Report on a collection of Columbellidae (Mollusca, Gastropoda) from the west Indian Ocean region (Madagascar, Glorieuses Islands, Comores Islands, and nearby banks and coral shawls) with descriptions of three new species and one new genus

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ABSTRACT. The authors have studied the Columbellidae of the West Indian Ocean region, through two sources: the BENTHEDI oceanographic expedition, and the THOMASSIN-PEYROT CLAUSADE collection, both preserved in the Muséum National d'Histoire Naturelle in Paris. 37 species were recorded. Three new species are described and range extensions are reported for 30 species.

RESUME. Les auteurs ont étudié les Columbellidae de l'Océan Indien occidental, dans un matériel déposé au Museum National d'Histoire Naturelle de Paris, provenant de deux sources: l'expédition océanographique BENTHEDI, d'une part, et la collection THOMASSIN-PEYROT CLAUSADE, d'autre part. 37 espèces sont répertoriées, avec pour 30 d'entre elles, une extension de la zone d'habitat. Trois nouvelles espèces sont décrites.

I. INTRODUCTION

To our knowledge, no study on the Columbellidae of the west Indian Ocean region nor Mozambique Channel, was ever made, except for two lists of species from Seychelles, one by VON MARTENS in 1880 (listing 6 species: *Columbella flavida*, *C. flavida* var. *undata*, *C. turturina*, *C. lactea*, *C. nympha*, *C. seychellarum*), and one by DAUTZENBERG in 1893 (listing 3 species: *Columbella azora* var. *albinodulosa*; *C. turturina*; *C. troglodytes*.); and two reports of species from Madagascar, one by VON MARTENS (one species, *Columbella fulgurans*) and one by DAUTZENBERG in 1932 (listing 7 species: *Columbella azora*; *C. galaxias*; *C. moleculina*; *C. flava*; *C. tankervillei*; *C. moleculinella*; *C. troglodytes*). Some of the reported species fall actually into synonymy, namely *Columbella azora* and *C. albinodulosa* (syn. *Euplica festiva*); *Columbella flavida* (syn. *Pyrene flava*); *Columbella lactea* (syn. *Mitrella moleculina*); *Columbella galaxias* (syn. *Mitrella nympha*); *Columbella moleculinella* (syn. *Pyreneola. shepstonensis*). The above lists concern thus only 10 species, most of them having a widely Indo-Pacific distribution. *Mitrella seychellarum* (Von Martens, 1904) is known only from Seychelles.

In the present paper, we record the Columbellidae collected in the 1970s by two sources:

(1) The BENTHEDI oceanographic Expedition was conducted on board R.V. "Le Suroit" under the direction of Dr. Bernard Thomassin. From 17 March to 14 April 1977, with a total of 125 stations (dredge hauls and trawlings down to 3700 m; SCUBA dives), the expedition surveyed the benthic marine fauna of the northeastern part of the Mozambique Channel: Glorieuses Is., Geyser, Zelée and Leven Banks (between Madagascar and the Comores) and Mayotte (Comorro archipelago). Philippe Bouchet was the malacologist of the expedition; unsorted bottom samples were later sorted in MNHN by Ms. Annie Tillier. Columbellids were present, as live-taken or empty shells, down to 550 m, and a total of 24 species is present in this collection. Previous papers based on this expedition have dealt with Buccinacea and Mitracea (CERNOHORSKY 1982) Terebridae (BRATCHER & CERNOHORSKY 1982), Architectonicidae (BIELER 1987) and Polyplacophora (LELOUP 1981, KAAS 1985).

(2) From 1972 to 1977, Drs Bernard Thomassin and Mireille Peyrot-Clausade (both from Station marine d'Endoume, Marseille, France) conducted an

ecological survey of the Tulear reef system (S.W. Madagascar). Numerous quantitative or semi-quantitative samples were collected in various microhabitats, with emphasis on sediments (THOMASSIN 1978) and small cavities in hard substrat (PEYROT-CLAUSADE 1977). This collection contains 595 lots of Columbellidae, for a total of 29 species.

Most species are represented from both sources. The total material consists of 809 lots of Columbellidae, containing only 37 species. Of the 10 species previously quoted by Dautzenberg and Von Martens from Madagascar, 7 have been found again in this material, namely *Pyrene flava*; *Euplica albinodulosa* a synonym of *Euplica festiva* (Deshayes in Laborde & Linant, 1834) (DRIVAS & JAY 1990); *Euplica turturina*; *Mitrella galaxias* (Reeve, 1859) a synonym of *M. nympha* (Kiener, 1841)(DRIVAS & JAY 1990); *Mitrella lactea* (Duclos, 1840) a synonym of *M. moleculina* (Duclos, 1840); *Pyreneola moleculinella* (Dautzenberg, 1932) a synonym of *P. shepstonensis* (E.A. Smith, 1910) (DRIVAS & JAY 1990); and *Zafra troglodytes*. But 2 of the previously quoted species are not represented in the Benthedi-Thomassin material, namely *Pyrene tankervillei*, and *Pyrene fulgurans*. Three new species are described, and range extensions are reported for 30 species. In the lists of material examined, the abbreviation "spm" refers to live-taken as well as empty shells. Unless otherwise stated, the material is now housed in the Muséum National d'Histoire Naturelle, Paris.

II. SYSTEMATICS

Family **COLUMBELLIDAE**

Genus ***Pyrene*** Röding, 1798.

General shape biconical; early whorls with a strong spiral subsutural cord, which disappears on later whorls; interior of outer lip crenulated.

Pyrene flava (Bruguière, 1789). Fig. 1.

Tulear, without mention of depth. BENTHEDI st. 5, Banc du Leven, 12°32' S, 47°40'2 E, 35-150m, (1 spm). st. 16, Mayotte 12°45'2 S, 45°15'7 E, 3-8m, (1spm). st.110, Banc de la Zélée 12°25'6 S, 46°16'2 E, 24m (1 spm).

Genus ***Euplica*** Dall, I889.

The genus is characterized by its two columellar folds, and a protoconch which bears fine axial riblets.

Euplica festiva (Deshayes in Laborde & Linant, 1834). Fig 2.

Synonym : *Euplica albinodulosa* (Gaskoin,1851).

Records : Tulear, without mention of depth.

Euplica ionida (Duclos, 1840). Fig. 3.

