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Shallow water turrids of Ile des Pins, New Caledonia (Mollusca, Gastropoda)

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Abstract: The marine malacofauna of New Caledonia is among the most studied and best known of the Indo-Pacific region. Previous studies have shown that its richness and species compositions are examples of extreme spatial heterogeneity. Turrids are among the richest and most diverse groups of marine gastropods. In the present paper the shallow-water turrid fauna of Ile des Pins is inventoried for the first time. 174 morphotypes hosted in 8 families are herein recorded, of which 22 species are considered new records for New Caledonia. The following new combinations were introduced: *Mitromorpha drivasi* (Chang, 1995), *Acrista nana* (Hervier, 1896), *Acrista latirella* (Melvill & Standen, 1896), *Acrista pusilla* (Dunker, 1871), *Acrista tuberculifera* (Hervier, 1896), *Hemilienardia idiomorpha* (Hervier, 1897), *Heterocithara diatula* (Hervier, 1897), *Heterocithara isophanes* (Hervier, 1897), and *Pseudorhaphitoma hervieri* Hedley, 1922.

Keywords: New Caledonia - inventory - Drilliidae - Pseudomelatomidae - Horaiclavidae - Turridae - Mitromorphidae - Clathurellidae - Raphitomidae - Mangeliidae.

INTRODUCTION

The turrids (s.l.), consist of a set of families previously classified in the family Turridae (Powell, 1966). Following a large phylogenetic study, Puillandre *et al.* (2011) assigned species of this family into 13 distinct families. Despite this improvement in higher level taxonomy, a considerable proportion of turrids have never been authoritatively reported since their original description. As a result, many species have never been assigned to modern genera.

In addition to the taxonomic problems, almost nothing is known about regional diversity of turrids and the differences in faunal assemblages of different regions. An exception might be New Caledonia (including the Loyalty Islands), which is the type locality of many turrid species and which has witnessed a number of incomparable marine sampling expeditions performed by the MNHN to Koumac, Touho, and Lifou. Based on these expeditions, a total of 504 turrid morphotypes were recorded, of which 231 were identified to species level (Bouchet in Payri & Richer de Forges, 2007). A study of recently published taxonomic literature demonstrated that at least 25 additional species have been described subsequently from New Caledonia (Fedosov & Puillandre, 2012; Kilburn *et al.*, 2014; Morassi *et al.*, 2017; Fedosov *et al.*, 2017; Kantor *et al.*, 2017; Fedosov & Puillandre, 2020).

A comparison of the turrid species composition of these three sites has revealed a very high level of heterogeneity between sites, with only 21% of species overlap (Philippe Bouchet, unpublished pers. communication). Since the previously sampled areas are in the northern part of New Caledonia (Koumac and Touho) and the Loyalty Islands, the aim of the present paper is the documentation of the shallow-water turrid fauna of the southernmost part of New Caledonia, the Isle des Pins.

MATERIALS AND METHODS

Sand grit was collected in preferential spots such as overhangs, caves and tunnels where specimens tend to accumulate. Sampled material was washed in fresh water, dried in thin mesh bags and sieved into different fractions (<1 mm, 1-2.5 mm, 2.5-5 mm, 5 mm-1 cm and >1 cm). Approximately 20 kg of material was collected at Ile des Pins, among which half (the fractions larger than 5 mm and smaller than 1 mm) were sorted on site. Remaining material was sorted mostly under a dissecting microscope at MHNG. When needed, the specimens have been cleaned with mounted needles and/or ultrasonic apparatus. The seldomly live collected specimens were preserved in 90% ethanol.

All dives were organized through the Kunié Diving resort at regular dive localities. Due to poor weather

conditions, sites were determined by vessel operators based on their accessibility, and therefore were limited to the most protected and closest dive spots from the resort harbour. All diving stations data (dates, collector names, minimum and maximum depth, precise GPS positions, habitats and eventual additional notes) were consistently recorded.

A six day collection trip in February 2019 sampled 11 stations across 8 sites ranging from a depth of 0.5-27 m. See Annex 1 for stations map and Annex 2 for stations GPS positions.

Specimen images were captured through a Canon 90D with an MP-E 65 mm 1-5x lens mounted on a stack shot rail. Raw images were then stacked with Zerene stacker and final editing was completed in GIMP.

Specimen identifications were based on original descriptions, comparisons with type material, or with well documented specimen vouchers. Type material specimens, type pictures or voucher specimens were obtained from MNHN, MHNbX, ANSP, NHMUK, AMS, NSMT, and from the late Dr Richard Kilburn. Each specimen was directly compared with illustrated morphotypes from an unpublished catalogue of samplings from Koumac, Touho and Lifou (unpublished data, MNHN), in order to complete the southern New Caledonian faunal list presented here.

The classification of conoideans adapted by Bouchet *et al.* (2011) is followed. Generic assignments were generally followed from accepted opinions in WoRMS (2022), in a few cases, the introduction of new combination was necessary. Plates are arranged by species morphology with similar characteristics prevailing over alphabetic order.

The qualifier “aff.”, meaning “species affinis” is used for morphospecies that are clearly distinguishable but close to known taxa. The appendix “cf.” meaning “confer” is used in cases where morphospecies might be conspecific with known species but some doubts remain.

If obsolete geographical names and measure units are given in the type locality, modern references are provided in square brackets “[]”.

Abbreviations

AMS	Australian Museum of Sydney
ANSP	Academy of Natural Sciences of Philadelphia
idp	Ile des Pins
MHNbX	Muséum d'Histoire Naturelle de Bordeaux
MHNG	Muséum d'Histoire Naturelle de Genève
MNHN	Muséum National d'Histoire Naturelle, Paris
NHMUK	Natural History Museum, London
NSMT	National Museum of Nature and Science (Japan)

RESULTS

In total, 2252 turrid specimens (or identifiable parts of specimens) were segregated into 174 morphotypes in 8 families. With 72 species, the family Raphitomidae was found to be the most diverse, while Pseudomelatomidae was the least diverse turrid family with only a single recorded species.

From those 174 morphotypes, 102 were recognized as described species, 35 were only assigned to genus level and are presumed to be new to science while the other 37 remaining morphotypes are similar to described species but are too poor in quality or represented by too few specimens to be sure. 46 morphotypes were represented by only a single specimen and 34 by two specimens, respectively, demonstrating that our sampling is far away from saturation, and that rare species make up an important part of the local turrid diversity. In contrast, *Anarithma metula* (though, it might represent a species complex) was represented by a total of 218 specimens. *Microdaphne morrisoni* and *Heterocithara strombillum*, secondarily were represented by more than 150 specimens each and were found at all stations sampled.

A comparison of the morphotypes found at Ile des Pins with those collected during the expeditions to Touho, Koumac and Lifou (MNHN unpublished catalogue of the New Caledonian turrid morphotypes), revealed that a total of 28 morphotypes were exclusively collected at Ile des Pins. However, since 6 species out of these 28 morphotypes were originally described from New Caledonia, 22 species are considered new records for New Caledonia. An additional 21 species would require a close examination and comparison to specimens collected at the other sites in order to confirm whether they are conspecific or not.

In the following list most morphotypes identified to genus level only have a number after “sp.” These numbers do not refer a numbering of unidentified morphotypes found in the present work, but to an unpublished, temporary numbering system of all species used by the authors in their research. Additionally, specimens demarcated with proceeding letters indicate strong affinities to the numerical distinctions.

Family Drilliidae Olsson, 1964

12 morphotypes

Genus *Clavus* Montfort, 1810

Type species: *Clavus flammulatus* Montfort, 1810 (type by original designation). Type locality: unknown.

Clavus bilineatus (Reeve, 1845)

Plate 1, fig. 1

Pleurotoma bilineata Reeve, 1845.

Type locality: 15 fm [27 m], Capul and Mindoro Islands, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3.2, idp6.

***Clavus formosus* (Reeve, 1846)**

Plate 1, fig. 5

Pleurotoma formosa Reeve, 1846.

Type locality: Capul Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp6.

***Clavus lamberti* (Montrouzier, 1860)**

Plate 1, fig. 2

Pleurotoma lamberti Montrouzier, 1860.

Type locality: Art Island, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp5, idp6, idp7, idp8.

***Clavus* aff. *lamberti* (Montrouzier, 1860)**

Plate 1, fig. 3

Material examined: New Caledonia, Ile des Pins: st. idp1.

Remarks: Known from a single worn specimen, which is similar to *Clavus lamberti*, but differs in having fewer axial ribs. This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Clavus moquinianus* (Montrouzier, 1874)**

Plate 1, fig. 9

Pleurotoma moquiniana Montrouzier in Souverbie & Montrouzier, 1874.

Type locality: Art Island, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp5, idp6, idp7.

Remarks: That species was not recorded in the unpublished MNHN catalogue of morphotypes, but was originally described from New Caledonia and is recorded from New Caledonia in Kilburn *et al.* (2014).

***Clavus pica* Reeve, 1843**

Plate 1, fig. 7

Pleurotoma pica Reeve, 1843.

Type locality: Capul Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp5.2.

***Clavus picoides* Kilburn, Fedosov & Kantor, 2014**

Plate 1, fig. 8

Clavus picoides Kilburn, Fedosov & Kantor, 2014.

Type locality: Stn. 1352, 22°22.2'S, 166°16.0-166°16.1'E; 27-35 m, Grand Récif Aboré outer slope, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp3.2, idp5.2.

***Clavus virginiae* Kilburn, Fedosov & Kantor, 2014**

Plate 1, fig. 4

Clavus virginiae Kilburn, Fedosov & Kantor, 2014.

Type locality: Stn. 1455, 20°56.8'S, 167°02.7'E; 15-20 m, Baie du Santal, between Cap Wekutr and Cap Wajez, Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp5, idp5.2, idp6, idp7.

Genus *Iredalea* Oliver, 1915

Type species: *Iredalea subtropicalis* W. R. B. Oliver, 1915 (type by original designation). Type locality: Sunday Island [Raoul Island], Kermadec Islands.

***Iredalea balteata* (Gould, 1860)**

Plate 1, fig. 11

Columbella (Anachis) *balteata* Gould, 1860.

Type locality: China Sea.

Material examined: New Caledonia, Ile des Pins: st. idp3, idp4.

***Iredalea* cf. *balteata* (Gould, 1860)**

Plate 1, fig. 12

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

Remarks: The specimens differ from typical *Iredalea balteata* in having more prominent nodule-like axial ribs and two rows of white spots on the brown band below periphery. More research is necessary to determine whether this is a case of polymorphism within one species, or if there is justification for a more speciose complex.

***Iredalea inclinata* (Sowerby III, 1893)**

Plate 1, fig. 6

Pleurotoma inclinata G. B. Sowerby III, 1893.**Type locality:** Mauritius.**Material examined:** New Caledonia, Ile des Pins: st. idp5, idp6, idp7.**Genus *Plagiostropha* Melvill, 1927****Type species:** *Plagiostropha quintuplex* Melvill, 1927 (type by monotypy). Type locality: unknown.***Plagiostropha* sp.**

Plate 1, fig. 10

Material examined: New Caledonia, Ile des Pins: st. idp7.**Family Pseudomelatomidae J. P. E. Morrison, 1966**

1 morphotype.

Genus *Crassispira* Swainson, 1840**Type species:** *Pleurotoma bottae* Valenciennes in Kiener, 1839 accepted as *Crassispira bottae* (Valenciennes in Kiener, 1839) (type by subsequent designation). Type locality: Mazatlán, M. Botta.***Crassispira scala* Kantor *et al.*, 2017**

Plate 2, fig. 13

Crassispira scala Kantor, Stahlschmidt, Aznar-Cormano, Bouchet & Puillandre, 2017.**Type locality:** st. PR159, 05°07.1'S, 145°49.4'E; 15 m, N. Wonad I., Madang Lagoon, Papua-New Guinea.**Material examined:** New Caledonia, Ile des Pins: st. idp5, idp5.2, idp6.**Family Horaiclavidae Bouchet *et al.*, 2011**

15 morphotypes.

Genus *Anacithara* Hedley, 1922**Type species:** *Mangelia naufraga* Hedley, 1909 accepted as *Anacithara naufraga* (Hedley, 1909) (type by original designation). Type locality: Hope Island, Queensland, Australia.***Anacithara* cf. *lita* (Melvill & Standen, 1896)**

Plate 2, fig. 23

Clathurella lita Melvill & Standen, 1896.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp7, idp8.**Remarks:** The present species is most probably conspecific with *Anacithara lita* (Melvill & Standen, 1896), but specimens with intact protoconchs are needed to be sure.***Anacithara* cf. *stricta* Hedley, 1922**

Plate 2, fig. 27

Anacithara stricta Hedley, 1922.**Type locality:** 17 to 20 fm. [31-37 m], Mast Head Island, Queensland, Australia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp5.2.**Remarks:** The present specimens appear to be *Anacithara stricta* Hedley, 1922. However, the type of the latter species is in such poor quality that fresh examples from the type locality are needed for comparison. This morphotype was not recorded among the specimens collected and documented by the unpublished MNHN catalogue of morphotypes.***Anacithara themeropsis* (Melvill & Standen, 1896)**

Plate 2, fig. 26

Drillia themeropsis Melvill & Standen, 1896.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2.***Anacithara conata* (Hedley, 1909)**

Plate 2, fig. 25

Mangelia naufraga var. *conata* Hedley, 1909.**Type locality:** Hope Island, Queensland, Australia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2.***Anacithara* sp.3**

Plate 2, fig. 24

Material examined: New Caledonia, Ile des Pins: st. idp5.2, idp6.

Genus *Carinapex* Dall, 1924

Type species: *Drillia minutissima* Garrett, 1873 (as a subgenus of *Daphnobela* Cossmann, 1896) accepted as *Carinapex minutissima* (Garrett, 1873) (type by original designation). Type locality: Viti Isles [Fiji].

***Carinapex amirowlandae* Wiedrick, 2015**

Plate 2, fig. 15

Carinapex amirowlandae Wiedrick, 2015.

Type locality: 100-250 m, North Central Punta Engano, Mactan Island, Cebu Province, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

***Carinapex chaneyi* Wiedrick, 2015**

Plate 2, fig. 17

Carinapex chaneyi Wiedrick, 2015.

Type locality: 8°39'S, 158°14'E; in rubble at 20-25 m off exposed side of Karunjou Island, off Marovo Lagoon, east side Vanguna Island, Solomon Islands.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp7.

Remarks: That species was erroneously identified as *Carinapex minutissima* in Bouchet *et al.* (2011).

***Carinapex minutissima* (Garrett, 1873)**

Plate 2, fig. 16

Drillia minutissima Garrett, 1873.

Type locality: Viti Isles [Fiji].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

Remarks: Based on the recent identification of *Carinapex chaneyi* (Wiedrick, 2015: 7) in Bouchet *et al.* (2011), *Carinapex minutissima* is here recognized from New Caledonia for the first time.

***Carinapex mooreorum* Wiedrick, 2015**

Plate 2, fig. 18

Carinapex mooreorum Wiedrick, 2015.

Type Locality: 19°55' 3.28"N, 155°53'26.38"W; in tide pool rubble at -0.3 m, "Anaeho" Omalu Point, Kona North District, Hawaii.

Material examined: New Caledonia, Ile des Pins: st. idp7.

***Carinapex philippinensis* Wiedrick, 2015**

Plate 2, fig. 14

Carinapex philippinensis Wiedrick, 2015.

Type locality: 11°29'0.12"N, 119°50'13.82"E; 150 m, Linapacan Island, Palawan Province, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp1.

Genus *Ceritoturris* Dall, 1924

Type species: *Crassispira bittium* Dall, 1924 accepted as *Ceritoturris bittium* (Dall, 1924) (type by original designation). Type locality: Hawaiian Islands.

***Ceritoturris papillosa* (Garrett, 1873)**

Plate 2, fig. 21

Drillia papillosa Garrett, 1873.

Type locality: Viti Isles [Fiji].

Material examined: New Caledonia, Ile des Pins: st. idp3, idp3.2, idp5, idp6, idp7, idp8.

