NEW CALEDONIAN LAND AND FRESH-WATER SNAILS

AN ANNOTATED CHECK LIST

ALAN SOLEM

FIELDIANA: ZOOLOGY
VOLUME 41, NUMBER 3
Published by
CHICAGO NATURAL HISTORY MUSEUM
APRIL 21, 1961
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Curator, Division of Lower Invertebrates

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New Caledonian Land and Fresh-Water Snails

INTRODUCTION

Pioneer studies on New Caledonian non-marine shells were made by Gassies (1863, 1871, 1880), Crosse (1894), and Dautzenberg (1923), and were recently summarized by Franc (1957) in an illustrated handbook designed to facilitate identifications. Only museum specimens from old collections were available to Franc and he did not attempt to make any innovations in classification.

A detailed study on New Hebridean non-marine mollusks and a survey of Pacific land snail geography (Solem, 1959) necessitated critical examination of many New Caledonian species. The material available in American museums is insufficient to allow any attempt at solving synonymies on the specific level, but did suggest a number of conclusions about the generic and family relationships of the New Caledonian species.

Franc’s study dealt entirely with the taxonomy of the New Caledonian snails on the specific level and my own efforts are thus supplementary to his handbook. Study of material collected by T. D. A. Cockerell in 1928 (Solem, 1960) and re-examination of museum material resulted in my compiling this check list. This paper primarily attempts to relate the New Caledonian snails to those found in other regions.

The order of families, genera, and species follows that of Franc (1957). Under each species, reference has been given to the original description, the first published illustration, and Franc (1957). Primary references to synonyms are included. It was thought unnecessary to repeat the extensive citations of references given by Crosse (1894) and Franc (1957). Since many species now recognized may be only geographic races of polytypic species, I have cited the type locality for each named form. In cases where several localities were cited in the original description, I have arbitrarily selected the first named as type locality. Where examination of specimens suggested changes in Franc’s synonymies or classification, the pertinent data are set forth as remarks under the species or genus concerned.
Material from several museum collections was examined. For convenience the museums are identified in the text by the following abbreviations:

ANSP Academy of Natural Sciences of Philadelphia
CM Carnegie Museum
CNHM Chicago Natural History Museum
UMMZ University of Michigan Museum of Zoology
USNM United States National Museum

In three genera, *Pleuropoma*, *Physastra*, and *Placostylus*, the variation found in the New Hebridean species strongly suggested that most of the many New Caledonian named forms are only local races or individual variants of a very small number of species. For *Pleuropoma* and *Physastra* I have simply presented a chronological list of names. For *Placostylus* I have followed the classification set forth by Pilsbry (1900, pp. 28–68) rather than the one used by Franc (1957, pp. 150–161). Only local population studies can untangle the specific synonymy in these genera and no museum has sufficient material to make any attempt at revising the species meaningful.

Species preceded by an asterisk were seen during this study. No attempt at study of the taxonomy on the specific level in *Physastra* and *Placostylus* was made, and thus no names in these two genera are starred.

A major nomenclatural headache concerns the status of varietal names. Under the proposed new rules of zoological nomenclature discussed at the 1958 International Congress of Zoology, infrasubspecific names have no legal status. If subsequently elevated to specific or subspecific rank they must date from that time. Mere use of the term “variety,” however, is not considered to be sufficient evidence that a name is infrasubspecific rather than subspecific.

Many of the authors who worked on the New Caledonian land shells had the habit of listing varietal names which have subsequently crept into the literature. Their method of proposing such names was not consistent and it is extremely doubtful that the names could be considered valid. In many cases, a series of varieties followed the Latin description of a species. A typical example (see Gassies, 1871, pp. 72–73) reads as follows:

"Var. β ponderosa, crassiuscula, peristoma duplex, lutea, nitida.  
Hab. Baie Lebris, Necoue. (M.E.Marie.)  
Var. χ acutior, concolor, castanea ad B. alexander similis.  
Hab. Kanala."

On the following page, a French translation of the description of the species is followed by the same varietal listings, with the Latin phrases
translated into colloquial French. In some cases only single words formed the Latin varietal descriptions; in other cases long phrases were used.

I have arbitrarily eliminated all of these varietal names from consideration on the basis that they are not consistently validly proposed and thus can have no nomenclatural standing. Whenever they have been subsequently elevated to specific rank or validly proposed, they are quoted from the later author. This procedure eliminates several hundred varietal names.

The species which Crosse (1894, pp. 170–173) removed from the New Caledonian faunal list are not included below, nor are full nomenclatural details cited for introduced species.

Systematic List

Family HELICINIDAE

The only twentieth century monograph of the Helicinidae (Wagner, 1907–11) is full of errors. Franc (1957, pp. 28–36) utilized Wagner’s classification and most of the changes suggested below result from corrections of Wagner’s mistakes; for example, Wagner (op. cit., pp. 260, 261) placed the New Caledonian Helicina primelana Gassies and the New Hebridean H. layardi Hartman in Palaeohelicina (Ceratopoma), although Ceratopoma Moellendorff, 1893, clearly has priority over Palaeohelicina Wagner, 1905. The New Hebridean Helicina sublaevigata Pfeiffer was put in Orohophana in 1905 and Aphanoconia (Sphaeroconia) in 1909. Helicina layardi and H. sublaevigata are synonyms (Solem, 1959, p. 174) and belong in Pleuropoma.

The record of Palaeohelicina from New Caledonia (Franc, 1957, pp. 35–36) is based on Wagner’s misclassification of Helicina primeana. Species of the genus Palaeohelicina, found in the Palau Islands, New Guinea, the Bismareks, and the Solomons, have a sharply carinate shell with strong spiral sculpture. None of the New Caledonian species are at all similar.

There are no clear-cut conchological differences by which Orobophana (not Orobaphana as in Franc, 1957) and Pleuropoma can be distinguished. Their radulae are quite different, but the conchological variation overlaps. None of the New Caledonian species have been dissected. While species such as Helicina porphyrostoma Crosse have the appearance of Orobophana, I suspect that they are derived from local Pleuropoma. Pending study of the animals, I prefer to retain all the New Caledonian species in Pleuropoma.
The record of *Helicina sublaevigata* Pfeiffer (see Franc, 1957, p. 34) from Lifu is based on a misidentification by Melville. Some of the specimens seen by Melville (UMMZ material) appear to be a variety of *Pleuropoma primeana* and I have dropped *sublaevigata* from the New Caledonian faunal list (see Solem, 1959, p. 175). *Helicina gallina* Gassies and *H. laeta* Crosse are variants of a species complex which ranges over the entire Pacific (see discussion of *Pleuropoma articulata* in Solem, 1959, pp. 176–178). The remaining species seem to be modifications of one basic stock.

For convenience specific names are listed in chronological order.

**Genus PLEUROPOMA** Moellendorff, 1893

*Type species.* — *Helicina dichroa* Moellendorff, 1890 (original designation).

**Pleuropoma togatula** (Morelet), 1857


*Orobaphana (sic) togatula* (Morelet), Franc, 1957, Moll. Neo-Caledonien, p. 32, pl. 3, fig. 34.

*Type locality.* — Ore meridionale, New Caledonia.

**Pleuropoma littoralis** (Montrouzier), 1859

*Helicina littoralis* Montrouzier, 1859, Jour. de Conchy., 7: 287, pl. 8, fig. 2.

*Aphanoconia littoralis* (Montrouzier), Franc, 1957, Moll. Neo-Caledonien, p. 30, pl. 3, fig. 33 (holotype of *littoralis*).

*Type locality.* — Art Island, New Caledonia.

**Pleuropoma littoralis pygmaea** (Gassies), 1880

*Helicina littoralis pygmaea* Gassies, 1880, Faune Conchy., 3: 68.

*Type locality.* — Nou Island, New Caledonia.

**Pleuropoma primeana** (Gassies), 1863

*Helicina primeana* Gassies, 1863, Faune Conchy., 1: 78, pl. 2, fig. 9.

*Palaeohelicina primeana* (Gassies), Franc, 1957, Moll. Neo-Caledonien, pp. 35–36, pl. 4, fig. 42.

*Type locality.* — Mount Mou, New Caledonia.

**Pleuropoma lifouana** (Crosse), 1869

*Helicina lifouana* Crosse, 1869, Jour. de Conchy., 17: 25–26, pl. 2, fig. 5.
Orobaphana (sic) sphaeroidea lifouana (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 35, pl. 4, fig. 41.

*Type locality.*—Lifu, Loyalty Islands.

**Pleuropoma gallina** (Gassies), 1870

*Helicina gallina* Gassies, 1870, Jour. de Conchy., 18: 145.

*Helicina mariei* Crosse, 1870, op. cit., 18: 244–245, 418, pl. 13, fig. 9.

*Aphanoconia gallina* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 29–30, pl. 3, fig. 32.

*Type locality.*—Lifu, Loyalty Islands (*gallina*), New Caledonia (*mariei*).

**Pleuropoma mediana** (Gassies), 1870

*Helicina mediana* Gassies, 1870, Jour. de Conchy., 18: 145–146; Gassies, 1871, Faune Conchy., 2: 128, pl. 5, fig. 8.

*Aphanoconia mediana* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 29, pl. 3, fig. 30.

*Type locality.*—Art Island, New Caledonia (here selected).

**Pleuropoma laeta** (Crosse), 1870

*Helicina laeta* Crosse, 1870, Jour. de Conchy., 18: 245–246; Gassies, 1871, Faune Conchy., 2: 132, pl. 8, fig. 8.

*Aphanoconia laeta* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 28–29, pl. 3, fig. 29 (holotype of *laeta*).

*Type locality.*—Mount Mou, New Caledonia.

**Pleuropoma porphyrostoma** (Crosse), 1870

*Helicina porphyrostoma* Crosse, 1870, Jour. de Conchy., 18: 245; Gassies, 1871, Faune Conchy., 2: 131–132, pl. 8, fig. 10.


*Orobaphana* (sic) *porphyrostoma* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 33–34, pl. 3, fig. 37 (holotype of *porphyrostoma*).

*Type locality.*—New Caledonia (*porphyrostoma*), Baie du Sud (*rossiteri*).

**Pleuropoma mouensis** (Crosse), 1870

*Helicina mouensis* Crosse, 1870, Jour. de Conchy., 18: 246; Gassies, 1871, Faune Conchy., 2: 130, pl. 8, fig. 9.

*Orobaphana* (sic) *mouensis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 34, pl. 3, fig. 39 (holotype of *mouensis*).

*Type locality.*—Mount Mou, New Caledonia.
*Pleuropoma benigna* (Crosse), 1870


_Type locality._—New Caledonia.

**Pleuropoma gassiesiana** (Crosse), 1874

_Helicina gassiesiana_ Crosse, 1874, *Jour. de Conchy.*, 22: 111, 184, pl. 4, fig. 6.

_Orobaphana* (sic) _gassiesiana* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, pp. 32–33, pl. 3, fig. 35 (holotype of _gassiesiana_).

_Type locality._—Mare, Loyalty Islands.

*Pleuropoma noumeensis* (Crosse), 1874

_Helicina noumeensis_ Crosse, 1874, *Jour. de Conchy.*, 22: 111, 186, pl. 4, fig. 7.

_Aphanoconia noumeensis* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 29, pl. 3, fig. 31 (holotype of _noumeensis_).

_Type locality._—Vicinity of Noumea, New Caledonia.

*Pleuropoma alrici* (Crosse), 1887

_Helicina alrici_ Crosse, 1887, *Jour. de Conchy.*, 35: 303; Crosse, 1895, *op. cit.*, 42: 79–80, pl. 5, fig. 7.

_Orobaphana* (sic) _alrici* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 34, pl. 3, fig. 38 (holotype of _alrici_).

_Type locality._—Kanala, New Caledonia.

**Pleuropoma mondaini** (Crosse), 1887


_Orobaphana* (sic) _mondaini* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 33, pl. 3, fig. 36 (holotype of _mondaini_).

_Type locality._—Baie du Sud, New Caledonia.

*Pleuropoma bourailensis* (Hartman), 1889


_Helicina nehoueensis_ Hartman, 1889, *op. cit.*, p. 93, pl. 5, fig. 9.

_Helicina saxoniana_ Hartman, 1889, *op. cit.*, pp. 93–94, pl. 5, fig. 10.


_Aphanoconia saxoniana* (Hartman), Franc, 1957, loc. cit.
SOLEM: NEW CALEDONIAN SNAILS

Type locality.—Bourail, New Caledonia (bourailensis), Nehoue, New Caledonia (nehoueensis), and west coast of New Caledonia (saxoniana).

Remarks.—After restudy of their types and paratypes, these three named forms were considered to be individual variations of the same species (see Solem, 1960).

Pleuropoma ouenensis (Cockerell), 1930


Type locality.—Dge, Ouen Island, New Caledonia.

Family POTERIIDAE

Clench (1949) divided the poteriids of Samoa, Fijis, New Hebrides, New Caledonia, and the Caroline Islands into several genera based solely on shell features. Solem (1959, p. 182) showed that the Samoan _Ostodes_ and Fijian–New Hebridean _Gonatoraphe_ are also characterized by anatomical features. The New Caledonian _Gassiesia_ has not yet been dissected. The speciation pattern in _Gassiesia_ worked out by Franc (1957, pp. 37–40) is changed only by the result of examining paratypes of _Ostodes vitreus_ Preston and the suggestion of _Cyclostoma forbesianus_ Pfeiffer as a probable synonym of _Gassiesia couderti_ Fischer and Bernardi.

Genus GASSIESIA Clench, 1949

_Type species._—_Cyclostoma artense_ Montrouzier, 1859 (original designation).

*Gassiesia couderti* (Fischer and Bernardi), 1856

_Cyclostoma courdertii* (sic) Fischer and Bernardi, 1856, _Jour. de Conchy._., 5: 299–300, pl. 10, figs. 3–5.
_Cyclostoma bocageanum_ Gassies, 1863, _Faune Conchy._., 1: 76–77, pl. 2, fig. 2.
_Gassiesia couderti_ (Fischer and Bernardi), Franc, 1957, _Moll. Néo-Caledonien_, p. 38, pl. 4, fig. 44 (holotype of _couderti_).

_Type locality._—New Caledonia (_couderti_), Lord Howe Island, New Hebrides (_forbesianus_, error for Isle of Pines?), Tuo Island, New Caledonia (_bocageanum)._
Fig. 7. *Gassiesia vitreus* (Preston), UMMZ 85687, paratopotype; New Caledonia.

*Gassiesia montrouzieri* (Souverbie), 1859
*Cyclotoma montrouzieri* Souverbie, 1859, Jour. de Conchy., 7: 291–293, pl. 8, fig. 5.
*Gassiesia montrouzieri* (Souverbie), Franc, 1957, Moll. Néo-Caledonien, pp. 38–39, pl. 4, fig. 45.
*Type locality.*—Art Island, New Caledonia.

*Gassiesia artense* (Montrouzier), 1859
*Cyclotoma (sic) artense* Montrouzier, 1859, Jour. de Conchy., 7: 286, pl. 8, fig. 1.
*Gassiesia artense* (Montrouzier), Franc, 1957, Moll. Néo-Caledonien, p. 39, pl. 4, fig. 46.
*Type locality.*—Art Island, New Caledonia.

*Gassiesia guesterianus* (Gassies), 1866
*Cyclotoma guesterianus* Gassies, 1866, Jour. de Conchy., 14: 50–51; Gassies, 1871, Faune Conchy., 2: 123, pl. 5, fig. 5.
*Cyclotoma vieillardii* Gassies, 1870, Jour. de Conchy., 18: 144–145; Gassies, 1871, Faune Conchy., 2: 124–125, pl. 5, fig. 7.
*Gassiesia guesterianus* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 39–40, pl. 4, fig. 47.
SOLEM: NEW CALEDONIAN SNAILS

Type locality.—Art Island, New Caledonia (guesterianus), Tuo Island, New Caledonia (vieillardi here selected).

*Gassiesia vitreus* (Preston), 1907. Figure 7.


Type locality.—New Caledonia.

Remarks.—Four paratypes (UMMZ 85687 and CNHM 26775) were examined. The operculum is thin, horny, multispiral (not pauci-spiral), and has a central depressed nucleus. The specimens are probably juvenile and have most of the basal sculpture reabsorbed. The spiral ribs are fewer and more prominent than in other *Gassiesia*, but the sculptural type is nearer that of *Gassiesia* than the Samoan *Ostodes*. The measurements of the four paratypes are:

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<th>H/D ratio</th>
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<td>0.70</td>
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<td>4.1</td>
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<td>0.68</td>
<td>4</td>
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<td>6.2</td>
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<tr>
<td></td>
<td>4.5</td>
<td>6.6</td>
<td>0.68</td>
<td>4(\frac{1}{4})</td>
</tr>
</tbody>
</table>

Family DIPLOMMATINIDAE

The family name Diplommatinidae Pfeiffer, 1856, has priority of both time and usage over Cochlostomatidae Tielecke, 1940. Generic classification of the Diplommatinidae is empiric and no phylogenetic conclusions can be drawn at this time (see Solem, 1959, p. 190). The New Caledonian species are usually placed in *Palaina*, although originally described as *Diplommatina*. The many subgeneric names available for *Palaina* probably only signify convergent evolution (see Solem, 1959, p. 190) and are not utilized below.

Genus PALAINA O. Semper, 1865

Type species.—*Diplommatina macgillivrayi* Pfeiffer, 1855 (subsequent designation of Iredale, 1944, p. 303).

*Palaina montrouzieri* (Crosse), 1874¹

*Diplommatina montrouzieri* Crosse, 1874, Jour. de Conchy., 22: 110, 394–395, pl. 12, fig. 8.

*Palaina* (Palaina) montrouzieri (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 41, pl. 4, fig. 48 (holotype of *montrouzieri*).

Type locality.—Baie du Sud, New Caledonia.

¹ See Solem (1960).
*Palaina montrouzieri humilior* Cockerell, 1930


*Type locality.*—In drift a few miles from Bourail, New Caledonia.

*Palaina mariei* (Crosse), 1867

*Diplommatina mariei* Crosse, 1867, Jour. de Conchy., 15: 179–180, pl. 7, fig. 6.

*Palaina* (Cylindropalaina) *mariei* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 41, pl. 4, fig. 49 (holotype of *mariei*).

