

# New species and genera of the family Pickworthiidae (Mollusca, Caenogastropoda)

Jacques LE RENARD  
Philippe BOUCHET

Muséum national d'Histoire naturelle, Département Systématique et Évolution,  
55 rue Buffon, F-75231 Paris cedex 05 (France)

lerenard@mnhn.fr

pbouchet@mnhn.fr

Le Renard J. & Bouchet P. 2003. — New species and genera of the family Pickworthiidae (Mollusca, Caenogastropoda). *Zoosystema* 25 (4) : 569-591.

## ABSTRACT

The radula of a species of Pickworthiidae, *Astrosansonia dautzenbergi* (Bavay, 1917) n. comb., is described for the first time. However, its generalized taenioglossate morphology does not allow a conclusive allocation to a superfamily. *Liotia dautzenbergi* Bavay, 1917, is made the type of the new genus *Astrosansonia* n. gen., characterized by a planispirally coiled teleoconch, and *Liotia micraster* O. Boettger, 1907, from the Miocene of Paratethys, is referred to it. *Mecoliotia philippina* Bandel & Kowalke, 1997, is made the type of the new genus *Clatrosansonia* n. gen., characterized by a finely reticulated sculpture identical on the base and spire, and a perfoliated peristome; six Recent species from the Atlantic and Indo-Pacific are referred to it. Nine new Recent Indo-Pacific species are described in five genera: *Clatrosansonia troendlei* n. gen., n. sp., *Mareleptopoma drivasi* n. sp., *M. intermedia* n. sp., *M. pellucens* n. sp., *M. vaubani* n. sp., *Microliotia alvaniooides* n. sp., *Reynellona bollandi* n. sp., *R. borbonica* n. sp., and *Sansonia alisonae* n. sp. A checklist of the currently known Recent (60) and Caenozoic fossil (6) species of Pickworthiidae is compiled. The Cretaceous genus *Urceolabrum* Wade, 1916 is not treated as a member of the Pickworthiidae, but its family position in the Caenogastropoda remains uncertain.

## KEY WORDS

Mollusca,  
Caenogastropoda,  
Pickworthiidae,  
Indo-Pacific,  
microgastropods,  
submarine caves,  
new genera,  
new species.

## RÉSUMÉ

*Nouveaux genres et espèces de la famille des Pickworthiidae (Mollusca, Caenogastropoda).*

La radula d'une espèce de Pickworthiidae, *Astrosansonia dautzenbergi* (Bavay, 1917) n. comb., est décrite pour la première fois ; elle est de type taenioglosse relativement peu différenciée et ne permet pas à elle seule de placer la famille dans une superfamille déterminée. Le nouveau genre *Astrosansonia* n. gen., caractérisé par l'enroulement planispiral de la téléoconque, est créé pour *Liotia dautzenbergi* Bavay, 1917, et *Liotia micraster* O. Boettger, 1907, du Miocène de la Paratéthis, lui est rapporté. Le nouveau genre *Clatrosansonia* n. gen., caractérisé par une sculpture réticulée identique sur la spire et la base et un péristome perfolié, est créé pour *Microliotia philippina* Bandel & Kowalke, 1997 ; six autres espèces actuelles de l'Atlantique et de l'Indo-Pacifique lui sont rapportées. Neuf nouvelles espèces actuelles indo-pacifiques sont décrites dans cinq genres : *Clatrosansonia troendlei* n. gen., n. sp., *Mareleptopoma drivasi* n. sp., *M. intermedia* n. sp., *M. pellucens* n. sp., *M. vaubani* n. sp., *Microliotia alvanioides* n. sp., *Reynellona bollandi* n. sp., *R. borbonica* n. sp., et *Sansonia alisonae* n. sp. Les espèces actuelles et/ou quaternaires (60) et cénozoïques (6) de la famille sont cataloguées. Le genre crétacé *Urceolabrum* Wade, 1916 n'est pas traité comme appartenant aux Pickworthiidae, mais sa position familiale au sein des Caenogastropoda demeure incertaine.

## MOTS CLÉS

Mollusca,  
Caenogastropoda,  
Pickworthiidae,  
Indo-Pacifique,  
microgastéropodes,  
grottes sous-marines,  
nouveaux genres,  
nouvelles espèces.

## INTRODUCTION

The family Pickworthiidae Iredale, 1917 currently consists of some 60 Recent and six fossil species of small to minute (1-5 mm) caenogastropods, living in Paleocene to Recent tropical regions. They are only rarely mentioned in the literature and, until recently, they were known only from empty shells in shell sand from shallow to moderately deep (0-200 m) water. In the last few years, living material and numerous empty shells have been obtained in submarine caves in the tropical western Pacific (Kase & Hayami 1992; Kase 1998a-c, 1999). As a result, our perception of the diversification of the family has been completely changed: more than 70% of the currently known Recent species of Pickworthiidae have been described since 1990 from the tropical western Atlantic (Moolenbeek & Faber 1984; Espinosa & Fernández-Garcés 1990; Espinosa *et al.* 1990; Rolán & Fernández-Garcés 1993) and from the tropical western Pacific

(Kuroda & Habe 1991; Bandel & Kowalke 1997; Kase 1998a-c, 1999).

We have been accumulating notes for a revision of the Recent and fossil species of the family, examining the type material of all nominal species and additional material in public and private collections worldwide. Regrettably, this work has been delayed for many years. The purpose of the present paper is to present descriptions of new genus-group and species-group taxa; other similar preliminary papers have been or will be published elsewhere by Ronald Janssen (Frankfurt-am-Main, Germany), Bruno Sabelli and Marco Taviani (Bologna, Italy), and Tomoki Kase (Tokyo, Japan). Then a comprehensive revision, to be published in collaboration with the authors mentioned above, will include descriptions, illustrations and comparisons of the *c.* 70 species, together with a review of genus level taxonomy, and a discussion of family level relationships. The tentative allocation of Pickworthiidae to Littorinoidea by Reid (1998) remains problematical.

## ABBREVIATIONS

- AMS Australian Museum, Sydney;  
 BPBM Bernice P. Bishop Museum, Honolulu;  
 LACM Los Angeles County Museum of Natural History;  
 MNHN Muséum national d'Histoire naturelle, Paris;  
 MZB Museo di Zoologia, Bologna;  
 NMNZ Museum of New Zealand *Te Papa Tongarewa*, Wellington;  
 SMF Senckenberg Museum, Frankfurt;  
 UHM University of Hawaii, Manoa;  
 UMZC University Museum of Zoology, Cambridge;  
 ZMA Zoological Museum, Amsterdam;  
 D maximum shell diameter;  
 H total shell height;  
 dd empty shell;  
 lv live collected specimen;  
 leg. collected by;  
 coll. [private] collection of.

## SYSTEMATICS

Class GASTROPODA Cuvier, 1797  
 Clade CAENOGASTROPODA Cox, 1960  
 Superfamily uncertain

Family PICKWORTHIIDAE Iredale, 1917

The family name Pickworthiidae remains valid, even though its type genus *Pickworthia* Iredale, 1917, has been synonymized with *Sansonia* Jousseaume, 1892 (ICZN 1999: Art. 40.1).

Genus *Astrosansonia* n. gen.

"*Astrosansonia*" – Bouchet 1987: figs 141, 142. — Preece 1995: 352. — Bouchet & Le Renard 1998: 740, 741, fig. 15.101F, G. (In none of these cases, the genus name *Astrosansonia* has been made available [no type species designated, no diagnosis and/or published in a nomenclaturally unavailable work]).

TYPE SPECIES. — *Liotia dautzenbergi* Bavay, 1917: 112, 113, pl. 3 figs 6-8 (Fig. 1).

ETYMOLOGY. — The name refers to the star-shaped contour of the base.

## DESCRIPTION

Shell very small, *Liotia*-shaped, with planispirally coiled teleoconch. Protoconch mucronate, consisting of 2.5 whorls, protruding almost vertically above teleoconch. Teleoconch with two to three

whorls, forming flat spire, with sharply keeled periphery. Shell with star-shaped contour in dorsal view, due to projecting spines of peripheral keel. Base with very broad, open umbilicus lined with elevated rim. Outer part of peristome very oblique, almost parallel to base; outer lip forming broad rim, with quadrate outline.

*Radula*

The radula of *Astrosansonia dautzenbergi* (Bavay, 1917) n. comb. (Fig. 1A, B) was extracted and mounted for SEM by A. Warén. It is of generalized taenioglossate type (Caenogastropoda). Its only significant feature is the central tooth, which differs from all known rissocean central teeth (W. Ponder pers. comm.), and does not allow a conclusive allocation of Pickworthiidae to a superfamily.

## REMARKS

*Astrosansonia dautzenbergi* n. comb. (Fig. 1) is very closely related to *A. micraster* (Boettger, 1907) n. comb., from the Miocene of Kostej, Rumania. Their slight differences may reflect chronological separation.

In the original description of *Liotia micraster*, Boettger (1907) compared it with *Liotia discoidea* Reeve, 1843, with which it shares a very depressed outline and crenulated periphery, as do all other species of *Dentarene* Iredale, 1929 or *Pterarene* Sakurai & Habe, 1977. However, *Dentarene* and *Pterarene* belong to Vetigastropoda, and are not confamilial with *Astrosansonia* n. gen. Several other skeneiform taxa, such as *Pseudoliotia* Tate, 1898 (see, e.g., *P. micans* (A. Adams, 1850)), resemble *Astrosansonia* n. gen. by their strongly oblique, double aperture. Within the family Pickworthiidae, the very flat discoidal outline is characteristic of *Astrosansonia* n. gen.

Genus *Clatrosansonia* Sabelli & Taviani n. gen.

TYPE SPECIES. — *Mecoliotia philippina* Bandel & Kowalke, 1997 (Fig. 2).

ETYMOLOGY. — From the Latin *clatri* (= bars, lattice), and from *Sansonia*. The spelling *clathr-*, although widely used (as in *clathrate*), is not Greek and seems uncommon in Latin.

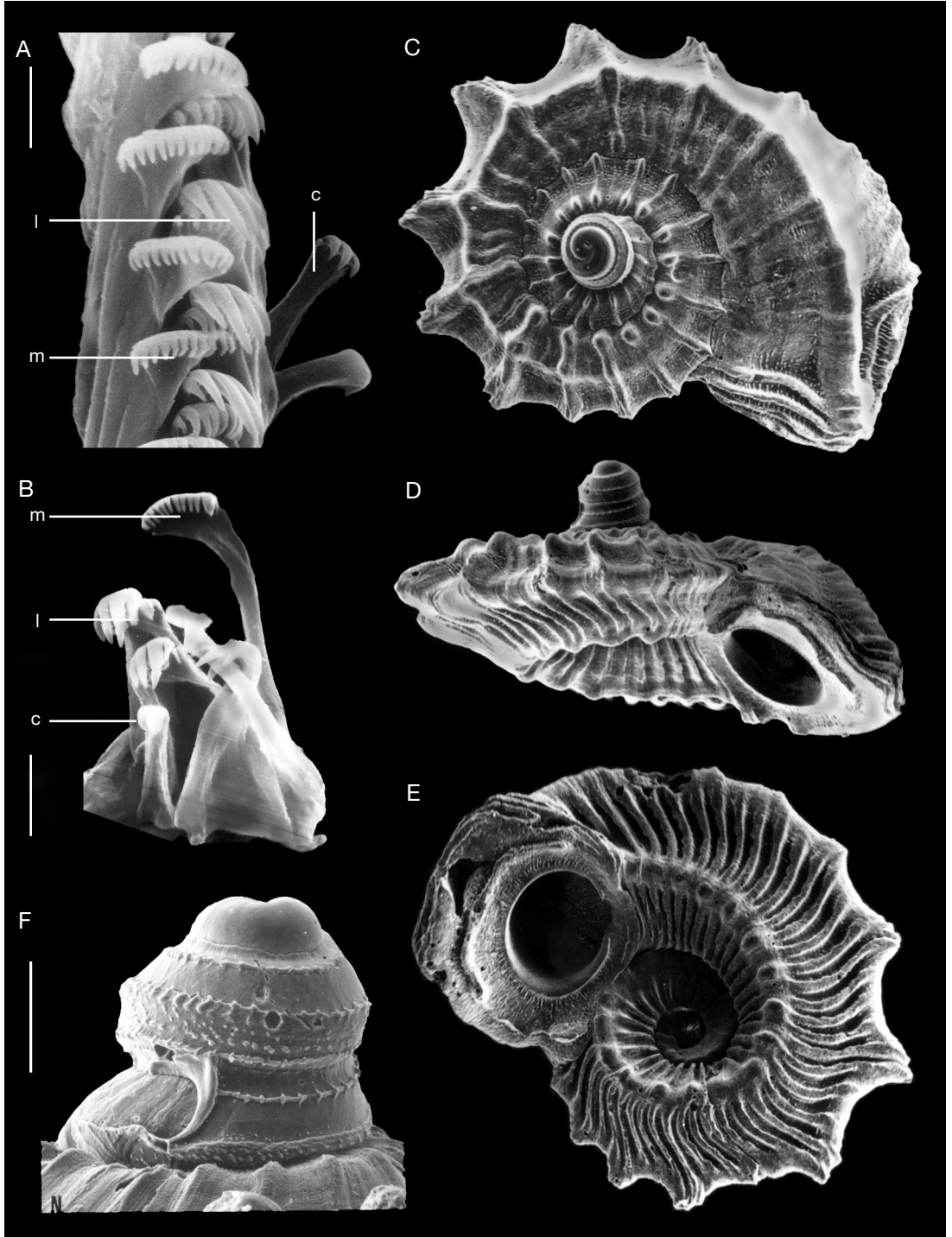


FIG. 1. — *Astrosansonia dautzenbergi* (Bavay, 1917) n. comb.; **A, B**, radula; **C-E**, topotype from Raiatea I., Society Is, Polynesia (MNHN), diameter 1.1 mm; **F**, protoconch. Abbreviations: **c**, central tooth; **l**, lateral; **m**, marginals. Scale bars: A, 2  $\mu$ m; B, 3  $\mu$ m; F, 50  $\mu$ m.

