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The Umboniinae (Mollusca: Gastropoda: Trochidae) of New Caledonia, with descriptions of two new genera and eight new species, plus an additional new species from the Bismarck Sea

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Abstract. All species of Umboniinae known to occur in New Caledonia are discussed (19 species, 8 new, belonging to 10 genera, 2 new) and a key to genera is provided. An additional new species is described from the Bismarck Sea. Nine species are perhaps endemic to New Caledonia. The diversity of the fauna is comparable to that of Japan and Australia, both regions of much greater extent and spanning a much broader latitudinal range. *Ethalia lampra* (Watson, 1880), previously known only from the original HMS *Challenger* material from Fiji, has been rediscovered in New Caledonia. Re-examination of the type material of *Monilea apicina* Gould, 1861 has led to a re-interpretation of the application of this name. Type specimens of a number of additional umboniine species examined for comparison are illustrated. Two new genera are proposed: *Kanakina* gen. nov. and *Tylorhaphe* gen. nov. Nine new species are described: *Ethalia anomphala* sp. nov., *Ethminolia hickmanae* sp. nov., *Sericominolia porcata* sp. nov., *S. safrocincta* sp. nov., *Talopena maestratii* sp. nov., *Tylorhaphe alisae* gen. et sp. nov., *T. fritillaria* gen. et sp. nov., *T. luteopicta* gen. et sp. nov. and *T. wallacei* gen. et sp. nov. Revised status: *Talopena* Iredale, 1918 is recognised as a full genus rather than a subgenus or synonym of *Monilea* Swainson, 1840. *Minolia agapeta* Melvill & Standen, 1896 is considered a distinct species, no longer to be regarded as a junior synonym of *Monilea apicina* Gould, 1861. *Trochus* (*Monilea*) *lifuanus* Fischer, 1878 is considered a distinct species, no longer to be regarded as a junior synonym of *Monilea vernicosa* Gould, 1861. New combinations: *Monilea incerta* Iredale, 1912 is reassigned to *Talopena* Iredale, 1918; *Monilea apicina* Gould, 1861, *Monilea menkei* A. Adams, 1855, *Monilea philippii* A. Adams, 1855, *Pseudominolia tramieri* Poppe, Tagaro & Dekker, 2006, *Trochus belcheri* Philippi, 1850, *Trochus calyculus* W. Wood, 1828, and *Trochus* (*Monilea*) *masoni* G. Nevill & H. Nevill, 1874 are all referred to *Talopena* Iredale, 1918. *Minolia glaphyrella* Melvill & Standen, 1895 is transferred to *Kanakina* gen. nov. Type localities: Nouméa, New Caledonia is designated as the type locality for *Trochus nucleus* Philippi 1850; the type locality 'Port Jackson' originally given for *Monilea apicina* Gould, 1861 is considered erroneous and is emended to Lansdowne Bank. New records for New Caledonian marine ecoregion: *Ethalia lampra* (Watson, 1880), *Talopena apicina* (Gould, 1861) and '*Talopena*' *tramieri* (Poppe, Tagaro & Dekker, 2006).

Keywords. Umboniinae, New Caledonia, taxonomy, new genera, new species.

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Introduction

The Umboniinae H. Adams & A. Adams, 1854 (1840) comprise a well-defined subfamily within the Trochidae Rafinesque, 1815, characterised primarily by their unusual radula with reduced teeth in the central field. Additional distinctive morphological features are also commonly present, such as long up-curving eyestalks with large eyes, a subterminally papillate snout and a medially bifid propodium with pinched-in, trigonal antero-lateral lobes (Hickman & McLean 1990). In a phylogenetic study involving morphological, behavioural and ecological characters, Hickman (1996) showed umboniine taxa to cluster as a monophyletic entity. More recent molecular studies (Williams *et al*. 2010, 2024) have also provided strong support for the monophyly of Umboniinae as a clade within the Trochidae. This independently corroborates previous morphology-based conclusions and will allow the future mapping of morphological characters onto molecular trees in the search for congruent patterns (Lee & Palci 2015).

Considerable diversity in shell morphology is evident within the subfamily, ranging from depressed lenticular (*Umbonium* Link, 1807) to turbiniform (*Rossiteria* Brazier, 1895) and even turriform (*Bankivia* Krauss, 1848), and shells may be smooth and glossy or sculptured with strong spiral cords. There is likewise substantial diversity in the external morphology of the animal, particularly the form of the left neck-lobe, the width of the forehead and snout, and the structure of the ctenidium. In less specialised genera such as *Ethalia* H. Adams & A. Adams, 1854 and *Talopena* Iredale, 1918, the external anatomy is conventionally trochid with a broad forehead and snout, a simply digitate left neck-lobe and a bipectinate ctenidium. In more highly specialised genera, however, such as *Umbonium*, the snout and forehead are reduced, the left neck-lobe elaborately divided and the ctenidium monopectinate (Fretter 1975). Such modifications are associated with a facultative filter-feeding mode of life. Similarly, whilst the eyestalks are usually long and up-curved, and the eyes large in most umboniines, in one less specialised genus (*Kanakina* gen. nov.) the eyestalks and eyes are of a size more typical of other trochids (see below). Yet in the highly specialised *Bankivia* and *Isanda* H. Adams & A. Adams, 1854 they are reduced or lost (Hickman & McLean 1990; Hickman 2003).

Hickman & McLean (1990) provided the first detailed systematic treatment of the Umboniinae, noting that it represented a marked evolutionary departure from the conventional trochid mode of life on hard substrata to one primarily associated with unconsolidated sediments. Subsequently, Herbert (1992) and Hickman (1998) have provided further details. Hickman & McLean (1990) subdivided the subfamily into three tribes, Monileini [=Talopiini], Bankiviini and Umboniini, exhibiting increasing levels of specialisation. However, they created a new subfamily, Lirulariinae, for *Lirularia* Dall, 1909. Subsequent studies have questioned the distinctness of *Lirularia* (Herbert 1992) and molecular data have shown that the genus belongs within the Umboniinae (Williams *et al*. 2010, 2024). Hickman (2003) later proposed a fourth tribe, Isandini, for the distinctive *Isanda*. At present, albeit with limited taxon representivity, the molecular data do not show any clustering of taxa consistent with the above tribal groups and they are not currently recognised as accepted entities (Williams *et al*. 2024; MolluscaBase 2024). For this reason, I have not employed a formal classification of genera below subfamily level.

The above notwithstanding, there are clear morphological similarities shared by some genera which point to patterns of relatedness. At present, however, our knowledge of umboniine morphology remains fragmentary and the information often does not relate to the type species of the genera concerned. A further complication is the fact that generic names have been used without precision, sometimes as hold-all taxa of convenience, for assemblages of dubiously related taxa, notably *Ethminolia* Iredale, 1924 and *Monilea* Swainson, 1840. This is chiefly because the relevant information regarding their type species is not available. In due course, the current generic referral of many species is likely to change. Teasing out patterns of relatedness amongst umboniine genera will require detailed, integrative studies combining morphological and molecular data, and must include that for type species. Currently, the picture is a confused one and the dataset is not adequately representative of the group. As a temporary

measure, I divide the New Caledonian genera into two groups based on differences in radula morphology. Currently, there is no definitive molecular support for these groups, but this may be due partly to the lack of resolution at lower levels within the molecular phylogeny (Williams *et al*. 2024) and partly to the fact that the groups themselves are almost certainly composite. Further subdivision will doubtless be necessary, for which the existing tribal names may be appropriate. In the meantime, much anatomical work needs to be done to provide a more complete dataset of morphological characters.

Umboniines are generally considered to be shallow-water molluscs, living in or on unconsolidated sediments in intertidal and nearshore habitats (mostly < 50 m). Whilst these are often low-energy environments, species of *Bankivia* and *Leiopyrga* H. Adams & A. Adams, 1863, and *Zethalia* Finlay, 1926 reportedly favour open, high-energy beaches (Walsby & Morton 1982; Hickman & McLean 1990; Ponder *et al.* 2020). In contrast species of *Lirularia* are associated with shallow-water rock and algal habitats (McLean 1986). The present study has also shown that one lineage at least, has colonised deeper-water habitats, extending to over 300 m. Species belonging to this lineage, described herein as *Tylorhaphe* gen. nov., resemble solariellids and have often been identified as such.

Most umboniine species are poorly known from a biological perspective and summaries of the limited information available were provided by Hickman & McLean (1990) and (Herbert 1992). Subsequently, Hickman (1998) has added further data with an Australian focus and has provided a detailed study of the anatomy and mode of life of *Isanda coronata* A. Adams, 1854 (Hickman 2003). The most specialised genera (*Bankivia*, *Isanda*, *Leiopyrga*, *Pseudominolia* Herbert, 1992 and *Umbonium*) are thought to combine facultative filter-feeding with selective deposit feeding, but the less specialised genera are most likely non-selective deposit-feeders. Some of the smallest species (e.g. those belonging to *Vanitrochus* Iredale, 1929) are considered epipsammic browsers, ingesting the microbial film on sediment grains (Hickman 2008).

Many umboniine taxa exhibit a vigorous escape response involving a rapid thrashing of the foot and twisting of the shell causing the animal to flip-flop or often actively 'swim' away from a predator (Fretter 1975; Kikuchi & Doi 1987; Herbert 1992; Hickman 2003, 2008; Vafiadis 2022). Amongst New Caledonian species, this was noted particularly in *Ethalia montrouzieri* (Souverbie, 1859), *Rossiteria nucleus* (Philippi, 1850) and *Vanitrochus semiustus* (Fischer, 1879). However, Alldredge & King (1977) observed that *V. semiustus* exhibited a diel migration, emerging from the sediment at night and actively swimming into plankton emergence traps, suggesting that swimming may have additional functions.

The earliest collections of New Caledonian species now considered referable to the Umboniinae were made in the mid- to late 19th century, during the era of the missionaries (Héros *et al*. 2007). Prominent amongst these were the catholic fathers Xavier Montrouzier on Grande Terre and Belep, and Pierre Lambert on Lifou, as well as the protestant Rev. James Hadfield and his wife Emma, also on Lifou. Their samples were sent 'home' to recognised experts, amongst whom Saint-Martin Souverbie (Bordeaux), Paul Fischer (Paris), and James Cosmo Melvill (Manchester) [together with Robert Standen (Manchester)] described species treated herein. The present investigation has also revealed that additional umboniine species occurring in New Caledonia were collected during this same time period by the 'US North Pacific Exploring Expedition' (1853–56) and the 'HMS *Challenger* Expedition' (1873–1876).

After a lull in activity during the early and mid-20th century, an energetic campaign initiated by French marine biologists and pursued with particular vigour by the malacology team, led chiefly by Philippe Bouchet, at the Muséum national d'Histoire naturelle, Paris, has resulted in the accumulation of a very large amount of new, well provenanced umboniine material from the New Caledonian marine ecoregion, including undescribed taxa. The purpose of the present contribution is to document this material and in so doing provide clarity regarding the use of some umboniine generic names and strengthen the foundation upon which to base future morphological and molecular studies. At the same time, I take the opportunity to describe a remarkable new umboniine species from Papua-New Guinea that belongs to a new genus described herein.

Material and methods

The material studied has been accumulated over many years. The bulk of samples stem from ORSTOM surveys (1985–1989), Expédition Montrouzier (1993), and subsequent KOUMAC 2.1 (2018) and KOUMAC 2.3 (2019) expeditions. Details of the sampling methods employed were provided by Bouchet (1994), Bouchet *et al*. (2001, 2002). Additional samples were obtained through the personal endeavours of individuals (chiefly Claude Berthault) and during ship-board cruises CHALCAL 1 (1984), CORAIL 2 (1988), MUSORSTOM 6 (1989), SUVA 2 (1998), LIFOU 2000, SALOMON 1 (2001), EXBODI (2011), KAVIENG (2014), KANACONO (2016) and KANADEEP 1 (2017). Given the number of collectors and the extended period over which the material studied was collected, the treatment of live-collected specimens has varied. For the most part, such specimens were initially preserved in 75–80% ethanol without prior relaxation, the bulk of this material was subsequently dried before storage. My observations on external anatomy were made using rehydrated specimens or photographs of living animals. Molecular vouchers collected more recently are stored in 96+% ethanol. All samples are deposited in the MNHN.

Shells were photographed using a Leica Z16 APO apochromatic zoom macroscope and image stacks were then combined using Helicon Focus Pro (Helicon Soft Ltd) to provide extended depth of field. For SEM study specimens were coated with gold and examined at low accelerating voltage (5–10 kV) using a Jeol Neoscope JCM-7000 Benchtop SEM. Radulae were extracted by maceration of the buccal mass in dilute NaOH, rinsed in distilled water and subsequently dehydrated in ethanol, mounted and air-dried on stubs before coating. Following Bouchet *et al.* (2008: 15) the bathymetric range of species is given as the 'inner values' of the depth range of individual samples to provide the most conservative estimate (excepting instances where only a single sample is available).

The conchological characters detailed in the species treatments and those most useful in relation to species discrimination largely concern shell shape and the nature and strength the spiral sculpture (striae, lirae, cords or angular keels), and ontogenetic changes in the latter with growth. In addition, the presence or absence of a somewhat enlarged subsutural cord, with or without beads/nodules is significant. Particularly important are features of umbilical morphology, notably the presence or absence of a peri-umbilical cord or band, an angular umbilical rim, radiating peri-umbilical pleats, a spiral ridge or funicle within the umbilicus (correlated with features on the columella lip), as well as the deposition of callus associated with the parieto-umbilical region. Such features are used extensively in the following key to genera and are illustrated in Fig. 1. The diagnoses given for genera and new species are differential, including only information needed to distinguish them from similar umboniine taxa.

Institutional abbreviations

AMS = Australian Museum, Sydney, Australia
CMNZ = Canterbury Museum, Christchurch, New Zealand
MCZ = Museum of Comparative Zoology, Harvard, USA
MHNBx = Muséum d'Histoire naturelle de Bordeaux, France
MHNG = Muséum d'Histoire naturelle, Geneva, Switzerland
MM = Manchester Museum, Manchester, UK
MNHN = Muséum national d'Histoire naturelle, Paris, France
NHMUK = Natural History Museum, London, UK
NMW = National Museum of Wales, Cardiff, UK
USNM = United States National Museum, Washington, USA

Other abbreviations

D = shell diameter
EEZ = exclusive economic zone

H = shell height
NO = Navire Océanographique
Stn = station

Results

Class Gastropoda
Subclass Vetigastropoda
Superfamily Trochoidea Rafinesque, 1815
Family Trochidae Rafinesque, 1815

Subfamily **Umboniinae** H. Adams & A. Adams, 1854 (1840)

Key to genera of Umboniinae in New Caledonia (Fig. 1)

Note: this key is based solely on shell characters and is only applicable to the umboniine fauna of New Caledonia. Umboniine species from other areas belonging to these genera may not key out to the correct genus using the features specified.

1. Shell lenticular to subglobose; glossy, later whorls essentially smooth, sculptured only with fine incised spiral striae at most; usually with significant callus deposition on base, associated with columella and umbilical region (Fig. 1A)..... ***Ethalia*** H. Adams & A. Adams, 1854 (page 7)
– Shell lenticular to elevated turbiniform; lustreless or somewhat glossy, if glossy then sculptured with numerous fine, close-set spiral lirae or with stronger spiral cords 2

2. Adult shell small, greatest dimension <4.0 mm; peristome complete or nearly so; lacking an umbilical funicle or thickened peri-umbilical cord 3
– Adult shell larger, diameter >4.0 mm; peristome interrupted in parietal region; umbilicus often with a funicle or thickened peri-umbilical cord..... 4

3. Shell very small (diameter <2.5 mm), distinctly wider than high.....
..... ***Ethminolia*** Iredale 1924 (page 98)
– Shell slightly larger (diameter ±3.0 mm), diameter and height similar .....
..... ***Vanitrochus*** Iredale, 1929 (page 121)

4. Shell with conical spire and shallowly indented suture; last adult whorl deep; interior of outer lip with distinct in-running spiral cords; columella lip bearing small nodules; edge of outer lip distinctly notched below periphery (Fig. 1B)..... ***Rossiteria*** Brazier, 1895 (page 42)
– Shell not as above 5

5. Spiral sculpture relatively uniform, comprising numerous fine, close-set lirae only, lacking stronger cord-like elements..... 6
– Shell not as above 7

6. Shell small (adult diameter <8.0 mm, usually <6.0 mm); spiral sculpture on spire whorls coarser than on final whorl; umbilical region commonly pale to deep pink, with axial pliculae radiating on to base ..... ***Ethaliella*** Pilsbry, 1905 (page 92)
– Shell larger (adult diameter up to 14.0 mm); spiral sculpture of more or less even strength throughout; umbilical region variously coloured (white, green-brown, reddish or yellow), but never pink and base lacking distinct axial pliculae ..... ***Sericominolia*** Kuroda & Habe, 1954 (page 54)

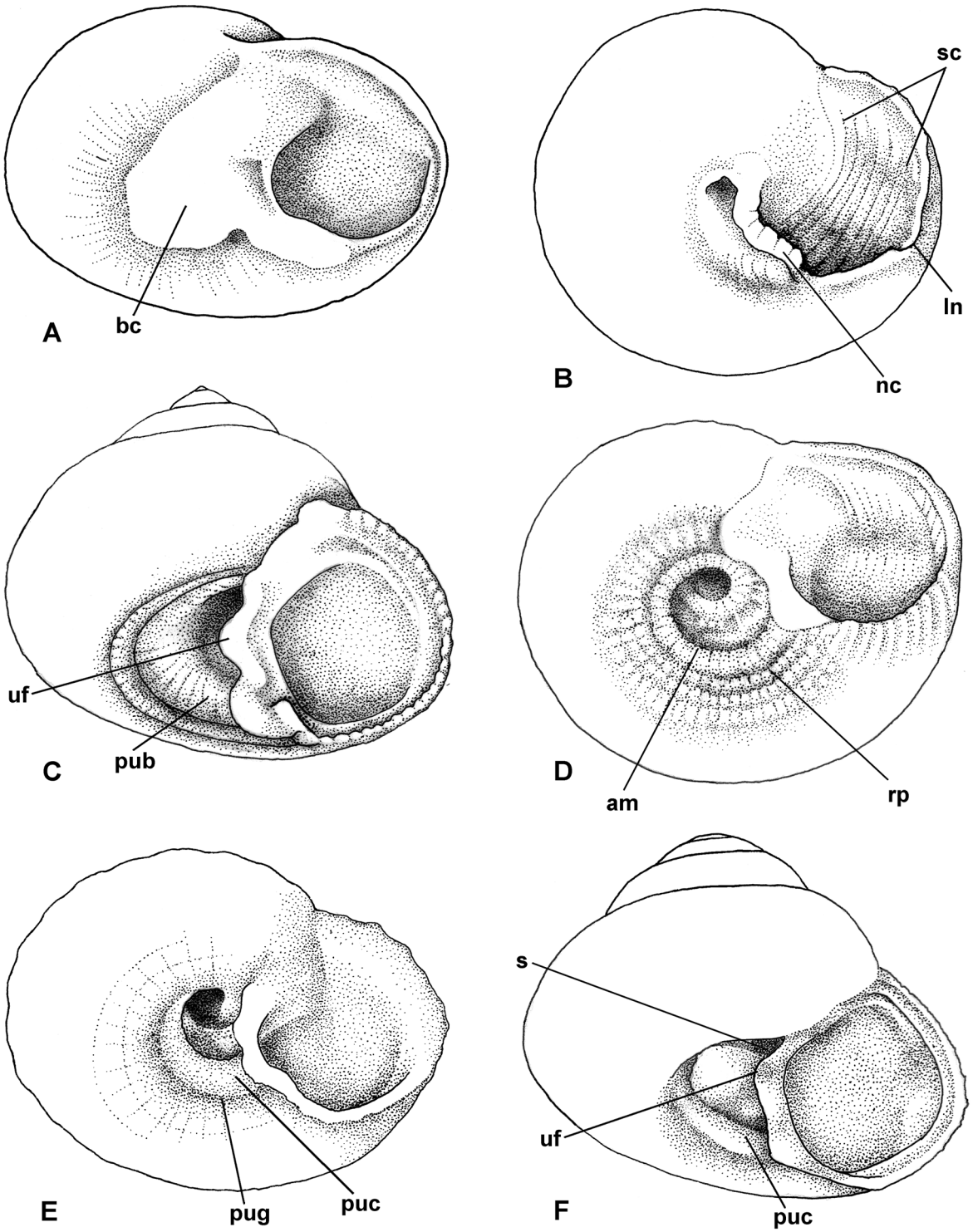

Fig. 1. Line drawings of shells to show umbilical features discussed in the key to genera; sculptural details of outer base and spire not shown. **A**. *Ethalia* H. Adams & A. Adams, 1854. **B**. *Rossiteria* Brazier, 1895. **C**. *Talopena* Iredale, 1918. **D**. *Tylorhaphe* gen. nov. **E**. *Parminolia* Iredale, 1929. **F**. *Kanakina* gen. nov. Abbreviations: am = angular margin of umbilicus; bc = basal callus; ln = labral notch; nc = nodular columella; pub = peri-umbilical band; puc = peri-umbilical cord; pug = peri-umbilical groove; rp = radiating pleats; s = sulcus; sc = spiral cords; uf = umbilical funicle. Drawings by Linda Davis, not to scale.

7. Shell relatively large (adult diameter > 8.0 mm); sculptured with spiral cords and fine axial pliculae; base with broad, thickened peri-umbilical band sculptured with curved pliculae; umbilicus with distinct funicle (Fig. 1C)..... ***Talopena*** Iredale, 1918 (page 71)
– Shell small (adult diameter < 7.5 mm); broad periumbilical band lacking, but umbilicus with thickened cord at or just inside its rim, and sometimes with a low funicle within..... 8

8. Shell glossy; subsutural spiral cord beaded or with raised nodules; umbilical margin angular, with radiating pleats and commonly with peri-umbilical cords (Fig. 1D); umbilical funicle lacking..... ..... ***Tylorhaphe*** gen. nov. (page 106)
– Shell not as above 9

9. Shell small and stout (adult diam. < 5.0 mm), apex acute; sculpture of distinct spiral cords, two of which stronger (at and just below shoulder), and frequently undulant; umbilicus with a thickened cord just inside its rim, set off from base by shallow groove; funicle weak (Fig. 1E)..... ***Parminolia*** Iredale, 1929 (page 35)
– Shell somewhat larger (adult diam. up to 7.5 mm), apex more rounded; spiral sculpture of low cords and finer lirae; thickened cord at rim of umbilicus, somewhat pliculate; funicle more conspicuous with distinct sulcus above (Fig. 1F) ..... ***Kanakina*** gen. nov. (page 28)

Umboniinae — Group 1

Radula typically umboniine (formula ∞ + (1) + 5 + 1 + 5 + (1) + ∞), with reduced teeth in the central field, but in this group the cusps of the marginal radular teeth have a dominant, lanceolate or spathulate central denticle that is very much larger than the lateral denticles (Figs 10D, 15D, 19F, 23F, 27F, 36F, 41E, 45F).

Genus ***Ethalia*** H. Adams & A. Adams, 1854

Ethalia H. Adams & A. Adams, 1854: 409.

Type species

Rotella guamensis Quoy & Gaimard, 1834 (subsequent designation Pilsbry 1889 in 1889–90: 16), Recent, central Indo-West Pacific. Generic fossil record: Paleocene to Recent (Paleobiology Database 2024).