*Type locality.*—Under dead leaves in forest near Noumea, New Caledonia.

*Palaina perroquini* (Crosse), 1871

*Diplommatina perroquini* Crosse, 1871, Jour. de Conchy., 19: 204–205; Crosse, 1873, op. cit., 21: 44–45, pl. 1, fig. 6.

*Palaina* (Macropalaina) *perroquini* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 42, pl. 4, fig. 51 (holotype of *perroquini*).

*Type locality.*—New Caledonia.

*Palaina obesa* (Hedley), 1898


*Palaina* (Macropalaina) *obesa* (Hedley), Franc, 1957, Moll. Néo-Caledonien, pp. 41–42, pl. 4, fig. 50.

*Type locality.*—Oubatche, New Caledonia.

Family HYDROBIIDAE

The radula, operculum, and genital anatomy offer many more characters than the shell for use in formulating a classification. Unfortunately, the New Caledonian species are known from the shell only, except for *Lyogyrus petiti* Crosse, whose radula was examined by Thiele (1928). The shell of *Hydrobia gentilsiana* Crosse is like the Lord Howe Island, New Hebridean, Fijian, and Rapan species belonging to *Fluviopupa* (see Solem, 1959, pp. 194–196), but the operculum has the same process as that found in *Hemistomia*, and the species is tentatively placed in that genus (see Solem, 1960).

*Lyogyrus*, sens. str., is limited to eastern North America. The placement of a New Caledonian species in this genus seems improbable, but the New Caledonian *L. perroquini* (UMMZ 91577) and the

1 See Solem (1960).
Massachusetts *L. pupoideus* (CNHM 32823) are almost identical in shell, and opercular and radular (teste Thiele) characters. The New Caledonian species is slightly larger and Thiele retained the name *Heterocyclus* Crosse, 1872, as a section of *Lyogyrus*. This procedure is adopted below. The unusual New Caledonian–North American relationship is paralleled by the Indonesian–North American endodontids (*Stenopylys–Helicodiscus*; see Solem, 1957), the New Zealand–North American frogs (*Leiopelma–Ascaphus*), and possibly the Oriental–North American fresh-water operculates (*Oncomelania–Pomatiopsis*; see van der Schalie and Dundee, 1956).

Crosse (1894) and Franc (1957) recognized two species of New Caledonian *Lyogyrus*. Both are found in the Lac des Grands Kaoris. Judging from the variation found in *Fluviopupa* (see Solem, 1959, p. 195) and the dimorphic shells of *Lyogyrus pupoideus* (CNHM 32823), I suspect that *L. perroquini* Crosse is the female and *L. petiti* Crosse the male of the same species.

Genus **LYOGYRUS** Gill, 1863

*Type species.*—*Valvata pupoidea* Gould, 1840 (original designation).

**Section Heterocyclus** Crosse, 1872

*Type species.*—*Heterocyclus perroquini* Crosse, 1872 (monotype).

*Lyogyrus (Heterocyclus) perroquini* (Crosse), 1872


*Lyogyrus (Heterocyclus) perroquini* Crosse, Franc, 1957, *Moll. Néo-Caledonien*, p. 44, pl. 4, fig. 54 (holotype of *perroquini*).

*Lyogyrus (Heterocyclus) petiti* (Crosse), Franc, 1957, op. cit., pp. 44–45, pl. 4, fig. 55 (holotype of *petiti*).

*Type locality.*—Baie du Sud, New Caledonia (*perroquini*), Lac de le Grande vallée des Kaoris, New Caledonia (*petiti*).

**Incertae sedis**

**Hydrobia crosseana** Gassies, 1874


*Type locality.*—Bonde, northeast New Caledonia.

*Remarks.*—Crosse (1894, pp. 373–374) could not establish the identity of this name and it was omitted by Franc (1957).
Family TRUNCATELLIDAE

The catalogue of Clench and Turner (1948) was not seen by Franc (1957). Without new material and restudy of types, no critical revision of New Caledonian truncatellids can be attempted. Five names have been proposed for New Caledonian populations and the following widely distributed species have been reported from the area: *Truncatella conspicua* Pfeiffer, 1856, *T. guerinii* A. and J. B. Villa, 1841 (of which *T. vitiana* Gould, 1848, and *T. valida* Pfeiffer, 1846, are synonyms), and *T. rustica* Mousson, 1865.

The five names applied to New Caledonian populations are:

**Truncatella labiosa** Souverbie, 1862

*Truncatella labiosa* Souverbie, 1862, Jour. de Conchy., 10: 242–243, pl. 9, fig. 9.

*Type locality.*—Art Island, New Caledonia.

*Remarks.*—Clench and Turner (1948, p. 164) consider this a synonym of *T. teres* Pfeiffer.

**Truncatella semicostata** Montrouzier, 1862

*Truncatella semicostata* Montrouzier, 1862, Jour. de Conchy., 10: 243–244, pl. 9, fig. 10.

*Type locality.*—Art Island, New Caledonia.

*Remarks.*—Clench and Turner (1948, p. 163) consider this a synonym of *T. marginata* Pfeiffer.

**Truncatella diaphana** Gassies, 1869

*Truncatella diaphana* Gassies, 1869, Jour. de Conchy., 17: 78; Gassies, 1871, Faune Conchy., 2: 138–139, pl. 5, fig. 16.

*Type locality.*—Art Island, New Caledonia.

**Truncatella subsulcata** Gassies, 1878


*Type locality.*—Lifu, Loyalty Islands.

**Truncatella cerea** Gassies, 1878


*Type locality.*—Isle of Pines, New Caledonia.

*Remarks.*—Clench and Turner (1948, p. 196) consider this to be a synonym of *Truncatella ceylanica* Pfeiffer.
Whether *Hemistomia* and its Australian relatives, *Tatea* and *Angrobia*, are rissoids or hydrobiids is still uncertain. Following Thiele (1929, p. 168), I have placed them in the rissoid subfamily Hemistomiinae. Specimens of the two previously described New Caledonian species (fig. 8, a, b) collected by T. D. A. Cockerell differed in size quite conspicuously (see Solem, 1960). The species described as *Hydrobia gentilsiana* by Crosse was found to have a clawed operculum (fig. 8, d) rather than the smooth hydrobiid type. The shell (fig. 8, c) of *gentilsiana* has a quite different facies than that of *Hemistomia* and the opercular claw is bifurcate rather than digitate. Despite these differences I prefer to place *gentilsiana* in *Hemistomia* rather than propose a new genus without studying the radula and genitalia.

**Family RISSOIDAE**

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**Genus HEMISTOMIA** Crosse, 1872

*Type species.—Hemistomia caledonica* Crosse, 1872 (monotype).
*Hemistomia caledonica* Crosse, 1872. Figure 8, a.

_Hemistomia caledonica_ Crosse, 1872, Jour. de Conch., 20: 72-73, 352-353, pl. 16, fig. 8; Franc, 1957, Moll. Néo-Caledonien, p. 47, pl. 5, fig. 59 (co-type of caledonica).

_Type locality._—Vicinity of Noumea, New Caledonia.

*Hemistomia fluminis* Cockerell, 1930. Figure 8, b.


_Type locality._—River drift a few miles from Bourail, New Caledonia.

*?Hemistomia gentilsiana* (Crosse), 1874. Figure 8, c, d.

_Hydrobia gentilsiana_ Crosse, 1874, Jour. de Conchy., 22: 112, 395-396, pl. 12, fig. 9; Franc, 1957, Moll. Néo-Caledonien, p. 43, pl. 4, fig. 52 (holotype of gentilsiana).

_Type locality._—Oubatche, near Puebo, New Caledonia, in fresh water at 300 meters elevation.

_Remarks._—Comparative measurements of the three New Caledonian _Hemistomia_ are given by Solem (1960).

Family ASSIMINEIDAE

Classification of the Assimineidae is confused, and no meaningful arrainment of the species is possible at this time. The radula of one New Caledonian species has been examined, but otherwise they are known only from shells and operculi. Only a few comments can be offered on the possible affinities of the New Caledonian morphs.

Specimens of _Hydrocena pygmaea_ Gassies (UMMZ 74268) are members of the _Assiminea nitida_ Pease complex (see Solem, 1959, p. 199). Pending revision of the entire group, the New Caledonian population can be called _Assiminea nitida pygmaea_. _Hydrocena caledonica_ Crosse is the type species of _Crossilla_ Thiele, 1928 (a section of _Assiminea_). Possibly _Hydrocena crosseana_ Gassies belongs to the same group. _Hydrocena hidalgoi_ Gassies has been reported under various generic names all the way from Mauritius to the Philippines and New Caledonia. Possibly more than one species is involved. Following van Benthem Jutting (1956, pp. 354-355, fig. 67), I am placing _hidalgoi_ in _Assiminea_ rather than _Paludinella_. _Hydrobia savesi_ Crosse appears to be an assimineid and is tentatively placed in "_Assiminea, _" sens. lat.
The species Franc placed in *Omphalotropis* show diverse affinities. *O. granum* belongs to the species complex which Thiele placed in the section *Oriella* (see Solem, 1959, p. 200). The actual number of species involved is uncertain, but far too many have been recognized, since the populations on each archipelago have been called distinct.

*Omphalotropis fischeriana* Gassies is not known to me and was not seen by Franc. It is listed under *Incertae sedis*.

*Omphalotropis coturnix* Crosse (CNHM 32236) and *O. rubra* Gassies (UMMZ 74347) are quite distinctive in appearance. The nucleus of the horny operculum is acentral and the shell has a microsculpture of very fine spiral threads. The New Hebridean *Omphalotropis* (see Solem, 1959, pp. 199–204) have the nucleus of the operculum centrally located and the shell is sculptured with spiral lirae crossed by retractive radial riblets. Study of the soft parts may result in recognition of a sectional or subgeneric unit for the New Caledonian species.

**Genus ASSIMINEA** Fleming, 1828  
*Type species.*—*Assiminea grayana* Fleming, 1828 (monotype).

**Assiminea (?) nitida pygmaea** (Gassies), 1867  
*Hydrocena pygmaea* Gassies, 1867, Jour. de Conchy., 15: 63; Gassies, 1871, Faune Conchy., 2: 134, pl. 5, fig. 11.  
*Type locality.*—Art Island, New Caledonia.  
*Remarks.*—Franc (1957, p. 49) listed *Hydrocena pygmaea* as a questionable synonym of *Assiminea crosseana*.

**Assiminea (?) hidalgoi** (Gassies), 1869  
*Hydrocena hidalgoi* Gassies, 1869, Jour. de Conchy., 17: 78; Gassies, 1871, Faune Conchy., 2: 136–137, pl. 5, fig. 14.  
*Paludinella hidalgoi* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 49–50, pl. 5, fig. 63.  
*Type locality.*—Art Island, New Caledonia.

**Assiminea (Crossilla) caledonica** (Crosse), 1869  
*Hydrocena caledonica* Crosse, 1869, Jour. de Conchy., 17: 24–25, pl. 2, fig. 4.  
*Assiminea (Crossilla) caledonica* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 48–49, pl. 5, fig. 61 (holotype of *caledonica*).
Type locality.—Vicinity of Noumea, New Caledonia (caledonica), and New Caledonia (turbinata).

**Assiminea (Crossilla) crosseana** (Gassies), 1869

*Hydrocena crosseana* Gassies, 1869, Jour. de Conchy., 17: 77–78; Gassies, 1871, Faune Conchy., 2: 133, pl. 5, fig. 13.


*Hydrocena turrita* Gassies, 1880, op. cit., 3: 71—new name for *turbinata* Gassies, 1871 (not Morelet, 1865).

*Assiminea crosseana* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 49, pi. 5, fig. 62.

Type locality.—Art Island, New Caledonia (crosseana), Noumea, New Caledonia (turbinata).

**“Assiminea” savesi** Crosse, 1887

*Hydrobia savesi* Crosse, 1887, Jour. de Conchy., 35: 304; Crosse, 1894, op. cit., 42: 374–375, pl. 7, fig. 8; Franc, 1957, Moll. Néo-Caledonien, p. 44, pl. 4, fig. 53 (holotype of *savesi*).

Type locality.—Thio, New Caledonia.

Remarks.—Specimens collected by T. D. A. Cockerell in 1928 (see Solem, 1960) clearly show the two pale brown stripes on the body whorl mentioned in the original description. This is a characteristic color pattern of the Assimineidae and the aspect of the shell is that of some of the widespread species of *Assiminea*. Without preserved material, or even dried specimens with operculi, generic reference must be tentative. This species is very questionably listed as *Assiminea*. Three adult shells had 4 to 4⅜ whorls, were 1.31 to 1.49 mm. in height and 0.82 to 0.92 mm. in diameter.

Genus **OPHALLOTROPIS** Pfeiffer, 1851

Type species.—*Cyclostoma aurantiaca* Deshayes, 1834 (subsequent designation of Gude, 1921, p. 355).

Section **Oriella** Thiele, 1927

Type species.—*Omphalotropis submaritima* Quadras and Moellendorff, 1894 (original designation).

**Omphalotropis (Oriella) granum** (Pfeiffer), 1855


*Hydrocena (Omphalotropis) maritima* Montrouzier, 1863, Jour. de Conchy., 11: 74–75, 165–166, pl. 5, fig. 4.
Omphalotropis granum (Pfeiffer), Franc, 1957, Moll. Néo-Caledonien, p. 51, pl. 5, fig. 66.

_Type locality._—Isle of Pines, New Caledonia (granum) and Art Island, New Caledonia (maritima).

**SECTION UNKNOWN**

*Omphalotropis (?) coturnix* (Crosse), 1867

_Hydrocena coturnix_ Crosse, 1867, Jour. de Conchy., 15: 181–184, pl. 7, fig. 5.

_Omphalotropis coturnix_ (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 50, pl. 5, fig. 64.

_Type locality._—In woods near Noumea, New Caledonia.

*Omphalotropis (?) rubra* (Gassies), 1874


_Omphalotropis rubra_ (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 51, pl. 5, fig. 65.

_Type locality._—Baie du Sud, New Caledonia.

_Incertae sedis

**Hydrocena fischeriana** Gassies, 1863

_Hydrocena fischeriana_ Gassies, 1863, Faune Conchy., 1: 115, pl. 7, fig. 18.


_Type locality._—Vicinity of Balade, New Caledonia.

_Remarks._—The identity of this species can be discovered only by the study of topotypic material.

**Hydrocena diaphana** Gassies, 1863

_Hydrocena diaphana_ Gassies, 1863, Faune Conchy., 1: 114–115, pl. 6, fig. 6.

_Type locality._—Fresh-water swamps on the Isle of Pines, New Caledonia.

_Remarks._—Crosse (1894, p. 391) could not classify this species from the description and figure. He had seen no specimen and dropped the name from the faunal list.

**Family PLANORBIDAE**

Hubendick (1948, 1955) established a phylogenetic classification of the planorbid snails. New Caledonia has three genera represented,
the physoid high-spired *Physastra* (*Isidora* of Franc, 1957, pp. 84–88),
the high-spired, spirally ribbed *Glyptophysa*, and the minute, planulate *Gyraulus*. Two names listed by Franc (1957) probably are based on introduced or mislabeled specimens.

*Planorbis morletianus* Crosse, 1887\(^1\) (type locality Baie du Sud, New Caledonia) (Franc, 1957, p. 89, pl. 7, fig. 121) may be a young specimen of the European *Planorbis planorbis* Linnaeus or *P. carinatus* Müller. The New Caledonian name could be based on either an introduced population or a mislabeled lot.

*Planorbis ingenuus* Morelet, 1857 (type locality New Caledonia) (Franc, 1957, pp. 90–91) is even more suspect. The only illustration (Gassies, 1863, pl. 7, fig. 16) resembles some of the North American *Helisoma* and is completely unlike any Pacific Ocean species. In the same paper, Morelet described *Ampullaria ormophora* as coming from New Caledonia. No ampullariids have been found east of Wallace's Line and I suspect that the locality for *Planorbis ingenuus* is equally untrustworthy.

Genus *PHYSASTRA* Tapparone-Canefri, 1883

*Type species.*—*Physastra vestita* Tapparone-Canefri, 1883 (original designation).

*Remarks.*—Hubendick (1948) showed that *Isidora* refers to species with a pseudopenis. The New Caledonian species have a true penis and must be placed in *Physastra*. Fifteen names have been applied to New Caledonian *Physastra*, and Franc (1957) recognized twelve species. Solem (1959, pp. 162–164) showed that the New Hebridean *Physastra* are anatomically identical with *P. dolioiolum* Gassies (as figured by Hubendick, 1948). The shell variation of the New Hebridean populations encompassed most of the New Caledonian "species." In the 1880's, E. L. Layard wrote W. D. Hartman (letter in the Carnegie Museum) that he had seen different "species" of New Caledonian *Physastra* in copulation. Without field studies, no revision of the "species" is possible. It is quite probable, however, that the fifteen names will be reduced to only one or two species.

A chronological list of the named forms follows. It is intended only as a nomenclatural guide and is not a list of species.

*Physastra nasuta* (Morelet), 1857


\(^1\) Not to be confused with the Venezuelan *Planorbis morletianus* Clessin, 1884.
Physa castanea Gassies, 1863 (not Lamarck, 1822), Faune Conchy., 1: 80, pl. 6, fig. 14.

Isidora nasuta (Morelet), Franc, 1957, Moll. Néo-Caledonien, p. 85, pl. 9, fig. 113.

Type locality.—Sanctam-Mariam de Balade, New Caledonia.

Physastra obtusa (Morelet), 1857


Isidora obtusa (Morelet), Franc, 1957, Moll. Néo-Caledonien, p. 86, pl. 9, fig. 115.

Type locality.—Sanctam-Mariam de Balade, New Caledonia.

Physastra hispida (Morelet), 1857


Isidora hispida (Morelet), Franc, 1957, Moll. Néo-Caledonien, pp. 87-88.

Type locality.—Sanctam-Mariam de Balade, New Caledonia.

Physastra caledonica (Morelet), 1857


Isidora caledonica (Morelet), Franc, 1957, Moll. Néo-Caledonien, p. 86, pl. 9, fig. 116.

Type locality.—Sanctam-Mariam de Balade, New Caledonia.