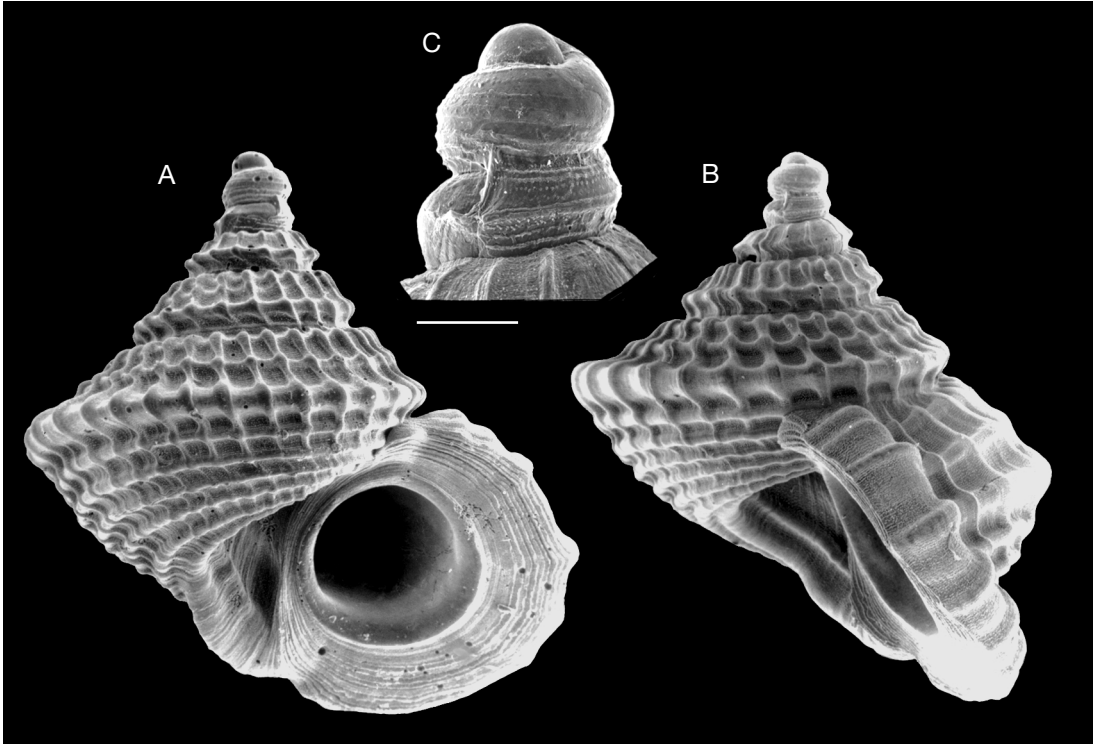


FIG. 2. — *Clatrosansonia philippina* (Bandel & Kowalke, 1997) n. comb., Jeddah, Red Sea (MZB 003794), H = 1.27 mm; **A, B**, apertural and side views; **C**, protoconch. Scale bar: C, 50  $\mu$ m.

SPECIES INCLUDED. — *Mecoliotia jousseaumei* Bavay, 1921; *Manzonia* (*Taramellia*) *minuta* Hornung & Mermod, 1928 [= *Merelina hians* Laseron, 1957]; *Alvania* (*Taramellia*) *corayi* Ladd, 1966; *Mareleptopoma cubensis* Espinosa, Fernández-Garcés & Rolán, 1990, *M. cheffae* Rolán, Espinosa & Fernández-Garcés, 1991 [similar to *M. cubensis*], *M. scalaris* Rolán & Fernández-Garcés, 1993, *Microliotia circumserata* Raines, 2002, and *Clatrosansonia trondlei* n. sp. *Clatrosansonia philippina* n. comb. has been designated as type species because it is the most common of all included species.

#### DESCRIPTION

Shells very small (height from 1 to 2 mm); H/D ratio ranging from 1 to 2. Sculpture very regularly clathrate, with numerous evenly-spaced spiral cords (eight to 13 on body whorl), similar in appearance on base and spire; spiral cords intersected by numerous axial lamellae (25 to 45 on body whorl). Intersection of axial and spiral sculpture forming slightly or very slightly prominent nodes. In addition to this primary sculpture,

microsculpture of spiral lamellae distinctly visible between ribs and cords. Stronger spiral cord or keel may mark periphery of body whorl. The more developed this peripheral keel, the flatter the spire whorls. Suture narrow but rather deep. Narrow but deep umbilicus always present, lined by strong prominent rib merging abruptly with base of peristome. Aperture rather broad; peristome consisting of numerous concentric rings stacked in flat disk projecting strongly outwardly. In lateral view, disc lying obliquely, parallel to one side of spire, so that the stouter the shell, the more oblique the apertural rim. Spiral sculpture extending onto body whorl to back and side of outer lip. Protoconch of all species except one planktotrophic, with 2.5 whorls; seven spiral cords, often in pairs, plus additional small pustules forming more or less regular spiral alignments. Sculpture of teleoconch initially with a single spiral cord, continuous with main spiral cord of larval shell.

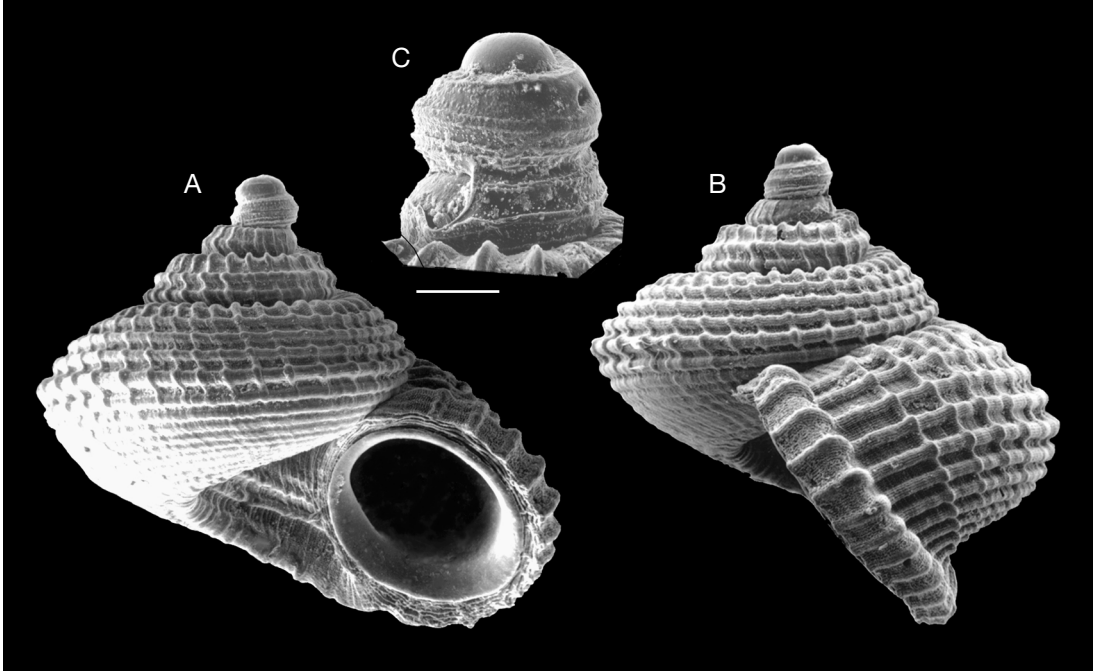


FIG. 3. — *Clatrosansonia troendlei* n. gen., n. sp., holotype, Tahiti, French Polynesia (MNHN), H = 1.0 mm; **A**, **B**, apertural and side views; **C**, protoconch. Scale bar: C, 50  $\mu$ m.

REMARKS

The species included by us in *Clatrosansonia* n. gen. are very homogeneous in the following characters: fine and regular reticulated sculpture, identical on the base and spire; umbilicus deep and lined with a rib; peristome with numerous concentric lamellae onto which the spiral sculpture extends.

*Clatrosansonia troendlei* n. sp.  
(Fig. 3)

TYPE MATERIAL. — Holotype (dd) in MNHN.

TYPE LOCALITY. — Afaahiti, Tahiti, Society Is, 25 m.

ETYMOLOGY. — The specific epithet honors Jean Tröndle, of La Force (France), an expert of the mollusc fauna of French Polynesia and a companion of field work in New Caledonia.

MATERIAL EXAMINED. — A total of 1 complete and 2 fragmentary specimens.

**French Polynesia.** Afaahiti, Tahiti, 25 m, 1985, leg. Tröndle, 1 dd (holotype; MNHN). — Hao, Tuamotu, 1984, leg. Le Renard, 1 fragm. (MNHN).

**New Caledonia.** Off Nouméa, Grand Récif Aboré, 22°22.21'N, 166°15'E, 15-35 m, 1992, leg. Bouchet & Marshall, 1 fragm. (MNHN; identification uncertain).

DISTRIBUTION. — Pacific Ocean: Society Islands; New Caledonia?

DESCRIPTION

Holotype (Fig. 3). Shell very small, turbanate and depressed. Protoconch (Fig. 3C) of 2.5 convex whorls, slightly styliform, slanting with respect to teleoconch axis. Sculpture of protoconch II consisting of six granular spiral cords, unequal, unevenly spaced. Adapical cord separated from suture by abrupt sutural ramp. Last half-whorl of larval shell with deep, narrow notch lined with recurved lip. Teleoconch with three convex whorls, separated by channeled suture. First teleoconch whorl with two spiral cords. Complete spiral sculpture, consisting of five equal equidistant cords, formed on the second teleoconch whorl; these cords separated by narrow and deep furrows.

Axial sculpture oblique and much fainter than spiral cords. Axial and spiral sculpture together forming very regular reticulation, with rectangular spirally elongate subunits, and prominent nodes at intersections. Body whorl of liotiid appearance, occupying 3/4 of total shell height, very convex and with only slight keel. Base with very broad umbilicus, separated from base by large muricated cord. Inner wall of umbilicus with three cords, parallel to periumbilical cord; between umbilicus and peripheral keel, base bearing eight nearly smooth concentric cords, with obsolete incremental striae between them. Aperture circular, surrounded by smooth margin and peristome with many concentric folds. In lateral view, peristome forming angle of 45° with columellar axis. Labral rib of peristome extending outwardly; 12 regular spiral cords of last whorl extending onto side of peristome. In addition to this main sculpture, microsculpture of finely granular spiral lamellae present.

#### Dimensions

H = 1.0 mm, D = 1.2 mm.

#### REMARKS

*Clatrosansonia troendlei* n. sp. is the most depressed of all *Clatrosansonia* n. gen., and thus resembles the type species *C. philippina* n. comb. However, it can be distinguished by its finer spiral sculpture (12 spiral cords on the body whorl instead of seven in *C. philippina* n. comb.), and spirally elongated (not squared) reticulations.

#### Genus *Mareleptopoma*

Moolenbeek & Faber, 1984

TYPE SPECIES. — *Mareleptopoma karpatensis* Moolenbeek & Faber, 1984, by original designation.

