischer, 1867, and *Sportella caillati* Conti, 1864, with "*Pythina setosa*" (Dunker in Grube, 1864). Dunker described *Coralliophaga setosa* from the island of Lussin (one of the Dalmatian islands in the northeastern Adriatic). A scrutiny of the original description [in Grube (1864: 48)] has convinced us that Monterosato (1875a: 15 no. 166; 1878a: 70) was right in considering Dunker's species to be juvenile *Cypricardia lithophagella* (Lamarck, 1819). Later on Jeffreys too was convinced, as he writes (1882: 952) "The marquis de Monterosato has satisfied me that Dunker's species is only the young of *Cypricardia lithophagella*; and I must therefore substitute for *setosa* the specific name given by Conti viz. *caillati*, which is several years older than either of the names proposed by dr. Fischer". This, however, is still in error as Conti (1864: 20) only cites "*Sportella caillati* Desh. 1852", giving neither a description nor any other indication. *Sportella caillati* Deshayes was described in 1857; it is a fossil species from the Eocene of the Paris Basin, France. So neither *setosa* nor *caillati* are applicable to the species in question.

The rare species described by P. Fischer (in De Folin & Périer, 1872: 49) as *Scintilla recondita* and figured (ibidem pl. 2 figs. 3, 3a) as *Sportella recondita*, is certainly different from *P. macandrewi*. It has recently been figured by Carrozza (1983: 69, bottom figures) and occurs throughout the Mediterranean, as far eastward as the Israelian coast.

Pseudopythina macandrewi (P. Fischer, 1867) is the type species of *Pseudopythina* P. Fischer, 1878; it is one of the largest and most solid species of the group in Europe. Contrary to what is stated by Chavan (1969: N 525) there are only cardinal teeth (two in the left valve and one plus a very small rudimentary tooth in the right valve) and no lateral teeth. However, there is a conspicuous nymph for the external ligament as well as a resilium for the internal ligament.

326 *Montacuta substriata* (Montagu, 1808)

B* 2.1

Tebble, 1966: 89, fig. 42; Janssen & Van der Slik, 1971: 48, pl. 24 figs. 73a, b; pl. 25 figs. 73c, d; Terreni, 1981: 89, tav. 9 fig. 7.

The slight radial ribs on the outer surface, which are characteristic for this species, are sometimes barely detectable. Type species of *Montacuta* Turton, 1822.

The specimen figured is from Norway, Trondheimfjord, Sletvik.

327 *Mysella bidentata* (Montagu, 1803)

Tebble, 1966: 91, 92, fig. 44; Janssen & Van der Slik, 1971: 49, pl. 23 figs. 76a, b; pl. 26 figs. 76c, d.

The most common species of the group, occurring all over Europe. There are no cardinal teeth, but one anterior and one posterior lateral tooth in each valve; those in the right valve are much more prominent.

328 *Tellimya ferruginosa* (Montagu, 1808)

Tebble, 1966: 91, fig. 43; Janssen & Van der Slik, 1971: 49, pl. 23 figs. 75a, b; pl. 26 figs. 75c, d; AG: 186.

This species, of elongated shape, somewhat resembles species of *Abra*, but the hinge has only lateral teeth and even these are usually difficult to recognize. Type species of *Tellimya* Brown, 1827.

The specimens figured under this name by Caldara et al. (1981: 155, tav. 1 figs. 6a, b, 159, tav. 3 figs. 5a, b) probably do not belong to this species and may be *Tellimya tenella* (Lovén, 1846) [= *T. ovata* (Friele, 1875)], a similar species, which has been redescribed by Ockelmann (1965).

329 *Vasconiella jeffreysiana* (P. Fischer, 1873)

B* 4.4, 4.2

Scintilla crispata P. Fischer, 1873; *Lepton lepisma* Monterosato, 1878

Kisch, 1958: pl. 3 figs. 1-3; Bouchet et al., 1979: 127, pl. 5 fig. 17.

Cornet (1982) and Van Aartsen (1982a) have summarized the presently known distribution and synonymy of this remarkable species.

The right valve has a deep indentation, the left valve is almost circular and so different that it has been described as a separate species (see the two synonyms cited above). This is mainly an Atlantic species although some valves from Algeria (Oran and Algiers) are known.

The specimens figured are from Portugal, province of Algarve, Alvor, UTM NB30.

330 *Epilepton clarkiae* (Clark, 1852)

B* 2.2

Tebble, 1966: 87, 88, fig. 44; Warén, 1983: pl. 8 figs. 1, 2.

In some forms this variable species looks very similar to young *Mysella bidentata*, but there is an additional small cardinal tooth in each valve.

This species and the next one are usually placed in the Cyamiacea, whereas all the preceding ones are classified with the Galeommatacea. However, Deroux (1961) suggests that *E. clarkiae* is a montacutid and on the basis of shell characters we also are inclined

to regard this species as belonging to the Galeommatacea. *E. clarkiae* is the type species of *Epilepton* Dall, 1899 (see Bowden & Heppell, 1968: 266, note 103).

The specimen figured is from Spain, province of Coruña, Ria de Arosa, UTM NH10.

331 *Neolepton sulcatulum* (Jeffreys, 1859)

B 1.7

Tebble, 1966: 86, fig. 39; Terreni, 1981: 89, tav. 9 fig. 8.

Not smooth but sculptured with concentric ribs. The hinge, well-figured by Tebble, is so different from that of the Galeommatacea that this species certainly belongs to a different superfamily. Whether this is the Cyamiacea is somewhat doubtful (Bowden & Heppell, 1968: 266, note 101).

332 *Cardita calyculata* (L., 1758)

Terreni, 1981: 89, tav. 9 fig. 9; AG: 187.

A well-known species, which may always be recognized by its characteristic, though variable, form.

333 *Venericardia antiquata* (L., 1758)

V. sulcata (Bruguière, 1792)

Ghisotti, 1975: 144, tav. 2 fig. 3; AG: 188.

A well-known, Mediterranean *Venericardia* species, similar to *Cardium* s.l., but differing by thicker valves and a much more pronounced hinge.

334 *Digitaria digitaria* (L., 1758)

L 7.2

Janssen & Van der Slik, 1974: 60, pl. 42 figs. 108 a-c.

This species cannot be confused with any other because of its excentric rather than concentric sculpture.

335 *Goodallia triangularis* (Montagu, 1803)

Tebble, 1966: 71, 72, fig. 30; Janssen & Van der Slik, 1974: pl. 42 figs. 106a-c; Caldara et al., 1981: 159, tav. 3 figs. 1-3.

A small, smooth, yellowish-brown shell with rather solid valves, occurring throughout Europe. Not to be confused with the smaller and more inaequilateral *G. macandrewi* (Smith, 1881), which also occurs in the Mediterranean.

336 *Acanthocardia paucicostata* (Sowerby, 1841)

Bouchet et al., 1979: 133, pl. 8 fig. 3; AG: 191.

Thin-shelled, with a relatively small number of ribs.

337 *Acanthocardia tuberculata* (L., 1758)

Tebble, 1966: 99, 100, figs. 49c, 50; Bouchet et al., 1979: 135, pl. 9 fig. 11; AG: 189.

A common European cockle species.

338 *Plagiocardium papillosum* (Poli, 1795)

Tebble, 1966: 101, fig. 51; Caprotti, 1976: 27, tav. 6 fig. 8.

With series of punctures between the radial ribs and series of well-developed dots (= papillae) on the crests of the ribs. *Parvicardium scabrum* (Philippi, 1836) is very similar; this species also has series of punctures between the ribs, which, however, are much smaller and more numerous. The ribs of *P. scabrum* are covered with transverse plates, not papillae.

339 *Parvicardium exiguum* (Gmelin, 1791)

Tebble, 1966: 103, 104, fig. 54; Høpner Petersen & Russell, 1971: pl. 2 figs. a, b; pl. 3 fig. a; AG: 191.

Only 20-22 ribs instead of 25 or 26 as in *P. papillosum* and *P. scabrum*. The form of this species from brackish waters differs from the purely marine one (Høpner Petersen & Russell, 1971: 411, 412).

340 *Parvicardium scabrum* (Philippi, 1836)

Cardium nodosum Turton, 1822, not Montagu, 1803

Tebble, 1966: 103, fig. 53.

The differences between this species and *Plagiocardium papillosum* have been mentioned above.

341 *Parvicardium scriptum* (BDD, 1892)

Originally figured by BDD (1892: pl. 45 figs. 13-18) and described as a variety of *P. exiguum*. This identification has been questioned by Høpner Petersen & Russell (1971: 410). However, their suggestion that the specimens figured "may have been taken from small *C. glaucum* Bruguière, 1789" is certainly incorrect. In our opinion the nominal taxon in question applies to neither *P. exiguum* nor (small) *Cardium glaucum*. In fact it is the most common small *Parvicardium* species in the Mediterranean, which is nearly always recognizable by the dark-red to black posterior half of the valves. Between the rather widely spaced ribs concentric rib-like plates are clearly visible. Most probably *P. scriptum* is not conspecific with *Cardium parvum* Philippi, 1844, not Da Costa, 1778, not Mawe, 1823, not Sowerby, 1840. Høpner Petersen & Russell (1972: 398) suggested that *C. parvum* may be synonymized with *C. (exiguum) commutatum* BDD, 1892.

394 *Parvicardium vroomi* nom. nov.¹

B 2.8

Cardium transversale Deshayes, 1854, not Roemer, 1849

Smith, 1885: 162, pl. 8 figs. 3-3b.

This species, of which single valves and complete specimens have been found, differs from the similar *Parvicardium scriptum* (BDD, 1892) in being flatter and more regularly oval. In the right valve, the lower, anterior, lateral tooth is more strongly curved inwards

¹ When we mounted our plates this species was still considered a problematical one. Hence the number 394, under which it is listed and figured.

and, consequently, the hinge looks more curved. The prodissoconch is bigger in *P. vroomi* (200-230 μm) than in *P. scriptum* (125-140 μm).

Our largest valve measures nearly 6 mm.

There can be no doubt that this species is identical with the one figured by Smith (1885: pl. 8 figs. 3-3b), who might have studied syntypes of *C. transversale* in the Cuming collection in BMNH (Fischer-Piette, 1977: 87). Because *C. transversale* is pre-occupied (Fischer-Piette, 1977: 155), we propose *Parvicardium vroomi* nom. nov. for the present species. Fischer-Piette (1977: 87) considered this species a form of *P. exiguum* (Gmelin, 1791) and, therefore, did not introduce a nomen novum for Deshayes' junior primary homonym.

The new name is given in honour of Mr. D. R. Vroom, senior assistant in the RMNH molluscan department, to acknowledge his skilful and accurate handling of large quantities of molluscs during many years.

342 *Cerastoderma edule* (L., 1758)

Tebble, 1966: 104, 105, fig. 55a; Bouchet et al., 1979: 135, pl. 9 fig. 9.

The common cockle, occurring in large numbers throughout the European seas.

343 *Cerastoderma glaucum* (Bruguière, 1789)

Tebble, 1966: pl. 12 figs. f, g; Høpner Petersen & Russell, 1971: pl. 2 fig. c; Van Urk, 1973: 106, figs. 3-14; AG: 192.

Van Urk (1973) has summarized the differences between this species and the preceding one. Bowden & Heppell (1968: 268, note 113) mention the fact that the authorship of this species is in doubt because it has been described by both Poiret and Bruguière in the same year. We have only followed the usual attribution to Bruguière.

344 *Laevicardium crassum* (Gmelin, 1791)

Tebble, 1966: pl. 7 fig. f; Bouchet et al., 1979: 133, pl. 8 fig. 1; AG: 191.

More broadly-triangular instead of oval, with barely indicated radial ribs. In these characters this European species differs from the Mediterranean *L. oblongum* (Gmelin, 1791).

345 *Mactra stultorum* L., 1758

M. corallina L., 1758

Tebble, 1966: pl. 7 fig. j; Lucas, 1974b: 9; Bouchet et al., 1979: 133, pl. 8 fig. 14; AG: 192.

We have followed Lucas (1974b: 8) in considering *M. corallina* to be "an albinistic form" of *M. stultorum*. This species occurs in considerable numbers throughout Europe. Several other forms or varieties have been described but we agree with Lucas in considering all these to belong to this single species.

346 *Spisula subtruncata* (Da Costa, 1778)

Tebble, 1966: figs. 68C, D; Lucas, 1974b: 16; AG: 193.

This species, as well as the similar *Spisula solida* (L., 1758) and *S. elliptica* (Brown, 1827), has been critically reviewed by Van Urk (1959).

347 *Lutraria lutraria* (L., 1758)

L. elliptica, Lamarck, 1801

Tebble, 1966: 133, fig. 69; Lucas, 1974c: 16; Bouchet et al., 1979: 137, pl. 8 fig. 9; AG: 193.

One of the biggest European bivalves. Holme (1959) has pointed out the differences with the very similar *L. angustior* Philippi, 1844; these differences have been admirably illustrated by Tebble (1966: 135, fig. 71, 136, fig. 72).

348 *Lutraria magna* (Da Costa, 1778)

L. oblonga (Gmelin, 1791)

Tebble, 1966: 134 fig. 70; Lucas, 1974c: 20; AG: 194 (*L. oblonga*).

More slender and elongated than *L. lutraria*, with the posterior dorsal margin usually clearly curved upwards. Differences in the hinge-teeth are also present. Lucas (1974c: 18) believes that Da Costa's description and references are in fact attributable to *L. lutraria*, but his reasoning on this point is unclear and we prefer the name *L. magna*, also used by Van Urk (1980: 251) in his recent review of the genus *Lutraria* in Europe.

349 *Eastonia rugosa* (Helbling, 1779)

Lucas, 1974c: 19.

A well-known Lusitanian and West African species, rarely occurring in the extreme western Mediterranean and along the North African coast as far east as Tunisia (Salambo and La Goulette: colln. Van Aartsen).

350 *Ervilia castanea* (Montagu, 1803)

Tebble, 1966: 136, fig. 73; Lucas, 1975: 11, 22.

A small species, not very common. *Erycina pusilla* Philippi, 1836, is a variety of this species. *Ervilia nitens* Laskey, 1801, sometimes erroneously attributed to Montagu, 1808, is a West Indian species and does not live in European seas.

351 *Ensis arcuatus* (Jeffreys, 1865)

Tebble, 1966: pl. 10 figs. f, g; Van Urk, 1964: pl. 2 fig. 5; ST8: 21 row 3.

One of the largest species of the Solenidae in Europe.

352 *Ensis minor* (Chenu, 1843)

Van Urk, 1964: pl. 1 fig. 2; S: 77Bi01; ST8: 21 row 2; AG: 195.

Van Urk (1964) has given a critical review of the genus *Ensis* in Europe and we refer to that paper for the differences between the various species. Although the name suggests otherwise, specimens of *E. minor* can grow up to about 17 cm length.

353 *Tellina tenuis* Da Costa, 1778

Tebble, 1966: pl. 9 figs. i, j; ST2: 21 row 5, 6; Bouchet et al., 1979: 129, pl. 6 fig. 14; AG: 198.

A well-known species, with cardinal as well as lateral teeth. The superficially similar *Macoma balthica* (L., 1758) has no lateral teeth.

354 *Tellina incarnata* L., 1758

ST1: 21 row 3; AG: 196.

Bigger than *T. tenuis*, only slightly inaequilateral and with concave posterior dorsal hinge-line. Sometimes the Atlantic form is separated under the name of *Tellina squalida* Pulteney, 1799. Some authors have doubted the identity of Linné's species with the one under discussion and have used *T. squalida* for both the Atlantic and the Mediterranean forms.

355 *Tellina donacina* L., 1758

Tebble, 1966: 146, figs. 74a, b; ST1: 21 row 5; AG: 196.

A rather common species, occurring all over Europe. The outside shows fine concentric ridges.

356 *Tellina planata* L., 1758

ST1: 21 row 7; AG: 197.

A relatively large, white shell which occurs throughout the Mediterranean.

357 *Tellina serrata* Brocchi, 1814

ST2: 21 row 2; AG: 198.

Characterized by fine, raised, concentric lamellae. The species is usually found in somewhat deeper water.

358 *Tellina pulchella* Lamarck, 1818

ST2: 21 row 3; AG: 197.

This species is somewhat like *T. donacina*, but larger, less inaequilateral and more slender.

359 *Macoma melo* (Sowerby, 1870)

Spada & Maldonado Quiles, 1974: tav. 1 fig. 14.

Known already from southern Spain. Characterized by its pink colour. Differs from the whitish, more oval, *M. cumana* (O. G. Costa, 1829) (= *Tellina costae* Philippi, 1836) by its less diverging cardinal teeth in the left valve.

360 *Gastrana fragilis* (L., 1758)

Tebble, 1966: 149, fig. 76; ST2: 21 row 9; Bouchet et al., 1979: 131, pl. 7 fig. 12; AG: 199.

A species without lateral teeth, concentrically striate on the outside. It occurs all along the European coasts, usually in somewhat brackish environments.

361 *Donax venustus* Poli, 1795

ST3: 21 row 6; AG: 200.

Differs from the similar *D. semistriatus* Poli, 1795, in the absence of the characteristic spiral grooves.

362 *Donax trunculus* L., 1758

ST:3: 21 row 1, 2; Bouchet et al., 1979: 135, pl. 9 fig. 2; AG: 200.

The inside of the ventral margin is finely crenulated.

363 *Donax variegatus* Gmelin, 1791

Tebble, 1966: pl. 10 fig. b; ST3: 21 row 7, 8; Bouchet et al., 1979: 135, pl. 9 fig. 1; AG: 199.

Contrary to the preceding species, the inside of the ventral margin is absolutely smooth. The form of the valves is also clearly less inaequilateral.

364 *Psammobia depressa* (Pennant, 1777)

Tebble, 1966: 156, fig. 80a; ST4: 21 row 1, 2, 3; Bouchet et al., 1979: 133, pl. 8 fig. 10; AG: 200.

More or less rounded anteriorly and posteriorly. A widely distributed species, well-known from the Atlantic and the Mediterranean.

365 *Psammobia costulata* Turton, 1822

Tebble, 1966: 157, figs. 81a, b; ST4: 21 row 5; Warén, 1983: pl. 9 figs. 1-4.

Warén (1983) has figured two syntypes of this rather rare species. It is usually found in somewhat deeper water and occurs all along the coasts of Europe.

366 *Scrobicularia plana* (Da Costa, 1778)

Tebble, 1966: 20, fig. 10; ST5: 21 row 1; Bouchet et al., 1979: 133, pl. 8 fig. 13; AG: 201.

A very common and well-known species. It might be worth noting that the species of *Scrobicularia* Schumacher, 1817, do not possess lateral teeth, whereas the *Abra* species, which may be superficially similar, do have these teeth.

367 *Scrobicularia cottardi* (Payraudeau, 1826)

ST5: 21 row 2; AG: 201.

Somewhat similar to the preceding species, but smaller and posteriorly acute instead of blunt. *S. cottardi* also somewhat resembles *Abra ovata* (Philippi, 1836), but the differences between the two genera are clearly manifested in both species.

368 *Abra alba* (W. Wood, 1802)

Tebble, 1966: 152, figs. 78a, b; ST6: 21 row 1; Bouchet et al., 1979: 129, pl. 6 fig. 15.

Occurring all along the coasts of Europe, rather common and well-known. The Mediterranean form of this species is somewhat smaller, slightly more inflated, and also more

transparent than the Atlantic one. The Mediterranean form is sometimes regarded as a separate species, *Abra pellucida* (Brocchi, 1814) (= *A. renierii* Bronn, 1832).