The extreme variability of colour pattern explains the fairly abundant synonymy:

Colombella ionida Duclos, 1840. (Type locality Reunion Island, by subsequent designation, DRIVAS & JAY, 1990)
Columbella scalpta Reeve, 1859. (Type locality unknown).
Columbella amirantium Smith, 1884. (Type locality: Eagle Isl. Amirantes).
Columbella amirantium var. *ovata* Hervier, 1899. (Type locality: Lifu,New Caledonia).
Columbella scalpta var. *decora* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella liocyma Pilsbry, 1904. (Type locality: Japan).

Records : Tulear, I7 lots without mention of depth; Nosy-Be, 1 lot without mention of depth; BENTHEDI st. 5, Banc du Leven, 12°32' S, 47°40'2 E, 35-150m, (12 spms); st. 8, Glorieuses, 11°29'2 S, 47°18'2 E, 250m, (1 spm); st. 14 , Banc du Geyser 12°22 S, 46°23'7 E, 5-20m, (19 spms); st. 16, Mayotte 12°45'2 S, 45°15'7 E, 3-8m, (1 spm); st. 24, Mayotte 12°37' S, 45°9'9 E, 16-18m, (3 spms); st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20m, (2 spms); st. 50, Mayotte, 12°54'5 S, 44°58'5 E, 32m, (1 spm); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (1 spm); st. 79, Mayotte, 12°33'5 S, 44°56'4 E, 25m, (5 spms); st. 93, Glorieuses , 11°32'3 S, 47° 16'4 E, 480-550m, (5 spms); st. 101, Glorieuses 11°25'7 S, 47°19'5 E, 26m, (4 spms); st. 106, Banc de la Zélée, 12°25'5 S, 46°16'1 E 18-24m, (2 spms); st. 110, Banc de la Zélée 12°25'6 S, 46°16'2 E, 24m, (10 spms); st. 117, Banc du Geyser 3-8m, (2spms); st. 124, Glorieuses, 11°32'1 S, 47°23'1 E, 24m, (41 spms); st. 125, Glorieuses, 11°30'6 S, 47°22'8 E, 7m, (2 spms).

Euplica turturina (Lamarck, 1822). Fig. 4.

Tulear: 5 lots without mention of depth. Tulear: 1 lot, internal slope, in cavities; Mayotte: 1 lot, Agalega islet, 12 m.; BENTHEDI st. 16, Mayotte, 12°45'2 S, 45°15'7 E, 3-8m, (1spm); st. 56, Mayotte, 12° 53'5 S, 44°57'1 E, 3-5m, (2 spms); st. 79, Mayotte, 12°33'5 S, 44°56'4 E, 25m, (1 spm); st. 101, Glorieuses, 11°25'7 S, 47°19'5 E, 26m, (1spm); st. 125, Glorieuses, 11°30'6 S, 47°22'8 E, 7m, (2 spms).

Euplica varians (Sowerby, 1832). Fig. 5.

Tulear: 2 lots on the reef, in cavities; Tulear:1 lot, internal slope; 29 lots, without mention of depth; Nosy-Bé: 1 lot without mention of depth; Nosy-Bé: 1 lot on the reef, 5 m; BENTHEDI, st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20 m, (1spm); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (1 spm).

Genus *Mitrella* Risso, 1826.

Protoconch smooth. Spire turreted, high compared to aperture; surface smooth or spirally sculptured; outer lip of aperture denticulate.

Mitrella albina (Kiener, 1841). Fig 6.

Tulear: 7 lots without mention of depth; Nosy-Bé 2 lots without mention of depth; BENTHEDI st. 14, Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (1 spm); st. 18, Mayotte, 12°45' S, 45°15'9 E, 15m, (1 spm); st. 23, Mayotte, 12°46'2 S, 45°15,5 E, 6m, (2 spms); st. 24, Mayotte 12°37' S, 45°9'9 E, 16-18m, (2 spms); st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20m, (10 spms); st. 50, Mayotte, 12°54'5 S, 44°58'5 E, 32m, (1 spm); st. 51, Mayotte, 12°54'5 S, 44°58'2 E, 15m, (8 spms); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (1 spm); st. 79, Mayotte, 12°33'5 S, 44°56'4 E, 25m, (8 spms); st. 93, Glorieuses, 11°32'3 S, 47°16'4 E, 480-550m, (1 spm); st. 100, Glorieuses, 11°32'4 S, 47°16'8 E, (1 spm); st. 101, Glorieuses, 11°25'7 S, 47°19'5 E, 26m, (4 spms); st. 110, Banc de la Zélée, 12°25'6 S, 46°16'2 E, 24m, (8 spms); st. 116, Banc du Geyser, 13m, (3 spms); st. 124, Glorieuses, 11°32'1 S, 47°23'1 E, 24m, (10 spms); st. 125, Glorieuses, 11°30'6 S, 47°22'8 E, 7m, (1 spm).

Mitrella albuginosa (Reeve, 1859). Fig. 7.

Tulear. BENTHEDI st. 5, Banc du Leven, 12°32 S, 47°40'2 E, 35-150m, 1 spm.

Mitrella conspersa (Gaskoin, 1851). Fig. 8.

Tulear. BENTHEDI st. 49, Mayotte, 12°54'6 S, 44°56'8 E, 300-450m, (1 spm).

Mitrella floccata (Reeve, 1859). Fig. 9.

BENTHEDI st. 5, Banc du Leven, 12°32' S, 47°40'2 E, 35-150m, (1spm)

Mitrella goubini (Hervier, 1899). Fig. 10.

Protoconch of 1.5 smooth whorls;

Records : Tulear: 3 lots without mention of depth; Nosy-Bé 1 lot on the reef, 5 m; BENTHEDI st. 14, Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (1 spm); st. 16, Mayotte, 3-8m, 12°45'2 S, 45°15'7 E, 3-8m, (1 spm); st. 21, Mayotte, 12°46'5 S, 45°15'5 E, 3-8m, (2 spms); st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20m. (1 spm); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (1 spm).

Mitrella innocens (Thiele, 1925). Fig. 11.

BENTHEDI st. 6, W des Glorieuses, 11°28'5 S, 47°12'2 E, 298-301m, (1 spm), 300-460m, (2 spms); st. 10, W des Glorieuses, 11°28'5 S, 47°17'7 E, 294-440m, (24 spms); st. 33, Mayotte, E passe Longosi, 12°53'5 S, 45°16'3 E, 275-400m, (4 spms); st. 71, Mayotte, NE récif N, 12°29'9 S, 45°02'E, 450m, (2 spms); st. 93, SW Grande Glorieuse, 11°32'3 S, 47°16'4 E, 480-550m, (32 spms); st. 94, SW Grande Glorieuse, 11°32'2 S, 47°16'4 E, 450m, (150 spms); st. 104, Glorieuses, N Ile du Lys, 11°26'4 S, 47°22'3 E, 330-530m, (2 spms); st. 120, SE Glorieuses, 11°30 S, 47°24'7 E, 335-395m, (53 spms); st. 122, Glorieuses SE Grande Glorieuse, 11°32' S, 47°23'2 E, 615-625m, (26 spms).