***Ceritoturris theoteles* (Melvill & Standen, 1896)**

Plate 2, fig. 19

Mangilia (*Glyphostoma*) *theoteles* (Melvill & Standen, 1896).

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp5, idp5.2, idp7.

Remarks: *Carinapex cernohorskyi* Wiedrick, 2015 appears to be conspecific. *Carinapex theoteles* was described from the Loyalty Islands, but is recorded from Japan, French Polynesia, and Hawaii under the name *C. cernohorskyi* in Wiedrick (2015).

***Ceritoturris cf. theoteles* (Melvill & Standen, 1896)**

Plate 2, fig. 20

Material examined: New Caledonia, Ile des Pins: idp7.

Remarks: The present species is very similar to *Carinapex theoteles* but differs in the rounded and similar-sized nodules of both spirals while in *C. theoteles*, the nodules of the abapical spiral row are much bigger and vertically elongated.

***Ceritoturris* sp.1**

Plate 2, fig. 22

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7.

Genus *Graciliclava* Shuto, 1983

Type species: *Graciliclava mackayensis* Shuto, 1983 accepted as *Graciliclava costata* (Hedley, 1922) (type by original designation). Type locality: 20°52'S / 149°29'E, 35 m, E of Mackay, Queensland, Australia.

***Graciliclava costata* (Hedley, 1922)**

Plate 3, fig. 28

Clavus costatus Hedley, 1922.

Type locality: 12 fm [22 m], Darnley Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp3, idp5.2.

Family Turridae H. Adams & A. Adams, 1853 (1838)

8 morphotypes.

Genus *Iotyrriis* Medinskaya & Sysoev, 2001

Type species: *Iotyrriis marquesensis* Sysoev, 2002 (type by subsequent designation). Type locality: 9°44.6'S, 138°51.1'W; 115-120 m, Marquesas Islands, French Polynesia.

***Iotyrriis cingulifera* (Lamarck, 1822)**

Plate 3, fig. 36

Pleurotoma cingulifera Lamarck, 1822.

Type locality: unknown.

Material examined: New Caledonia, Ile des Pins: st. idp piscine.

Genus *Lophiotoma* T. L. Casey, 1904

Type species: *Pleurotoma tigrina* Lamarck, 1822 accepted as *Lophiotoma acuta* (Perry, 1811) (type by subsequent designation). Type locality: unknown.

***Lophiotoma* sp.**

Plate 3, fig. 29

Material examined: New Caledonia, Ile des Pins: st. idp2.

Genus *Turridrupa* Hedley, 1922

Type species: *Pleurotoma acutigemmata* E. A. Smith, 1877 accepted as *Turridrupa acutigemmata* (E. A. Smith, 1877) (type by original designation). Type locality: unknown.

***Turridrupa bijubata* (Reeve, 1843)**

Plate 3, fig. 33

Pleurotoma bijubata, Reeve, 1843.

Type locality: Under rocks, Bureas Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3, idp5, idp8.

***Turridrupa consobrina* Powell, 1967**

Plate 3, fig. 32

Turridrupa astricta consobrina Powell, 1967.

Type locality: 40-50 feet [12-15 m], Maalaea Bay, Maui Island, Hawaii.

Material examined: New Caledonia, Ile des Pins: st. idp5.2, idp7, idp8.

***Turridrupa diffusa* Powell, 1967**

Plate 3, fig. 30

Turridrupa diffusa Powell, 1967.

Type locality: Samoa.

Material examined: New Caledonia, Ile des Pins: st. idp5.2, idp6.

***Turridrupa* cf. *jubata* (Hinds, 1843)**

Plate 3, fig. 31

Pleurotoma jubata Hinds, 1843.

Type locality: In mud at 32.9 m, Straits of Malacca.

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: The present species differs from typical specimens of *Turridrupa jubata* (Hinds, 1843) by the smaller and more slender shape, the weaker spiral cords, and the less flared out anal sinus opening.

Genus *Xenuroturris* Iredale, 1929

Type species: *Xenuroturris legitima* Iredale, 1929 (type by original designation). Type locality: Michaelmas Cay, Queensland, Australia.

***Xenuroturris legitima* Iredale, 1929**

Plate 3, fig. 35

Xenuroturris legitima Iredale, 1929.

Type locality: Michaelmas Cay, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp4.

***Xenuroturrus millepunctata* (G.B. Sowerby III, 1909)**

Plate 3, fig. 34

Pleurotoma millepunctata G. B. Sowerby III, 1909.**Type locality:** Monac Island, New, Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp2.**Family Mitromorphidae T. L. Casey, 1904**

16 morphotypes.

Genus *Lovellona* Iredale, 1917**Type species:** *Conus atramentosus* Reeve, 1849 accepted as *Lovellona atramentosa* (Reeve, 1849) (type by original designation). Type locality: 25 fm [45.7 m], Mindoro Island, Philippines.***Lovellona atramentosa* (Reeve, 1849)**

Plate 4, fig. 37

Conus atramentosus Reeve, 1849.**Type locality:** 25 fm [45.7 m], Mindoro Island, Philippines.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp5, idp6, idp8.**Genus *Mitromorpha* Carpenter, 1865****Type species:** *Daphnella filosa* Carpenter, 1864 accepted as *Mitromorpha carpenteri* Glibert, 1954 (type by monotypy). Type locality: Santa Barbara, California, USA.**Remarks:** *Anarithma* Iredale, 1916 closely resembles *Mitromorpha* but can be distinguished by a swollen columella bearing a small v-shaped notch instead of folds. We agree with Chino & Stahlschmidt (2009) that the use of weakly distinguishable genera in such a species-rich and confusing group as the turrids is not recommended. Until studies based on molecular data are available, we assign all species to the genus *Mitromorpha* and omit *Anarithma*.***Mitromorpha alphonisiana* (Hervier, 1900)**

Plate 4, fig. 51

Columbella alphonisiana Hervier, 1900.**Type locality:** Lifou. Loyalty Islands, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp8.***Mitromorpha drivasi* (Chang, 1995) n. comb.**

Plate 4, fig. 39

Anarithma drivasi Chang, 1995.**Type locality:** Lüdao Islet, Taiwan.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp3, idp5.**Remarks:** This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.***Mitromorpha fischeri* (Hervier, 1900)**

Plate 4, fig. 40

Columbella fischeri Hervier, 1900.**Type locality:** Lifou. Loyalty Islands, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp3, idp5, idp6, idp8.***Mitromorpha inornata* (Hervier, 1900)**

Plate 4, fig. 48

Columbella stepheni var. *inornata* Hervier, 1900.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp5.***Mitromorpha iozona* (Hervier, 1900)**

Plate 4, fig. 50

Columbella iozona Hervier, 1900.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp3, idp6.***Mitromorpha metula* (Hinds, 1843)**

Plate 4, figs 42-43

Clavatula metula Hinds, 1843.**Type locality:** unknown.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.**Remarks:** This species may represent a species complex and further genetic analysis is required to resolve its taxonomic position.

***Mitromorpha salisburyi* (Cernohorsky, 1978)**

Plate 5, fig. 52

Mitrolumna salisburyi Cernohorsky, 1978.**Type locality:** 32 fm [59 m], Maile Point, Oahu, Hawaii.**Material examined:** New Caledonia, Ile des Pins: st. idp3, idp6.***Mitromorpha sublachryma* (Hervier, 1900).**

Plate 4, fig. 44

Columbella sublachryma Hervier, 1900.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp5, idp5.2, idp6, idp7.**Remarks:** This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes, but was originally described from Lifou, therefore it is not considered new to New Caledonia.***Mitromorpha cf. sublachryma* (Hervier, 1900)
morph 1**

Plate 4, fig. 45

Type locality: Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.**Remarks:** The present species differs from typical *Anarithma sublachryma* (Hervier, 1900) by the less developed axial sculpture, the two spiral grooves per whorl (compared to one in *Anarithma sublachryma*), by the two pinkish cords on the upper suture and grooves, and by the large brown dorsal blotch on the final whorl.***Mitromorpha cf. sublachryma* (Hervier, 1900)
morph 2**

Plate 4, fig. 46

Type locality: Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.**Remarks:** The present morphotype differs from the typical *Anarithma sublachryma* (Hervier, 1900) by the faint axial sculpture, the almost smooth surface of the shell and by the more elongated and less biconical profile. This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.***Mitromorpha cf. sublachryma* (Hervier, 1900)
morph 3**

Plate 4, fig. 47

Type locality: Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.**Remarks:** The present morphotype differs from *Anarithma sublachryma* (Hervier, 1900) in being much more stout, with shorter whorls, relatively deeper spiral grooves, resulting in a rugose shell surface similar to that of *A. metula* (Hinds, 1843). This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.***Mitromorpha aff. thalaoides* Chino & Stahlschmidt,
2014**

Plate 5, fig. 53

Mitromorpha thalaoides Chino & Stahlschmidt, 2014.**Type locality:** Baie du Santal, WSW of Pointe d'Easo, Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp5, idp8.**Remarks:** The present morphotype differs from *Mitromorpha thalaoides* Chino & Stahlschmidt, 2014 by the ovate shape (instead of biconic), the larger adult size, the more numerous and finer knobs, and the completely different coloration.***Mitromorpha* sp. 3**

Plate 4, fig. 41

Material examined: New Caledonia, Ile des Pins: st. idp5, idp5.2.***Mitromorpha* sp. 5**

Plate 4, fig. 49

Material examined: New Caledonia, Ile des Pins: st. idp6.**Remarks:** This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.***Mitromorpha* sp. 6**

Plate 4, fig. 38

Material examined: New Caledonia, Ile des Pins: st. idp8.

Family Clathurellidae H. Adams & A. Adams, 1858

25 morphotypes.

Genus *Acrista* Hedley, 1922

Type species: *Lienardia punctilla* Hedley, 1922 accepted as *Acrista punctilla* (Hedley, 1922) (type by original designation). Type locality: 5 to 8 fathoms [9–15 m], Murray Island, Queensland, Australia.

Remarks: Described as a subgenus of *Lienardia*, we consider it a full genus being more similar to *Etrema* but differing in the trigonal aperture, the sculpture of axial ribs crossed by prominent spiral cords, forming compressed nodules, and the outer lip by having only a few but larger teeth.

***Acrista nana* (Hervier, 1896) n. comb.**

Plate 5, fig. 59

Glyphostoma comptum var. *nana* Hervier, 1896a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: The freshly collected specimen in this study has brownish-orange colored grooves between the intersection of the spiral cords and faintly between the ribs, features absent in the type material. It is assumed that the type species are specimens that lost the coloration since all other morphological characters agree well.

Even though *Pleurotoma compta* Reeve, 1845 is a typical *Lienardia*, the present subspecies is more indicative of *Acrista* as defined herein.

This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes, but was described from the Loyalty Island, therefore is not new to New Caledonia.

***Acrista latirella* (Melvill & Standen, 1896) n. comb.**

Plate 5, fig. 57

Mangilia (*Glyphostoma*) *latirella* Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp8.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes, but was described from Loyalty Island, therefore is not new to New Caledonia.

***Acrista pusilla* (Dunker, 1871) n. comb.**

Plate 5, fig. 56

Clathurella pusilla G. Dunker, 1871.

Type locality: Viti Islands [Fiji].

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3, idp4, idp5, idp6, idp7.

Remarks: is very similar to *Glyphostoma trigonostomum* Hervier, 1896b

***Acrista tuberculifera* (Hervier, 1896) n. comb.**

Plate 5, fig. 58

Glyphostoma marcheii var. *tuberculifera* Hervier, 1896a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp3.2.

Remarks: Our single specimen agrees well with the type specimen of *Glyphostoma marcheii* var. *tuberculifera* Hervier, 1896 (syntype MNHN-IM-2000-30091). However, we have strong doubts about the validity of the presumed type specimens since they are not even remotely similar to the type of *Lienardia marcheii* Jousseaume, 1884 (syntype MNHN-IM-2000-3082). Given that the existent types of *Glyphostoma marcheii* var. *tuberculifera* are instead much closer to *Glyphostoma disconica* Hervier (1896) (syntype MNHN-IM-2000-2904), described in the same publication, is a further hint of a possible confusion of the type specimens. Unfortunately, an original figure of the *Glyphostoma marcheii* var. *tuberculifera* type is missing and the meagreness of the original description is of little help. However, the resolving this dilemma is beyond the scope of the present paper but could be of interest to future workers.

Genus *Clathurella* Carpenter, 1857

Type species: *Clavatula rava* Hinds, 1843 accepted as *Clathurella rava* (Hinds, 1843) (type by subsequent designation). Type locality: 18 fm [33 m], Gulf of Nicoya, Central America.

***Clathurella verrucosa* Stahlschmidt, Poppe & Tagaro, 2018**

Plate 5, fig. 63

Clathurella verrucosa Stahlschmidt, Poppe & Tagaro, 2018.

Type locality: Pamilacan Island, Bohol, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp7.

Genus *Etrema* Hedley, 1918

Type species: *Mangilia* (*Glyphostoma*) *aliciae* Melvill & Standen, 1895 accepted as *Etrema aliciae* (Melvill & Standen, 1895) (type by original designation). Type locality: Lifou, New Caledonia.

***Etrema* cf. *crassilabrum* (Reeve, 1843)**

Plate 6, fig. 76

Pleurotoma crassilabrum Reeve, 1843.

Type locality: Ticao Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp1.

Remarks: The present species is very similar to *Etrema crassilabrum* (Reeve, 1843) but differs slightly in the weaker spiral sculpture and the less developed denticles in the columella. However, the single available specimen is subadult and a comparison of adult specimens with the type or topotypic specimens is required to provide confirmation.

***Etrema* aff. *crassilabrum* (Reeve, 1843)**

Plate 6, fig. 75

Material examined: New Caledonia, Ile des Pins: st. idp3.2.

Remarks: The present species differs from *Etrema crassilabrum* (Reeve, 1843) in the denser and weaker axial sculpture as well as in a different colouration.

***Etrema* cf. *glabriplicatum* (Sowerby III, 1913)**

Plate 6, fig. 77

Glyphostoma glabriplicatum G. B. Sowerby III, 1913.

Type locality: Osumi, Japan.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp4.

Remarks: The present species is similar to *Etrema glabriplicatum* (Sowerby III, 1913) but differs in the stouter profile, brown coloration below periphery on later teleoconch whorls and the denser axial sculpture.

***Etrema* cf. *polydesma* Hedley, 1922**

Plate 6, fig. 73

Etrema polydesma Hedley, 1922.

Type locality: 15 fm. [27 m], Palm Islands, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3.2, idp5.2, idp8.

Remarks: The present species appears to be conspecific with *Etrema polydesma* Hedley, 1922, but differs slightly in the colouration and sculpture. A comparison with the type or fresh topotypic specimens is required to provide confirmation.

***Etrema* sp. 1a**

Plate 6, fig. 70

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3.2, idp5.2, idp7.

Remarks: The present species is remotely related to *Etrema polydesma* Hedley, 1922, but differs in the less angulated whorls.

***Etrema* sp. 1b**

Plate 6, fig. 71

Material examined: New Caledonia, Ile des Pins: st. idp1.

Remarks: The present species might be conspecific with *Etrema* sp.1 but differs slightly in the colouration and sculpture. More specimens are required to examine if the differences are stable or just within the intraspecific variation.

***Etrema* sp. 1c**

Plate 6, fig. 72

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: The present species is also similar to *Etrema* sp.1 but differs in the more angulated whorls and the rougher axial and spiral sculpture.

***Etrema* sp. 5**

Plate 6, fig. 78

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: The present species is only known by a single subadult specimens, but differs in sculpture and colour pattern from all other species reported here.

***Etrema* sp. 6**

Plate 6, fig. 74

Material examined: New Caledonia, Ile des Pins: st. idp4.

Remarks: The present species is known from one subadult specimen and is remotely similar to *Etrema crassilabrum* but differs in the less angulated whorls and different colour pattern.

Genus *Lienardia* Jousseaume, 1883

Type species: *Clavatula rubida* Hinds, 1843 accepted as *Lienardia rubida* (Hinds, 1843) (type by original designation). Type locality: 7 fm [13 m], New Guinea.