Diagnosis

Shell relatively large for subfamily (diameter up to 25 mm), lenticular, globose-lenticular or subglobose; smooth and glossy, or lustreless with fine, close-set spiral lirae; axial sculpture weak; umbilicus usually present, often with thickened rim and obstructed to a variable extent by callus deposition associated with umbilical funicle and parietal lip; outer lip simple, its interior smooth. Operculum corneous, thick, multispiral, but not tightly so; whorl overlap narrow, peripheral fringe scarcely evident; spiral microsculpture lacking. Radula with base-plates of rachidian and lateral teeth relatively robust; inner marginal tooth transitional with reduced cusp; cusps of marginals 3–10 largest, comprising a large bluntly lanceolate central denticle with 1–2 smaller denticles at its outer base. Ctenidium bipectinate, anterior portion free.

Remarks

It remains to be established whether species such as *Ethalia bellardi* (Issel, 1869), *E. bysma* Herbert, 1992, *E. gilchristae* Herbert, 1992 and *E. minolina* Melvill, 1897, which have less glossy, somewhat lustreless shells with fine, close-set, spiral sculpture, and relatively limited callus deposition in the umbilical region, are truly referable to *Ethalia*. Insights from preliminary molecular studies have shown that *E. gilchristae* does not cluster with the type species (Williams *et al*. 2024).

Ethalia anomphala sp. nov.
urn:lsid:zoobank.org:act:8F0C73C8-973B-4710-BD6A-8D4B5262E846
Figs 2–4

Diagnosis

Ethalia anomphala sp. nov. is characterised by its glossy, lenticular shell with completely occluded umbilicus, even in juvenile specimens. Last adult whorl less globose and not as deep as in the co-occurring *E. montrouzieri*, and not attaining such a large size (maximum diameter 13.5 vs 22.0 mm).

Etymology

From the Greek '*omphalos*' (*ομφαλός*) m. – a navel or umbilicus; '*anomphalos*' – without a navel; in reference to the completely occluded umbilicus.

Material examined

Holotype (Fig. 2A–D)
NEW CALEDONIA • empty shell; Plateau Chesterfield-Bellona, Stn D56; 21°24.4′ S, 159°08.8′ E; depth 60 m; Jul. 1984; CHALCAL 1 leg.; MNHN-IM-2000-38840.

Paratypes
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 1 specimen, dead; Stn DW156; 19°49′ S, 158°21′ E; depth 42 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN-IM-2000-38841 • 3 specimens, dead; Plateau Chesterfield-Bellona, Stn D45; 20°48.93′ S, 158°30.21′ E; depth 50 m; Jul. 1984; CHALCAL 1 leg.; MNHN-IM-2000-38842 • 1 specimen, dead; same data as for holotype; MNHN-IM-2000-38843. – **Lansdowne-Fairway Banks** • 3 specimens, dead; Stn DW26; 20°22′ S, 161°05′ E; depth 62 m; 22 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN-IM-2000-38844 • 1 specimen, dead; Bancs Lansdowne–Fairway, Stn DW02; 20°50′ S, 161°37′ E; depth 62 m; 20 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN-IM-2000-38845. – **Belep** • 1 specimen, living; Lagon Nord, Stn 487; 18°55′ S, 163°31′ E; depth 37 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN-IM-2000-38846. – **Grande Terre** • 1 specimen, living; Nouméa, Grand Récif Sud, Stn 391; 22°46′ S, 167°01′ E; depth 65 m; 22 Jan. 1985; B. Richer-ORSTOM leg.; MNHN-IM-2000-38847.

Other material
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 1 specimen, dead; Plateau des Chesterfield, Stn DW144; 19°28′ S, 158°23′ E; depth 50 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW125; 19°28′ S, 158°24′ E; depth 54 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW14 ± 3; 19°37′ S, 158°25′ E; depth 45 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 3 specimens, dead; Plateau des Chesterfield, Stn DW133; 19°31′ S, 158°25′ E; depth 45 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D46; 20°52.26′ S, 158°33.74′ E; depth 65 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Stn DW50; 19°18′ S, 158°34′ E; depth 50 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D26; 19°10.72′ S, 158°34.95′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 2 specimens, dead; Plateau Chesterfield-Bellona, Stn D49; 20°58.2′ S, 158°35.0′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D50; 21°04.4′ S, 158°40.7′ E; depth 70 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Stn DW65; 19°15′ S, 158°41′ E; depth 62 m; 24 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn DC39; 20°29.8′ S, 158°48.7′ E; depth 40 m; 23 Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW82; 19°12′ S, 158°50′ E; depth 62 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau

Chesterfield-Bellona, Stn D55; 21°23.9′ S, 158°59.6′ E; depth 60 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 3 specimens, dead; Stn D62; 21°46.60′ S, 159°30.70′ E; depth 40 m; 26 Jul. 1984; CHALCAL 1 leg.; MNHN. – **Lansdowne-Fairway Banks** • 1 specimen, dead; Stn DW18; 20°44.1′ S, 161°00′ E; depth 69 m; 21 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 3 specimens, dead; Bancs Lansdowne–Fairway, Stn DW09; 20°53′ S, 161°35′ E; depth 62 m; 20 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Bancs Lansdowne–Fairway, Stn DW04; 20°52′ S, 161°37′ E; depth 64 m; 20 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, living; Stn D6; 20°57′ S, 161°43′ E;

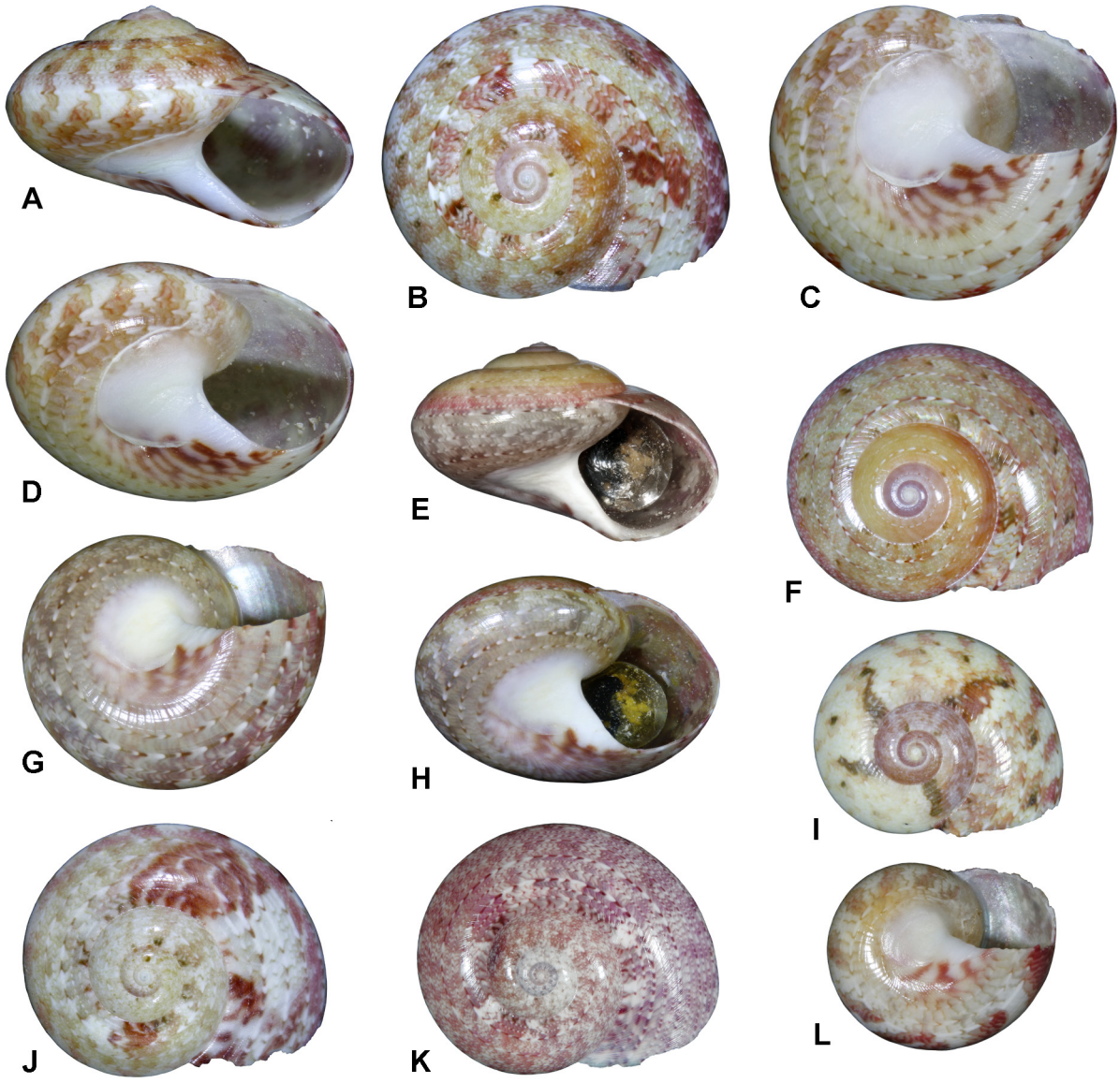

Fig. 2. *Ethalia anomphala* sp. nov. **A–D**. Holotype, Plateau Chesterfield-Bellona, Stn D56, height 8.2 mm, diameter 12.6 mm (MNHN-IM-2000-38840). **E–H**. Nouméa, Grand Récif Sud, Stn 391, diameter 11.1 mm (paratype, MNHN-IM-2000-38847). **I**. Boldly marked specimen, Lansdowne-Fairway Banks, Stn DW26, diameter 9.0 mm (paratype, MNHN-IM-2000-38844). **J**. Boldly marked specimen, Plateau Chesterfield-Bellona, Stn D45, diameter 11.2 mm (paratype, MNHN-IM-2000-38842). **K**. Finely patterned specimen, Belep, Lagon Nord, Stn 487, diameter 11.1 mm (paratype, MNHN-IM-2000-38846). **L**. Basal view of juvenile specimen to show completely closed umbilicus, Lansdowne-Fairway Banks, Stn DW02, diameter 8.3 mm (paratype, MNHN-IM-2000-38845).

depth 45 m; Jul. 1984; CHALCAL 1 leg.; MNHN. – **Belep** • 1 specimen, living; Stn 1159; 19°13′ S, 163°07′ E; depth 50 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Yaté** • 1 specimen, dead; Stn 618; 22°05′ S, 166°56′ E; depth 53–58 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Nouméa** • 2 specimens, dead; Grand Récif Sud, Stn 545; 22°52′ S, 166°50′ E; depth 37 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN.

Description (Fig. 2)

Shell. Of moderate size (diameter up to 13.5 mm), lenticular (H/D 0.59–0.66); teleoconch of up to 5.5 whorls; glossy throughout, except for umbilical callus and columella pillar; periphery rounded, close to mid-whorl; suture level with or slightly above periphery; base anomphalous. First teleoconch whorl with ±3 narrow spiral cords; cords broadening during second whorl and with additional intermediaries arising; sculpture appearing more like incised striae between low, broad cords at start of third whorl; subsequent whorls with only wide-set, incised striae; microscopic axial threads evident throughout, with more distinct, regularly spaced, collabral growth-lines on last adult whorl; base with fewer, more widely-spaced incised striae; striae more close-set and growth-lines more evident toward umbilicus; umbilicus entirely occluded by large callus lobe extending from parietal lip. Aperture roundly quadrate, peristome interrupted in parietal region; columella lip thickened and with indistinct transverse ridges; umbilical callus and columella lustreless with microshagreened surface; outer lip simple, strongly prosocline above periphery, orthocline below; interior smooth, nacreous in live-collected specimens.

Colour. Shell mottled or washed in shades of pale yellowish-white, pale orange-yellow, rose-pink, deep pink or crimson, with narrow capillary lines of alternating white and brownish dashes or chevron-shaped marks; sometimes with greenish or brownish subsutural lines, spots or blotches; region bordering umbilical callus behind basal lip usually with bold reddish radiating markings; protoconch white.

Dimensions. Holotype, height 8.0 mm, diameter 12.2 mm; largest specimen, diameter 13.5 mm.

Protoconch (Fig. 3A–B). As in *Ethalia montrouzieri*; diameter ± 190 µm.

Operculum and radula (Fig. 3C–F). As in *Ethalia montrouzieri*.

External anatomy (from rehydrated specimens). Limited detail evident; inter-tentacular region (forehead) of moderate width; snout prominent, subterminally papillate; cephalic tentacles slender; eyestalks well developed, each distally expanded and containing a large black eye; left neck-lobe digitate; right neck-lobe with entire margin and rolled to form exhalant siphon; four micropapillate epipodial tentacles on each side with a white epipodial sense organ at base of each, one also beneath each neck-lobe. Sides of foot and epipodium with dense white to cream pigmentation, particularly the metapodium. Details of ctenidial structure not clear, but anterior portion not attached.

Habitat

No substratum data recorded; dead shells at depths of 37–70 m (living specimens 37–65 m).

Distribution (Fig. 4)

Known only from the eastern Coral Sea (Chesterfield-Bellona Plateau and Lansdowne-Fairway Banks), the Lagon Nord and the south of Grande Terre, New Caledonia.

Remarks

Ethalia anomphala sp. nov. is a distinctive species on account of its completely occluded umbilicus, even in juvenile specimens. The co-occurring *Ethalia montrouzieri* also has an extensive callus largely occluding the umbilicus in adult specimens, but the umbilicus is clearly patent in juvenile and subadult

specimens and even adult specimens retain a small chink medial to the base of the columella. *Ethalia montrouzieri* also attains a larger size (diameter up to 22.0 mm), and has a more globose profile with a deeper last adult whorl. *Ethalia lampra* is a smaller species (diameter up to 8.0 mm) that lacks an expanded umbilical callus and has only a small reflection at the end of the umbilical funicle. The completely occluded umbilicus of *E. anomphala* is reminiscent of that of species of *Umbonium*, but it lacks the highly specialised anatomical modifications found in species belonging to that genus.

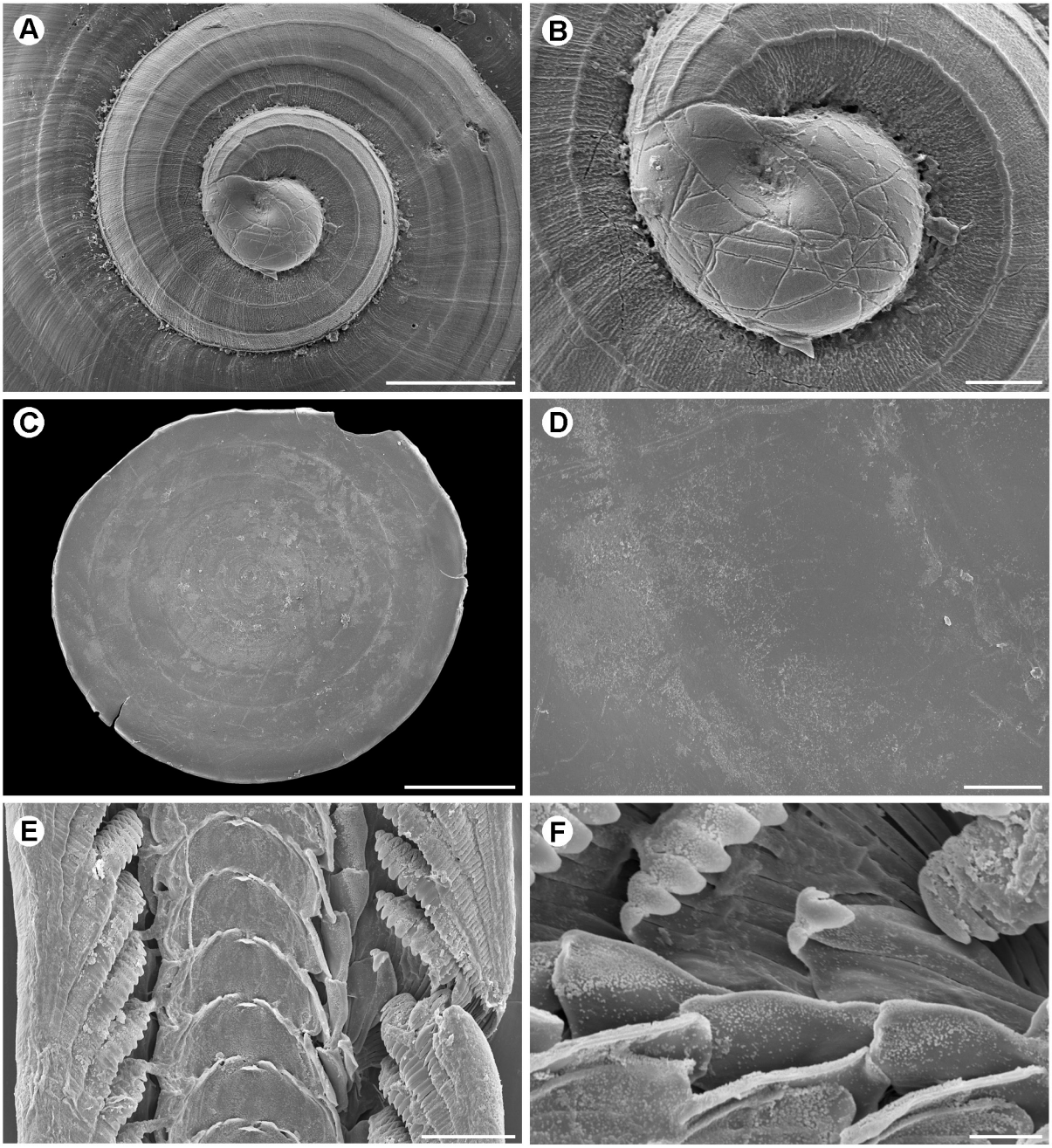

Fig. 3. *Ethalia anomphala* sp. nov. **A**. Apical view of early spire whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum sculpture. **E**. Radula, entire width. **F**. Radula, latero-marginal transition zone. A–B. Lansdowne-Fairway Banks, Stn DW26 (paratype, MNHN-IM-2000-38844). C–F. Belep, Stn 487 (paratype, MNHN-IM-2000-38846). Scale bars: A = 200 µm; B = 50 µm; C = 1.0 mm; D–E = 100 µm; F = 25 µm.

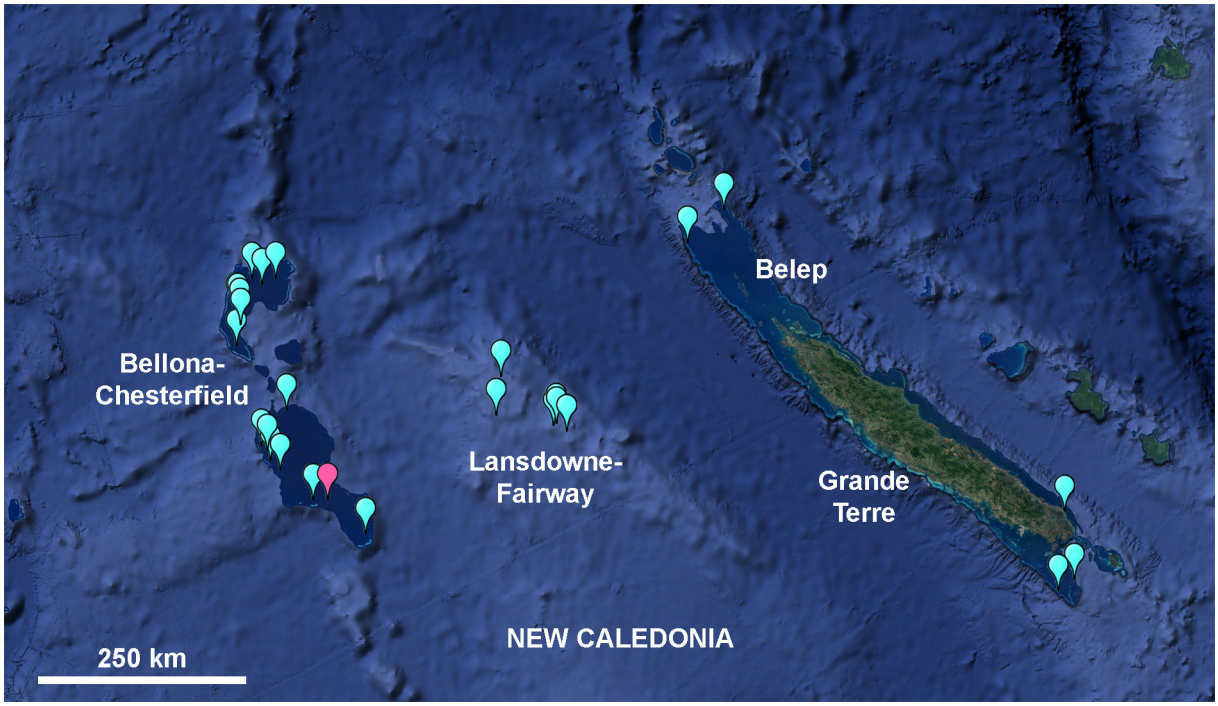

Fig. 4. Map of the eastern Coral Sea showing the distribution of *Ethalia anomphala* sp. nov. Type locality indicated in pink.

The distribution of *Ethalia anomphala* sp. nov. is unusual in that it seems to be restricted to isolated reefs away from the main land mass of Grande Terre, occurring only in the extreme north and south of the latter. Lamprell & Healy (2001) observed similar distributions in some species of *Spondylus* Linnaeus, 1758. This pattern may reflect a preference for ecosystems where the sediment is primarily bioclastic, with little or no terrigenous material.

Ethalia lampra (Watson, 1880)
Figs 5–7

Trochus (*Solariella*) *lamprus* Watson, 1880: 93. Type locality: Levuka, Fiji, 12 fath. [22 m], 29/vii/1874.

Trochus (*Solariella*) *lamprus* – Watson 1886: 74, pl. 6 fig. 9.
Monilea (*Minolia*) *lampra* – Pilsbry 1889–1890: 272, pl. 36 figs 17–18.
Ethalia lamprus [*sic*] – Herbert 1992: 409, figs 123–124 (holotype).

Material examined

Holotype (Fig. 5A–D)
FIJI • empty shell; Ovalau Island, off Levuka; 17°41′ S, 187°50′ E; depth 12 fathoms [22 m]; 29 Jul. 1874; HMS *Challenger* leg.; NHMUK 1887.2.9.291.

Other material
NEW CALEDONIA – **Grande Terre, Koumac** • 1 specimen, dead; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 1 specimen, dead; Stn KD568; 20°40.1′ S, 164°14.3′ E; depth 2 m; 16 Nov. 2019; KOUMAC

2.3 leg.; sable blanc et quelques débris coralliens; MNHN • 1 specimen, living; Stn KD559; 20°46′ S, 164°15.5′ E; depth 12–14 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, dead; Stn KD553; 20°47.9′ S, 164°17.2′ E; depth 5–10 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN. – **Grande Terre, Nouméa** • 1 specimen, dead; Grand Récif Aboré, Stn 1346; 22°21.9′ S, 166°16.1′ E; depth 5–6 m; 5 Oct. 1992; P. Bouchet leg.; fonds blanc; MNHN. – **Loyalty Islands**, **Lifou** • 5 specimens, dead; Baie du Santal, north of Cap Aimé Martin [=Acadro], Stn 1448; 20°45.8′ S, 167°01.6′ E; depth 20 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; aspirateur, fonds durs; MNHN • 1 specimen, dead; Baie du Santal, NE of Baie de Gaatcha, Stn 1444; 20°55′ S, 167°05.2′ E; depth 9–20 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; pente alternant zones caillouteuses "mortes" et passées sableuses grossières; MNHN • 1 specimen, dead; Baie du Santal, W of Pointe d'Easo, Stn 1451; 20°47.3′ S, 167°06.8′ E; depth 10–21 m; 19 Nov. 2000; Atelier LIFOU 2000 leg.; 2ème patate corallienne; MNHN • 5 specimens, living; Baie du Santal, W/SW of Pointe d'Easo, Stn 1430; 20°47.5′ S, 167°07.1′ E; depth 20–25 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; patates coralliennes, passées séd.; MNHN • 1 specimen, living; Baie du Santal, between Îlot Huca Hutighé and coast, Stn 1421; 20°52.4′ S, 167°08.5′ E; depth 4 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; sable grossier sur dalle; MNHN • 1 specimen, dead; Baie du Santal, in front of Chépénéhé, Stn 1415; 20°47.1′ S, 167°09.1′ E; depth 3–7 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable; MNHN.