Mitrella margarita (Reeve, 1859). Fig. 12.

Tulear: 10 lots without mention of depth; Nosy-Bé: 1 lot without mention of depth.

Mitrella moleculina (Duclos, 1840). Fig. 13.

The interrupted subsutural dark-brown line is a distinctive character, but uncommonly lacking, especially in albino specimens. Its pattern may be very similar to *M. goubini*, but it is easily distinguished from it in its protoconch of 3.5 smooth whorls instead of 1.5.

Records : Tulear: 16 lots without mention of depth; Nosy-Bé: 1 lot without mention of depth; BENTHEDI st. 5, Banc du Leven, 12°32' S, 47°40'2 E, 35-150m, (2 spms); st. 6, Glorieuses, 11°28'5 S, 47°12'2 E, 460-500m, (1 spm); st. 14 , Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (15 spms); st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20m, (1 spm); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (7 spms); st. 78, Mayotte, 12°33'7 S, 44°55'6 E, 80-140m, (1 spm); st. 79 Mayotte, 12°33'5 S, 44°56'4 E, 25m. (2 spms); st. 93, Glorieuses, 11°32'3 S, 47°16'4 E, 480-550m, (5 spms); st. 94, Glorieuses, 11°32'2 S, 47°16'4 E, 450m, (1 spm); st. 106, Banc de la Zélée, 12°25'5 S, 46°16'3 E, 18-24m, (1 spm); st. 109, Banc de la Zélée, 12°25'6 S, 46°15'2 E, 50m. (1 spm); st. 110, Banc de la Zélée, 12°25'6 S, 46°16'2 E, 24m, (2 spms).

Mitrella nympha (Kiener, 1841). Fig. 14.

Tulear: 1 lot without mention of depth.

Mitrella rorida (Reeve, 1859). Fig. 15.

Tulear: 2 lots without mention of depth; Mayotte: 1 lot, Agalega islet, 12 m.

Mitrella seychellarum (Von Martens, 1904). Fig. 16.

Tulear; BENTHEDI st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (7 spms); st. 79 Mayotte, 12°33'5 S, 44°56'4 E, 25m, (2 spms).

Mitrella venulata (Sowerby, 1894). Fig. 17.

Tulear: 1 lot without mention of depth.

Genus ***Pyreneola*** Iredale,1918.

Shell small in size, ovate elongate, with a rather elevated spire; surface smooth; anterior canal short and narrow; columellar callus expended posteriorly, its edge somewhat raised.

Pyreneola cincinnata (Von Martens, 1880). Fig. 18.

Tulear: 9 lots without mention of depth.

Pyreneola lozoueti n.sp. Figs. 20-21.

Description.

Spire a little higher than aperture. Protoconch of about 1.5 smooth whorls. Teleoconch of 6 whorls. Surface smooth except for 5 spiral ridges on base of body-whorl. Columella with 3 denticles that are the continuation of the spiral ridges. Outer lip with 6 distinct denticles. Colour slightly greyish-white with, on some specimens, a spiral row of small lacteous white blotches, situated just above suture on whorls, and at the middle of body-whorl; and a second spiral row of larger blotches on lower part of body-whorl. On all specimens, on base, intervals between spiral ridges tinted with pale violet.

Dimensions.

Holotype heigth 4.4 mm, breadth 1.5 mm. Adult size varies: heigth from 3.4 mm to 5.5 mm and breadth from 1.2 mm to 1.9 mm.

Remarks.

Pyreneola lozoueti n.sp. differs from *Pyreneola cincinnata* (Von Martens, 1880), described from Mauritius, in its protoconch (1.5 whorls instead of 2.5) and in its colour pattern with lack of the thin wavy axial brown lines interrupted by oval white blotches; it differs from *Pyreneola shepstonensis* (E.A. Smith, 1910), described from South-Africa, in its more slender shape, and colour pattern, consisting in *P. shepstonensis* in a spiral brown line with a row of brown blotches on each side, on a creamy-white background; and it differs from *Pyreneola melvilli* (Hedley, 1899) described from Australia, which has same size and shape, in its colour pattern, in the lack of the second spiral row of white blotches on body-whorl, in the presence of fine axial brown lines between the white blotches, on the whole shell; and in the lack of violet bands on base.

Type material.

Holotype and paratypes 1-28 in the Muséum National d'Histoire Naturelle, Paris; paratype 29 in the collection of J. Drivas.

Type locality.

Banc du Leven, BENTHEDI st. 5, 12°32' S, 47°40'2 E, 35-150m, (holotype and paratypes 1-5).

Other material.

Banc de la Zélée BENTHEDI st. 110 S, 12°25'6 S, 46°16'2 E, 24m; (paratypes 6 and 7); Banc du Geyser st. 14 , W, 12°22 S, 46°23'7 E, 5-20m. (paratypes 8 to 14); Glorieuses, st. 8, W Glorieuse, 11°29'2 S, 47°18'2 E, 250m, (paratype15); Glorieuses st. 93, SW Grande Glorieuse, 11°32'3 S, 47°16'4 E, 480-550m, (paratype 16.); Glorieuses st. 122, SE Grande Glorieuse, 11°32' S, 47°23'2 E, 615-625m, (paratypes 17-18); Glorieuses st. 124, SE Glorieuse, 11°32'1 S, 47°23'1 E, 24m, (paratypes 19-28); Paratype 29 collected in Mahe island, Seychelles, by the senior author, at the depth of 15 m, in the collection of J. Drivas.

Etymology.

Named for Mr. Pierre Lozouet, Muséum National d'Histoire Naturelle, Paris.

Pyreneola melvilli (Hedley, 1835). Fig. 19.

BENTHEDI st. 14 , Banc du Geyser 12°22 S, 46°23'7 E, 5-20m, (1 spm).

Pyreneola shepstonensis (Smith, 1910). Fig. 22.

Tulear: 3 lots, without mention of depth.

Genus ***Indomitrella*** Oostingh,1944.