The specimen figured in AG (: 202) as *A. alba* belongs to *Abra longicallus* (Scacchi, 1834), a well-known species from deeper water.

369 *Venus verrucosa* L., 1758

Tebble, 1966: 115, pl. 8 fig. d; ST9: 21 row 1, 2; Bouchet et al., 1979: 135, pl. 9 fig. 10; AG: 204.

With very conspicuous, raised lamellae. Between the lamellae there are radial grooves. *Venus verrucosa* is the type species of *Venus* L., 1758.

370 *Circomphalus casina* (L., 1758)

Tebble, 1966: pl. 8 fig. e; ST9: 21 row 3; AG: 204.

With conspicuous, raised lamellae; in this species there are no radial grooves. We have followed Bowden & Heppell (1968: 268, note 114) in placing this species in *Circomphalus* Mörch, 1853.

371 *Chamelea gallina gallina* (L., 1758)

ST13: 21 row 1-5; AG: 207.

A well-known Mediterranean species in which the concentric ribs are rather irregular and flat-topped; the inside of the valves usually shows a purple blotch posteriorly.

The Atlantic subspecies, viz. *Chamelea gallina striatula* (Da Costa, 1778), has sharper and more regular concentric ribs and the inside of the valves is usually uniformly whitish.

372 *Clausinella fasciata* (Da Costa, 1778)

Tebble, 1966: pl. 9 figs. a, b, c; ST12: 21 row 1; Bouchet et al., 1979: 133, pl. 8 fig. 7; AG: 208.

Somewhat like the preceding species, but with only a few, very broad concentric ribs. This is the Atlantic form.

The Mediterranean form is known as *C. brongniarti* (Payraudeau, 1826) and differs from the Atlantic one by its relatively narrow, but widely spaced concentric ribs. We consider *Clausinella scalaris* (Bronn, 1831) a different, fossil species, although some recent forms of the present species resemble it superficially.

373 *Timoclea ovata* (Pennant, 1777)

Tebble, 1966: 116, fig. 62; ST12: 21 row 2; Bouchet et al., 1979: 133, pl. 8 fig. 6.

This European species is one of the few Veneridae with radial sculpture.

374 *Gouldia minima* (Montagu, 1803)

Tebble, 1966: pl. 9 figs. d, e; Martino, 1973: 12.

This species, like the preceding one, occurs along the Atlantic coast as well as in the Mediterranean. Practically without sculpture and rather flat.

375 *Dosinia lupinus* (L., 1758)

Tebble, 1966: pl. 11 fig. a; ST10: 21 row 4; Bouchet et al., 1979: 133, pl. 8 fig. 5; AG: 205.

Both this and the next species occur all along the coasts of Europe. Both have spiral sculpture, which is finest in *D. lupinus*.

376 *Dosinia exoleta* (L., 1758)

Tebble, 1966: pl. 11 fig. b; ST10: 21 row 5; Bouchet et al., 1979: 133, pl. 8 fig. 4; AG: 205.

Apart from the clearly coarser concentric sculpture, this species can also be separated from the preceding one by its somewhat more oval shape.

377 *Pitar rudis* (Poli, 1795)

ST10: 21 row 3; AG: 205.

A more southern species, with fine, regular, concentric sculpture; rather swollen. This species is most common in somewhat deeper water.

378 *Callista chione* (L., 1758)

Tebble, 1966: pl. 8 fig. b; ST10: 21 row 1; Bouchet et al., 1979: 137, pl. 10 fig. 4; AG: 205.

The smooth and very shiny surface of this European species makes it unmistakable.

379 *Irus irus* (L., 1758)

Tebble, 1966: pl. 7 fig. g; ST10: 21 row 2; Bouchet et al., 1979: 133, pl. 8 fig. 11; AG: 208.

This shell is usually irregularly rectangular and has a sculpture of widely spaced, concentric, raised lamellae.

Bowden & Heppell (1968: 260, note 71) have convincingly demonstrated that this species should be placed in *Irus* F. C. Schmidt, 1818, of which genus it is the type species by tautonymy.

380 *Tapes decussatus* (L., 1758)

Tebble, 1966: pl. 8 fig. h; ST11: 21 row 1, 2; Bouchet et al., 1979: 135, pl. 9 fig. 8; AG: 208.

Tapes decussatus has a clearly visible radiating sculpture in addition to the concentric striae. In *Paphia aurea* the sculpture is almost only concentric. As in the two *Paphia* species mentioned below, the pallial sinus is shorter than in *Venerupis senegalensis* (see below), whereas it is not confluent with the pallial line.

381 *Paphia aurea* (Gmelin, 1791)

Tebble, 1966: pl. 8 figs. i, j; ST11: row 4; Bouchet et al., 1979: 135, pl. 9 fig. 4; AG: 207.

Apart from the differences mentioned above, the inside of the valves of this species is usually golden-yellow, hence its name.

382 *Paphia rhomboides* (Pennant, 1777)

Tebble, 1966: 120, fig. 63b, pl. 8 fig. f; Bouchet et al., 1979: 133, pl. 8 fig. 9; AG: 207; ST11: 21 row 7, the two figures at the right.

The pallial sinus and the pallial line enclose only a very narrow space, in which respect *P. rhomboides* differs from the preceding species.

383 *Venerupis senegalensis* (Gmelin, 1791)

Venus pullastra Montagu, 1803

Tebble, 1966: pl. 8 fig. g; ST11: 21 row 3 (*V. geographica*); Bouchet et al., 1979: pl. 9 fig. 5; AG: 206.

This species has long been known as *Venerupis pullastra*, but Bowden & Heppell (1968: 261, note 74) have demonstrated that *V. senegalensis* is the right name to be used for it, *V. geographica* (Gmelin, 1791) is a synonym.

The pallial sinus reaches to about midway in the valves and is confluent with the pallial line for a certain distance; this in contrast to the species of *Tapes* and *Paphia*.

384 *Petricola lithophaga* (Retzius, 1786)

ST14: 18 fig. 2; Bouchet et al., 1979: 139, pl. 11 fig. 5; AG: 209.

This species can be separated easily from *Barnea candida* (L., 1758), the only other boring bivalve found near Algeciras, because *P. lithophaga* has clearly developed teeth, whereas *B. candida* has none.

385 *Sphenia binghami* Turton, 1822

Tebble, 1966: 169, fig. 90; Warén, 1983: pl. 10 figs. 1-4.

A well-known species.

386 *Corbula gibba* (Olivi, 1792)

Tebble, 1966: 171, fig. 91; ST15: 21 row 1; AG: 209.

A well-known and unmistakable European species.

387 *Gastrochaena dubia* (Pennant, 1777)

Tebble, 1966: pl. 11 fig. 1; Bouchet et al., 1979: 139, pl. 11 fig. 2; ST15:21; AG: 210.

This bivalve is known as a borer in hard substrates (sandstone, limestone, etc.). The valves are widely gaping.

388 *Pholas* cf. *dactylus* L., 1758

Tebble, 1966: 176, fig. 94; AG: 211.

Maybe *Pholas callosa* Cuvier, 1817, is a separate species to which the fragment of a *Pholas* spec. which we found might belong.

389 *Barnea candida* (L., 1758)

Tebble, 1966: 181, fig. 96a; Bouchet et al., 1979: 139, pl. 11 fig. 6; AG: 212.

Besides the differences mentioned under *Petricola lithophaga*, the present species is also much larger and bores in softer substrates.

390 *Teredo* spec.

Several loose valves were found, but it has not been possible to name these.

391 *Thracia distorta* (Montagu, 1803)

Tebble, 1966: pl. 11 figs. g, h; AG: 214.

This is the only European *Thracia* species in which the posterior part of the shell is larger than the anterior part.

Problematical species

The following two species could not be identified satisfactorily.

392 "*Fossarus*" spec. L 1.9 (x 110; x 375)

We have studied 53 specimens (AD 9885/9, MK/6, RMNH/1, HA/37) of this species from Getares. The same species is known from the Ria de Arosa in northwestern Spain (AD 3793/3) and Alvor, Portugal (AD 16088/3). Although similar to species of the genus *Fossarus* Philippi, 1841, in general shape, the protoconch of our "*Fossarus*" spec. is quite different from that of the type species *Fossarus ambiguus* (L., 1758) (fig. 149).

393 Gen. et spec. unknown L 3.4 (x 110)

We could study 42 specimens (AD 17583/2, HA/10, MK/25, RMNH/5) of this very characteristic species, which has only been obtained at Getares. Even fragments and juvenile specimens can be recognized easily.

We realized that this might be a freshwater species, living e.g. in springs near Getares. However, similar pyrghuloid species are not known for the southern Iberian peninsula.

3. ADDITIONAL DATA FROM THE LITERATURE

Hidalgo (1917), summarizing the information on the Mollusca of the Bay of Algeciras, including the material obtained by the Porcupine expedition described by Jeffreys (1878-1885), records 163 species from "Algeciras", 114 of which were also found by us. From Gibraltar 202 additional species are recorded by Hidalgo. Of these, we have only found 77 species in our Algeciras material. This, however, is understandable because most of the species mentioned from Gibraltar clearly are derived from deeper water (circalittoral) and, therefore, would not be expected to be present among our beach or littoral material.

On the other hand 203 species were found in our material which are not mentioned by Hidalgo. These are mainly small to very small species of families such as Rissoidae, Caecidae, Cerithiopsidae, Pyramidellidae, Galeommatidae etc.

Quite recently, Garcia Gomez (1983a, b) has published two studies about the Mollusca of southern Spain, including the Bay of Algeciras. The first publication (1983a) concerns the Nudibranchia and can be regarded as a supplement to our own paper.

In the second publication Garcia Gomez (1983b) mentions 149 molluscan species from the Bay of Algeciras ("Sta. E4-Sta. E9"), including three cephalopods. Of these 149 species, 120 are mentioned by Hidalgo (1917) already. Of all the species mentioned by Garcia Gomez, we only did not find *Gibbula ardens*, *Jujubinus gravinae*, *Epitonium*

turtonae, "*Lunatia rizzae*", *Urosalpinx cf. fusulus*, *Chauvetia granulata*, *Mitrolumna olivoidea*, *Musculus discors*, *Lithophaga lithophaga*, *Crassostrea angulata*, *Cardita trapezia*, *Ventricoloidea nux* and the cephalopods. It may be questioned whether all these species are correctly identified. This is especially true for *Chauvetia granulata* and *Mitrolumna olivoidea*.

4. ZOOGEOGRAPHICAL NOTES

A total of 629 molluscan species is at present known from the Bay of Algeciras, including 36 nudibranchs and three cephalopods. The great majority of these species have a Mediterranean or European distribution.

Several species have a West African-Lusitanian distribution and, if occurring in the Mediterranean at all, they are found mainly along the North African coast. Among these can be mentioned: *Jujubinus ruscurianus*, *Calliostoma gubbiolii*, *Skeneopsis sultanarum*, *Barleeia compacta*, *Cingula aartseni*, *Cingula bruggeni*, *Alvania parvula*, *Alvania vermaasi*, *Mesalia mesal*, *Chauvetia pellisphocae*, *Mitrella bruggeni*, *Naytiopsis granum*, *Aciculina tingitana*, *Gibberula epigrus*, *G. oryza*, *Perna picta*, *Vasconiella jeffreysiana*, *Ungulina cuneata*, *Macoma melo*.

Only very few species have a mainly Atlantic distribution: *Monodonta lineata*, *Hydrobia joossei*, *Cingula pulcherrima*, *Plagyostila asturiana*, *Pseudopythina macandrewi*.

A few species are so far only known from a very restricted area. These species, among which *Dikoleps pruinosa*, *Tricolia nordsiecki*, *Aclis verduini* (known from Tangier), *Onoba moreleti* (known from the Azores), as well as the new species *Gibberula jansseni*, *Cypraeolina vanhareni* and *Mitrolumna wilhelminae*, might be more widely distributed, probably along the West African coast. *Alvania altenai* may prove to belong to the Mediterranean fauna.

5. GENERAL NOTES CONCERNING THE GENUS MITRELLA RISSO

Mitrella Risso, 1826

The European, mostly Mediterranean, species of this genus have always been problematical as regards identity. BDD (1882: 74) already wrote "nous croyons que les Columbelles méditerranéennes ne sont pas encore suffisamment connues pour qu'il soit possible d'établir aujourd'hui leur détermination définitive. Il existe, en effet, dans ce groupe des formes fort voisines, ...". Since then there have been two reviews by Kobelt (1889, 1900 and 1893-1895), based on material of Monterosato and Brusina. Some species were added by Monterosato (1889), by Pallary (1900, 1904), and by Coen (1933). Recently the genus has been reviewed by Schirò (1978d, 1979) and by Sabelli & Spada (GI19, 1981). The fact that Schirò (1978d: 8) writes "what we are trying to do is not a revision, but just a display of the already known taxa" and Sabelli & Spada (GI19, 1981) "Il nostro lavoro è consistito essenzialmente nell'individuare alcuni tipi morfologici ai quali vari Autori hanno affibbiato nomi specifici ..." shows, that we are still a long way from a satisfactory identification of the taxa concerned.

We also were not in a position to revise all the taxa, which have been mentioned in the literature as possibly belonging to the European fauna. Still, we think it useful to give a

list of the names we have encountered and their bibliography. In this connection it should be pointed out, that the two reviews by Kobelt were apparently written at the same time, but published in different years.

The following note by Monterosato (1890: 185) has caused much confusion: "Nel fasc. 8 dess' Iconografia des Dott. Kobelt, sono descritte e figurate varie specie di questa regione. Una di quest è la *M. intertexta* Reeve, (ex typo in Brit. Museum), alludendo alla *M. intexta*, Gaskoin; la *M. scripta* var. *elongata* B.D.D.; la *M. lanceolata*, Locard, con l'habitat erroneo delle coste di Provenza; la *M. spelta*, Monts. mss. e la *M. svelta* (Monts.) Kobelt." Most of the species mentioned in this note are not mentioned by Kobelt and several of the taxa are synonyms, as follows from our notes below.

The type species of *Mitrella* is *Mitrella flaminea* Risso, 1826 (= *Murex scriptum* L., 1758).

The following list contains all the species of *Mitrella* which we have found in the literature, with original references and notes. Valid species (not necessarily European) are marked with an asterisk.

(* *acuta*, *Columbella*, Kobelt (1889: 39, 40; 1893: 176, 177, Taf. 24 Fig. 8, 9; 1900: Taf. 40 Fig. 7, 8).

According to Kobelt this species is closely related to *M. gervillei* and some authors have considered it a form of that species from the North African (Tunisian) coast.

acutalis, *Mitrella scripta* var. Monterosato (1923: 10).

Described as "Nuova forma del gruppo della *Gervillei* Payr. ma attenuata alla punta. Unicolore cornea. Piuttosto rara". We consider this a dubious species.

brisei, *Columbella*. Brusina (1870: 133, 134).

See under *coccinea*.

* *broderipi*, *Columbella*. Sowerby (1844a: 53; 1844b: 143, 144, pl. 40 figs. 178, 179).

Described from specimens in the Broderip collection, originating from Alboran Island. The syntypes are still in BMNH (no. 198311). The study of these seven shells surprisingly showed them to be identical with what is usually known as *Mitrella hidalgoi*, as figured by Pallary (1902: pl. 1 figs. 5-7) and more recently by Schirò (1979: 8) as well as by Sabelli & Spada (GI19: fig. 8, as *P. dichroa*). On the back of the wooden tablet onto which these shells were originally glued, a note (in pencil) reads: "C. Broderipi Sow/Thes. Con. I f.178-9/The types/Sowerby's size line is too long/Old Coll.". The length of the specimens is between 6.1 and 6.4 mm, whereas the breadth varies between 2.8 and 3.0 mm. We have selected one of these specimens as the lectotype, a figure of which is given here (fig. 176a; L 6.2 mm).

Apparently nobody before us had studied this type-lot, which has led to the (erroneous) use of the name *broderipi* for the species figured by Spada & Maldonado Quiles (1974: 69, tav. 1 fig. 9), Schirò (1979: 8, various figs.), and Sabelli & Spada (GI19: second unpagged page, figs. 7a-c).

We consider *Mitrella broderipi* auct., not Sowerby, 1844, a valid species. Because we have not been able to identify this species with any of the many nonimal taxa dealt with in the present list, we introduce *Mitrella bruggeni* spec. nov. for it, primarily referring

to the description and differentiation by Sabelli & Spada cited above. Our Algeciras material is frequently decollate; the specimens have 7-8 teeth on the inside of the outer lip, as in *Mitrella scripta*, which is more slender than *M. bruggeni*, however.

Length of the shells 8.7-12.4 mm, breadth 3.9-5.2 mm.

This species is named in honour of Dr. A. C. van Bruggen, to acknowledge his agreeable cooperation as a malacologist with the third author.

Material. - Holotype (fig. 178): Spain, province of Cádiz, Getares (4 km S. of Algeciras), UTM TE89 (RMNH 55674). Paratypes: Type locality (AD 17633a/10, BMNH/2, MK/25, RMNH 55681/10, USNM/2); Spain, province of Málaga, Fuengirola, UTM UF54 (AD 10108/2).

In addition only the three shells figured by Sabelli & Spada (GI19: figs. 7a-c) should be considered paratypes. These specimens are from Morocco, viz. Ceuta, UTM TE97, and Restinga, Tetuan, UTM TE94, and from Spain, province of Málaga, Fuengirola.

bruggeni spec. nov., *Mitrella*. See *broderipi*, above.

Mitrella broderipi auct., not Sowerby, 1844.

**coccinea*, *Buccinum*. Philippi (1836: 225).

Proposed as variety c of *Buccinum linnaei* Payraudeau, 1826, by Philippi (1836: 225) with the following diagnosis "unicolor, aut serie punctorum minorum fuscorum prope suturam ornata, 7'" [= 15.3 mm] longa. Mart. 4, t. 150. f. 1410. - *Voluta nasuta* Gm. p. 3455."

We consider this to be the same as *Columbella brisei* Brusina, 1870, introduced for *Columbella nasuta* sensu Brusina, 1865, not Gmelin, 1791, and, according to Brusina (1865: 11), identical with Philippi's variety.

crossiana, *Columbella*. Récluz (1851: 257, pl. 7 fig. 5).

Considered synonymous with *M. gervillei* in the literature.

?*decollata*, *Columbella*. Brusina (1865: 10).

Brusina apparently was much impressed by "L'apice è troncato, cosa che non mi fu dato vedere in alcuna altra della nostra specie marine ...". The species was also found by the Pola Expedition (Station 260, 128 m deep) (see Sturany, 1896: 26, 27, Taf. 2 Fig. 44). This taxon is very closely related to *M. gervillei*; several authors (e.g. Monterosato, Kobelt, and Sabelli & Spada) consider it only a form of that species.

**dichroa*, *Columbella*. Sowerby (1844a: 50; 1844b: 129, 130, pl. 40 figs. 168, 169).

This well-known species was described from St. Vincent, a Caribbean island. We see no reason at all why this species should be identical with *M. hidalgoi*, as recently suggested by Sabelli & Spada (GI19: spec. 8). A good recent figure of *C. dichroa* is to be found in Warmke & Abbott (1961: pl. 20 fig. K).

The type material should be considered lost. In case *Columbella dichroa* should be proven to be identical with (the real) *C. broderipi* Sowerby, 1844, we propose, as first revisors of these two simultaneously published nominal taxa, that *M. broderipi* should be given priority. In the meantime *M. dichroa* Sowerby, 1844, is considered a separate, Western Atlantic species.

elongata, *Columbella scripta* var. BDD (1882: 75, pl. 13 figs. 3, 4).

Not *C. (rustica) elongata* Philippi, 1836.