***Lienardia compta* (Reeve, 1845)**

Plate 5, fig. 60

Pleurotoma compta Reeve, 1845.

Type locality: Baclayon, Bohol Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp3, idp3.2, idp5, idp5.2, idp6, idp7.

***Lienardia fallax* (G. Nevill & H. Nevill, 1875)**

Plate 6, fig. 64

Clathurella rugosa var. *fallax* G. & H. Nevill, 1875.

Type locality: Mauritius and Bourbon [Reunion]; Ceylon [Sri Lanka].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

***Lienardia giliberti* (Souverbie in Souverbie & Montrouzier, 1874)**

Plate 6, fig. 67

Pleurotoma giliberti Souverbie in Souverbie & Montrouzier, 1874.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp4, idp7.

***Lienardia mighelsi* Iredale & Tomlin, 1917**

Plate 6, fig. 66

Lienardia mighelsi Iredale & Tomlin, 1917.

Type locality: Sandwich Islands [Hawaii].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7.

***Lienardia roseotincta* (Montrouzier in Souverbie & Montrouzier, 1872)**

Plate 6, fig. 68

Pleurotoma (Clathurella) roseotincta Montrouzier in Souverbie & Montrouzier, 1872.

Type locality: Art Island, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp4, idp5, idp5.2.

***Lienardia tricolor* (Brazier, 1876)**

Plate 6, fig. 65

Clathurella tricolor Brazier, 1876.

Type locality: Palm Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp5, idp6.

***Lienardia* aff. *vultuosa* (Reeve, 1845)**

Plate 6, fig. 69

Pleurotoma vultuosa Reeve, 1845.

Type locality: Baclayon, Bohol Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp4.

Remarks: The present morphotype is similar to *Lienardia vultuosa* (Reeve, 1845) but differs in having a stouter shell profile and fewer denticles in the interior of the outer lip. The specimens analysed here appear to belong to the *Lienardia vultuosa-leucostigmata-rhodacme* species-complex. A detailed study is needed to establish limits of either interspecific or intraspecific variation based on coloration, sculpture and lip dentation.

***Lienardia* sp. 1**

Plate 5, fig. 61

Material examined: New Caledonia, Ile des Pins: st. idp1, idp6.

Remarks: Specimens collected and analysed in this study were not recorded in the MNHN unpublished catalogue of morphotypes.

***Lienardia* sp. 2**

Plate 5, fig. 62

Material examined: New Caledonia, Ile des Pins: st. idp3.2.

Remarks: This morphotype was not recorded in the MNHN catalogue of morphotypes.

Genus *Nannodiella* Dall, 1919

Type species: *Philbertia (Nannodiella) nana* Dall, 1919 accepted as *Nannodiella nana* (Dall, 1919) (type by original designation). Type locality: 26 fm [48 m], off Cacachitas, Gulf of California.

Remarks: The following two species are only provisionally placed in *Nannodiella* due to the similar shell shapes and the spout-like anal sinus, characters that may prove to be artificial. The type species of the

genus *Nannodiella*, *Philbertia* (*Nannodiella*) *nana* Dall 1919, an east pacific species, lacks the apertural denticles which are well developed in *N. acricula* and *N. cf. tortilabia*.

***Nannodiella acricula* (Hedley, 1922)**

Plate 5, fig. 54

Etrema acricula Hedley, 1922.

Type locality: 5-8 fm. [9-15 m], Murray Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

***Nannodiella cf. tortilabia* (Hedley, 1922)**

Plate 5, fig. 55

Etrema tortilabia Hedley, 1922.

Type locality: 5-8 fm. [9-15 m], off Murray Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

Remarks: The present morphotype appears to be *Nannodiella tortilabia* (Hedley, 1922). However, the type of the latter species is of poor quality and the figure by Hedley (1922) only illustrated a specimen with a much more acute apex, further complicating the identification of the morphotype. Verification of specimens from the type locality, or nearby, is necessary to confirm the true identity of this specimen.

Family Raphitomidae Bellardi, 1875

76 morphotypes.

Genus *Austrodaphnella* Laseron, 1954

Type species: *Austrodaphnella clathrata* Laseron, 1954 (type by original designation). Type locality: Pittwater, NSW, Australia.

***Austrodaphnella torresensis* Shuto, 1983**

Plate 11, fig. 140

Austrodaphnella torresensis Shuto, 1983.

Type locality: 9-15 m, off Murray Islands, Torres Strait, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp5, idp5.2, idp6, idp7, idp8.

Genus *Daphnella* Hinds, 1844

Type species: *Pleurotoma lymneiformis* Kiener, 1839 accepted as *Daphnella lymneiformis* (Kiener, 1839) (type by subsequent designation). Type locality: Mauritius.

***Daphnella canaliculata* Ardovalini, 2009**

Plate 11, fig. 145

Daphnella canaliculata Ardovalini, 2009.

Type locality: 100 m, off Balicasag Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp7.

***Daphnella ornata* Hinds, 1844**

Plate 11, fig. 143

Daphnella ornata Hinds, 1844.

Type locality: 6 fm [11 m], in mud, New Guinea.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp6, idp7.

***Daphnella pluricarinata* (Reeve, 1845)**

Plate 11, fig. 141

Pleurotoma pluricarinata Reeve, 1845.

Type locality: 7 fm [13 m], Burias Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp5.

Remarks: *Daphnella attractoides* Hervier, 1897 is a synonym of *Daphnella pluricarinata* (Reeve, 1845).

***Daphnella vitrea* Garrett, 1873**

Plate 10, fig. 136

Daphnella vitrea Garrett, 1873.

Type locality: Paumotu Islands [Tuamotu, French Polynesia].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3.

***Daphnella* sp. 2**

Plate 11, fig. 146

Material examined: New Caledonia, Ile des Pins: st. idp4, idp5.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Daphnella* sp. 3**

Plate 10, fig. 135

Material examined: New Caledonia, Ile des Pins: st. idp8.

Genus *Diaugasma* Melvill, 1917

Type species: *Daphnella epicharta* Melvill & Standen, 1903 accepted as *Diaugasma epicharta* (Melvill & Standen, 1903) (type by monotypy). Type locality: 24°58'N, 56°54'E; 156 fathoms [285 m], Gulf of Oman.

***Diaugasma olyra* (Reeve, 1845)**

Plate 11, fig. 144

Pleurotoma olyra Reeve, 1845.

Type locality: Unknown.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp5, idp6, idp7, idp8.

Genus *Eucyclotoma* Boettger, 1895

Type species: *Clathurella bicarinata* Pease, 1863 accepted as *Eucyclotoma bicarinata* (Pease, 1863) (type by subsequent designation). Type locality: Kingmill Islands, Kiribati.

***Eucyclotoma bicarinata* (Pease, 1863)**

Plate 10, fig. 138

Clathurella bicarinata Pease, 1863.

Type locality: Kingmill Islands, Kiribati.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp5, idp6.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Eucyclotoma carinulata* (Souverbie, 1875)**

Plate 11, fig. 139

Pleurotoma carinulata Souverbie, 1875.

Type locality: Art Island, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp7.

***Eucyclotoma* cf. *tricarinata* (Kiener, 1839)**

Plate 10, fig. 137

Pleurotoma tricarinata Kiener, 1839.

Type locality: Unknown.

Material examined: New Caledonia, Ile des Pins: st. idp7.

Genus *Exomilus* Hedley, 1918

Type species: *Mangelia lutaria* Hedley, 1907 accepted as *Exomilus lutarius* (Hedley, 1907) (type by original designation). Type locality: 80 fm. [146 m], 22 miles E of Narrabeen, NSW, Australia.

Remarks: We follow Fedosov & Puillandre (2012) by using the genus *Exomilus* for the following two species, even though the type of *Exomilus* is a temperate species and probably not related to the species listed here, while some of the species currently placed in *Kermia* or *Pseudodaphnella* appear to be closer. However, the delimitation of these complicated genera needs molecular methods and is beyond the scope of the present paper. The use of *Exomilus* is utilized for the reason of consistency.

***Exomilus compressus* Fedosov & Puillandre, 2012**

Plate 8, fig. 99

Exomilus compressa Fedosov & Puillandre, 2012.

Type locality: 15°24'22"S, 167°13'02"E, 38 m, Palikulo Bay, Vanuatu.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp4, idp5, idp5.2, idp6, idp7, idp8.

***Exomilus edychrous* (Hervier, 1897)**

Plate 8, fig. 101

Clathurella edychroa Hervier, 1897a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

Genus *Hemilienardia* O. Boettger, 1895

Type species: *Pleurotoma* (*Defrancia*) *malleti* Récluz, 1852 accepted as *Hemilienardia malleti* (Récluz, 1852) (type by original designation). Type locality: Pacific Ocean.

***Hemilienardia acinonyx* Fedosov et al., 2017**

Plate 7, fig. 85

Hemilienardia acinonyx Fedosov, Stahlschmidt, Puillandre, Aznar-Cormano & Bouchet, 2017.

Type locality: Panglao Island, off Momo Beach, lumun-lumun net, 60-80 m.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp5, idp5.2, idp8.

***Hemilienardia calcicincta* (Melvill & Standen, 1895)**

Plate 7, fig. 83

Mangilia (Glyphostoma) calcicincta Melvill & Standen, 1895.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp2.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes, but was described from Lifou, therefore is not new to New Caledonia.

***Hemilienardia cf. gemmulata* Wiedrick, 2017**

Plate 7, fig. 82

Hemilienardia gemmulata Wiedrick, 2017.

Type locality: 11°29'0.12"N, 119°50'13.82"E; in tangle nets at 150 m, off Linapacan Island, Palawan Province, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp5.2.

Remarks: There is a group of very similar species, morphologically comprising of *Hemilienardia gemmulata*, *H. fenestrata* (Melvill, 1898), and *H. hersilia* (Hedley, 1922), that appear to be different species. The present morphotype appears to differ slightly from *Hemilienardia gemmulata* in the larger size, more shouldered whorls, and denser sculpture. Molecular studies are required for a resolution to this species complex.

***Hemilienardia homochroa* Hedley, 1922**

Plate 7, fig. 79

Hemilienardia homochroa Hedley, 1922.

Type locality: Two Isles, off Cape Flattery, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp1.

***Hemilienardia idiomorpha* (Hervier, 1897) n. comb.**

Plate 7, fig. 84

Clathurella idiomorpha Hervier, 1897a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1.

Remarks: The diagonally cancellated protoconch is indicative of the family Raphitomidae and this species is tentatively assigned to the genus *Hemilienardia*.

***Hemilienardia malleti* (Récluz, 1852)**

Plate 7, fig. 80

Pleurotoma (Defrancia) malleti Récluz, 1852.

Type locality: Pacific Ocean.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp6, idp7.

***Hemilienardia mikesevernsi* Wiedrick, 2017**

Plate 7, fig. 81

Hemilienardia mikesevernsi Wiedrick, 2017.

Type locality: 19°40'3.18"N, 156°1'48.91"W; in sand and rubble at 8-29 m, Off Honokohau Harbor, Kona North District, Hawai'i, Hawaiian Islands.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2.

***Hemilienardia shawnmilleri* Wiedrick, 2017**

Plate 7, fig. 87

Hemilienardia shawnmilleri Wiedrick, 2017.

Type Locality: 26°50.8'N, 128°17.2'E; in sand and coral among channels and caves at 12-20 m, North northwest Oku, Ryukyushoto, Okinawa-jima, Okinawa Prefecture, Japan.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3.2, idp5.2, idp6.

***Hemilienardia* sp.**

Plate 7, fig. 86

Material examined: New Caledonia, Ile des Pins: st. idp1, idp5, idp5.2.

Genus *Kermia* W. R. B. Oliver, 1915

Type species: *Kermia benhami* W. R. B. Oliver, 1915. (type by original designation). Type locality: 10-30 m, near Sunday Island, Kermadec Islands.

***Kermia benhami* Oliver, 1915**

Plate 8, fig. 102

Kermia benhami Oliver, 1915.

Type locality: 10-30 m, near Sunday Island, Kermadec Islands.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

***Kermia cf. benhami* Oliver, 1915**

Plate 8, fig. 103

Material examined: New Caledonia, Ile des Pins: st. idp5, idp6.

Remarks: The New Caledonian morphotype is similar to *Kermia benhami* (Oliver, 1915), but differs in broader and more angulate whorls, as well as in a different ratio of aperture length to total shell length, (1.9 versus 2.3 for *K. benhami*). The specimens sampled from southern New Caledonia were not recorded in the unpublished MNHN catalogue of morphotypes.

***Kermia episema* (Melvill & Standen, 1896)**

Plate 9, fig. 117

Clathurella episema Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

***Kermia melanoxytum* (Hervier, 1896)**

Plate 9, fig. 122

Glyphostoma melanoxytum Hervier, 1896a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

***Kermia* sp.20**

Plate 8, figs 104-106

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp7, idp8.

Remarks: These morphotypes may prove to be a species complex, as they vary in pattern, shape, and colour. But since all kind of intermediates exist, it is difficult to draw a line and segregate them into morphospecies. Molecular studies are required for resolving this species complex.

Genus *Kuroshiodaphne* Shuto, 1965

Type species: *Daphnella fuscobalteata* E. A. Smith, 1879 accepted as *Kuroshiodaphne fuscobalteata* (E. A. Smith, 1879) (type by original designation). Type locality: Station 21.33°45'N, 132°30'E; 30 fathoms

[55 m], between south-western extremity of Nippon and the island of Shikoku [Japan].

***Kuroshiodaphne* aff. *supracancellata* (Schepman, 1913)**

Plate 11, fig. 142

Daphnella supracancellata Schepman, 1913.

Type locality: 75 m, Kwandang Bay entrance. [Sulawesi, Indonesia].

Material examined: New Caledonia, Ile des Pins: st. idp5.

Remarks: The specimen collected is similar to *Kuroshiodaphne supracancellata* (Schepman, 1913), but differs in the less convex whorls, broader spiral cords, and the less constricted aperture at the anterior and posterior ends. This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

Genus *Microdaphne* McLean, 1971

Type species: *Philbertia trichodes* Dall, 1919 accepted as *Microdaphne trichodes* (Dall, 1919) (type by original designation). Type locality: Panama Bay.

***Microdaphne morrisoni* Rehder, 1980**

Plate 11, fig. 153

Microdaphne morrisoni Rehder, 1980.

Type locality: Moto Mataira, Raoia, Tuamotu Islands [French Polynesia].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.

Genus *Pleurotomella* Verrill, 1872

Type species: *Pleurotomella packardii* Verrill, 1872. (type by monotypy). Type locality: 42°11'N, 67°17'W; 150 fm [275 m], St. George's Bank.

***Pleurotomella* cf. *itama* (Melvill, 1906)**

Plate 12, fig. 156

Daphnella (*Pleurotomella*) *itama* Melvill, 1906.

Type locality: 24°58'N, 56°54'E; 156 fm [285 m], Gulf of Oman.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3.

Remarks: The generic placement of that species is tentative. The specimens collected seem to be

congeneric to *Pleurotomella itama* (Melvill, 1906) described from the Gulf of Oman, but differ from the latter by the stronger sculpture and the more angulated whorls.

Genus *Pseudodaphnella* Boettger, 1895

Type species: *Pleurotoma philippinensis* Reeve, 1843 accepted as *Pseudodaphnella philippinensis* (Reeve, 1843) (type by original designation). Type locality: found under stones at low water, Islands of Masbate and Luzon, Philippines.

***Pseudodaphnella* cf. *apicalis* (Montrouzier in Souverbie, 1861)**
Plate 10, fig. 127

Pleurotoma apicalis Montrouzier in Souverbie, 1861.

Type locality: Art Island, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp8.

Remarks: The present specimen might be *Pseudodaphnella apicalis* (Montrouzier, 1861), but differs in having more shouldered whorls.

***Pseudodaphnella aureotincta* (Hervier, 1897)**
Plate 9, fig. 112

Clathurella tincta var. *aureotincta* Hervier, 1897a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp5.2.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes, but was described from Lifou, and therefore is not new to New Caledonia.