Shell with axial sculpture, and smooth interspaces. Protoconch smooth.

Indomitrella puella (Sowerby, 1844). Fig. 23.

Tulear: 1 lot, without mention of depth.

Genus ***Pleurifera*** gen. n.

Type species: ***Mitrella suzannae*** (Drivas & Jay, 1990)

Diagnosis.

Protoconch with axial riblets; teleoconch bearing a fine axial sculpture at least on earlier whorls, and a fine spiral sculpture more visible on later whorls.

Remarks: Axially sculptured protoconch is found only in the genus *Euplica*. *Pleurifera* differs from *Euplica*

in the general shape of the high spired shell, and in the axial and spiral sculpture of teleoconch whorls.

Pleurifera suzannae (Drivas & Jay, 1990). Fig. 24.

BENTHEDI st. 6, Glorieuses 11°28'5 S, 47°12'2 E, 460-500m, (1 spm).

Genus *Metanachis* Thiele, 1924.

Early whorls with axial sculpture, disappearing on subsequent whorls; upper part of columella bearing a single denticle.

Metanachis marquesa (Gaskoin, 1851). Fig. 25.

Tulear: 11 lots without mention of depth; Nosy-Bé: 1 lot without mention of depth; BENTHEDI st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-8m, (1 spm).

Genus *Zafra* A. Adams, 1860.

Shell small, with axial ribs, and no spiral sculpture except for basal cords.

Zafra geyserensis n.sp. Figs. 26-27.

Description.

Spire heigth almost equal to aperture. Protoconch of about 1.5 smooth whorls. Teleoconch of 4 convex whorls, convexity more marked at upper part of whorls, forming a shoulder. Axial sculpture consisting of axial ribs numbering 16 on last whorl. No spiral sculpture except for 7 spiral ridges on base of body-whorl. Columella smooth. Three denticles inside outer lip. Upper part of whorls lacteous-white, lower part yellowish-grey; a single darker spiral band on lowest part of body-whorl; base white.

Dimensions.

Holotype heigth 2 mm, breadth 0.6 mm. Paratypes 1 and 2: heigth 1.8 mm, breadth 0.6 mm

Remarks.

The shape of this shell recalls that of *Seminella peasei* (Von Martens & Langkavel, 1871) *nom. subst.* for *varia* Pease, 1860, *non* Sowerby, 1832, described from Hawaii; but it differs from it in the lack of spiral sculpture in the intervals of axial ribs. It differs from *Zafra troglodytes* (Souverbie, 1866) described from New Caledonia, in its smaller size, in its more angular whorls, in its protoconch, carinated on *Z. troglodytes* but rounded in *Z. geyserensis*.

Type material.

Holotype and paratype 1 in the Muséum National d'Histoire Naturelle, Paris. Paratype 2 in the collection of J. Drivas.

Type locality.

Banc du Geyser BENTHEDI st. 14 , 12°22 S, 46°23' 7E, 5-20m. (Holotype and paratype 1)

Other material.

Paratype 2 from Mahe Island, Seychelles, 15 m deep, collected by J. Drivas.

Etymology.

Named after the "Banc du Geyser" the type locality.

Zafra morini (Viader, 1938). Fig. 28.

Tulear: 3 lots without mention of depth; Mayotte: 3 lots; Dzaoudzi, 1 lot, 8-25 m; Mayotte: 1 lot, Agalega islet, 12 m; BENTHEDI: st. 16, Mayotte, 12°45'2 S, 45°15'7 E, 3-8m, (3 spms); st. 21, Mayotte, 12°46'5 S, 45°15'5 E, 3-8m, (9 spms); st. 24, Mayotte 12°37' S, 45°9'9 E, 16-18m, (7 spms).

Zafra obesula (Hervier, 1899). Fig. 29.

Tulear: 1 lot without mention of depth; BENTHEDI st. 21, Mayotte, 12°46'5 S, 45°15'5 E, 3-8m, (2 spms).

Zafra ocellatula (Hervier, 1899). Fig. 30.

Tulear: 11 lots without mention of depth; Nosy-Bé: 1 lot without mention of depth; BENTHEDI st. 14, Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (3 spms); st. 32, Mayotte, 12°45'1 S, 45°17'9 E, 15-20m, (1 spm); st. 117, Banc du Geyser, 12°22 S, 46°23'7 E, 3-8m, (1 spm).

Zafra minuscula (Gould, 1860). Fig. 31.

Synonym: *Zafra regulus* (Souverbie, 1864).

Records: Tulear: 4 lots without mention of depth.

Zafra succinea (Hervier, 1899). Fig. 32.

Tulear: 17 lots without mention of depth; Nosy-Bé 1 lot without mention of depth; Mayotte: 1 lot, Dzaoudzi 8 m; BENTHEDI st. 21, Mayotte, 12°46'5 S, 45°15'5 E, 3-8m, (1 spm); st. 70, Mayotte, 12°34'6 S, 45°5'2 E, 10-20m, (5 spms).

Zafra troglodytes (Souverbie, 1866). Fig. 33.

Tulear: 14 lots without mention of depth; Nosy-Bé: 1 lot, on the reef, 5 m.

Genus *Seminella* Pease,1868.

Shell small, bearing axial ribs and fine spiral sculpture; denticles inside outer lip.

Seminella peasei (Von Martens & Langkavel, 1871). Fig. 34.

One of the most variable species of Columbellidae, in colour pattern. Synonymy as follows:

Cythara varia Pease, 1860. (Type locality: Sandwich Islands (=Hawaii).
Columbella nana Dunker, 1871(*Non* Duclos, 1840). (Type locality: Viti Island).
Columbella (Seminella) peasei Von Martens & Langkavel, 1871. (Type locality: Hawaii).
Columbella nanisca Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella nanisca var. *subobscura* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella nanisca var.*hyacincta* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella nanisca var.*zebriolata* Hervier, 1899. (Type locality: Lifu, New Caledonia)
Columbella nanisca var.*violacea* Hervier, 1899. (Type locality: Lifu, New Caledonia)
Columbella nanisca var. *parthenica* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella nanisca var. *respersa* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella nanisca var. *diastata* Hervier, 1899. (Type locality: Lifu, New Caledonia).
Columbella roseotincta Hervier,1899. (Type locality: Lifu, New Caledonia).