Described as a variety of *M. scripta*; based upon specimens of "la faune des éponges (côtes de Barbarie)". According to the label, the syntypes are from Gabès. Kobelt (1893: 173; 1889: 36, 37) considered this a form of *M. scripta* and did not even mention the name *elongata*, contrary to the suggestion by Monterosato (1890: 185).

The two syntypes in MNHN clearly belong to a species very similar to *M. scripta*, but larger (L. 18.0 mm and 17.7 mm for the specimens of figs. 3 and 4, respectively) and with more oblique sutures. We have selected the specimen illustrated by fig. 3 as the lectotype. See also *spelta* and *lanceolata*.

flaminea, *Mitrella*. Risso (1826: 248, pl. 10 fig. 144).

On the basis of Risso's type material, Arnaud (1978: 117) has shown that this is indeed a synonym of *M. scripta* (L., 1758) as assumed by all authors before him.

**gervillei*, *Mitra*. Payraudeau (1826: 165 no. 332, pl. 8 fig. 21).

A good and generally recognized species, which is frequently decollate.

?*hidalgoi*, *Mitrella*. Monterosato (1889: 116).

Monterosato has described this species as follows: "C'est une nouvelle forme, à peu près de la grandeur du *M. minor*, Scacchi, mais appartenant au groupe du *M. scripta*, très solide, à tours ventrus, à suture marginée, à coloration fauve uniforme, etc. – var. *albida* – Mogador (Ponsonby)". We have some doubts whether the species of Monterosato is really the one figured as *Columbella hidalgoi* by Pallary (1902: pl. 1 figs. 5-7), upon which the current interpretation of this species is based. *C. hidalgoi* sensu Pallary is only 6.5 mm long and variegated with white dots. The specimen described and figured by Locard (1897: 143, 144, pl. 14 figs. 14-16), identified as such by Monterosato, turned out to be a worn, discoloured shell of only 5.3 mm; as far as could be concluded from this specimen (MNHN), it seems to be identical to *M. hidalgoi* Monterosato, sensu Pallary 1902. Unfortunately the original specimens upon which Monterosato based his description were not available for study.

**intexta*, *Columbella*. Gaskoin (1851: 7)

Described from the Cuming collection, originating from Australia. Mentioned only by Monterosato (1890: 185).

intertexta, *Columbella*. Reeve (1858: pl. 17 spec. 88).

Reeve apparently described the preceding species ("Mus. Cuming") and cited "Gaskoin, Proc. Zool. Soc." under this name from Australia. There can be no doubt that the correct name should be *intexta* Gaskoin. There is no reason to assume that this species occurs in European waters.

**kraussii*, *Columbella*. Sowerby (1844a: 53; 1844b: 144, pl. 40 fig. 180).

Described from a sample found by Dr. F. Krauss at Natal (South Africa). Watson (1897: 282) records it from Madeira and the Canary Islands, stating that it is like *C. broderipi* and suggesting that *Columbella albuginosa* Reeve (1859: pl. 35 spec. 223) might

be the same. Watson also writes "and probably *C. pediculus* Monterosato and some other Mediterranean forms which he individualizes ... are synonyms as well". We cannot agree with any of these suggestions as Sowerby (1844a: 53) describes his *C. kraussii* as "anfractibus 5-6, sub-ventricosis, longitudinaliter costellatis, costellis distantibus, interstitiis laevibus", whereas none of the species mentioned by Watson is axially ribbed. This taxon is classified with *Anachis* H. & A. Adams, 1853, by Kilburn & Rippey (1982: 96, pl. 22 figs. 3a, b).

**lanceolata*, *Columbella*. Locard (1886: 102, 539).

Proposed as a new name for *C. scripta* var. *elongata* BDD, 1882, not Philippi, 1836.

linnaei, *Buccinum*. Payraudeau (1826: 161, pl. 8 figs. 10, 11, 12).

Unanimously considered identical with *M. scripta* (L.) in the literature.

**minor*, *Columbella*. Scacchi (1836: 10, fig. 11).

Scacchi gives the length of his species as "Alt. lin: 4". His figure measures 18.5 mm. Although it is not known (to us) exactly which measure was meant by "lin." in this case, we may safely assume that Scacchi's figure was drawn at about two times magnification. BDD (1882: 78) and Locard (1892: 45) indicate 10 x 3.5 mm.

This species is the type of the (sub)genus *Columbellopsis* BDD, 1882. However, later on (1898: 766) BDD recognized the synonymy with *Atilia* H. & A. Adams, 1853. As long as the boundaries between species are so poorly known, as is the case in this group, we see no reason to place *M. minor* in a subgenus of its own.

nasuta, *Voluta*. Gmelin (1791: 3455).

This name has been used by Philippi (1836: 225) and by Brusina (1865: 11) to indicate a species which seems to be restricted to the Adriatic and which Brusina (1870) called *C. brisei*.

**nitidulina*, *Columbella*. Locard (1897: 143, 144, pl. 14 figs. 10-13).

This species was described after three specimens dredged by the *Talisman* off the coast of West Africa and near the Azores, at depths of between 2200 and 3000 m. According to that description it differs from most of the other species dealt with here by a thickened but smooth inside of the outer lip.

**pallaryi*, *Pyrene*. Dautzenberg (1927: 89).

Proposed as a nomen novum for *Columbella vulpecula* Pallary, 1900, not Sowerby, 1844. See under *vulpecula*.

?*parvula*, *Buccinum*. Dunker (1847: 64).

Dunker described this species from a doubtful locality "Ind. occid.?" and with a length of "3.5 lin.", which would mean 7.6 mm. Later on Philippi (1849: 65, 66, pl. 22.1 [*Buccinum* II] fig. 7) repeated Dunker's description and gave a figure in which the real length is indicated as about 9 mm. *Columbella parvula* was cited by Dautzenberg (1910: 60) from West Africa. Maybe Dautzenberg's specimens, which we did not study, are conspecific with *M. broderipi* auct., not Sowerby (= *Mitrella bruggeni* spec. nov.); it is

quite uncertain whether they are identical with *Buccinum parvula* Dunker, which we consider a nomen dubium.

**pediculus*, *Columbella*. Kobelt (1895: 178, 179, Taf. 24 Fig. 13, 14; 1900: 41, Taf. 40 Fig. 11, 12).

Kobelt described this species, citing Scacchi as its author. We have not been able to find any taxon published by Scacchi as *pediculus* so that the authorship must be that of Kobelt. *C. pediculus* has been considered a good species by both Schirò (1979: 7, 8) and Sabelli & Spada (GI19: spec. 6). Both authors use the name *pediculus* Monterosato, 1878, which, however, is a nomen nudum.

politum, *Buccinum*. Cantraine (1835: 17).

According to Monterosato (1878a: 104) this is *minor* Scacchi, 1836. We consider it a nomen dubium.

**scripta*, *Murex*. Linné (1758: 755, spec. 496).

The most abundant and best known species of the whole group.

(?)*spelta*, *Columbella*. Kobelt (1893: 174, 175, Taf. 24 Fig. 3, 4, 5, 10).

Kobelt clearly states "*Mitrella spelta* Monterosato in litt. - Kobelt Iconographia marina p. 37 t. 39 fig. 12-15 *svelta* ex err.)".

The species was mentioned and figured again, but not described, by Pallary (1904: 229, pl. 7 fig. 20) as *Mitrella spelta* Monterosato. The original description gives 22.5 mm, whereas the figure by Pallary shows a shell of about 18 mm length. As we have seen none of these shells we can only suggest that this species may be *M. lanceolata*.

svelta, *Mitrella*. Kobelt (1889: 37, Taf. 39 [publ. 1900] Fig. 12-15).

A misspelling for *spelta*; see under that name.

syrtica, *Mitrella*. Pallary (1906: 5).

In view of the dimensions cited by Pallary, 17 x 5.5 mm, this might be *lanceolata* Locard, 1886.

(*)*vatovai*, *Mitrella*. Coen (1933: 169, tav. 7 fig. 66).

Described and figured after one specimen only (16 x 7.5 mm). Schirò (1979: 8) doubts whether this is a *Mitrella* at all and Sabelli & Spada (GI19) do not mention it.

We have not seen the holotype, so that we are not able to express any opinion.

vulpecula, *Columbella*. Pallary (1900: 279, pl. 6 fig. 8), not Sowerby, 1844.

Pallary does not really describe but only figures the species (with Monterosato as its author). The measurements of his type specimen are given as 16 x 6 mm. He also mentions a variety *minor* (12. x 5 mm).

As we have not seen any type specimens it is difficult to express an opinion. The species described and figured by Sabelli & Spada (GI19: spec. 5) under this name is a good species, well characterized by its quite different protoconch (see especially their fig. 5a, illustrating a specimen from the bay of Almeria, Spain).

Because the name *Columbella vulpecula* was preoccupied by Sowerby, 1844, Dautzenberg (1927: 89) proposed the nomen novum *Pyrene pallaryi*.

As a general remark we want to add that varieties have been described for many species, such as *minor*, *lactea*, *albida*, as well as several other colour varieties. This underlines the variability of form and colour patterns within the species. Several species are prone to develop local forms or subspecies, especially along the North African coast. In our material from Algeciras we have recognized at least five species.

6. GENERAL NOTES CONCERNING THE FAMILY MARGINELLIDAE FLEMING

Marginellidae Fleming, 1828

Species of this family have been discriminated in the past on the basis of the number of teeth on the columella and the presence or absence of denticulations on the inside of the (usually thickened) outer lip. The first character seems reasonably practical, although the teeth rapidly become smaller the higher they are placed; the highest one can be quite obsolete but detectable in the one specimen and not discernible in another specimen of the same species.

The second character, the presence of denticulations on the inside of the outer lip, is apparently very variable indeed. Coomans (1975: 26) recorded specimens both with and without denticulations in *Prunum spryi* (Clover, 1974), *Bullata bullata* (Born, 1778), and *Prunum labrosum* (Redfield, 1870). The same phenomenon occurs in *Gibberula philippii* (Monterosato, 1878). The original description by Philippi (1844a: 197) says "denticuli labri minores" [as compared with *Gibberula miliaria* (L., 1758)]. BDD (1883: 124), however, declare "Labre simple non denticulé", Locard (1892: 41) "labre lisse", Nordsieck (1968: 153) "Lippe innen ganz fein gezähnel", Nordsieck & Talavera (1979: 155) "Labro finamente dentado en el interior", and finely Schirò (1981a: 19) "the outer lip that completely lacks denticulation". All the many specimens of this species we have seen do show a denticulation, albeit sometimes very faint and only visible under certain light conditions.

It thus seems reasonable not to attach too much importance on the presence or (near) absence of denticulation on the outer lip. For instance, most specimens of the Lusitanian *Gibberula epigrus* (Reeve, 1865) which we saw, show no obvious denticulation.

As a result it turns out that related species within the genera *Gibberula* Swainson, 1840, and *Cypraeolina* Cerulli-Irelli, 1911, to which the majority of the European species belong, can only be separated on the basis of the shell-form, which may be difficult.

Gibberulina Monterosato, 1884, has been proposed as a substitute for *Bullata* Jousseume, 1875, in order to avoid the combination *Bullata bullata* (see Monterosato, 1884: 139). Thus *Gibberulina* should not be used for the species related to *Voluta clandestina* Brocchi, 1814, which is the type species of *Cypraeolina*.

The type species of *Gibberula* is *Voluta miliaria* L., 1758.

The fact that from nearly all species varieties such as *minor*, *major*, *nana*, *elongata* and so on, besides numerous colour forms, have been described, makes us wonder how many species there are in Europe and surrounding seas. A complete revision of all the species

described is far beyond the scope of this paper. We have only tried to make a start, giving an annotated list of all species concerned as far as we know. Species from deep water are included although most have not been studied by us and are represented by only a few type specimens.

Our list, without colour forms, cites the genus in which the species was originally described; if a name is marked with an asterisk it concerns a valid species in our opinion.

* *abyssicola*, *Gibberula*. Locard (1897: 130, pl. 4 figs. 22-25).

According to Locard this species is also found at great depths in the Mediterranean.

* *atomus*, *Marginella*. Smith (1890: 267, pl. 23 fig. 12).

Described from St. Helena.

* *caelata*, *Marginella*. Monterosato (1877b: 44, pl. 2 fig. 3).

Described from Alger (ex Joly). The name is also spelt *coelata* by Monterosato in later publications and by other authors. The Hebrew University (HUJ) has four syntypes of this species, which we have seen. The dimensions range from 4.5 x 3.3 mm to 4.25 x 2.95 mm. All specimens are light yellowish-white with a very broad, vague red-brown band and orange-brown apical whorls. There are five or six teeth on the columella and the outer lip is finely denticulate within, the denticulation becoming coarser abapically.

As Pallary (1900: 216) mentions "Le type figuré mesure 4.5 mm", we have chosen the largest of the four syntypes as lectotype (fig. 193a; L 4.5 mm).

The shells are more pyriform than the rather cylindrical *Gibberula miliaria* (L., 1758) and the lowest tooth, which borders the canal, looks somewhat indented as if some material has been chipped off.

We know this species from the Bay of Algeciras, Algeria, off Sicily (Isola dei Porri and Isola di Porto Palo), and the southern Portuguese coast.

The two original labels, in Monterosato's handwriting, read "Gibberula caelata". One label says "d'Alger (Joly)" the other "Alger!!".

Contrary to what is stated by Mienis (1976: 8), the original Coen number on the box of these species is 2002, not 9858.

We did not detect any essential difference with the syntypes of *Gibberula recondita* Monterosato, 1884, in HUJ.

calameli, *Marginella*. Jousseau (1875: 5, t. 18 fig. 3).

This species has always been regarded as a form of *Volvarina mitrella* (Risso, 1826), with which opinion we entirely agree.

* *chudeaui*, *Marginella*. Dautzenberg (1910: 41, pl. 2 figs. 1, 2).

Described from the West African Atlantic coast; some authors have recently announced its presence in the Mediterranean (Alboran Seas) and along the Portuguese coast. However, in our opinion the figures given by e.g. Spada & Maldonado Quiles (1974: 69, fig. 13), Curini Galletti (1978: 7, fig. 5) and Schirò (1981a: 19) all apply to *Gibberula epigrus* (Reeve, 1865). The real *Gibberula chudeaui* is smaller (4 x 2 mm) and has a different shape according to Dautzenberg's figure.

We have not been able to study type material of this species.

* *clandestina*, *Voluta*. Brocchi (1814: 642, pl. 15 fig. 11).

Well-known throughout the Mediterranean. This species is the type of the genus *Cypraeolina* Cerulli-Irelli, 1911. It is not mentioned by Pinna & Spezia in their recent work on Brocchi's types. Figured by Schirò (1981b: 6).

coelata, *Marginella*. Monterosato (1878a: 109).

Apparently a different spelling for *caelata*.

* *consanguinea*, *Marginella*. Smith (1890: 226, pl. 23 fig. 11).

Described from St. Helena.

curta, *Volvarina*. Monterosato (1884: 138).

Described as a variety of *Volvarina mitrella*, but not sufficiently well defined to be recognized with certainty. Seems much like *calameli*.

* *epigrus*, *Marginella*. Reeve (1865: spec. 151, pl. 26 fig. 151).

Originally described from Mogador [= Es-Saouira] (Morocco) with dimensions of 5.5 x 3.0 mm according to the figure. Mentioned by Monterosato (1884: 139 and 1889: 119, "Coste di Barberia; Tanger (Ponsonby)"). The shell can easily be recognized as different from the very variable *Gibberula miliaria* (L., 1758) by its more slender shape and by the fact, that the inside of the outer lip is practically smooth. Figures of this species are mentioned under *chudeaui*.

exilis, *Voluta*. Gmelin (1791: 3444).

According to Schirò (1981a: 19) this is a senior synonym of *Gibberula epigrus*. However, Nordsieck & Talavera (1979: 154, pl. 38 fig. 5) use the name for quite a different *Volvarina* species and consider it synonymous with *Marginella triticea* (Lamarck, 1822) (= *fusca* Sowerby, 1846). Philippi (1836: 232) also regarded *Voluta triticea* and *V. exilis* as synonymous, but used these names for a Mediterranean species, which he later on (1844a: 197) recognized as different, describing it as *Marginella secalina*.

The original, vague description is based on a shell of 10-11 mm from an unknown locality. We have to consider *V. exilis* a nomen dubium.

* *guanacha*, *Marginella*. D'Orbigny (1839: 88, pl. 6 figs. 32-34).

A species from the Canary Islands, recently figured by Nordsieck & Talavera (1979: pl. 38 fig. 11). Inside of the outer lip straight over most of its length, differing in this respect from *Cypraeolina vanhareni* spec. nov. The "*Gibberula guanacha*" mentioned by Chaster (1896: 2) and Pallary (1920: 30) most probably is the latter species.

inflexa, *Marginella*. Sowerby (1846: 389, pl. 65 fig. 132).

No locality is mentioned in the original description. According to Monterosato (1884: 138) this is *Volvarina mitrella*.

inflexa, *Volvarina* (*mitrella* var.). Monterosato (1884: 138).

Whether or not Monterosato had *M. inflexa* Sowerby in mind, cannot be decided.

* *jansseni* spec. nov., *Gibberula*. See p. 40.

majuscula, *Marginella (miliaria* var.). BDD (1883: 123).

"Un peu plus grande que le type". Not figured and not recognizable with certainty.

majuscula, *Gibberula (miliaria* var.). Monterosato (1884: 138).

Marginella majuscula Monterosato, 1878a: 109 [nom. nud.].

The description by Monterosato reads "più del doppio, grande quanto la *M. oryza*, Lk., del Senegal e da sembrare una varietà bianca di essa".

Whether or not this is the same as *majuscula* BDD, 1883, seems somewhat questionable.

Later on Pallary (1900: 260) gave as dimensions 8 x 5.5 mm, although his figure (pl. 6 fig. 7) measures 8 x 5.0 mm. It seems likely that BDD, Monterosato and Pallary indicated the biggest specimens of the variable *Gibberula miliaria* by the name *majuscula*.

miliacea, *Volvaria*. Lamarck (1822: 364).

All authors agree that this nominal taxon is synonymous with *Gibberula miliaria*. The original, incomplete description does not give a locality, however, and the length indicated, viz. "près de 2 lignes", is not much more than 4.5 mm, which is rather small for *G. miliaria*. We therefore only tentatively agree with the present view.

Philippi (1836: 232) gives 5.5 mm for his *M. miliacea* Lamarck.

* *miliaria*, *Voluta*. Linné (1758: 730 spec. 354).

The dimensions given for this species by various authors differ a great deal: BDD (1883: 123), 7 x 4 mm; Locard (1892: 40), 6-8 x 3.5-4.5 mm; Philippi (1836: 232), 5.5 mm. In our experience the larger specimens are 5.5 to 6 mm. Monterosato (1884: 138) mentions the varieties *major* (typica), *media*, *minor*, *attenuata* and *cylindrica*, which are all nomida nuda. BDD (1883: 123) mention a var. *nana* as a "forme très petite".

Apparently this species is highly variable in dimensions and colour. Apart from the typical whitish form, there have been described various other colour-forms.

This species is the type of the genus *Gibberula* Swainson, 1840.

minor, not *Marginella minor* C. B. Adams, 1852.

For a number of species a variety *minor* has been described. We mention only the following.

minor, *Marginella (occulta* var.). Sturany (1896: 9).

Based on specimens in Monterosato's collection as "*obtusa*", with dimensions 2.1-2.2 x 1.6-1.7 mm. We have never seen such very swollen specimens.

minor, *Marginella (occulta* var.). Dautzenberg (1910: 44).