Physastra tetrica (Morelet), 1857


Isidora tetrica (Morelet), Franc, 1957, Moll. Néo-Caledonien, p. 84, pl. 9, fig. 111 (holotype of variety beta).

Type locality.—Sanctam-Mariam de Balade, New Caledonia.

Physastra auriculata (Gassies), 1857

Physa auriculata Gassies, 1857, Jour. de Conchy., 6: 274-275, pl. 9, figs. 5-6.

Isidora auriculata (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 85, pl. 9, fig. 114.

Type locality.—Marshes near Balade, New Caledonia.

Physastra kanakina (Gassies), 1857

Physa kanakina Gassies, 1857, Jour. de Conchy., 9: 275, pl. 9, figs. 7-8.
Type locality.—In the river at Balade, New Caledonia.
Remarks.—Franc (1957, p. 86) considered this a synonym of P. caledonica.

Physastra guillaini (Crosse and Marie), 1868

Physa guillaini Crosse and Marie, 1868, Jour. de Conchy., 8: 324-325, pl. 13, fig. 1.
Isidora guillaini (Crosse and Marie), Franc, 1957, Moll. Néo-Caledonien, pp. 84-85, pl. 9, fig. 112 (holotype of guillaini).

Type locality.—Tangoin near Noumea, New Caledonia.

Physastra artensis (Gassies), 1869

Physa artensis Gassies, 1869, Jour. de Conchy., 17: 76; Gassies, 1871, Faune Conchy., 2: 141-142, pl. 7, fig. 8.

Type locality.—Art Island, New Caledonia.

Remarks.—Franc (1957, p. 84) listed this as a doubtful species.

Physastra varicosa (Gassies), 1871

Physa varicosa Gassies, 1871, Faune Conchy., 2: 197.

Type locality.—Boulari Bay, New Caledonia.

Physastra incisa (Gassies), 1880

Physa incisa Gassies, 1880, Faune Conchy., 3: 72, pl. 2, fig. 13.

Type locality.—Bourail, New Caledonia.

Remarks.—Franc (1957, p. 85) listed this as a synonym of P. guillaini.

Physastra doliolum (Gassies), 1874

Isidora doliolum (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 87, pl. 9, fig. 118.

Type locality.—Ouagap, New Caledonia.

Physastra perlucida (Gassies), 1880

Physa perlucida Gassies, 1880, Faune Conchy., 3: 75-76, pl. 4, fig. 9.
Isidora perlucida (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 86-87, pl. 9, fig. 117.

Type locality.—Isle of Pines, New Caledonia.
Physastra sarasini (Dautzenberg), 1923

Physa sarasini Dautzenberg, 1923, Nova Caledonia, Zool., 3: 152, fig. 4.
Isidora sarasini (Dautzenberg), Franc, 1957, Moll. Néo-Caledonien, p. 87, pl. 9, fig. 119.

*Type locality.*—Vallée de Ngoi at 200 meters altitude, New Caledonia.

Genus GLYPTOPHYSA Crosse, 1872

*Type species.*—Physa petiti Crosse, 1872 (original designation).

*Remarks.*—The remarkable sculpture of spiral ribs at once separates this monotypic genus from the other New Caledonian physoid planorbs. Physa aliciae Reeve, from Australia, has the same type of sculpture. Iredale (1943) created the genus Glyptamoda for the Australian species. Neither Glyptophysa nor Glyptamoda has been dissected and their affinities remain to be determined.

*Glyptophysa petiti* (Crosse), 1872

Isidora (Glyptophysa) petiti (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 88, pl. 9, fig. 120 (holotype of petiti).

*Type locality.*—Lac de la Grande vallée des Kaoris, New Caledonia.

Genus GYRAULUS Charpentier, 1837

*Type species.*—Planorbid hispidus Draparnaud, 1805 (=albus Müller) (subsequent designation of Dall, 1870).

*Remarks.*—Gyraulus-like snails are world wide in distribution and their taxonomy is presently chaotic. One New Caledonian species, G. montrouzieri Gassies, is known from the New Hebrides (Solem, 1959, pp. 164–166); otherwise the species are known only from New Caledonia.

Usually three species are recognized. Possibly Planorbus fouqueti Gassies may be a variant of G. montrouzieri, corresponding to the infralineatus form of the Indonesian convexiusculus (see van Ben-them Jutting, 1931).

*Gyraulus montrouzieri* (Gassies), 1863

Planorbis montrouzieri Gassies, 1863, Faune Conchy., 1: 79, pl. 7, fig. 17.
Planorbus fouqueti Gassies, 1871, Jour. de Conchy., 18: 146; Gassies, 1871, Faune Conchy., 2: 139–140, pl. 5, fig. 10.
Gyraulus montrouzieri (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 90, pl. 9, fig. 122.

Type locality.—Swamp near Kanala, New Caledonia (montrouzieri) and Boulari, New Caledonia (fouqueti).

*Gyraulus rossiteri (Crosse), 1871

Planorbis rossiteri Crosse, 1871, Jour. de Conchy., 19: 204; Gassies, 1880, Faune Conchy., 3: 76-77, pl. 1, fig. 25.

Gyraulus rossiteri (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 90, pl. 9, fig. 123 (holotype of rossiteri).

Type locality.—Mare, Loyalty Islands.

Family ANCYLIDAE

Classification of the Ancylidae is based entirely upon the structures of the soft parts. Neither of the two New Caledonian species has been dissected. Franc (1957, pp. 91-92) tentatively referred them to Protancylus. The shells are quite different in appearance, and Hubendick (1958) showed that Protancylus is actually a modified, but primitive, planorbid genus. Pending study of the animals, the New Caledonian species are left in Ancylus, sens. lat.

Genus ANCYLUS Geoffroy, 1767

Type species.—Patella lacustris Linnaeus, 1758 (monotype).

Ancylus reticulatus Gassies, 1865

Ancylus reticulatus Gassies, 1865, Jour. de Conchy., 13: 212; Gassies, 1871, Faune Conchy., 2: 143-144, pl. 4, fig. 17.


Type locality.—Art Island, New Caledonia.

Ancylus noumeensis Crosse, 1871

Ancylus noumeensis Crosse, 1871, Jour. de Conchy., 19: 203-204; Crosse, 1872, op. cit., 20: 356, pl. 16, fig. 5.

Protancylus noumeensis (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 92, pl. 10, fig. 124.

Type locality.—Noumea, New Caledonia.

Family VERONICELLIDAE (=Vaginulidae)

Both of the New Caledonian species were undoubtedly introduced by man. Eleutherocaulus alte Ferussac probably came from Africa
and Angustipes plebeius Fischer from South America or the West Indies. Detailed references to the two species can be found in Solem (1959, pp. 41–42).

Eleutherocaulus alte (Ferussac), 1823

Laevicaulus alte (Ferussac), Franc, 1957, Moll. Néo-Caledonien, p. 93, pl. 10, fig. 125 (radula).

_Type locality._—Pondicherry, India.

Angustipes (Sarasinula) plebeius (Fischer), 1868

Vaginulus plebeius Fischer, 1868, Jour. de Conchy., 16: 145–146; Gassies, 1871, Faune Conchy., 2: 12, pl. 1, fig. 1.
Vaginulus (Sarasinula) plebeius Fischer, Franc, 1957, Moll. Néo-Caledonien, pp. 93–94, pl. 10, fig. 126 (radula).

_Type locality._—Art Island, New Caledonia.

Family SUCCINEIDAE

Classification of the Succineidae depends upon a knowledge of the genital anatomy and the radular structure. None of the New Caledonian species has been dissected. Neighboring island groups have species which show a correlation between radula and shell microsculpture. The differences are probably of supraspecific value (Solem, 1959, p. 54) although all the species are here retained under Succinea. The shell microsculpture of the New Caledonian species suggests that they belong in the section Papusuccinea Iredale, 1941.

Genus SUCCINEA Draparnaud, 1801

_Type species._—Helix putris Linnaeus, 1758.

Section Papusuccinea Iredale, 1941

_Type species._—Succinea strubelli Strubell, 1895 (original designation).

Remarks.—The New Caledonian species are listed chronologically.

*Succinea (Papusuccinea) montrouzieri* Crosse, 1867

_Succinea australis_ Fischer, 1860 (not Ferussac, 1821), Jour. de Conchy., 8: 199; Gassies, 1863, Faune Conchy., 1: 19, pl. 1, fig. 1.
Succinea *montrouzieri* Crosse, 1867, Jour. de Conchy., 15: 433-435, pl. 12, fig. 5; Franc, 1957, Moll. Néo-Caledonien, p. 95, pl. 10, fig. 127 (holotype of *montrouzieri*).

*Type locality.*—Art Island, New Caledonia.

**Succinea (Papusuccinea) paulucciae** Gassies, 1870

*Succinea paulucciae* Gassies, 1870, Jour. de Conchy., 15: 433-435, pl. 12, fig. 5; Franc, 1957, Moll. Néo-Caledonien, p. 95, pl. 10, fig. 127 (holotype of *montrouzieri*).

*Type locality.*—Art Island, New Caledonia.

**Succinea (Papusuccinea) fischeri** Gassies, 1871

*Succinea fischeri* Gassies, 1871, Faune Conchy., 2: 15-16, pl. 7, fig. 17; Franc, 1957, Moll. Néo-Caledonien, p. 95.

*Type locality.*—Conception, near Noumea, New Caledonia.

**Succinea (Papusuccinea) calcara** Gassies, 1874


*Type locality.*—Art Island, New Caledonia.

**Succinea (Papusuccinea) viridicata** Gassies, 1880

*Succinea viridicata* Gassies, 1880, Faune Conchy., 3: 12, pl. 1, fig. 2; Franc, 1957, Moll. Néo-Caledonien, p. 95.

*Type locality.*—Along running water near Bourail, New Caledonia.

**Family ATHORACOPHORIDAE**

A detailed criticism of the monograph by Grimpe and Hoffmann (1925) is presented in Solem (1959, pp. 44-52). Franc (1957) had no new material and only summarized the results of Grimpe and Hoffmann. The variation found in New Hebridean populations of *Aneitea* raised grave doubts as to the validity of most of the species named by Grimpe and Hoffmann. Without new material, only a nomenclatural checklist can be presented.

*Trihoniophorus* is an Australian genus and the New Caledonian record of *Aneitea sarasini* Grimpe and Hoffmann as a species of *Trihoniophorus* appears doubtful. The types were evidently juvenile and their classification is uncertain. The bases for generic separation of *Aneitea* and *Trihoniophorus* are given in Solem (1959, pp. 45-46).
SOLEM: NEW CALEDONIAN SNAILS

Aneityopsis Grimpe and Hoffmann, 1925, is an objective synonym of Aneitea Gray, 1860, since they have the same type species.

The New Caledonian species are listed in chronological order under Aneitea.

Genus ANEITEA Gray, 1860

_Type species._—Aneitea macdonaldi Gray, 1860 (monotype).

**Aneitea hirudo** (Fischer), 1868

_Athoracophorus hirudo_ Fischer, 1868, Jour. de Conchy., 16: 146, 225–234, pl. 11, figs. 1–4.

_Aneitea (Aneityopsis) hirudo_ (Fischer), Franc, 1957, Moll. Néo-Caledonien, p. 98, pl. 10, fig. 129 (radula).

_Type locality._—New Caledonia.

**Aneitea modesta** (Crosse and Fischer), 1870

_Athoracophorus modesta_ Crosse and Fischer, 1870, Jour. de Conchy., 18: 238; Gassies, 1871, Faune Conchy., 2: 13–14, pl. 2, fig. 1.

_Aneitea (Aneityopsis) modesta_ (Crosse and Fischer), Franc, 1957, Moll. Néo-Caledonien, p. 99, pl. 10, fig. 130 (radula).

_Type locality._—New Caledonia.

**Aneitea sarasini** Grimpe and Hoffmann, 1925

_Aneitea sarasini_ Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 415–417, figs. 15a, 16a, 17a, 18a, 20, pl. 5, fig. 1a–b.

_Aneitea (Triboniophorus) sarasini_ Grimpe and Hoffmann, Franc, 1957, Moll. Néo-Caledonien, p. 97, pl. 10, fig. 128 (radula).

_Type locality._—On Mount Humboldt, New Caledonia, at 1100 meters altitude.

**Aneitea ehrmanni** Grimpe and Hoffmann, 1925

_Aneitea ehrmanni_ Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 418–419, figs. 15b, 16b, 17b, 18b, 20, pl. 5, fig. 6a–f.

_Aneitea ehrmanni var. biglandula_ Grimpe and Hoffmann, 1925, op. cit., 3: 419–421, figs. 15c, 16c, 17c, 18c, 20, pl. 5, fig. 2a–b.


_Type locality._—Forest at 250 meters, Coula-Boréaré, New Caledonia (ehrmanni), and 800–1,000 meters on Mount Kanala, New Caledonia (biglandula).
Aneitea simrothi Grimpe and Hoffmann, 1925

*A. simrothi* Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 421–423, figs. 15e, 16g, 17d, 18e, 20, pl. 5, figs. 5a–b, 14a–b.

*A. simrothi* var. *oubatchensis* Grimpe and Hoffmann, 1925, op. cit., 3: 423–425, figs. 16h, 17c, 18f, pl. 5, fig. 4a–b.


*Type locality.*—In axil of *Pandanus* at 1,300 meters on summit of Mount Ignambi, New Caledonia (*simrothi*) and 100 meters near Oubatche, New Caledonia (*oubatchensis*).

Aneitea platei Grimpe and Hoffmann, 1925

*A. platei* Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 425–427, figs. 16f, 17f, 18d, 20, pl. 5, fig. 9a–d, pl. 6, fig. 7.

*A. (Aneityopsis) platei* Grimpe and Hoffmann, Franc, 1957, Moll. Néo-Caledonien, p. 100, pl. 10, fig. 133 (radula).

*Type locality.*—Between *Pandanus* leaves at 800–1,000 meters on Mount Kanala, New Caledonia.

Aneitea rouxi Grimpe and Hoffmann, 1925

*A. rouxi* Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 427–428, figs. 15d, 16e, 17g, 20, pl. 5, fig. 7a–c.


*Type locality.*—Forest at 800 meters on Mount Kanala, New Caledonia.

Aneitea neocaledonica Grimpe and Hoffmann, 1925

*A. neocaledonica* Grimpe and Hoffmann, 1925, Nova Caledonia, Zool., 3: 428–429, figs. 16d, 17h, 18g, 20, pl. 5, fig. 15.


*Type locality.*—In fallen palm fronds at 800 to 1,000 meters on Mount Kanala, New Caledonia.

Family **TORNATELLINIDAE**

The classification utilized below is that contained in a monograph of the Tornatellinidae by Cooke and Kondo, now in press at the Bishop Museum. The necessary data were supplied by Dr. Kondo.
Genus ELASMIAS Pilsbry, 1910

Type species.—Tornatellina aperta Pease, 1864 (original designation).

*Elasmias mariei* (Crosse), 1874

*Tornatellina mariei* Crosse, 1874, Jour. de Conchy., 22: 109–110, 393–394, pl. 12, fig. 7.

*Elasmias mariei* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 102, pl. 10, fig. 136 (holotype of mariei).

*Type locality.*—Baie du Sud, New Caledonia.

Genus LAMELLIDEA Pilsbry, 1910

Type species.—*Pupa peponum* Gould, 1847 (original designation).

Section Tornatellinops Pilsbry, 1919

*Type species.*—Tornatellina novoseelandica Pfeiffer, 1852 (original designation).

*Lamellidea (Tornatellinops) noumeensis* (Crosse), 1870

*Tornatellina noumeensis* Crosse, 1870, Jour. de Conchy., 18: 244; Gassies, 1871, Faune Conchy., 2: 95–96, pl. 8, fig. 16.

*Lamellidea (Tornatellinops) noumeensis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 102–103, pl. 10, fig. 137 (holotype of noumeensis).

*Type locality.*—Maitre Island, Noumea, New Caledonia.

Family PUPILLIDAE (= Vertiginidae)

The nine species reported from New Caledonia are placed in four genera. *Cylindrovertilla* (not *Cylindroverticilla* as in Franc, 1957) is known only from New Caledonia and the New South Wales–Queensland coastal area of Australia; *Nesopupa* is widely distributed in the Pacific, Oriental, and Ethiopian regions; *Gastrocopta* is nearly worldwide; and *Pupisoma* is almost circumtropical. The specific affinities of the New Caledonian *Nesopupa* remain to be determined. *Gastrocopta pediculus* has been spread by man over the Pacific and *G. servilis* is from the West Indies. *G. obstructa* has not been examined by a pupillid specialist and its taxonomic position is unknown. The identity of *Pupa condita* Gassies, 1870, is uncertain.

Genus CYLINDROVERTILLA O. Boettger, 1881

*Type species.*—*Pupa fabreana* Crosse, 1872 (subsequent designation of Pilsbry, 1920, p. 43).
*Cylindrovertilla paitensis* (Crosse), 1872


*Cylindroverticilla (sic) paitensis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 104–105, pl. 11, fig. 139 (holotype of _paitensis_).

_Type locality._—Paita, east coast of New Caledonia.

*Cylindrovertilla fabreana* (Crosse), 1872


*Cylindroverticilla (sic) fabreana* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 104, pl. 11, fig. 138 (holotype of _fabreana_).

_Type locality._—Anse Vata, Noumea, New Caledonia.

Genus NESOPUPA Pilsbry, 1900

_Type species._—_Pupa tantilla_ Gould, 1847 (original designation).

_Nesopupa (Nesopupa) lifouana_ (Gassies), 1871


_Type locality._—Under ferns and in moss, Lifu, Loyalty Islands.

_Nesopupa (Nesopupa) mariei_ (Crosse), 1871


_Type locality._—Vicinity of Noumea, New Caledonia.

Genus GASTROCOPTA Wollaston, 1878

_Type species._—_Pupa acarus_ Benson, 1856 (subsequent designation of Pilsbry, 1916–18, p. 7).

*Gastrocopta (Sinalbinula) pediculus* (Shuttleworth), 1852


_Type locality._—Marquesas Islands.
Gastrocopta (Sinalbinula) obstructa (Gassies), 1871


*Gastrocopta (Sinalbinula) obstructa* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 107.

_Type locality._—Conception near Noumea, New Caledonia.