Records : Tulear: 17 lots without mention of depth; BENTHEDI st. 5, Banc du Leven, 12°32' S, 47°40'2 E, 35-150m, (1 spm); st. 8, Glorieuses,11°29'2 S, 47°18'2 E, 250m, (1 spm); st. 14, Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (4 spms); st. 24, Mayotte, 12°37' S, 45°9'9 E, 16-18m, (1 spm); st. 34, Glorieuses, 11°32'2 S, 47°16'4 E, 450m, (1 spm); st. 35, Mayotte, 12°52'1 S, 45°16'2 E, 3-30m, (1 spm); st. 70, Mayotte, 12°34'6 S, 45°5'2 E, 10-20m, (5 spms); st. 106, Banc de la Zélée, 12°25'5 S, 46°16'3 E, 18-24m. (2 spms); st. 110, Banc de la Zélée, 12°25'6 S, 46°16'2 E, 24m, (3 spms).

Seminella saviniae (Viader, 1951). Fig. 35.

Tulear: 9 lots wihout mention of depth.

Genus *Mokumea* Habe, 1991.

Shell fusiform, thin, smooth and polished; surface decorated by oblique stripes and white spiral zones.

Mokumea parvula (Viader, 1951). Fig. 36.

Tulear, 1 lot, without mention of depth.

Mokumea zeleensis n.sp. Fig. 37-38.

Description.

Heigth of spire equal to aperture. Shape fusiform. Shell of 4 whorls, with indistinct protoconch, and rounded apex. Whorls slightly convex. Outer surface smooth, except for 11 spiral ridges on base of body-whorl. Columella and outer lip smooth. Colour plain pale brown except for one porcelaineous-white narrow spiral band just under suture.

Dimensions.

Holotype heigth 2.8 mm, breadth 1 mm. Paratype 1 heigth 1.5 mm, breadth 0.6 mm. Paratype 2 heigth 2.5 mm, breadth 1 mm. Paratype 3 heigth 2.1 mm, breadth 0.8 mm.

Remarks.

This species differs from *Mokumea parvula* (Viader, 1951) described from Mauritius, in its more slender shape, in the more numerous spiral cords on base (11 instead of 6) and in its colour plain brown. It differs from *Mokumea divaricata* (Pilsbry, 1904) described from Japan, in its more slender shape, in the more numerous spiral cords on base, in the lack of columellar fold, and in its colour plain brown. Furthermore it differs from *Mokumea albovittata* (Lopez, Coelho and Cardoso, 1965), described from Brazil, in the above characters.

Type material.

Holotype and paratypes 1-2 in the Muséum National d'Histoire Naturelle, Paris. paratype 3 in the collection of J. Drivas.

Type locality.

Holotype and paratype 1 from Banc de la Zélée, BENTHEDI st. 110 R, 12°25'6 S, 46°16'2 E, 24m.

Other material.

Paratype 2 from Mayotte, BENTHEDI st. 35, 12°52'1 S, 45°16'2 E, 3-30m. Paratype 3 off Praslin island, Seychelles, 24 m , collected by J. Drivas.

Etymology.

Named after the "Banc de la Zelée", Indian Ocean, the type locality.

Genus *Zafrona* Iredale, 1916.

Shell with a large smooth protoconch; teleoconch whorls sculptured with axial ribs crossed by spiral cords; outer lip and columella denticulate.

Zafrona isomella (Duclos, 1840). Fig. 39.

This species is quite variable in colour pattern. Synonymy:

Colombella isomella Duclos,1840. (Type Locality Reunion, by subsequent designation, DRIVAS & JAY 1990).

Columbella isomella var. *notata* Hervier,1899. (Type locality: Lifu, New Caledonia).
Columbella isomella var. *transversa* Hervier,1899. (Type locality: Lifu, New Caledonia).
Columbella isomella var. *subfelina* Hervier,1899. (Type locality: Lifu, New Caledonia).
Pyrene retiaria Tomlin,1931. (Type locality: Port Shepstone, South Africa).

Records : Tulear. BENTHEDI st. 14, Banc du Geyser, 12°22 S, 46°23'7 E, 5-20m, (2 spms); st. 56, Mayotte, 12°53'5 S, 44°57'1 E, 3-5m, (1 spm).

Genus *Aesopus* Gould, 1860.

Shell characterized by the high spire, slender shape, and the low, bulbous protoconch.

Aesopus spiculus (Duclos, 1840). Fig. 40.

Tulear, 4 lots, without mention of depth.

Addendum. In addition to the Benthedi-Thomassin material, the authors have found in Nosy-Bé island, Madagascar, at the depth of 15 m, specimens of 2 additional species, that were quoted in the previous lists of Dautzenberg and von Martens, but were not collected in the Benthedi-Thomassin material, namely: *Pyrene tankervillei* (Hervier, 1899), *Euplica azora* (Duclos, 1840).