Description (Fig. 5)

Shell. A relatively small, lenticular to globose-lenticular species (diameter up to 8.0 mm), H/D somewhat variable (0.6–0.73); shell glossy, sculpture weak; periphery below mid-whorl, weakly angled; suture shallowly channelled; base somewhat flattened, umbilicus relatively narrow. Second teleoconch

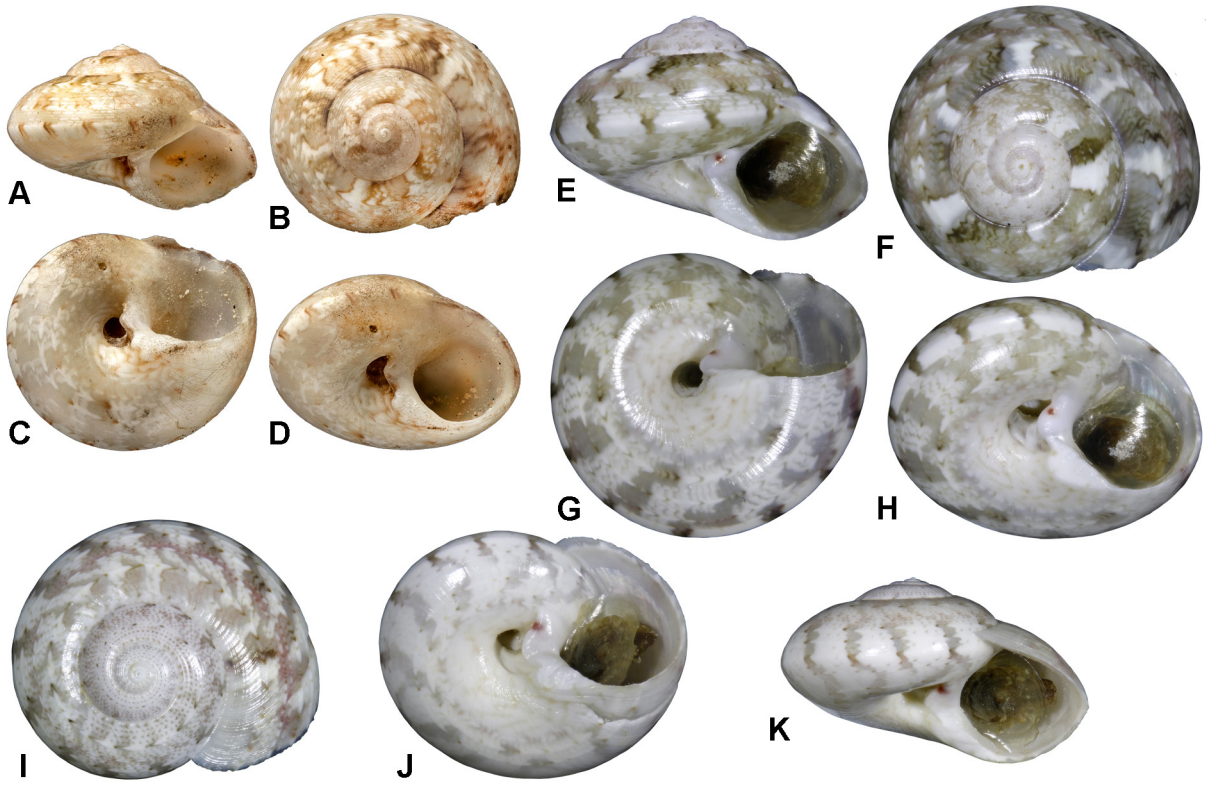

Fig. 5. *Ethalia lampra* (Watson, 1880). **A–D**. Holotype of *Trochus* (*Solariella*) *lamprus* Watson, 1880, diameter 6.1 mm (NHMUK 1887.2.9.291), images courtesy of Kevin Webb, NHM Photo Unit. © The Trustees of the Natural History Museum, London. **E–H**. Koumac, Stn KD559, height 5.6 mm, diameter 7.7 mm (MNHN). **I–K**. Lifou, Stn 1421, diameter 7.5 mm (MNHN).

whorl with ±6 spiral lirae, abapical one strongest, forming a weak, shallowly undulant, suprasutural cord (Fig. 6A–B) that evanesces during third whorl; juveniles of 2–3 whorls with a weakly angled periphery delineated by a similar cord; subsequent sculpture appearing to comprise incised striae rather than raised lirae, their spacing and strength variable; microscopic thread-like axial sculpture present with weak, but regular collabral growth-lines developing on last whorl; much of base almost completely smooth save for axial microsculpture, but thickened peri-umbilical area bearing microscopic spiral lirae and curved axial threads. Umbilicus open, relatively narrow with thickened rim and broad internal funicle; columella lip thick, appearing bilobed due to an ear-like reflection at end of umbilical funicle and a flattened pad at end of thickened umbilical rim, both with fine, pustular microsculpture, the latter also with indistinct transverse ridges.

Colour. Pattern variable; apical whorls whitish with sparse flecks, later whorls more heavily mottled with blotches and zig-zag lines of white and shades of olive-green/brown and brownish-grey; also with spiral capillary lines of alternating white and darker chevron-like marks; periphery with a white

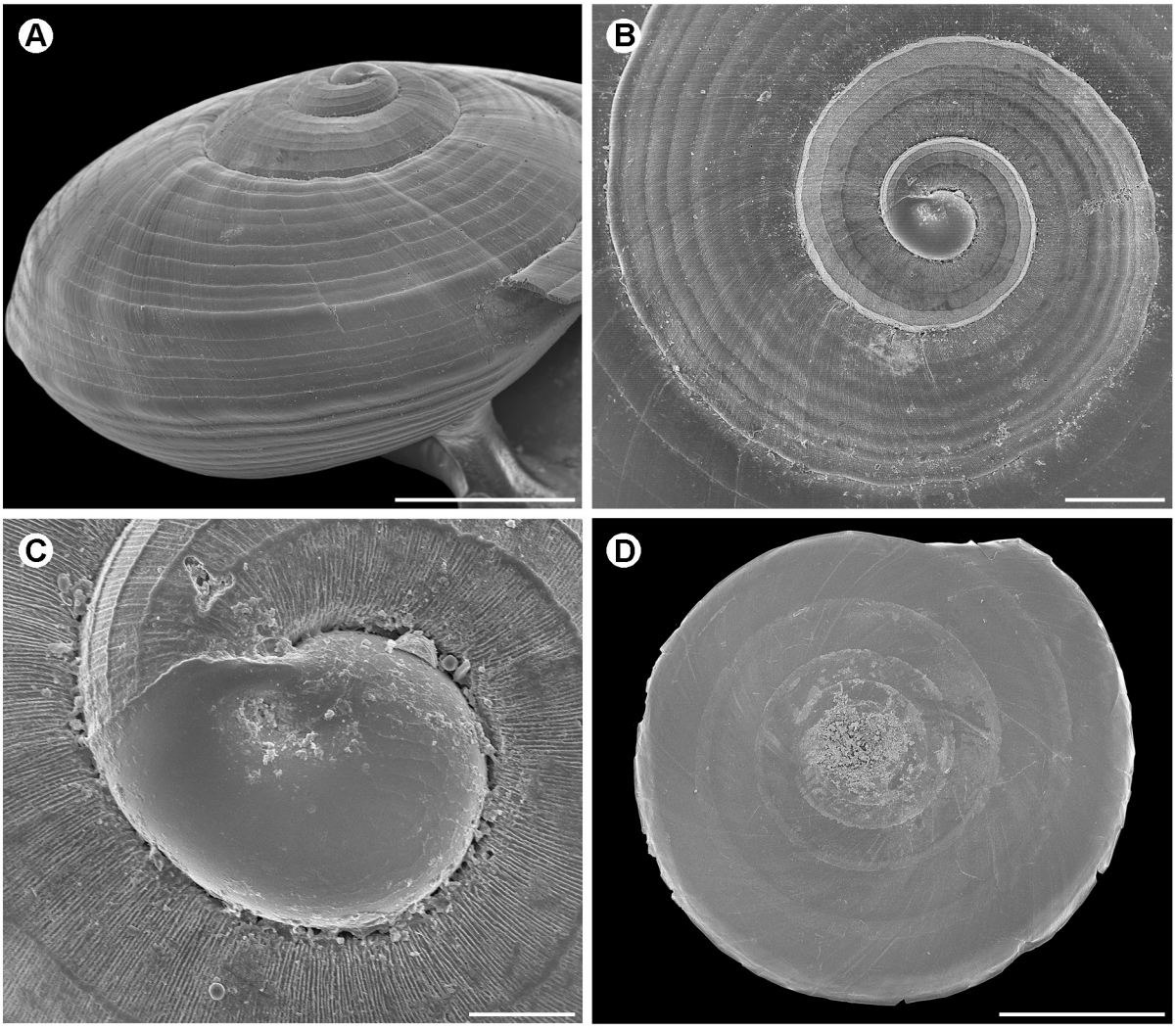

Fig. 6. *Ethalia lampra* (Watson, 1880) (all MNHN). **A**. Oblique view of apical whorls showing thickened peripheral and suprasutural cords. **B**. Apical view of early whorls showing shallowly undulant suture on second teleoconch whorl. **C**. Protoconch. **D**. Operculum. A–C. Lifou, Stn 1430. D. Koumac, Stn KD559. Scale bars: A = 0.5 mm; B = 200 µm; C = 50 µm; D = 1.0 mm.

spiral band broken by darker markings; base with similar but more faint patterning. Coloration of some specimens largely shades of pink rather than green/brown/grey. There is commonly a small dark maroon spot on the upper portion of the reflected callus at the end of the umbilical funicle.

Dimensions. Protoconch (Fig. 6C). As in *Ethalia montrouzieri*, diameter ± 185 µm.

Operculum (Fig. 6D). As in *Ethalia montrouzieri*.

Radula. Not examined.

External anatomy. As in *E. montrouzieri*.

Habitat

Sandy substrata. On Grande Terre, all localities are in the outer portion of the lagoon, on the inner edge of the barrier reef; at depths of 4–20 m (living specimens the same).

Distribution (Fig. 7)

Known only from New Caledonia (Grande Terre and Lifou) and Fiji. A similar distribution to that of *Ethminolia hickmanae* sp. nov.

Remarks

This species has not been recorded since it was first discovered nearly 150 years ago, on 29th July, 1874. Mentions of it in the literature have been few, offering only revised opinions regarding its generic position (see chresonymy above). Comparison of the Fijian holotype (NHMUK 1887.2.9.291, Fig. 5A–D) with material from New Caledonia leaves little doubt that the latter is conspecific. The holotype is somewhat smaller than the largest New Caledonian specimens, but as Watson (1880) noted "it is not quite full-grown". Its coloration is also more brownish, but this may well be due to its age and the fact that it was not collected alive. The Fijian type locality is only ± 1250 km distant from New Caledonia

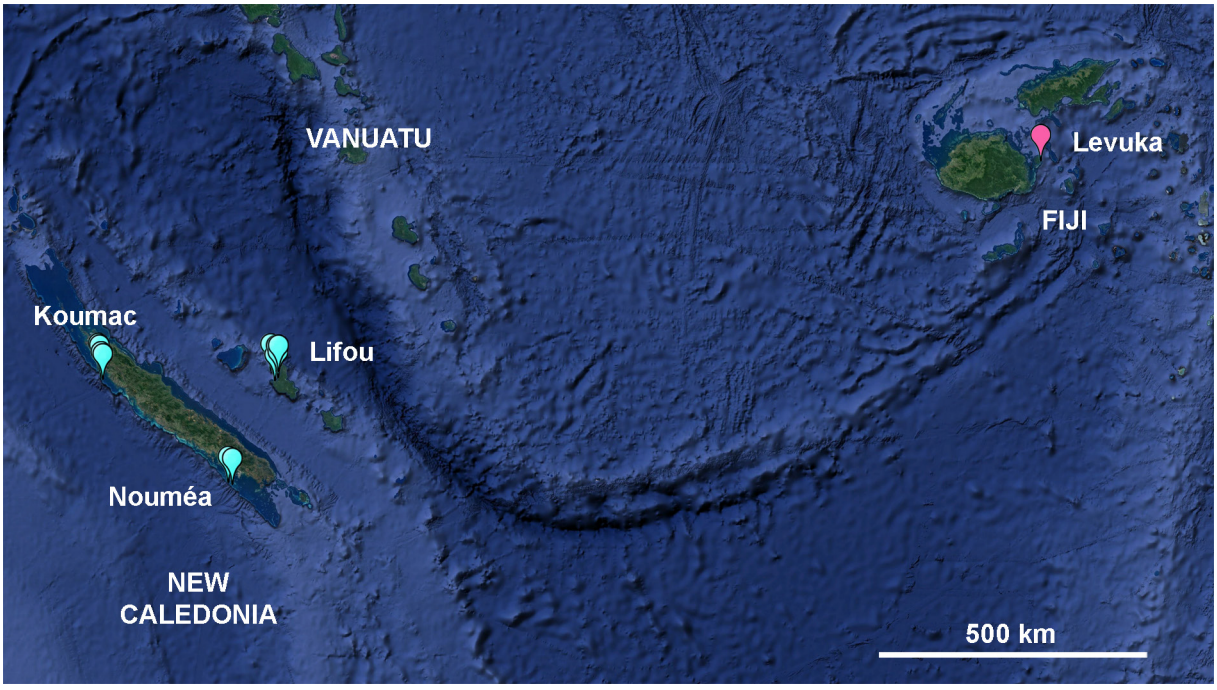

Fig. 7. Distribution of *Ethalia lampra* (Watson, 1880). Type locality indicated in pink.

and most probably the species will also be found to occur in the intervening area, around the islands of Vanuatu. *Ethalia lampra* differs from other New Caledonian *Ethalia* species in being smaller (diameter < 10.0 mm) and in having a patent umbilicus with a thickened rim and internal funicle.

Ethalia montrouzieri (Souverbie, 1859)
Figs 8–12

Rotella montrouzieri Souverbie, 1859: 376. Type locality: "*Insula Art*", Belep, New Caledonia.

Rotella montrouzieri – Souverbie 1860: 123, pl. 2 fig. 11. — Fischer 1878: 207; 1879 in 1875–1880: 379. — Herbert 1996: 412, figs 3–5 (holotype).
Ethalia guamensis var. *montrouzieri* – Pilsbry 1889–1890: 459, pl. 59 fig. 37.
Ethalia guamensis montrouzieri – Kaicher 1990: 5700.
Ethalia montrouzieri – Hickman & McLean 1990: 127, fig. 82c [?= *E. catharinae*]. — Héros *et al*. 2007: 209.

Material examined

Holotype (Fig. 8A–D)
NEW CALEDONIA • Belep, Île Art; MHNBx 2004.TY.126.

Other material
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 1 specimen, dead; Plateau des Chesterfield, Stn DW72; 19°15′ S, 158°21′ E; depth 32 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 3 specimens, dead; Plateau des Chesterfield, Stn DW44; 19°22′ S, 158°23′ E; depth 40 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW128; 19°28′ S, 158°30′ E; depth 38 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW41; 19°22′ S, 158°32′ E; depth 52 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW117; 19°25′ S, 158°32′ E; depth 52 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, living; Plateau des Chesterfield, Stn DW38; 19°22′ S, 158°43′ E; depth 61 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 7 specimens, dead; Plateau des Chesterfield, Stn DW110; 19°09′ S, 158°56′ E; depth 40 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW60; 19°15′ S, 158°57′ E; depth 45 m; 24 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 8 specimens, living; Plateau Chesterfield-Bellona, Stn D54; 21°25.9′ S, 158°59.5′ E; depth 36–42 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, living; Plateau Chesterfield-Bellona, Stn D60; 21°48.65′ S, 159°27.95′ E; depth 45 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 8 specimens, living; Plateau Chesterfield-Bellona; no coordinates; no depth; 1984; CHALCAL 1 leg.; MNHN. – **d'Entrecasteaux Reefs – Lagon Nord – Belep** • 3 specimens, living; Atoll de Huon, Stn 438; 18°10′ S, 162°51′ E; depth 37 m; 25 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Atoll de Surprise, Stn 445; 18°18′ S, 163°02′ E; depth 41 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Atoll de Surprise, Stn 473; 18°24′ S, 163°03′ E; depth 50 m; 1 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Atoll de Surprise, Stn 465; 18°22′ S, 163°05′ E; depth 45 m; 1 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Atoll de Surprise, Stn 466; 18°24′ S, 163°07′ E; depth 42 m; 1 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 6 specimens, dead; Atoll de Surprise, Stn 471; 18°28′ S, 163°07′ E; depth 42 m; 1 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 5 specimens, dead; Stn 1158; 19°10′ S, 163°07′ E; depth 48 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn 1168; 19°16′ S, 163°09′ E; depth 50 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1157; 19°10′ S, 163°10′ E; depth 48 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Lagon Nord, Stn 542; 19°06′ S,

163°10′ E; depth 50 m; 6 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 1169; 19°19′ S, 163°11′ E; depth 47 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Lagon Nord, Stn 541; 19°06′ S, 163°13′ E; depth 45 m; 6 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1170; 19°18′ S, 163°14′ E; depth 65 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1197; 19°36′ S, 163°22′ E; depth 41 m; 1 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Lagon Nord, Stn 536; 19°09′ S, 163°23′ E; depth 61 m; 6 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 535; 19°11′ S, 163°25′ E; depth 46 m; 6 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1205; 19°42′ S, 163°26′ E; depth 38 m; 2 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Lagon Nord, Stn 478; 18°53′ S, 163°27′ E; depth 37 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 479; 18°55′ S, 163°28′ E; depth 37 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Lagon Nord, Stn 482; 18°59′ S, 163°31′ E; depth 33 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Lagon Nord, Stn 481; 18°57′ S, 163°32′ E; depth 50 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 485; 18°58′ S, 163°33′ E; depth 32 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 1213; 19°50′ S, 163°33′ E; depth 32 m; 3 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 7 specimens, dead; Lagon Nord, Stn 519; 19°02′ S, 163°34′ E; depth 39 m; 5 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn 1217; 19°52′ S, 163°36′ E; depth 30 m; 3 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 1118; 19°35′ S, 163°52′ E; depth 30 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1105; 19°40′ S, 163°57′ E; depth 25 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1104; 19°42′ S, 163°59′ E; depth 22 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Balabio Island** • 1 specimen, dead; Stn 1046; 20°05′ S, 164°07′ E; depth 6–7 m; 4 May 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Poum** • 2 specimens, dead; Stn 1016; 20°09′ S, 163°49′ E; depth 19–20 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1017; 20°08′ S, 163°51′ E; depth 21 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 1015; 20°10′ S, 163°52′ E; depth 25 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1007; 20°12′ S, 163°52′ E; depth 23–24 m; 2 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1008; 20°11′ S, 163°53′ E; depth 27 m; 2 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 984; 20°21′ S, 163°56′ E; depth 21–23 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 989; 20°18′ S, 163°57′ E; depth 21 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 9 specimens, living; Stn 982; 20°22′ S, 163°59′ E; depth 34–48 m; 29 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 971; 20°26′ S, 164°00′ E; depth 25–26 m; 29 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 961; 20°29′ S, 164°02′ E; depth 19–20 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Pouébo** • 1 specimen, dead; Stn 901; 20°13′ S, 164°22′ E; depth 22–40 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn 898; 20°14′ S, 164°27′ E; depth 22 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Stn 895; 20°16′ S, 164°27′ E; depth 16 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 896; 20°15′ S, 164°29′ E; depth 20 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 892; 20°18′ S, 164°32′ E; depth 26 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn 891; 20°20′ S, 164°34′ E; depth 25 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 890; 20°20′ S, 164°36′ E; depth 23 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn 888; 20°22′ S, 164°38′ E; depth 20 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 885; 20°26′ S, 164°42′ E; depth 32 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Koumac** • 2 specimens, living; Stn 954; 20°31′ S, 164°03′ E; depth 15–17 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn KD537; 20°31′ S, 164°03.3′ E; depth 12 m; 6 Nov. 2019; KOUMAC 2.3 leg.; sable blanc, éponges; DNA voucher, photographed alive (image LC349); MNHN IM-2019-7682 • 1 specimen, living; Stn KD533; 20°32.2′ S, 164°05.5′ E; depth 11 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 1 specimen, living; Stn KD565; 20°32.9′ S, 164°05.7′ E;

depth 3 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et algues vertes filamenteuses et cotoneuses; MNHN • 1 specimen; Stn 953; 20°32′ S, 164°06′ E; depth 18–19 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 10 specimens, living; Stn KD563; 20°33.4′ S, 164°06.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 5 specimens, living; Pointe de Babouillat, Stn 1292; 20°22.4′ S, 164°06.8′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles; MNHN • 1 specimen; Stn 952; 20°31′ S, 164°07′ E; depth 16–17 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen; Stn 946; 20°35′ S, 164°08′ E; depth 16–17 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 948; 20°32′ S, 164°09′ E; depth 16 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens; Stn 945; 20°35′ S, 164°10′ E; depth 15–16 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Passe du Baron, Stn KR644; 20°33.8′ S, 164°10.3′ E; depth unknown; 29 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; MNHN • 7 specimens, living; Grand Récif de Koumac, Stn KR218; 20°36.1′ S, 164°10.5′ E; depth 11 m; 16 Sep. 2018; KOUMAC 2.1 leg.; patate sur fonds blancs; DNA vouchers: MNHN-IM-2013-84747, -84748, -84749 • 23 specimens, living; Chenal de l'Infernet, Stn 1305; 20°36.2′ S, 164°11.0′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; largest specimen 21.6 × 15.0 mm; MNHN • 5 specimens, living; Stn 943; 20°37′ S, 164°11′ E; depth 15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 3 specimens; Stn 944; 20°35′ S, 164°12′ E; depth 14–15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Îlot Magone, Stn 1283; 20°33.5′ S, 164°12.2′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, platier sableux; MNHN • 5 specimens, living; between Grand Récif de Koumac and l'Infernet, Stn KR607; 20°38.3′ S, 164°12.4′ E; depth 7–15 m; 5 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; DNA vouchers: MNHN-IM-2013-81081, -81082 • 30+ specimens, living; Chenal de l'Infernet, Stn 1306; 20°39.1′ S, 164°12.4′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 1 specimen, living; Récif l'Infernet, Stn 1302; 20°35.8′ S, 164°12.7′ E; depth 9–10 m; Oct. 1993; Expédition Montrouzier leg.; pente interne; MNHN • 5 specimens, living; Stn KD542; 20°38.6′ S, 164°12.7′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 1 specimen, dead; NW of Récif de l'Infernet, Stn KR619; 20°35.5′ S, 164°12.9′ E; depth 10 m; 19 Sep. 2018; KOUMAC 2.1 leg.; fond sablo-vaseux, tâches d'algues; MNHN • 1 specimen, living; Stn 941; 20°39′ S, 164°13′ E; depth 15–16 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; between Grand Récif de Koumac and l'Infernet, Stn KR616; 20°38.5′ S, 164°13.1′ E; depth 15 m; 15 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; DNA vouchers: MNHN-IM-2013-84628, -84629 • 9 specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 2 specimens, living; Stn KD541; 20°39′ S, 164°13.3′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 2 specimens, dead; around l'Îlot Kendec, Stn 1309; 20°40.5′ S, 164°13.4′ E; depth 18 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 1 specimen, dead; close to Passe de Koumac, Stn KR627; 20°38.6′ S, 164°13.5′ E; depth 12 m; 24 Sep. 2018; KOUMAC 2.1 leg.; MNHN • 13 specimens, living; Stn KD516; 20°39.2′ S, 164°13.5′ E; depth 10 m; 1 Nov. 2019; KOUMAC 2.3 leg.; sable gris; DNA vouchers: MNHN-IM-2019-3429 (image LC158) and IM-2019-3430 • 4 specimens, living; Stn KS522; 20°39.3′ S, 164°13.6′ E; depth 15 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sable blanc à *Halophila*; MNHN • 2 specimens, living; Récif de l'Infernet, Stn 1287; 20°37.0′ S, 164°14.0′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds divers; MNHN • 2 specimens, dead; Stn KD568; 20°40.1′ S, 164°14.3′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques débris coralliens; MNHN • 1 specimen, living; Stn KD561; 20°45.4′ S, 164°14.4′ E; depth 1 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable grossier; MNHN • 6 specimens, living; Récif de l'Infernet, Stn 1301; 20°37.1′ S, 164°14.7′ E; depth 1–5 m; Oct. 1993; Expédition Montrouzier leg.; fonds divers; MNHN • 1 specimen, dead; Récif de l'Infernet, Stn KR632; 20°37.5′ S, 164°14.7′ E; depth 8 m; 25 Sep. 2018; KOUMAC 2.1 leg.; bord du platier; MNHN • 1 specimen, dead; Passe Deverd, Stn 1319; 20°44.7′ S, 164°15.5′ E; depth 15–20 m; Oct. 1993; Expédition Montrouzier leg.; dalle; MNHN • 5 specimens, living; Plateau Karembé, Stn 1286; 20°38′ S, 164°16′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles avec blocs; MNHN • 1 specimen, living; Stn 940; 20°38′ S, 164°16′ E; depth