*Gastrocopta (Gastrocopta) servilis* (Gould), 1843 (=lyonsiana Ancey, 1892)


_Type locality._—Matanzas, Cuba (servilis), and Punahu, Oahu, Hawaiian Islands (lyonsiana).

_Remarks._—Specimens were collected at several localities by T. D. A. Cockerell in 1928 (see Solm, 1960). Comparison of these examples with many lots of _G. servilis_ collected in the Dutch West Indies by P. Wagenaar Humelinck (CNHM) led me to formalize the suggestion made by Pilsbry (1916, p. 142) that the species _lyonsiana_ was based upon introduced individuals of the Antillean _G. servilis_.

Genus _PUPISOMA_ Stoliczka, 1873

_Type species._—*Pupa lignicola* Stoliczka, 1871 (monotype).

*Pupisoma (Ptychopatula) dioscoricola* (C. B. Adams), 1845


_Type locality._—Jamaica (dioscoricola) and vicinity of Noumea, New Caledonia (vimentiana).

_Remarks._—The identity of _Helix vimentiana_ is uncertain. Franc (1957, p. 146) placed it as a synonym of _Coneuplecta calculosa._ A shell in the University of Michigan Museum of Zoology (UMMZ 138347) labeled as _Helix vimentiana_ was the West Indian species cited here. Probably it was imported on plants from the West Indies.
Incertae sedis

Pupa condita Gassies, 1869

Pupa condita Gassies, 1869, Jour. de Conchy., 17: 73; Gassies, 1871, Faune Conchy., 2: 99–100, pl. 4, fig. 5; Crosse, 1894, Jour. de Conchy., 42: 303–304.

_Type locality._—Art Island, New Caledonia.

_Remarks._—Crosse (1894, pp. 303–304) suggested that this is a marine snail, possibly belonging to the genus _Rissoa_.

Family _ENIDAE_ (= _Buliminidae_)

The single species reported from New Caledonia may have been introduced from Africa or Madagascar (see Solem, 1959, p. 60) although several names have been applied to the Pacific populations.

Genus _RHACHISTIA_ Connolly, 1925

(= _Eorrhachis_ Tomlin and Peile, 1930; _Rhachispeculum_ Iredale, 1933; and _Rachistia_ Franc, 1957)

_Type species._—_Bulimus rhodotaenia_ Martens, 1901 (original designation).

*Rhachistia histrio_ (Pfeiffer), 1855


_Bulimus magenii_ Gassies, 1856, Jour. de Conchy., 5: 181, pl. 6, fig. 5.

_Bulimus bidwilli_ Cox, 1868, Monog. Australian Land Shells, p. 72, pl. 13, fig. 11.


_Type locality._—Tanna Island, New Hebrides (_histrio_), New Caledonia (_magenii_), and Burnett River, Queensland, Australia (_bidwilli_).

_Remarks._—A complete synonymy and discussion of this species can be found in Solem (1959, pp. 60–62).

Family _FERUSSACIIDAE_

The single New Caledonian species was imported accidentally from the West Indies.

Genus _CECILIOIDES_ Ferussac, 1814

_Type species._—_Buccinum aciculum_ Müller, 1774 (monotype).
SOLEM: NEW CALEDONIAN SNAILS

Subgenus GEOSTILBIA Crosse, 1867

Type species.—Geostilbia caledonica Crosse, 1867 (monotype).

*Cecilioides (Geostilbia) aperta* (Swainson), 1840

*Macrospira aperta* Swainson, 1840, Treatise on Malac., p. 335, fig. 97e–f.


*Geostilbia caledonica* Crosse, 1867, Jour. de Conchy., 15: 186–187, pl. 7, fig. 4.


*Caecilioides (Geostilbia) caledonica* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 109, pl. 11, fig. 142 (holotype of caledonica).

Type locality.—Cuba (gundlachi), under leaves and old wood in the gardens of Noumea, New Caledonia (caledonica), and unknown (aperta).

Family SUBULINIDAE

Subulinids probably were native to the West Indies, but they have been spread throughout the world by commerce. Most of the introduced populations have been described, at one time or another, as new species. In only a few cases have the synonymies been completely re-worked. I consider it highly improbable that any of the New Caledonian subulinids are native, but it is presently impossible to ascertain the identity of some named forms. They are listed as incertae sedis.

*Subulina octona* (Bruguière), 1792


*Subulina octona* (Bruguière), Franc, 1957, Moll. Néo-Caledonien, p. 110, pl. 11, fig. 143.

Type locality.—Guadeloupe, West Indies.

*Lamellaxis (Allopeas) gracilis* (Hutton), 1834

*Bulimus gracile* Hutton, 1834, Jour. Asiatic Soc. Bengal, 3: 93.

*Bulimus artensis* Gassies, 1866, Jour. de Conchy., 14: 50; Gassies, 1871, Faune Conchy., 2: 94–95, pl. 3, fig. 9.

*Bulimus diaphanus* Gassies, 1859 (not Pfeiffer, 1855), Jour. de Conchy., 7: 370.

*Bulimus souverbianus* Gassies, 1863, Faune Conchy., 1: 52–53, pl. 2, fig. 5—new name for *Bulimus diaphanus* Gassies.

*Opeas gracile* (Hutton), Franc, 1957, Moll. Néo-Caledonien, p. 111, pl. 11, fig. 144.

Type locality.—Mirzapur, India (gracile), and Art Island, New Caledonia (artensis and souverbianus).
Pseudopeas tuckeri (Pfeiffer), 1846


*Type locality.*—Sir Charles Hardy’s Island, northeast coast of Queensland, Australia.

**Incertae sedis**

Opeas gracile var. neocaledonicum Pilsbry, 1906. Figure 9.


![Figure 9. *Opeas gracile* var. *neocaledonicum* Pilsbry, ANSP 24133, holotype; New Caledonia.](image)

*Type locality.*—New Caledonia.

*Remarks.*—The holotype (ANSP 24133) appears to be an aberrant individual of *Lamellaxis gracilis* (Hutton).

Bulimus (Subulina) pronyensis Gassies, 1879


*Type locality.*—Vicinity of Prony Bay, New Caledonia.

*Remarks.*—Known from a single example.

Bulimus blanchardianus Gassies, 1863

*Bulimus blanchardianus* Gassies, 1863, Faune Conchy., 1: 53, pl. 6, fig. 1.
SOLEM: NEW CALEDONIAN SNAILS


Type locality.—In the interior of New Caledonia.

Remarks.—Known from a single specimen which may have been “a broken or abnormal shell, or possibly a marine form” (Pilsbry, 1906, p. 178).

Family ENDODONTIDAE

The Endodontidae are the dominant land snails of New Caledonia in both number of species and number of genera. A bewildering variety of sizes, shapes, colors, and sculptures have evolved, and adequate classification of the species is difficult. Endodontids dominate the fauna of most of Australia and all of New Zealand, and are very important on the Polynesian and Melanesian islands.

Tom Iredale and others have published over 90 generic names for the endodontid snails of Australia, New Zealand, Lord Howe, Norfolk, and the Kermadec Islands. Many more are available for the New Caledonian and Polynesian species. In trying to classify the New Hebridean (Solem, 1959, pp. 77-89) and New Caledonian endodontids I was fortunate in being able to examine shells of about 90 per cent of the named genera. Shape, whorl increment, coloration, ribbing, and apertural dentition apparently are characters which vary widely, producing convergent evolution in totally different lineages. Although a few species show indications of a transition between the basic types, apical sculpture of the Endodontidae seems to present the most satisfactory shell character for use in classification (see Solem, 1959, pp. 78-80). Since less than 5 per cent of the Pacific endodontids have had any portion of their soft parts described and figured, present classification must be based completely on conchology.

The New Caledonian endodontids can be divided into two series of genera, one with spiral apical sculpture, the other with radial apical sculpture. Platyrhytida has lost the apical sculpture and its affinities are unknown. The two series are shown graphically (fig. 10). The resultant classification is radically different from that presented by Franc (1957). For comparison, the two are presented side by side in Table 1.

Only the genus Rhytidopsis comes close to showing a transition between the radial and spiral apical sculpture. The aberrant R. minutula has fine wavy spiral apical sculpture and has lost (?) the prominent radial ribs on the spire while retaining the microsculpture. R. prevostiana is larger, with prominent radial ribs. Part of its apex
has spiral wavy lines, the rest radial ribs. *R. corymbus* has the typical radial ribs of *Pararhytida* and *Tropidotropis*. *R. chelonites* has the sculpture reduced to micro-radials over the entire shell. A few genera in other parts of the Pacific show a similar transition, so that it cannot be assumed that spiral and radial sculpture in different regions implies phylogenetic relationships. Nevertheless, the differences in apical sculpture provide useful criteria for a provisional classification of species within a particular region.

Table 1.—Classification of the New Caledonian Endodontidae

<table>
<thead>
<tr>
<th>Franc (1957)</th>
<th>Solem (this paper)</th>
</tr>
</thead>
<tbody>
<tr>
<td>r. Ptychodon</td>
<td>s. <em>Andrefrancia</em>, Group III</td>
</tr>
<tr>
<td>s. Acanthoptyx</td>
<td>r. <em>Tropidotropis</em></td>
</tr>
<tr>
<td>r. Tropidotropis</td>
<td></td>
</tr>
<tr>
<td>? Flammulina</td>
<td>r. <em>Rhytidopsis</em></td>
</tr>
<tr>
<td>r. (Rhytidopsis)</td>
<td>s. <em>Monomphalus</em></td>
</tr>
<tr>
<td>s. (Monomphalus)</td>
<td>r. <em>Pararhytida</em></td>
</tr>
<tr>
<td>r. <em>Pararhytida</em></td>
<td>(Pararhytida)</td>
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<td>(Micromphalia)</td>
<td>(Micromphalia)</td>
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<tr>
<td>(Plesiopsis)</td>
<td>(Plesiopsis)</td>
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<tr>
<td>r., s. Allodiscus</td>
<td></td>
</tr>
<tr>
<td>? (Platyhytida)</td>
<td>? <em>Platyhytida</em></td>
</tr>
</tbody>
</table>

r=radial apical sculpture; s=spiral apical sculpture; ?=smooth apical whorls.

Of the New Caledonian species that Franc (1957) listed as belonging to the Endodontidae, *Helix kanakina* Gassies, 1866, *H. inculta* Gassies, 1874, *Charopa gassiesiana* Preston, 1907, and *C. marionae* Preston, 1907, appear to belong to the Pararhytidae and are discussed below (pp. 488–489).

APEX WITH SPIRAL SCULPTURE

The most “typical” endodontids found on New Caledonia are those Franc (1957, pp. 113–125) placed in *Charopa*. The latter is a New Zealand genus in which the shell has smooth apical whorls. The genotype, *Helix coma* Gray, shows traces of radial ribbing on the apex and *Charopa* may represent a secondary derivative from a radially ribbed group. The New Caledonian “*Charopa*” have an apical sculpture of 18 to 20 spiral lirae. A similar sculpture of 10 to 12 spiral lirae is found in the New Zealand, Polynesian, and Melanesian *Mocella* (Solem, 1959, p. 83). East Australian and Tasmanian genera such as *Roblinella* and *Gyrococchlea* have the same sculpture as the New Caledonian species, but differ in shape and size. For several
Fig. 10. Classification of the New Caledonian Endodontidae, showing probable relationships within basic sculptural types.
reasons it seems probable that few lirae is the primitive condition and many lirae the advanced (see Solem, 1959, p. 298). Besides apical sculpture, the New Caledonian species differ from *Mocella* in having a larger umbilicus and a partial “ridge” inside the umbilicus.

Genus **ANDREFRANCIA** Solem, 1960

*Type species.*—*Helix rhizophorarum* Gassies, 1865 (original designation).

*Remarks.*—Using Iredalean taxonomy, six genera would have been recognized. The “species groups” outlined below have the same basic apical sculpture and probably are modifications from the same ancestral stock. The groups (fig. 11) are readily separable but form a homogeneous series in comparison with other New Caledonian endodontids. Without a better understanding of speciation and local distribution, nomenclatural recognition of more supra-specific groups would be unwise.

*Acanthoptyx* Ancey, 1888, may be only an extreme modification of the *Andrefrancia* complex, although it is retained as a distinct genus at this time.

*Andrefrancia* was proposed (see Solem, 1960) for the New Caledonian species formerly placed in *Charopa* and *Ptychodon* and is dedicated to Dr. André Franc, whose monograph (Franc, 1957) stimulated this work.

I. **GROUP OF ANDREFRANCIA ALVEOLUS** (Gassies), 1881

Color brown or flammulated; umbilicus contained 4.5 to 5 times in the diameter; lip very sinuous; radial ribs sinuately retractive; suture more or less channeled.

*Remarks.*—*Andrefrancia subcoacta* is nearest the generalized Group VI, while *A. alveolus* represents a specialization paralleling the New Zealand *Fectola* in lip and sutural characters. *Fectola* differs in having radial apical sculpture and a much wider umbilicus.

*Andrefrancia alveolus* (Gassies), 1881


*Charopa alveolus* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 117.

*Type locality.*—Baie du Prony, New Caledonia.

*Andrefrancia margueritae* (Preston), 1907. Figure 12.


*Charopa alveolus* Franc, 1957 (not Gassies, 1881), Moll. Néo-Caledonien, pl. 12, fig. 150 (holotype of *margueritae*).
<table>
<thead>
<tr>
<th>CHARACTER</th>
<th>GROUP</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
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<tr>
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<td>1.75-3</td>
<td>3-5</td>
<td>4-6</td>
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<td>slanted</td>
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<td>4-6</td>
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<tr>
<td>WHORLS</td>
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Fig. 11. Picture key to Andrefrancia.
**Type locality.**—New Caledonia.

**Remarks.**—A paratype (ANSP 98180) showed several important differences from *A. alveolus* (CNHM 46239). The latter is smaller, proportionately higher, the apex elevated rather than sunken, the suture more deeply channeled, and the ribbing much finer and more strongly sinuate. Comparative measurements of the two species are given in Table 2.

<table>
<thead>
<tr>
<th>Species</th>
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<th>Diameter</th>
<th>H/D Ratio</th>
<th>Whorls</th>
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<td><em>Andrefrancia alveolus</em></td>
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<td>4.84</td>
<td>52.4</td>
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<tr>
<td>CNHM 46239</td>
<td>2.80</td>
<td>4.67</td>
<td>60.1</td>
<td>4(\frac{3}{8})</td>
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<tr>
<td><em>Andrefrancia margueritae</em></td>
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<td>6.66</td>
<td>43.2</td>
<td>4(\frac{1}{2})</td>
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<tr>
<td>ANSP 98180 (paratype)</td>
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</table>

*Andrefrancia subcoacta* (Gassies), 1870


*Charopa subcoacta* (Gassies), Franc, 1957, *Moll. Néo-Caledonien*, pp. 122–123, pl. 12, fig. 160 (holotype of *subcoacta*).

**Type locality.**—Art Island, New Caledonia.
II. GROUP OF *Andrefrancia dispersa* (Gassies), 1863

Color brown; whorls loosely coiled; size large; umbilicus contained 3 to 4 times in the diameter; lip not sinuous.

*Remarks.*—The relatively large size (6-8 mm.), rapid whorl increment, and narrow umbilicus are diagnostic. *A. dispersa* is nearest the Group VI prototype and *A. calliope* is the largest and most specialized.

*Andrefrancia rusticula* (Gassies), 1859

*Helix rusticula* Gassies, 1859, *Jour. de Conchy.*, 7: 369; Gassies, 1863, Faune Conchy., 1: 28, pl. 1, fig. 11.


*Charopa rusticula* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 117-118, pl. 12, figs. 151 (holotype of *rusticula*), 151a (holotype of *melitae*).

*Type locality.*—Isle of Pines, New Caledonia (*rusticula*), and Art Island, New Caledonia (*melitae*).

*Andrefrancia dispersa* (Gassies), 1863

*Helix gyrina* Gassies, 1859 (not Deshayes, 1850), *Jour. de Conchy.*, 7: 369.

*Helix dispersa* Gassies, 1863, Faune Conchy., 1: 29, pl. 1, fig. 12—new name for *gyrina* Gassies, 1859 (not Deshayes, 1850).

*Charopa dispersa* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 121, pl. 12, figs. 157a (holotype of *dispersa*), 157b (holotype of *ahena*), pl. 13, fig. 157.


*Type locality.*—Isle of Pines, New Caledonia (*gyrina*) and New Caledonia (*ahena*).

*Remarks.*—A paratype of *Charopa ahena* Preston (ANSP 98184) has been damaged and retains only 3½ whorls. The whorl increment of the holotypes is not identical (see Franc, 1957, pl. 12, fig. 157a, 157b) but the two forms may be ecological races.

*Andrefrancia calliope* Crosse, 1869


*Charopa calliope* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 122, pl. 13, fig. 159 (holotype of *calliope*).

*Type locality.*—New Caledonia.

III. GROUP OF *Andrefrancia vincentina* (Crosse), 1870

Color pale horn; size minute (1.75 to 3 mm.); aperture variously toothed.
Remarks.—Because of the toothed aperture these species have usually been referred to the New Zealand–Polynesian Ptychodon–Thaumatodon complex. Apertural dentition has developed several times in the Endodontidae, and I consider that apical sculpture is a much more conservative character. Ptychodon and Thaumatodon have radially ribbed apical whorls and are much larger. The Indonesian Beilania (see Solem, 1957) has the same type of apical sculpture, but the sculpture is much coarser. All the New Caledonian toothed species have the same apical sculpture as the untoothed shells. A. vincentina is very close to the toothless A. saburra (the smallest member of Group VI); A. berlieri has a more complicated tooth structure; and A. derbesianus and A. cockerelli have a very complicated apertural dentition. Probably they were derived from three different ancestors, but for practical purposes of identification they can be lumped together.

*Andrefrancia vincentina* (Crosse), 1870

*Helix vincentina* Crosse, 1870, Jour. de Conch., 18: 238–239, 406–407, pl. 13, fig. 5.

*Ptychodon (Thaumatodon) vincentina* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 129, pl. 14, fig. 168 (holotype of vincentina).

*Type locality.*—Saint Vincent, New Caledonia.