#### REMARKS

*Mareleptopoma* differs from *Sansonia* by its rissoiform (not trochiform) outline, more convex whorls, a less thickened and less oblique apertural rim, a narrow (if present) umbilicus, and a convex base sculptured with numerous concentric cords not forming a major keel at the periphery.

The type species of *Mareleptopoma* is rather peculiar, and the original generic diagnosis is too specific. We have therefore modified the original concept of *Mareleptopoma* in order to accommodate several additional species: the general outline is turbinate or rissoiform, rather than trochiform; the protoconch may be multispiral or paucispiral, depending on the mode of development (the original diagnosis erroneously described the protoconch of *M. karpatensis* as mammillated, suggesting a lecithotrophic development, but Moolenbeek & Faber's original figure 48 shows a sinusigera larval shell, with a deep sinus); there is a narrow, but open umbilicus in several species; a microsculpture of spiral rows of granules may or may not be present, depending on the species. As redefined, *Mareleptopoma* is pan-tropical in distribution, and is known since the Oligocene (P. Lozouet pers. comm.). Moreover, it includes the most abundant species of Pickworthiidae, *M. iredalei* (Bavay, 1921).

#### *Mareleptopoma drivasi* n. sp.

(Fig. 4)

"*Mareleptopoma drivasi*" – Bouchet 1987: figs 86, 87 (*nomen nudum*).

TYPE MATERIAL. — Holotype (dd) and 4 paratypes (dd) in MNHN.

TYPE LOCALITY. — Cap La Houssaye, La Réunion, 12 m.

ETYMOLOGY. — The specific epithet honours Jean Drivas, one time resident of La Réunion and enthusiastic collector of Indo-Pacific micromolluscs.

MATERIAL EXAMINED. — A total of 13 specimens (10 lots).

**La Réunion.** Cap La Houssaye, 12 m, 1984, leg. Drivas, 1 dd, holotype (MNHN; Fig. 4A, B, C). — Boucan Canot, 57 m, 1984, leg. Drivas, 4 dd, paratypes (MNHN; Fig. 4D). — Boucan Canot, 45–50 m, coll. Palazzi, 1 dd.

**Japan.** Najikin, Morobu Peninsula, Okinawa, 26°42'N, 127°56'E, 35 m, 1978, leg. Bolland, 1 dd (LACM 78-22.4). — 1 km WNW Onna Village, Okinawa, 26°30'N, 127°51'E, 55 m, 1978, leg. Bolland, 1 dd (LACM 78-26.3).

**Palau.** Helen I., fore reef, in crevice, 1994, leg. Myers, 1 dd (MNHN ex Paulay). — Tobi I., fore reef, in crevice, 17 m, 1994, leg. Myers, 1 dd (MNHN ex Paulay).

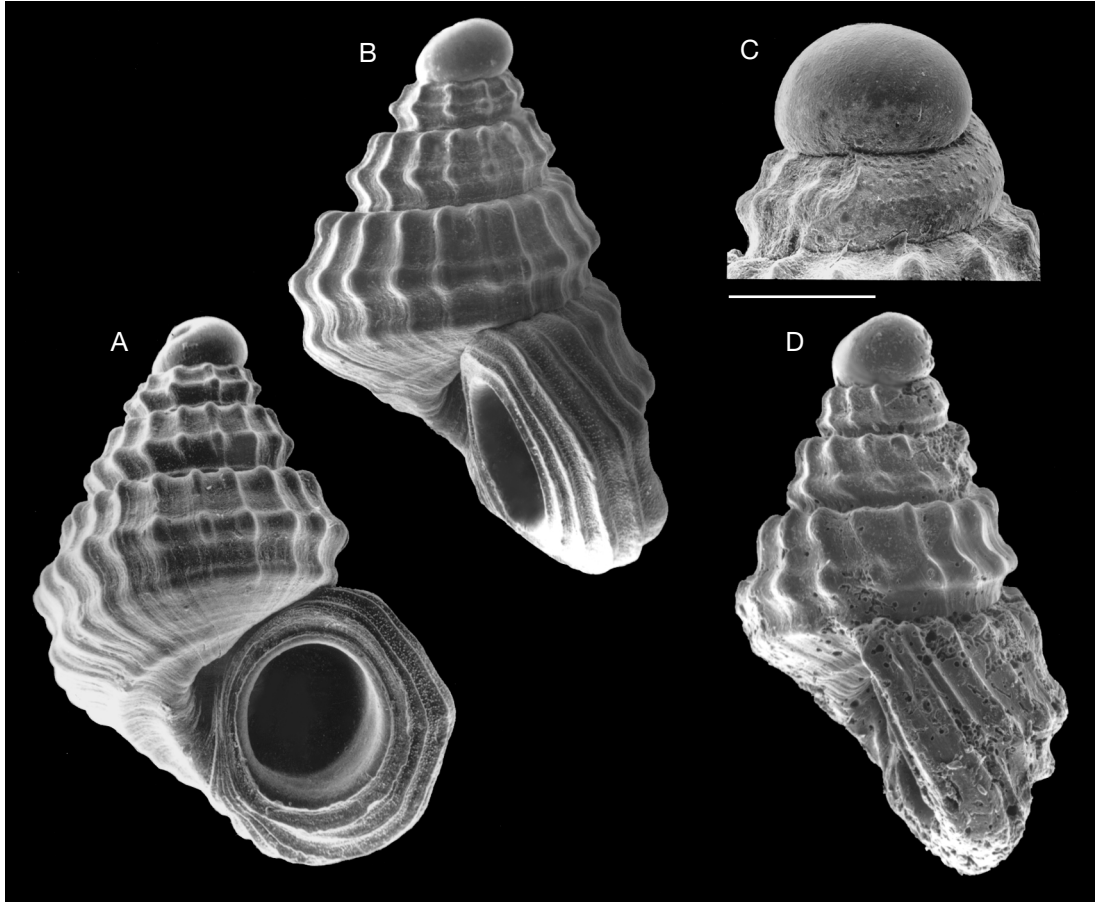


FIG. 4. — *Mareleptopoma drivasi* n. sp.: **A-C**, holotype, cap La Houssaye, La Réunion (MNHN), H = 1.1 mm; **A, B**, apertural and side views; **C**, protoconch; **D**, paratype, Boucan Canot, La Réunion (MNHN), H = 0.93 mm. Scale bar: C, 100  $\mu$ m.

**Guam.** Apra Harbour, IM shoal, south side, in underhung area, c. 1-1.5 m into reef, depth 5-7 m, 1994, leg. Paulay, 1 dd (MNHN).

**Mariana.** Saipan, roof of "Grotto", 5-10 m, 1994, leg. Paulay, 1 dd (MNHN).

**Indonesia.** Pulau Run, Banda Archipelago, 21 m, 1994, leg. Birkeland, 1 dd (MNHN ex Paulay).

**DISTRIBUTION.** — Indian Ocean: La Réunion; Pacific Ocean: Okinawa, Guam, Marianas, Indonesia.

**DESCRIPTION**

Holotype (Fig. 4A, B, C). Shell very small, rissoiform, consisting of five whorls. Protoconch (Fig. 4C) consisting of 1.5 smooth globular whorls, indicating non-planktotrophic larval development. Teleoconch sculpture consisting of

two spiral cords, one below suture, another at mid-whorl. Third spiral cord present as a sutural thread, hidden by deep suture. Axial sculpture consisting of faint straight equidistant ribs, slightly oblique; nine such ribs on first teleoconch whorls, 22 on body whorl. Intersections of axial and spiral sculpture forming prominent narrow tubercles. Base convex, sculptured, in addition to three nodulose spiral cords, with faint smooth cord in middle of base, plus a strong cord surrounding umbilicus. Umbilicus open. Aperture rounded; peristome thickened, more so in outer than inner part. Successive positions of peristome seen concentrically on outer lip; six such rings gradually narrow aperture of holotype.



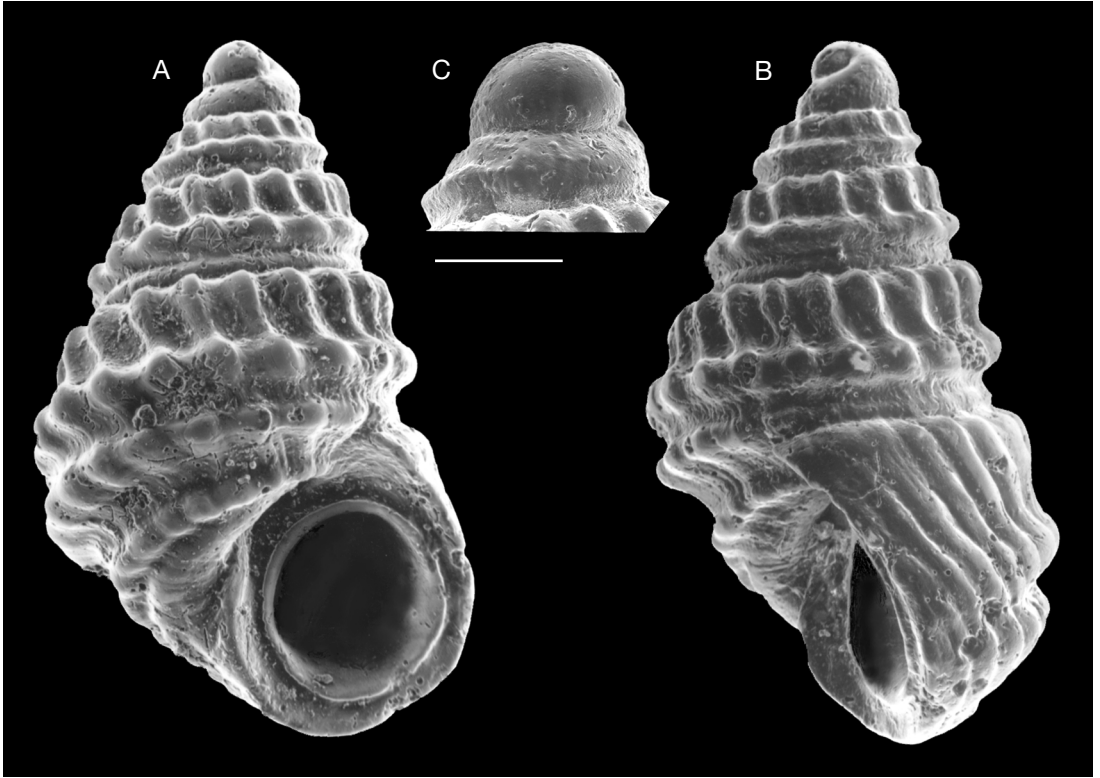


FIG. 5. — *Mareleptopoma intermedia* n. sp., holotype, Fanning, Line Islands (BPBM), H = 1.3 mm; **A, B**, apertural and side views; **C**, protoconch. Scale bar: C, 100  $\mu$ m.

#### Dimensions

H = 1.1 mm, D = 0.78 mm.

#### REMARKS

The sculpture of *Mareleptopoma drivasi* n. sp. resembles that of *M. iredalei*; however, the body whorl of *M. drivasi* n. sp. is larger and forms 45% of the total shell height (vs 35% in *M. iredalei*). The peristome of *M. drivasi* n. sp. is much broader, and its larval shell is of non-planktotrophic type.

#### *Mareleptopoma intermedia* n. sp. (Fig. 5)

TYPE MATERIAL. — Holotype (dd) and 4 paratypes in BPBM.

TYPE LOCALITY. — Fanning I., Line Islands, Central Pacific.

ETYMOLOGY. — The specific name reflects the intermediate position of this species, which blends the characters of a teleoconch of *M. iredalei* with a protoconch of *M. drivasi* n. sp.

MATERIAL EXAMINED. — A total of 7 specimens (4 lots).

**Line Islands.** Fanning I., leg. Kay, 3 dd (holotype and 2 paratypes).

**Micronesia.** Ponape, barrier reef, mid pass, among *Acropora*, 1964, leg. Kay, 2 dd (paratypes).

**Lord Howe Island.** Dredged, 1 dd (AMS 059754 ex coll. Bell). — HMAS *Kimbla*, stn LH1, off Lord Howe I., 31°34.9'S, 159°03'E, 73 m, calcareous *Lithothamnium* nodules, 1976, leg. Ponder, Lowry & Rowe, 1 dd (AMS 154749).

DISTRIBUTION. — Pacific Ocean: Line Islands, Ponape, Lord Howe.