The dimension is given as "2 mm de hauteur". Specimens we have from the Mediterranean and which could belong to this variety are even smaller (1.7 x 1.1-1.2 mm) and usually have the teeth on the inside of the outer lip somewhat more pronounced than in *Cypraeolina occulta* (Monterosato, 1869), but apparently do not differ in other respects.

minor, *Marginella (turgidula* var.). Locard & Caziot (1900: 225).

"En dehors du type, nous signalerons une var. *minor* qui atteint à peine 2 mm de hauteur."

minor, *Gibberula (turgidula* var.). Pallary (1900: 261).

"De taille minuscule, quoique parfaitement adulte". This may be *Gibberula jansseni* spec. nov.

minor, *Gibberula (oryza* var.). Pallary (1920: 30).

"Haut. 4 à 4.5 mm".

?*minusculina*, *Volutella*. Locard (1897: 127, pl. 21 figs. 6-8).

We have no opinion as we did not see any type specimen.

minuta, *Marginella*. Philippi (1844a: 197, pl. 27 fig. 23).

Not *M. minuta* L. Pfeiffer, 1840, and, therefore, renamed *philippii* Monterosato, 1878. Philippi (loc. cit.) states: "denticuli labri minores" while comparing this species with *G. miliaria* (as "*M. miliacea* Lamarck").

**mitrella*, *Volva*. Risso (1826: 250, fig. 143).

A well-known species, which is the type of the genus *Volvarina* Hinds, 1844.

M. secalina Philippi is a synonym; *M. inflexa* Sowerby and *M. calameli* Jousseaume are forms of this species. Figured by Schirò (1981b: 6).

**monterosatoi*, *Gibberula*. Locard (1897: 131, pl. 4 figs. 26-28).

obtusa, *Marginella (occulata* var.) Monterosato (1878a: 109).

A nomen nudum, like *obtusa* Monterosato (1884: 139), and *obtusa* Locard (1897: 133). There are two more nominal taxa called *Marginella obtusa*, both described in 1870, by Sowerby and by Fuchs, respectively.

**occulata*, *Marginella*. Monterosato (1869: 17, pl. 1 fig. 10).

A good species, from somewhat deeper water, occurring throughout the Mediterranean. The original description does give no details about the structure of the inside of the outer lip. Locard (1892: 41) indicates "labre finement plissé", whereas Nordsieck (1968: 153) states "aber keine Zähnen an der inneren Lippe". Most specimens we have seen have teeth on the inside of the outer lip, but sometimes these are hardly detectable. Figured by Schirò (1981b: 6).

**oryza*, *Volvaria*. Lamarck (1822: 364).

A West African species, mentioned by Pallary (1902: 8; 1920: 30) from Tangier and found by us in the present material.

The original description gives the dimension as "3 lignes" (= 6.5 mm), which is rather small for the species.

parvulina, *Volutella*. Locard (1897: 126, pl. 21 figs. 3-5).

We have seen two syntypes, measuring 2.5 x 1.5 mm and 2.1 x 1.4 mm. The inside

of the outer lip is very clearly denticulate (not mentioned in the text), but still we consider this species synonymous with *Cypraeolina occulta* (Monterosato).

* *philippii*, *Marginella*. Monterosato (1878a: 109).

Nomen novum for *Marginella minuta* Philippi, 1844, not L. Pfeiffer, 1840.

Figured by Schirò (1981a: 18).

recondita, *Gibberula*. Monterosato (1884: 138).

Having studied the two syntypes in HNJ (no. 32431, ex Coen coll. no. 7831), which are 4.9 x 3.45 mm and 4.5 x 3.2 mm, uniformly white-yellowish, and more pyriform than *G. miliaria*, we can only conclude that Monterosato apparently did not consider the colouring very important, as is also apparent from his original diagnosis. Monterosato did not indicate dimensions. Locard (1892: 40) gives 6 x 4 mm, although it is not clear on what basis.

The label accompanying the syntypes (in Monterosato's handwriting) states "Palermo". Because the smallest of the two specimens is best preserved, we have selected this specimen (fig. 193b; L 4.5 mm) as lectotype of *G. recondita*. At the same time we consider this taxon synonymous with *G. caelata* Monterosato (see there). In this connection it is noteworthy that Monterosato (1884: 138) cites "Alger" as one of the localities of this species as well as of *caelata*. We are not sure what species Schirò's figure (1981a: 18) depicts.

* *retusa*, *Gibberula*. Locard (1897: 128, pl. 4 figs. 19-21).

According to Locard (1897: 130) this species has been dredged in deep water in the Mediterranean by the "Washington" expedition. Judging from the figure it is similar to, but more pyriform than *Gibberula philippii*. We did not see type specimens, which are from off the Atlantic Spanish-Portuguese coast and off Morocco. It seems that all the dimensions on Locard's plate 4 are too large as compared with the descriptions.

secalina, *Marginella*. Philippi (1844a: 197, pl. 27 fig. 19).

A synonym of *Volvarina mitrella*.

(?) *secrета*, *Gibberula*. Monterosato (1889: 118).

A type specimen from Casablanca, kept in HNJ (no. 32432, ex Coen 7834) has the dimensions 5.9 x 4.0 mm and is uniformly yellowish-white. We have not designated it as the lectotype, because the specimen is badly preserved and does not show the "deux fascies interrompus" mentioned in the original description as well as by Pallary (1920: 300), who considers *secrета* a colour form of "*G. miliaria*". We tentatively also consider *G. secrета* synonymous with the variable *G. miliaria*.

* *turgidula*, *Marginella*. Locard & Caziot (1900: 225).

A small *Gibberula*, closely related to *G. philippii*, judging from the description. The syntypes should be in the Monterosato collection, which is not accessible at present.

Figured by Schirò (1981a: 18). The species is also described by Pallary (1900: 261) "ex Monterosato" as *Gibberula turgidula*. Most probably Pallary's description was published in 1900 after that of Locard & Caziot, as is also accepted by Schirò (1981a: 18).

Because we have not been able to study type specimens, we can only tentatively assume that *G. turgidula* is a good species, different from *G. philippii*.

* *vanhareni* spec. nov., *Cypraeolina*. See p. 40.

(*) *vignali*, *Marginella*. Dautzenberg & Fischer (1896: 433, pl. 15 fig. 17).

Judging from the original figure, this species is similar to *G. philippii*, with which the authors did not compare it. However, as it was described from deep water near the Azores and because we did not see the type(s), we hesitate to simply consider it synonymous with *G. philippii*.

Sinistral specimens are known for several species, viz. *Gibberula miliaria*, *G. philippii* and *Cypraeolina clandestina* (see BDD, 1883: 123-126), as well as for *C. vanhareni* (p. 40) and *Volvarina mitrella* (see Schirò, 1981b: 7).

7. GENERAL NOTES CONCERNING THE FAMILY TURRIDAE SWAINSON

Turridae Swainson, 1840

The taxonomy at the family and generic level has been summarized by Powell (1942, 1966). We have principally followed his scheme of classification. The members of the subfamily Mangeliinae Fischer, 1887, included in *Mangelia* Risso, 1826 [type species, design. Hermannsen, 1852: *Mangelia striolata* Risso, 1826 (= *Murex attenuatus* Montagu, 1803)] and *Mangiliella* BDD, 1883 (type species, orig. design.: *Pleurotoma multilineolata* Deshayes, 1835), which occur mainly in the Mediterranean, have been listed by Van Aartsen & Fehr-de Wal (1978). As these authors have pointed out, following Powell (1942: 26), the primary difference between *Mangelia* and *Mangiliella* is found in the "polygyrate" (with several, narrow whorls) or "paucispiral" (with few, broad whorls) protoconchs, respectively. This same difference exists between two groups of species usually placed in a single genus, viz. *Bela* Gray, 1847 (type species, design. Gray, 1847: *Murex nebula* Montagu, 1803).

In the subfamily Daphnellinae Hedley, 1922, the same difference occurs between two groups of species. In the first group the protoconch consists of three to four relatively small whorls, with a characteristic diagonal sculpture. Such protoconchs have been well figured by Richter & Thorson (1975: Taf. 13 Fig. 86-91, Taf. 14 Fig. 92-95). We will show that the correct name for this group is *Raphitoma* Bellardi, 1847.

The second group encompasses species which when adult are very similar to those of the first group, except for the protoconch, which "resembles that of a *Trophon*, i.e. paucispiral and globular" (Powell, 1966: 125, sub *Raphitoma pseudohystrix*). It can be added that this protoconch is not smooth but spirally lirate; it looks exactly like the first whorl of the polygyrate protoconch of *Raphitoma*, but on a bigger scale. A good figure of this type of protoconch is given by Glibert (1954: pl. 7 fig. 7, as "*Raphitoma hystrix* Jan"); this picture is taken from a recent shell, *Philbertia pseudohystrix* (Sykes, 1906). This second group of species constitutes the genus *Philbertia* Monterosato, 1884, with the type species (by tautonymy) *Pleurotoma philberti* Michaud, 1829 (recorded as a synonym of *Pleurotoma bicolor* Risso, 1826).

The type species of *Raphitoma* Bellardi, 1847 (also cited as 1848; see the References, p. 93) has been much discussed. Powell (1942: 20; 1966: 125), following Woodring (1928), considered "*Pleurotoma hystrix* De Cristofori & Jan, 1832", as designated by Monterosato (1875b: 72), to be the type species, stating (1966: 125): "the case is complicated by the fact that the Italian Pliocene typical *hystrix* has a protoconch composed of 3-4 whorls, while in the recent shell, which Sykes named *pseudohystrix*, the protoconch resembles that of a *Trophon*, i.e. paucispiral and globular". Jeffreys (1870: 82) described the protoconch of the recent *Philbertia pseudohystrix* (Sykes, 1906) as follows (sub "*Defrancia hystrix*, Jan"): "the apex in the present species being twisted and spirally striated, like that of a *Trophon*!"

Because Gougerot & Le Renard (1981: 72, 73) argued that *Raphitoma vulpecula* Bellardi, 1847, should be considered the type species of *Raphitoma*, designated as such by Bellardi (1875), it is worth mentioning that the earliest type designation concerning *Raphitoma* is by Monterosato (1872: 16): "Il typo della *Raphitoma* è il *P. hystrix* di Jan, una specie che difficilmente può esser piazzata in uno dei generi conosciuti, poichè i caratteri dell'apice l'allontano dalla *Defrancia*, ed il taglio (échancre) presso la sutura, dalle altre *Pleurotomae*."

Several type specimens and other shells once belonging to the collection of De Cristofori & Jan have been discussed by Pinna (1971); some of these specimens have been figured as well. Among the figured shells there is one specimen, originally labelled *Pleurotoma hystrix*, which is designated as the lectotype of "*Raphitoma (Raphitoma) hystrix* (De Cr. e Jan, 1832)" by Pinna (1971: 440, pl. 76 fig. 1). This lectotype is from "Tabiano" (Pinna, 1971: 430), which implies that it represents a fossil species, ranging in possible age from Late Miocene (Messinian) to Middle Pliocene (Piacentian), as may be concluded from Barbieri & Selli (1971). Its protoconch, although only partly present, still clearly shows a characteristic diagonal sculpture (Pinna, in litt. to Van Aartsen). This is in agreement with the former opinion of Sykes (1906) and other authors, who considered the fossil and the recent "*hystrix*" not conspecific, the type designation of *Raphitoma* being based on the fossil taxon.

Most unfortunately there is a complicating factor, however, which has been overlooked for one and a half century. In contrast to what is suggested by e.g. Sherborn (1927: 3097), *Pleurotoma hystrix* De Cristofori & Jan, 1832, is a nomen nudum. The name is validated, in a slightly different spelling, as *Raphitoma histrix*, by Bellardi (1847: 85, tav. 4 fig. 14 [= 1848: 613, tav. 14 fig. 14]), who indicated, in addition to his description and figure: "1832 Pl. histrix Jan Cat. p. 10. n. 59. - 1845 Jan in litt. et specim." Although Bellardi (1847 [1848]) mentions only "Fossile dell'Astigiano" with the actual description (p. 85 [613]), the occurrence of the species outside the region of Asti, at "Fabbiano" is indicated in a table in the same publication (p. 116 [644]). Probably "Fabbiano" is an incorrect spelling of Tabiano, the locality east of Salsomaggiore in the province of Parma, where the lectotype selected by Pinna, mentioned above, had been obtained.

The specimen figured as *Raphitoma histrix* by Bellardi (1847: tav. 4 fig. 14 [= 1848: tav. 14 fig. 14]) is not listed by Ferrero Mortara et al. (1981) in their review of type specimens and figured specimens in the collections of Bellardi and Sacco, and, therefore, this only syntype with certainty may be considered lost. This specimen is quite different from the lectotype in the De Cristofori & Jan collection mentioned above. The shell

figured as "*Peratotoma hystrix* (Jan)" by Sacco (1904: tav. 13 fig. 37) is different again, and might represent a third species; this is rather surprising because we may accept that Sacco used the Bellardi collection for his studies.

Putting all facts and speculations together, we may say that it is not absolutely impossible that Bellardi did ever study the specimen from Tabiano labelled as *hystrix* in the De Cristofori & Jan collection. We also cannot exclude the possibility that more than one species was represented among the original type specimens of *Raphitoma hystrix*. The note "Jan in litt. et specim.", the citation of "Fabbiano" (= Tabiano) with the original description, and Sacco's (1904) figure of the species in contrast to that of Bellardi (1847), are important in this respect.

Although much can be argued against it, we propose to accept the selection by Pinna (1971: 440, pl. 76 fig. 1) of the lectotype for *Raphitoma hystrix* Bellardi, from the De Cristofori & Jan collection. Our main argument is, that the stability of nomenclature is served best by doing so.

The recent *Philbertia pseudohystrix* (Sykes, 1906) is well figured by a number of recent authors, e.g. Spada et al. (1973: 65, tav. 4 fig. 6), Terreni (1981: 63, tav. 6 fig. 7, as "*Raphitoma hystrix* De Cristofori & Jan") and by Bogi et al. (1980b: 19 fig. 2, as "*Raphitoma hystrix hispidula* Monterosato"). It is usually dredged from deeper water and rather rare. We did not find it in our material.

The Anglo-Belgian Pliocene fossil figured by Glibert (1960: pl. 4 fig. 18) and by Van Regteren Altena et al. (1961: pl. 18 fig. 171) as *Raphitoma hystrix* seems to agree best with *Philbertia frigida* (Monterosato, 1923), figured by Monterosato (1923: pl. 1 fig. 15) after a fossil shell from Ficarazzi.

The type species of the genus *Philbertia* Monterosato, 1884, is *Pleurotoma philberti* Michaud, 1829. As to the protoconch of this species, Monterosato (1884: 132) only indicates "Apice acuto"; in an earlier publication, however, he states (1875a: 48) "Apice contorto, microscopicamente puntilineato" (sub "*P. (Defrancia) Philberti*, Michaud"). Marshall (1912: 301) is more specific: "... in *C. bicolor* Risso (1826) = *C. philberti* Michaud (1829) the shell is more oblong, and the embryonic whorls are 1½, coarse, and blunt; in *C. purpurea* and var. *minor* they are 3½, conical, and sharp." Somewhat further on, writing about *P. laviae* Philippi, Marshall writes "*C. bicolor* Risso is similar in size, sculpture, and contour, but the apex is specifically different". The type of protoconch of *P. laviae* Philippi has been described earlier by Monterosato (1875a: 44) as follows: "apice conico, stiliforme e con i giri angolati". This is contrary to the remarks by Spada et al. (1973: 55) concerning their "*Philbertia laviae* (Philippi)" and "*Philbertia bicolor* (Risso)".

In our opinion there can be no doubt that *Pleurotoma laviae* Philippi, 1844, has a protoconch of the *Raphitoma*-type, with several angulate and diagonally cancellate whorls. This we concluded from many samples, identified by Monterosato, in IRSN. The protoconch of *Pleurotoma philberti* Michaud, 1829, is of the same type as that of "*Raphitoma pseudohystrix* Sykes, 1906; this paucispiral type of protoconch is typical for *Philbertia*."

Several authors in the past, e.g. Monterosato and Marshall, have assumed the synonymy of *Pleurotoma bicolor* Risso, 1826, and *Pleurotoma philberti* Michaud, 1829. However, Arnaud (1978: 109) recently stated that two syntypes of *P. bicolor* turned out to belong to "*Philbertia purpurea*, Montagu, 1803", which is an Atlantic species, not known with certainty from the Mediterranean, certainly belonging to *Raphitoma* as defined

above. These "syntypes", however, are 20 mm high, whereas Risso mentions only 12 mm, so that we cannot accept them as such. *Pleurotoma bicolor* Risso, 1826, remains an obscure nominal taxon.

Recognizing two genera we modify the classification given by Powell (1966: 125, 134) as follows.

Raphitoma Bellardi, 1847

Type species (design. Monterosato, 1872: 16): *Raphitoma histrix* Bellardi, 1847.

Homotoma Bellardi, 1875, not Guérin-Ménéville, 1844. Type species (design. Powell, 1966: 134): *Murex reticulatus* Renier, 1804 [Invalid name: Opinion 316 (1954)], = *Murex echinatus* Brocchi, 1814.

Peratotoma Harris & Burrows, 1891, nomen novum for *Homotoma* Bellardi, 1875, not Guérin-Ménéville, 1844.

Cirillia Monterosato, 1884, not Rondani, 1856. Type species (by monotypy): *Pleurotoma linearis* Montagu, 1803.

Lineotoma Nordsieck, 1977, nomen novum for *Cirillia* Monterosato, 1884, not Rondani, 1856.

Characterized by a polygyrate protoconch with three to four whorls; apart from the initial ones, these are diagonally cancellate and usually carinate. For the species with non-carinate, but still diagonally cancellate protoconch whorls, the subgenus *Leufroyia* Monterosato, 1884 [type-species (by tautonymy): *Pleurotoma leufroyi* Michaud, 1828] will be used.

Philbertia Monterosato, 1884

Type species (by tautonymy): *Pleurotoma philberti* Michaud, 1829.

Cordieria Monterosato, 1884, not Raoult, 1848. Type species (by tautonymy): *Pleurotoma cordieri* Payraudeau, 1826, sensu Monterosato, 1875.

Adult shells are very similar to *Raphitoma*, but differ by a paucispiral protoconch of only about 1.5 whorls, which shows spiral lines with rows of punctures.

Although a critical evaluation of all European *Raphitoma* and *Philbertia* species described is far beyond the scope of this paper, we will at least indicate a few species about whose classification we are already certain.

Raphitoma (*Raphitoma*)

- R. (R.) echinata* (Brocchi, 1814)
- R. (R.) histrix* Bellardi, 1847
- R. (R.) laviae* (Philippi, 1844)
- R. (R.) linearis* (Montagu, 1803)
- R. (R.) pupoides* (Monterosato, 1884)
- R. (R.) purpurea* (Montagu, 1803)
- Raphitoma* (*Leufroyia*)
- R. (L.) leufroyi* (Michaud, 1828)
- R. (L.) concinna* (Scacchi, 1836)
- R. (L.) erronea* (Monterosato, 1884)

Philbertia

- P. alternans* Monterosato, 1884
- P. cordieri* (Payraudeau, 1826)
- P. corbis* (Michaud, 1838)
- P. horrida* (Monterosato, 1884)
- P. nivea* (Marshall, in Sykes, 1906)
- P. pallaryi* Nordsieck, 1977
- P. philberti* (Michaud, 1829)
- P. pruinosa* (Pallary, 1906)
- P. pseudohystrix* (Sykes, 1906)

Many of these species have been figured by Spada et al (1973: 65, tav. 4) and Bogi et al. (1980b: 19; 1980c: 15), but many specimens are not correctly identified by these authors.