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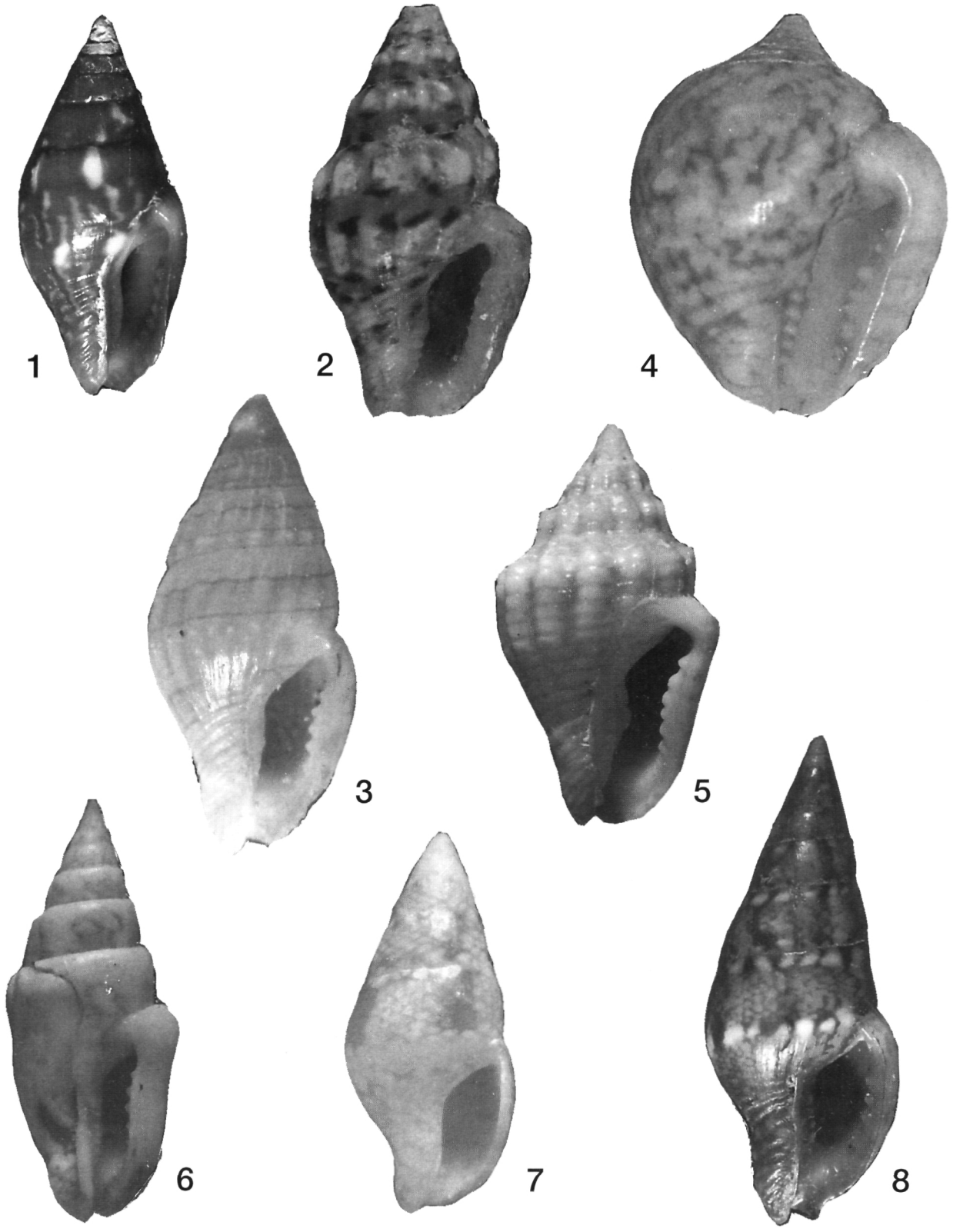


Fig. 1: *Pyrene flava* (Bruguière, 1789) : 20 mm. **Fig. 2**: *Euplica festiva* (Deshayes in Laborde & Linant, 1834) : 10 mm. **Fig. 3**: *Euplica ionida* (Duclos, 1840) : 6 mm. **Fig. 4**: *Euplica turturina* (Lamarck, 1822) : 13 mm. **Fig. 5**: *Euplica varians* (Sowerby, 1832) : 8 mm. **Fig. 6**: *Mitrella albina* (Kiener, 1841) : 13 mm. **Fig. 7**: *Mitrella albuginosa* (Reeve, 1859) : 8.8 mm. **Fig. 8**: *Mitrella conspersa* (Gaskoin, 1851) : 10 mm.

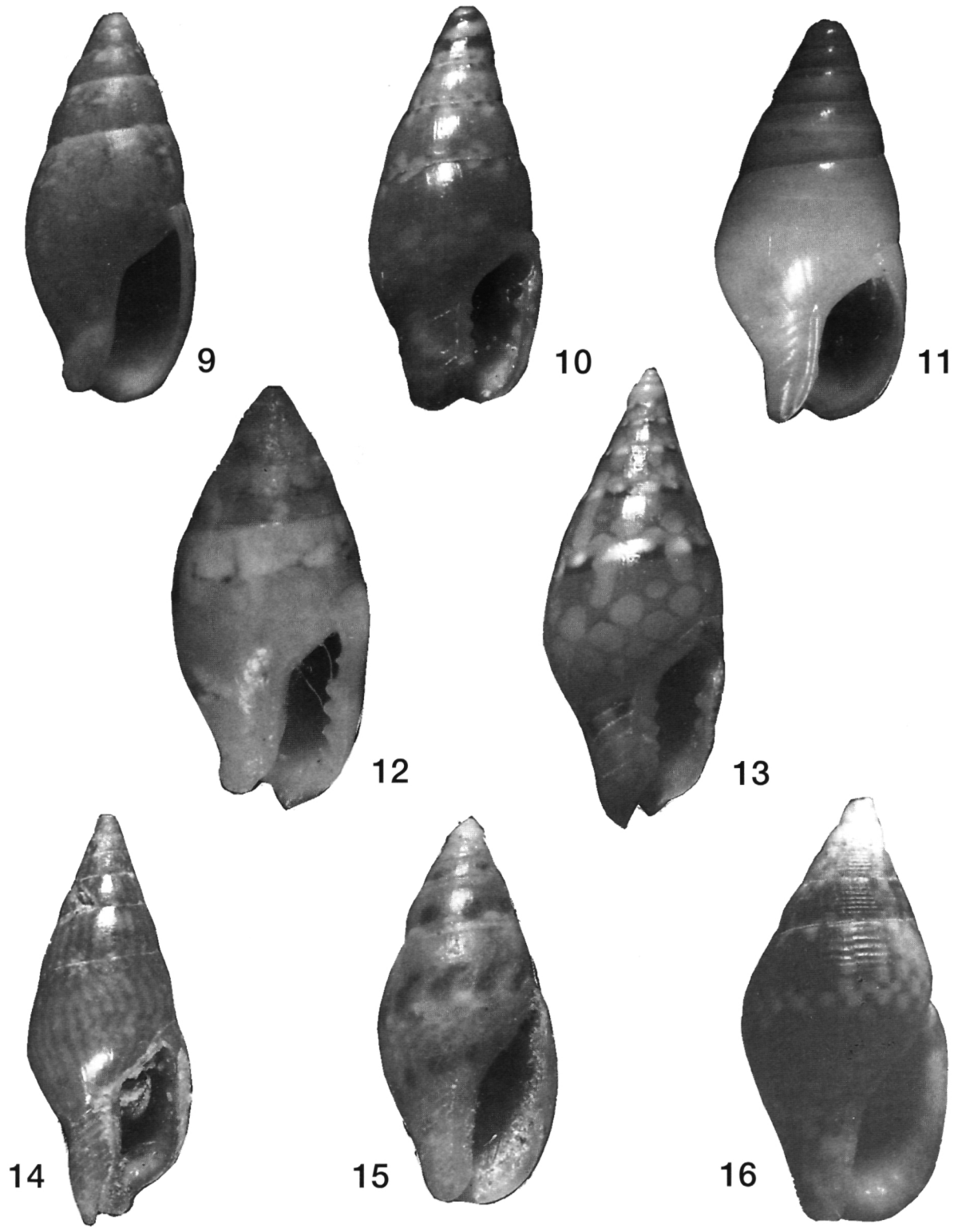


Fig. 9: *Mitrella floccata* (Reeve, 1859) : 13.3 mm. **Fig. 10**: *Mitrella goubini* (Hervier, 1899) : 5 mm. **Fig. 11**: *Mitrella innocens* (Thiele, 1925) : 5.4 mm. **Fig. 12**: *Mitrella margarita* (Reeve, 1859) : 8 mm. **Fig. 13**: *Mitrella moleculina* (Duclos, 1840) : 6 mm. **Fig. 14**: *Mitrella nympha* (Kiener, 1841) : 10mm. **Fig. 15**: *Mitrella rorida* (Reeve, 1859) : 6 mm. **Fig. 16**: *Mitrella seychellarum* (Von Martens, 1904) : 9.5 mm.