*Andrefrancia derbesianus* (Crosse), 1875

*Helix derbesianus* Crosse, 1875, Jour. de Conch., 23: 143; Crosse, 1879, op. cit., 27: 44–45, pl. 2, fig. 2.

*Endodontia (Thaumatodon) quadridens* Gude, 1905, Jour. Malac., 12, (1), p. 13, pl. 4, fig. 5a–d.


*Type locality.*—Vicinity of Noumea, New Caledonia (derbesianus), and Artillery Point, Noumea, New Caledonia (quadridens).

Remarks.—A paratype of *E. quadridens* (UMMZ 138324) did not show any significant differences from specimens of *derbesianus*.

*Andrefrancia cockerelli* Solem, 1960


*Type locality.*—River drift at sea coast a few miles from Bourail, New Caledonia.

Remarks.—The trilamellate aperture and widely spaced ribbing are distinctive and easily separate *A. cockerelli* from the otherwise similar *A. derbesianus*. 
**Andrefrancia berleri** (Crosse), 1875

_Helix berleri_ Crosse, 1875, Jour. de Conchy., 23: 144; Crosse, 1879, op. cit., 27: 43-44, pl. 2, fig. 3.

_Ptychodon (Thaumatodon) berleri_ (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 128, pl. 14, fig. 166 (holotype of _berleri_).

_Type locality._—Vicinity of Noumea, New Caledonia.

IV. **Group of Andrefrancia ostiolum** (Crosse), 1870

Shell with elevated spire; umbilicus very narrow; and ribbing greatly reduced.

**Remarks.**—The “milky” color and nearly smooth shells approximate the zonitid taxa, but fresh shells show the spiral apical sculpture of _Andrefrancia_. _A. ostiolum_ is the most specialized, while _A. melaleucarum_ and _A. bourailensis_ are closer to the Group VI prototype.

**Andrefrancia ostiolum** (Crosse), 1870

_Helix ostiolum_ Crosse, 1870, Jour. de Conchy., 18: 240-241; Crosse, 1873, op. cit., 21: 341-342, pl. 14, fig. 5.

_Helix morosula_ Gassies, 1871, Faune Conchy., 2: 48-49, pl. 7, fig. 18.


_Charopa ostiolum_ (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 114-115, pl. 11, fig. 145 (holotype of _ostiolum_).

_Type locality._—New Caledonia (_ostiolum_), Conception near Noumea, New Caledonia (_morosula_), and Koutoumo Island, New Caledonia (_koutoumensis_).

**Andrefrancia bourailensis** (Gassies), 1872. Figure 13.


_Type locality._—Bourail, New Caledonia.

**Remarks.**—Omitted by Franc (1957), this species was rediscovered in material collected by T. D. A. Cockerell and redescribed by Solem (1960).

**Andrefrancia melaleucarum** (Gassies), 1872


_Charopa melaleucarum_ (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 115, pl. 11, fig. 146 (holotype of _melaleucarum_).

_Type locality._—Nou Island, New Caledonia (here selected).
V. GROUP OF *Andrefrancia costulifera* (Pfeiffer), 1854

Shell medium-sized; flammulated with red and horn; slightly to distinctly keeled; ribs widely spaced or obsolete; umbilicus contained 3.5 to 4 times in the diameter.

*Remarks.*—The members of this series approach *Rhytidopsis* but differ in the large umbilicus and partially keeled body whorl. The degree of carination and prominence of the ribs vary widely. Field studies may result in subspecific recognition of some of the names synonymized below, but presently available data do not permit any varietal recognition.

*Andrefrancia costulifera* (Pfeiffer), 1854

*Helix costulifera* Pfeiffer, 1854, Conch. Icon., *Helix*, pl. 201, fig. 1418.

*Helix pinicola* Gassies, 1863 et seq. (not Pfeiffer, 1854), Faune Conchy., 1: 27, pl. 1, fig. 10.


*Charopa bazini* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 115–116, pl. 11, fig. 147 (holotype of *bazini*).
**SOLEM: NEW CALEDONIAN SNAILS**  

_Type locality._—Isle of Pines, New Caledonia (*costulifera*) and Baie du Sud, New Caledonia (*bazini*).

**Incertae sedis**

The figures of the following two named entities suggest that they may be members of the _costulifera_ complex. Without critical restudy of the types in the British Museum, no definite classification is possible.

**Helix pinicola** Pfeiffer, 1854

*Helix pinicola* Pfeiffer, 1854, Conch. Icon., _Helix_, pl. 201, fig. 1413.

_Type locality._—Isle of Pines, New Caledonia.

**Remarks.**—Sykes (1895, p. 72) suggested that this might not be a New Caledonian snail.

**Helix textrix** Pfeiffer, 1855


_Type locality._—Lord Howe’s Island, New Hebrides (error?).

**Remarks.**—No species at all similar to this has been found in the New Hebrides (Solem, 1959) or on Lord Howe Island off Australia (Iredale, 1944). _Helix textrix_ may prove, like _Cyclostoma forbesianus_ Pfeiffer (see p. 425), to be based on a mislabeled shell from the Isle of Pines.

VI. **Group of Andrefrancia rhizophorarum** (Gassies), 1865

Shell small, unicolored; body whorl rounded; ribs relatively close-set; umbilicus contained 2.5 to 4.5 times in the diameter and usually possessing an internal angulation.

**Remarks.**—This is the most generalized group of _Andrefrancia_. The named forms are very similar and careful field studies are needed to determine the exact amount of speciation which has occurred. _A. saburra_ is the smallest morph and nearest to Group III. _A. vetula_ and _A. rhizophorarum_ are the largest and nearest to Group II. The named forms are listed chronologically.

*Andrefrancia vetula* (Gassies), 1858

*Helix vetula* Gassies, 1858, Jour. de Conchy., 7: 69–70; Gassies, 1863, Faune Conch., 1: 29, pl. 1, fig. 13.

*Charopa vetula* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 124, pl. 12, fig. 162a (holotype of _vetula_), pl. 13, fig. 162.

_Type locality._—New Caledonia.
*Andrefrancia rhizophorarum* (Gassies), 1865


*Charopa rhizophorarum* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 124–125, pl. 13, fig. 163.

*Type locality.*—Port-de-France, New Caledonia.

*Andrefrancia noumeensis* (Crosse), 1870


*Charopa noumeensis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 116–117, pl. 11, fig. 148 (holotype of *noumeensis*).

*Type locality.*—Vicinity of Noumea, New Caledonia.

*Andrefrancia decreta* (Gassies), 1871


*Charopa decreta* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 119, pl. 12, fig. 154 (holotype of *decreta*).

*Type locality.*—Nou Island, New Caledonia (*decreta*), and vicinity of Noumea, New Caledonia (*subtersa*).

*Andrefrancia taslei* (Crosse), 1874


*Charopa ochracea* Gude, 1905, *Jour. of Malac.*, 12, (1), p. 13, pl. 4, fig. 8a–c.

*Charopa taslei* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 121–122, pl. 13, fig. 158.

*Type locality.*—Near Noumea, New Caledonia (*taslei*), and Artillery Point, Noumea, New Caledonia (*ochracea*).

*Andrefrancia saburra* (Gassies), 1874


*Type locality.*—Art Island, New Caledonia.

*Andrefrancia confinis* (Gassies), 1875


Type locality.—Nou Island, New Caledonia.

*Andrefrancia lifuana* (Gude), 1905

*Charopa lifuana* Gude, 1905, Jour. of Malac., 12, (1), p. 12, pl. 4, fig. 6a–c.

Type locality.—Lifu, Loyalty Islands.

*Andrefrancia gwendolinae* (Preston), 1907

*Charopa gwendolinae* Preston, 1907, Ann. Mag. Nat. Hist., (7), 19: 218, fig. 3; Franc, 1957, Moll. Néo-Caledonien, p. 117, pl. 12, fig. 149 (holotype of *gwendolinae*).

Type locality.—New Caledonia.

Remarks.—A paratype (ANSP 98198) is 6.77 mm. in diameter and 3.68 mm. high, with 6⅓ whorls. The tightly wound whorls and sunken spire are diagnostic, with the umbilicus contained 4 times in the diameter. This species is perhaps nearest Group I.

Incertae sedis

*Helix cimex* Pfeiffer, 1854

*Helix cimex* Pfeiffer, 1854, Conch. Icon., Helix, pl. 201, fig. 1411.

Type locality.—Lord Howe’s Island, New Hebrides (error?).

Remarks.—The figure is very poor, but possibly this is a third species from the Isle of Pines that has been mislabeled (see pp. 425, 461). The type is in the British Museum.

Genus *ACANTHOPTYX* Ancey, 1888

Shell with spiral apical sculpture; radial ribs irregular and produced into thin lamellae; body whorl with two or three carinae.

Type species.—*Helix acanthinula* Crosse, 1868 (monotype).

Remarks.—*Acanthoptyx* probably represents an extreme modification of the *Andrefrancia* complex, but the conchological differences are large enough to warrant generic separation. Pilsbry (1894, pl. 9, fig. 25) showed that the radula of *A. acanthinula* has typically endodontid dentition.

*Acanthoptyx acanthinula* (Crosse), 1868

*Helix acanthinula* Crosse, 1868, Jour. de Conchy., 16: 94–96, pl. 1, fig. 6.
Acanthoptyx acanthinula (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 125–126, pl. 13, fig. 164 (holotype of acanthinula).

Type locality.—Noumea, New Caledonia.

Acanthoptyx subacanthinula (Crosse), 1894

Charopa subacanthinula Crosse, 1894, Jour. de Conchy., 42: 238–240, pl. 8, fig. 2.


Type locality.—Baie du Sud, New Caledonia.

Genus MONOMPHALUS Ancey, 1882 (=Psyra Hutton, 1883)

Shell with spiral apical sculpture, rest of shell with strong to reduced radial ribs and typical endodontid microsculpture; spire flat or concave; umbilicus very minute; body whorl very high.

Type species.—Helix bavayi Crosse and Marie, 1868 (here designated).

Remarks.—Monomphalus has generally been placed in Flammulina, Rhitydopsis, or the paryphantid genus Diplomphalus. The shell microsculpture shows that it is an endodontid, while the spiral apical sculpture separates it from Flammulina or Rhitydopsis.

*Monomphalus lifuana* (Montrouzier), 1860

Helix lifuana Montrouzier, 1860, Jour. de Conchy., 8: 206, 317–318, pl. 11, fig. 5.

Helix lifuana Marie, 1867, op. cit., 15: 18—an unnecessary emendation.

Flammulina (Monomphalus) lifuana (sic) (Montrouzier), Franc, 1957, Moll. Néo-Caledonien, pp. 134–135, pl. 15, fig. 177.

Type locality.—Lifu, Loyalty Islands.

*Monomphalus bavayi* (Crosse and Marie), 1868

Helix bavayi Crosse and Marie, 1868, Jour. de Conchy., 16: 149–151, pl. 8, fig. 3.

Flammulina (Monomphalus) bavayi (Crosse and Marie), Franc, 1957, Moll. Néo-Caledonien, p. 133, pl. 15, fig. 174.

Type locality.—Mount Mou, New Caledonia.

Monomphalus cerealis (Crosse), 1868

Helix cerealis Crosse, 1868, Jour. de Conchy., 16: 151–152, pl. 9, fig. 1.

Flammulina (Monomphalus) cerealis (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 133–134, pl. 15, fig. 175 (holotype of cerealis).

Type locality.—Mount Mou, New Caledonia.
Monomphalus gentilsiana (Crosse), 1870

*Helix gentilsiana* Crosse, 1870, Jour. de Conchy., 18: 136, 403-404, pl. 13, fig. 4.

*Type locality.*—Kanala, New Caledonia.

*Helix rossiteriana* Crosse, 1871

*Helix heckeliana* Crosse, 1872, op. cit., 20: 71; Crosse, 1873, op. cit., 21: 347-350, pl. 14, fig. 1—unnecessary new name for *Helix rossiteriana*.
*Flammulina (Monomphalus) heckeliana* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 134, pl. 15, fig. 176 (holotype of *heckeliana*).

*Type locality.*—Baie du Sud, New Caledonia.

**Genus TROPIDOTROPIS** Ancey, 1888

Shell planulate; spire flattened; periphery sharply keeled; sculpture reduced; umbilicus widely open, apex radially ribbed.

*Type species.*—*Helix trichocoma* Crosse, 1868 (monotype).

*Remarks.*—Tropidotropis may be an extreme modification of the Rhytidopsis stock, but the soft parts of both genera are essentially unknown.

*Tropidotropis trichocoma* (Crosse), 1868

*Helix trichocoma* Crosse, 1868, Jour. de Conchy., 16: 158-160, pl. 8, fig. 6.
*Tropidotropis trichocoma* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 126-127, pl. 14, fig. 165a-b (holotype of *trichocoma*).

*Type locality.*—Mount Mou, New Caledonia (*trichocoma*), and New Caledonia (*gudei*).

**Genus RHYTIDOPSIS** Ancey, 1882

Shell small (7 mm.); apex radially ribbed; whorls inflated; radial sculpture prominent or reduced.

*Type species.*—*Helix chelonites* Crosse, 1868 (monotype).

*Remarks.*—The New Zealand species usually associated with Rhytidopsis, such as *Flammulina chiron* Gray, have smooth nuclear whorls. Their general appearance is the same as that of Rhytidopsis, but this is probably the result of convergent evolution.
The anatomy of *Rhytidopsis chelonites* was noted by Saint Simon (1880).

*Rhytidopsis chelonites* (Crosse), 1868

*Helix chelonites* Crosse, 1868, *Jour. de Conchy.*, 16: 157–158, pl. 9, fig. 2.


*Type locality.*—Mount Mou, New Caledonia.

*Rhytidopsis minutula* (Crosse), 1870


*Flammulina* (*Rhytidopsis*) *minutula* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 132, pl. 15, fig. 173 (holotype of *minutula*).

*Type locality.*—New Caledonia.

*Rhytidopsis prevostiana* (Crosse), 1874


*Flammulina* (*Rhytidopsis*) *prevostiana* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, pp. 131–132, pl. 15, fig. 171 (holotype of *prevostiana*).

*Type locality.*—Baie du Sud, New Caledonia.

*Rhytidopsis corymbus* (Crosse), 1874


*Flammulina* (*Rhytidopsis*) *corymbus* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 131, pl. 14, fig. 170 (holotype of *corymbus*).

*Type locality.*—Model farm near Noumea, New Caledonia.

*Rhytidopsis rouxi* (Dautzenberg), 1923


*Type locality.*—Summit of Mount Ignambi, New Caledonia.

Genus *PARARHYTIDA* Aney, 1882

Shell medium- to large-sized (10 to 40 mm.); spire elevated; body whorl rounded to keeled; apex radially ribbed; radial ribs prominent or obsolete.

*Type species.*—*Helix dictyodes* Pfeiffer, 1847 (subsequent designation of Pilsbry, 1894, p. 52).
Remarks.—The evolutionary developments within Pararhytida are recognized by the three sectional names—Pararhytida (sens. str.), Micromphalia, and Plesiopsis. Micromphalia is the most generalized and seems near the Rhytidopsis stock, from which it most obviously differs in having apertural teeth. Plesiopsis is a specialization in apertural dentition, although retaining a generalized shell sculpture. Pararhytida, sens. str., has the sculpture reduced, the shell becoming progressively more carinate, and the size reaches the maximum found in the Endodontidae.

Section Pararhytida, sens. str.

Shell large (17 to 40 mm.), carinated; sculpture reduced.

*Pararhytida (Pararhytida) dictyodes* (Pfeiffer), 1847

*Helix dictyoides* (sic) Pfeiffer, 1852, *Conch. Icon.*, *Helix*, pl. 80, fig. 423.  

*Type locality.*—New Guinea (error).

*Pararhytida (Pararhytida) mouensis* (Crosse), 1868

*Helix mouensis* Crosse, 1868, *Jour. de Conchy.*, 16: 152–154, pl. 8, fig. 5.  

*Type locality.*—Mount Mou, New Caledonia.

*Pararhytida (Pararhytida) dictyonina* (Euthyme), 1885


*Type locality.*—Noumea, New Caledonia.

*Pararhytida (Pararhytida) marteli* (Dautzenberg), 1907

*Trochomorpha (Videna) marteli* Dautzenberg, 1907, *Jour. de Conchy.*, 54: 257–259, pl. 8, figs. 7–9.  

*Type locality.*—Forest of Mount Ignambi, New Caledonia.

Section Micromphalia Ancey, 1882

Shell medium-sized (9 to 15 mm.); spire elevated; aperture with basal denticle; sculpture reduced; umbilicus minute.
Type species.—*Helix abax* Marie, 1870 (subsequent designation of Zilch, 1959, p. 224).

*Pararhytida (Micromphalia) vieillardi* (Crosse and Marie), 1867

*Helix vieillardi* Crosse and Marie, 1867, *Jour. de Conchy.*, 15: 58–60, pl. 4, fig. 5.


Type locality.—Summit of Mount Mou, New Caledonia.

*Pararhytida (Micromphalia) caledonica* (Crosse), 1868


*Pararhytida (Micromphalia) caledonica* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 139, pl. 16, fig. 180 (holotype of *caledonica*).

Type locality.—Bogota, shore of Lake Kanala, New Caledonia.

*Pararhytida (Micromphalia) abax* (Marie), 1870


*Pararhytida (Micromphalia) abax* (Marie), Franc, 1957, *Moll. Néo-Caledonien*, pp. 138–139, pl. 16, fig. 179 (holotype of *abax*).

Type locality.—Baie du Sud, New Caledonia.

Section Plesiopsis Ancey, 1888

Shell medium-sized (10 mm.); spire flat; radial sculpture very prominent; body whorl rounded; aperture with complex dentition.

Type species.—*Helix lombardoi* Montrouzier, 1860 (monotype).

*Pararhytida (Plesiopsis) lombardoi* (Montrouzier), 1860


Type locality.—Hienghène, New Caledonia.

SMOOTH APICAL WHORLS

Genus PLATYRHYTIDA Cockerell, 1894

(=Platystoma Ancey, 1882, not Meigen, 1803, or Agassiz, 1829, and Saissetia Ancey, 1888, not Déplanche, 1858)
SOLEM: NEW CALEDONIAN SNAILS

Type species.— *Helix saisseti* Gassies, 1860 (original designation).