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- N. B.: This series of plates with text is published under various headings in "La Conchiglia". The "Tav. 17" has been published anonymously, but should be ascribed to J. J. van Aartsen. The first 16 tables of the series, which also have been published anonymously, should be ascribed to K. & M. Angioy, as may be concluded from a note with table 24 (Nicolay & Angioy, 1983: 18). The series started as "Synoptic tables of Mediterranean and European shells", whereas the most recent part of it (table 24) has been published under the heading "Synoptic Tables of Eur. & Medit. Conchology"; other headings occur, but confusion is not likely to occur.
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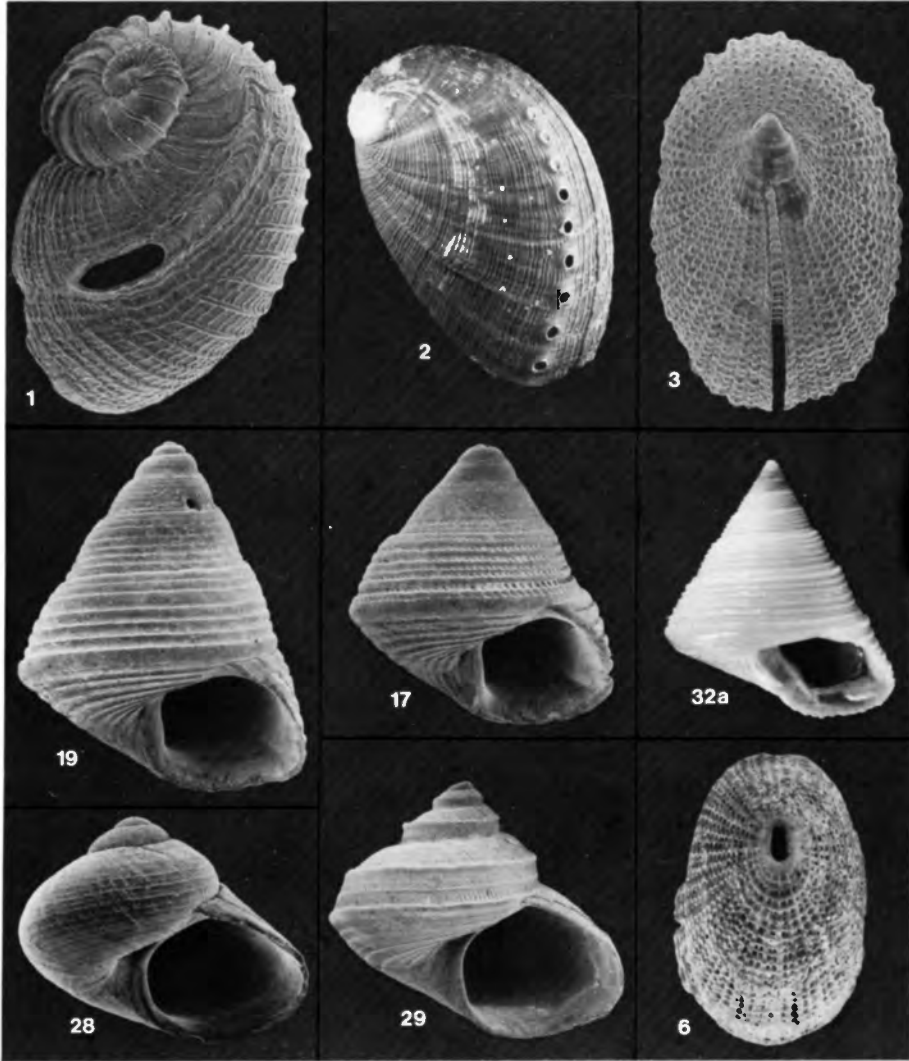
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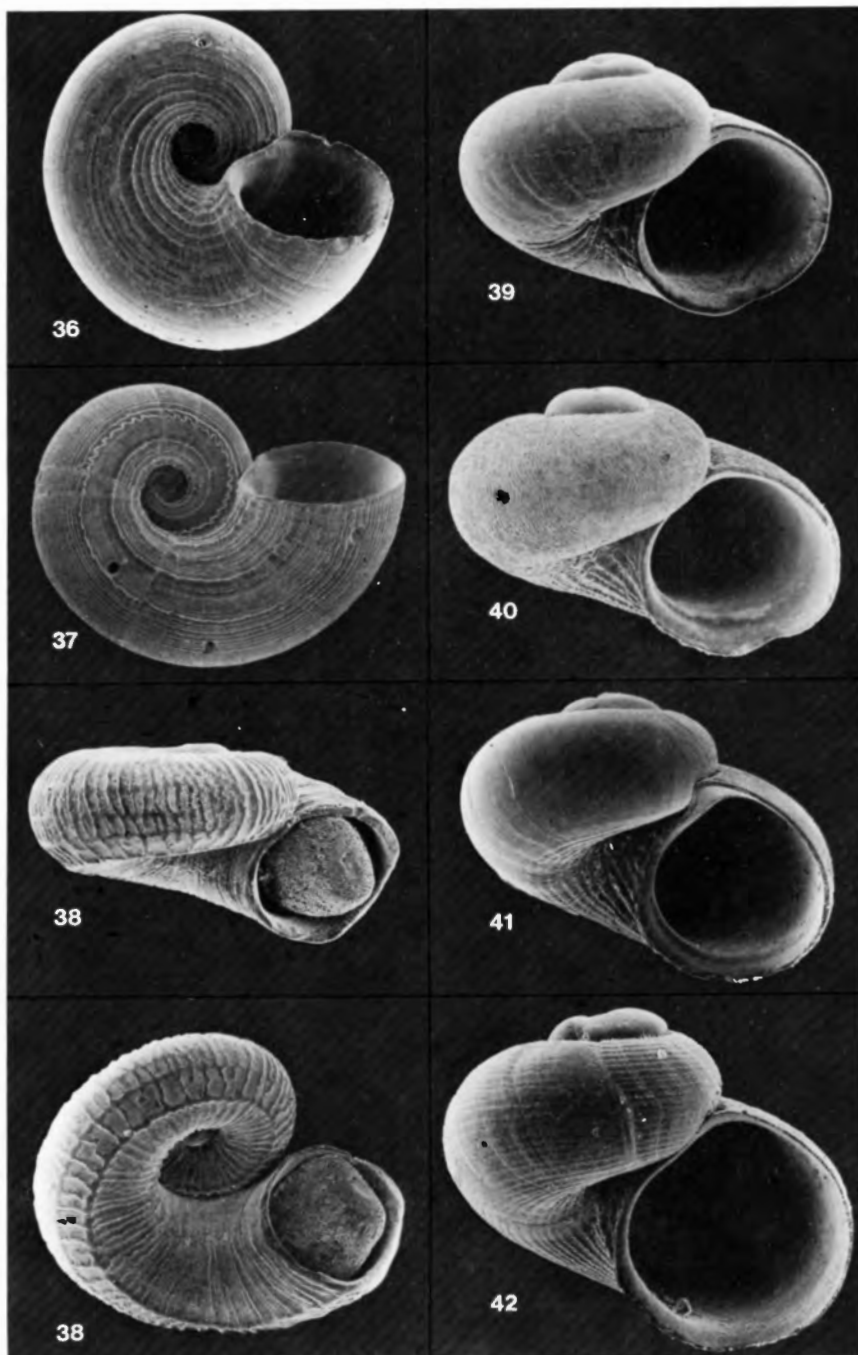
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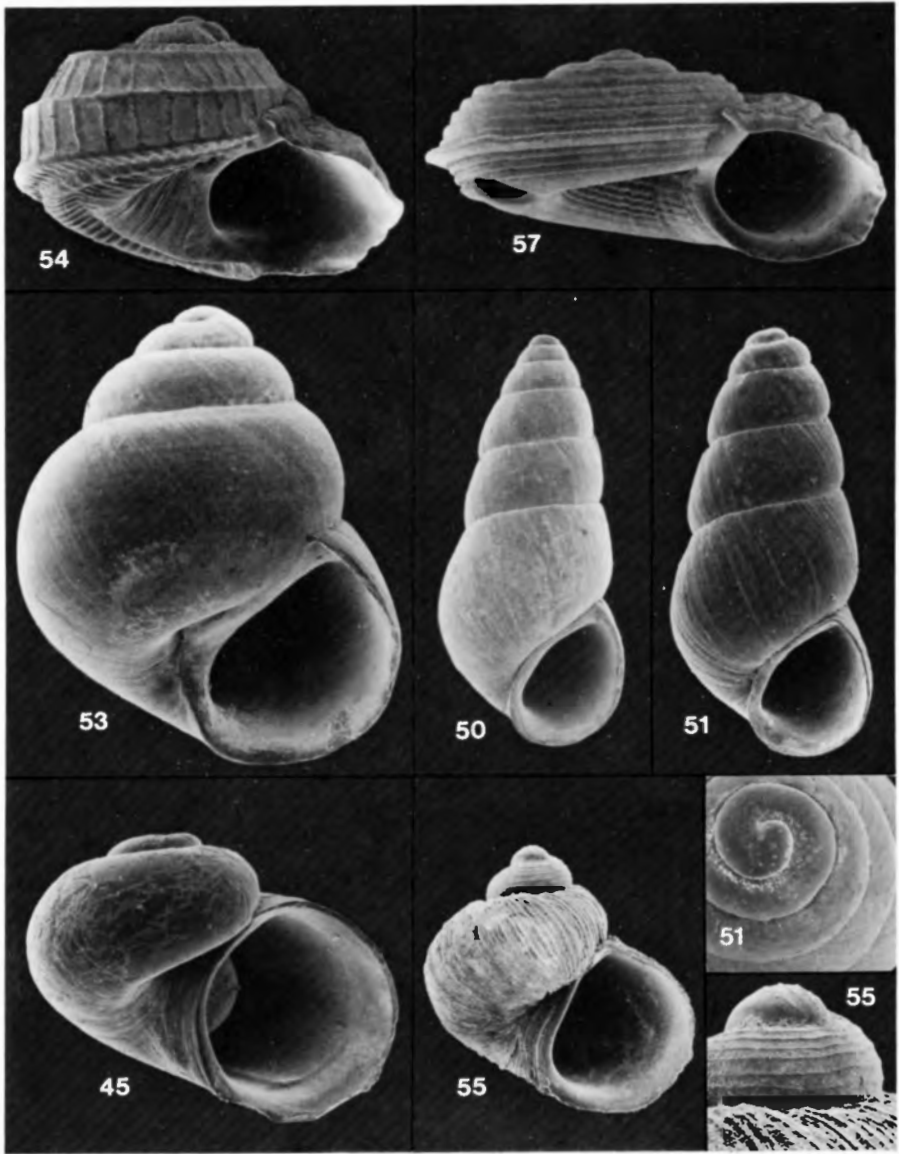
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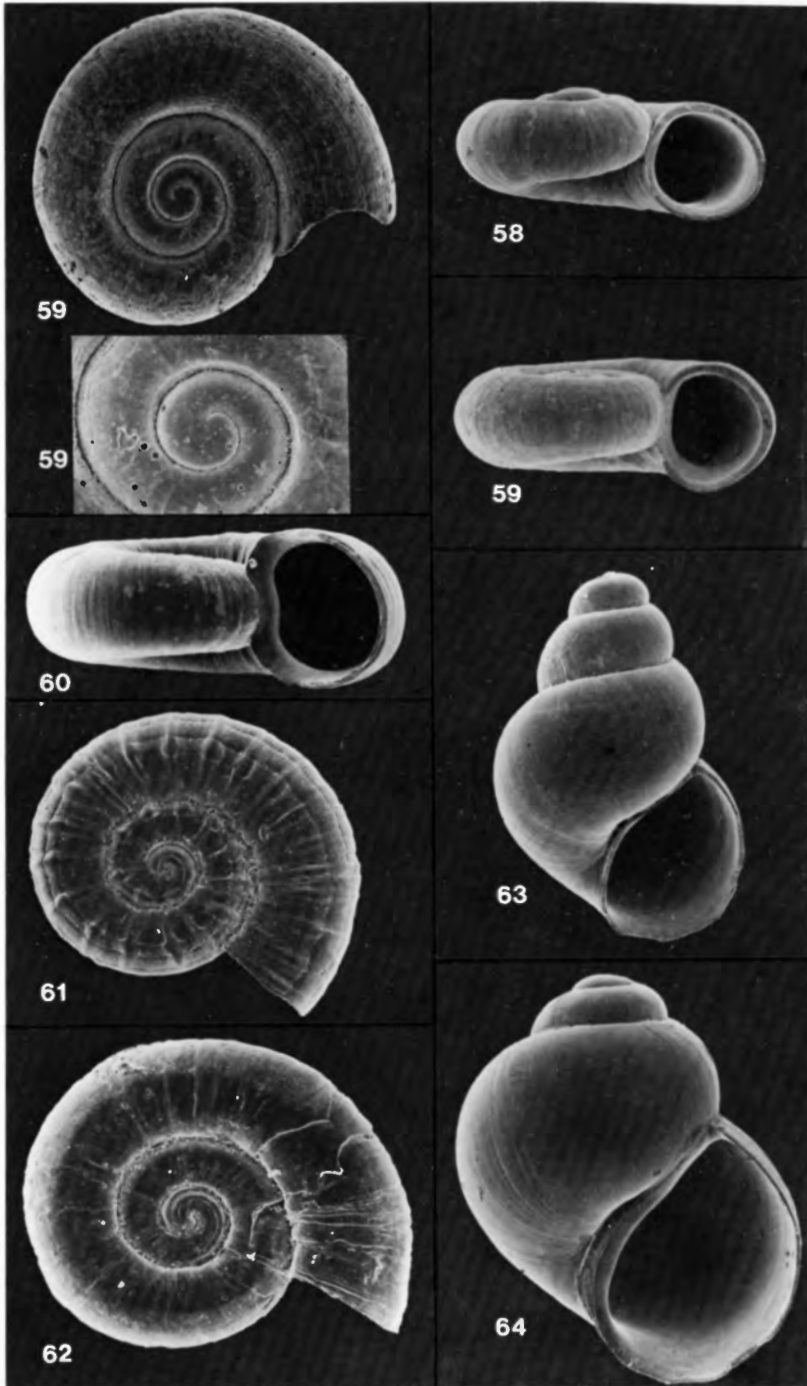
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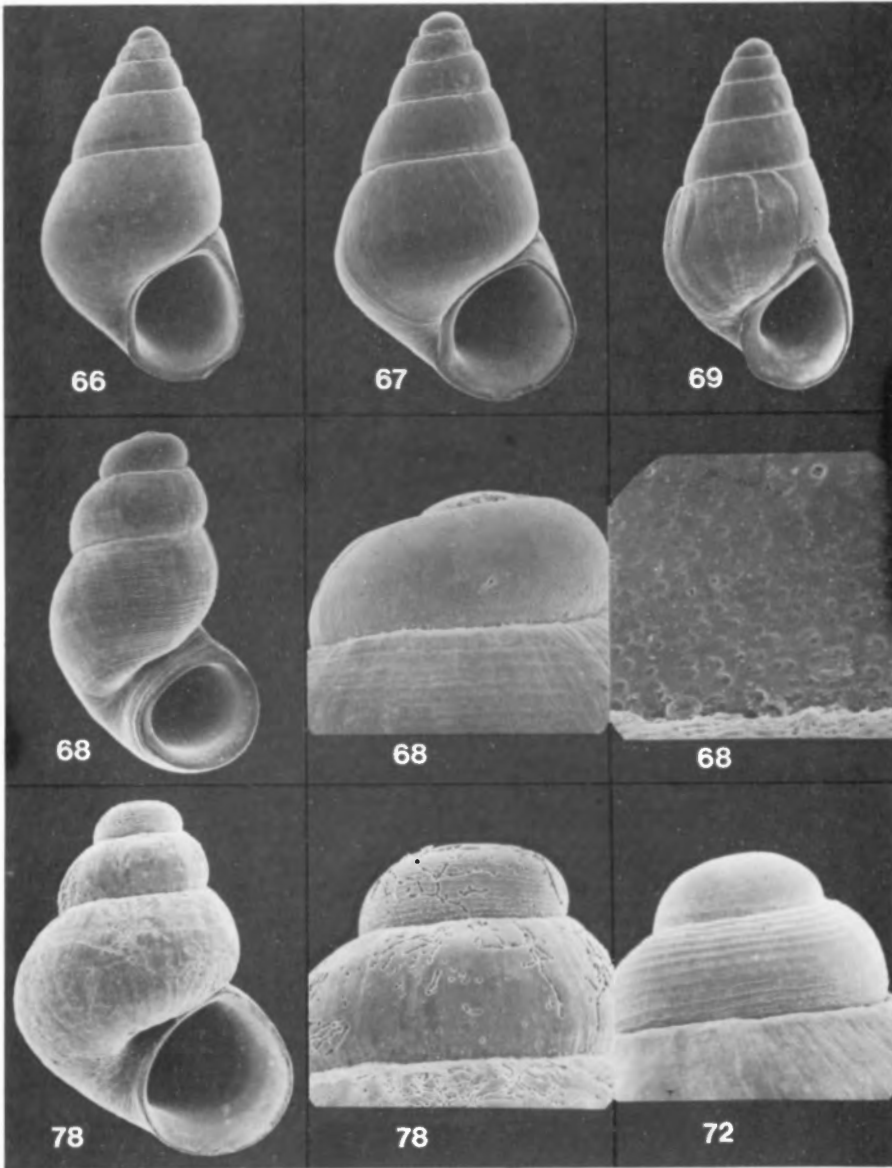
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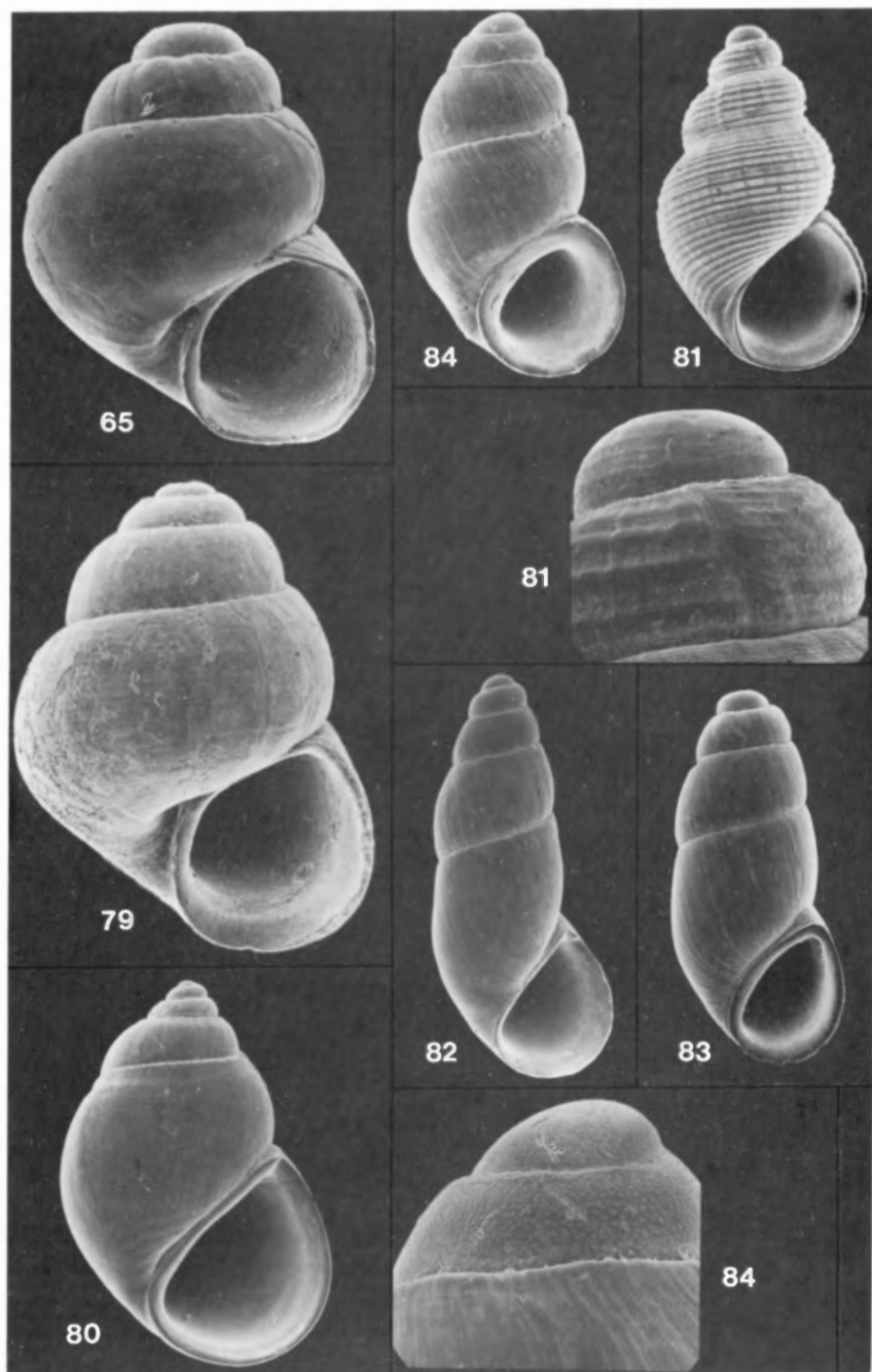