10 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 936; 20°41′ S, 164°16′ E; depth 14–15 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn KD572; 20°45.8′ S, 164°16.1′ E; depth 22–23 m; 18 Nov. 2019; KOUMAC 2.3 leg.; sable grossier, coquilles; MNHN • 4 specimens, living; Stn KD577; 20°45.8′ S, 164°16.2′ E; depth 21 m; 19 Nov. 2019; KOUMAC 2.3 leg.; fond dur, quelques algues brunes; MNHN • 2 specimens, living; Pointe Pandop, Stn KR625; 20°35.1′ S, 164°16.3′ E; depth 8 m; 23 Sep. 2018; KOUMAC 2.1 leg.; vase et petits rochers, débris coquilliers; MNHN • 2 specimens, living; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; MNHN • 1 specimen, dead; Stn KR1067; 20°38.4′ S, 164°16.5′ E; depth 18 m; 22 Nov. 2019; KOUMAC 2.3 leg.; plateforme sableuse et tombant de massif corallien intermédiaire; MNHN • 7 specimens, living; Stn KD574; 20°43.5′ S, 164°16.9′ E; depth 12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; MNHN • 1 specimen; Stn 932; 20°46′ S, 164°17′ E; depth 23 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn KD546; 20°41′ S, 164°17.1′ E; depth 6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et algues; DNA voucher; MNHN-IM-2019-8224 • 3 specimens, living; Stn KD553; 20°47.9′ S, 164°17.2′ E; depth 5–10 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher; MNHN-IM-2019-8775 • 1 specimen, dead; Pointe N Plateau Karembé, Stn KM321; 20°37.6′ S, 164°17.3′ E; depth 0 m; 26 Sep. 2018; KOUMAC 2.1 leg.; platier intérieur, coraux et herbiers; MNHN • 2 specimens, living; Stn KD583; 20°43.5′ S, 164°17.3′ E; depth 12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable fin; MNHN • 1 specimen, dead; Stn KR636; 20°39.6′ S, 164°17.5′ E; depth 2–5 m; 27 Sep. 2018; KOUMAC 2.1 leg.; fonds sableux; MNHN • 1 specimen, living; east of Kendec channel, Stn KR216; 20°43.3′ S, 164°17.6′ E; depth unknown; 15 Sep. 2018; KOUMAC 2.1 leg.; DNA voucher; MNHN-IM-2013-84485 • 1 specimen, living; Stn KD547; 20°42.2′ S, 164°18.2′ E; depth 2–6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et herbier; DNA voucher, photographed alive (image LC398); MNHN-IM-2019-8234 • 1 specimen, living; between Grand Récif Mathieu and Îlot Deverd, Stn KR635; 20°47.9′ S, 164°18.2′ E; depth 15 m; 26 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; DNA voucher; MNHN-IM-2013-85258 • 7 specimens, living; Stn KD552; 20°49.4′ S, 164°18.5′ E; depth 10–11 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher; MNHN-IM-2019-8777 • 1 specimen, dead; caye de sable devant Kaala-Gomen, Stn 1288; 20°40.0′ S, 164°19.0′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles; MNHN • 1 specimen, dead; Stn KR1068; 20°42.1′ S, 164°19.3′ E; depth 2 m; 23 Nov. 2019; KOUMAC 2.3 leg.; patch corallien et débris d'arrière récif intermédiaire; MNHN • 4 specimens, living; Pointe Devers, Stn KR1025; 20°46.2′ S, 164°22.6′ E; depth 4 m; 6 Nov. 2019; KOUMAC 2.3 leg.; fond vaseux à caulerpe, tombant de platier de récif frangeant; MNHN • 4 specimens, living; Stn 916; 20°56′ S, 164°28′ E; depth 13 m; 26 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 913; 20°58′ S, 164°32′ E; depth 10–13 m; 26 Apr. 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Touho** • 1 specimen, living; parages de la Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 1 specimen, dead; Grand Récif Mengalia, Stn 855; 20°38′ S, 165°09′ E; depth 22 m; 12 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; vicinity of Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN • 6 specimens, living; Baie de Touho, Stn 1237; 20°46.9′ S, 165°13.8′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; sable fin et herbiers abrités; MNHN • 5 specimens, dead; platform off the wharf of Touho, Stn 1242; 20°46.2′ S, 165°14.5′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, blocs, sable, herbiers; MNHN • 1 specimen, living; Lagon du Grand Récif Mengalia, Stn 1264; 20°44.5′ S, 165°15.9′ E; depth 8 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse, dôme détritique; MNHN • 1 specimen, living; Grand Récif Mengalia, Stn 870; 20°38′ S, 165°16.0′ E; depth 37 m; 13 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Mengalia, Stn 1245; 20°45.2′ S, 165°16.3′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbiers; MNHN. – **Grande Terre, Bourail** • 2 specimens, living; chenal du lagon de Poé, Stn 1326; 21°37.2′ S, 165°22.7′ E; depth 1–3 m; 1 Sep. 1993; Expédition Montrouzier leg.; MNHN. – **Grande Terre, Poindimié** • 1 specimen, dead; Stn 816; 20°53′ S, 165°25′ E; depth 31 m; 10 Jan. 1987; B. Richer-ORSTOM leg.; MNHN •

1 specimen, dead; Stn 788; 21°02′ S, 165°35′ E; depth 33 m; 9 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 772; 21°08′ S, 165°41′ E; depth 30 m; 8 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 763; 21°11′ S, 165°44′ E; depth 42 m; 8 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Canala** • 1 specimen, dead; Stn 754; 21°13′ S, 165°49′ E; depth 36 m; 7 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 702; 21°27′ S, 166°08′ E; depth 37 m; 10 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 697; 21°28′ S, 166°10′ E; depth 35–36 m; 10 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Thio** • 1 specimen, dead; Stn 682; 21°34′ S, 166°19′ E; depth 36–37 m; 9 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 676; 21°35′ S, 166°23′ E; depth 41 m; 9 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Baie de St Vincent** • 4 specimens, living; Stn 214; 21°55′ S, 165°48′ E; depth 12 m; 20 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 9 specimens, living; Stn 186; 22°04′ S, 166°00′ E; depth 11 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 187; 22°03′ S, 166°02′ E; depth 13 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 7 specimens, living; Stn 188; 22°03′ S, 166°02′ E; depth 15 m; 21 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Stn 170; 22°09′ S, 166°07′ E; depth 22 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 173; 22°08′ S, 166°07′ E; depth 20–50 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn 163; 22°12′ S, 166°08′ E; depth 15 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 162; 22°13′ S, 166°09′ E; depth 10 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Nouméa** • 16 specimens, living; Stn DE56; 22°08.4′ S, 166°07.7′ E; depth 19–20 m; no date; B. Richer-ORSTOM leg.; MNHN • 7 specimens, living; Stn DE54; 22°11.9′ S, 166°08.3′ E; depth 13 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 3 specimens, living; Stn DE53; 22°13.4′ S, 166°10.1′ E; depth 10 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, living; Stn 51; 22°15′ S, 166°11′ E; depth 10 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE52; 22°15.1′ S, 166°11.3′ E; depth 9–10 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 17 specimens, living; Stn 50; 22°17′ S, 166°12′ E; depth 12 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn DE51; 22°16.8′ S, 166°12.5′ E; depth 10–11 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn 49; 22°19′ S, 166°14′ E; depth 10 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn DE60; 22°13.6′ S, 166°14.1′ E; depth 21 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 3 specimens, living; Stn DE50; 22°18.0′ S, 166°14.1′ E; depth 15–16 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Stn DE49; 22°19.8′ S, 166°14.5′ E; depth 19–20 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, dead; Stn 40; 22°21′ S, 166°15′ E; depth 21 m; 24 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 277; 22°17′ S, 166°16′ E; depth 30 m; 8 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand Récif Aboré, Stn 1346; 22°21.9′ S, 166°16.1′ E; depth 5–6 m; 5 Oct. 1992; P. Bouchet leg.; fonds blanc; MNHN • 2 specimens, living; Stn DE48; 22°20.8′ S, 166°16.2′ E; depth 20–24 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen; Stn DE62; 22°16.8′ S, 166°16.6′ E; depth 32–34 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn 8; 22°23′ S, 166°18′ E; depth 15 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 8 specimens, living; Stn DE46; 22°23.4′ S, 166°18.8′ E; depth 10–11 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 6 specimens, living; Stn 257; 22°22′ S, 166°20′ E; depth 9 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn 7; 22°24′ S, 166°20′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 255; 22°25′ S, 166°20′ E; depth 11 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 7 specimens, living; Stn DE45; 22°24.7′ S, 166°20.7′ E; depth 10 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 9 specimens, living; Île aux Goélands, Stn 1368; 22°24.3′ S, 166°20.7′ E; depth 10 m; 16 Apr. 1993; P. Bouchet leg.; fonds blancs; MNHN • 5 specimens, living; Stn 4; 22°23′ S, 166°21′ E; depth 9 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Crouy; 22°21.5′ S, 166°21.7′ E; depth 1–6 m; 1990–2003; Berthault leg.; MNHN • 2 specimens, living; Île aux Goélands, Stn 1503;

22°22.4′ S, 166°22.5′ E; depth 5–7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 2 specimens, living; Stn 253; 22°22′ S, 166°23′ E; depth 16 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 21; 22°23′ S, 166°23′ E; depth 10 m; 23 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 2; 22°19′ S, 166°24′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 20 specimens, living; Stn 281; 22°24′ S, 166°24′ E; depth 10 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 283; 22°27′ S, 166°24′ E; depth 13 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Îlot Maître, Stn 1361; 22°20.2′ S, 166°24.3′ E; depth 6 m; 24 Mar. 1993; P. Bouchet leg.; sable grossier dans herbier mixte; MNHN • 2 specimens, living; Stn DE43; 22°26.5′ S, 166°24.3′ E; depth 11–12 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 3 specimens, living; Ile Ouen-Baie du Prony, Stn 64; 22°28′ S, 166°25′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 284; 22°26′ S, 166°25′ E; depth 6 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 20 specimens, living; Stn DE42; 22°27.5′ S, 166°25.3′ E; depth 15 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 7 specimens, living; Baie des Citrons; 22°17.5′ S, 166°26.2′ E; depth 1–5 m; 1987–2007; Berthault leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 63; 22°26′ S, 166°26′ E; depth 20 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 7 specimens, living; Ile Ouen-Baie du Prony, Stn 66; 22°28′ S, 166°27′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 9 specimens, living; Passe de Boulari; 22°31.4′ S, 166°27.5′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn DE41; 22°28.2′ S, 166°27.7′ E; depth 19–21 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Stn DE39; 22°31.9′ S, 166°28.1′ E; depth 33–34 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Baie de Sainte Marie–Îlot Uéré; 22°18.5′ S, 166°28.3′ E; depth 0–3 m; 1995-2003; Claude Berthault leg.; MNHN • 8 specimens, living; Stn DE38; 22°33.6′ S, 166°28.6′ E; depth 22–24 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, dead; Ile Ouen-Baie du Prony, Stn 82; 22°33′ S, 166°29′ E; depth 10 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE37; 22°34.5′ S, 166°30.0′ E; depth 20–21 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 4 specimens, living; Ile Ouen-Baie du Prony, Stn 83; 22°32′ S, 166°30′ E; depth 22 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn DE70; 22°25.6′ S, 166°31.0′ E; depth 20–21 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Ile Ouen-Baie du Prony, Stn 84; 22°30′ S, 166°31′ E; depth 17 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 29077; 22°16′ S, 166°32′ E; depth 11 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn DE36; 22°35.5′ S, 166°32.0′ E; depth 17–19 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 8 specimens, living; Ile Ouen-Baie du Prony, Stn 98; 22°36′ S, 166°32′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Ile Ouen-Baie du Prony, Stn 95; 22°31′ S, 166°33′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn DE35; 22°36.5′ S, 166°33.8′ E; depth 16 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, living; Ile Ouen-Baie du Prony, Stn 100; 22°33′ S, 166°35′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 99; 22°33′ S, 166°35′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE34; 22°37.7′ S, 166°35.8′ E; depth 19–21 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 5 specimens, living; Stn DE33; 22°38.4′ S, 166°38.0′ E; depth 31–33 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 13 specimens, living; Ile Ouen-Baie du Prony, Stn 226; 22°38′ S, 166°39′ E; depth 28 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE30; 22°35.8′ S, 166°39.6′ E; depth 12–13 m; 28 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 105; 22°25′ S, 166°41′ E; depth 33 m; 22 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 15 specimens, living; Grand Récif Sud, Stn 293; 22°42′ S, 166°41′ E; depth 20 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 294; 22°44′ S, 166°42′ E; depth 21 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Grand Récif Sud, Stn 296; 22°41′ S, 166°44′ E; depth 26 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 291; 22°38′ S, 166°44′ E; depth 31 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand

Récif Sud, Stn 306; 22°43′ S, 166°45′ E; depth 38 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Ile Ouen-Baie du Prony, Stn 233; 22°35′ S, 166°46′ E; depth 30 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand Récif Sud, Stn 305; 22°42′ S, 166°46′ E; depth 26 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Grand Récif Sud, Stn 341; 22°49′ S, 166°46′ E; depth 19 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 304; 22°40′ S, 166°48′ E; depth 27 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Grand Récif Sud, Stn 339; 22°46′ S, 166°48′ E; depth 26 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Grand Récif Sud, Stn 312; 22°42′ S, 166°49′ E; depth 26 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 345; 22°46′ S, 166°50′ E; depth 39 m; 29 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 149; 22°29′ S, 166°51′ E; depth 48 m; 24 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 336; 22°42′ S, 166°51′ E; depth 26 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 555; 22°50′ S, 166°51′ E; depth 32 m; 16 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand Récif Sud, Stn 547; 22°55′ S, 166°53′ E; depth 29 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 559; 22°44′ S, 166°55′ E; depth 52 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 564; 22°47′ S, 166°56′ E; depth 35 m; 16 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 331; 22°33′ S, 166°59′ E; depth 79 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 410; 22°42′ S, 167°22′ E; depth 35 m; 24 Jan. 1985; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Yaté** • 1 specimen, dead; Stn 641; 21°53′ S, 166°43′ E; depth 50–52 m; 7 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 633; 21°56′ S, 166°48′ E; depth 50 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 632; 21°57′ S, 166°50′ E; depth 44–45 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 624; 21°60′ S, 166°52′ E; depth 46–44 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Île des Pins** • 1 specimen, living; Stn 592; 22°34′ S, 167°22′ E; depth 22 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 8 specimens, living; Stn 590; 22°30′ S, 167°24′ E; depth 20 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Stn 589; 22°32′ S, 167°24′ E; depth 31 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN• 11 specimens, living; Stn 591; 22°36′ S, 167°24′ E; depth 14 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 581; 22°42′ S, 167°26′ E; depth 23 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands**, **Ouvéa** • 1 specimen, living; Lagon d'Ouvéa, Stn 1231; 20°31′ S, 166°23′ E; depth 23 m; 9 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 1 specimen, living; Lagon d'Ouvéa, Stn 1229; 20°37′ S, 166°23′ E; depth 16 m; 15 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 1 specimen, dead; Lagon d'Ouvéa, Stn 1232; 20°32′ S, 166°24′ E; depth 31 m; 9 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 1 specimen, living; Lagon d'Ouvéa, Stn 1233; 20°29.1′ S, 166°29.0′ E; depth 15 m; 12 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN. – **Loyalty Islands**, **Lifou** • 6 specimens, living; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 1 specimen, dead; Baie du Santal, in front of Ngoni beach, Stn 1458; 20°46.7′ S, 167°03.1′ E; depth 17–24 m; 4 Nov. 2000; Atelier LIFOU 2000; dredged; MNHN • 2 specimens, living; Baie du Santal, Baie de Gaatcha, Stn 1463; 20°55′ S, 167°03.3′ E; depth 20–30 m; 10 Nov. 2000; Atelier LIFOU 2000; dragages sable et débris coralliens; MNHN • 1 specimen, dead; Baie du Santal, Baie de Gaatcha, Stn 1419; 20°55.6′ S, 167°04.5′ E; depth 5 m; 10 Nov. 2000; Atelier LIFOU 2000; limon sur dalle, algues photophiles; MNHN • 12 specimens, living; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN.

Description (Fig. 8)

Shell. A moderate to large, globose-lenticular species (diameter up to 22 mm, but usually < 18 mm) with a glossy, typically *Ethalia*-like shell; last adult whorl deep, periphery below mid-whorl, suture shallowly sunken (Fig. 9A); whorl profile variable, some specimens with indistinct rounded shoulder (Fig. 8N). Although glossy, shell not without sculpture; early teleoconch whorls with fine spiral lirae (Fig. 9B) that

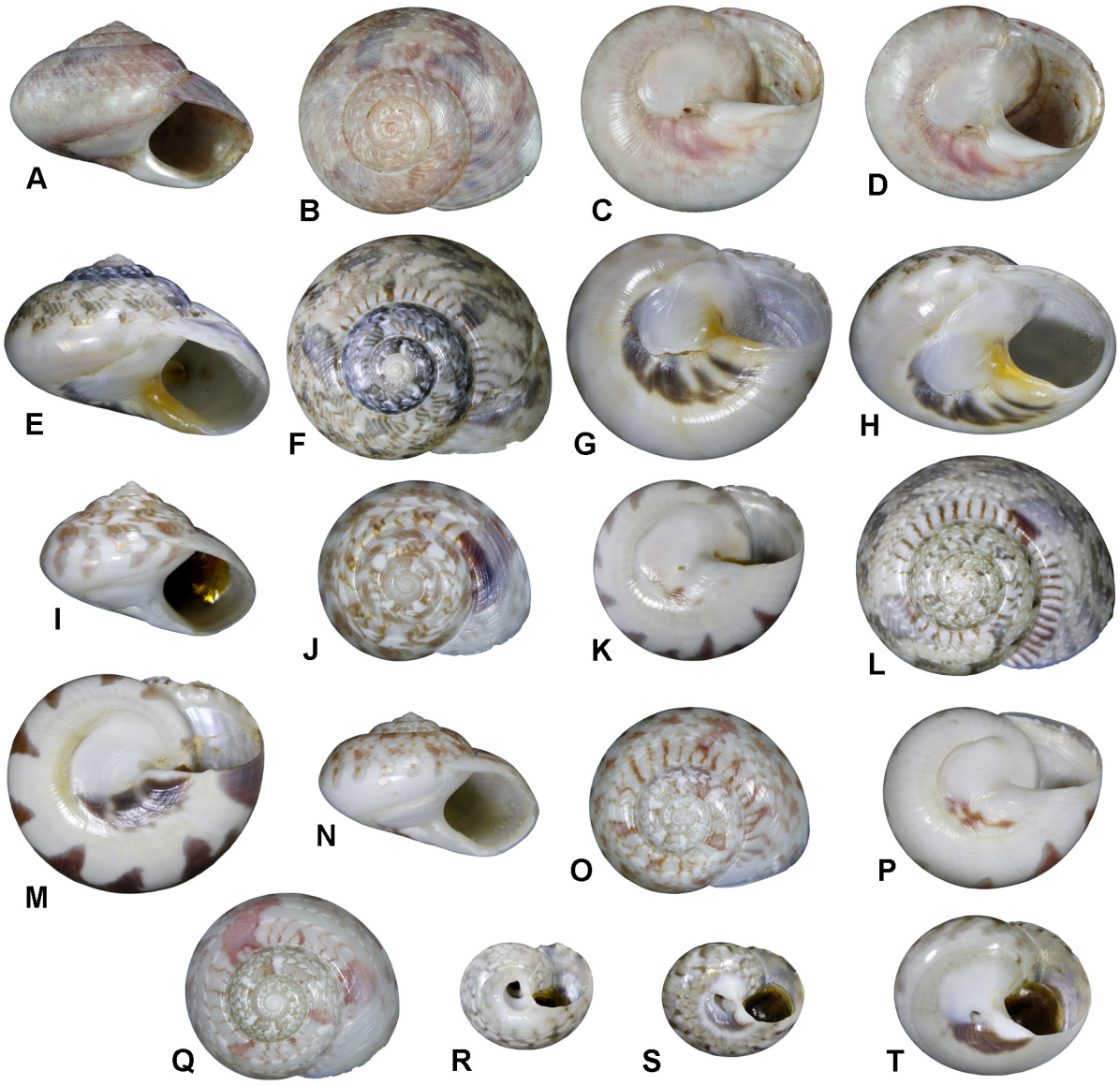

Fig. 8. *Ethalia montrouzieri* (Souverbie, 1859). **A–D**. Holotype of *Rotella montrouzieri* Souverbie, 1858, Île Art, Belep, diameter 15.5 mm (MHNBx 2004.TY.126, images courtesy of Laurent Charles). **E–H**. Koumac, Stn KD577, diameter 16.4 mm (MNHN). **I–K**. Lifou, Stn 1413, diameter 13.4 mm (MNHN). **L**. Specimen with distinct subsutural lines, Passe de Boulari, Nouméa, diameter 16.1 mm (MNHN). **M**. Specimen with bold trigonal peripheral blotches, Passe de Boulari, Nouméa, diameter 15.9 mm (MNHN). **N–P**. Shouldered specimen, Chesterfield-Bellona Plateau, diameter 13.6 mm (MNHN). **Q**. Specimen with pale pink colour pattern, Chesterfield Plateau, Stn DW38, diameter 13.5 mm (MNHN). **R–T**. Growth series, Koumac, Stn KD542, diameters respectively 8.2 mm, 8.8 mm, 12.2 mm (MNHN).

become broader and more flat-topped with growth; sculpture appearing to comprise incised striae rather than raised lirae on mid-spire whorls; evanescing to a variable extent on last whorl which is sculptured primarily by fine close-set growth-lines. Much of base almost completely smooth, but peri-umbilical area somewhat thickened and bearing microscopic spiral threads and curved axial threads; umbilicus of adult specimens almost completely plugged by callus extending from paries, a small umbilical chink usually remaining; callus lustreless and indistinctly wrinkled; umbilicus patent in juveniles, becoming progressively more obstructed by callus with growth (Fig. 8R–T). Columella lip thick, with a nacreous mid-region between parietal callus and thickened termination of umbilical rim, the latter with indistinct oblique ridges.