#### DESCRIPTION

Holotype (Fig. 5). Shell very small, rissoiform. Protoconch (Fig. 5C) consisting of 1.5 smooth

globular whorls, indicating a non-planktotrophic larval development. Teleoconch with 3.5 whorls; spire conical; whorls with flat profile, separated by deep sutural groove with slightly granulated thread inside. On first teleoconch whorl, sculpture initially consisting of two beaded cords; anterior cord rapidly strengthening into prominent rounded keel, on abapical third of whorl. This keel separated from sutural cord by simple groove, and bearing rounded tubercles (about 18 per whorl). Adapical cord soon developing into coronate shoulder. Nodes of two spiral cords linked by faint prosocline costae; adult sculpture thus appearing regularly decussated. Body whorl occupying 68% of total height, with overall evenly curved outline, not angulated by main keel. Sutural cord developing around base into strong cord, with tubercles prolongating axial costae. Slightly convex base, showing two contiguous weaker cords; exterior cord also beaded, separated from peripheral cord by groove; inner cord forming somewhat irregular pad, winding around imperceptible umbilical slit. Subcircular aperture flaring into simple rim; rim slightly prominent over peristomal plane. Thick peristome surrounding aperture completely; outer lip not strongly prominent, clearly prosocline.

#### Dimensions

H = 1.3 mm, D = 0.8 mm.

#### REMARKS

*Mareleptopoma intermedia* n. sp. shares with *M. drivasi* n. sp. and *M. pellucens* n. sp. a smooth, non-planktotrophic protoconch. From the latter it can be distinguished by its strong sculpture, its less slender shape and its less extensive peristome. From *M. drivasi* n. sp., it differs primarily in its sculpture, with more prosocline and more nodulose ribs, two much stronger cords on the base, its reduced umbilical slit, and its narrower aperture. *Mareleptopoma intermedia* n. sp. also resembles more superficially *Mareleptopoma iredalei*, *Sansonia sumatrensis* (Thiele, 1925), or *Reynellona bollandi* n. sp. (Fig. 10), from which it differs, among other characters, by its paucispiral, rather than multispiral, protoconch. *Mare-*

*leptopoma* appears to be the most appropriate genus for the present species (and for the other elongate species just cited), although it may appear to differ morphologically from the type species.

#### *Mareleptopoma pellucens* n. sp.

(Fig. 6)

TYPE MATERIAL. — Holotype (dd) AMS 135347; 11 paratypes AMS 135347 and 135349; 1 paratype each MNHN and MZB 31019.

TYPE LOCALITY. — Bathurst, Rottneest I., Western Australia.

ETYMOLOGY. — From the Latin *pellucens*, meaning translucent, alluding to the particular transparency of the shells of this species.

MATERIAL EXAMINED. — A total of 28 specimens (5 lots).

Western Australia. Bathurst, Rottneest I., 1977, leg. Hewitt, 14 dd (holo- and paratypes). — HMAS *Moresby*, off Rottneest I., 31°38'S, 115°13.6'E, 62 m, sand and coral, 1981, 2 dd (AMS 331822; identification uncertain). — HMAS *Moresby*, off Rottneest I., 31°43.1'S, 115°12.5'E, 98-124 m, broken shell and coral, 1981, 2 dd (AMS 331823, 331819; identification uncertain). — HMAS *Moresby*, Direction Bank, off Rottneest I., 31°36.7'S, 115°11.9'E, 72 m, 1980, 8 dd (AMS 331817; identification uncertain). — HMAS *Moresby*, Direction Bank, off Rottneest I., 31°42'S, 115°13.6'E, 105-120 m, 1980, 2 dd (AMS 331821, 331824; identification uncertain).

DISTRIBUTION. — Western Australia.

#### DESCRIPTION

Holotype (Fig. 6A, B, C). Shell very small, risoiform, consisting of five translucent uncoloured whorls. Protoconch (Fig. 6C) smooth, consisting of 1.5 whorls, with nucleus slightly immersed. Transition indistinct between protoconch and teleoconch. Sculpture initially consisting of two rounded spiral cords, slightly nodulose where they intersect rounded oblique axial ribs. Adapical cord situated very close to suture, separated from it by narrow abrupt sutural ramp. Abapical cord situated at lower third of whorl, separated from suture by flat deep channel. Body whorl occupying 63% of total height; base with two additional spiral cords, equal in strength and sculpture to others.

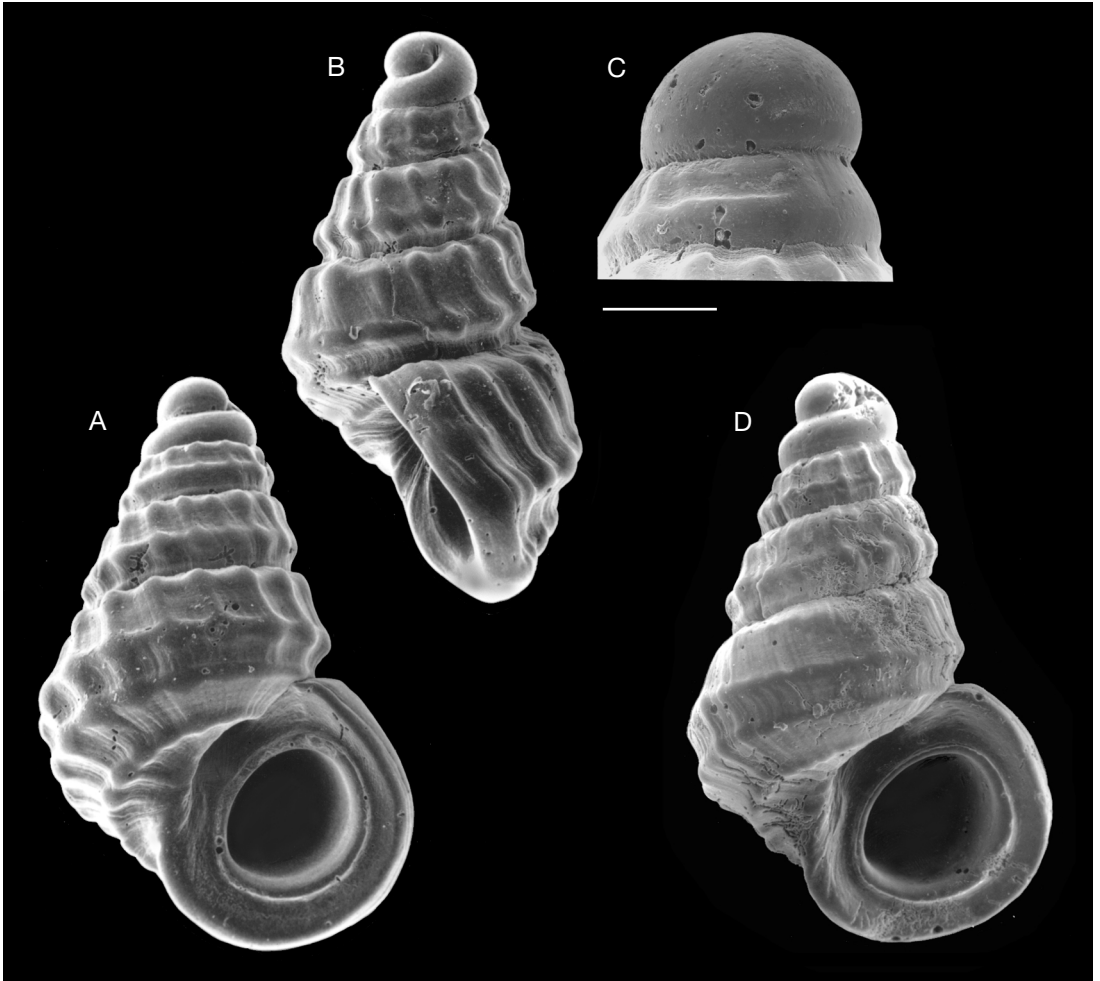


FIG. 6. — *Mareleptopoma pellucens* n. sp., Rottnest I., Western Australia (AMS 135347); **A-C**, holotype, H = 1.1 mm; **A, B**, apertural and side views; **C**, protoconch; **D**, paratype, H = 0.75 mm. Scale bar: C, 100  $\mu$ m.

Columellar area with narrow, deep umbilicus, separated from base by rounded cord merging with apertural rim. Peristome prosocline, surrounding  $3/4$  of aperture, depressed at center. Aperture with distinctly raised margin.

#### Dimensions

H = 1.1 mm, D = 0.74 mm.

#### REMARKS

*Mareleptopoma pellucens* n. sp. is easily distinguished from other species by its glassy shell and rounded sculpture, difficult to observe because of

the transparency of the shell. Some specimens (e.g., paratype Fig. 6D) have a shallower suture, axial sculpture restricted to the first teleoconch whorl, and a simply sculptured body whorl with five smooth spiral facets. It most closely resembles *M. drivasi* n. sp.: the protoconch of both species is non-planktotrophic, but that of *M. pellucens* n. sp. has a unique appearance due to its immersed nucleus. *M. pellucens* n. sp. is also more slender; its sculpture is smoother, without sharp tubercles. The transparency of the shell and the shape of the protoconch give this species a pyramidellid appearance, but the obvious relationship with

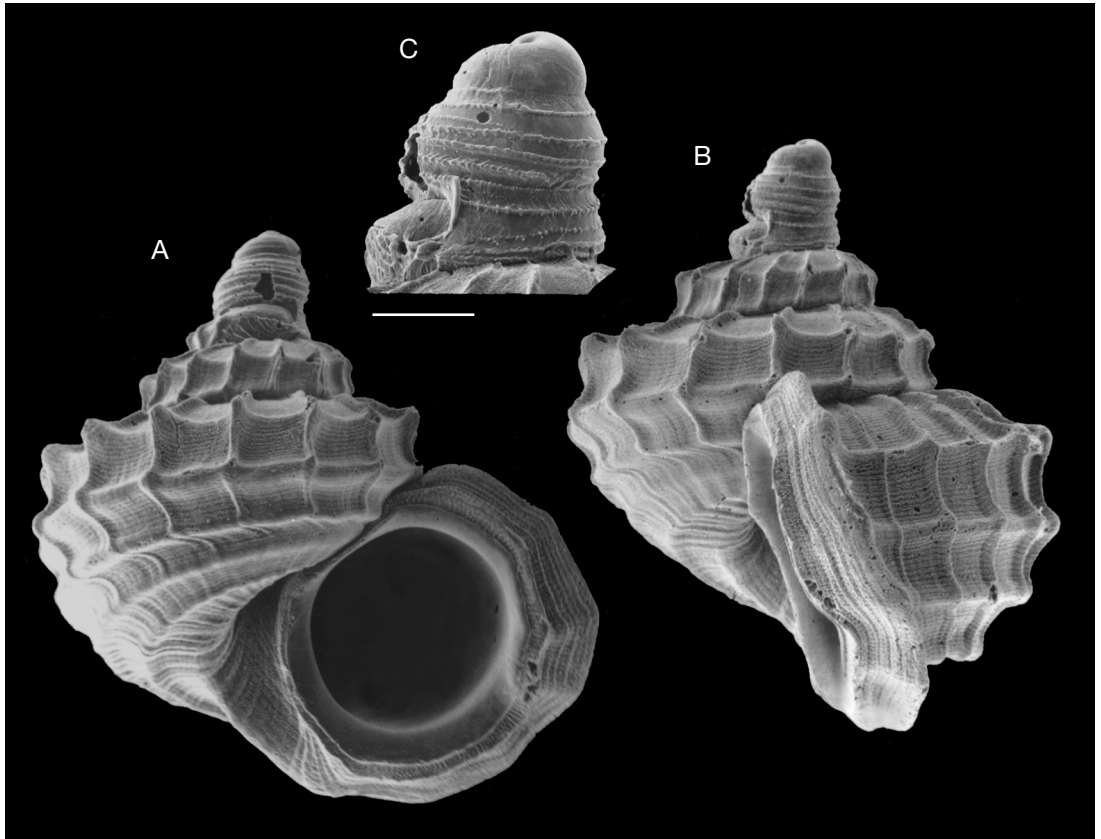


FIG. 7. — *Mareleptopoma vaubani* n. sp., holotype, off Nouméa, New Caledonia, 250-350 m (MNHN), H = 0.95 mm; **A, B**, apertural and side views; **C**, protoconch. Scale bar: C, 50  $\mu$ m.

*M. drivasi* n. sp. has led us to include the present species in *Mareleptopoma*, although with some hesitation; *M. pellucens* n. sp. shows the most distant characters when compared with *M. karpatensis*, the type species of *Mareleptopoma*, to which it seems to be linked by a continuum of species with intermediate morphologies.

Several lots from Rottneest Island listed above have corroded shells and look subfossil; due to this bad preservation, these are only tentatively referred to *M. pellucens* n. sp. This is so far the only Pickworthiidae known from Western Australia.

*Mareleptopoma vaubani* n. sp.  
(Fig. 7)

TYPE MATERIAL. — Holotype (dd) in MNHN.