***Pseudodaphnella* cf. *barnardi* (Brazier, 1876)**
Plate 9, fig. 110

Clathurella barnardi Brazier, 1876.

Type locality: Barnard Island, north east Australia [Queensland].

Material examined: New Caledonia, Ile des Pins: st. idp2.

Remarks: According to Fedosov & Puillandre, 2012, "*Pseudodaphnella phaeogranulata* nov. sp. strongly resembles *P. barnardi*, its closest molecular relative. The only difference seems to be in the colour of the axial bands, which are black in *P. barnardi* and brown in *P. phaeogranulata*." The coloration of the present

species is blackish-brown and without molecular confirmation, its identity is uncertain.

***Pseudodaphnella caelata* (Garrett, 1873)**
Plate 9, fig. 123

Clathurella caelata, Garrett, 1873.

Type locality: Viti Isles [Fiji].

Material examined: New Caledonia, Ile des Pins: st. idp2.

***Pseudodaphnella caletria* (Melvill & Standen, 1896)**
Plate 8, fig. 94

Clathurella caletria Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2.

***Pseudodaphnella daedalea* (Garrett, 1873)**
Plate 10, fig. 126

Clathurella daedalea Garrett, 1873.

Type locality: Viti Isles [Fiji].

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp5, idp6, idp7.

***Pseudodaphnella* aff. *drupelloides* (Kilburn, 2009)**
Plate 8, fig. 108

Kermia drupelloides Kilburn, 2009.

Type locality: 30°17'S, 30°45'E; ca -35 m, in shell grit, off Scottburgh, KwaZulu-Natal, South Africa.

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: The New Caledonian morphotype is very similar to *Pseudodaphnella drupelloides* (Kilburn, 2009) but appears to differ in having slightly stronger knobs on the teleoconch whorls and a stronger parietal pad that constricts the opening of the anal sinus.

***Pseudodaphnella fallax* Fedosov & Puillandre, 2012**
Plate 9, fig. 113

Pseudodaphnella fallax Fedosov & Puillandre, 2012.

Type locality: stn. B19, 9°29.4'N, 123°56.0'E; 17 m, Expedition 'Panglao 2004', Pamilacan Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp6.

***Pseudodaphnella granosa* (Dunker, 1871)**

Plate 8, fig. 107

Clathurella granosa G. Dunker, 1871.**Type locality:** Upolu [Samoa].**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp5, idp5.2, idp6, idp7.***Pseudodaphnella hadfieldi* (Melvill & Standen, 1895)**

Plate 10, fig. 124

Pleurotoma (*Drillia*) *hadfieldi* Melvill & Standen, 1895.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp2, idp7.***Pseudodaphnella infrasulcata* (Garrett, 1873)**

Plate 8, fig. 98

Clathurella infrasulcata Garrett, 1873.**Type locality:** Viti Isles [Fiji].**Material examined:** New Caledonia, Ile des Pins: st. idp6, idp7.***Pseudodaphnella* aff. *lineata* Fedosov & Puillandre, 2012**

Plate 9, fig. 114

Pseudodaphnella lineata Fedosov & Puillandre, 2012.**Type locality:** stn. B25, 9°29.4'N, 123°56.1'E; 16 m, Expedition 'Panglao 2004', Philippines.**Material examined:** New Caledonia, Ile des Pins: st. idp1.**Remarks:** The Ile des Pins specimen differs from typical *Pseudodaphnella lineata* Fedosov & Puillandre, 2012 in having a slightly stronger spiral sculpture and the less-convex and almost flat-sided whorls, resulting in a different shell profile.***Pseudodaphnella martensi* (G. Nevill & H. Nevill, 1875)**

Plate 9, fig. 115

Clathurella martensi G. Nevill & H. Nevill, 1875.**Type locality:** Balapiti in Ceylon [Sri Lanka].**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp4, idp6, idp7.***Pseudodaphnella philippinensis* (Reeve, 1843)**

Plate 10, fig. 129

Pleurotoma philippinensis Reeve, 1843.**Type locality:** Masbate and Luzon Islands, Philippines.**Material examined:** New Caledonia, Ile des Pins: st. idp2.***Pseudodaphnella producta* (Pease, 1860)**

Plate 10, fig. 125

Clathurella producta Pease, 1860.**Type locality:** Sandwich Islands [Hawaii].**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp5, idp5.2, idp6, idp7, idp8.***Pseudodaphnella punctifera* (Garrett, 1873)**

Plate 9, fig. 121

Clathurella punctifera Garrett, 1873.**Type locality:** Society, Samoa, and Viti [Fiji].**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp5, idp7.***Pseudodaphnella* aff. *punctifera* (Garrett, 1873)**

Plate 9, fig. 120

Material examined: New Caledonia, Ile des Pins: st. idp7.**Remarks:** The Ile des Pins morphotype differs from *Pseudodaphnella punctifera* (Garrett, 1873) in having a stronger sculpture and different coloration.***Pseudodaphnella rubroguttata* (H. Adams, 1872)**

Plate 9, fig. 118

Clathurella rubro-guttata H. Adams, 1872.**Type locality:** New Hebrides [Vanuatu].**Material examined:** New Caledonia, Ile des Pins: st. idp1.**Remarks:** This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.***Pseudodaphnella* cf. *rubroguttata* (Adams, 1872)**

Plate 9, fig. 119

Material examined: New Caledonia, Ile des Pins: st. idp1, idp5.2.**Remarks:** Specimens from New Caledonia are similar to *Pseudodaphnella rubroguttata* (Adams, 1872) but

have a less bulbous outline and a stronger parietal region that constricts the opening of the anal sinus.

***Pseudodaphnella santoa* Fedosov & Puillandre, 2012**

Plate 9, fig. 116

Pseudodaphnella santoa Fedosov & Puillandre, 2012.

Type locality: 15°32'23"S, 167°12'08"E; Aoré Is., N Side of Ambuei Bay, Vanuatu.

Material examined: New Caledonia, Ile des Pins: st. idp1.

***Pseudodaphnella spyridula* (Melvill & Standen, 1896)**

Plate 8, fig. 100

Clathurella spyridula Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3.2, idp4, idp5, idp5.2, idp7.

***Pseudodaphnella thereganum*
(Melvill & Standen, 1896)**

Plate 7, fig. 89

Mangilia (Glyphostoma) thereganum Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp5.2, idp7.

***Pseudodaphnella thespesia* (Melvill & Standen, 1896)**

Plate 10, fig. 128

Daphnella thespesia Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp5, idp8.

***Pseudodaphnella tigroidella* (Hervier, 1896)**

Plate 7, fig. 93

Glyphostoma tigroidellum Hervier, 1896a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp4, idp5, idp6, idp7, idp8.

***Pseudodaphnella cf. tincta* (Reeve, 1846)**

Plate 9, fig. 111

Pleurotoma tincta Reeve, 1846.

Type locality: Unknown.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp3, idp3.2, idp4, idp5, idp6, idp7.

Remarks: The present morphotype is similar to *Pseudodaphnella tincta* (Reeve, 1846) but differs in the stronger sculpture, the larger size and lower number of apertural denticles and coloration.

***Pseudodaphnella* sp. 8**

Plate 7, fig. 92

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3, idp3.2, idp5, idp6, idp7.

***Pseudodaphnella* sp. 9**

Plate 8, fig. 96

Material examined: New Caledonia, Ile des Pins: st. idp3, idp5.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Pseudodaphnella* sp. 10**

Plate 7, fig. 88

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp5, idp6.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Pseudodaphnella* sp. 11**

Plate 8, fig. 95

Material examined: New Caledonia, Ile des Pins: st. idp2.

***Pseudodaphnella* sp. 12**

Plate 7, fig. 90

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Pseudodaphnella* sp. 14**

Plate 8, fig. 97

Material examined: New Caledonia, Ile des Pins: st. idp3, idp5.

***Pseudodaphnella* sp. 15**

Plate 7, fig. 91

Material examined: New Caledonia, Ile des Pins: st. idp1, idp5.

***Pseudodaphnella* sp. 21**

Plate 9, fig. 109

Material examined: New Caledonia, Ile des Pins: st. idp6.

Genus *Thetidos* Hedley, 1899

Type species: *Thetidos morsura* Hedley, 1899 (type by original designation). Type locality: 40-80 fm [73-146 m], Funafuti Atoll, [Tuvalu].

***Thetidos* cf. *morsura* Hedley, 1899**

Plate 12, fig. 154

Thetidos morsura Hedley, 1899.

Type locality: 40-80 fm [73-146 m], Funafuti Atoll, [Tuvalu].

Material examined: New Caledonia, Ile des Pins: st. idp3.2, idp5.2.

Remarks: Fedosov & Stahlschmidt (2014) demonstrated that *Thetidos morsura* either displays considerable morphological variability in shell structure and colouration or represents a complex of related species. The present morphospecies is less globular but more pyramidal in shape and has higher aperture. This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

Genus *Tritonoturris* Dall, 1924

Type species: *Clathurella robillardi* H. Adams, 1869 accepted as *Tritonoturris amabilis* (Hinds, 1843) (type by original designation). Type locality: Barkly Island, Mauritius.

***Tritonoturris cumingii* (Powys, 1835)**

Plate 10, fig. 130

Buccinum cumingii Powys in Powys & G. B. Sowerby I, 1835.

Type locality: Grimwood's Isle [Fangatau southeast of Mururoa, Tuamotu Archipelago, French Polynesia].

Material examined: New Caledonia, Ile des Pins: st. idp2, idp5.

***Tritonoturris lifouana* (Hervier, 1897)**

Plate 10, fig. 134

Daphnella lifouana Hervier, 1897a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp6, idp8.

***Tritonoturris menecharmes* (Melvill, 1923)**

Plate 11, fig. 147

Veprecula menecharmes Melvill, 1923.

Type locality: Mauritius.

Material examined: New Caledonia, Ile des Pins: st. idp3, idp5, idp5.2.

***Tritonoturris subrissoides* (Hervier, 1897)**

Plate 10, fig. 133

Daphnella varicosa var. *subrissoides* Hervier, 1897a.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp2, idp3.2, idp5, idp6, idp8.

***Tritonoturris* cf. *subrissoides* (Hervier, 1897)**

Plate 10, fig. 132

Material examined: New Caledonia, Ile des Pins: st. idp5.

Remarks: This morphospecies differs from *Tritonoturris subrissoides* (Hervier, 1897) in having a stronger and denser axial sculpture. Compared to *Tritonoturris* sp. 1, it has less angulate whorls and less recurved axial ribs. This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Tritonoturris* sp. 1**

Plate 10, fig. 131

Material examined: New Caledonia, Ile des Pins: st. idp6.

Genus *Veprecula* Melvill, 1917

Type species: *Clathurella sykesii* Melvill & Standen, 1903 accepted as *Veprecula sykesii* (Melvill & Standen, 1903) (type by original designation). Type locality: 24°58'N, 56°51' E; 156 fathoms [285 m], Gulf of Oman.

***Vepracula* aff. *spanionema* (Melvill, 1917)**

Plate 11, fig. 148

Clathurina spanionema Melvill, 1917.**Type locality:** 24°58'N, 56°51'E; 156 fathoms [285 m], Gulf of Oman.**Material examined:** New Caledonia, Ile des Pins: st. idp1.**Remarks:** *Vepracula spanionema* (Melvill, 1917) was described from the Gulf of Oman and is only here tentatively recorded, based on an eroded type specimen from idp1. A comparison of fresh material from the type locality is needed to confidently authenticate these two morphotypes as being conspecific.***Vepracula vacillata* Hedley, 1922**

Plate 11, fig. 149

Vepracula vacillata Hedley, 1922.**Type locality:** 5-10 fm [9-18 m], Hope Island, Queensland, Australia.**Material examined:** New Caledonia, Ile des Pins: st. idp4.***Vepracula* aff. *vepratrica* (Hedley, 1903)**

Plate 11, fig. 151

Pleurotoma vepratrica Hedley, 1903.**Type localities:** 63-75 fm [115-137 m], off Port Kembla; 50-52 fm [91-95 m], off Botany Bay; 41-50 fm [75-91 m], off Cape Three Points; 24 fm [44 m], off Cabbage Tree Island, Port Stephens; Torres Straits.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp4.**Remarks:** This morphotype is very similar to *Vepracula vepratrica* (Hedley, 1903) but differs in having a higher and has less convex protoconch, as well as fainter sculpture in the teleoconch whorls.***Vepracula* sp. 1**

Plate 11, fig. 152

Material examined: New Caledonia, Ile des Pins: st. idp1.***Vepracula* sp. 2**

Plate 11, fig. 150

Material examined: New Caledonia, Ile des Pins: st. idp5.**Raphitomid sp.**

Plate 12, fig. 155

Material examined: New Caledonia, Ile des Pins: st. idp3.**Remarks:** Unequivocal shell characteristics which would enable an assignment of this species to a genus are missing and, therefore, we assign it tentatively to Incertae sedis rather than to a specific genus.**Family Mangeliidae Fischer, 1883**

21 morphotypes

Genus *Eucithara* Fischer, 1883**Type species:** *Mangelia stromboides* Reeve, 1846 accepted as *Eucithara stromboides* (Reeve, 1846) (type by original designation). Type locality: Bohol Island, Philippines.***Eucithara celebensis* (Hinds, 1843)**

Plate 12, fig. 160

Mangelia celebensis Hinds, 1843.**Type locality:** 10 fm [18 m], Straits of Macassar.**Material examined:** New Caledonia, Ile des Pins: st. idp2.***Eucithara crystallina* (Hervier, 1897)**

Plate 12, figs 161-162

Cithara crystallina Hervier, 1897b.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp5.***Eucithara* cf. *harpellina* (Hervier, 1897)**

Plate 12, fig. 157

Cithara harpellina Hervier, 1897b.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: idp2.**Remarks:** The present morphotype is similar to *Eucithara harpellina* (Hervier, 1897), but differs in having more shouldered whorls and a finer spiral sculpture.

***Eucithara cf. isseli* (G. Nevill & H. Nevill, 1875)**

Plate 12, fig. 159

Cythara isseli G. & H. Nevill, 1875.**Type locality:** Balapiti, Ceylon [Sri Lanka].**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp5.2.**Remarks:** Compared to typical *Eucithara isseli* (Nevill & Nevill, 1875) specimens, the present specimens differ in having a denser axial sculpture.***Eucithara cf. lepidella* (Hervier, 1897)**

Plate 12, fig. 158

Cithara lepidella Hervier, 1897b.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp3, idp5, idp6.**Remarks:** As the type material could not be located, it was not possible to compare it directly with our specimens. According to the original figure of *E. lepidella*, this form differs in having a denser axial sculpture and more numerous denticles on the inner and outer lips.***Eucithara souverbiei* (Tryon, 1884)**

Plate 12, fig. 163

Mangilia (Cythara) souverbiei Tryon, 1884.**Type locality:** New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp5, idp8.**Genus *Gingicithara* Kilburn, 1992****Type species:** *Mangelia lyrica* Reeve, 1846 accepted as *Gingicithara lyrica* (Reeve, 1846) (type by original designation). Type locality: among coarse sand, 7 fathoms [13 m], Burias Island, Philippines.***Gingicithara notabilis* (E. A. Smith, 1888)**

Plate 12, figs 164-165

Pleurotoma (Mangilia) notabilis E. A. Smith, 1888.**Type locality:** unknown.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.**Genus *Heterocithara* Hedley, 1922****Type species:** *Clathurella bilineata* Angas, 1871 accepted as *Heterocithara bilineata* (Angas, 1871) (type by original designation). Type locality: Dredge near "Sow and Pigs reef", Port Jackson, NSW, Australia.***Heterocithara diatula* (Hervier, 1897) n. comb.**

Plate 13, fig. 175

Mangilia diatula Hervier, 1897b.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp4, idp5, idp5.2, idp7.***Heterocithara himerta* (Melvill & Standen, 1896)**

Plate 13, fig. 168

Mangilia himerta Melvill & Standen, 1896.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp6, idp7, idp8.***Heterocithara isophanes* (Hervier, 1897) n. comb.**

Plate 13, figs 172-173

Mangilia isophanes Hervier, 1897b.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp5, idp5.2, idp6, idp8.**Remarks:** No syntypes of *M. isophanes* were detected at MNHN, but a specimen in the Dautzenberg collection (ISBN; probably received from Hervier) agrees well with the original drawing and with the present specimens. The species shows some variability in the colour pattern of the shell.***Heterocithara strombillum* (Hervier, 1896)**

Plate 13, fig. 167

Glyphostoma strombillum Hervier, 1896a.**Type locality:** Lifou, New Caledonia.**Material examined:** New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp7, idp8.***Heterocithara* sp. 13**

Plate 12, fig. 166

Material examined: New Caledonia, Ile des Pins: st. idp5, idp5.2.