Colour. Pattern variable, but ground colour usually pale fawn-grey to pale fawn-brown, mottled with darker lines and blotches in shades of olive-green, grey-green, grey-brown and reddish-brown; subsutural region often with a band of radiating brown or red-brown lines (Fig. 8F, L), between this and periphery are several capillary lines of alternating white and darker chevron-like marks; periphery and outer region of base uniformly white or with bold red-brown or maroon-brown trigonal blotches that extend on to outer base (Fig. 8M); remainder of base uniformly dirty-white to yellowish-white,

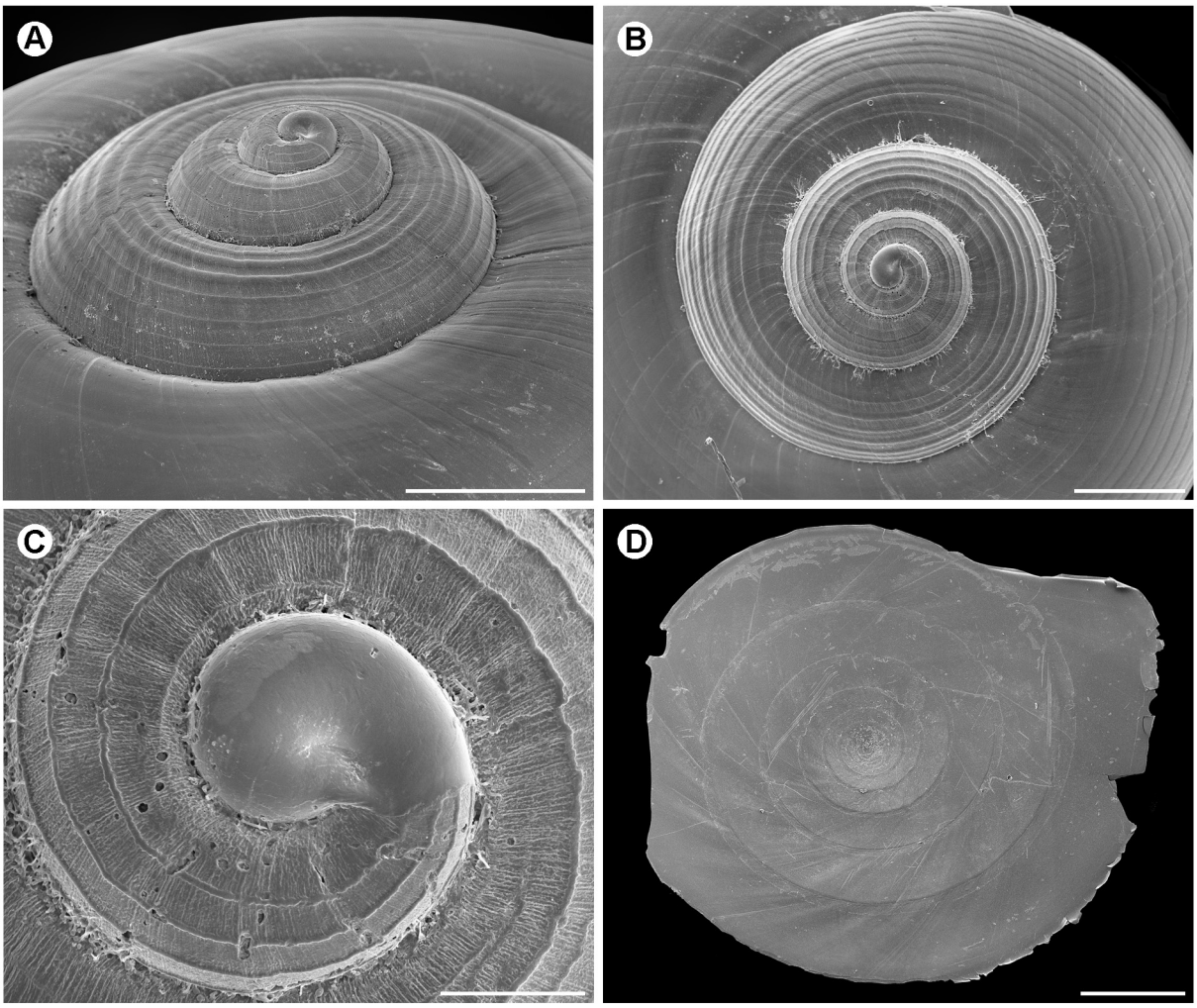

Fig. 9. *Ethalia montrouzieri* (Souverbie, 1859) (MNHN). **A**. Oblique view of spire. **B**. Apical view of early whorls. **C**. Protoconch. **D**. Operculum. A. Koumac, Stn KD552. B–C. Koumac, Stn KD563. D. Koumac, Stn KR1025. Scale bars: A–B = 0.5 mm; C = 100 μm; D = 1.0 mm.

but thickened peri-umbilical region frequently heavily marked with grey-brown or maroon-brown; umbilical callus and columella white, but columella base and area around umbilical chink sometimes yellow or yellowish-orange (Fig. 8H). Coloration of specimens from the Chesterfield-Bellona Plateau often of a more pinkish hue (Fig. 8Q).

Protoconch (Fig. 9C). Typically umboniine, diameter ± 200 µm; apical beak present and confluent with terminal lip; apical bulb mostly worn but with traces of an irregular network of fine threads; terminal lip weakly convex.

Operculum (Fig. 9D). Corneous, moderately thick, dark yellow-brown; multispiral, but not tightly so and with relatively long growing margin; peripheral fringe narrow, whorl overlap limited; surface lacking spiral microsculpture.

Radula (Fig. 10). Formula ∞ + (1) + 5 + 1 + 5 + (1) + ∞, with ± 50 transverse rows of teeth; teeth in central field with distinct base-plates, but shafts and cusps lacking; rachidian broader than long; laterals 1–4 subtriangular, pinched in anteriorly (shaft vestige); laterals 2–4, with outer margin slightly raised and somewhat thickened; fifth lateral subquadrate, elongate. Innermost marginal transitional, with stout base-plate and reduced shaft and cusp; other marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner marginal teeth with large bluntly lanceolate central denticle bearing 1–2 small pointed denticles at its outer base and an even smaller, more slender one at inner base (usually not

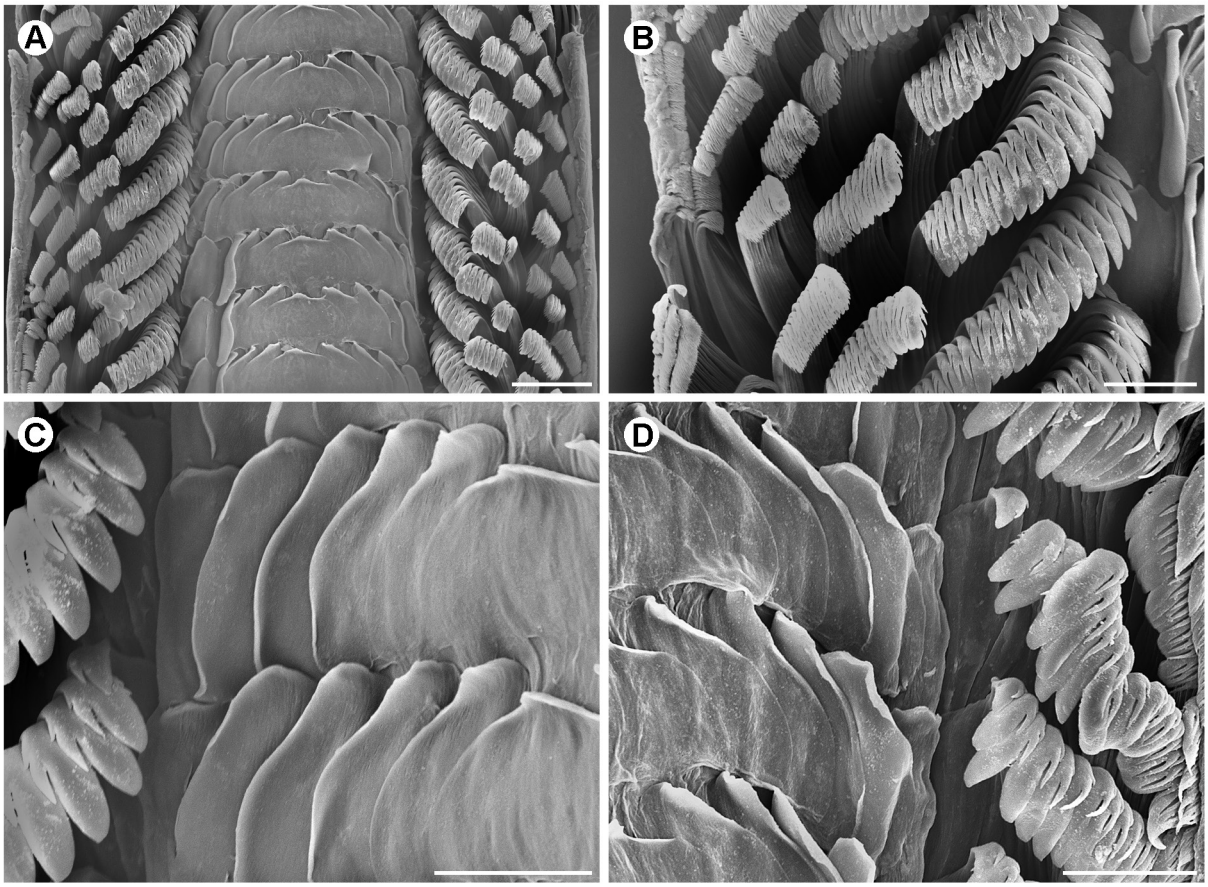

Fig. 10. *Ethalia montrouzieri* (Souverbie, 1859), radula, Koumac, Stn KR1025 (MNHN). **A**. Radula, entire width. **B**. Marginal teeth. **C**. Lateral and innermost marginal teeth. **D**. Latero-marginal area showing transitional innermost marginal tooth with reduced cusp. Scale bars: A = 100 µm; B–D = 50 µm.

visible due to tooth overlap); marginals 3–10 with largest cusps; cusps progressively smaller and with more numerous, finer denticles thereafter, outermost ones with finely pectinate margins.

External anatomy (from photographs and rehydrated specimens) (Fig. 11). Head with distinct forehead between cephalic tentacles; snout moderately long, cylindrical, a single transverse row of digit-like papillae halfway down anterior face, additional, similar papillae present in distal quarter; cephalic lappets small and smooth-edged; cephalic tentacles long and slender, micropapillate, left and right of similar size; eyestalks long, their tips conspicuously expanded and containing large black eyes with eye aperture directed upwards; left neck-lobe a row of 10–15 close-set, non-papillate digit-like projections, larger anteriorly and alternating in size, progressively smaller posteriorly; right neck-lobe well developed, rolled to form an exhalant siphon; four micropapillate epipodial tentacles on each side, each with a well-developed stalked epipodial sense organ near its base; an epipodial sense organ also present beneath each neck-lobe; propodium slightly indented in mid-line with a small lateral propodial lobe on each side; foot flattened with broad sole, tapering posteriorly. Head-foot mostly pale translucent greyish-white; eyestalks, left neck-lobe digits, epipodial fringe and sense organs with opaque white pigmentation; forehead and anterior of snout often tinged yellowish-brown; columellar region above operculum darker yellowish-brown; cephalic and epipodial tentacles with faint transverse dark bands; sides of foot white, its sole often with grey-brown mottling. Ctenidium for the most part bipectinate, anterior portion unattached.

Habitat

Very common in lagoonal habitats; living specimens mostly at depths of 0–30 m, exceptionally to 61 m; largely associated with white and grey sandy substrata in the channels between reefs.

Distribution (Fig. 12)

To date known only from the New Caledonian marine ecoregion, with records from the Chesterfield-Bellona Plateau, d'Entrecasteaux Reefs, Belep, Grande Terre, Île des Pins and the Loyalty Islands.

Remarks

In 1996, I concluded that *Rotella montrouzieri* belonged to the *Ethalia guamensis* complex (sensu Pilsbry 1889–1890 and Pilsbry 1905), noting that it required further study due to unresolved taxonomic issues associated with this complex (Herbert 1996). To a large extent these issues have been resolved in the intervening years. The Japanese *Ethalia guamensis sanguinea* Pilsbry, 1905 is now considered to

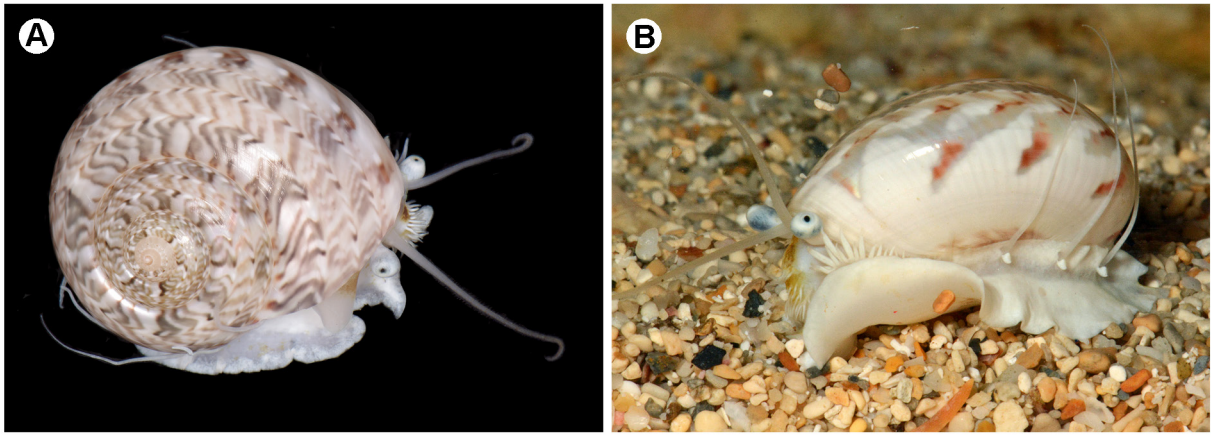

Fig. 11. *Ethalia montrouzieri* (Souverbie, 1859), living specimens, diameter 10–15 mm. **A**. Koumac, Stn KD516 (MNHN-IM-2019-3429, image LC158). **B**. Nouméa, Côte Blanche, depth 6 m, epipodial sense organ associated with first epipodial tentacle obscured by sole of foot, image David Massemin.

be a separate species (Higo *et al*. 1999; Sasaki 2000) whereas *Ethalia guamensis selenomphala* Pilsbry, 1905 is not considered distinct from *E. guamensis* (Higo *et al*. 1999).

It is now evident that *E. montrouzieri*, treated as another subspecies of *E. guamensis* by Pilsbry (1905), but considered a synonym of *E. guamensis* by Higo *et al*. (1999), is also a distinct species. In *E. guamensis* a callus pillar appears to rise out of the umbilicus and fuses with the parietal region, leaving a narrow and deep semi-circular umbilical cavity. Whereas in *E. montrouzieri*, the callus arises as a tongue-like deposit in the parietal region that enlarges with growth until it almost completely occludes the umbilicus, leaving only a small chink-like opening between it and the thickened peri-umbilical rim. In this respect, it closely resembles *Ethalia catharinae* Poppe, Tagaro & Dekker, 2006 from the Philippines, which is undoubtedly a closely related species. The description of *E. catharinae* matches the features of *E. montrouzieri* to a considerable degree, except that the spiral sculpture of the early whorls is said to disappear during the third whorl, and later whorls are smooth and glossy. In addition, its umbilical callus is of a uniform yellowish-green colour. In *E. montrouzieri* the spiral sculpture on the early whorls likewise consists of fine cords, but with growth these transform into incised spiral striae that persist throughout, albeit with considerable individual variation in the strength and density of the striation on the last adult whorl. Furthermore, the umbilical callus in *E. montrouzieri* is normally uniformly white (occasional specimens have the columella lip tinged with orange-yellow, Fig. 8E–H) and there is frequently a broad brownish peri-umbilical band. It is difficult to evaluate the significance of these differences, considering the geographical distance between the populations, and further insight must await molecular studies.

The holotype of *Rotella montrouzieri* from Île Art, Belep (Fig. 8A–D) has relatively dense spiral striation and appears less glossy than material from Grande Terre. Whilst the later may simply be related to the age of the specimen, recently collected material from Lifou (Fig. 8J) also shows more dense spiral striation on the last whorl, suggesting regional variation in this feature.

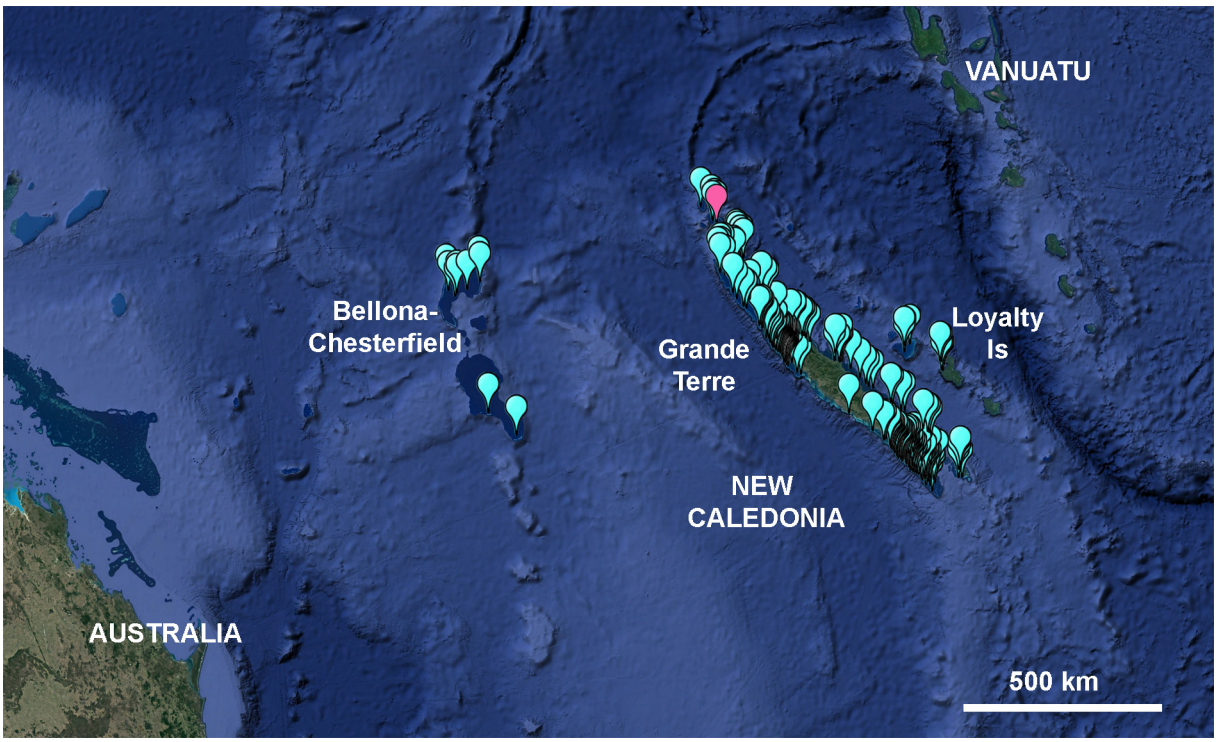

Fig. 12. Map of the Coral Sea showing the distribution of *Ethalia montrouzieri* (Souverbie, 1859). Type locality indicated in pink.

Genus ***Kanakina*** gen. nov.
urn:lsid:zoobank.org:act:E943029C-AD4A-42CE-B3A7-40321F5F3B3F

Type species

Minolia glaphyrella Melvill & Standen, 1895.

Diagnosis

Shell turbiniform to depressed-turbiniform, periphery below mid-whorl; base somewhat flattened, umbilicate; sculpture of fine spiral cords and finer spiral lirae with close-set, microscopic axial threads in intervals; lacking gloss or iridescence. Umbilical margin bearing thickened cord crenulated by radiating pliculae; another thickened cord (funicle) within umbilicus, above which is a narrow, deep sulcus underlying insertion of inner lip; columella thickened and somewhat reflected, with distinct swellings at ends of umbilical cords; interior of outer lip smooth, slightly thickened subterminally at maturity.

Operculum: surface lacking spiral microsculpture.

Radula: marginals 3–10 with largest cusps; cusps with a large, bluntly lanceolate central denticle bearing a robust pointed denticle at its outer base and a minute denticle at inner base.

External anatomy: eyestalks short, eyes small.

Etymology

Named for the Kanak people, aboriginal Melanesian inhabitants of New Caledonia. Gender – feminine.

Remarks

The generic position of the type species has long remained uncertain. Although originally referred to the solariellid genus *Minolia* A. Adams, 1860, it is clearly not referable to the Solariellidae. Preliminary molecular data have shown that material identified under this name clusters within a strongly supported clade otherwise comprising only species referable to *Sericominolia* Kuroda & Habe, 1954 (Williams *et al*. 2024). Its radula morphology is consistent with this, but nonetheless, there are features of the external anatomy, notably its short eyestalks and small eyes, which set *Kanakina* gen. nov. apart from *Sericominolia* species. In addition, the shell has more uneven spiral sculpture, composed of fine lirae and stronger cords, and it is never as glossy and iridescent, even when live-taken. Furthermore, the umbilical rim is not simply thickened, but instead bears a discrete cord and the interior of the outer lip is somewhat thickened at maturity. I believe these anatomical and conchological differences are sufficient to indicate that '*Minolia*' *glaphyrella* is generically distinct from *Sericominolia*. Additional molecular studies with more representative sampling will be needed to explore further the relationship between *Kanakina* gen. nov. and *Sericominolia*.

Kanakina glaphyrella (Melvill & Standen, 1895) gen. et comb. nov.
Figs 13–17

Minolia glaphyrella Melvill & Standen, 1895: 125, pl. 3 fig. 18. Type locality: Lifou, Loyalty Islands, New Caledonia (Hadfield).

Monilea glaphyrella – Hedley 1910: 353.
Minolia glaphyrella – Herbert 1992: 404, fig. 135, lectotype.
Talopena? *glaphyrella* – Héros *et al*. 2007: 2109.
Ethminolia glaphyrella – Raines 2007: 72, table 1.
Sericominolia glaphyrella – Williams *et al*. 2024: 6.

Material examined

Lectotype (Fig. 13E–G)
NEW CALEDONIA – **Loyalty Islands, Lifou** • NMW.1955.158.01504 (designated by Herbert 1996: 404).