Remarks.—The species included in *Platyrhytida* are diverse in size and sculpture, but agree in their type of whorl increment and in having a minute umbilicus which is often plugged by a callus. Quite possibly *Platyrhytida* is polyphyletic, but without dissection of the soft parts no conclusions can be drawn. There are few positive shell features on which to base a classification. *H. astur* has been shown to have endodontid dentition; otherwise even family position would be uncertain.

Usually *Platyrhytida* is considered to be a subgenus of the New Zealand *Allodiscus*. The latter has a typically endodontid micro-sculpture and a much tighter whorl increment. *Platyrhytida* has either a smooth shell (*P. perroquiniana* and *P. baladensis*) or reduced radial ribs with a criss-cross microsculpture of fine lines between the broad low radials (*P. turneri, P. saisseti*, and *P. goulardiana*).

*P. saisseti* is the most specialized species, being largest in size and having the radial ribs beaded.

*Platyrhytida turneri* (Pfeiffer), 1860


*Helix astur* Souverbie, 1860, Jour. de Conchy., 8: 205–206, 315–316, pl. 11, fig. 7.


*Helix oriunda* Gassies, 1880, op. cit., 3: 20; Gassies, 1880, Jour. de Conchy., 28: 325–326, pl. 10, fig. 2.

*Allodiscus (Platyrhytida) turneri* (Pfeiffer), Franc, 1957, Moll. Néo-Caledonien, p. 141, pl. 16, fig. 182.

Type locality.—New Caledonia (*turneri* and *astur*), Port-de-France, New Caledonia (*occlusa*), and forests of model farm near Yahoue, New Caledonia (*oriunda*).

Remarks.—*Helix turneri* was described “between February and May, 1860” and *Helix astur* “April 1, 1860.” The question of priority is uncertain, and, following Franc, I am arbitrarily utilizing Pfeiffer’s name.

*Platyrhytida baladensis* (Souverbie), 1863

*Helix baladensis* Souverbie, 1863, Jour. de Conchy., 11: 276–277, pl. 12, fig. 1.


*Allodiscus (Platyrhytida) bruniana* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 142–143, pl. 16, fig. 185.
Type locality.—Balade, New Caledonia (baladensis), and Ouagap, New Caledonia (bruniana).

*Platyrhytida perroquiniana* (Crosse), 1869


*Alloidiscus (Platyrhytida) perroquiniana* (Crosse), Franc, 1957, *Moll. Néo-Caledonien*, p. 142, pl. 16, fig. 184 (holotype of *perroquiniana*).

Type locality.—Baie du Sud, New Caledonia.

*Platyrhytida goulardiana* (Crosse), 1870

*Helix goulardiana* Crosse, 1870, *Jour. de Conchy.*, 18: 136—137, 405—406, pl. 13, fig. 3.


Type locality.—Mount Mou, New Caledonia.

*Platyrhytida saisseti* (Gassies), 1871


Type locality.—Kanala, New Caledonia.

Superfamily **LIMACACEA**

The limacoid snails have replaced the more primitive Arionacea (Endodontidae) on continental areas and are an important part of the snail fauna on most Pacific islands. It was thus extremely surprising to find that they are almost completely absent from New Caledonia. Franc (1957, pp. 143—150) listed nine New Caledonian limacoid species, four introduced and five "endemic." The latter are known from shells only and their family position is uncertain. Two are listed as Pulmonata incertae sedis, while three are placed in *Orpiella* (*Halozonites*) at the suggestion of H. B. Baker.

Of the introduced species, *Coneuplecta calculosa* and *Liardetia samoensis* are Polynesian species spread by natives, *Derocecra laeve* is a European slug, and *Hawaiiia minuscula* a North American—West Indian species widely disseminated by commerce. They are listed below, but references to supraspecific categories have been thought unnecessary.
Hawaiiia minuscula (Binney), 1841


*Type locality.*—Ohio, United States of America.

Deroceras laeve (Müller), 1774


*Type locality.*—Denmark (laeve) and Mount Mou, New Caledonia (mouensis).

Coneuplecta (Durgellina) calculosa (Gould), 1852


*Helix dendrobia* Crosse, 1868, Jour. de Conchy., 16: 96–97, pl. 1, fig. 5.


*Type locality.*—Tahiti, Society Islands (calculosa), and on the trees at Koe, New Caledonia (dendrobia).

*Liardetia (Liardetia) samoensis* (Mousson), 1865


*Zonites subfulvus* Gassies, 1866, op. cit., 14: 49; Gassies, 1871, Faune Conchy., 2: 16, pl. 1, fig. 4.

*Kaliella subfulva* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 147, pl. 17, fig. 190a–c.

*Type locality.*—Upolu, Samoa (samoensis), and Art Island, New Caledonia (subfulvus).

*Remarks.*—A full discussion of the species is given by Solem (1959, pp. 96–97).

Genus ORPIELLA (Gray), 1855

*Type species.*—*Helix scorpio* Gould, 1847 (monotype).

*Remarks.*—The three New Caledonian species are referred to this complex with a great deal of hesitation. The anatomy of *Helicarion woodwardi* has been poorly figured, but the identity of this shell with
Helix artensis is unknown. Even its family position is uncertain. The general appearance of these shells recalls some of the Orpiella. For this reason they have here been tentatively placed in that genus. This reference is so tentative that I did not accept Orpiella as a genus present in New Caledonia (Solem, 1959).

*Orpiella (Halozonites) artensis (Souverbie), 1859

Helix artensis Souverbie, 1859, Jour. de Conchy., 7: 289–291; Gassies, 1863, Faune Conchy., 1: 19–20, pl. 1, fig. 2.

Microcystis artensis (Souverbie), Franc, 1957, Moll. Néo-Caledonien, pp. 145–146, pl. 17, fig. 188.

Type locality.—Art Island, New Caledonia.

*Orpiella (Halozonites) desmazesii (Crosse), 1872


Microcystis desmazesii (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 144, pl. 16, fig. 186.

Type locality.—Vicinity of Noumea, New Caledonia.

Orpiella (Halozonites) woodwardi (Godwin-Austen), 1903


Type locality.—Lifu, Loyalty Islands.

Remarks.—Some specimens collected on Lifu by A. Willey, who found the type specimens, were in the UMMZ collection. They were not identified, but were the same as O. artensis. It is thus possible that H. woodwardi may be a synonym, but only study of the type specimen can determine its relationship.

Family BULIMULIDAE

Genus Placostylus Beck, 1837

Type species.—Placostylus bootis Menke (emended), which has been subsequently restricted to the New Caledonian Limax fibratus Martyn, 1789 (see Pilsbry, 1900, p. 19).

Remarks.—The International Commission on Zoological Nomenclature (Opinion 456) invalidated Martyn’s names as a group but stated that requests for preservation of individual names would be favorably received. Martyn’s species was beautifully figured and a
type locality designated by Pain (1958). I prefer to retain Martyn’s name rather than to try to determine the identity of one of the ill-figured and badly described synonyms from the late 1700’s and early 1800’s. While this is against the letter of the International Code, it is a much more practical solution.

If varietal names are accepted as being nomenclaturally available, there are more than 130 named forms of New Caledonian Placostylus. The current rules of nomenclature are inconclusive, but it is possible to eliminate the varietal names on the basis that they are “infrasub-specific” forms. Since most of the names proposed as varieties are of dubious validity under the best of circumstances (see p. 420), their elimination can only simplify matters.

In prefacing his revision of the fibratus complex, Pilsbry (1900, p. 35) quoted Dante’s famous “All hope abandon, ye who enter here.” The bewildering variation and chaotic literature defy any solution based on library work or existing museum collections. Pilsbry (1901–1902, pp. iii–liv) tentatively recognized 34 New Caledonian species. Franc (1957, pp. 150–161) listed only 22 (including one described after Pilsbry’s monograph) and overlooked P. strattoni Pain (1955, pp. 18–19, fig. 9).

Neither classification is satisfactory, but for nomenclatural purposes Pilsbry’s is here adopted. The primary purpose of this list is to provide type locality data for the currently named species and their principal synonyms. The many early names applied to ill-copied figures of P. fibratus Martyn are not listed but can be found in Pilsbry (1900, pp. 39–42). All validly proposed synonyms accompanied by precise type locality data are included, but a few unfigured forms with the type locality “New Caledonia” have been omitted. Their identity could be discovered only by recovery of missing type specimens. Speculation on them is a waste of printed pages.

Careful analysis of the variation in extensive collections from local populations is the only way in which any revision of the speciation can be attempted. Some information overlooked by Franc (1957) has been added, but remarks are limited to indicating where Franc’s classification differed from that of Pilsbry.

The New Caledonian Placostylus are usually divided into two groups, ranked as sections by Pilsbry (1901–1902, pp. 67–68) and genera by Franc (1957, pp. 160–161). I indicated (Solem, 1959, fig. 5) that the New Caledonian species were monophyletic, the shell divergence between the sections (or genera) representing minor habitat adaptations, as previously suggested by Pilsbry (1900, p. 67).
Careful study of the shells indicates that the New Caledonian species are much more closely related to each other than to any species from other island groups.

The sectional division of Pilsbry is retained here to indicate the arboreal versus terrestrial groupings.

**Section Leucocharis** Pilsbry, 1900

*Type species.—Bulimus pancheri* Crosse, 1870 (original designation).

**Placostylus (Leucocharis) pancheri** (Crosse), 1870


*Leucocharis pancheri* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 160–161, pl. 21, fig. 213.

*Type locality.—*Mountains near Boulari, New Caledonia.

**Placostylus (Leucocharis) loyaltyensis** (Souverbie), 1879

*Bulimus loyaltyensis* Souverbie, 1879, Jour. de Conchy., 27: 25–26, pl. 3, fig. 1.

*Leucocharis loyaltyensis* (Souverbie), Franc, 1957, Moll. Néo-Caledonien, p. 161, pl. 21, fig. 214.

*Type locality.—*Mare, Loyalty Islands.

**Placostylus (Leucocharis) porphyrocheila** (Dautzenberg and Bernier), 1901


*Type locality.—*New Caledonia.

*Remarks.—*A variety *rubicunda* from Houailou, New Caledonia, was described by Dautzenberg and Bernier (1901, p. 301, pl. 8, fig. 6) only a few months after the original description. When the type locality of the nominate form can be established, the variety may be considered a validly described subspecies. Until then I prefer to leave it in nomenclatural limbo.

**Section Placostylus**, sens. str.

**Placostylus (Placostylus) eddystonensis** (Pfeiffer), 1855

SOLEM: NEW CALEDONIAN SNAILS

*Bulimus hienguenensis* Crosse, 1871, Jour. de Conchy., 19: 181 (substitute name).
*Placostylus hienghenensis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 158, pl. 20, fig. 208.

**Type locality.**—Eddystone Island, Solomon Islands (*eddystonensis*, error subsequently corrected to Hienguen, New Caledonia, by Gassies, 1863, p. 260), Isle of Pines (*servaini*).

*Placostylus (Placostylus) bavayi* (Crosse and Marie), 1868

*Bulimus bavayi* Crosse and Marie, 1868, Jour. de Conchy., 16: 161–164, pl. 8, fig. 1.

**Type locality.**—Summit of Mount Mou, New Caledonia (*bavayi*), and New Caledonia (*dupuyi*).

*Placostylus (Placostylus) bondeensis* (Crosse and Souverbie), 1869

*Bulimus bondeensis* Crosse and Souverbie, 1869, Jour. de Conchy., 17: 270–272, pl. 8, fig. 1.
*Placostylus bondeensis* (Crosse and Souverbie), Franc, 1957, Moll. Néo-Caledonien, p. 159, pl. 20, fig. 209.

**Type locality.**—Bonde, New Caledonia.

*Placostylus (Placostylus) layardi* Kobelt, 1891

*Placostylus layardi* Kobelt, Franc, 1957, Moll. Néo-Caledonien, pp. 159–160, pl. 20, fig. 211.

**Type locality.**—Tie-baghi Mountain, near Coumac, northwestern New Caledonia (*layardi*).

**Remarks.**—Pilsbry (1900, p. 33) raised Crosse’s varietal name *curta* to specific rank in the belief that *Diplomorpha layardi* Ancey, 1884, was congeneric. *Diplomorpha* is a distinct genus (see Solem, 1959, pp. 137–138), and Kobelt’s name should be retained.

*Placostylus (Placostylus) savesi* Crosse, 1886

*Placostylus savesi* Crosse, 1886, Jour. de Conchy., 34: 163–165, pl. 7, figs. 3, 3a.
Type locality.—Pouembo, New Caledonia.

Remarks.—Franc (1957, p. 159) suggested that this might be a synonym of *P. bavayi*.

**Placostylus (Placostylus) rossiteri** (Brazier), 1881

*Bulimus (Placostylus) rossiteri* Brazier, Crosse, 1881, Jour. de Conch., 29: 338–340, pl. 12, fig. 6.

Type locality.—Bonedondia village, Nehone Bay, New Caledonia.

**Placostylus (Placostylus) alexander** (Crosse), 1855

*Bulimus alexander* Crosse, 1855, Rev. Mag. Zool., (2), 7: 34, 83–84, pl. 4, figs. 1–3.
*Placostylus alexander* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 152, pl. 18, fig. 194.

Type locality.—New Caledonia.

Remarks.—Pilsbry (1900, pp. 35–37) lists a number of varietal names. If they had been advanced to subspecific rank and refigured, these would be nomenclaturally available from the time of such usage, but under present circumstances they are not acceptable.

**Placostylus (Placostylus) corpulentus** (Gassies), 1871

*Placostylus corpulentus* (Gassies), Kobelt, 1891, Syst. Conch. Cab., I, (13a), pp. 121–122, pl. 30, fig. 1.

Type locality.—Isle of Pines, New Caledonia (here selected).

Remarks.—Reported from the Isle of Pines by Pain (1955, p. 11), but not mentioned by Franc (1957).

**Placostylus (Placostylus) abbreviatus** (Gassies), 1871

*Bulimus abbreviatus* Gassies, 1871, Faune Conchy., 2: 192; Gassies, 1880, Faune Conchy., 3: 41–42, pl. 4, fig. 1.

Type locality.—Unknown (restricted to Lifu, Loyalty Islands, by Gassies, 1880, p. 41).

Remarks.—Not mentioned by Franc (1957).

**Placostylus (Placostylus) kanalensis** Kobelt, 1891

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Placostylus houailouensis Dautzenberg, 1901, Jour. de Conch., 49: 301-302, pl. 8, figs. 4, 5.
Placostylus canalensis (sic) (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 154, pl. 19, fig. 198.

Type locality.—Kanala, New Caledonia (kanalensis), Tchio Island, New Caledonia (subeffusus), and Houailou, New Caledonia (houailouensis).

Placostylus (Placostylus) fibratus (Martyn), 1789

Limax fibratus Martyn, 1789, Universal Conch., pl. 25 (see Pilsbry, 1900, pp. 40-41, for the synonyms based on copies of this figure or references to it).

Bulimus auris-midae Reeve, 1848, Conch. Icon., fig. 170.

Bulimus bairdii Reeve, 1848, op. cit., fig. 272.

Bulimus insignis Petitt, 1850, Jour. de Conch., 1: 57, pl. 3, fig. 1.

Bulimus danieli Crosse, 1855, Rev. Mag. Zool., (2), 7: 84-85, pl. 4, figs. 4, 5.

Bulimus edwardsianus Gassies, 1863, Faune Conch., 1: 40-41, pl. 4, fig. 2.

Bulimus ouensis Gassies, 1870, Jour. de Conch., 18: 142; Gassies, 1871, Faune Conch., 2: 68-69, pl. 3, fig. 5.

Bulimus pinicola Gassies, 1870, Jour. de Conch., 18: 142-143; Gassies, 1871, Faune Conch., 2: 59-60, pl. 4, fig. 1.

Bulimus infundibulum Gassies, 1871, Faune Conch., 2: 86-87 (Pain, 1955, pp. 16-17, figs. 6, 7, considers this a valid subspecies of P. fibratus).

Bulimus aesopeus Gassies, 1871, Faune Conch., 2: 87-88; Gassies, 1871, Jour. de Conch., 21: 51, pl. 2, fig. 6.


Bulimus imbricatus Gassies, 1871, op. cit., 2: 187-188.

Bulimus albo-roseus Gassies, 1871, op. cit., 2: 189.

Bulimus patens Gassies, 1871, op. cit., 2: 190.

Bulimus superfasciatus Gassies, 1871, op. cit., 2: 190.


Placostylus (fibratus var.?) knohlauchi Kobelt, 1890, Syst. Conch. Cab., 1, (13a), pp. 15-16, pl. 3, fig. 1.

Placostylus leucolenus Crosse, 1895, Jour. de Conch., 43: 80-82, pl. 5, fig. 6.

Placostylus fibratus bourailensis Cockerell, 1929, Nautilus, 42, (3), p. 74, pl. 2, figs. 4-6.

Placostylus fibratus powelli Pain, 1955, Jour. de Conch., 95: 12-14, figs. 2, 3.

Placostylus fibratus mosesi Pain, 1955, op. cit., 95: 14, fig. 4.

Placostylus (Placostylus) fibratus kumacensis Pain, 1958, Jour. of Conch., 24, (8), pp. 276–277, pl. 8, lower figures.

**Type locality.**—Isle of Pines, New Caledonia (pinicola, aesopeus, carbonarius, insignior, leucoelenus), New Caledonia (insignis, aurismidae, danieli, knoblauchi), unknown (bairdii), Nekete, New Caledonia (edwardsianus), Ouen Island, New Caledonia (ouensis), Kou-toumo Island, New Caledonia (infundibulum), Boulari, New Caledonia (lalannei, patens, superfasciatus, imbricatus), Alcmene Island, New Caledonia (alboroseus), Necou, New Caledonia (necouensis), vicinity of Noumea, New Caledonia (mosesi), and 1,250 feet elevation in the Tie-baghi Mountain near Kumac, New Caledonia (kumacensis).

**Remarks.**—The type locality of typical fibratus has long been uncertain. Charles Hedley concluded from the narrative of Cook’s voyage that the Ile Amere between the Isle of Pines and New Caledonia was the type station (see Pilsbry, 1900, pp. 235–236). Cockerell (1929, p. 76) suggested that the Isle of Pines was more probable. Pain (1958) reported that typical P. fibratus was still living on Ile Amere in 1945, and this can be designated as type locality.