TYPE LOCALITY. — New Caledonia, off Nouméa, *Vauban*, 1979, stn 40, 22°30'S, 166°24'E, 250-350 m.

ETYMOLOGY. — The species is named after RV *Vauban*, on board of which the holotype was collected.

MATERIAL EXAMINED. — A total of 3 specimens (3 lots). **Japan.** Horseshoe Cliffs, 1 km WNW Onna Village, Okinawa, 26°29.6'N, 127°50.5'E, 60 m, gravel, 1979, leg. Bolland, 1 dd (LACM 79-76.4).

**Philippines.** Panglao I., Bohol, 18 m, 1 dd (UHM). **New Caledonia.** New Caledonia, off Nouméa, *Vauban*, stn 40, 22°30'S, 166°24'E, 250-350 m, 1979, leg. Warén, 1 dd (holotype, MNHN).

DISTRIBUTION. — Pacific Ocean: Okinawa, Philippines, New Caledonia.

DESCRIPTION

Holotype (Fig. 7). Shell very small, turritate, consisting of six whorls. Protoconch (Fig. 7C)

consisting of three whorls, styliform; protoconch I consisting of one smooth whorl; two protoconch II whorls bearing five or six granular spiral cords of unequal strength. Deep sinusigera notch, lined by reflected lip adpressed to whorl above. Protoconch axis slightly tilted on teleoconch axis. Teleoconch whorls angular, growing rapidly in diameter, separated by deep suture. Sculpture on spire consisting of two spiral cords of equal strength; one at upper third of whorls, separated from suture by broad, sloping ramp; the other very close to abapical suture. Axial sculpture consisting of raised narrow ribs, straight, orthocline, numbering 15 per whorl. Intersections of axial and spiral sculptures forming reticulations with depressed centers edged by spiny projections. Base of body whorl convex, with four smooth equidistant cords of equal strength. Periumbilical cord lining deep, rather narrow umbilicus. Axial sculpture hardly extending on base, with many incremental lines becoming more distinct, extending into umbilicus. Beside this first order sculpture, microsculpture of regular spiral lamellae. Aperture only slightly oblique, rounded, large (slightly narrowed by interior labral thickening). Peristome foliated, thickened into very narrow varix, with undulating profile in lateral view, with polygonal rounded outline in apertural view (due to termination of spiral cords of body whorl). Sculpture remaining strong behind peristome, with four rows of square reticulations.

#### *Dimensions*

H = 0.95 mm, D = 0.96 mm.

#### *REMARKS*

*Mareleptopoma vaubani* n. sp. shares characters with *M. karpatensis* and *M. spinosa* (Hedley, 1902). With *M. karpatensis*, it shares the same outline, general shape, sculpture of the protoconch, teleoconch sculpture forming reticulations with spiny intersections, very convex base, and lamellar microsculpture. It differs however by its broader umbilicus, stouter shape and stronger sculpture. It closely resembles *M. spinosa* by its size, depressed appearance, and spiny sculpture. It can be distinguished from the latter by the basal disk with

cords, by the peristome and axial ribs being almost straight in lateral view, and by the broad sutural ramp without a sutural cord. *Mareleptopoma vaubani* n. sp. can also be recognized by its first teleoconch whorl with two keels instead of one, by a spiral keel not overhanging the suture and by its flange-like labral rim. The protoconch of *M. vaubani* n. sp. has less convex whorls and stronger sculpture than that of *M. spinosa*.

#### Genus *Microliotia* Boettger, 1902

TYPE SPECIES. — *Microliotia brandenburgi* Boettger, 1902, by original designation.

#### *Microliotia alvanioides* n. sp. (Fig. 8)

TYPE MATERIAL. — Holotype (dd) and 8 paratypes in MNHN; 1 paratype each SMF 308414 and MZB 31021.

TYPE LOCALITY. — Marquesas Is, off Fatu Hiva, 10°34'S, 138°42'W, 1150-1250 m, MUSORSTOM 9, stn DR1247.

ETYMOLOGY. — The epithet *alvanioides* is derived from the superficial resemblance to the rissoid genus *Alvania*.

MATERIAL EXAMINED. — A total of 8 specimens (2 lots).

**Marquesas Is.** MUSORSTOM 9, stn DR1198, 09°50'S, 139°09'W, 290-320 m, off Hiva Oa, 7 dd (paratypes). — Stn DR1247, 10°34'S, 138°42'W, 1150-1250 m, off Fatu Hiva, 4 dd (holotype and paratypes).

#### *DESCRIPTION*

Holotype (Fig. 8A, B). Shell small, rissoiform, consisting of 7.75 whorls. Protoconch (Fig. 8D) of 2.25 whorls, globular, protoconch I smooth, protoconch II sculptured in its later part with one strong adapical, and two strong abapical cords, and traces of weaker cords on periphery, protoconch/teleoconch transition marked by broad, deep sinusigera notch, sinus bordered by recurved lip. Teleoconch whorls 5.5, very flat in profile, suture rather deep at bottom of narrow, deep furrow. Sculpture on spire consisting of axial ribs, 13 on second whorl, 18 on last whorl, interspaces as broad as ribs, opisthocline on first

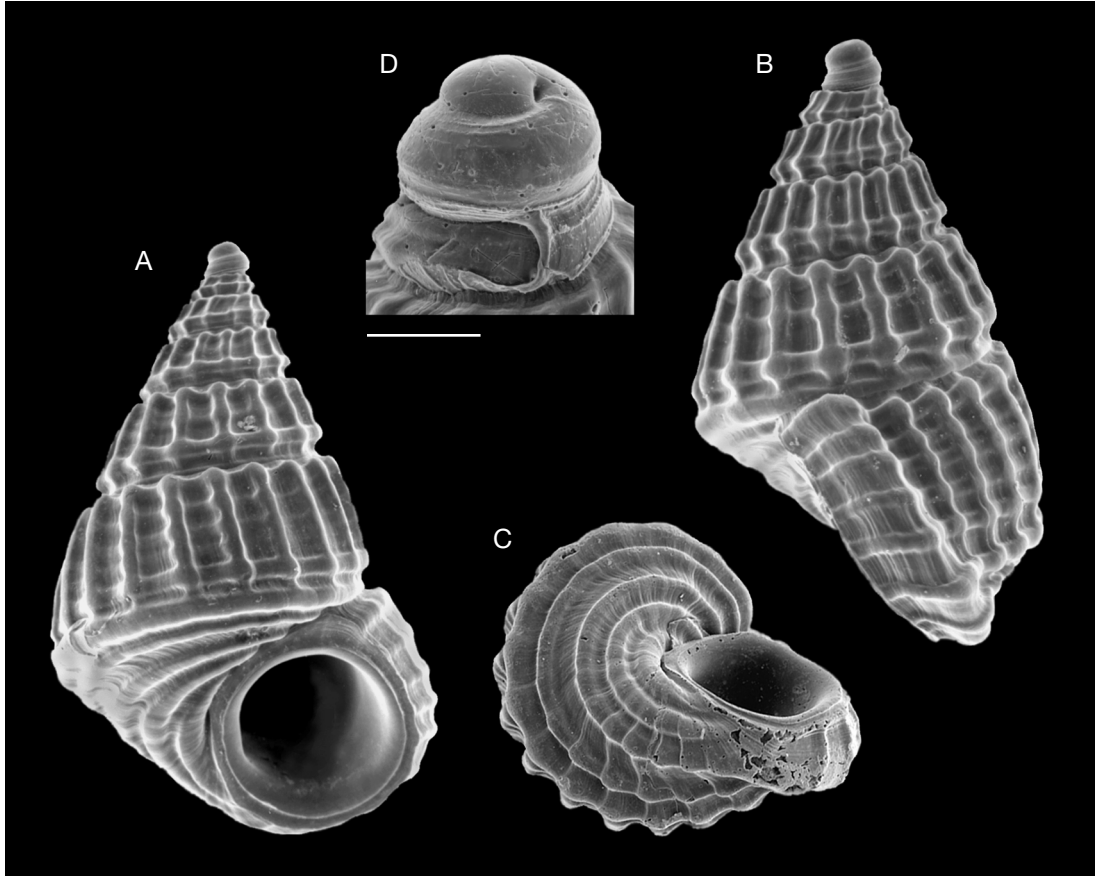


FIG. 8. — *Microliotia alvanioides* n. sp., off Fatu Hiva, Marquesas Is (MNHN); **A, B**, holotype, apertural and side views, H = 1.75 mm; **C, D**, paratypes; **C**, basal view; **D**, protoconch. Scale bar: D, 100  $\mu$ m.

three whorls, then orthocline on penultimate whorl, and prosocline on last whorl, intersected by strong spiral cords, one adapical, one abapical, stronger, forming nodular intersections with axial ribs; additional, weaker cords in between, one on penultimate whorl, three and then four on last whorl. Body whorl occupying 62% of total shell height. Base rather convex, sculptured by five thick spiral cords, interspaces narrower than cords, undulating when intersecting axial sculpture (Fig. 8C). No umbilicus. Aperture rounded, very prosocline. Spiral cords extending onto thickened peristome varix.

*Dimensions*

H = 1.75 mm, D = 1.15 mm.

REMARKS

*Microliotia alvanioides* n. sp. resembles very much the type species, *M. brandenburgi*, from the Miocene of the Paratethys, and differs by having less convex, flat whorls, and fewer and much stronger basal cords.

Genus *Reynellona* Iredale, 1917

TYPE SPECIES. — *Reynellona natalis* Iredale, 1917, by original designation.

*Reynellona bollandi* n. sp.

(Fig. 9)

TYPE MATERIAL. — Holotype (dd) LACM 2455 and 13 paratypes LACM 2456; 2 paratypes (lv) AMS; 1 paratype each MNHN, SMF 308415 and MZB 31020.

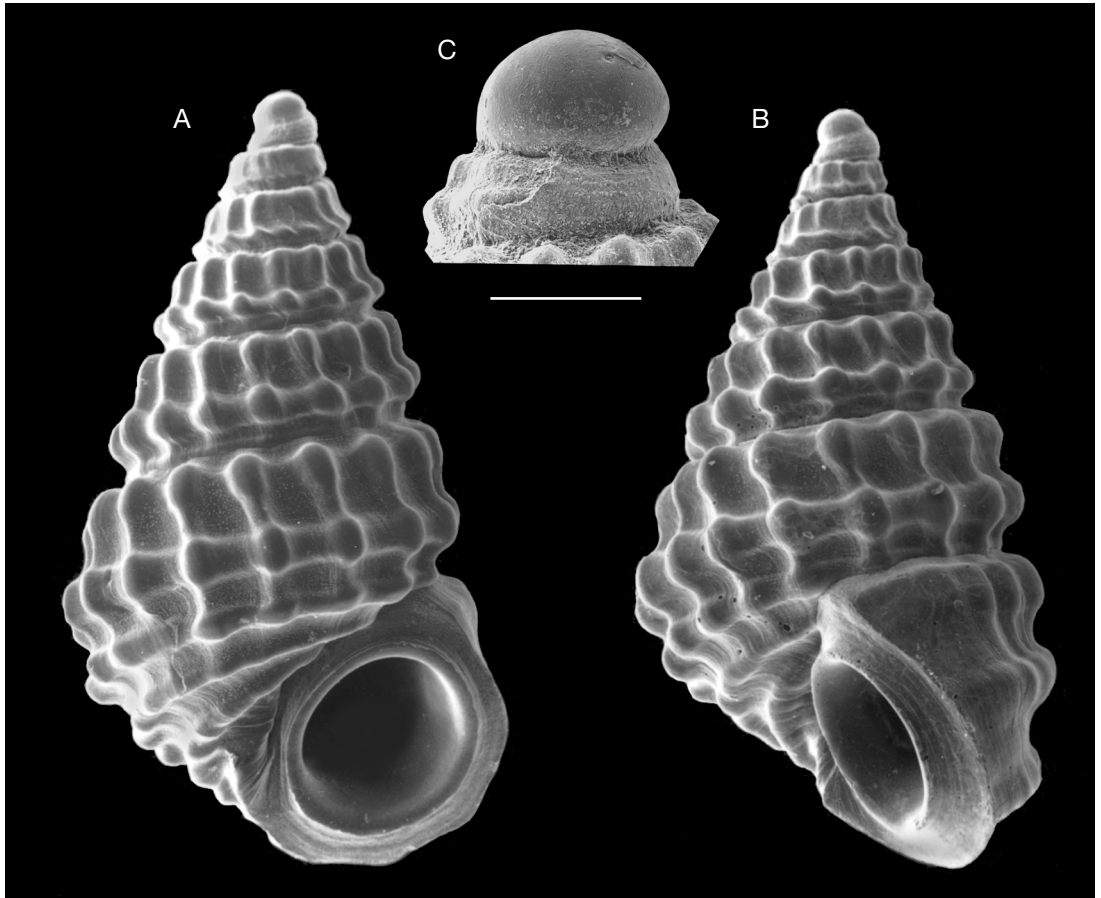


FIG. 9. — *Reynellona bollandi* n. sp., holotype, Okinawa, Japan (LACM 2455), H = 2.2 mm; **A, B**, apertural and side views; **C**, protoconch. Scale bar: C, 100  $\mu$ m.