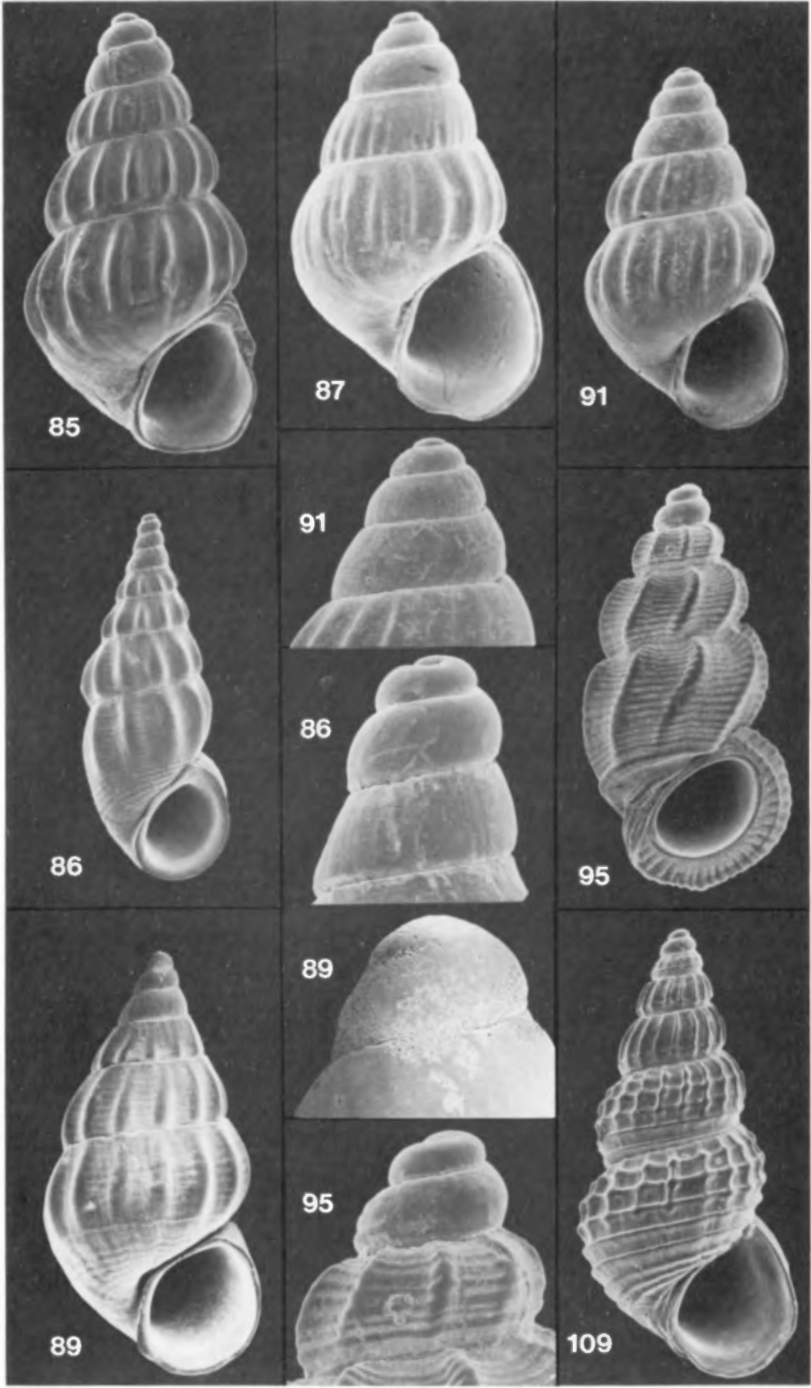


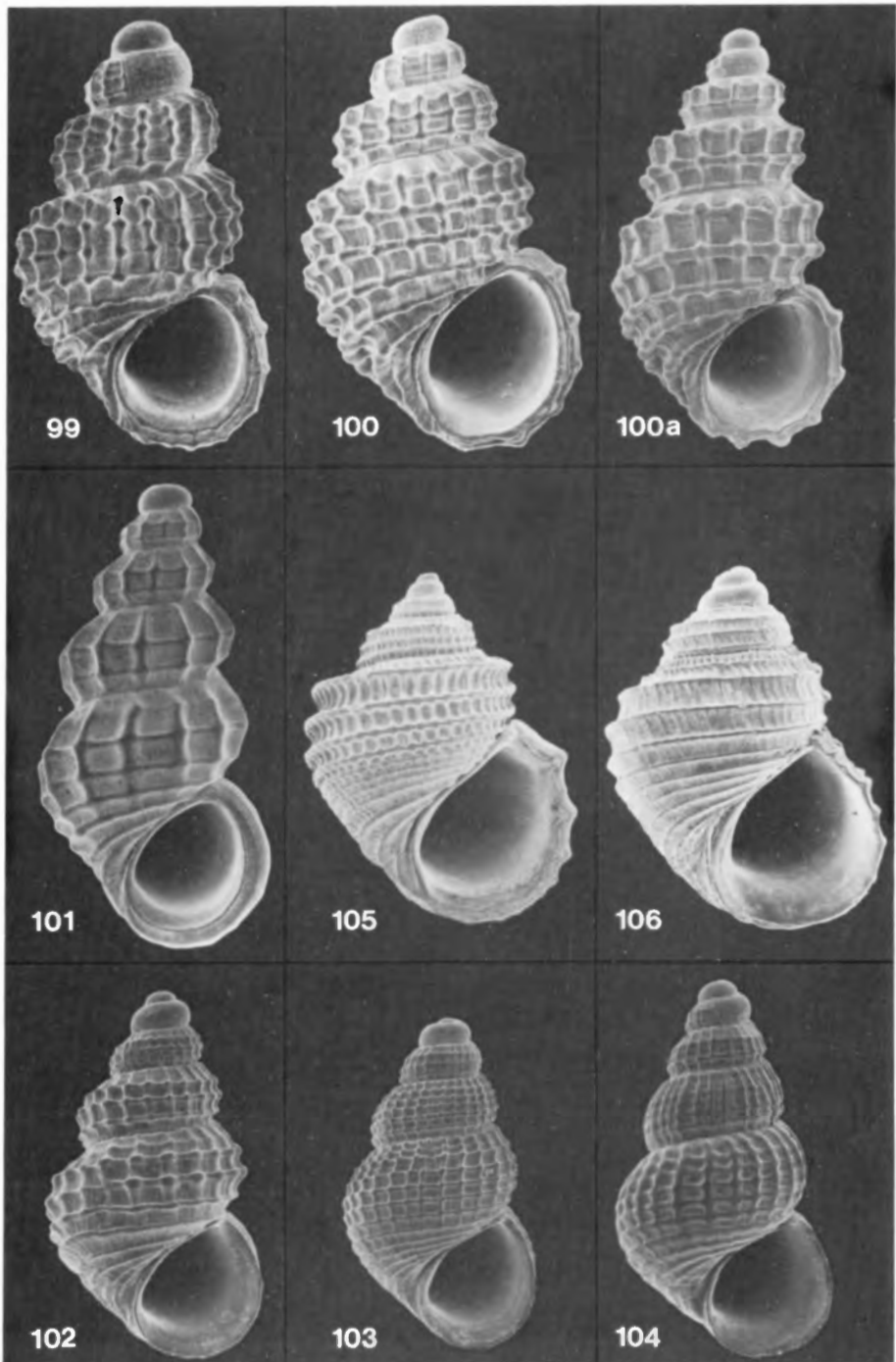


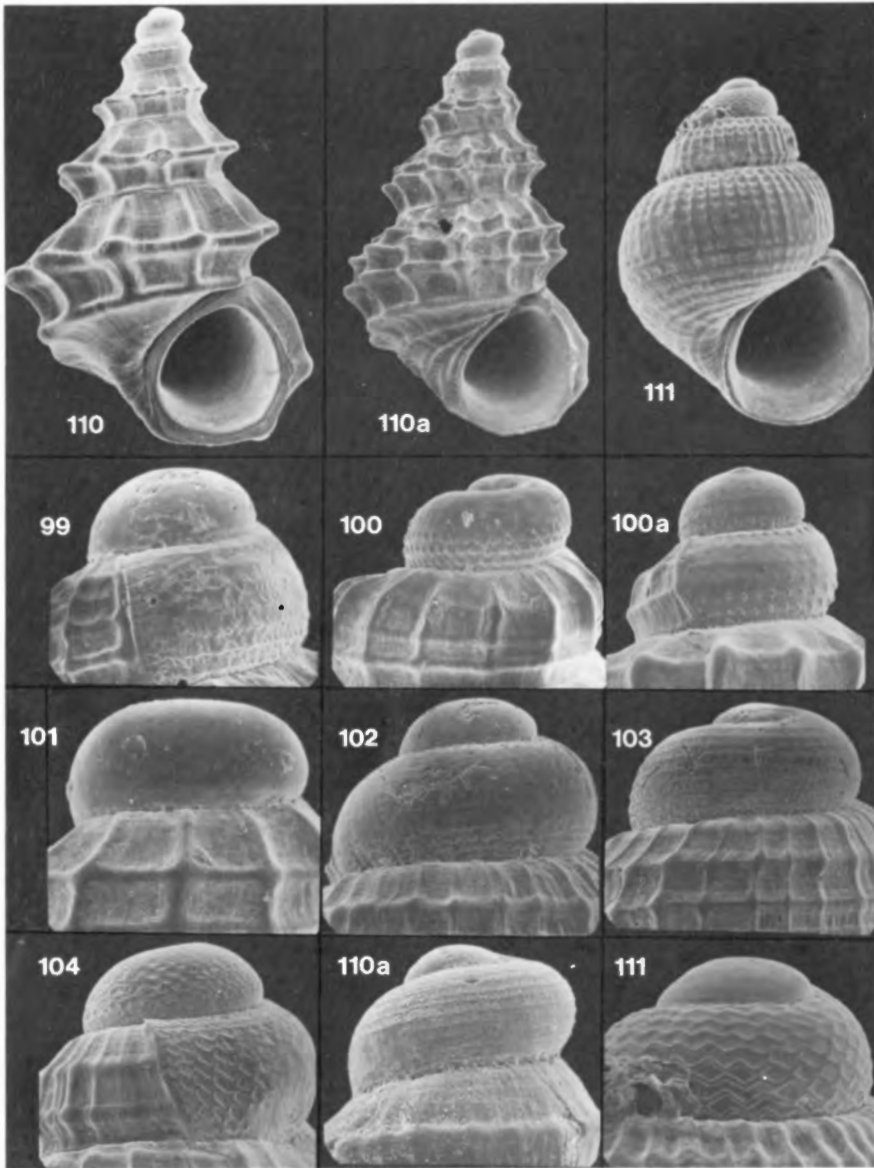


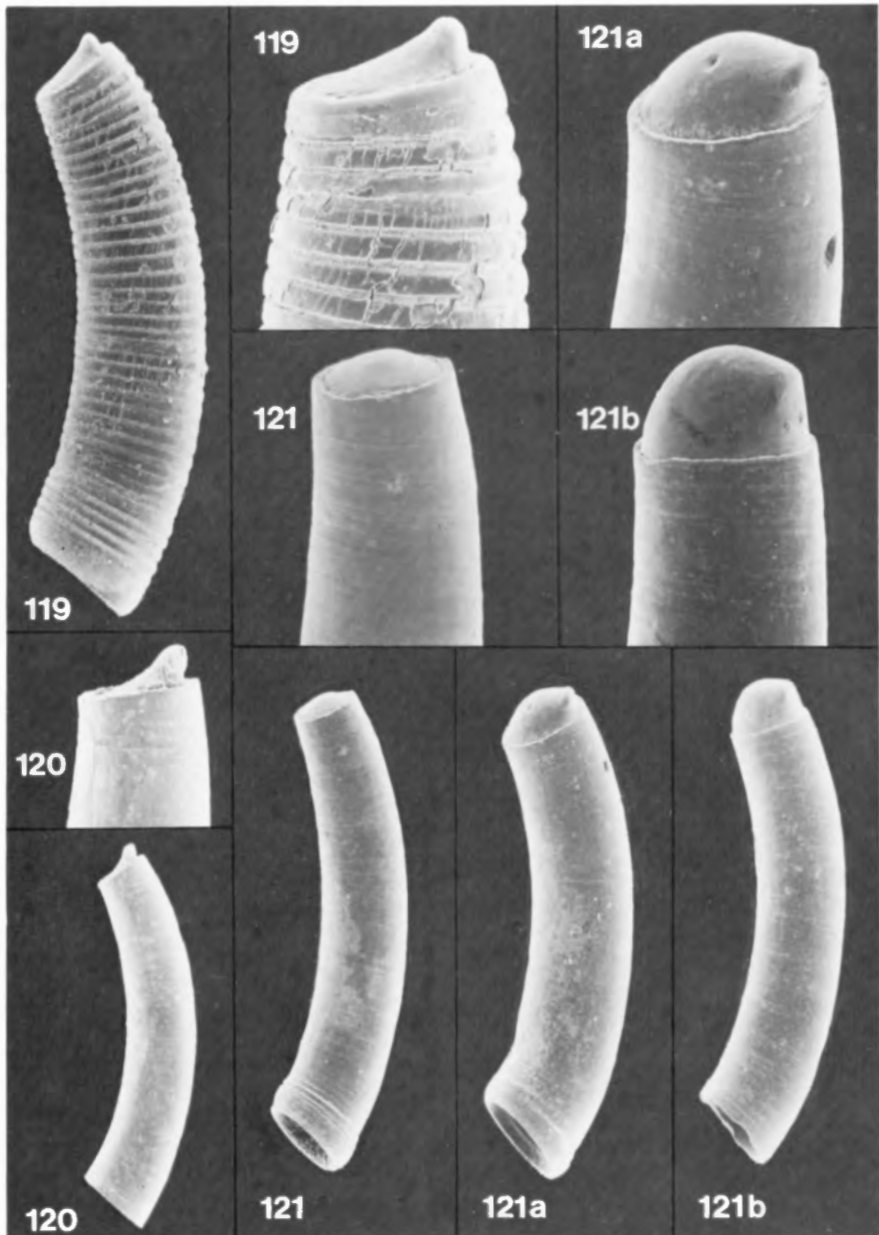


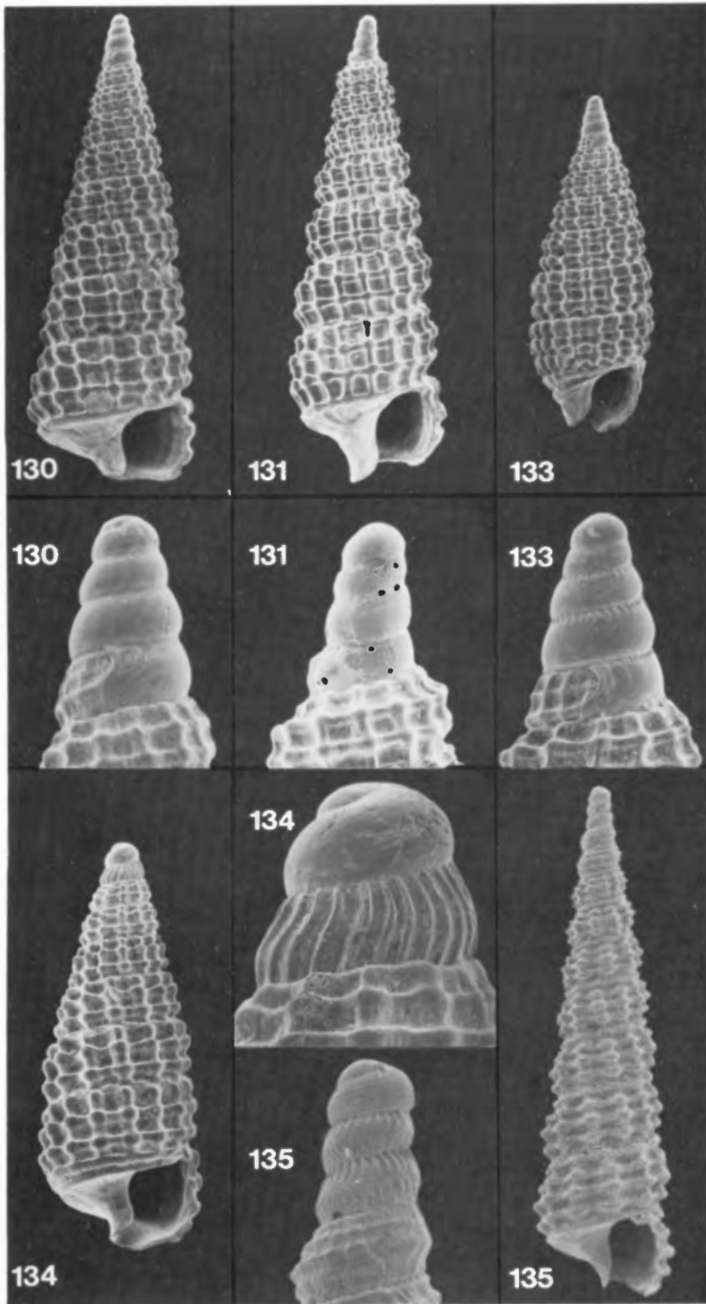


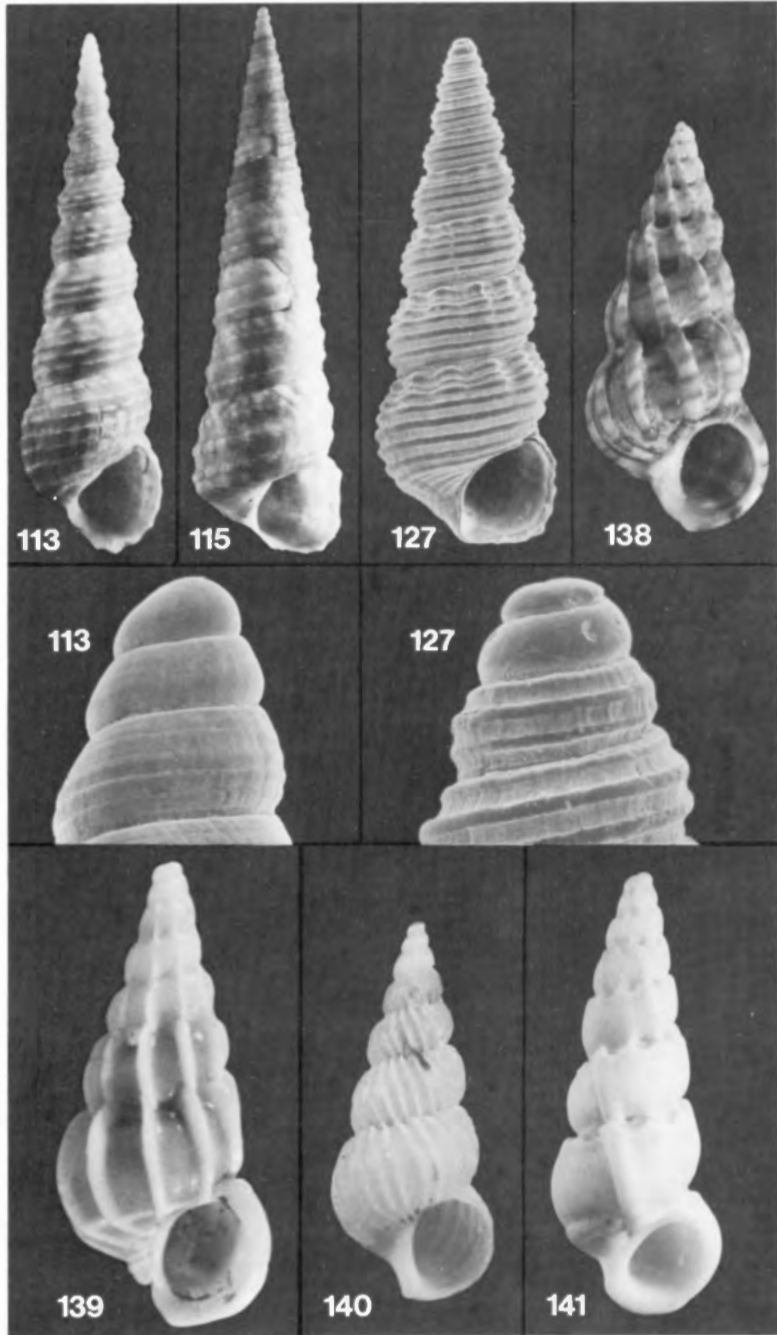