Placostylus (Placostylus) arenosus (Gassies), 1878


**Type locality.**—Lifu, Loyalty Islands.

**Remarks.**—Franc (1957) does not mention this species.

Placostylus (Placostylus) ouveanus (Mousson), 1869

*Bulimus ouveanus* "Dotzauer" Mousson, 1869, Jour. de Conchy., 17: 60–62, pl. 4, figs. 4, 4a.

**Type locality.**—Uvea, Loyalty Islands.

**Remarks.**—Franc (1957, p. 152) listed this as a synonym of *P. fibratus*.

Placostylus (Placostylus) falcicula (Gassies), 1871


**Type locality.**—Baie du Sud, New Caledonia.
Remarks.—Franc (1957, p. 152) listed this as a synonym of *P. fibratus*.

**Placostylus (Placostylus) albersi** Dautzenberg and Bouge, 1923


*Type locality.*—New Caledonia (*eximiu*s), Sanctam-Mariam de Balade (*souvillei*).

Remarks.—Franc (1957, p. 153) listed several of Pilsbry’s species as synonyms. If this course is adopted, one of these names must be used for the species. The identity of *Bulimus souvillei* is not known and the name should be treated as a *nomen dubium*.

**Placostylus (Placostylus) lamberti** (Gassies), 1869

*Bulimus lamberti* Gassies, 1869, Jour. de Conchy., 17: 72–73; Gassies, 1871, Faune Conchy., 2: 69–70, pl. 3, fig. 6.

**Placostylus lamberti** (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 154–155, pl. 19, fig. 199.

*Type locality.*—Uvea, Loyalty Islands.

**Placostylus (Placostylus) boulariensis** (Souverbie), 1869

*Bulimus boulariensis* Souverbie, 1869, Jour. de Conchy., 17: 417–418; Gassies, 1871, Faune Conchy., 2: 60–61, pl. 1, fig. 12.

*Type locality.*—Woods around Boulari, New Caledonia.

Remarks.—Franc (1957, p. 154) considered this to be a synonym of *P. lamberti*.

**Placostylus (Placostylus) guestieri** (Gassies), 1869

*Bulimus guestieri* Gassies, 1869, Jour. de Conchy., 17: 72; Gassies, 1871, Faune Conchy., 2: 74–75, 192–193, pl. 3, fig. 11.

*Bulimus cicatricosus* Gassies, 1871, Faune Conchy., 2: 72–73, pl. 4, fig. 2.

*Bulimus (baray var.?) rhinocheti* Kobelt, 1891, Syst. Conch. Cab., 1, (13a), pp. 75–76, pl. 18, fig. 1.

*Type locality.*—Uvea, Loyalty Islands (*guestieri*), Kanala, New Caledonia (*cicatricosus*, *rhinocheti*).

Remarks.—Franc (1957, p. 153) listed this as a synonym of *P. albersi*. 

Placostylus (Placostylus) senilis (Gassies), 1869


_Type locality._—Isle of Pines, New Caledonia (_subsenilis_), and New Caledonia (_senilis_).

_Remarks._—Neither of these names is mentioned by Franc (1957).

Placostylus (Placostylus) buccalis (Gassies), 1870


_Type locality._—Ouen Island, New Caledonia.

_Remarks._—Franc (1957, p. 153) listed this as a synonym of _P. albersi_.

Placostylus (Placostylus) goroensis (Souverbie), 1870

_Bulimus goroensis_ Souverbie, 1870, Jour. de Conchy., 18: 76; Gassies, 1871, Faune Conchy., 2: 76, pl. 4, fig. 3.

_Placostylus goroensis_ (Souverbie), Franc, 1957, Moll. Néo-Caledonien, p. 154, pl. 18, fig. 197.

_Type locality._—Goro, New Caledonia.

Placostylus (Placostylus) submariei (Souverbie), 1869

_Bulimus submariei_ Souverbie, 1869, Jour. de Conchy., 17: 273–274; Souverbie, 1870, op. cit., 18: 76, pl. 9, fig. 2.

_Placostylus submariei_ (Souverbie), Franc, 1957, Moll. Néo-Caledonien, p. 157, pl. 19, fig. 204.

_Type locality._—Bonde, New Caledonia.

Placostylus (Placostylus) mariei (Crosse and Fischer), 1867

_Bulimus mariei_ Crosse and Fischer, 1867, Jour. de Conchy., 15: 187–192, pl. 7, figs. 1, 2.

_Placostylus submariei_ Kobelt, 1890 (not Souverbie, 1869), Syst. Conch. Cab., 1, (13a), p. 17, pl. 3, fig. 2.

_Placostylus mariei_ (Crosse and Fischer), Franc, 1957, Moll. Néo-Caledonien, p. 156, pl. 19, fig. 203.

_Type locality._—Gatope, New Caledonia.

Placostylus (Placostylus) neckliaiensis Kobelt, 1891

Type locality.—Neckliai, west coast of New Caledonia.

Remarks.—Franc (1957, p. 156) listed this as a synonym of *P. duplex*.

**Placostylus (Placostylus) porphyrostomus** (Pfeiffer), 1851

*Bulimus auris-borinus* Reeve, 1848 (not Bruguière, 1792), Conch. Icon., *Bulimus*, fig. 185.


*Bulimus lessonii* Petit, 1853, Jour. de Conchy., 4: 405, pl. 11, fig. 6.


*Bulimus debeauxii* Gassies, 1871, Faune Conchy., 2: 184–185; Gassies, 1881, Jour. de Conchy., 29: 337, pl. 11, fig. 4.


Type locality.—New Caledonia (*lessonii*), Portum Galliae, New Caledonia (*singularis*), Isle of Pines, New Caledonia (*debeauxii*), and unknown (*porphyrostomus*).

**Placostylus (Placostylus) leoni** Haas, 1935


Type locality.—Artillery Point, Noumea, New Caledonia.

**Placostylus (Placostylus) monackensis** Kobelt, 1891


Type locality.—Monack Island, New Caledonia.

Remarks.—Franc (1957, p. 156) listed this as a synonym of *P. duplex*.

**Placostylus (Placostylus) duplex** (Gassies), 1871


*Placostylus duplex major* “Gassies” Pain, 1955, Jour. de Conchy., 95: 17, fig. 8.

Type locality.—Nou Island, New Caledonia.

**Placostylus (Placostylus) caledonicus** (Petit), 1845

*Bulimus caledonicus* Petit, 1845, Rev. Mag. Zool., 1845: 53; Gassies, 1863, Faune Conchy., 1: 44, pl. 5, fig. 3.
Placostylus caledonicus (Petit), Franc, 1957, Moll. Néo-Caledonien, p. 157, pl. 19, fig. 205.

*Type locality.*—New Caledonia.

Placostylus (Placostylus) poyensis Kobelt, 1891


*Type locality.*—Poya, west coast of New Caledonia.

*Remarks.*—Franc (1957, p. 156) listed this as a synonym of *P. duplex*.

Placostylus (Placostylus) pseudocaledonicus (Montrouzier), 1859

*Bulimus pseudocaledonicus* Montrouzier, 1859, Jour. de Conchy., 7: 379, pl. 14, fig. 3.

*Bulimus annibal* Souverbie, 1869, op. cit., 17: 416–417; Souverbie, 1870, op. cit., 18: 78, pl. 9, figs. 3, 3a.

*Bulimus gaudryanus* Gassies, 1878, op. cit., 26: 335–337; Gassies, 1880, Faune Conch., 3: 38, pl. 1, fig. 24.


*Placostylus saxtoni* "Layard" Kobelt, 1891, op. cit., I, (13a), pp. 97–98, pl. 23, figs. 5, 6.

*Placostylus smithii* Kobelt, 1891, op. cit., I, (13a), pp. 105–107, pl. 26, figs. 1, 2.


*Type locality.*—New Caledonia (*pseudocaledonicus*), Bonde, New Caledonia (*annibal*), Ouagap, New Caledonia (*gaudryanus*), Pouen Island, New Caledonia (*pouenanus*), Koumac, New Caledonia (*saxtoni*), west coast of New Caledonia (*smithii*) and Cape Goulvein, New Caledonia (*goulvainensis*).

Placostylus (Placostylus) scarabus (Albers), 1854

*Bulimus scarabus* Albers, 1854, Malak. Blätt., 1: 219; Gassies, 1863, Faune Conchy., 1: 46, pl. 5, fig. 2.


*Placostylus scarabus verdis* Pain, 1955, Jour. de Conchy., 95, (1), pp. 14–16, fig. 5.

*Type locality.*—New Caledonia (*scarabus*), southwest coast near Port-de-France, New Caledonia (*verdis*).
Placostylus (Placostylus) strattoni Pain, 1955


*Type locality.*—New Caledonia.

*Remarks.*—Not mentioned by Franc (1957). This species was described from a single individual without precise locality data and may be based on a mislabeled shell from another archipelago or a juvenile of one of the other New Caledonian species.

Family **Camaenidae**

Genus *Draparnaudia* Montrouzier, 1859

*Type species.*—*Draparnaudia michaudi* Montrouzier, 1859 (monotypic).

*Remarks.*—The uncertainty of the systematic position of this genus has been fully discussed (Solem, 1959, pp. 120–121). Only dissection of the soft parts can determine whether it is a camaenid, a bulimulid, or a tornatellinid.

*Draparnaudia singularis* (Pfeiffer), 1854

*Helix singularis* Pfeiffer, 1854, *Conch. Icon.*, *Helix*, pl. 200, fig. 1407a, b.


*Draparnaudia michaudi* Montrouzier, 1859


*Type locality.*—New Caledonia (*sinistrorsa* and *michaudi*).

*Remarks.*—Pilsbry (1901–1902, p. 16) recognized Montrouzier’s variety “B” under the name *castaneofasciata*. This large shell from Art Island has a broad chestnut band at the periphery of the body. If the population deserves nomenclatural recognition, the name should date from Pilsbry’s usage. There is another unnamed variety on Lifu (see Pilsbry, op. cit., p. 283), but I do not choose to give it nomenclatural status.
**Draparnaudia gassiesi gassiesi** Pilsbry, 1902

*Bulimus turgidulus* Gassies, 1871 (not Deshayes, 1864), Faune Conchy., 2: 188–189; Gassies, 1873, Jour. de Conchy., 21: 49, pl. 2, fig. 4.


*Draparnaudia turgidulus* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 163, pl. 21, fig. 217.

*Type locality.*—Nou Island, New Caledonia.

**Draparnaudia gassiesi microumbilicata** Solem, 1960

*Type locality.*—River drift at seacoast a few miles from Bourail, New Caledonia.

**Draparnaudia crossei** Pilsbry, 1901


*Type locality.*—New Caledonia.

*Remarks.*—Specimens in the American Museum of Natural History from Uvea, Loyalty Islands, provide the first definite locality record. They were compared with the holotype and three paratypes (ANSP 31520).

**Draparnaudia lifuana** Pilsbry, 1901

*Bulimus theobaldianus* Gassies, 1870 (not Benson, 1857), Jour. de Conchy., 18: 143; Gassies, 1871, Faune Conchy., 2: 93, pl. 3, fig. 9.


*Type locality.*—Lifu, Loyalty Islands.

**Bradybaenidae**

**Bradybaena similaris** (Ferussac), 1821

*Helix similaris* Ferussac, 1821, Tabl. Syst. Limacons, 3: 47.

*Bradybaena similaris* (Ferussac), Franc, 1957, Moll. Néo-Caledonien, p. 165, pl. 21, fig. 221.

*Type locality.*—Timor.

*Remarks.*—One of the most widely distributed culture snails.
Family HELICIDAE

Helix (Cryptomphalus) aspersa Müller, 1774

Helix aspersa Müller, 1774, Hist. Vermium, 2: 59.
Helix (Cryptomphalus) aspersa (Müller), Franc, 1957, Moll. Néo-Caledonien, p. 165.

Type locality.—Italy.
Remarks.—A European snail introduced to serve as food.

Family PARYPHANTIDAE (= Rhytididae)

The paryphantids are one of the dominant land snail taxa of Australia, New Zealand, New Caledonia, and South Africa. Solem (1959, pp. 147-151) reviewed their distribution and classification.

Three groups of paryphantids can be recognized in the New Caledonian fauna:

1. Diplomphalus-Microphyura, which is without known extra-limital relatives.
2. Ptychorhytida, which shows New Zealand and Australian affinities.
3. Ouagapia, possibly a polyphyletic category, with species in the New Hebrides, Fijis, Tonga, Samoa, Solomon Islands, Bismareks, New Guinea, and northern Queensland.

Franc (1957, pp. 174-175) placed two minute species in a fourth genus, Macrocylindus. The soft parts of both species are unknown. True Macrocylindus is several times their size, has uniform coloration of greasy white, and lacks the fine spiral sculpture characteristic of the New Caledonian species. Until the latter have been dissected, they cannot be classified even to family level with any degree of assurance. They are listed below as Pulmonata incertae sedis.

In color, form, and macrosculpture, many paryphantids (carnivorous) and endodontids (herbivorous) are strikingly similar. Several shells described as belonging to one family have, upon study of the soft parts, been shown to belong to the other. Examination of the microsculpture of all available New Caledonian material showed that there is apparently one constant conchological difference between the two families. The Paryphantidae never have radial microriblets present between the macroribs, while all endodontids show at least traces of the radial microsculpture, with the obvious exception of taxa such as Platyrhytida, where all sculpture is secondarily lost.
The absence of any microradial sculpture has caused me to transfer *Helix kanakina* Gassies, 1866, *Charopa marionae* Preston, 1907, *Helix inculta* Gassies, 1874, *Charopa gassiesiana* Preston, 1907, and probably *C. vicina* Preston, 1907, from the Endodontidae to the Paryphantidae.

*Diplomphalus* and *Microphyura* are here left as separate genera, although dissection may result in their being synonymized. Franc (1957, pp. 166–174) followed Thiele (1931, p. 724) in uniting *Ouagapia* and *Ptychorhytida* into one genus. I have referred *Ptychorhytida* to the New Zealand–Australian *Rhytida*, while *Ouagapia* is left as a distinct genus.

Genus **RHYTIDA** Albers, 1860

*Type species.*—*Helix greenwoodi* Gray, 1850 (original designation).

*Remarks.*—Few species have had the animals dissected and classification must be based entirely on shell characters. I indicated (1959, p. 157) that the New Caledonian species seemed most closely related to some east Australian forms. More detailed study of the New Caledonian species has suggested that parallel evolution may have occurred in the two areas. The adaptive radiation in New Caledonia (fig. 14) has the same range in shell morphology as that which can be traced in Australia from Tasmania north to Queensland. The New Caledonian species in some features more closely approach Australian, in others New Zealand, forms. Without dissection of the animals, no exact classification can be established. Temporarily, I am placing all the New Caledonian species in *Ptychorhytida* and considering it to be a subgenus of *Rhytida*.

Subgenus **Ptychorhytida** Moellendorff, 1903

*Type species.*—*Helix beraudi* Gassies, 1858 (original designation).

*Remarks.*—The New Zealand *Rhytida* (sens. str.) differ in having the radial ribs of the spire anastomosing and becoming rugose to pitted on the body whorl and base. The various conchological variations outlined below in New Caledonian species find their parallels in Australian species groups for which Iredale has provided generic names. The phyletic or convergent nature of the similarities can be determined only by dissections. The sequence in the New Caledonian species is so nearly continuous, however, that I suspect convergent evolution rather than multiple introductions.
**NEW CALEDONIAN RHYTIDIDAE**

**GROUPS**

**OUAGAPIA**

radial sculpture
- on top
- on base

spiral sculpture
- aperture toothed

* only in *R. subsidialis*

**Fig. 14.** Classification of the New Caledonian Paryphantidae (=Rhytididae).
Perhaps four New Caledonian species groups can be recognized. Group I has the most generalized shell structure, with Groups II, III, and IV representing increasing specializations.

I. **GROUP OF Rhytida (Ptychorhytida) kanakina** (Gassies), 1866

Shell small; aperture large; untoothed; microsculpture of fine spiral lines; and strong radial ribs continuing into the umbilicus.

*Remarks.*—These species are usually placed in “Charopa” (= Andrefrancia), but the lack of microradial shell sculpture suggests that they are paryphantids. In shape and sculpture they correspond to the Tasmanian paryphantids that Iredale placed in Tasmaphena.

*Rhytida (Ptychorhytida) kanakina* (Gassies), 1866

*Helix kanakina* Gassies, 1866, Jour. de Conchy., 14: 49–50; Gassies, 1871, Faune Conchy., 2: 35–36, pl. 2, fig. 10.


*Charopa vicina* Preston, 1907, op. cit., (7), 19: 219, fig. 5.

*Charopa kanakina* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 119–120, pl. 12, figs. 155a (holotype of vicina), 155b (holotype of marionae), pl. 13, fig. 155.

*Charopa inculta* (Gassies), Franc, op. cit., p. 120, pl. 12, fig. 156 (?holotype of inculta).

*Type locality.*—Art Island, New Caledonia (*kanakina*), Baie du Sud, New Caledonia (*inculta*), and New Caledonia (*marionae* and *vicina*).

*Remarks.*—Franc (1957, p. 120) suggested that the type of *Helix inculta* in the British Museum was not the *inculta* of Gassies, but rather a mislabeled shell. His figured specimen is *R. kanakina* and the synonymization above is based on the labeled type. A paratype of *Charopa marionae* (UMMZ 138293) cannot be separated from *R. kanakina*.

*Rhytida (Ptychorhytida) candeloti* (Crosse and Marie), 1868

*Helix candeloti* Crosse and Marie, 1868, Jour. de Conchy., 16: 148–149, pl. 8, fig. 2.

*Ouagapia (Ouagapia) candeloti* (Crosse and Marie), Franc, 1957, Moll. Néo-Caledonien, p. 168, pl. 21, fig. 223 (holotype of candeloti).

*Type locality.*—Mount Mou, New Caledonia.
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Incertae sedis

Charopa gassiesiana Preston, 1907


_Type locality._—New Caledonia.