***Heterocithara* sp. 14**

Plate 13, fig. 169

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp4, idp5, idp5.2, idp6, idp8.

***Heterocithara* sp. 16**

Plate 13, fig. 170

Material examined: New Caledonia, Ile des Pins: st. idp3, idp5, idp5.2, idp6, idp8.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Heterocithara* sp. 17**

Plate 13, fig. 171

Material examined: New Caledonia, Ile des Pins: st. idp2, idp5, idp7, idp8.

***Heterocithara* sp. 18**

Plate 13, fig. 174

Material examined: New Caledonia, Ile des Pins: st. idp6.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

***Heterocithara* sp. 19**

Plate 13, fig. 176

Material examined: New Caledonia, Ile des Pins: st. idp1, idp2, idp3, idp3.2, idp5, idp5.2, idp7.

Remarks: This morphotype was not recorded in the unpublished MNHN catalogue of morphotypes.

Genus *Macteola* Hedley, 1918

Type species: *Purpura anomala* Angas, 1877 accepted as *Macteola anomala* (Angas, 1877) (type by original designation). Type locality: 25 fathoms [46 m], Port Jackson-Heads, NSW, Australia.

***Macteola* cf. *interrupta* (Reeve, 1846)**

Plate 13, figs 180-181

Mangelia interrupta Reeve, 1846.

Type locality: Ticao Island, Philippines.

Material examined: New Caledonia, Ile des Pins: st. idp1, idp4, idp5.

Remarks: The southern New Caledonian specimens differs from *Macteola interrupta* (Reeve, 1846) by

having more sloping whorls resulting in a different shell outline, as well as a completely different colour pattern.

***Macteola thalycra* (Melvill & Standen, 1896)**

Plate 13, fig. 179

Mangelia thalycra; Melvill & Standen, 1896.

Type locality: Lifou, New Caledonia.

Material examined: New Caledonia, Ile des Pins: st. idp5, idp7.

Genus *Pseudorhaphitoma* O. Boettger, 1895

Type species: *Mangelia fairbanki* G. Nevill & H. Nevill, 1875 accepted as *Pseudorhaphitoma fairbanki* (G. Nevill & H. Nevill, 1875) (type by original designation). Type locality: Bombay [India].

***Pseudorhaphitoma hervieri* Hedley, 1922 n. comb.**

Plate 13, fig. 178

Anacithara hervieri Hedley, 1922.

Type locality: 5 to 8 fathoms [9-15 m], Murray Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp5, idp7.

Remarks: This species was originally described in the genus *Anacithara* (a genus which is now classified in the Horaiclavidae) but the axially ribbed protoconch is clearly indicative of Mangeliidae. The claviform shells with the high spire, the denticle on the callus of the inner lip, and the granular spiral sculpture is characteristic for the genus *Pseudorhaphitoma* Boettger, 1895.

***Pseudorhaphitoma transitans* Hedley, 1922**

Plate 13, fig. 177

Pseudorhaphitoma transitans Hedley, 1922.

Type locality: 15 fathoms [27 m], Plam Island, Queensland, Australia.

Material examined: New Caledonia, Ile des Pins: st. idp2.

DISCUSSION

While the number of morphotypes observed during this mission seems relatively low compared to the average number of morphospecies reported in the three sites surveyed by the MNHN (approximately 280 species per site), this richness is considered remarkable when taking

into account the limited sampling effort and range of the habitats surveyed. Typical expeditions performed by the MHNH average approximately 500 workdays across all participants for the duration of the mission, compared to a much smaller effort (8 workdays in the field) in the current study. Moreover, only a small portion of the north-western region of Ile des Pins was sampled, with all stations but one within a 4.6 km² proximity. Furthermore, the range of habitats sampled was limited to outer reefs and passages while fringing reefs, intermediate reefs, sea grass beds and other soft bottom habitats were unexplored. In perspective, the area sampled by the Montrouzier expeditions, estimated at 350 km² at Touho and Koumac (Bouchet, 1994), covered a full range of available habitats. Therefore, it is assumed that a comparable sampling effort at Ile des Pins would very likely result in many additional morphotypes.

ACKNOWLEDGMENTS

The mission carried out during February 2019, under permit authorization n° 4296-2018/ARR/DENV and 4525-2018/ARR/DENV, was delivered by the Department of Environment in the South Province of New Caledonia. The customary authorization to collect in Ile des Pins was gracious given on the spot by M. Adrien Apikaoua in absence of the high chief Hilarion Vendegou and we are appreciative of this authorization by M. Apikaoua. We are grateful to the Kunié Diving Club team for their enthusiastic assistance which enabled a successful sampling effort on this trip. We also sincerely thank Charles Laurent, Shawn Wiedrick and Dr Peter Schuchert for their in detailed review of the manuscript. The mission was personally funded by the authors and was additionally supported by the MHNG. The second author is grateful to the Molluscan Science Foundation, Inc. (Owings Mills, U.S.A.), Dr Michael A. Mont and Dr Felix Lorenz for their financial support of his research on turrid taxonomy. Last, but not least, we want to thank M. Pierre Laboute for his kind support in Noumea.

Plate 1

Figs 1-12: Drilliidae

(1) *Clavus bilineatus* (Reeve, 1845), 12.6 mm. (2) *Clavus lamberti* (Montrouzier, 1860) 8.2 mm. (3) *Clavus* aff. *lamberti* (Montrouzier, 1860), 6.2 mm. (4) *Clavus virginiae* Kilburn, Fedosov & Kantor, 2014, 9.3 mm. (5) *Clavus formosus* (Reeve, 1846), 14.4 mm. (6) *Iredalea inclinata* (Sowerby III, 1893), 17.0 mm. (7) *Clavus pica* Reeve, 1843, 22.1 mm. (8) *Clavus picoides* Kilburn, Fedosov & Kantor, 2014, 10.9 mm. (9) *Clavus moquinianus* Montrouzier, 1874, 7.4 mm. (10) *Plagiostropha* sp., 5.3 mm. (11) *Iredalea balteata* (Gould, 1860), 4.4 mm. (12) *Iredalea* cf. *balteata* (Gould, 1860), 4.8 mm.

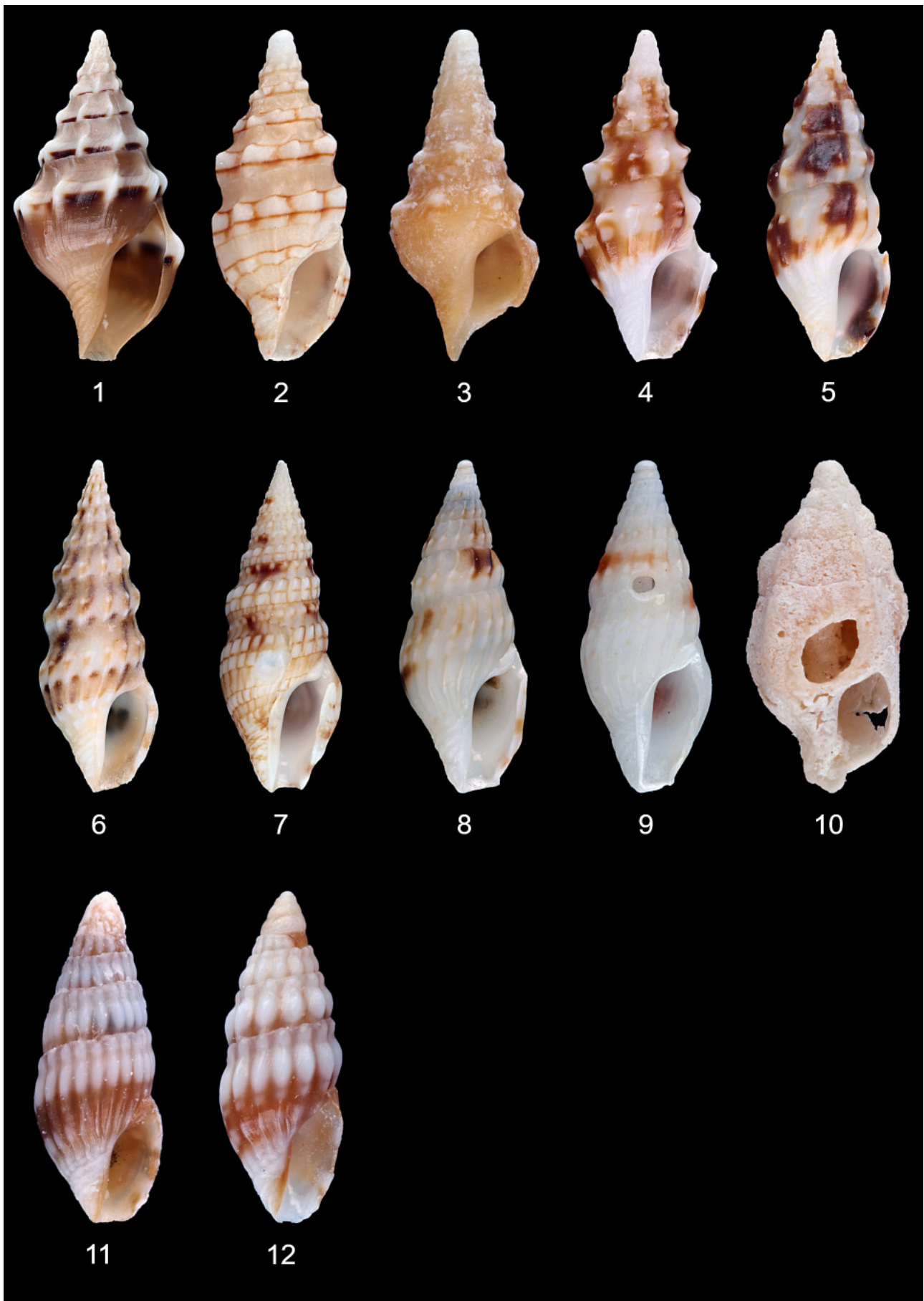


Plate 2

Figs 13-23: Pseudomelatomidae; Horaiclavidae

(13) *Crassispira scala* Kantor, Stahlschmidt, Aznar-Cormano, Bouchet & Puillandre, 2017, 16.6 mm. (14) *Carinapex philippinensis* Wiedrick, 2015, 3.8 mm. (15) *Carinapex amirowlandae* Wiedrick, 2015, 3.3 mm. (16) *Carinapex minutissima* (Garrett, 1873), 2.5 mm. (17) *Carinapex chaneyi* Wiedrick, 2015, 3.5 mm. (18) *Carinapex mooreorum* Wiedrick, 2015, 2.3 mm. (19) *Ceritoturris theoteles* (Melvill & Standen, 1896) 4.5 mm. (20) *Ceritoturris* cf. *theoteles* (Melvill & Standen, 1896) 4.3 mm. (21) *Ceritoturris papillosa* (Garrett, 1873), 2.6 mm. (22) *Ceritoturris* sp.1, 3.3 mm. (23) *Anacithara* cf. *lita* (Melvill & Standen, 1896) 5.3 mm.

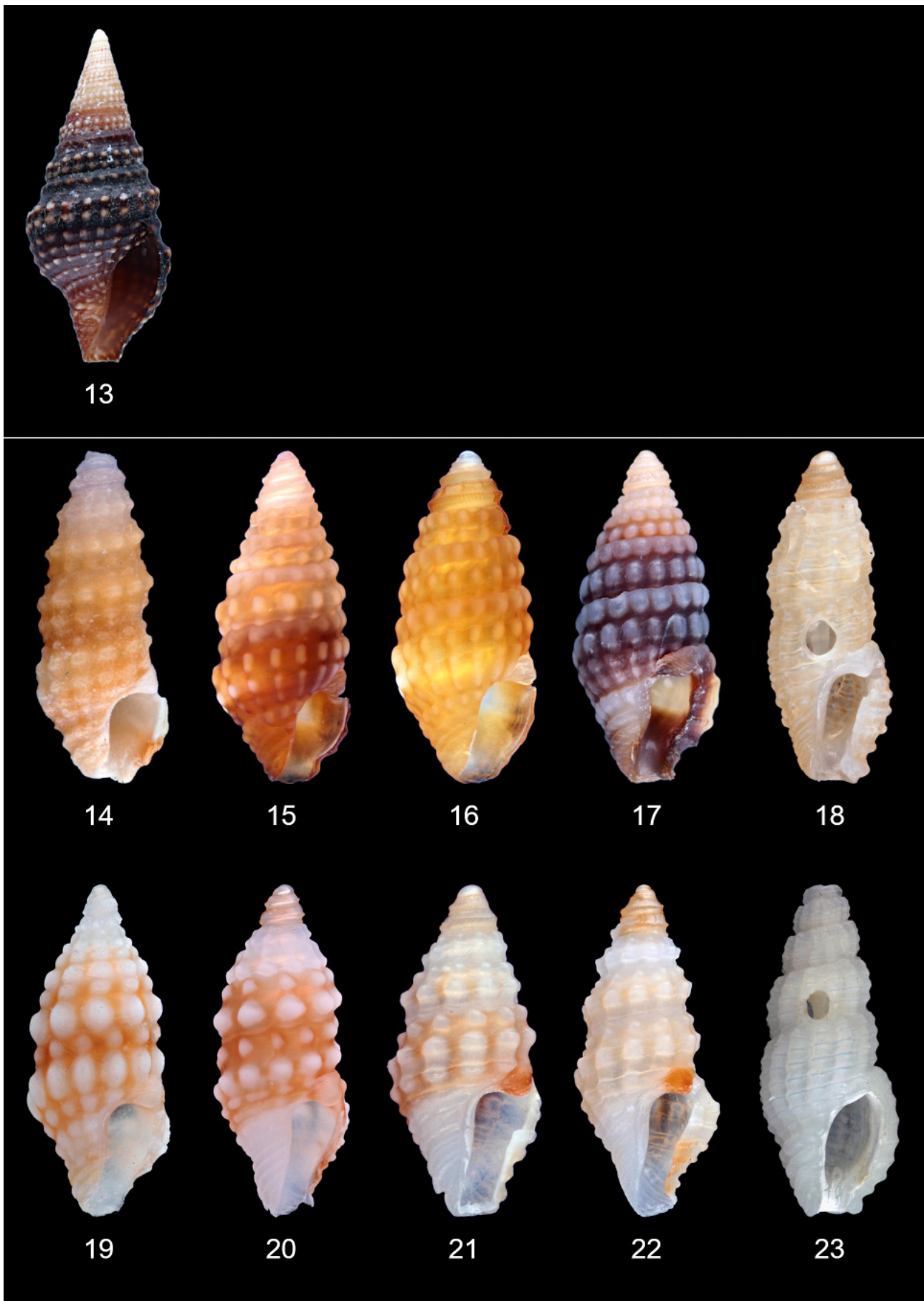


Plate 3

Figs 24-36: Horaiclavidae; Turridae

(24) *Anacithara* sp.3, 6.4 mm. (25) *Anacithara conata* (Hedley, 1909), 4.6 mm. (26) *Anacithara themeropsis* (Melvill & Standen, 1896) 4.3 mm. (27) *Anacithara* cf. *stricta* Hedley, 1922, 4.4 mm. (28) *Graciliclava costata* (Hedley, 1922), 7.3 mm. (29) *Lophiotoma* sp., 33.9 mm. (30) *Turridrupa diffusa* Powell, 1967, 17.5 mm. (31) *Turridrupa* cf. *jubata* (Hinds, 1843), 20.2 mm. (32) *Turridrupa consobrina* Powell, 1967, 13.1 mm. (33) *Turridrupa bijubata* (Reeve, 1843), 13.9 mm. (34) *Xenuroturrus millepunctata* (G.B. Sowerby III, 1909), 31.9 mm. (35) *Xenuroturrus legitima* Iredale, 1929, 37.0 mm. (36) *Iotyrus cingulifera* (Lamarck, 1822), 28.8 mm.