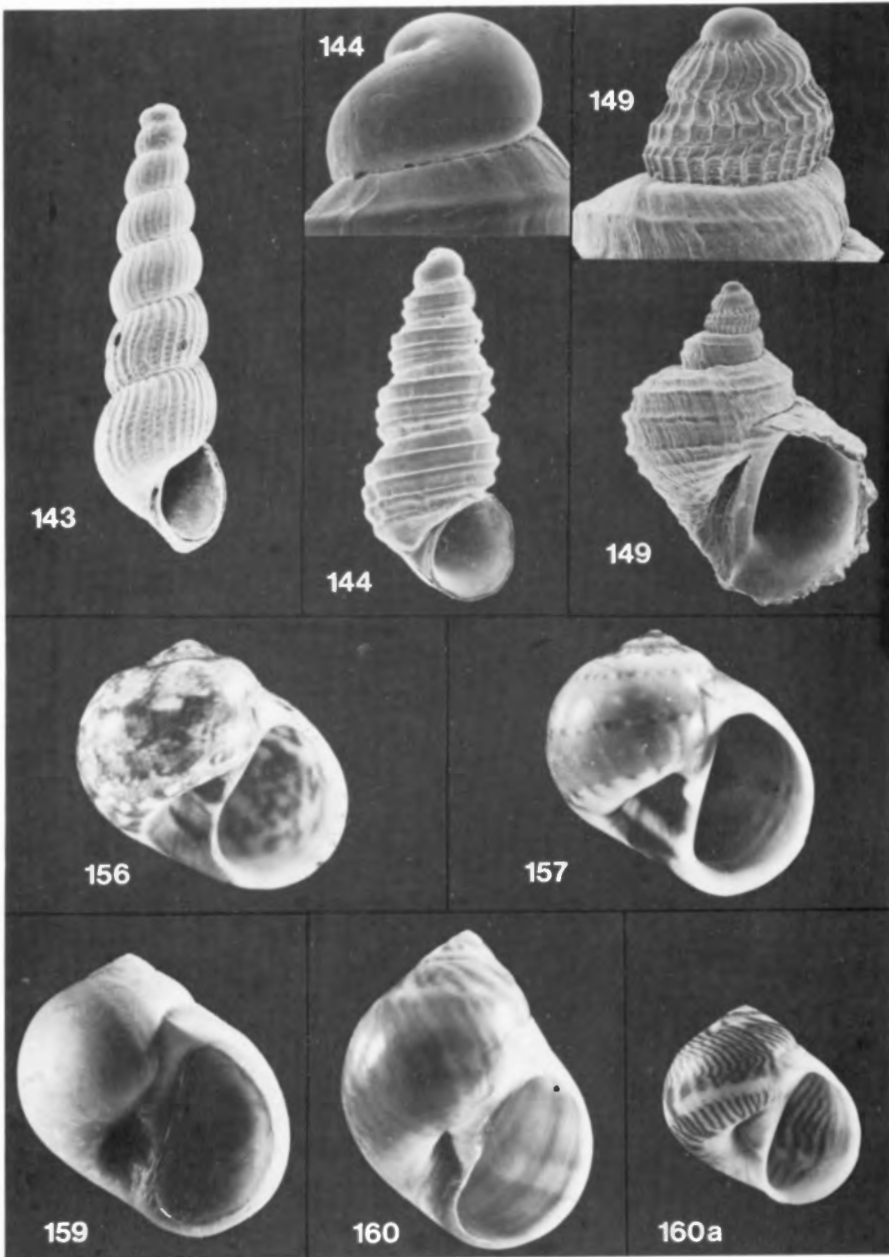


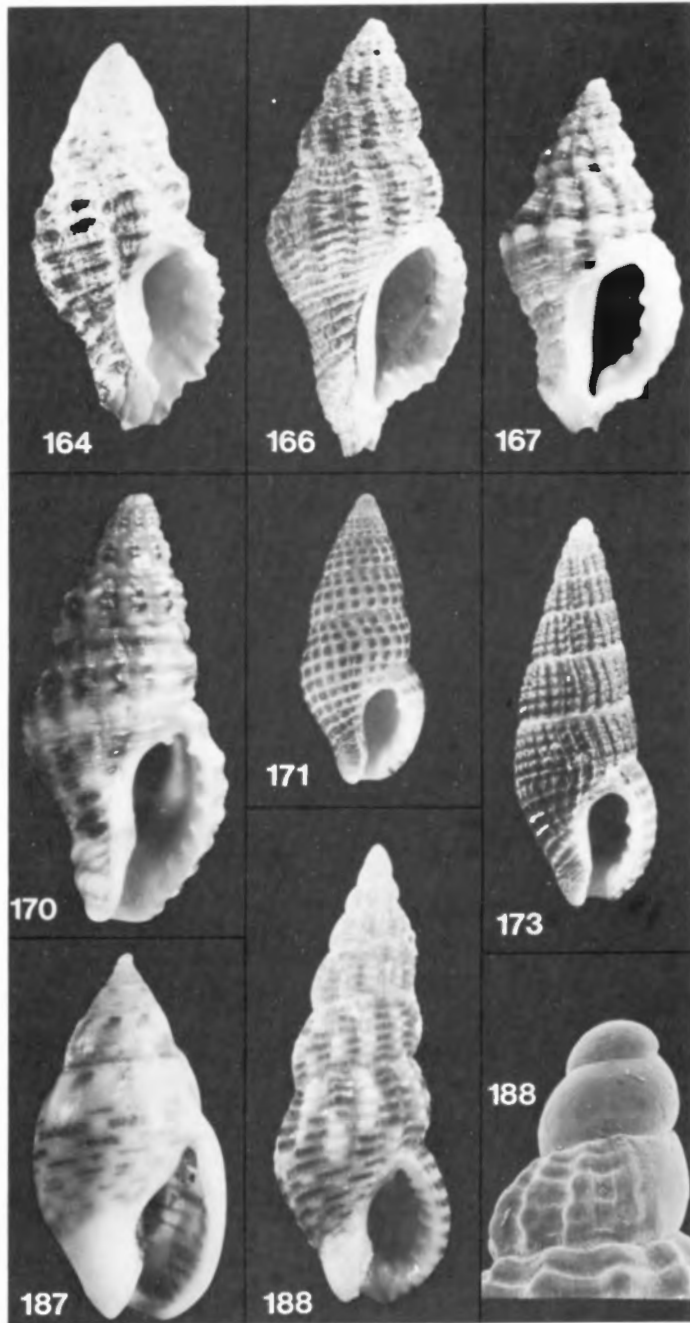


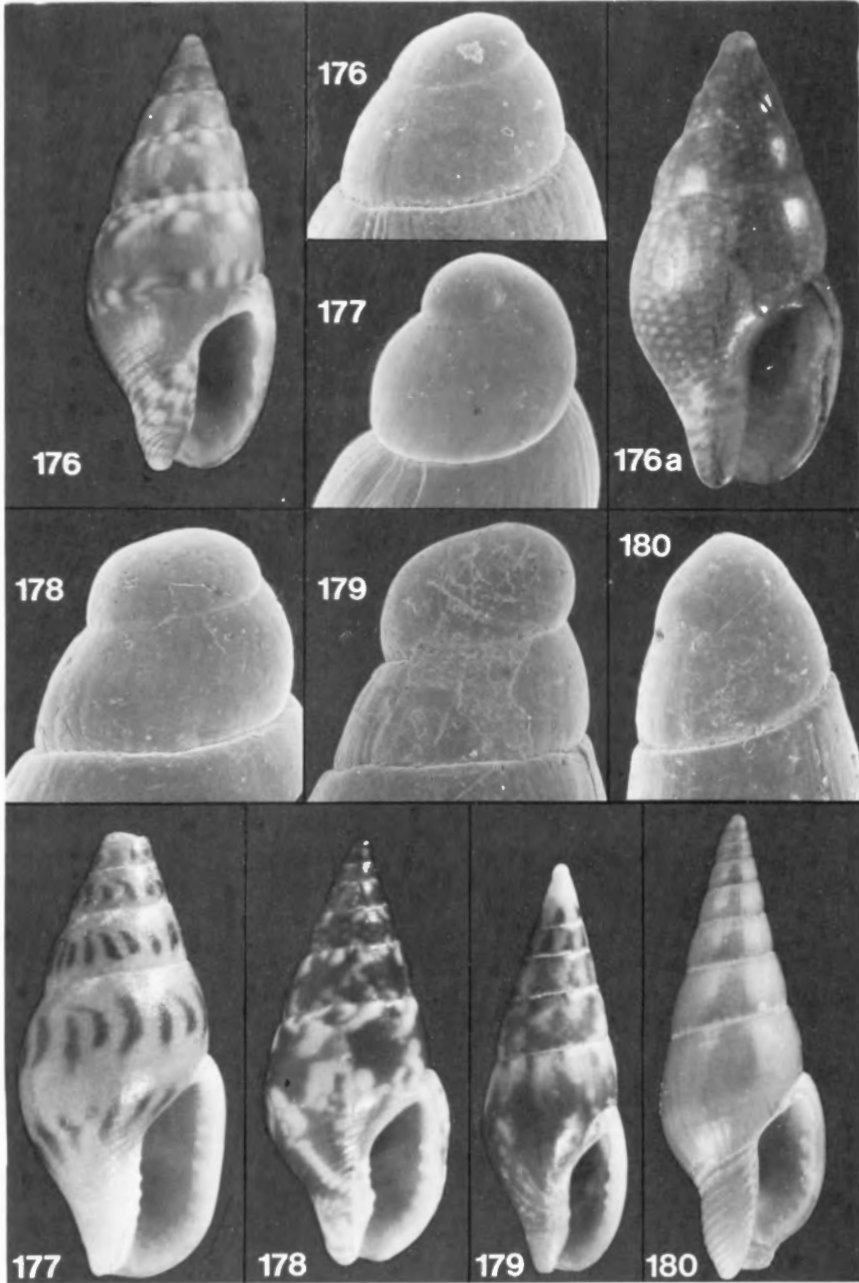


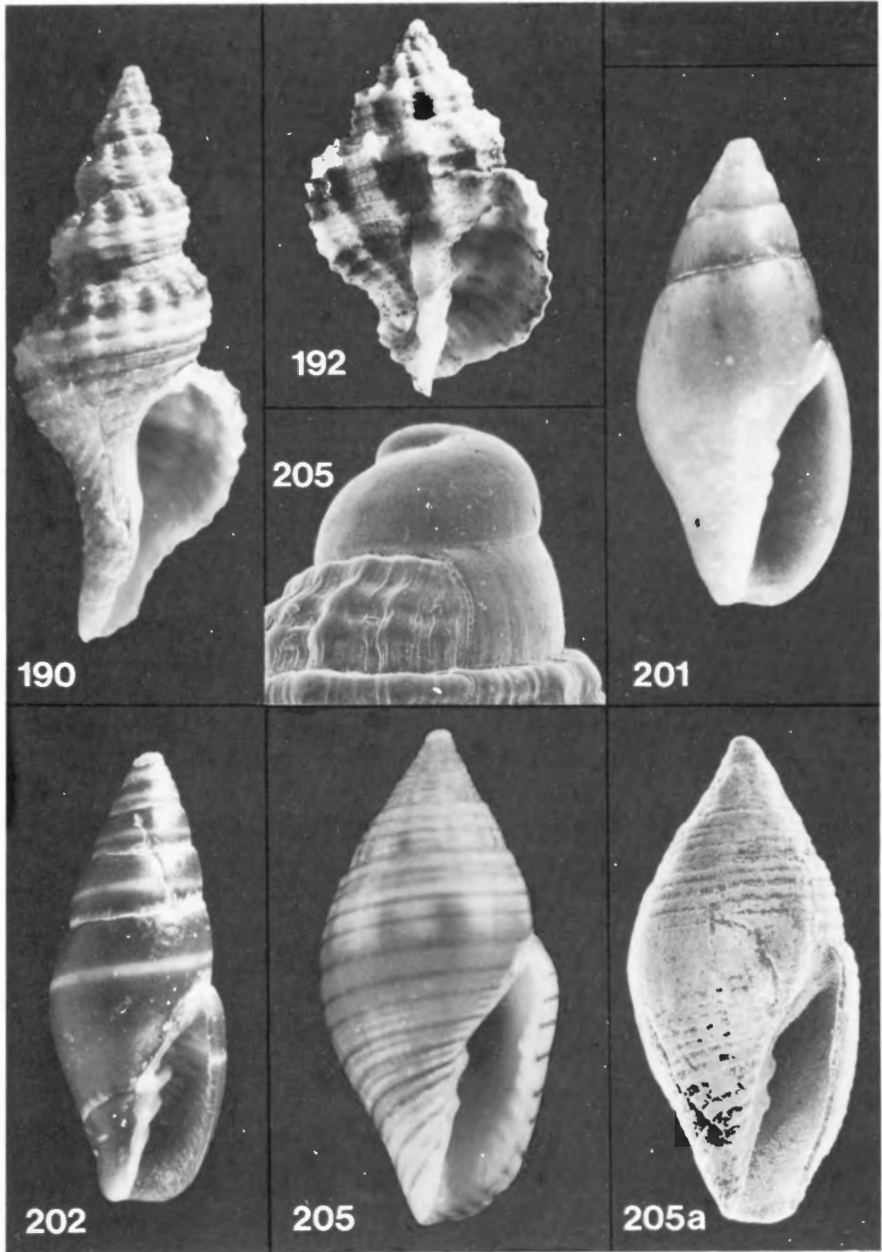


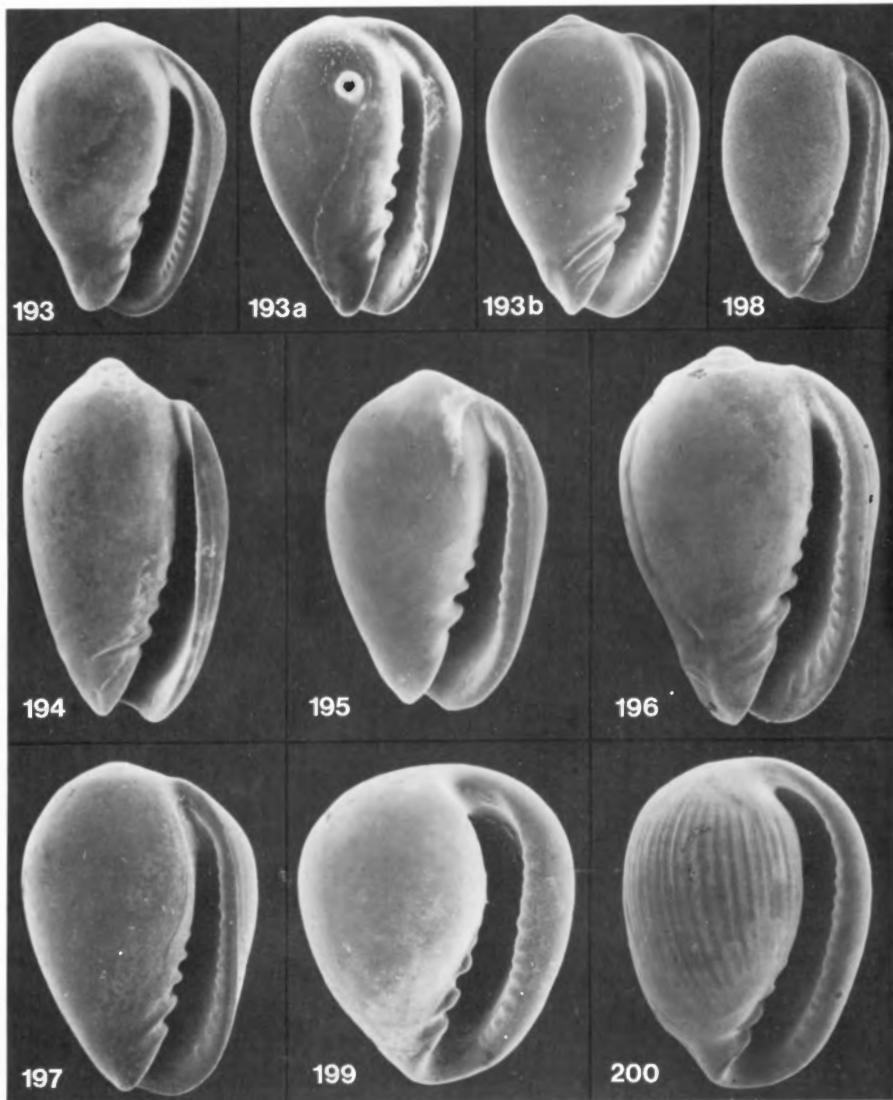


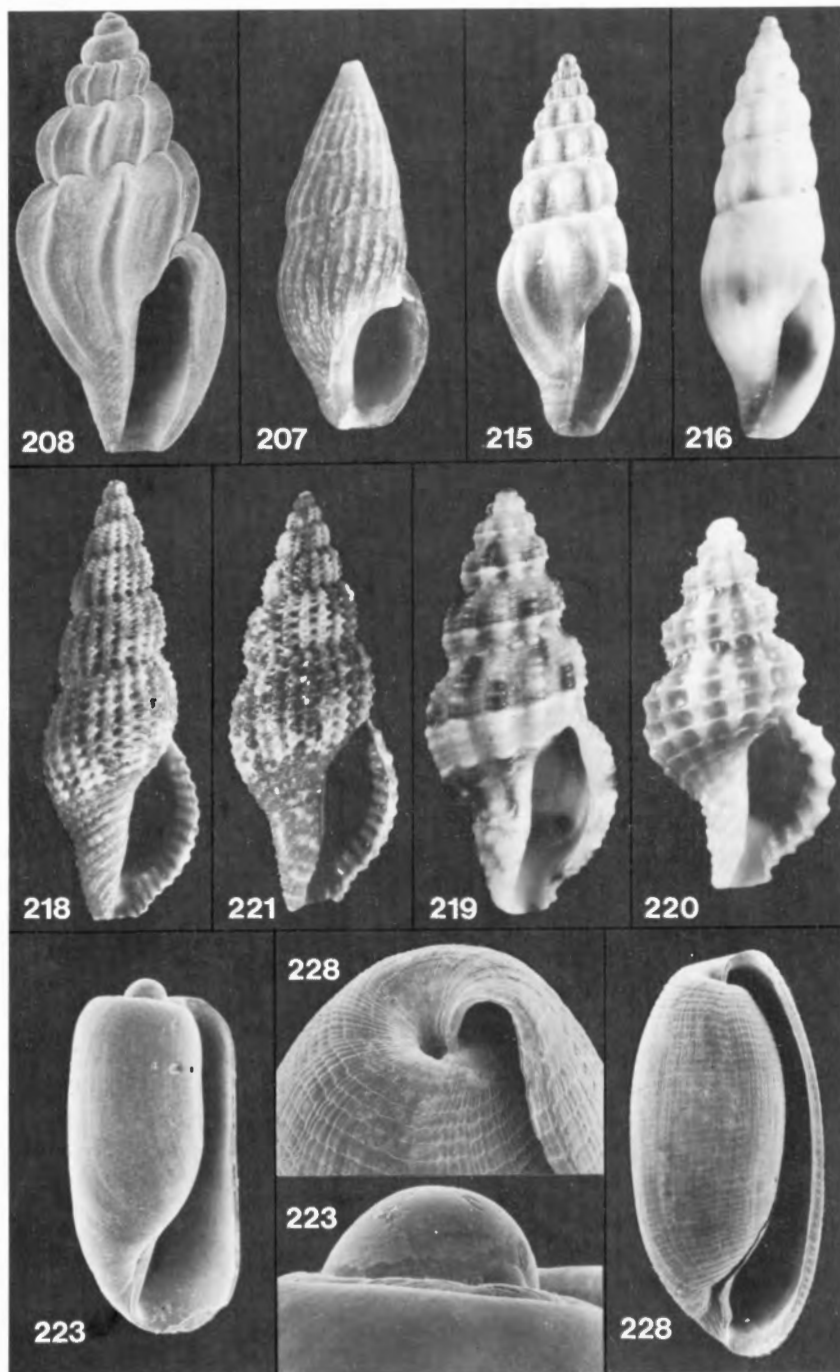


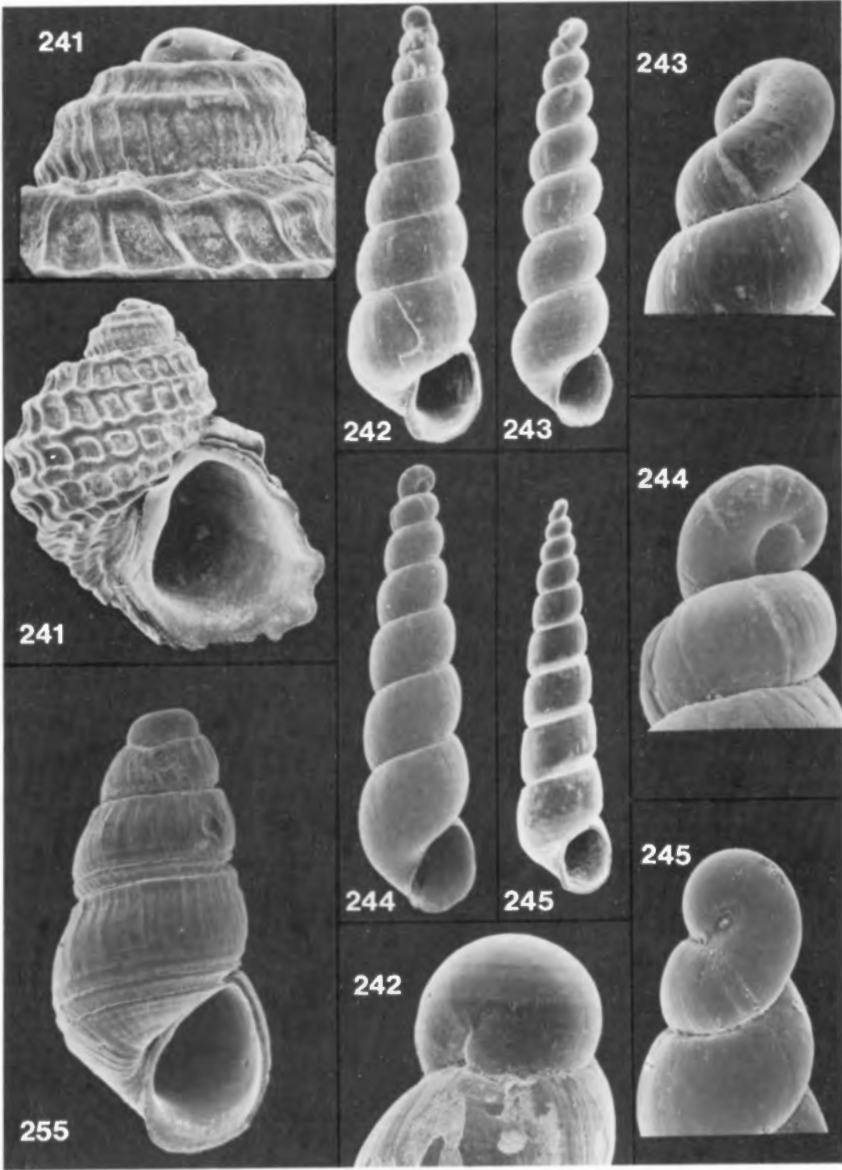