**TYPE LOCALITY.** — 1 km WNW Onna Village, Horseshoe Cliffs, Okinawa, 26°30'N, 127°51'E, 46–55 m.

**ETYMOLOGY.** — The specific epithet honors R. F. Bolland, who made superb collections of Okinawa micromolluscs in 1978, including the present new species.

**MATERIAL EXAMINED.** — A total of 74 specimens (14 lots).

**Western Australia.** N end Mermaid Reef, Rowley Shoals, 17°03'S, 119°36'E, 18–20 m, outside coral reef, 1986, leg. Bratcher, 2 dd (LACM 86-250.1).

**Japan.** 1 km WNW Onna Village, Horseshoe Cliffs, Okinawa, 26°30'N, 127°51'E, 46–55 m, 1978, leg. Bolland, 17 dd (holo- and paratypes LACM, MNHN, SMF, MZB). — Zampa-misaki (= Bolo Point), Okinawa, 2 lv (paratypes AMS). — C. 1 km N Nakijin Village, Nakijin, Okinawa, 26°42'N, 127°56'E, 33 m,

1978, leg. Bolland, 5 dd (LACM 78-22.6). — 1 km W Onna Village, Horseshoe South, Okinawa, 26°30'N, 127°51'E, 33 m, 1978, leg. Bolland, 2 dd (LACM 78-20.5). — 1 km W Onna Village, Horseshoe South, Okinawa, 26°30'N, 127°56'E, 50 m, 1978, leg. Bolland, 1 dd (LACM 78-99.4). — 1 km WNW Onna Village, Okinawa, 26°30'N, 127°51'E, 45 m, 1978, leg. Bolland, 2 dd (LACM 78-26.4). — 1 km WNW Onna Village, Okinawa, 26°30'N, 127°51'E, 55 m, 1978, leg. Bolland, 9 dd (LACM 78-27.7). — 1 km WNW Onna Village, Okinawa, 26°30'N, 127°51'E, 60 m, 1978, leg. Bolland, 6 dd (LACM 78-29.3). — 1 km WNW Onna Village, Okinawa, 26°30'N, 127°51'E, 63 m, 1978, leg. Bolland, 10 dd (LACM 78-101.3). — Horseshoe Cliffs, 1 km WNW Onna Village, Okinawa, 26°29.6'N, 127°50.5'E, 60 m, gravel, 1979, leg. Bolland, 6 dd (LACM 79-76.5). — 1.5 km ESE Zampa-misaki (= Bolo Point), Okinawa, 26°26'N,

127°42'E, 43 m, 1978, leg. Bolland, 2 dd (LACM 78-24.4). — 0.5 km ESE Zampa-misaki (= Bolo Point), Okinawa, 26°26'N, 127°42'E, 53 m, 1978, leg. Bolland, 9 dd (LACM 78-100.6). Hawaii. Kapa'a Beach Park, NW Hawaii, 20°13'N, 155°54.5'W, 11-15 m, dead coral and sand, 1986, leg. Don Shasky, 1 dd (LACM 86-419.2).

DISTRIBUTION. — Indian Ocean: Western Australia; Pacific Ocean: Okinawa, Hawaii.

DESCRIPTION

Holotype (Fig. 9). Shell small, rissoiform, consisting of seven whorls. Protoconch (Fig. 9C) of 2.5 whorls, sculptured in its later part with six spirally granular cords of uneven strength; cord located at mid-whorl stronger than others, extending by abapical side of broad, deep sinusigera notch; sinus bordered by recurved lip extending apically over preceding larval whorl. Protoconch axis slightly tilted over teleoconch axis. Teleoconch whorls convex, with suture rather shallow at bottom of narrow, deep furrow. Sculpture on spire consisting of two strong spiral cords, close to suture, forming nodular intersections with prosocline axial ribs; ribs weaker than spiral cords, 15 per whorl. Abapical spiral cord narrower and more prominent, giving body whorl slightly angular outline. Body whorl occupying 56% of total shell height. Base rather convex, sculptured by three prominent spiral cords undulating strongly when intersecting axial sculpture. An additional cord, vertical along narrow umbilical chink. Aperture rounded, forming volcano-shaped protrusion. Peristome appearing clearly cut in lateral view; varix of outer lip broadly extending backwards, but only slightly thickened.

Dimensions

H = 2.2 mm, D = 1.2 mm.

REMARKS

*Reynellona bollandi* n. sp. closely resembles *R. semipellucida* Kase, 1998, but the latter species is more slender and its sculpture consists of two beaded spiral rows instead of bi-tuberculated axial ribs as in *R. bollandi* n. sp. The sculpture of *R. bollandi* n. sp. indeed more closely resembles

that of *Mareleptopoma iredalei*, which is smaller (1.6 mm vs 2.2 mm in *R. bollandi* n. sp.) having however a larger protoconch (280 µm in diameter vs 180 µm) and a strongly prominent outer lip. Another species with beaded sculpture is *Sansonia sumatrensis*, which is rissoiform (which is unusual for a *Sansonia*), and differs by its peristome thickened into a prominent rim, its base sculptured with a single strong cord separated from the periphery by a broad furrow (vs two weaker beaded cords in *R. bollandi* n. sp.), and its distinctly open umbilicus.

*Reynellona borbonica* n. sp.

(Fig. 10)

TYPE MATERIAL. — Holotype and 3 paratypes in MNHN.

TYPE LOCALITY. — La Réunion, *Marion-Dufresne*, cruise MD 32, stn DR47, 21°23'S, 55°37'E, 205-215 m.

ETYMOLOGY. — The specific name refers to the type locality, La Réunion, formerly called Île Bourbon.

MATERIAL EXAMINED. — A total of 4 specimens (2 lots).

**La Réunion.** *Marion-Dufresne*, cruise MD 32, stn DR47, 21°23'S, 55°37'E, 205-215 m, 3 dd (holo- and paratypes). — Stn DC26, 21°22'S, 55°47'E, 310 m, 1 dd (paratype).

DISTRIBUTION. — Indian Ocean: La Réunion.

DESCRIPTION

Holotype (Fig. 10A, B). Shell small, rissoiform, white, consisting of seven whorls. Protoconch (Fig. 10C) with smooth initial whorl, with globular, prominent nucleus; second larval whorl sculptured with six evenly spaced rows of granules. Protoconch ending in broad sinusigera notch, not lined by raised lip. Teleoconch forming slightly pupiform conical spire, with flat whorls. Early teleoconch whorls sculptured with two spiral cords, close to suture; following whorls bearing four, equidistant, sub-equal cords with small but prominent nodules aligned along axial riblets. Riblets becoming obsolete on older part of teleoconch whorls. Suture at bottom of deep furrow, just below obsolete, smooth spiral cord. Body whorl occupying 60% of total shell



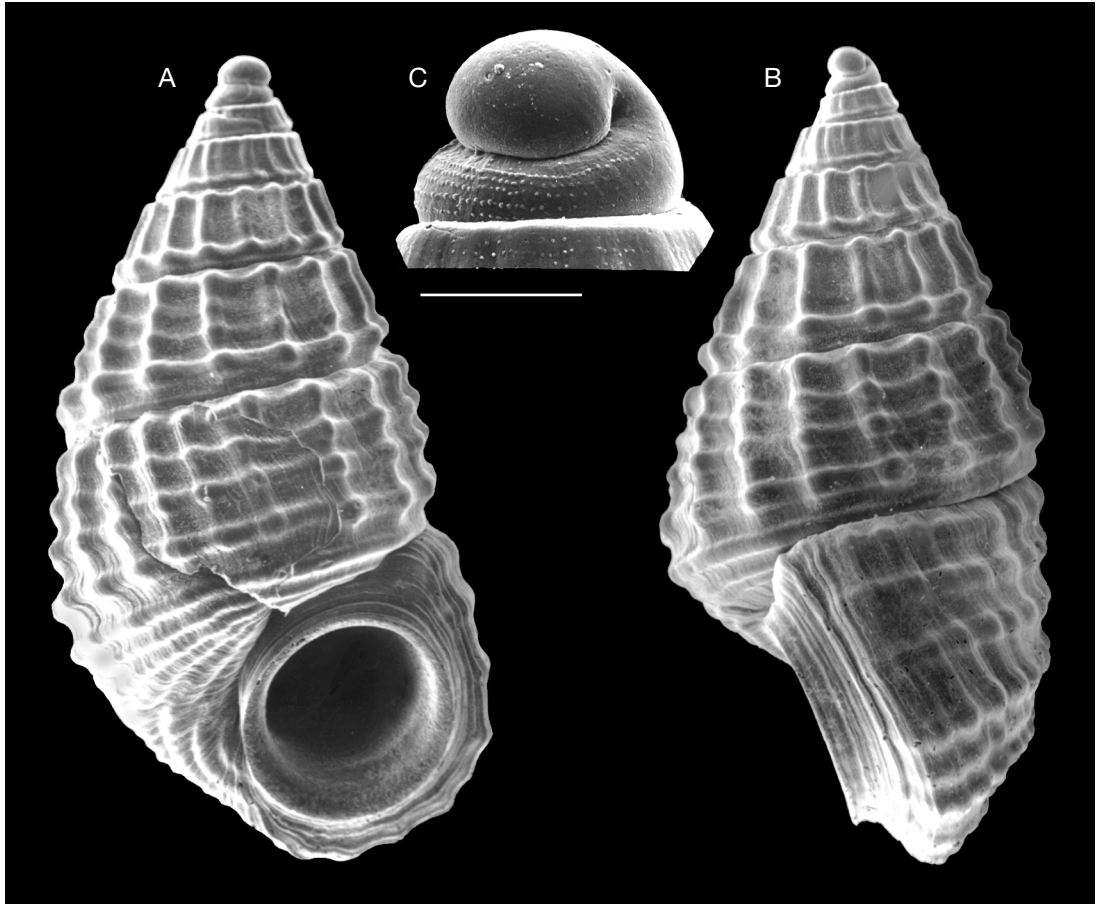


FIG. 10. — *Reynellona borbonica* n. sp., La Réunion, *Marion-Dufresne*, cruise MD 32, stn DR47 (MNHN); **A, B**, holotype, H = 3.1 mm; **C**, paratype, protoconch. Scale bar: C, 100  $\mu$ m.

height. Base convex, with five concentric cords, plus one small cord extending into umbilicus; axial sculpture not extending over base. Umbilicus reduced to narrow chink along columella; apertural tube overhanging umbilicus. Fine incremental lines visible on body whorl. In addition, microsculpture of small granules scattered all over teleoconch. Peristome formed by successive concentric tubes, flaring at their ends, and together forming conical protrusion over oblique plane of peristome. No labral varix present.

#### *Dimensions*

H = 3.1 mm, D = 1.7 mm.

#### REMARKS

The general appearance is that of many Rissoidae, but allocation to the Pickworthiidae is fairly certain. Characters of the spire, base, and aperture suggest placement in *Reynellona*. The sculpture of four spiral cords with nodules aligned along axial costulae resembles that of *Microliotia* Boettger, 1902.

#### Genus *Sansonia* Jousseaume, 1892

*Mecoliotia* Hedley, 1899: 555, fig. 68; type species: *M. halligani* Hedley, 1899, by original designation.

*Pickworthia* Iredale, 1917: 332, 333, pl. XIII figs 6-8; type species: *P. kirkpatricki* Iredale, 1917, by original designation.