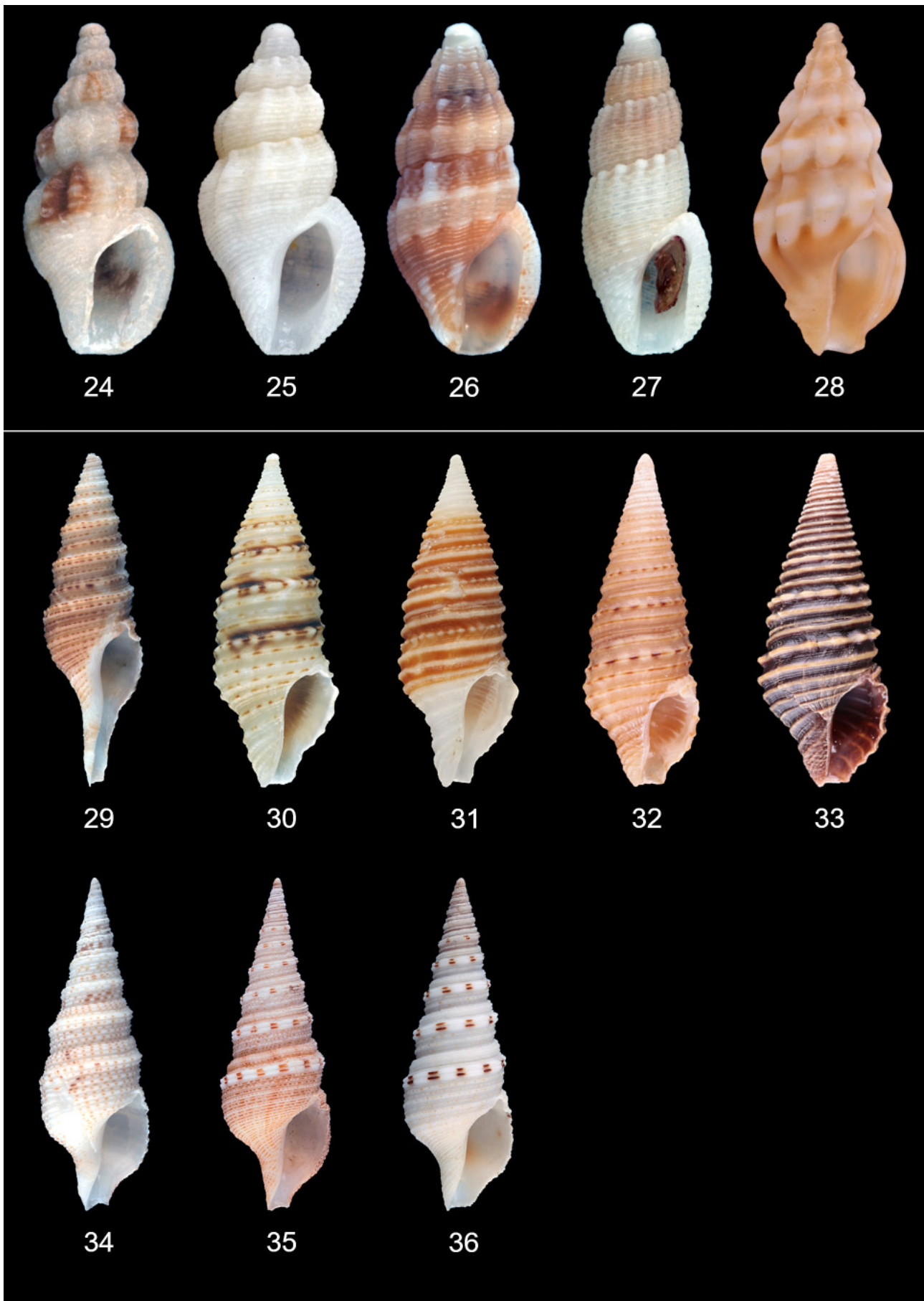


Plate 4

Figs 37-51: Mitromorphidae. (37) *Lovellona atramentosa* (Reeve, 1849), 9.2 mm. (38) *Mitromorpha* sp.6, 7.3 mm. (39) *Mitromorpha drivasi* Chang, 1995, 6.6 mm. (40) *Mitromorpha fisheri* (Hervier, 1900), 5.2 mm. (41) *Mitromorpha* sp.3 6.4 mm. (42-43) *Mitromorpha metula* (Hinds, 1843), 3.6 mm, 5.3 mm. (44) *Mitromorpha sublachryma* (Hervier, 1900), 6.2 mm. (45) *Mitromorpha* cf. *sublachryma* morph 1 (Hervier, 1900), 6.5 mm. (46) *Mitromorpha* cf. *sublachryma* morph 2 (Hervier, 1900), 9.1 mm. (47) *Mitromorpha* cf. *sublachryma* morph 3 (Hervier, 1900), 4.8 mm. (48) *Mitromorpha inornata* (Hervier, 1900), 4.6 mm. (49) *Mitromorpha* sp. 5, 6.2 mm. (50) *Mitromorpha iozona* (Hervier, 1900), 5.4 mm. (51) *Mitromorpha alphonsiana* (Hervier, 1900), 5.5 mm.

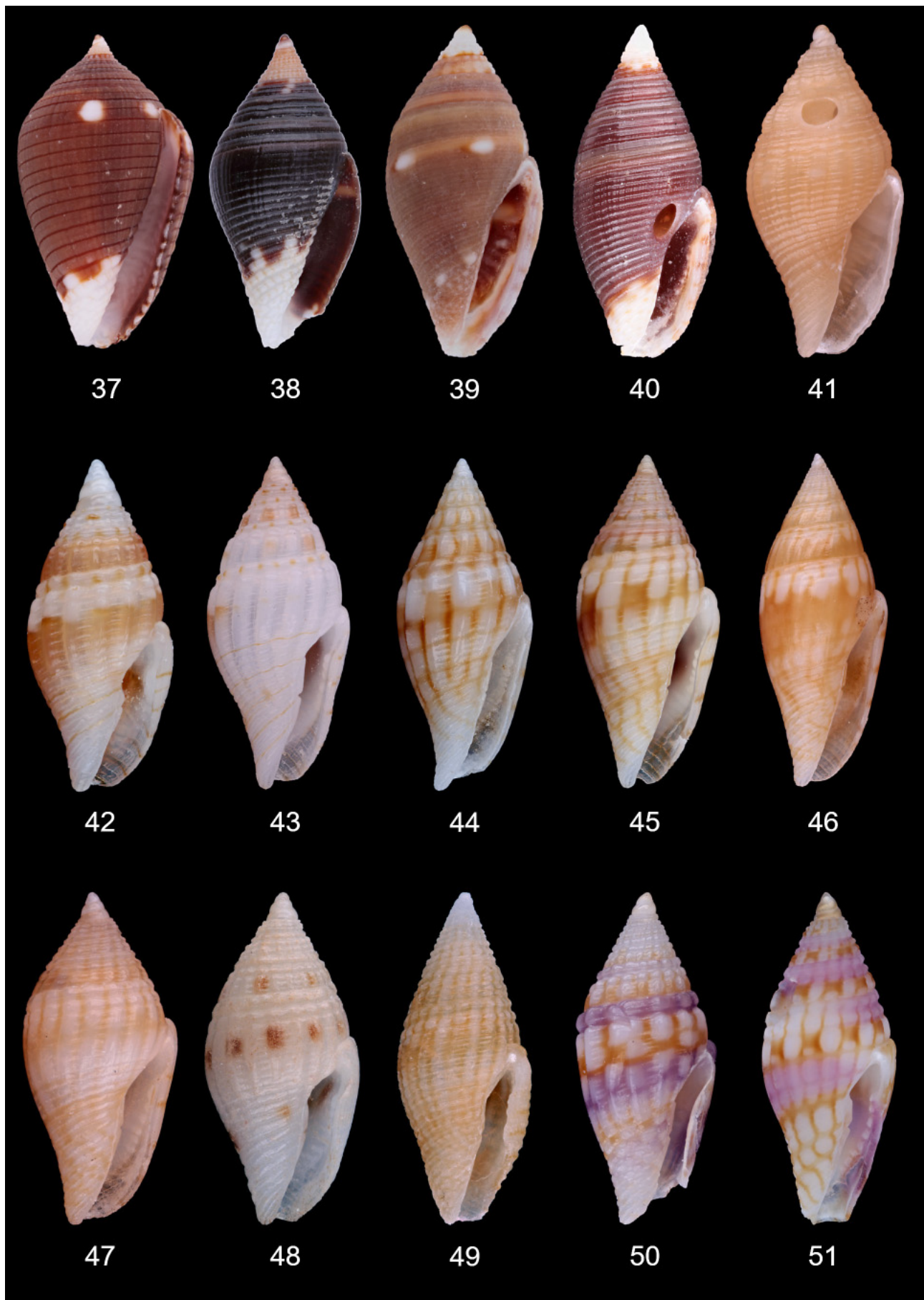


Plate 5

Figs 52-63: Mitromorphidae; Clathurellidae. (52) *Mitromorpha salisburyi* (Cernohorsky, 1978), 4.3 mm. (53) *Mitromorpha* aff. *thalaoides* (Chino & Stahlschmidt, 2014), 4.7 mm. (54) *Nannodiella acricula* (Hedley, C., 1922), 3.1 mm. (55) *Nannodiella* cf. *tortilabia* (Hedley, C., 1922), 3.4 mm. (56) *Acrista pusilla* (Dunker, 1871), 4.0 mm. (57) *Acrista latirella* (Melvill, Standen, 1896), 3.5 mm. (58) *Acrista tuberculifera* (Hervier, 1896), 4.8 mm. (59) *Acrista nana* (Hervier, 1896), 6.3 mm. (60) *Lienardia compta* (Reeve, 1845), 7.3 mm. (61) *Lienardia* sp. 1, 8.1 mm. (62) *Lienardia* sp. 2, 4.9 mm. (63) *Clathurella verrucosa* Stahlschmidt, Poppe & Tagaro, 2018, 4.7 mm.

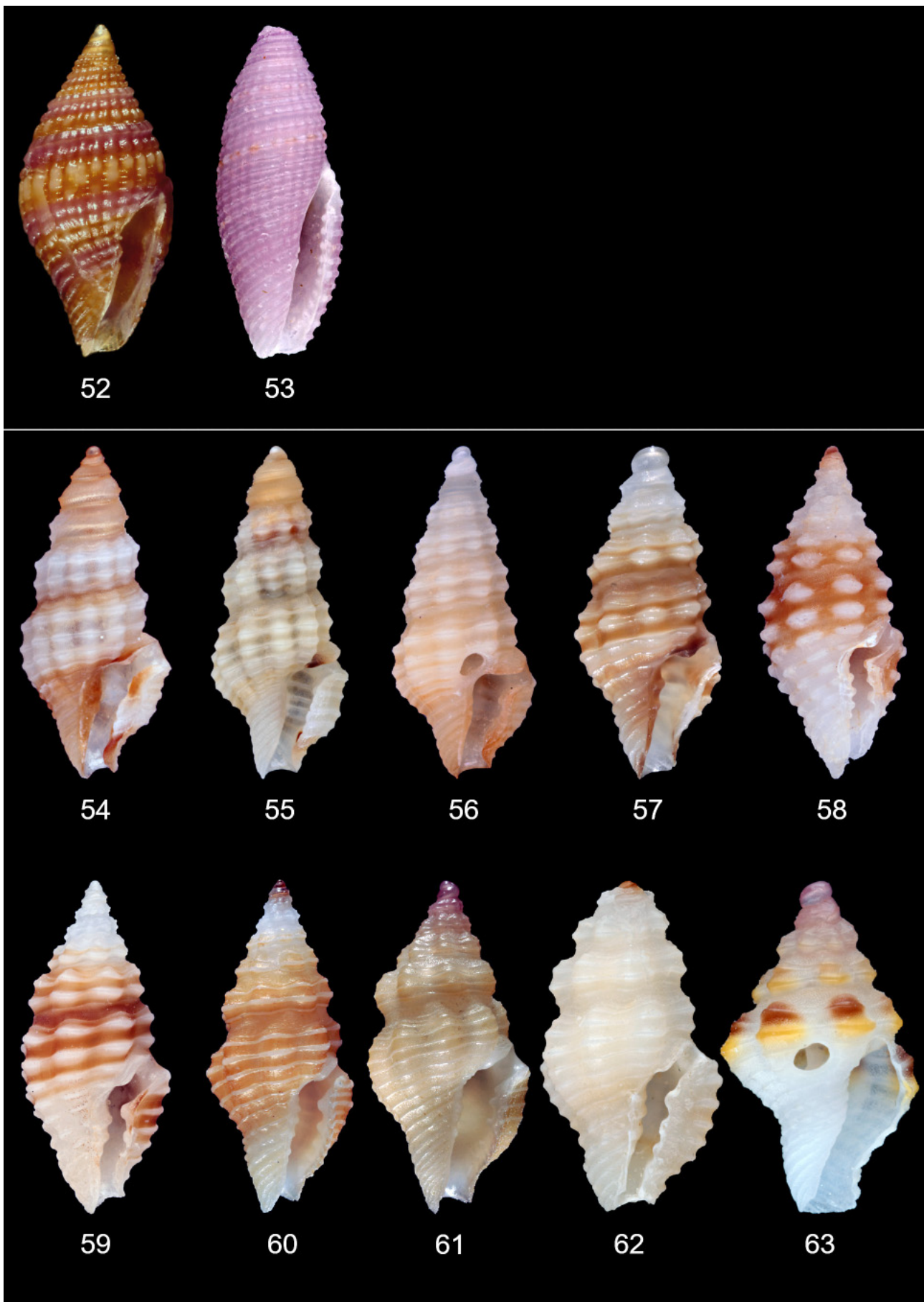


Plate 6

Figs 64-78: Clathurellidae. (64) *Lienardia fallax* (G. Nevill & H. Nevill, 1875), 4.4 mm. (65) *Lienardia tricolor* (Brazier, 1876), 6.4 mm. (66) *Lienardia mighelsi* Iredale & Tomlin, 1917, 6.3 mm. (67) *Lienardia giliberti* (Souverbie, S.M. in Souverbie, S.M. & R.P. Montrouzier, 1874), 7.4 mm. (68) *Lienardia roseotincta* (Montrouzier in Souverbie & Montrouzier, 1872), 7.7 mm. (69) *Lienardia* aff. *vultuosa* (Reeve, 1845), 10.9 mm. (70) *Etrema* sp. 1, 10.0 mm. (71) *Etrema* sp. 1b, 11.5 mm. (72) *Etrema* sp. 1c, 6.5 mm. (73) *Etrema* cf. *polydesma* Hedley, 1923, 4.3 mm. (74) *Etrema* sp. 6, 6.7 mm. (75) *Etrema* aff. *crassilabrum* (Reeve, 1843), 8.5 mm. (76) *Etrema* cf. *crassilabrum* (Reeve, 1843), 11.6 mm. (77) *Etrema* cf. *glabriplicatum* (Sowerby III, 1913), 9.5 mm. (78) *Etrema* sp. 5, 4.0 mm.