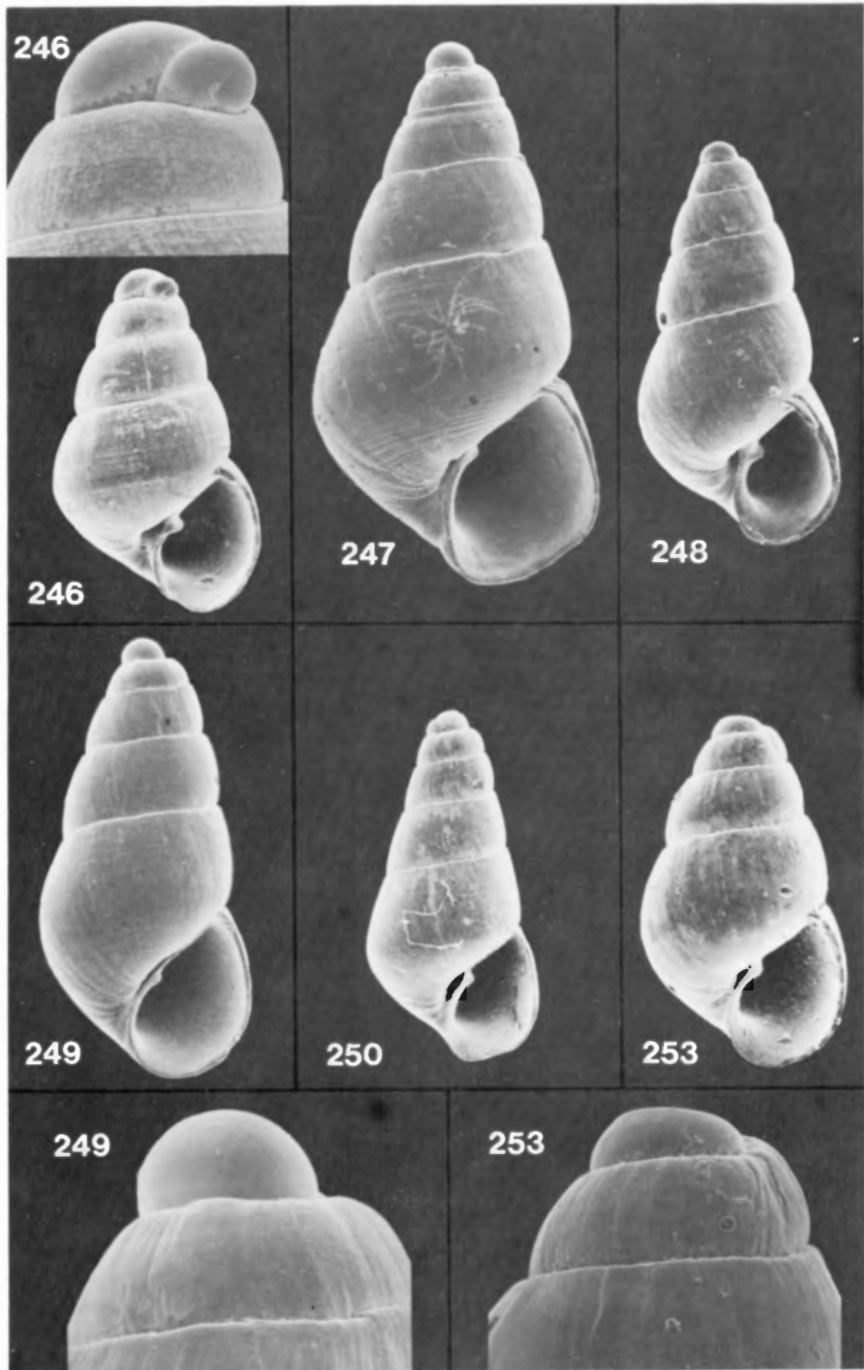


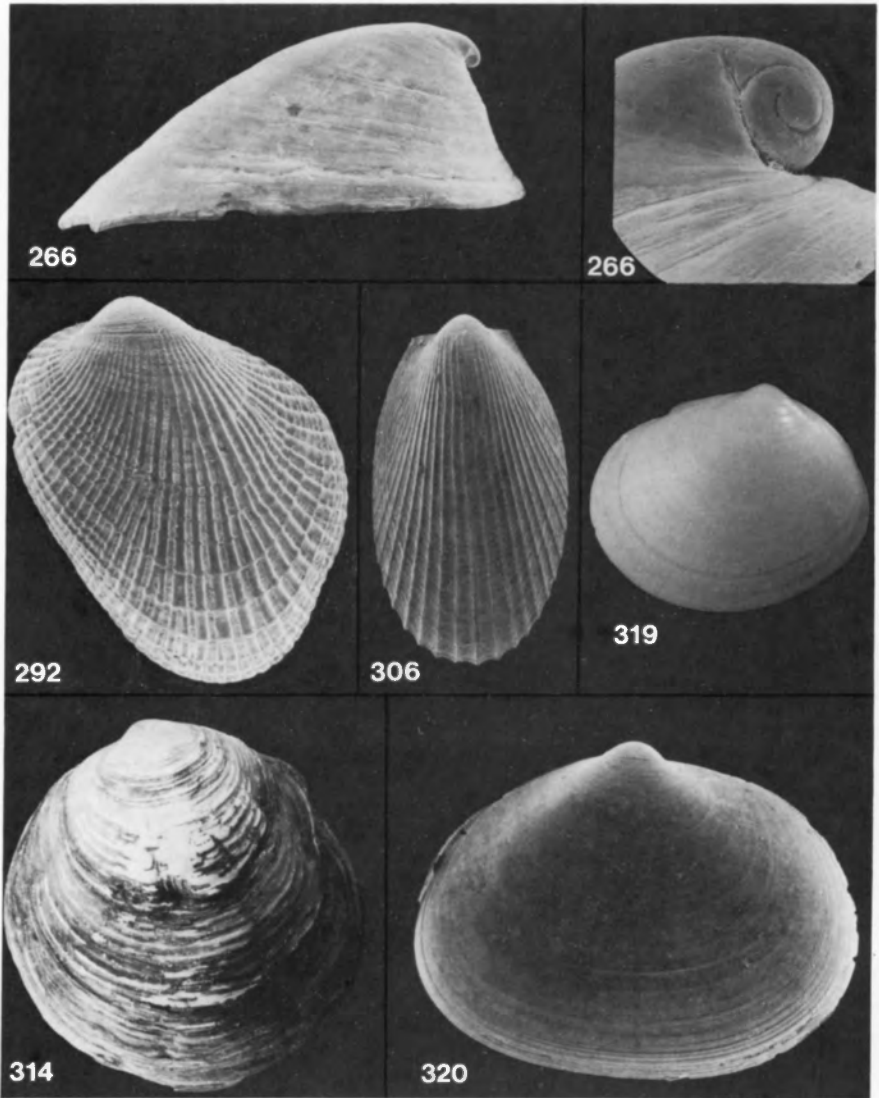


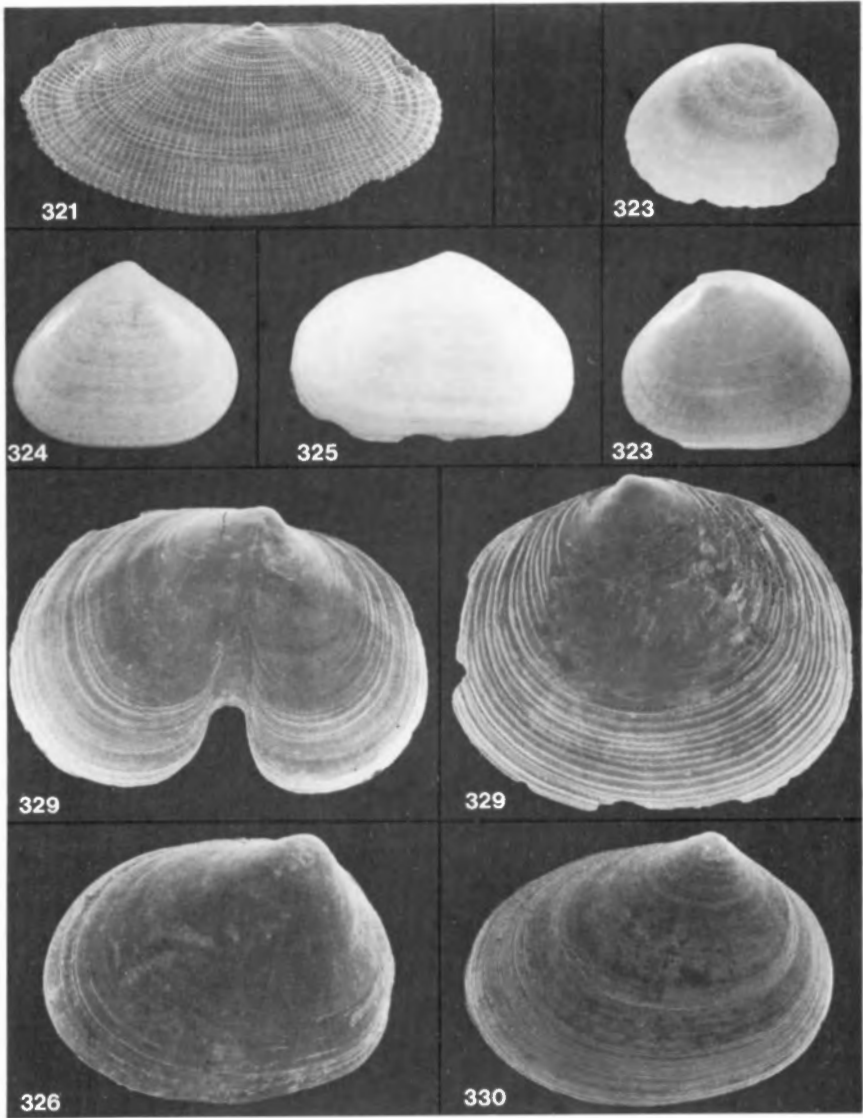


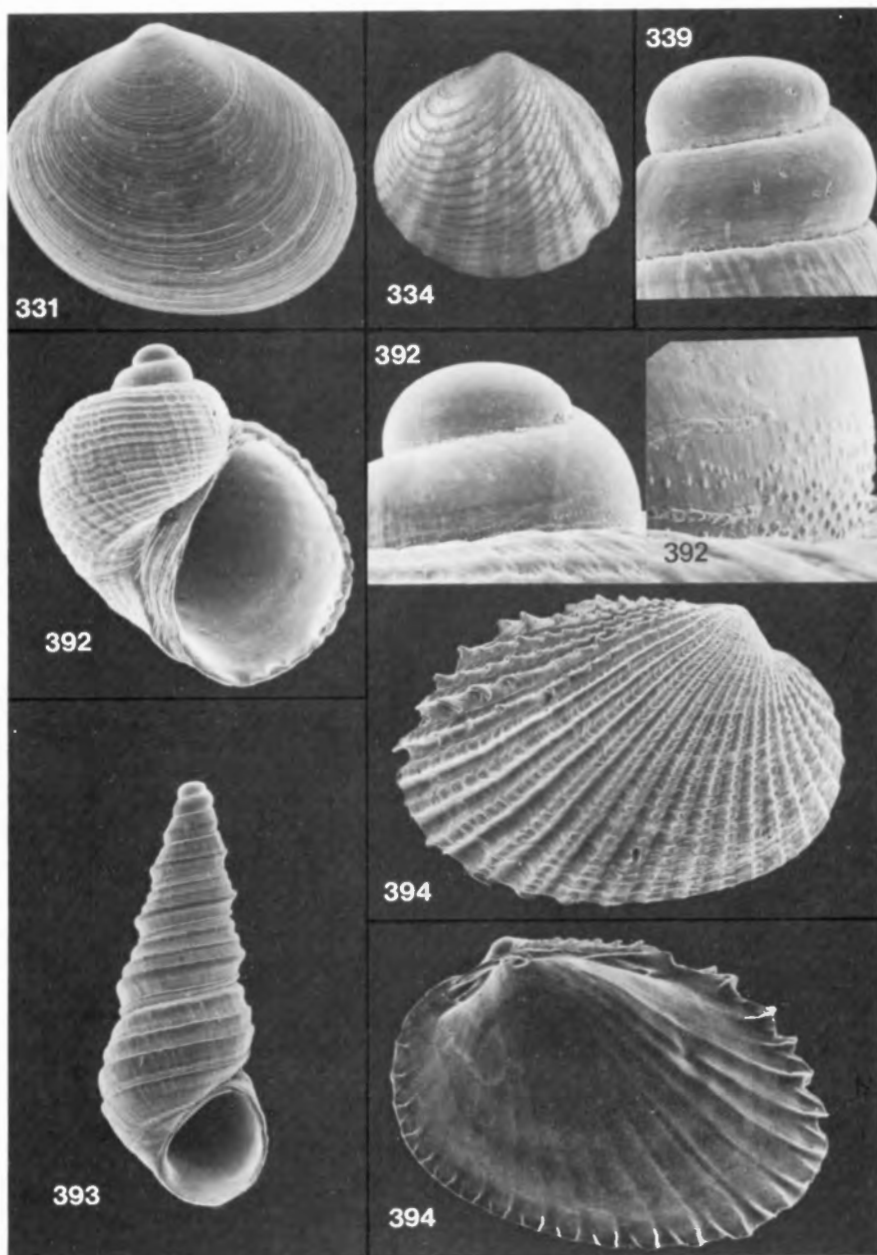












Note: no. 339 should be 393!

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