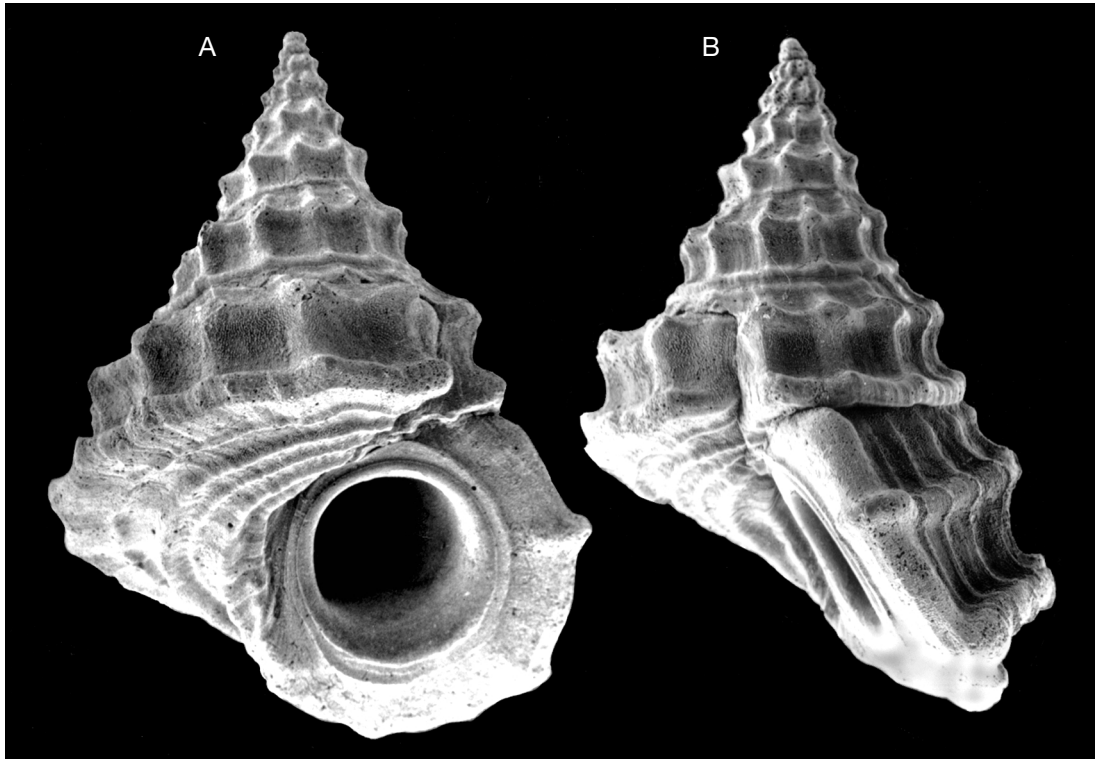


FIG. 11. — *Sansonia alisonae* n. sp., holotype, Carter Reef, North Queensland (AMS 135348), H = 4.2 mm.

TYPE SPECIES. — *Iphitus tuberculatus* Watson, 1886, by monotypy.

*Sansonia alisonae* n. sp.  
(Fig. 11)

TYPE MATERIAL. — Holotype (dd) AMS 135348.

TYPE LOCALITY. — North Queensland, Australia, Carter Reef, 14°32'S, 145°35'E, 27-30 m.

ETYMOLOGY. — The species is named after Dr Alison Kay, who contributed a great amount of unpublished information about Pickworthiidae in central Pacific.

MATERIAL EXAMINED. — A total of 6 specimens (6 lots).

**La Réunion.** *Marion-Dufresne*, cruise MD 32, stn DC85, 21°00'S, 55°15'E, 58-70 m, 1982, leg. Bouchet, Métivier & Warén, 1 dd (MNHN).

**New Caledonia.** LAGON, stn 830, off Poindimié, 20°49'S, 165°19'E, depth 105-110 m, 1987, leg. B. Richer de Forges-ORSTOM, 1 dd (MNHN).

**Hawaii.** Waimea Bay, Oahu, 30 m, leg. Kay, 1 dd (UHM).

**Australia.** Carter Reef, 14°32'S, 145°35'E, North Queensland, 27-30 m, 1980, leg. Ponder, 1 dd (holotype, AMS 135348). — Davis Reef, 30 m, 1987, leg. K. Severin, 1 dd (LACM 144377).

**Red Sea.** *Marion-Dufresne*, core MD 1022, off Sanganab, Sudan, 19°44.34'N, 37°28.23'E, 720 m, core length 10-20 m (?Holocene calciturbidite), 1992, leg. Taviani, 1 dd (MZB).

DISTRIBUTION. — Red Sea; Indian Ocean: La Réunion; Pacific Ocean: Queensland, New Caledonia, Hawaii.

DESCRIPTION

Holotype (Fig. 11). Shell small, trochiform, consisting of eight whorls. Protoconch consisting of two whorls, but corroded in material examined and cannot be studied in detail. Teleoconch whorls very angular due to spiral keel at upper adapical third. Second keel of same strength situated above adapical suture, becoming dominant on body whorl. Additional subsutural cord rather faint. Body whorl occupying 62% of total height. Base flat, with four

concentric cords and very narrow umbilicus lined by another cord. Periphery marked by very strong keel, forming crenulated margin around base. Axial sculpture consisting of ribs (10 on earlier teleoconch whorls, 16 on last whorl), forming prominent, slightly spiny tubercles when intersecting spiral keel, and rather round tubercles when intersecting subsutural keel. Axial sculpture not extending over base on body whorl. Axial ribs and spiral keels forming regular, coarse reticulated pattern, with pointed nodes at intersections, giving spire an angular and shouldered appearance. Axial ribs becoming more crowded on last fourth of body whorl as they approach peristome and become weaker. Round, double aperture appearing rather small because of strong development of outer lip, the latter forming rather thin, broad, oblique rim reaching columellar area. Two spiral keels of body whorl reaching outer lip. Microscopic granular sculpture, most probably original.

#### *Dimensions*

H = 4.2 mm, D = 3.4 mm.

#### REMARKS

This is one of the largest species of *Sansonia*. The general morphology is very characteristic, especially because of the prominent periphery of the body whorl, the shouldered whorls and the coarse reticulation formed by intersection of axial and spiral sculpture.

#### DISCUSSION

The present paper brings the total number of Recent (including Quaternary) species of

Pickworthiidae to 60; in addition, six fossil species are known from Cenozoic deposits. Of the Recent taxa, all nine genera, with 50 species, are from the tropical Indo-Pacific; only five genera (*Chrystella*?, *Clatrosansonia* n. gen., *Mareleptopoma*, *Reynellona* and *Sansonia*), with 10 species, are from the tropical western Atlantic or from Cape Verde (two species, one of them also known as a Pliocene fossil). An exceptionally high number have been recorded, or are known only, from oceanic highlands or offshore reefs, which probably reflects the habitat preference for caves and tunnels in coral reef barriers.

Dockery (1993) transferred *Urceolabrum* Wade, 1926, from the Turbinidae to the Pickworthiidae, on account that the shell lacks a nacreous layer and the protoconch is multispiral. The shell of *Urceolabrum* is indeed superficially very similar to that of *Sansonia*, and we agree that the multispiral protoconch of *U. mantachieensis* Sohl, 1964 (not the type species) excludes its classification in the Vetigastropoda. However, the protoconch illustrated by Dockery (1993: pl. 2, fig. 3) is high-spined, smooth, considerably larger (height 330 µm) than that of any modern or fossil species unambiguously pickworthiid, and also apparently lacks the deep sinusigera notch that characterizes the protoconch II of species of Pickworthiidae with planktotrophic larval development. We regard the similarity in teleoconchs as convergence between *Urceolabrum* and Pickworthiidae, but refrain from suggesting another family allocation.

#### CHECKLIST OF THE PICKWORTHIIDAE OF THE WORLD (new taxa in bold)

Genus *Ampullosansonia* Kase, 1999

*A. crassicostata* Kase, 1999. Recent, Mariana, Palau, Tonga

*A. fragilis* Kase, 1999. Recent, Philippines, Palau

*A. hyalina* Kase, 1999. Recent, Hawaii. [Type species]

Genus *Astrosansonia* n. gen.

- A. dauzenbergi* (Bavay, 1917) n. comb. Recent, Wallis I., French Polynesia. [Type species]  
*A. micraster* (Boettger, 1907) n. comb. Miocene, Rumania

Genus *Chrystella* Laseron, 1957

- C. finckhi* (Hedley, 1899). Recent, Ellice Is  
*C. islandica* Laseron, 1957. Recent, Christmas I. [Type species]  
*C. katyae* (Rolán, Espinosa & Fernández-Garcés, 1991) n. comb. Recent, Cuba  
*C.?* *verdensis* (Rolán & Rubio, 1999) n. comb. Recent, Cape Verde

Genus *Clatrosansonia* Sabelli & Taviani n. gen.

- C. chefyae* (Rolán, Espinosa & Fernández-Garcés, 1991) n. comb. Recent, Cuba  
*C. circumserrata* (Raines, 2002) n. comb. Recent, Easter Is  
*C. corayi* (Ladd, 1966) n. comb. Holocene, Marshall Is  
*C. cubensis* (Espinosa, Fernández-Garcés & Rolán, 1990) n. comb. Recent, Cuba  
*C. jousseaumei* (Bavay, 1921) n. comb. Recent, Loyalty Is  
*C. minuta* (Hornung & Mermod, 1928) n. comb. [= *Merelina hians* Laseron, 1957 (n. syn.)]. Recent, Red Sea, Christmas I.  
*C. philippina* (Bandel & Kowalke, 1997) n. comb. Recent, Philippines. [Type species]  
*C. scalaris* (Rolán & Fernández-Garcés, 1993) n. comb. Recent, Cuba  
*C. troendlei* n. sp. Recent, South Pacific

Genus *Discrevinia* Laseron, 1957

- D. balba* Laseron, 1957. Recent, Christmas I. [Type species]

Genus *Gania* Bandel & Kowalke, 1997

- G. carinata* Bandel & Kowalke, 1997. Eocene, France. [Type species]

Genus *Mareleptopoma* Moolenbeek & Faber, 1984

- M. drivasi* n. sp. Recent, La Réunion, western North Pacific  
*M. intermedia* n. sp. Recent, Line Is, Micronesia, Lord Howe  
*M. iredalei* (Bavay, 1921). Recent, Polynesia, Micronesia, Loyalty Is, Réunion, Mauritius  
*M. italica* (Raffi & Taviani, 1985) n. comb. Pliocene, Italy. [Also found Recent, Cape Verde (Rolán *et al.* 1991)]  
*M. karpatensis* Moolenbeek & Faber, 1984. Recent, Lesser Antilles. [Type species]  
*M. kenneyi* (Ladd, 1966) n. comb. Miocene, Marshall Is  
*M. lychoviensis* (Krach, 1981) n. comb. Miocene, Poland  
*M. pellucens* n. sp. Recent, Western Australia  
*M. rectangularis* Rolán & Fernández-Garcés, 1993. Recent, Cuba  
*M. spinosa* (Hedley, 1902) n. comb. Recent, Queensland  
*M. vaubani* n. sp. Recent, New Caledonia, Philippines, Okinawa

Genus *Microliotia* Boettger, 1902 [= *Latilabrum* Kuroda & Habe, 1991]

- M. alvanoioides* n. sp. Recent, Marquesas  
*M. brandenburgi* Boettger, 1902. Miocene, Rumania. [Type species of *Microliotia*]  
*M. fenestrata* Kase, 1998. Recent, Philippines, Palau  
*M. hawaiiensis* Kase, 1998. Recent, Hawaii  
*M. koizumii* Kase, 1998. Recent, Ogasawara Is, Philippines, Palau, Mariana  
*M. mactanensis* Kase, 1998. Recent, Philippines, Palau  
*M. mirabilis* (Kuroda & Habe, 1991). Recent, S Japan. [Type species of *Latilabrum*]  
*M. ohashii* Kase, 1998. Recent, Okinawa, Philippines, Palau, Mariana Is  
*M. pumilis* Kase, 1998. Recent, Philippines, Mariana  
*M. suturalis* Kase, 1998. Recent, Philippines

Genus *Reynellona* Iredale, 1917

- R. bollandi* n. sp. Recent, Western Australia, Okinawa, Hawaii  
*R. borbonica* n. sp. Recent, La Réunion  
*R. granulata* Kase, 1998. Recent, Mariana Is  
*R. marigodon* Kase, 1998. Recent, Okinawa, Philippines, Palau, Mariana Is  
*R. marshallensis* Kase, 1998. Recent, Marshall Is  
*R. maxima* Kase, 1998. Recent, Tonga  
*R. natalis* Iredale, 1917. Recent, Christmas I., Okinawa

*R. semipellucida* Kase, 1998. Recent, Philippines  
*R. semisculpta* (Espinoza & Fernández-Garcés, 1990) n. comb. Recent, Cuba

Genus *Sansonia* Jousseaume, 1892 [= *Mecoliotia* Hedley, 1899 = *Pickworthia* Iredale, 1917]

*S. alisonae* n. sp. Recent, Indo-Pacific

*S. andamanica* (Preston, 1908) [= *Pickworthia andrewsi* Iredale, 1917 = *Sansonia sansonia* Jousseaume, 1921 =