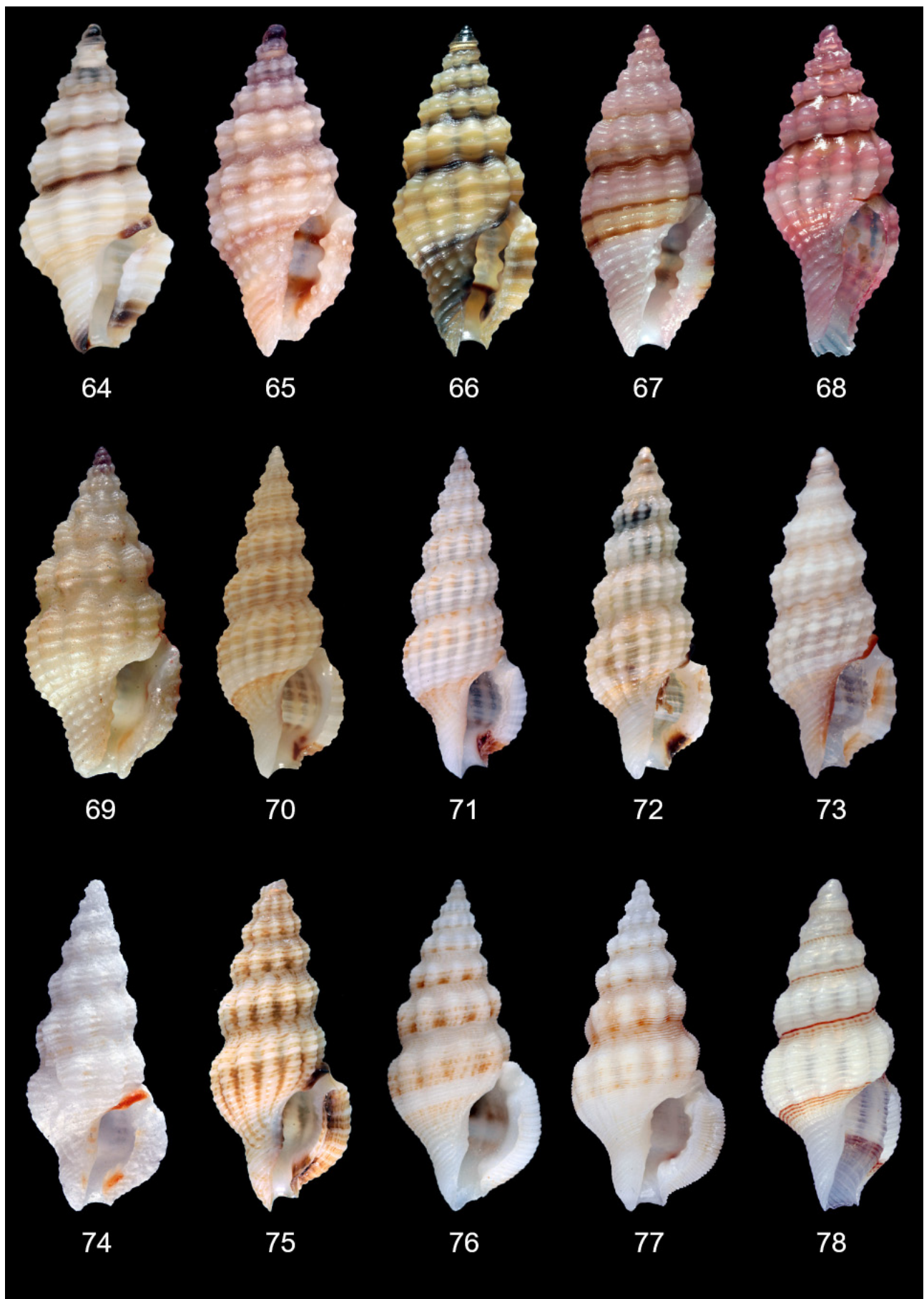


Plate 7

Figs 79-93: Raphitomidae. (79) *Hemilienardia homochroa* (Hedley, 1922), 3.8 mm. (80) *Hemilienardia malleti* (Récluz, 1852), 4.4 mm. (81) *Hemilienardia mikesevernsi* Wiedrick, 2017, 4.1 mm. (82) *Hemilienardia* cf. *gemmulata* Wiedrick, 2017, 6.9 mm. (83) *Hemilienardia calcicincta* (Melvill & Standen, 1895), 3.4 mm. (84) *Hemilienardia idiomorpha* (Hervier, 1897), 4.1 mm. (85) *Hemilienardia acinonyx* Fedosov *et al.*, 2017, 7.5 mm. (86) *Hemilienardia* sp., 4.0 mm. (87) *Hemilienardia shawnmilleri* Wiedrick, 2017, 5.0 mm. (88) *Pseudodaphnella* sp.10, 4.5 mm. (89) *Pseudodaphnella thereganum* (Melvill & Standen, 1896), 6.9 mm. (90) *Pseudodaphnella* sp. 12, 6.4 mm. (91) *Pseudodaphnella* sp.15, 5.9 mm. (92) *Pseudodaphnella* sp. 8, 6.5 mm. (93) *Pseudodaphnella tigroidella* (Hervier, 1896), 7.2 mm.

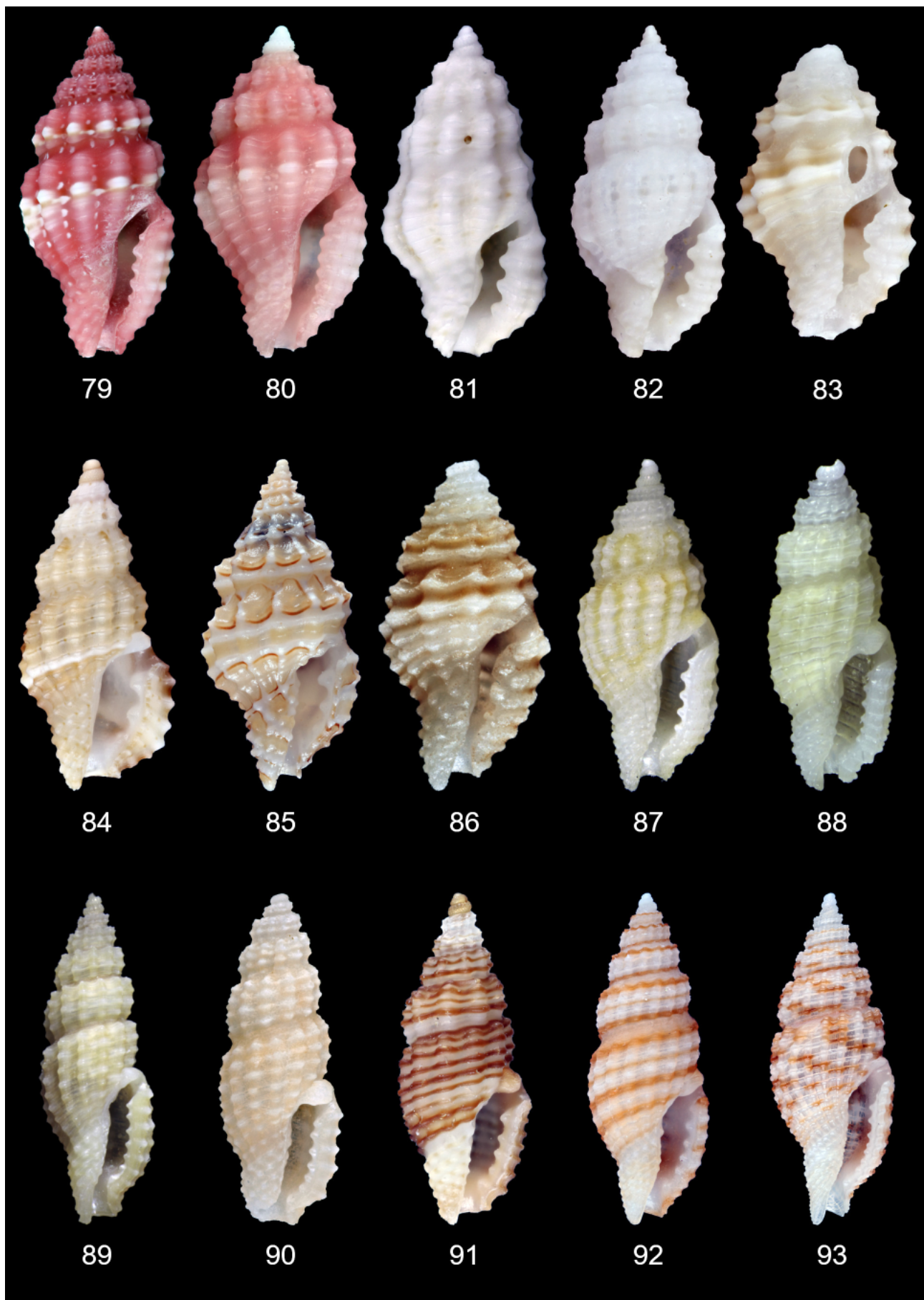


Plate 8

Figs 94-108: Raphitomidae. (94) *Pseudodaphnella caletria* (Melvill & Standen, 1896), 6.0 mm. (95) *Pseudodaphnella* sp. 11, 4.3 mm. (96) *Pseudodaphnella* sp. 9, 7.3 mm. (97) *Pseudodaphnella* sp.14, 3.0 mm. (98) *Pseudodaphnella infrasulcata* (Garrett, 1873), 6.9 mm. (99) *Exomilus compressus* Fedosov & Puillandre, 2012, 3.6 mm. (100) *Pseudodaphnella spyridula* (Melvill & Standen, 1896), 2.9 mm. (101) *Exomilus edychrous* (Hervier, 1897), 3.2 mm. (102) *Kermia benhami* Oliver, 1915, 3.1 mm. (103) *Kermia* cf. *benhami* Oliver, 1915, 3.1 mm. (104-106) *Kermia* sp. 20., 3.3 mm, 2.9 mm, 3.3 mm. (107) *Pseudodaphnella granosa* (Dunker, 1871), 5.5 mm. (108) *Pseudodaphnella* aff. *drupelloides* (Kilburn, 2009), 3.5 mm.

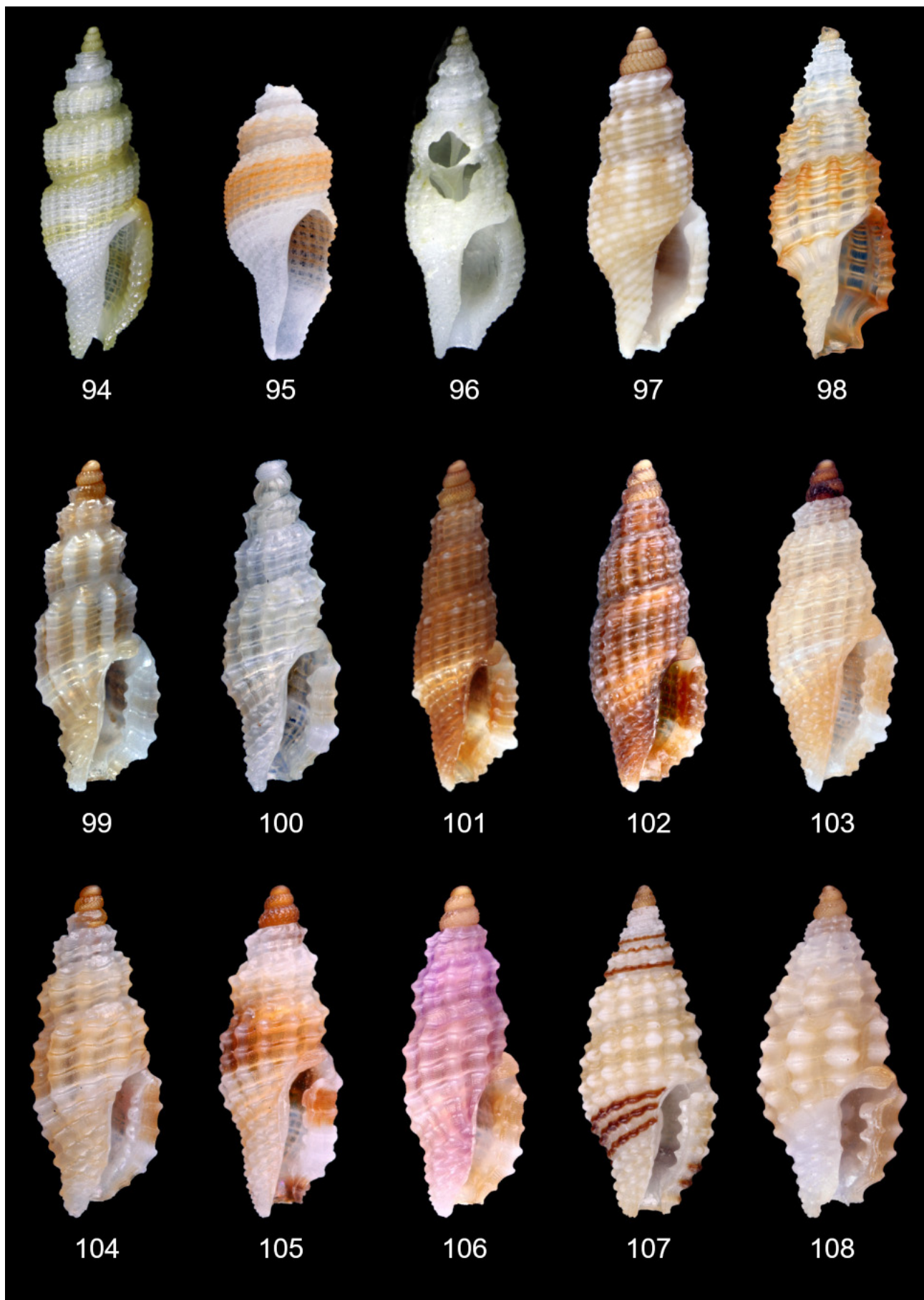


Plate 9

Figs 109-123: Raphitomidae. (109) *Pseudodaphnella* sp. 21, 5.2 mm. (110) *Pseudodaphnella* cf. *barnardi* (Brazier, 1876), 4.1 mm. (111) *Pseudodaphnella* cf. *tinctoria* (Reeve, 1846), 4.9 mm. (112) *Pseudodaphnella aureotincta* (Hervier, 1897), 7.0 mm. (113) *Pseudodaphnella fallax* Fedosov & Puillandre, 2012, 5.0 mm. (114) *Pseudodaphnella* aff. *lineata* Fedosov & Puillandre, 2012, 4.5 mm. (115) *Pseudodaphnella martensi* (G. Nevill & H. Nevill, 1875), 4.4 mm. (116) *Pseudodaphnella santos* Fedosov & Puillandre, 2012, 5.3 mm. (117) *Kermia episema* (Melvill & Standen, 1896), 3.1 mm. (118) *Pseudodaphnella rubroguttata* (Adams, 1872), 8.3 mm. (119) *Pseudodaphnella* cf. *rubroguttata* (Adams, 1872), 6.1 mm. (120) *Pseudodaphnella* aff. *punctifera* (Garrett, 1873), 4.4 mm. (121) *Pseudodaphnella punctifera* (Garrett, 1873), 4.5 mm. (122) *Kermia melanoxylum* (Hervier, 1896), 5.7 mm. (123) *Pseudodaphnella caelata* (Garrett, 1873), 4.6 mm.



Plate 10

Figs 124-138: Raphitomidae. (124) *Pseudodaphnella hadfieldi* (Melvill & Standen, 1895), 7.9 mm. (125) *Pseudodaphnella producta* (Pease, 1860), 4.9 mm. (126) *Pseudodaphnella daedalea* (Garrett, 1873), 6.8 mm. (127) *Pseudodaphnella* cf. *apicalis* (Montrouzier in Souverbie, 1861), 4.8 mm. (128) *Pseudodaphnella thespesia* (Melvill & Standen, 1896), 5.5 mm. (129) *Pseudodaphnella philippinensis* (Reeve, 1843), 16.9 mm. (130) *Tritonoturris cumingii* (Powys, 1835), 5.2 mm. (131) *Tritonoturris* sp. 1, 6.6 mm. (132) *Tritonoturris* cf. *subrissoides* (Hervier, 1897), 4.8 mm. (133) *Tritonoturris subrissoides* (Hervier, 1897), 8.1 mm. (134) *Tritonoturris lifouana* (Hervier, 1897), 7.2 mm. (135) *Daphnella* sp. 3, 5.0 mm. (136) *Daphnella vitrea* Garrett, 1873, 4.3 mm. (137) *Eucyclotoma* cf. *tricarinata* (Kiener, 1839), 4.7 mm. (138) *Eucyclotoma bicarinata* (Pease, 1863), 4.7 mm.