_Remarks._—The photograph of the holotype (Franc, 1957, p. 12, fig. 152) suggests that this name is based on a juvenile specimen of one of the heavily sculptured _Ptychorhytida_. Without direct examination of the type, reference to a particular species is impossible. It is listed as a doubtful relative of the _kanakina_ complex.

II. **GROUP OF Rhytida (Ptychorhytida) beraudi** (Gassies), 1858

Shell medium- to large-sized; radial ribs prominent (_beraudi_ and _ferrieziana_) or produced into irregular sinuous lamellae (_berneiri_) and continuing into the umbilicus; a few heavy spiral lines (absent in _berneiri_) superimposed on the fine spiral microsculpture.

_Remarks._—_R. berneiri_ represents an extreme modification but is most similar to the other included species. The three species are much larger than those in Group I and are intermediate in characters between the Tasmanian _Tasmaphena_ and the east Australian _Strangesta_.

*Rhytida (Ptychorhytida) beraudi* (Gassies), 1858

*Helix beraudi* Gassies, 1858, Jour. de Conchy., 7: 68–69; Gassies, 1863, Faune Conchy., 1: 33–34, pl. 1, fig. 18.


_Type locality._—Balade, New Caledonia.

*Rhytida (Ptychorhytida) ferrieziana* (Crosse), 1868

*Helix ferrieziana* Crosse, 1868, Jour. de Conchy., 16: 278–279; Crosse, 1869, op. cit., 17: 27–28, pl. 1, fig. 4.


_Type locality._—Baie du Sud, New Caledonia.

*Rhytida (Ptychorhytida) berneiri* Dautzenberg, 1901

_Rhytida berneiri_ Dautzenberg, 1901, Jour. de Conchy., 49: 299–301, pl. 8, figs. 1–3.
Ouagapia (Ouagapia) berneiri (Dautzenberg), Franc, 1957, Moll. Néo-Calédonien, pp. 167–168, pl. 21, fig. 222 (holotype of berneiri).

Type locality.—Houailou, New Caledonia.

III. Group of Rhytida (Ptychorhytida) testudinaria (Gassies), 1859

Shell large; aperture toothless; radial ribs absent from below periphery of body whorl; prominent regular heavy spiral lines in addition to the fine microsculpture; and color variegated.

Remarks.—The heavy spiral lines and reduced radial sculpture are also characteristic of the east Australian group that Iredale called Echotrida. In R. subsidialis the radials above the periphery of the body whorl are reduced in prominence, thus approaching Group IV in sculpture.

*Rhytida (Ptychorhytida) testudinaria* (Gassies), 1859

*Helix testudinaria* Gassies, 1859, Jour. de Conchy., 7: 368–369; Gassies, 1863, Faune Conchy., 1: 30, pl. 1, fig. 14.

*Helix paulucciae* Crosse, 1868, Jour. de Conchy., 16: 154–157, pl. 8, fig. 4.

*Helix coguiensis* Crosse, 1872, op. cit., 20: 69–70, 148–151, pl. 7, fig. 5.

*Ouagapia (Ptychorhytida) testudinaria* (Gassies), Franc, 1957, Moll. Néo-Calédonien, pp. 171–172, pl. 22, fig. 228 (holotype of paulucciae).

Type locality.—Forests of Balade, New Caledonia (testudinaria), Mount Mou, New Caledonia (paulucciae), and Mount Cogui, Baie du Sud, New Caledonia (coguiensis).

*Rhytida (Ptychorhytida) inaequalis* (Pfeiffer), 1854

*Helix inaequalis* Pfeiffer, 1854, Conch. Icon., Helix, pl. 198, fig. 1394.


*Ouagapia (Ouagapia) inaequalis* (Pfeiffer), Franc, 1957, Moll. Néo-Calédonien, p. 169, pl. 21, fig. 225.

Type locality.—Isle of Pines, New Caledonia (inaequalis), forests of New Caledonia (fischeri), and Kanala, New Caledonia (deplanchei).

*Rhytida (Ptychorhytida) subsidialis* (Crosse), 1870


Type locality.—Vicinity of Mount Mou, New Caledonia.
IV. GROUP OF Rhytida (Ptychorhytida) aulacospira (Pfeiffer), 1846

Radial ribs almost completely lost; impressed spiral lines very prominent; umbilicus moderately open; color usually flammulated.

Remarks.—The east Australian Murphitella is comparable in sculpture, although differing in size. R. aulacospira has a narrow umbilicus and is clearly related to the other Ptychorhytida, but R. lamberti with its wide umbilicus approaches Ouagapia opaoana in form.

*Rhytida (Ptychorhytida) aulacospira* (Pfeiffer), 1846


*Helix luteolina* Gassies, 1863, Faune Conchy., 1: 35–36, pl. 5, fig. 7.

*Helix ouveana* Souverbie, 1869, Jour. de Conchy., 17: 416; Souverbie, 1870, op. cit., 18: 82–83, pl. 9, fig. 1 (bad); Gassies, 1871, Faune Conchy., 2: 32–33, pl. 2, fig. 4.

*Helix deplanchesi* Gassies, 1870, Jour. de Conchy., 18: 141; Gassies, 1871, Faune Conchy., 2: 37–38, pl. 3, fig. 3.


*Type locality.*—Unknown (aulacospira), New Caledonia (*multisulcata*), Isle of Pines, New Caledonia (*luteolina*), Ouvea, Loyalty Islands (*ouveana*), Lifu, Loyalty Islands (*deplanchesi*), model farm near Yahoue, New Caledonia (*yahouensis*).

Remarks.—The holotype of *Helix aulacospira* is refigured in Solem (1959, pl. 10, figs. 10–12).

**Rhytida (Ptychorhytida) lamberti** (Gassies), 1871


*Type locality.*—Conception, near Noumea, New Caledonia.

Remarks.—The only specimen seen (CNHM 37013) is a widely umbilicated relative of *R. aulacospira*. Franc (1957, p. 169) mentioned a carina in the umbilicus, which suggests *Ouagapia*. Further study is needed.
Genus **OUAGAPIA** Crosse, 1894

*Type species.—* *Helix raynali* Gassies, 1863 (monotype).

*Remarks.*—Several species diverse in both sculpture and size are lumped together under *Ouagapia*. The genotype, *O. raynali*, is the largest (39 mm.) and most specialized species. It has lost the radial ribs completely and has a microsculpture of very fine, impressed spiral lines. *O. villandrei* Gassies from San Christoval in the Solomons has no fine spiral sculpture and has modified radial ribbing. The ribs are prominent on the upper portion of the shell and in the umbilicus, but are absent from the lower half of the body whorl. The unribbed portion of this relatively large species (28 mm.) has a few short, irregular, impressed spiral lines.

Most members of the genus (see Solem, 1959, pp. 159–160) are small (5–8 mm.), with strong radial ribs above the periphery of the body whorl, strong, impressed spiral lines below, and an umbilical ridge. The Polynesian and Melanesian species are relatively simple, but in New Guinea, the Bismarcks, and northern Queensland there are species with a prominent carina on the periphery of the body whorl, a more pronounced umbilical keel, and variously modified surface sculpture. The generic name *Torresiropa* Iredale, 1933, is available for the carinate series and probably could be extended to cover the Polynesian–Melanesian species. Without studying the soft parts of the various species, little would be gained by guessing as to affinities. *O. raynali* has many similarities to the east Australian *Murphitella*. Pending examination of the soft parts *Ouagapia* is left as a single unit.

*Ouagapia raynali* (Gassies), 1863

*Helix raynaldi* (sic) Gassies, 1863, Faune Conchy., 1: 34–35, pl. 5, fig. 6—a misspelling corrected to *raynali* by Gassies (1863, p. 332).

*Ouagapia* (*Ouagapia*) *raynali* (Gassies), Franc, 1957, Moll. Néo-Caledonien, p. 168, pl. 21, fig. 224.

*Type locality.*—Near Port-de-France, New Caledonia.

*Ouagapia opaoana* (Gassies), 1867

*Helix opaoana* Gassies, 1867, Jour. de Conchy., 15: 61; Gassies, 1871, Faune Conchy., 2: 40, pl. 1, fig. 6.


*Type locality.*—Art Island, New Caledonia.
**Ouagapia rufotincta** (Gassies), 1874


*Type locality.*—Bourail, New Caledonia.

**ERRONEOUS LOCALITY**

**Ouagapia villandrei** (Gassies), 1865

_Helix villandrei_ Gassies, 1865, Jour. de Conchy., 13: 210; Gassies, 1868, op. cit., 16: 271-272, pl. 9, fig. 3.

*Type locality.*—Interior of New Caledonia (error).

*Remarks.*—This species was found subsequently on San Cristo-val Island in the Solomons (see Clapp, 1923).

Genus **DIPLOMOPHALUS** Crosse and Fischer, 1873

*Type species.*—_Helix cabriti_ Gassies, 1863 (original designation).

*Remarks.*—Fischer (1873) showed that the type species had paryphantid dentition, but no other member of the genus has been dissected. The species are conchologically characterized by their concave spire, narrow whorls, and sculpture of incised spiral lines crossing heavy radial ribs. With the assumption that heavy sculpture and a helicoid or planulate shell are primitive characters, the species of _DiplomPhalus_ can be grouped into three series representing increasing specializations. The name _Pseudomphalus_ Ancey (1882, p. 86)\(^1\) is available for Group III but that group is not considered to be strongly enough characterized to warrant taxonomic recognition.

I. **GROUP OF DiplomPhalus mariei** (Crosse), 1867

Apex and umbilicus only slightly depressed; body whorl keeled at peripheries but only slightly inflated; size 4.5 to 6.5 mm.; radial ribs prominent.

**DiplomPhalus mariei** (Crosse), 1867

_Helix mariei_ Crosse, 1867, Jour. de Conchy., 15: 211, 312-315, pl. 11, fig. 1.

_DiplomPhalus mariei_ (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 178, pl. 23, fig. 236.

*Type locality.*—Koe, New Caledonia.

\(^1\)Type species, _Helix fabrei_ Crosse, 1875 (subsequent designation of Zilch, 1960, p. 551).
*Diplomphalus vaysseti* (Marie), 1871  
*Helix vaysseti* Marie, 1871, Jour. de Conchy., **19**: 325–328.  
*Diplomphalus vaysseti* (Marie), Crosse, 1874, op. cit., **22**: 388, pl. 12, fig. 2; Franc, 1957, Moll. Néo-Caledonien, pp. 177–178, pl. 22, fig. 235.  
*Type locality.*—In the mountains at Cape Colnett, New Caledonia.

*Diplomphalus seberti* (Marie), 1881  
*Diplomphalus seberti* (Marie), Crosse, 1894, op. cit., **42**: 177, pl. 8, fig. 1; Franc, 1957, Moll. Néo-Caledonien, p. 177, pl. 23, fig. 234a–c.  
*Type locality.*—Kanala, New Caledonia.

*Diplomphalus fischeri* Franc, 1953  
*Type locality.*—New Caledonia.

II. **Group of Diplomphalus montrouzieri** (Souverbie), 1858  
Apex and umbilicus moderately depressed; body whorl keeled at peripheries and relatively inflated; diameter 7 to 8.5 mm.; radial ribs more numerous and much finer.

*Diplomphalus montrouzieri* (Souverbie), 1858  
*Helix montrouzieri* Souverbie, 1858, Jour. de Conchy., **7**: 63–65, 296, pl. 8, fig. 7.  
*Diplomphalus montrouzieri* (Souverbie), Franc, 1957, Moll. Néo-Caledonien, p. 177.  
*Type locality.*—Art Island, New Caledonia.

*Diplomphalus cabriti* Gassies, 1863  
*Helix volutella* Gassies, 1858 (not Pfeiffer, 1856), Jour. de Conchy., **7**: 70–71.  
*Helix cabriti* Gassies, 1863, Faune Conchy., **1**: 21–22, pl. 1, fig. 4.  
*Diplomphalus cabriti* (Gassies), Franc, 1957, Moll. Néo-Caledonien, pp. 176–177, pl. 23, fig. 233a–b (holotype of *cabriti*).  
*Type locality.*—Balade, New Caledonia.

III. **Group of Diplomphalus megei** (Lambert), 1873  
Apex partially covered by overlap of body whorl and umbilicus very concave; body whorl rounded at periphery and greatly inflated; diameter 7 to 16 mm.; radial ribs reduced to fine lines.
*Diplomphalus megei* (Lambert), 1873

*Diplomphalus fabrei* Crosse, 1875, op. cit., 23: 136–138, pl. 6, fig. 1.

_Type locality._—Baie du Sud, New Caledonia (*megei and fabrei*).

Genus **MICROPHYURA** Ancey, 1882

_Type species._—*Helix microphis* Crosse, 1868.

**Remarks.**—None of the species has been dissected. All are minute (2 to 3.5 mm.), planulate, with narrow whorls, radially ribbed or smooth, with incised spiral lines, and the lip thickened with internal apertural lamellae. The heavily ribbed species are miniatures of Group I *Diplomphalus*, but the smoother species are very similar to the endodontid genus *Stenopylis* (see Solem, 1957) in shape and lip formation. The details of whorl increment, sculpture, and apertural dentition are quite different and the similarities are almost certainly convergent. Anatomical studies may result in placing *Microphyura* as a subgenus of *Diplomphalus*.

*Microphyura microphis* (Crosse), 1868

*Helix microphis* Crosse, 1868, Jour. de Conchy., 16: 91–92, pl. 1, fig. 3.
*Microphyura microphis* (Crosse), Franc, 1957, Moll. Néo-Caledonien, pp. 179–180, pl. 34, fig. 238a–d (holotype of microphis).

_Type locality._—Under dead moist leaves in woods near Noumea, New Caledonia.

*Microphyura jeanneneyi* (Dupuy), 1894


_Type locality._—Under plant litter in woods at Baie du Sud, New Caledonia (gravei) and Teremba, New Caledonia (*jeanneneyi*).

**Remarks.**—The present rules of nomenclature date the morph *gravei* from Crosse, 1896, and thus the often synonymized name *jeanneneyi* must be used for this species.
*Microphyura cornea* Franc, 1953

*Microphyura cornea* Franc, 1953, Jour. de Conchy., 93: 84–85, fig. 1; Franc, 1957, Moll. Néo-Caledonien, p. 181, pl. 24, fig. 240a–c (holotype of *cornea*).

*Type locality.*—New Caledonia.

*Microphyura denisi* Franc, 1953

*Microphyura denisi* Franc, 1953, Jour. de Conchy., 93: 85–86, fig. 2; Franc, 1957, Moll. Néo-Caledonien, pp. 181–182, pl. 24, fig. 241a–c (holotype of *denisi*).

*Type locality.*—New Caledonia.

**Pulmonata incertae sedis**

The following named forms, described from empty shells, cannot be placed in any family category with assurance. Known only from the type lots, often single specimens, their identity and taxonomic position are uncertain. None was seen during this study and the smooth, featureless shells provide few clues as to their correct classification. Rather than continue guessing, I have simply listed them as problematic forms pending examination of the types or collection of new material.

They are listed under their original generic name.

**Helix lalannei** Gassies, 1869

*Helix lalannei* Gassies, 1869, Jour. de Conchy., 17: 71; Gassies, 1871, Faune Conchy., 2: 49–50, pl. 2, fig. 6.


*Type locality.*—Art Island, New Caledonia.

**Helix alleryana** Crosse, 1869

*Helix alleryana* Crosse, 1869, Jour. de Conchy., 17: 414; Crosse, 1874, op. cit., 22: 99–100, pl. 3, fig. 5.

*Microcystis alleryana* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 145, pl. 17, fig. 187 (holotype of *alleryana*).

*Type locality.*—Mount Mou, New Caledonia.

*Remarks.*—The smooth apical whorls and longitudinal striations suggest the Endodontidae or Paryphantidae rather than the limacoid taxa. Study of the microsculpture might provide a clue to the relationships.
Helix conceptionensis Gassies, 1871


**Type locality.**—Conception, near Noumea, New Caledonia.

**Remarks.**—Based on a single individual, this form has not been rediscovered and the location of the type is unknown. It was not listed by Franc (1957).

Zonites subnitens (Gassies), 1872


**Type locality.**—Bourail, New Caledonia.

Zonites hamelianus Crosse, 1874


*Macrocycloides hamelianus* (Crosse), Franc, 1957, Moll. Néo-Caledonien, p. 174, pl. 23, fig. 231 (holotype of *hamelianus*).

**Type locality.**—Baie du Sud, New Caledonia.

**DISCUSSION**

Careful systematic revisions of the New Caledonian *Pleuropoma, Physastra, Aneitea,* and *Placostylus* would probably reduce the 225 named forms listed above to about 160 or 170 valid species, eighteen of which were introduced by human agency. For purposes of discussion, it would be more realistic to assume that there are 6 (instead of 16) *Pleuropoma,* 2 (instead of 15) *Physastra,* 3 (instead of 8) *Aneitea,* and 20 (instead of 36) *Placostylus* actually found in New Caledonia.

If we use these figures, and ignore *Truncatella* and the few named forms listed under *incertae sedis,* the New Caledonian fauna will contain 11 fresh-water species, 23 land prosobranchs, 20 native bulimulids, 49 endemic endodontids, 24 paryphantids, 19 miscellaneous endemic pulmonates and 18 introduced pulmonates—a total of 164 species.

Of the non-introduced land species, 135 in number, 93 (69 per cent) belong to the Bulimulidae, Paryphantidae, or Endodontidae. Most of the remainder, 23 (17 per cent), are land prosobranchs, with only 19 (14 per cent) belonging to other pulmonate families. Com-
pared with the fauna of the New Hebrides (see Solem, 1959, pp. 204–211) this is a very limited and restricted one. Its character is basically the same as that of New Zealand and to a lesser extent Australia, although the degree of endemism, as in the New Hebrides, is exceedingly high. Except for *Draparnaudia singularis*, which is also found in the New Hebrides (Solem, 1959, p. 122) and the fresh-water *Gyraulus* and *Physastra* (op. cit., pp. 163, 164), the New Caledonian species are all either endemic or so widely distributed that introduction by human agency is either strongly suspected or proven.

The very high degree of insular endemism among Pacific land snails is probably due to the long isolation of the faunas, since the overall patterns of distribution (op. cit., pp. 320–329) suggest definite dispersal waves.
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