Paralectotypes
NEW CALEDONIA – **Loyalty Islands, Lifou** • 7 specimens; NMW.1955.158.115 • 5 specimens; NMW.1955.158.116 • 1 specimen; MM EE.3737.

Other material
NEW CALEDONIA – **Grande Terre, Koumac** • 1 specimen, living; Îlot Double, Stn KM700; 20°28.0′ S, 164°07.7′ E; depth 0 m; 28 Oct. 2019; KOUMAC 2.3 leg.; gros blocs de corail mort et platier sous le vent de l'îlot de massif intermédiaire, et débris coralliens sur platier de massif intermédiaire; DNA voucher, photographed alive (image LC017, Fig. 16); MNHN-IM-2019-2902 • 1 specimen, dead; Îlot Double, Stn KB500; 20°28′ S, 164°07.8′ E; depth 0 m; 28 Oct. 2019; KOUMAC 2.3 leg.; corail mort et débris coralliens sur platier de massif corallien intermédiaire; MNHN • 3 specimens, dead; Stn KB514; 20°29.2′ S, 164°10.5′ E; depth 1 m; 15 Nov. 2019; KOUMAC 2.3 leg.; débris coralliens dans passe de lagune; MNHN • 1 specimen, living; Îlot de la Table, Stn KB502; 20°33.5′ S, 164°11.2′ E; depth 0 m; 31 Oct. 2019; KOUMAC 2.3 leg.; blocs et sable sur sable sur platier de récif frangeant; MNHN • 1 specimen, dead; Stn KB662; 20°35.2′ S, 164°13.9′ E; depth 1 m; 21 Nov. 2019; KOUMAC 2.3 leg.; patchs coralliens dispersés, sur sable et débris; MNHN • 4 specimens, living; Récif de l'Infernet, Stn KS500; 20°36.6′ S, 164°14.4′ E; depth 3 m, 28 Oct. 2019; KOUMAC 2.3 leg.; patch corallien de terrasse sableuse d'arrière récif de massif corallien intermédiaire; DNA vouchers and radula prep.: MNHN-IM-2019-2890 and -2891 • 7 specimens, dead; Pointe de Pandop, Stn 1279; 20°35′ S, 164°15.5′ E; depth 0–1 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds durs, herbiers; MNHN • 5 specimens, dead; Anse de Koumac [Baie de Ouanap], Stn 1277; 20°34.0′ S, 164°16.0′ E; depth 0–2 m; Oct. 1993; Expédition Montrouzier leg.; fonds meubles, herbiers; MNHN • 1 specimen, living; Anse de Koumac [Baie de Ouanap], Stn 1278; 20°34.0′ S, 164°16.0′ E; depth 0–2 m; Oct. 1993; Expédition Montrouzier leg.; fonds durs; MNHN • 1 specimen, dead; Plateau Karembé, Stn 1286; 20°38′ S, 164°16′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles avec blocs; MNHN • 1 specimen, living; Pointe Pandop, Stn KM100; 20°35.0′ S, 164°16.5′ E; depth 0 m; 12 Nov. 2019; KOUMAC 2.3 leg.; marée; DNA voucher; MNHN-IM-2019-7689 • 2 specimens, living; Tangadiou, Stn KB516; 20°35′ S, 164°16.6′ E; depth 0 m; 18 Nov. 2019; KOUMAC 2.3 leg.; coraux vivants et morts; MNHN • 1 specimen, dead; Stn KB669; 20°42.1′ S, 164°19.3′ E; depth 3 m; 23 Nov. 2019; KOUMAC 2.3 leg.; bord externe de récif intermédiaire; MNHN. – **Grande Terre, Touho** • 2 specimens, dead; around the Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 1 specimen, dead; Îlot Ouao (= Î. Camille), Stn 1246; 20°42.8′ S, 165°08.7′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbier; MNHN • 3 specimens, dead; vicinity of Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN • 4 specimens, dead; Baie de Touho, Stn 1237; 20°46.9′ S, 165°13.8′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; sable fin et herbiers abrités; MNHN • 9 specimens, dead; platform off the wharf of Touho, Stn 1242; 20°46.2′ S, 165°14.5′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, blocs, sable, herbiers; MNHN • 1 specimen, dead; between Baie de Touho and Îlot Atit, Stn 1240; 20°46.5′ S, 165°15′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; platier abrité, sable, herbier; MNHN • 10 specimens, dead; Tiwaka estuary, Stn 1248; 20°50.3′ S, 165°16.0′ E; depth 0 m; 1 Sep. 1993; Expédition Montrouzier leg.; marée, platier, laisses de mer; MNHN • 4 specimens, dead; Grand Récif Mengalia, Stn 1245; 20°45.2′ S, 165°16.3′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbiers; MNHN • 1 specimen, dead; Tié Shoal, Stn 1271; 20°52.7′ S, 165°19.5′ E; depth 5–25 m; Sep. 1993; Expédition Montrouzier leg.; tombants, sable sur dalle; MNHN. – **Grande Terre, Bourail** • 6 specimens, dead; lagon de Poé,

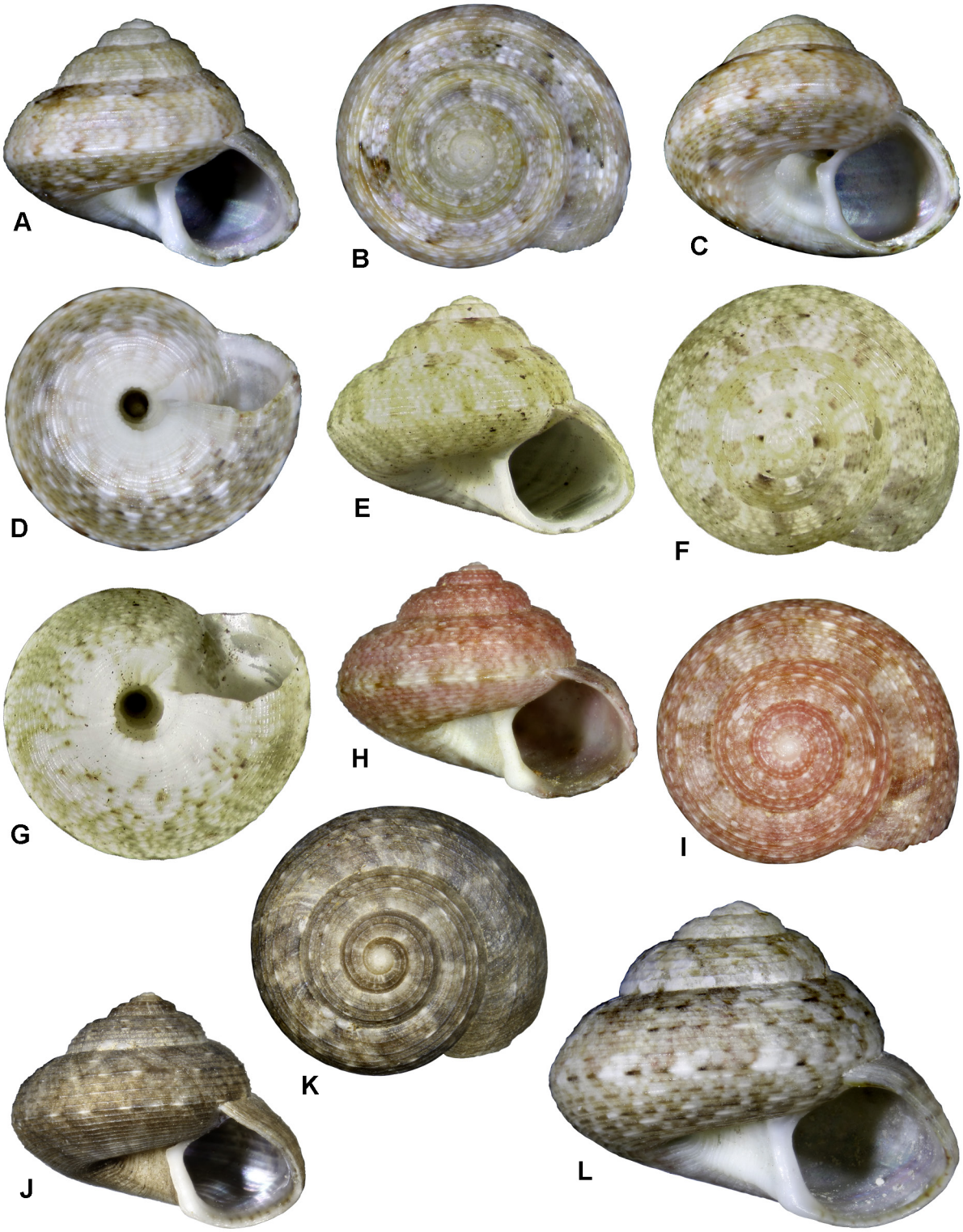

Fig. 13. *Kanakina glaphyrella* (Melvill & Standen, 1895) gen. et comb. nov. **A–D**. Koumac, Stn KS500, diameter 5.1 mm (MNHN). **E–G**. Lectotype, Lifou, diameter 5.3 mm (NMW.1955.158.01504). **H–I**. Orange-pink specimen, Touho, Stn 1248, diameter 5.2 mm (MNHN). **J–K**. Olive-brown specimen, Koumac, Stn 1278, diameter 5.1 mm (MNHN). **L**. Largest specimen, Lifou, Stn 1406, diameter 7.1 mm (MNHN).

Stn 1324; 21°36.9′ S, 165°22.7′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; fonds mixtes, herbier; MNHN. – **Grande Terre, Nouméa** • 1 specimen, dead; SE Sèche Croissant, Stn 1507; 22°19.6′ S, 166°22.4′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main, récolte à vue; MNHN. – **Loyalty Islands**, **Lifou** • 2 specimens, dead; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 1 specimen, dead; Baie du Santal, small bay west of Pointe d'Easo, Stn 1422; 20°47.1′ S, 167°07.4′ E; depth 4 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable sur dalle, patates; MNHN • 3 specimens, dead; Baie du Santal, Easo, vicinity of intertidal marina, Stn 1406; 20°46.85′ S, 167°07.75′ E; depth 0 m; 18 Nov. 2000; Atelier LIFOU 2000 leg.; fonds durs; MNHN • 3 specimens, living; Baie du Santal, to east of Pointe d'Easo, Stn 1418; 20°46.9′ S, 167°07.9′ E; depth 1–5 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable et herbier autour du wharf; MNHN.

Description (Fig. 13)

Shell. Small to moderate in size (diameter up to 7.1 mm, but usually <6.0 mm), turbiniform to depressed-turbiniform (H/D 0.79–0.90); whorls at most weakly shouldered, periphery below mid-whorl, weakly angled; base somewhat flattened, with moderately broad umbilicus. Sculpture of fine spiral cords and finer spiral lirae with close-set, microscopic axial threads in their intervals (Fig. 14A–B); first teleoconch whorl with three spiral cords, increasing in number with subsequent growth, adapical one suggesting a weak shoulder; approx. six first-order spiral cords above and including periphery at start of last adult whorl, with secondary and sometimes tertiary spirals in intervals; basal sculpture similar, comprising alternating cords and lirae. Umbilical margin delineated by a low, broad, thickened cord crenulated by radiating pliculae; interior of umbilicus steep-sided with another similar thickened cord (funicle) just below insertion of inner lip on to paries, above which is a narrow, deep sulcus which spirals into umbilicus. Aperture roundly quadrate; columella thickened and somewhat reflected, with distinct swellings at ends of umbilical cords; interior of outer lip smooth but slightly thickened subterminally at maturity.

Colour. Shell dull, lacking gloss or iridescence even when collected alive; colour pattern typically comprises a fine mottling in shades of greenish-brown on a pale greyish-white ground (sometimes more brownish at periphery), with green and/or whitish blotches below suture and at periphery; spiral cords marked with alternating white, green and dark green flecks, the darker markings most conspicuous on 'shoulder' and peripheral spirals; umbilicus paler, often uniformly white. Occasional specimens more deeply pigmented, with darker brown blotches below suture and at periphery; others with a more overall orange-pink or olive-brown coloration. Apex whitish.

Protoconch (Fig. 14B). Typically umboniine, diameter ± 170 µm; apical beak present and confluent with terminal lip; apical bulb sculptured with oblique and subspiral threads creating an irregular network, almost hexagonal in places; terminal lip weakly convex.

Operculum (Fig. 14C–D). Corneous; multispiral, but with relatively few whorls, growing edge moderately long; peripheral fringe radially striate; surface lacking spiral microsculpture.

Radula (Fig. 15). Formula $\infty + (1) + 5 + 1 + 5 + (1) + \infty$, with ± 35 transverse rows of teeth; teeth of central field reduced; rachidian base-plate broadly trigonal with broad, blunt anterior edge; base-plates of inner lateral teeth expanded and bluntly rounded basally, outer anterior edge somewhat raised and ridge-like; outer laterals less trigonal. Innermost marginal transitional, with reduced shaft and cusp; other marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner marginal teeth with a large, bluntly lanceolate central denticle bearing a robust pointed denticle at its outer base and a minute denticle at inner base (usually not visible due to tooth overlap); marginals 3–10 with largest cusps; cusps progressively smaller thereafter, the outermost ones with finely pectinate margins.

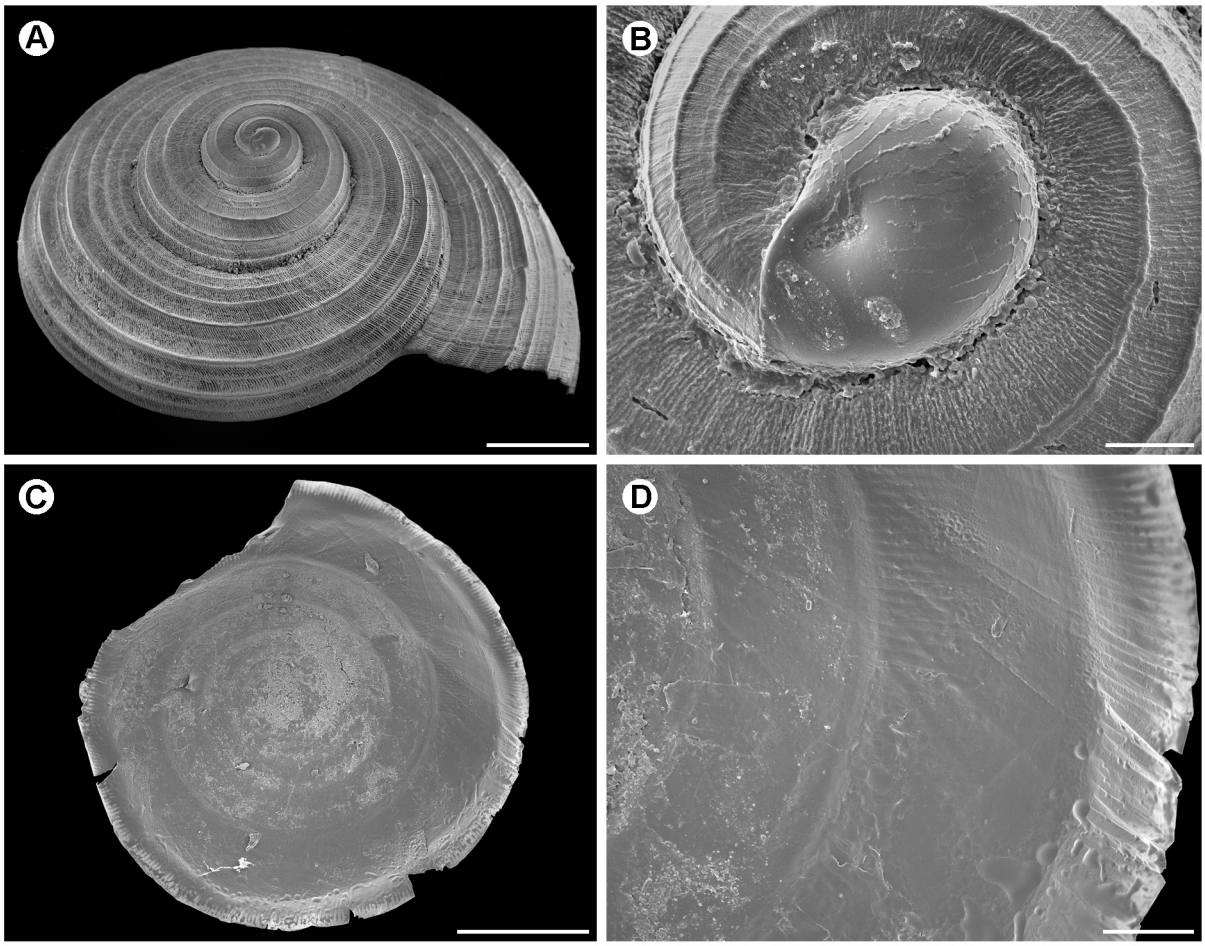

Fig. 14. *Kanakina glaphyrella* (Melvill & Standen, 1895) gen. et comb. nov. (all MNHN). **A**. Apical whorls of juvenile, Koumac, Stn KB502. **B**. Protoconch, Koumac, Stn KB502. **C–D**. Operculum, Koumac, Stn KS500. Scale bars: A, C = 0.50 mm; B = 50 µm; D = 100 µm.

External anatomy (from photographs and rehydrated specimens) (Fig. 16). Head with distinct forehead between cephalic tentacles; snout broad with a transverse row of digit-like papillae halfway down anterior face, distal part of snout more finely papillate; cephalic lappets not evident; cephalic tentacles long and slender, micropapillate, left and right of similar size; eyestalks sort, not up-turned; eyes black, small; left neck-lobe more extensive anteriorly, its edge with digit-like projections (10 or more); right neck-lobe rolled to form an exhalant siphon; four micropapillate epipodial tentacles on each side, each with a well-developed stalked epipodial sense organ (often whitish) near its base; an epipodial sense organ also present beneath each neck-lobe; propodium with a small lateral propodial lobe on each side, foot bluntly tapering posteriorly. Head-foot mostly pale milky-white; sides of foot sparsely speckled with greenish-brown and opaque white pigment granules; cephalic tentacles with narrow, widely separated, transverse dark bands. Ctendium appearing bipectinate, anterior portion unattached.

Habitat

Mostly associated with intertidal platforms and shallow flats on intermediary reefs and in near-shore part of lagoon; living specimens at depths of 0–5 m, dead specimens to 25 m, but mostly < 10 m.

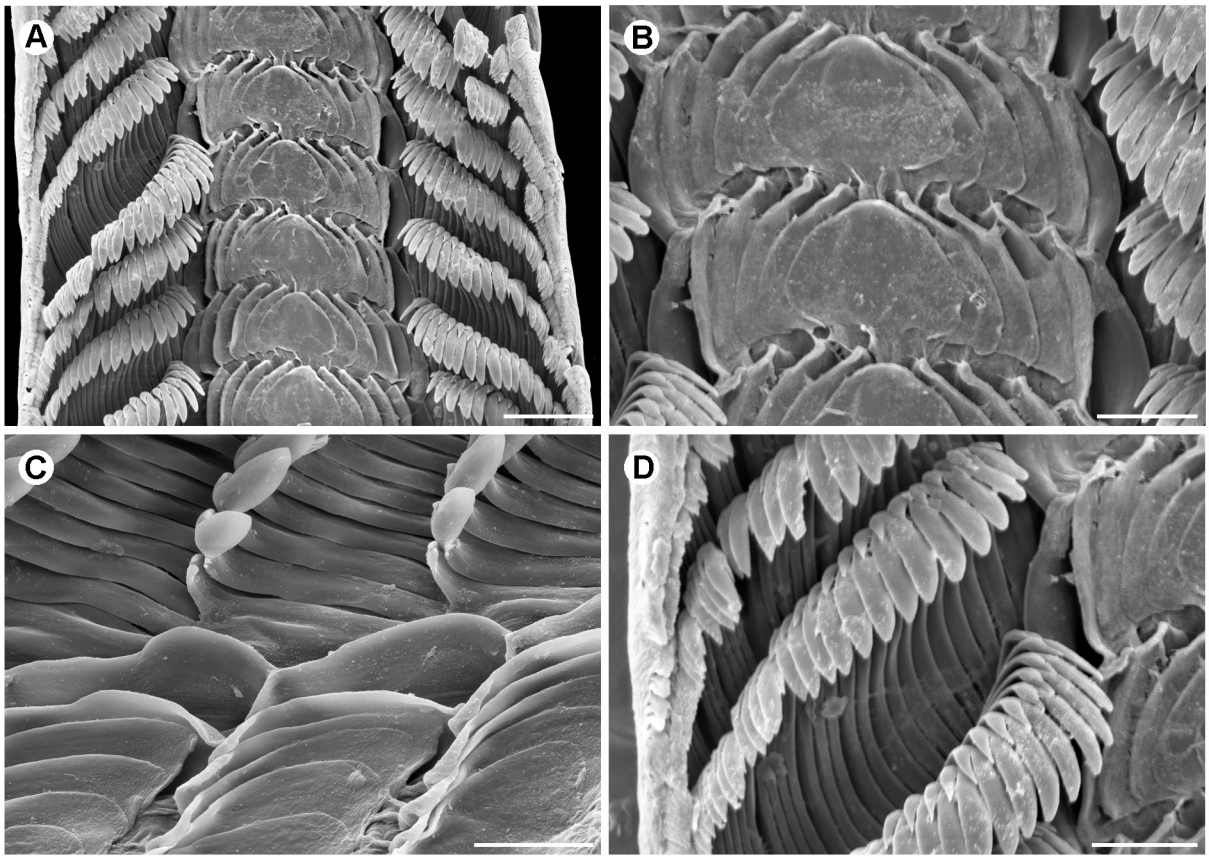

Fig. 15. *Kanakina glaphyrella* (Melvill & Standen, 1895) gen. et comb. nov., radula, Koumac, Stn KS500 (MNHN). **A**. Entire width of radula in mid-region. **B**. Central field with reduced teeth. **C**. Oblique view of latero-marginal area showing reduced cusp on innermost marginal tooth. **D**. Marginal tooth series. Scale bars: A = 50 µm; B, D = 25 µm; C = 20 µm.

Distribution (Fig. 17)

Known within the New Caledonian marine ecoregion, only from Grande Terre and the Loyalty Islands, but recorded also in Queensland (Hedley 1910). Similar material has also been found in the Philippines and Vanuatu (Williams *et al.* 2024).

Remarks

Compared with New Caledonian *Sericominolia* species, the shell of *Kanakina glaphyrella* gen. et comb. nov. has a more distinctly angled periphery situated well below mid-whorl and lacks both gloss and iridescence. Its spiral sculpture is also more uneven, comprising both cords and lirae. *Solariella sanjuanensis* Poppe, Tagaro & Dekker, 2006 from the Philippines has a similarly shaped shell with a thickened cord at the umbilical margin, but it evidently lacks a second cord deep within the umbilicus and has fewer stronger spiral cords above the periphery. Another similar species, *Ethminolia akuana* Raines, 2007 from Easter Island, has cancellate sculpture on the first teleoconch whorl, a sunken suture, narrower umbilicus, stronger funicle and a more biconical profile with the periphery closer to mid-whorl.

The relationship between New Caledonian samples of this species and material from the Philippines and Vanuatu, provisionally identified as *Sericominolia glaphyrella* (Melvill & Standen, 1895) by Williams *et al*. (2024), requires further study. As yet, no molecular data are available for New Caledonian specimens.