*S. umbilicata* Jousseaume, 1921 = *S. fauroti* Jousseaume, 1921]. Recent, Red Sea, Christmas I., Andaman Is

*S. cebuana* Bandel & Kowalke, 1997 [?= *Mareleptopoma iredalei*]. Recent, Philippines

*S. costata* Kase, 1998. Recent, New Caledonia

*S. halligani* (Hedley, 1899). Recent, Ellice Is. [Type species of *Mecoliotia*]

*S. hedegaardi* Bandel & Kowalke, 1997. Paleocene, Denmark

*S. hilutangensis* Bandel & Kowalke, 1997 [?= *S. sumatrensis*]. Recent, Philippines

*S. iejimensis* Kase, 1998. Recent, Okinawa

*S. kirkpatricki* (Iredale, 1917) [= *Sansonia andrei* Jousseaume, 1921 = *Sansonia christinae* Selli, 1973 (n. syn.)]. Pleistocene-Recent, Red Sea, Christmas I. [Type species of *Pickworthia*]

*S. nuda* Kase, 1998. Recent, Palau, Philippines

*S. shigemitsui* Kase, 1998. Recent, Okinawa

*S. sumatrensis* (Thiele, 1925). Recent, Sumatra

*S. tuberculata* (Watson, 1886) [= *Mecoliotia bermudezi* Clench & Aguayo, 1936]. Pleistocene-Recent, Caribbean, Gulf of Mexico. [Type species]

Genus *Sherbornia* Iredale, 1917

*S. mirabilis* Iredale, 1917. Recent, Christmas I., Tuamotu. [Type species]

Genus *Tinianella* Kase, 1999

*T. tabulata* Kase, 1999. Recent, Mariana. [Type species]

## Acknowledgements

We thank all who have offered their help, by making the material under their care or from their private collections available for study: J. Drivas (then at La Réunion), E. A. Kay (UHM), B. Marshall (NMNZ), P. Lozouet (MNH), J. McLean (LACM), D. Merle (MNH), R. G. Moolenbeek (ZMA), the late D. Moore (University of Miami), S. Palazzi (Modena, Italy), G. Paulay (University of Guam), W. F. Ponder (AMS), R. C. Preece (UMZC), J. Tröndle (La Force, France). A. Warén (SMNH, Stockholm) kindly prepared the radula of *Astrosansonia dautzenbergi* n. comb.

## REFERENCES

- ADAMS A. 1850. — Monograph of *Cyclostrema*, *Marryat*, and *Separatista*, Gray; two genera of gastropodous mollusks. *Proceedings of the Zoological Society of London* 1850: 24-25.  
 BANDEL K. & KOWALKE T. 1997. — Systematic value of the larval shell of fossil and modern Vanikoridae,

Pickworthiidae and the genus *Fossarus* (Caenogastropoda, Mollusca). *Berliner geowissenschaftliche Abhandlungen* ser. E, 25: 3-29.

- BAVAY A. 1917. — Quelques coquilles des sables littoraux de divers pays. *Journal de Conchyliologie* 63: 91-114, pls II, III.  
 BAVAY A. 1921. — Coquilles des sables marins de l'Indo-Pacifique. Genres *Sansonia* Jousseaume, *Pickworthia* Iredale et *Mecoliotia* Hedley. *Journal de Conchyliologie* 66: 155-161, pl. VI.  
 BOETTGER O. 1902. — Zur Kenntnis der Fauna der mittelmiocän Schichten von Kostež im Krasso-Szörenyer Komitát. I. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt* 51 [1901]: 1-200 (dated 1901, published 1902).  
 BOETTGER O. 1907. — Zur Kenntnis der Fauna der mittelmiocän Schichten von Kostež im Krasso-Szörenyer Komitát. III. *Verhandlungen und Mittheilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt* 55 [1905]: 101-244 (dated 1905, published 1907).  
 BOUCHET P. 1987. — *La protoconque des gastéropodes : aspects biologiques, taxonomiques et évolutifs*. Thèse d'État (multigraphie), Paris, France, 181 p.  
 BOUCHET P. & LE RENARD J. 1998. — Family Pickworthiidae, in BEESLEY P. L., ROSS G. J. B. & WELLS F. (eds), *Mollusca, The Southern Synthesis*.

- Fauna of Australia*, Vol. 5B. CSIRO Publishing, Melbourne: 739-741.
- CLENCH W. J. & AGUAYO C. G. 1936. — A new Pleistocene *Mecoliotia* from Cuba. *The Nautilus* 49 (3): 91-93.
- DOCKERY D. T. 1993. — The streptoneuran gastropods, exclusive of the Stenoglossa, of the Coffee Sand (Campanian) of northeastern Mississippi. *Mississippi Department of Environmental Quality, Office of Geology, Bulletin* 129: 1-191.
- ESPINOSA J. & FERNÁNDEZ-GARCÉS R. 1990. — Una nueva especie antillana del genero *Sansonia* (Mollusca: Archaeogastropoda). *Poeyana* 408: 1-3.
- ESPINOSA J., FERNÁNDEZ-GARCÉS R. & ROLÁN E. 1990. — *Mareleptopoma cubensis* n. sp., a new species from Cuba (Gastropoda Prosobranchia). *Basteria* 54: 239-241.
- ESPINOSA J., FERNÁNDEZ-GARCÉS R. & ROLÁN E. 1994. — Catálogo actualizado de los moluscos marinos actuales de Cuba. *Reseñas Malacológicas* 9: 1-90 [incl. *Mareleptopoma karpatensis*].
- HEDLEY C. 1899. — The Mollusca of Funafuti Atoll (supplement). *Memoirs of the Australian Museum* 3 (9): 549-565.
- HEDLEY C. 1902. — Studies on Australian Mollusca. Part VI. *Proceedings of the Linnaean Society of New South Wales* 27: 7-29.
- HORNUNG A. & MERMOD G. 1928. — Mollusques de la mer Rouge recueillies par A. Issel faisant partie des collections du Musée civique d'Histoire naturelle de Gênes. Quatrième partie, rissoidés. *Annali dagli Museo Civico di Storia Naturale di Genova* 52, 6 Dicembre 1927 (published 1928 after *Zoological Record*): 363-372.
- ICZN 1999. — *International Code of Zoological Nomenclature*. 4<sup>th</sup> ed. International Trust for Zoological Nomenclature, London, 306 p.
- IREDALE T. 1917. — On some new species of marine Mollusca from Christmas Island, Indian O. *Proceedings of the Malacological Society of London* 12 (6): 331-334, pl. XIII.
- IREDALE T. 1929. — Queensland molluscan notes, No. 1. *Memoirs of the Queensland Museum of Brisbane* 9: 261-297, pls xxx, xxxi.
- JOUSSEAU F. 1892. — Réflexions sur la faune malacologique de la mer Rouge. *Annales des Sciences naturelles, Zoologie* 12 (7): 343-363.
- JOUSSEAU F. 1921. — Sur quelques mollusques de la mer Rouge nouveaux ou non figurés. *Mémoires de la Société zoologique de France* 28 (1-2): 53-60, pl. III.
- KASE T. 1998a. — The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: four new species of *Sansonia*. *Venus, The Japanese Journal of Malacology* 57 (3): 161-172.
- KASE T. 1998b. — The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: seven new species of *Microliotia*. *Venus, The Japanese Journal of Malacology* 57 (3): 173-190.
- KASE T. 1998c. — The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: five new species of *Reynellona*. *Venus, The Japanese Journal of Malacology* 57 (4): 245-257.
- KASE T. 1999. — The family Pickworthiidae (Gastropoda: Caenogastropoda) from tropical Pacific submarine caves: *Ampullosansonia* n. gen. and *Tinianella* n. gen. *Venus, The Japanese Journal of Malacology* 58 (3): 91-100.
- KASE T. & HAYAMI I. 1992. — Unique submarine cave fauna: composition, origin and adaptation. *Journal of Molluscan Studies* 58 (4): 446-449.
- KRACH W. 1981. — Badenskie utwory rafowe na Roztoczu lubelskim [Reef formations of the Badenian near Lublin (Roztocze)]. *Prace geologiczne, Warszawa* 121: 1-115, pls I-XXIV (in Polish).
- KURODA T. & HABA T. 1991. — Two new genera and species of gastropods from Tokunoshima in Amami Islands, south of Kyushu, Japan. *Venus, The Japanese Journal of Malacology* 50 (3): 175-178.
- LADD H. S. 1966. — Chitons and gastropods (Haliotidae through Adeorbidae) from the Western Pacific Islands. *U.S. Geological Survey, Professional Paper* 531: 1-98, pls I-XVI.
- LASERON C. F. 1957. — The families Rissoidae and Rissoidae (Mollusca) from the Solanderian and Damperian zoogeographical provinces. *Australian Journal of Marine and Freshwater Research* 7 (3): 384-485.
- MOOLENBEEK R. G. & FABER M. J. 1984. — Studies of West Indian marine Mollusca. A new Gastropod genus and species from Bonaire, Netherlands Antilles. *Uitgaven natuurw. StudKring Suriname* 114: 98-103.
- PREECE R. C. 1995. — The composition and relationships of the marine molluscan fauna of the Pitcairn Islands. *Biological Journal of the Linnean Society of London* 56: 339-358.
- PRESTON H. B. 1908. — Description of (a) new species of marine and freshwater shells in the collection of the Indian Museum. *Records of the Indian Museum* 2 (45): 45-48.
- RAFFI S. & TAVIANI M. 1985. — *Sansonia italica* n. sp.: First evidence of *Sansonia* Jousseaume 1892 from the Mediterranean Pliocene (Gastropoda, Prosobranchia). *Archiv für Molluskenkunde* 115 (4/6): 279-286.
- RAINES B. K. 2002. — Contributions to the knowledge of Easter Island Mollusca. *La Conchiglia, The Shell*, year XXXIV, 304 (3): 11-40.
- REEVE L. 1843. — Monograph of the genus *Delphinula*. *Conchologica Iconica* I: 10 unnumbered p., 5 pls.
- REID D. G. 1998. — Superfamily Littorinoidea, in BEESLEY P. L., ROSS G. J. B. & WELLS F. (eds),

- Mollusca, The Southern Synthesis. Fauna of Australia*, Vol. 5B. CSIRO Publishing, Melbourne: 737.
- ROLÁN E. 1991. — *Sansonia italica* Raffi & Taviani, 1985 primera cita para la fauna de Cabo Verde. *Noticiario de le SEM* 13: 43.
- ROLÁN E. & FERNÁNDEZ-GARCÉS R. 1993. — Descripción de dos nuevas especies del género *Mareleptopoma* (Gastropoda, Prosobranchia) de Cuba. *Iberus* 11 (1): 57-60.
- ROLÁN E. & RUBIO R. 1999. — New information on the malacological fauna (Mollusca, Gastropoda) of the Cape Verde Archipelago, with the description of five new species. *Apex* 14 (1): 1-10, figs 20-22.
- ROLÁN E., ESPINOSA J. & FERNÁNDEZ-GARCÉS R. 1991. — Los géneros *Sansonia* y *Mareleptopoma* en la isla de Cuba (Mollusca, Gastropoda). *Thalassas* 8: 85-91 (dated 1990, published 1991).
- SAKURAI K. & HABE T. 1977. — Two new species of the family Liotiidae from Amami-Oshima, South of Kyushu. *Venus, The Japanese Journal of Malacology* 36 (3): 99-102.
- SELLI R. 1973. — Molluschi quaternari di Massaua e di Gibuti, in *Missione Geologica A.G.I.P. nella Dancalia meridionale e sugli altopiani Hararini (1936-1938)*. IV: *Documentazione Paleontologica*, parte II. Accademia Naz. Lincei, Roma: 151-444, pls I-XXX.
- TATE R. 1898. — On two deep-level deposits of newer Pleistocene in South Australia. *Transactions of the Royal Society of South-Australia* 22: 65-71.
- THIELE J. 1925. — Gastropoda der deutschen Tiefsee-Expedition, 1898-1899. Teil 2. *Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition 1898-1899* 17 (2): 35-382, pls I-XXXIV.
- WADE B. 1926. — The fauna of the Ripley Formation of Coon Creek, Tennessee. *U.S. Geological Survey, Professional Paper* 137: 1-272, pls i-ixxii.
- WATSON R. B. 1886. — Report on the scientific results of the voyage of the H.M.S. *Challenger* during the years 1873-1876. *Zoology. Report on the Gastropoda. Challenger Report* 15 (42): 25-756, pls I-L.

*Submitted on 6 August 2002;  
accepted on 17 January 2003.*