Plate 11

Figs 139-153: Raphitomidae. (139) *Eucyclotoma carinulata* (Souverbie, 1875), 4.7 mm. (140) *Austrodaphnella torresensis* Shuto, 1983, 3.9 mm. (141) *Daphnella pluricarinata* (Reeve, 1845), 5.2 mm. (142) *Kuroshiodaphne* aff. *supracancellata* (Schepman, 1913), 15.2 mm. (143) *Daphnella ornata* Hinds, 1844, 11.7 mm. (144) *Diaugasma olyra* (Reeve, 1845), 8.0 mm. (145) *Daphnella canaliculata* Ardovini, 2009, 7.6 mm. (146) *Daphnella* sp. 2, 4.1 mm. (147) *Tritonoturris menecharmes* (Melvill, 1923), 11.7 mm. (148) *Vepracula* aff. *spanionema* (Melvill, 1917). (149) *Vepracula vacillata* Hedley, 1922, 4.9 mm. (150) *Vepracula* sp. 2, 4.9 mm. (151) *Vepracula* aff. *vepratica* (Hedley, 1903), 4.4 mm. (152) *Vepracula* sp.1, 5.8 mm. (153) *Microdaphne morrisoni* Rehder, 1980, 3.2 mm.



Plate 12

Figs 154-166: Raphitomidae; Mangeliidae. (154) *Thetidos* cf. *morsura* (Hedley, 1899), 4.5 mm. (155) Raphitomid sp., 3.1 mm. (156) *Pleurotomella* cf. *itama* (Melvill, 1906), 4.9 mm. (157) *Eucithara* cf. *harpellina* (Hervier, 1897), 4.9 mm. (158) *Eucithara* cf. *lepidella* (Hervier, 1897), 6.8 mm. (159) *Eucithara* cf. *isseli* (G. Nevill & H. Nevill, 1875), 8.2 mm. (160) *Eucithara celebensis* (Hinds, 1843), 7.1 mm. (161-162) *Eucithara crystallina* (Hervier, 1897), 5.0 mm, 4.4 mm. (163) *Eucithara souverbiei* (Tryon, G.W. 1884), 5.2 mm. (164-165) *Gingicithara notabilis* (E. A. Smith, 1888), 3.9 mm, 3.4 mm. (166) *Heterocithara* sp. 13, 6.4 mm.

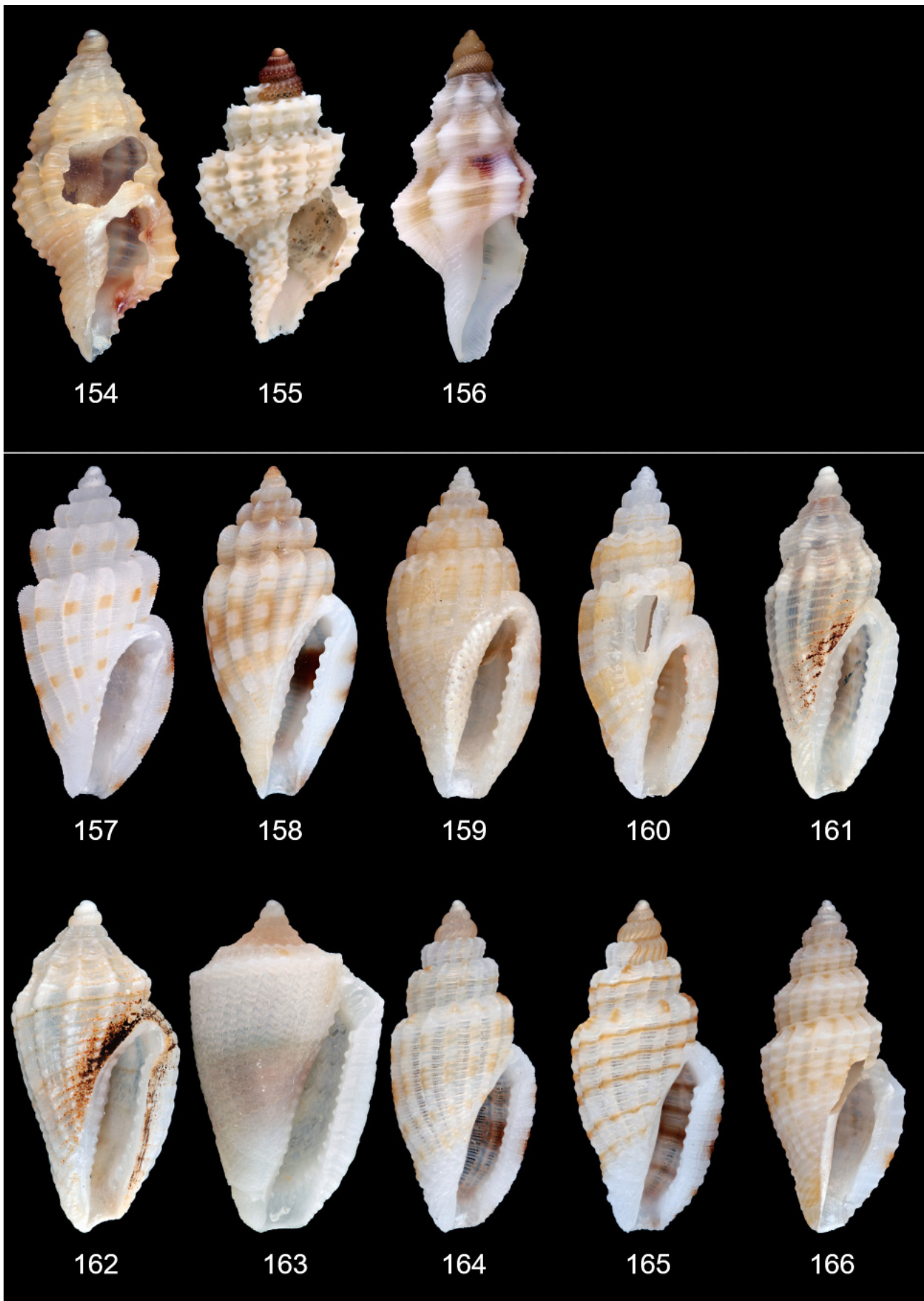
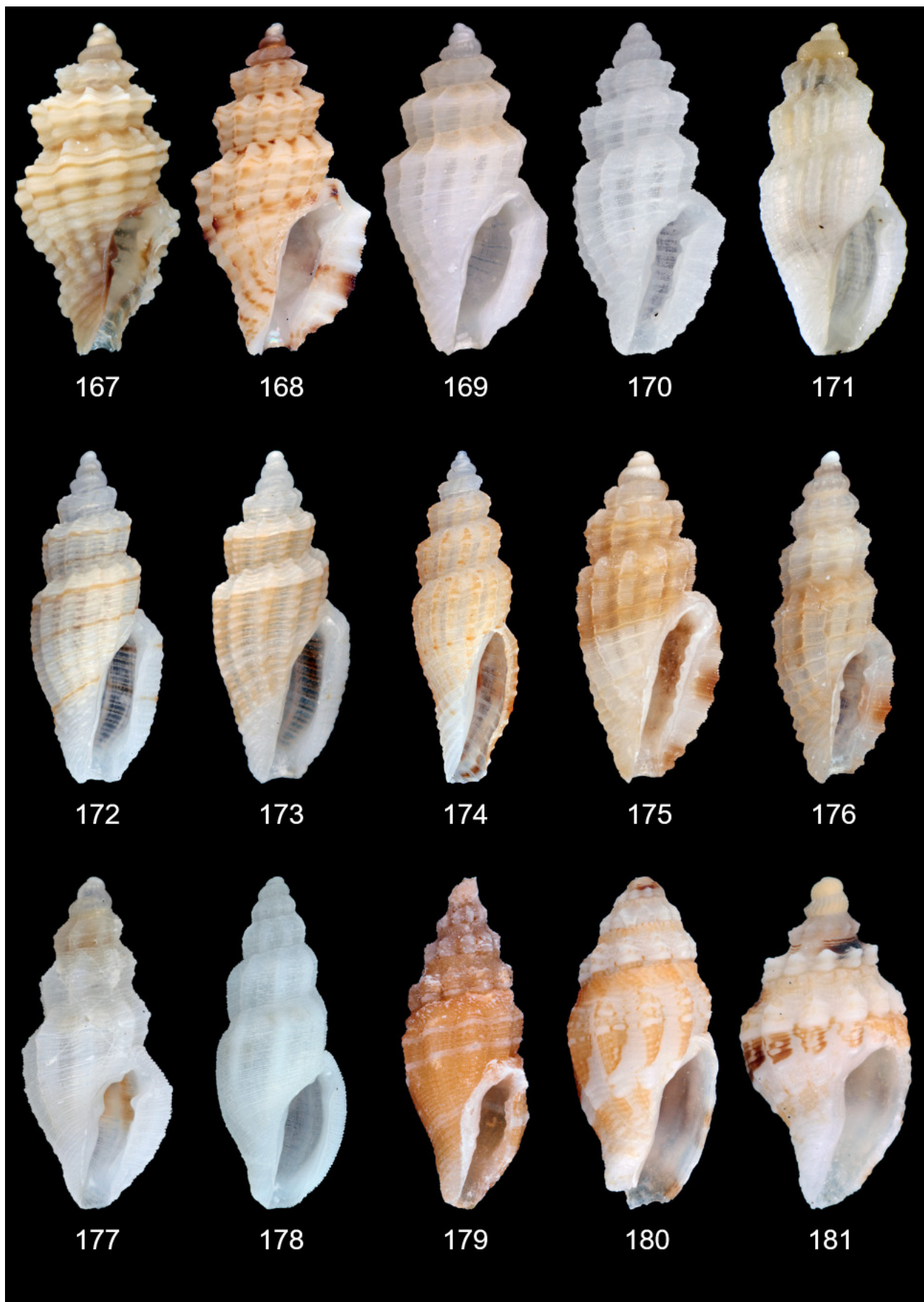


Plate 13

Figs 167-181: Mangeliidae. (167) *Heterocithara strombillum* (Hervier, 1896), 3.5 mm. (168) *Heterocithara himerta* (Melvill & Standen, 1896), 5.3 mm. (169) *Heterocithara* sp. 14, 4.3 mm. (170) *Heterocithara* sp. 16, 3.6 mm. (171) *Heterocithara* sp. 17, 4.0 mm. (172-173) *Heterocithara isophanes* (Hervier, 1897), 4.2 mm, 3.8 mm. (174) *Heterocithara* sp. 18, 6.8 mm. (175) *Heterocithara diatula* Hervier, 1897, 3.3 mm. (176) *Heterocithara* sp. 19, 3.3 mm. (177) *Pseudorhaphitoma transitans* Hedley, 1922, 3.3 mm. (178) *Pseudorhaphitoma hervieri* Hedley, 1922, 5.0 mm. (179) *Macteola thalycra* (Melvill & Standen, 1896), 6.0 mm. (180) *Macteola* cf. *interrupta* (Reeve, 1846), 5.4 mm. (181) *Macteola* cf. *interrupta* (Reeve, 1846), juvenile 3.3 mm.

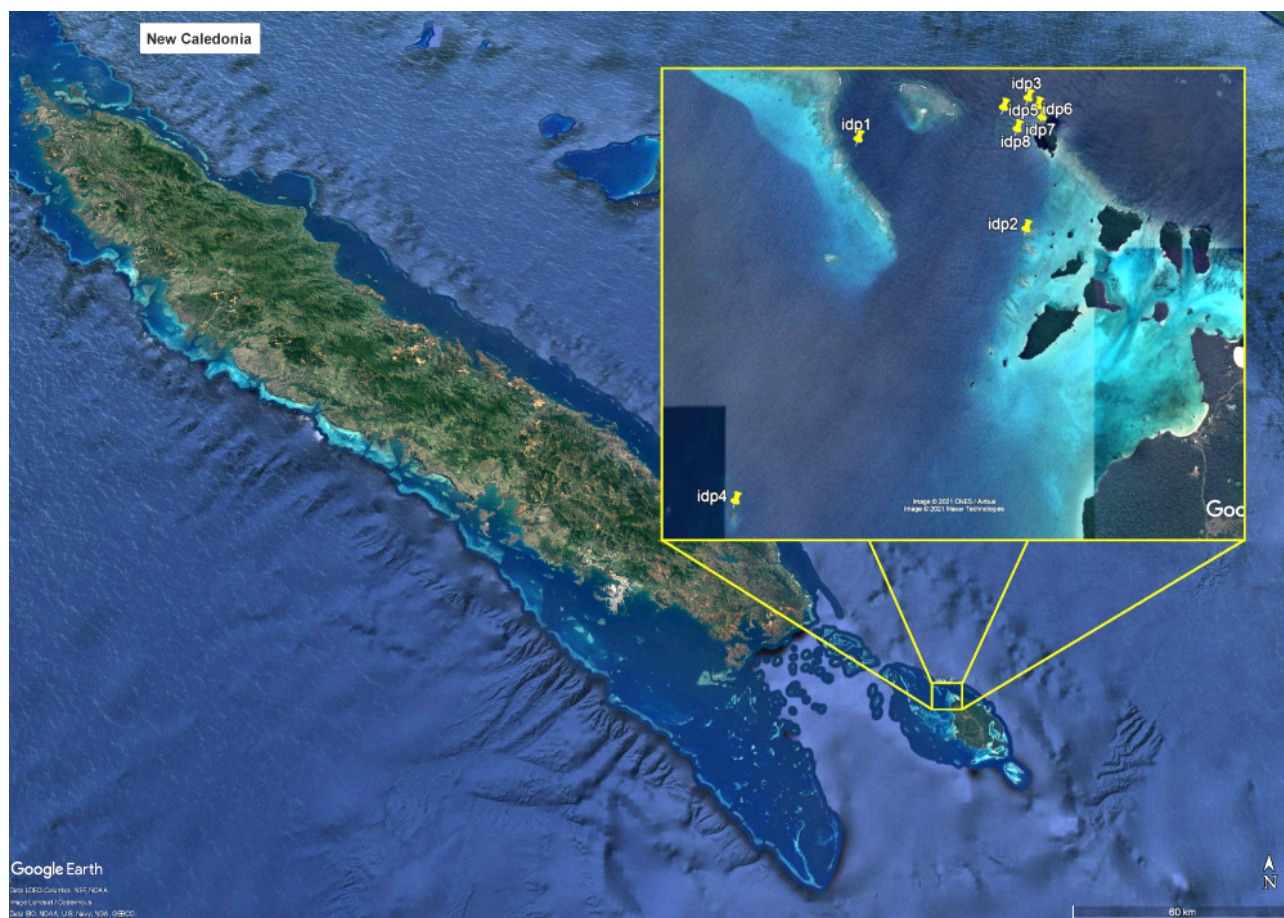


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Annex 1: Overview of the sampling sites**Annex 2:** Dive stations

Station	Latitude	Longitude	Depth min. [m]	Depth max. [m]	Date
idp1	22°31.054' S	167°23.383' E	8	20	03/02/2019
idp2	22°31.641' S	167°24.571' E	6	15	03/02/2019
idp3	22°30.787' S	167°24.586' E	16	27	04/02/2019
idp4	22°33.414' S	167°22.515' E	8	17	04/02/2019
idp5	22°30.848' S	167°24.412' E	16	27	05/02/2019
idp6	22°30.839' S	167°24.653' E	9	22	05/02/2019
idp3.2	22°30.787' S	167°24.586' E	24	25	07/02/2019
idp5.2	22°30.848' S	167°24.412' E	22	24	07/02/2019
idp7	22°30.912' S	167°24.684' E	13	23	08/02/2019
idp8	22°30.989' S	167°24.508' E	6	21	08/02/2019
idp piscine	22°35'2.22»S	167°31'40.72»E	0.5	2	06/02/2019