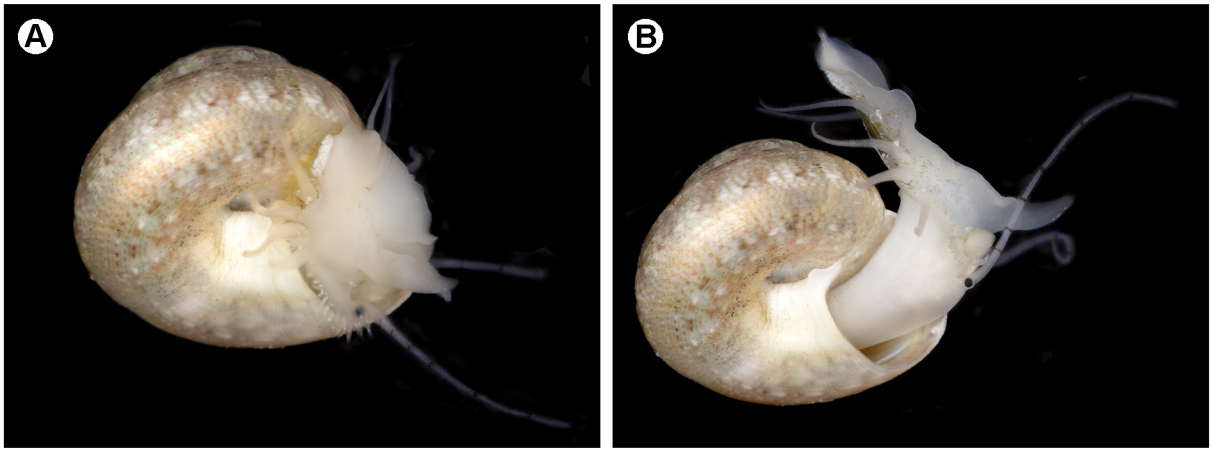

Fig. 16. *Kanakina glaphyrella* (Melvill & Standen, 1895), living animal, Koumac, Stn KM700 (MNHN-IM-2019-2902) (image LC017). Shell diameter ± 5.5 mm.

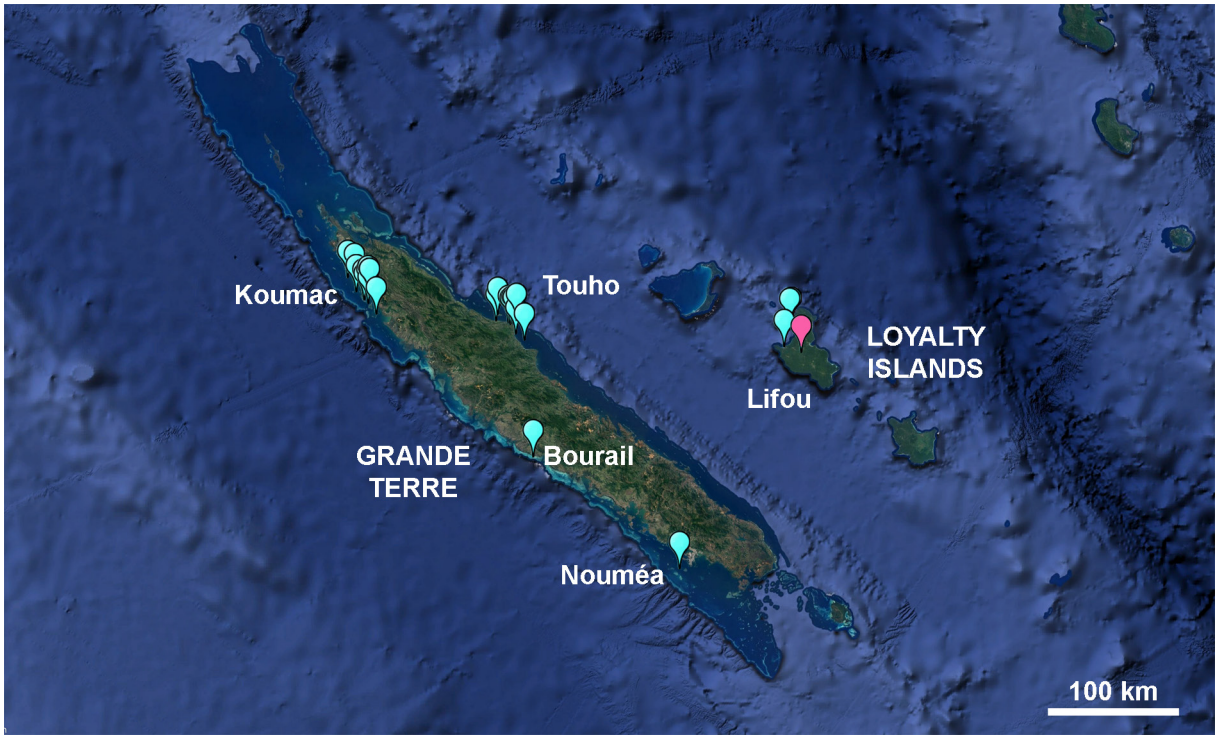

Fig. 17. Map showing the New Caledonian distribution of *Kanakina glaphyrella* (Melvill & Standen, 1895) – Grande Terre and the Loyalty Islands. Type locality (approximate) indicated in pink.

Genus ***Monilea*** Swainson, 1840

Monilea Swainson, 1840: 220, 350.

Type species

Trochus calliferus Lamarck, 1822 (monotypy), Recent, Indo-West Pacific.

Remarks

The taxonomy of the genus *Monilea* is complex and in need of revision – much remains unresolved. If illustrated at all, the original figures of the species described in the 19th century were frequently poor. As a consequence, use of these names in more recent literature has lacked authority and many have been used inconsistently. Rarely was there evidence that the type material had been consulted and more recent authors have simply followed earlier authors in applying names. This situation is further exacerbated by the fact that recent illustrations often present the shell in apertural view only, which does not show critical features of umbilical morphology. Some of the species currently referred to *Monilea* (MolluscaBase 2024) belong instead to *Talopena*, which I consider to be a distinct genus. This issue is discussed further under the Remarks for *Talopena* (below) where I provide illustrations of the holotypes of the type species of both genera (Fig. 34) and detail the characters which set them apart. None of the New Caledonian material examined is referable to *Monilea*.

Genus ***Parminolia*** Iredale, 1929

Parminolia Iredale, 1929a: 271, 294.

Type species

Minolia agapeta Melvill & Standen, 1896 (original designation), Miocene to Recent, New Caledonia.

Diagnosis

Shell small and stout, lacking gloss or iridescence; trochoid turbiniform, umbilicate; sculpture of spiral cords, two of which are stronger and frequently undulant, one at shoulder and one just below this; axial sculpture of close-set, microscopic threads; umbilicus with a thickened cord just inside its rim, set off from remainder of base by a distinct furrow; interior of umbilicus with a low, broad funicle (sometimes indistinct); columella thickened and somewhat reflected, with distinct swellings at ends of umbilical cords; outer lip thick, smooth internally.

Operculum: surface lacking spiral microsculpture.

Radula: marginals 3–10 with largest cusps; cusps with an acuminate central denticle bearing 1–2 long slender basal denticles on both sides.

External anatomy: eyestalks well developed, their tips expanded and containing large black eyes; details of ctenidial structure not evident, but its tip appearing unattached.

Remarks

Iredale's discussion of this taxon on page 271 is ambiguous in that it is unclear whether he proposed to designate *Monilea apicina* Gould, 1861 or *Minolia agapeta* Melvill & Standen, 1896, which he considered a junior synonym of the former, to be the type species of *Parminolia*. The issue was clarified on page 294, where he explicitly cited *Minolia agapeta* as the type species of *Parminolia*. This matter is of significance since *Minolia agapeta* is not in fact a junior synonym of *Monilea apicina* (see Remarks under *Talopena apicina* below).

Resembles *Kanakina* gen. nov. but shell smaller, thicker, more conical and with stronger spiral sculpture. The umbilical cord lies within the umbilicus rather than at its rim and is separated from the base by a furrow. The umbilical funicle is low and broad, and a deep sulcus between it and the parietal suture is lacking.

Parminolia agapeta (Melvill & Standen, 1896)
Figs 18–20

Minolia agapeta Melvill & Standen, 1896: 312, pl. 11 fig. 77. Type locality: Lifou, Loyalty Islands, New Caledonia (Hadfield).

Isanda (*Parminolia*) *apicina* – Ladd 1966 (non *Monilea apicina* Gould, 1861): 39, pl. 5 figs 1–2 (not 3–4 = holotype of *Monilea apicina*); Miocene and Recent.

Material examined

Syntypes

NEW CALEDONIA • 1 specimen (Fig. 18A–C); Loyalty Islands, Lifou; MM.EE.3700 • 2 specimens; Loyalty Islands, Lifou; NMW.1955.158.00097 • 2 specimens; Loyalty Islands, Lifou; NMW.1955.158.00098 • 3 specimens; Loyalty Islands, Lifou; NHMUK 1897.1.22.137–139.

Other material

NEW CALEDONIA – **Grande Terre**, **Koumac** • 3 specimens, living; Stn KD533; 20°32.2′ S, 164°05.5′ E; depth 11 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 10 specimens, living; Stn KD563; 20°33.4′ S, 164°06.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, dead; Stn KB636; 20°38.4′ S, 164°11′ E; depth 3 m; 11 Nov. 2019; KOUMAC 2.3 leg.; blocs et corail mort de tombant interne de récif barrière; MNHN • 5 specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 1 specimen, living; Stn KD568; 20°40.1′ S, 164°14.3′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques débris coralliens; DNA voucher; MNHN-IM-2019-9358 • 1 specimen, dead; Chenal de la Passe de Koumac, Stn 1315; 20°40.7′ S, 164°14.7′ E; depth 66–87 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 4 specimens, living; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; MNHN • 1 specimen, dead; Stn KD559; 20°46′ S, 164°15.5′ E; depth 12–14 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, dead; Stn KD558; 20°43.7′ S, 164°15.9′ E; depth 6 m; 13 Nov. 2019; KOUMAC 2.3 leg.; petits blocs et débris coralliens; MNHN • 1 specimen, dead; around Plateau Karembé, Stn 1303; 20°37.7′ S, 164°15.9′ E; depth 0–8 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux, blocs; MNHN • 1 specimen, dead; Stn KB517; 20°37.6′ S, 164°17.3′ E; depth 0 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable, herbier et blocs coralliens morts; MNHN • 2 specimens, dead; Stn KD552; 20°49.4′ S, 164°18.5′ E; depth 10–11 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN. – **Grande Terre**, **Touho** • 2 specimens, dead; surroundings of l'Îlot Ouao (=Î. Camille), Stn 1255; 20°43′ S, 165°08′ E; depth 11 m; Sep. 1993; Expédition Montrouzier leg.; sable, dômes détritiques; MNHN • 6 specimens, living; Grand Récif Mengalia, Stn 1245; 20°45.2′ S, 165°16.3′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbiers; MNHN. – **Grande Terre**, **Nouméa** • 1 specimen, dead; Quatre Bancs de l'Ouest, Stn 1510; 22°26.5′ S, 166°18.35′ E; depth 0–1 m; 26 Oct. 2000; Cosel and Trondlé leg.; drague à main; MNHN • 17 specimens, dead; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 1 specimen, dead; Île aux Goélands, Stn 1368; 22°24.3′ S, 166°20.7′ E; depth 10 m; 16 Apr. 1993; P. Bouchet leg.; fonds blancs; MNHN • 1 specimen, dead; Île aux Goélands; 22°22.4′ S, 166°22.8′ E; depth 0–4 m; 1997–1999; Claude Berthault leg.; MNHN • 1 specimen, dead; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 12 Feb. 2002; Berthault leg.; MNHN • 15 specimens, living; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 1 specimen, dead; Baie de Sainte Marie – Îlot Uéré; 22°18.5′ S, 166°28.3′ E;

depth 0–3 m; 1995-2003; Claude Berthault leg.; MNHN • 15 specimens; Île de Nou; NMW.1955.158. – **Loyalty Islands, Loyalty Ridge** • 1 specimen, dead; Ride des Loyauté, Stn DW431; 20°22′ S, 166°10′ E; depth 21 m; 18 Feb. 1989; NO *Alis*-MUSORSTOM 6 leg.; MNHN. – **Loyalty Islands, Lifou** • 2 specimens, dead; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1448; 20°45.8′ S, 167°01.6′ E; depth 20 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; aspirateur, fonds durs; MNHN • 5 specimens, living; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 1 specimen, dead; Baie du Santal, Cap Aimé Martin [=Acadro], Stn 1441; 20°46.4′ S, 167°02′ E; depth 20 m; 13 Nov. 2000; Atelier LIFOU 2000 leg.; surplomb sciaphile; MNHN • 1 specimen, dead; Baie du Santal, between Cap Mandé and Cap Lefèvre [= Nem], Stn 1453; 20°54.6′ S, 167°02.1′ E; depth 21–30 m; 22 Nov. 2000; Atelier LIFOU 2000 leg.; tombant massif avec gorgones; MNHN • 6 specimens, living; Baie du Santal, Baie de Gaatcha, towards Cap Mandé, Stn 1424; 20°54.9′ S, 167°03′ E; depth 4 m; 15 Nov. 2000; Atelier LIFOU 2000 leg.; sable fin et algues photophiles sur dalle; MNHN • 1 specimen, dead; Baie du Santal, Baie de Gaatcha, Stn 1436; 20°55.5′ S, 167°04.2′ E; depth 20 m; 10 Nov. 2000; Atelier LIFOU 2000 leg.; patate corallienne sur tombant; MNHN • 60+ specimens, living; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 4 specimens, living; Baie du Santal, NE of Baie de Gaatcha, Stn 1444; 20°55′ S, 167°05.2′ E; depth 9–20 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; pente alternant zones caillouteuses "mortes" et passées sableuses grossières; MNHN • 2 specimens, living; Baie du Santal, in front of Huneté, Stn 1426; 20°45.9′ S, 167°06.2′ E; depth 4–7 m; 20 Nov. 2000; Atelier LIFOU 2000 leg.; dalle et petites poches de séd.; MNHN • 5 specimens, dead; Baie du Santal, in front of Huneté, Stn 1414; 20°45.9′ S, 167°06.2′ E; depth 4–7 m; 20 Nov. 2000; Atelier LIFOU 2000 leg.; drague triangulaire; MNHN • 2 specimens, dead; Baie du Santal, W/SW of Pointe d'Easo, Stn 1430; 20°47.5′ S, 167°07.1′ E; depth 20–25 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; patates coralliennes, passées séd.; MNHN • 5 specimens, living; Baie du Santal, Baie d'Huneté, Stn 1425; 20°46.8′ S, 167°07.2′ E; depth 4–5 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture sed.; MNHN • 50+ specimens, living; Baie du Santal, in front of Peng, Stn 1423; 20°54′ S, 167°07.3′ E; depth 12 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; passées sableuses entre patates; MNHN • 6 specimens, living; Baie du Santal, small bay west of Pointe d'Easo, Stn 1422; 20°47.1′ S, 167°07.4′ E; depth 4 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable sur dalle, patates; MNHN • 1 specimen, dead; Baie du Santal, east of Pointe d'Easo, Stn 1418; 20°46.9′ S, 167°07.9′ E; depth 1–5 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable et herbier autour du wharf; MNHN • 12 specimens, living; Baie du Santal, between Îlot Huca Hutighé and coast, Stn 1421; 20°52.4′ S, 167°08.5′ E; depth 4 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; sable grossier sur dalle; MNHN • 6 specimens, living; Lifou, Baie du Santal, in front of Chépénéhé, Stn 1415; 20°47.1′ S, 167°09.1′ E; depth 3–7 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable; MNHN • 4 specimens, living; Baie du Santal, Pointe de Chépénéhé, Stn 1420; 20°47.7′ S, 167°09.4′ E; depth 4–5 m; 18 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture séd.; MNHN • 1 specimen, dead; Baie du Santal, Pointe de Chépénéhé, Stn 1438; 20°47.7′ S, 167°09.4′ E; depth 6 m; 11 Nov. 2000; Atelier LIFOU 2000 leg.; tombant avec grandes passées sableuses; MNHN • 2 specimens, dead; Baie du Santal, in front of Kiki, Stn 1427; 20°47.6′ S, 167°10.2′ E; depth 10 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable grossier et coraux vivants au pied des patates; MNHN • 22 specimens, living; Baie du Santal, in front of Kiki, Stn 1411; 20°47.6′ S, 167°10.4′ E; depth 48 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable entre patates; MNHN.

KIRIBATI • 4 specimens, dead; Tarawa; Cox leg.; NMW.1955.158.

Description (Fig. 18)

Shell. Relatively small (adult shell diameter 4–5 mm) and stout, spire trochiform with indented suture; whorls weakly shouldered and weakly angled at periphery; base rounded with relatively narrow umbilicus. Sculpture of spiral cords, usually 4–5 on penultimate whorl, with finer spiral lirae on shoulder; a further cord level with abapical suture; shoulder cord and the one below it usually stronger

and distinctly undulant, reminiscent of piped icing on a cake (Fig. 19A); peripheral cord also often undulant; cord intervals with close-set microscopic axial pliculae. Basal cords finer, more evenly sized and evenly spaced; peri-umbilical region sometimes with weak axial pliculae, more distinct in strongly sculpture specimens; umbilicus with a thickened cord just inside its rim, set off from remainder of base by a distinct furrow; a further low, broad funicle (sometimes indistinct) within umbilicus; aperture roundly quadrate; outer lip thick, internally smooth.

Colour. Pattern variable, but ground colour commonly whitish, mottled with shades of green/brown, or pink/red, often as subsutural blotches or flames and smaller peripheral spots; base usually with fewer markings, rarely with irregular axial flames. Occasional specimens with a pale pink wash above and below periphery (Fig. 18I). Apex normally whitish, but apical bulb of protoconch very occasionally dark.

Protoconch (Fig. 19B). Typically umboniine, diameter ± 170 µm; apical beak present and confluent with terminal lip; sculptured with subspiral threads toward periphery and near apical beak, crossed by transverse threads in region of apical bulb; terminal lip weakly convex.

Operculum (Fig. 19C–D). Corneous, whorls relatively wide and growing edge moderately long; peripheral fringe narrow, not remaining evident on early whorls; surface lacking spiral microsculpture.

Radula (Fig. 19E–F). Formula $\infty + (1) + 5 + 1 + 5 + (1) + \infty$, with ± 35 transverse rows of teeth; teeth of central field reduced, but base-plates remaining distinct; rachidian base-plate subquadrate with rounded anterior shoulders and a small rounded vestige of a shaft; base-plates of inner lateral teeth trigonal, pinched in anteriorly toward cusp vestige, outer margin rounded and expanded, overlapping outer neighbour; outer laterals more quadrate and elongate. Innermost marginal transitional, with trigonal base-plate and reduced shaft and cusp; other marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner series with an acuminate central denticle bearing 1–2 long slender basal denticles on both sides; marginals 3–10 with largest cusps; cusps progressively smaller thereafter.

External anatomy (from rehydrated specimens). Limited detail evident; inter-tentacular region (forehead) of moderate width, evidently with a thin transverse fold of tissue, pigmented with white, extending between the tentacles; snout prominent, subterminally papillate; eyestalks well developed, their tips expanded and containing large black eyes; left neck-lobe a rounded flap with digitate margin; right neck-lobe extensive, its margin entire and rolled to form a long exhalant siphon; four micropapillate epipodial tentacles on each side. Sides of foot with some whitish pigmentation, particularly the metapodium. Structure of ctenidium unclear, its tip appearing unattached.

Habitat

Mostly associated with white, sandy substrata and coralline debris on the inner side of the barrier reef; intertidal to a depth of 48 m (living specimens the same).

Distribution (Fig. 20)

Reliably known only from the New Caledonian marine ecoregion and northward to Kiribati and the Marshall Islands (Ladd 1966, Miocene and Recent), but potentially more widely distributed under the name *Parminolia apicina*.

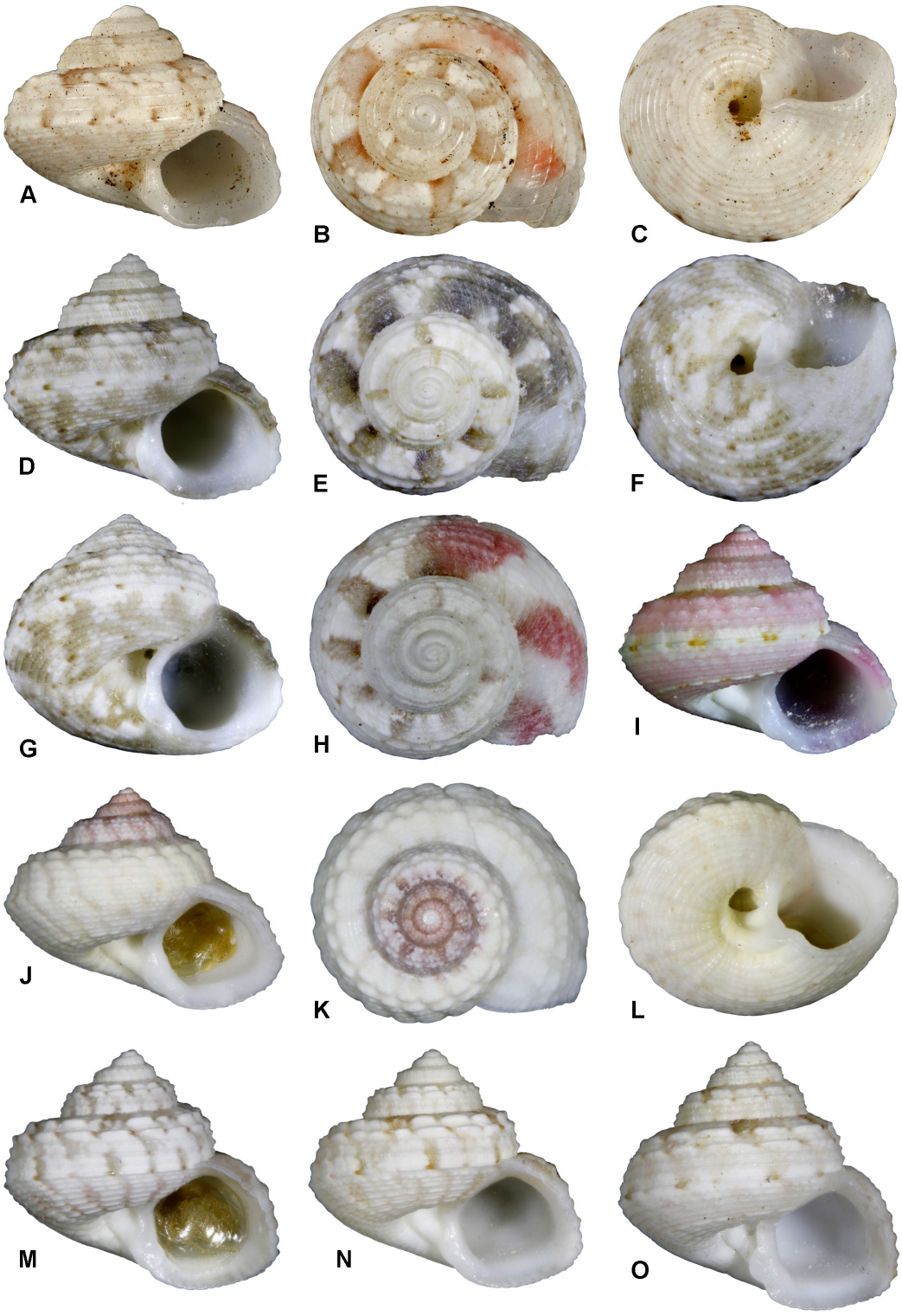

Fig. 18. *Parminolia agapeta* (Melvill & Standen, 1896). **A–C**. Figured syntype of *Minolia agapeta* Melvill & Standen, 1896, diameter 4.7 mm (MM EE.3700). **D–G**. Koumac, Stn KD558, diameter 4.5 mm (MNHN). **H**. Koumac, Stn KD559, diameter 5.2 mm (MNHN). **I**. Koumac, Stn KD563, diameter 4.5 mm (MNHN). **J–L**. Nouméa, Anse Vata, diameter 4.5 mm (MNHN). **M**. Lifou, Stn 1423, diameter 4.0 mm (MNHN). **N**. Lifou, Stn 1423, diameter 4.2 mm (MNHN). **O**. High-spired specimen, Koumac, Stn, KD552, diameter 4.6 mm (MNHN).