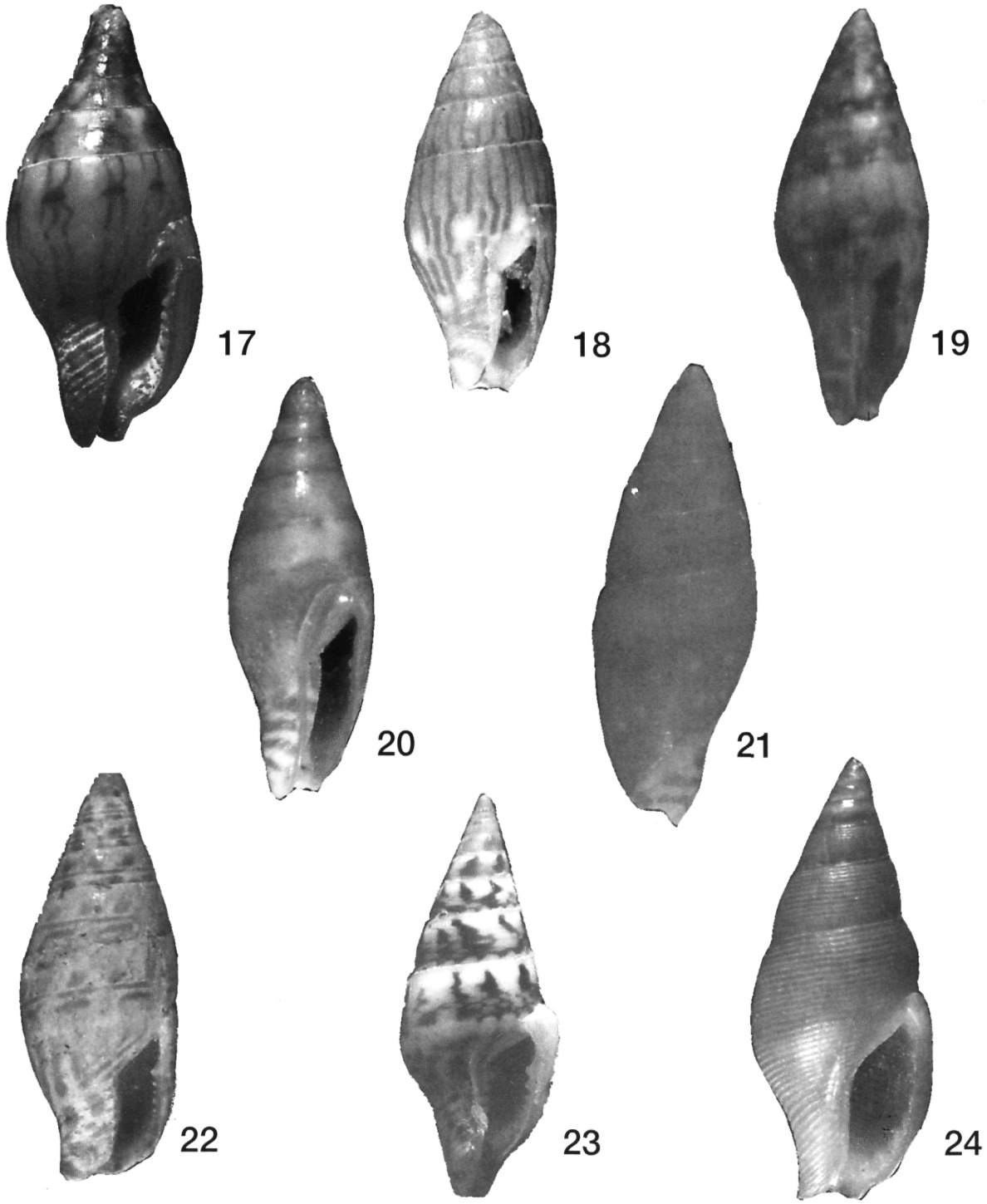
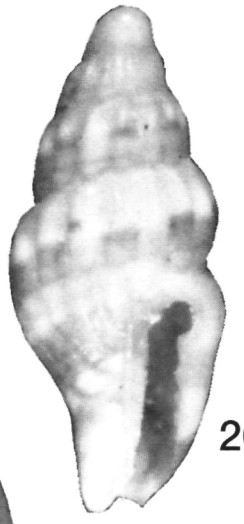
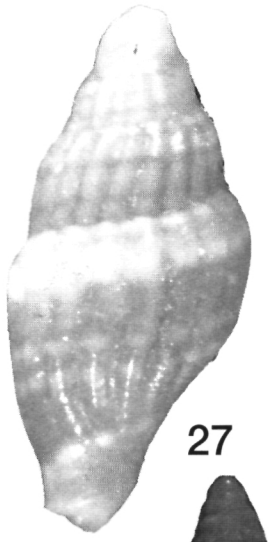


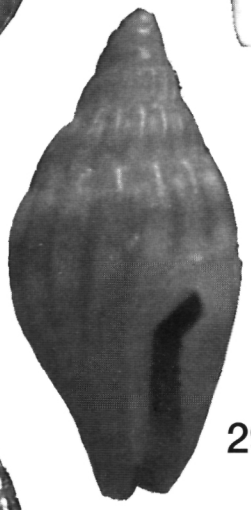
Fig. 17: *Mitrella venulata* (Sowerby, 1894) : 10 mm. **Fig. 18**: *Pyreneola cincinnata* (Von Martens, 1880) : 4 mm. **Fig. 19**: *Pyreneola melvilli* (Hedley, 1835) : 5.3 mm. **Figs. 20 - 21**: *Pyreneola lozoueti* n.sp. Holotype : 4.4 mm x 1.5 mm, MNHN, Paris. **Fig. 22**: *Pyreneola shepstonensis* (Smith, 1910) : 5 mm. **Fig. 23**: *Indomitrella puella* (Sowerby, 1844) : 11 mm. **Fig. 24**: *Pleurifera suzannae* (Drivas & Jay, 1990) : 5 mm.


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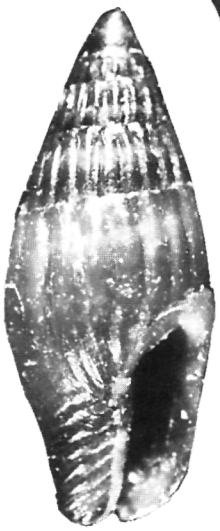

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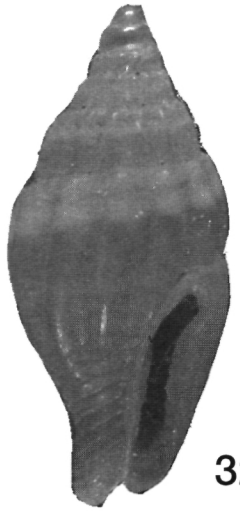

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Fig. 25: *Metanachis marquesa* (Gaskoin, 1851) : 11 mm. **Figs. 26-27**: *Zafra geyserensis* Holotype : 2 mm x 0.6 mm, MNHN, Paris. **Fig. 28**: *Zafra morini* (Viader, 1938) : 3 mm. **Fig. 29**: *Zafra obesula* (Hervier, 1899) : 3.8 mm. **Fig. 30**: *Zafra ocellatula* (Hervier, 1899) : 4.5 mm. **Fig. 31**: *Zafra minuscula* (Gould, 1860) : 2 mm. **Fig. 32**: *Zafra succinea* (Hervier, 1899) : 5 mm. **Fig. 33**: *Zafra troglodytes* (Souverbie, 1866) : 5 mm.

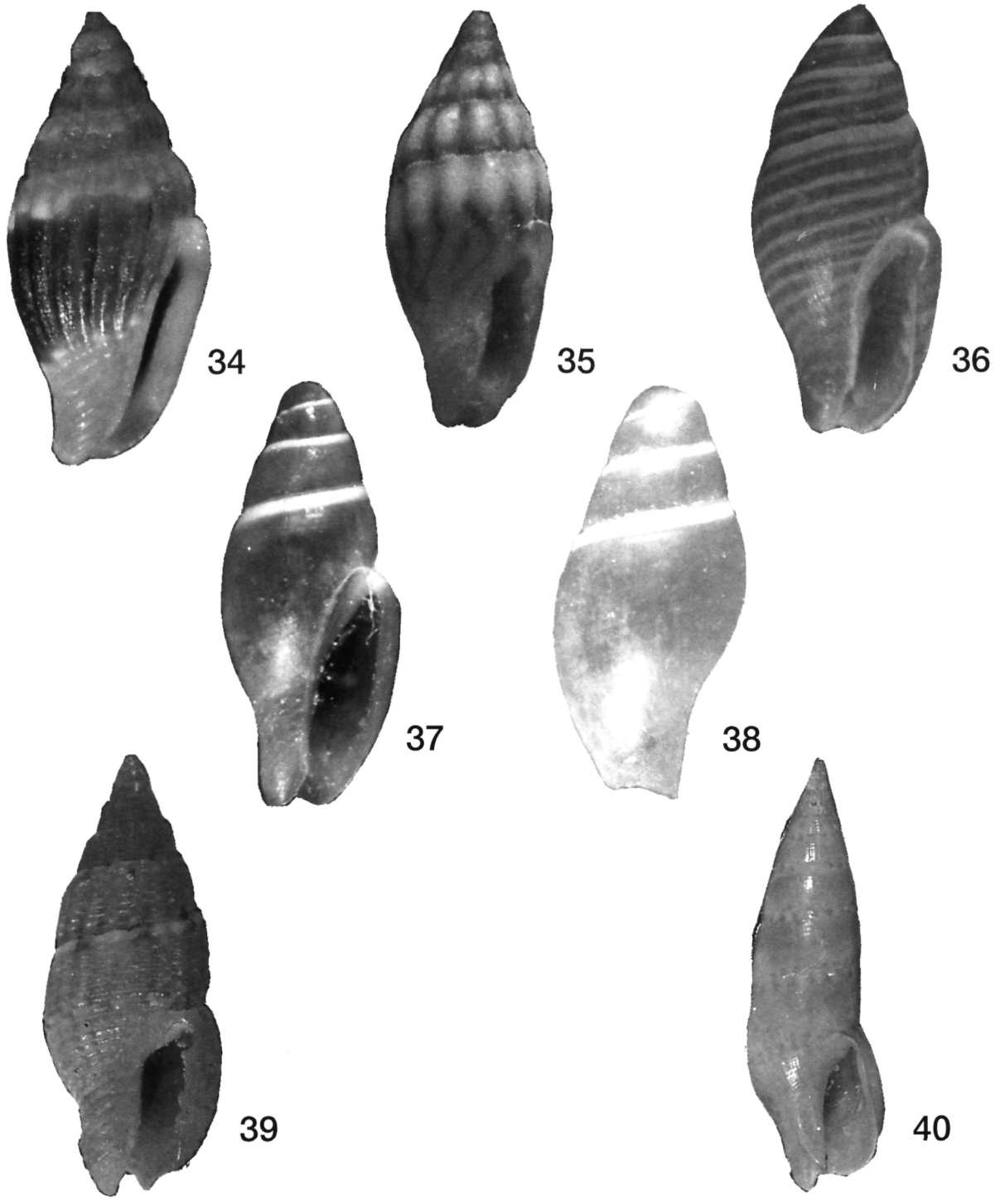


Fig. 34: *Seminella peasei* (Von Martens & Langkavel, 1871) : 3 mm. **Fig. 35**: *Seminella saviniae* (Viader, 1951) : 2 mm. **Fig. 36**: *Mokumea parvula* (Viader, 1951) : 2.5 mm. **Figs. 37-38**: *Mokumea zeleensis* n.sp. Holotype : 2.8 mm x1 mm, MNHN, Paris. **Fig. 39**: *Zafrona isomella* (Duclos, 1840) : 5 mm. **Fig. 40**: *Aesopus spiculus* (Duclos, 1840) : 14 mm.