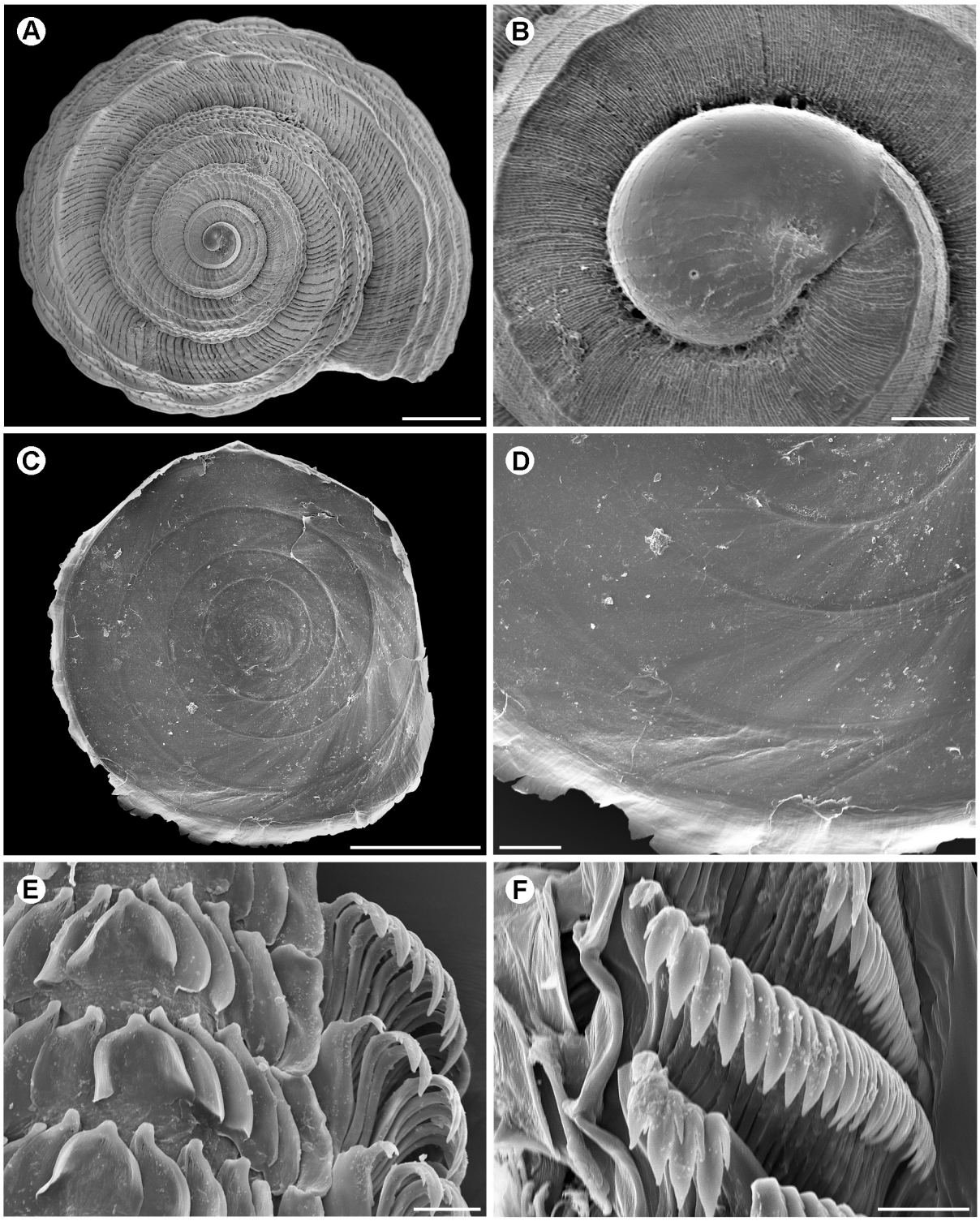

Fig. 19. *Parminolia agapeta* (Melvill & Standen, 1896) (all MNHN). **A**. Detail of shell microsculpture, Koumac, Stn KB636. **B**. Protoconch, Koumac, Stn KD533. **C–D**. Operculum, Lifou, Stn 1423. **E–F**. Radula, Lifou, Stn 1423. Scale bars: A, C = 0.5 mm; B = 50 µm; D = 100 µm; E–F = 25 µm.

Remarks

The strength of the sculpture in *P. agapeta* exhibits considerable variation. In some specimens the spiral cords are relatively weak and scarcely undulant, in others they are strong and distinctly undulant. In occasional very strongly sculptured specimens the dips of the undulations align in prosocline furrows which extend around the periphery and onto the base, ending as peri-umbilical pliculae. These specimens closely resemble *Gibbula vanwalleghemi* Poppe, Tagaro & Dekker, 2006 from the Philippines. The latter is undoubtedly congeneric with *P. agapeta* and may prove to be a synonym thereof, but confirmation of such synonymy must await evidence from molecular data.

Under SEM (Fig. 19B), the microsculpture on the first teleoconch whorl is typically umboniine, comprising extremely fine, close-set axial threads. However, during the second whorl additional axial ribs develop, strengthening during the third whorl and rendering the spiral cords weakly granular at the intersections. On the fourth whorl the axial sculpture no longer appears as ribs but as flat-topped buttresses separated by narrow, deep clefts (Fig. 19A). These clefts are interrupted by the primary spiral cords. The type specimens were evidently collected as beached specimens and thus details of sculpture are worn.

Although Ladd (1966) followed Iredale in treating *Minolia agapeta* as a synonym of *Monilea apicina*, he noted that his Marshall Islands material differed from Gould's type and this is evident in his illustrations. I believe Ladd's Marshall Island material to be referable to *Parminolia agapeta*, rather than to *Talopena apicina*. The same may well apply to the majority of literature records of *Monilea apicina* and *Parminolia apicina*.

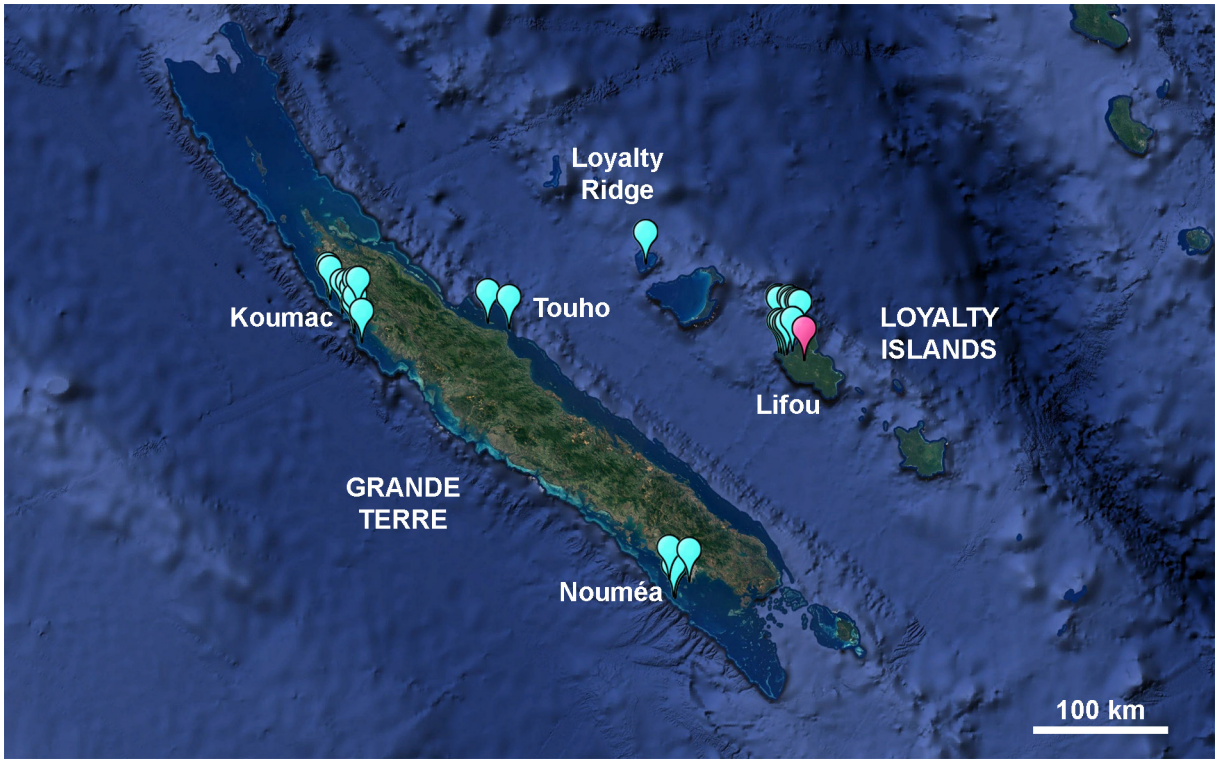

Fig. 20. Map showing the New Caledonian distribution of *Parminolia agapeta* (Melvill & Standen, 1896) in Grande Terre and the Loyalty Islands. Type locality (approximate) indicated in pink.

Monilea pusilla A. Adams, 1853 of unknown provenance is similar to *Parminolia agapeta*, but the holotype (NMHUK 1968101, H. Cuming Coll'n) has a strong carina-like cord at the shoulder on the second whorl and somewhat stronger axial sculpture on the early spire whorls. In addition, the umbilical funicle is narrower and more well defined, and the swelling at its termination at the base of the columella is less pronounced. In the absence of locality data for *M. pusilla*, these minor differences are difficult to evaluate, but the species clearly resembles *P. agapeta* closely and it is undoubtedly congeneric. I here provide the first illustration of the taxon (Fig. 78A–C).

Genus ***Rossiteria*** Brazier, 1895

Gibbula (*Rossiteria*) Brazier, 1895: 728.

Type species

Trochus nucleus Philippi, 1850 (by typification of replaced name), Recent, central Indo-West Pacific. **Nom. nov.** for *Trochus* (*Solanderia*) Fischer, 1879, non *Solanderia* Duchassaing & Michelin, 1846 [Cnidaria]. Generic fossil record: Miocene to Recent (Paleobiology Database 2024).

Diagnosis

Shell turbiniform, stout, size moderate (diameter up to 12 mm); whorls evenly rounded, last adult whorl deep; sculpture of spiral cords and finer lirae crossed by curved axial riblets producing fine, granular reticulation; umbilicus open, narrow, with two low funicles; columella lip thickened, bearing low nodules internally and notched basally; outer lip strongly indented below periphery; interior of outer lip with well-developed in-running ridges.

Operculum corneous, with relatively few, rapidly expanding whorls; surface with fine spiral microsculpture; peripheral fringe narrow with indistinct radial striations.

Radula with base-plates of rachidian and lateral teeth relatively robust; inner marginal tooth transitional with reduced cusp; cusps of marginals 5–10 largest, lanceolate with a large acuminate central denticle bearing smaller denticles along both margins.

Details of ctenidial morphology not available.

Remarks

Rossiteria is a distinctive genus to which species can be referred with relative confidence on account of characteristic shell features.

Rossiteria nucleus (Philippi, 1850)
Figs 21–25

Trochus nucleus Philippi, 1850: 171. Type locality: none given; here designated: Nouméa, New Caledonia (see Remarks below).

Trochus nucleus – Philippi 1846–1855: 306 [1855], pl. 44 fig. 9 [1850]. — Fischer 1878 in 1875–1880: 256, pl. 86 fig. 2.
Monilea (*Solanderia*) *nuclea* – Pilsbry 1890 in 1889–1890: 257, pl. 61 figs 31–32.
Gibbula (*Rossiteria*) *nucleus* – Brazier 1895: 728.
Monilea (*Rossiteria*) *nuclea* – Schepman 1908: 45.
Monilea nuclea – Hedley 1910: 353.
Monilea nucleus – Orr Maes 1967: 103: pl. 3 fig. H. — Cernohorsky 1978: 35, pl. 9 fig. 6. — Fukuda 1993: 25, pl. 6 fig. 74; 1995: 35.

Rossiteria nuclea – Hickman & McLean 1990: fig. 82d. — Higo *et al*. 1999: 68. — Sasaki 2000: 81, fig. 133. — Héros *et al*. 2007: 209.

Rossiteria nucleus – Wilson 1993: 94. — Hylleberg & Kilburn 2003: 26. — Poppe *et al*. 2006: 110, pl. 58 fig. 6. — Poppe & Tagaro 2008: 202, pl. 46 fig. 8. — Hasegawa 2018: 122.

Etymological note

The Latin word '*nucleus*' m., a kernel, is a noun in apposition and should not be made to agree in gender with the generic name.

Material examined

NEW CALEDONIA – **Chesterfield Plateau** • 1 specimen, dead; Plateau des Chesterfield, Stn DW146; 19°37′ S, 158°16′ E; depth 44 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW122; 19°28′ S, 158°17′ E; depth 32 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW158; 19°46′ S, 158°17′ E; depth 28 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW155; 19°49′ S, 158°25′ E; depth 42 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW128; 19°28′ S, 158°30′ E; depth 38 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW110; 19°09′ S, 158°56′ E; depth 40 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 7 specimens, living; Plateau des Chesterfield, Stn DW87; 19°06′ S, 159°00′ E; depth 31 m; 26 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN. – **d'Entrecasteaux Reefs – Lagon Nord – Belep** • 9 specimens, living; Atoll de Huon, Stn 438; 18°10′ S, 162°51′ E; depth 37 m; 25 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Atoll de Huon, Stn 443; 18°00′ S, 162°55′ E; depth 40 m; 25 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Atoll de Huon, Stn 441; 18°04′ S, 162°56′ E; depth 37 m; 25 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 5 specimens, dead; Atoll de Surprise, Stn 446; 18°19′ S, 163°04′ E; depth 36 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Atoll de Surprise, Stn 448; 18°22′ S, 163°07′ E; depth 30 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Atoll de Surprise, Stn 449; 18°22′ S, 163°09′ E; depth 21 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 15 specimens, living; Atoll de Surprise, Stn 454; 18°30′ S, 163°10′ E; depth 36 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1197; 19°36′ S, 163°22′ E; depth 41 m; 1 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Lagon Nord, Stn 478; 18°53′ S, 163°27′ E; depth 35 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Lagon Nord, Stn 482; 18°59′ S, 163°31′ E; depth 33 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 1217; 19°52′ S, 163°36′ E; depth 30 m; 3 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1118; 19°35′ S, 163°52′ E; depth 30 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1105; 19°40′ S, 163°57′ E; depth 25 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1087; 19°48′ S, 164°00′ E; depth 24 m; 24 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Ouégoa** • 1 specimen, living; mouth of Diahot River, Stn KD590; 20°16.6′ S, 164°18.2′ E; depth 1 m; 23 Nov. 2019; LPR-NC DIAHOT leg.; sédiment sombre sablo-vaseux à *Halophila*; DNA voucher; MNHN-IM-2019-9897 • 1 specimen, dead; Pointe de Pam, Stn KM310; 20°13.9′ S, 164°19.4′ E; depth 0 m; 17 Sep. 2018; LPR-NC MISCELLANEA leg.; palétuviers en bord de mer, estran avec sable sombre, vaseux, herbier; MNHN. – **Grande Terre**, **Pouébo** • 1 specimen, living; Stn 898; 20°14′ S, 164°27′ E; depth 22 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Poum** • 1 specimen, dead; Stn 1025; 20°07′ S, 163°49′ E; depth 25–28 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 1016; 20°09′ S, 163°49′ E; depth 19–20 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 1017; 20°08′ S, 163°51′ E; depth 21 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 1007; 20°12′ S, 163°52′ E; depth 23–24 m; 2 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 990; 20°19′ S, 163°55′ E; depth 22–

23 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 984; 20°21′ S, 163°56′ E; depth 21–23 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 989; 20°18′ S, 163°57′ E; depth 21 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 985; 20°20′ S, 163°58′ E; depth 15–17 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 982; 20°22′ S, 163°59′ E; depth 34–48 m; 29 Apr. 1988; B. Richer-ORSTOM leg.; MNHN• 7 specimens, living; Stn 961; 20°29′ S, 164°02′ E; depth 19–20 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Koumac** • 2 specimens, dead; Stn 954; 20°31′ S, 164°03′ E; depth 15–17 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn KD537; 20°31′ S, 164°03.3′ E; depth 12 m; 6 Nov. 2019; KOUMAC 2.3 leg.; sable blanc, éponges; DNA voucher; MNHN-IM-2019-7683 • 7 specimens, living; Stn KD532; 20°31.3′ S, 164°04′ E; depth 12–13 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 8 specimens, living; Stn KD536; 20°31.1′ S, 164°05.1′ E; depth 13 m; 6 Nov. 2019; KOUMAC 2.3 leg.; petits débris coralliens, éponges; MNHN • 2 specimens, dead; Stn KD533; 20°32.2′ S, 164°05.5′ E; depth 11 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 2 specimens, living; Stn KD565; 20°32.9′ S, 164°05.7′ E; depth 3 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et algues vertes filamenteuses et cotoneuses; MNHN • 8 specimens, living; Stn 953; 20°32′ S, 164°06′ E; depth 18–19 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 19 specimens, living; Stn KD563; 20°33.4′ S, 164°06.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, living; Stn KR217; 20°33.8′ S, 164°06.3′ E; depth 2–5 m; 24 Feb. 2019; KOUMAC 2.2 leg.; MNHN • 7 specimens, dead; Pointe de Babouillat, Stn 1292; 20°22.4′ S, 164°06.8′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles; MNHN • 4 specimens, living; Stn 947; 20°33′ S, 164°07′ E; depth 17–18 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 8 specimens, living; Stn KD534; 20°32.4′ S, 164°07.2′ E; depth 16 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc, éponges, *Halophila*, algues brunes, *Halimeda*; MNHN • 1 specimen, dead; NW Récif du Baron, Stn KR622; 20°33.3′ S, 164°09.7′ E; depth 12 m; 20 Sep. 2018; KOUMAC 2.1 leg.; fond de sable envasé avec massifs d'Acropora morts; MNHN • 7 specimens, living; Stn 945; 20°35′ S, 164°10′ E; depth 15–16 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Passe du Baron, Stn KR644; 20°33.8′ S, 164°10.3′ E; depth unknown; 29 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; MNHN • 10 specimens, living; Passe du Baron, Stn 1307; 20°33.7′ S, 164°10.3′ E; depth 12 m; Oct. 1993; Expédition Montrouzier leg.; sable à *Heteropsammia*; MNHN • 15 specimens, living; Grand Récif de Koumac, Stn KR218; 20°36.1′ S, 164°10.5′ E; depth 11 m; 16 Sep. 2018; KOUMAC 2.1 leg.; patate sur fonds blancs; MNHN • 1 specimen, living; Stn KD539; 20°34.1′ S, 164°10.6′ E; depth 11 m; 6 Nov. 2019; KOUMAC 2.3 leg.; algues brunes, éponges; DNA voucher; MNHN-IM-2019-7696 • 9 specimens, living; Stn 943; 20°37′ S, 164°11′ E; depth 15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 24 specimens, living; Chenal de l'Infernet, Stn 1305; 20°36.2′ S, 164°11.0′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 12 specimens, living; Stn KD543; 20°35.4′ S, 164°11.1′ E; depth 15 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris et algues; MNHN • 2 specimens, dead; Stn 944; 20°35′ S, 164°12′ E; depth 14–15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 7 specimens, living; Stn KD556; 20°32.9′ S, 164°12.2′ E; depth 5–6 m; 11 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 2 specimens, dead; Îlot Magone, Stn 1283; 20°33.5′ S, 164°12.2′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, platier sableux; MNHN • 16 specimens, living; Chenal de l'Infernet, Stn 1306; 20°39.1′ S, 164°12.4′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 9 specimens, dead; Stn KD518; 20°34.7′ S, 164°12.5′ E; depth 5–6 m; 1 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; MNHN • 6 specimens, living; Stn KD517; 20°36.3′ S, 164°12.7′ E; depth 11 m; 1 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; MNHN • 6 specimens, living; Stn KD542; 20°38.6′ S, 164°12.7′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 2 specimens, dead; Récif l'Infernet, Stn 1302; 20°35.8′ S, 164°12.7′ E; depth 9–10 m; Oct. 1993; Expédition Montrouzier leg.; pentes interne; MNHN • 3 specimens, dead; Îlot Tangadiou, Stn 1282; 20°33.5′ S, 164°13.0′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, platier d'îlot, fonds mixtes; MNHN • 1 specimen, dead; Stn 941; 20°39′ S, 164°13′ E; depth 15–16 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 7 specimens, living; Stn

942; 20°37′ S, 164°13′ E; depth 15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; lagoon between the land and l'Infernet, Stn 1299; 20°34.4′ S, 164°13.0′ E; depth 12–14 m; Oct. 1993; Expédition Montrouzier leg.; dalle à gorgones, limon; MNHN • 8 specimens, living; between Grand Récif de Koumac and l'Infernet, Stn KR616; 20°38.5′ S, 164°13.1′ E; depth 15 m; 15 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; DNA vouchers: MNHN-IM-2013-84630 to -84635 • 22 specimens, dead; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 2 specimens, living; Stn KS521; 20°38.4′ S, 164°13.2′ E; depth 16 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sable blanc à *Halophila*; MNHN • 2 specimens, dead; Stn KD541; 20°39′ S, 164°13.3′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 5 specimens, living; around l'Îlot Kendec, Stn 1309; 20°40.5′ S, 164°13.4′ E; depth 18 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 5 specimens, living; Stn KD516; 20°39.2′ S, 164°13.5′ E; depth 10 m; 1 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 1 specimen, living; Stn KS510; 20°34.3′ S, 164°13.5′ E; depth 10 m; 6 Nov. 2019; KOUMAC 2.3 leg.; dalle ensablée à gorgones, caulerpes, de lagon; MNHN • 3 specimens, living; Stn KS522; 20°39.3′ S, 164°13.6′ E; depth 15 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sable blanc à *Halophila*; MNHN • 10 specimens, living; Stn KD568; 20°40.1′ S, 164°14.3′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques débris coralliens; MNHN • 2 specimens, dead; Récif de l'Infernet, Stn KB600; 20°36.6′ S, 164°14.4′ E; depth 1 m; 28 Oct. 2019; KOUMAC 2.3 leg.; corail mort, corail vivant, débris de tombant interne de massif corallien intermédiaire, corail mort, débris, qq coraux vivants de platier de massif corallien intermédiaire; MNHN • 7 specimens, dead; Récif de l'Infernet, Stn KS500; 20°36.6′ S, 164°14.4′ E; depth 3 m; 28 Oct. 2019; KOUMAC 2.3 leg.; patch corallien de terrasse sableuse d'arrière récif de massif corallien intermédiaire; MNHN • 1 specimen, living; Stn KD561; 20°45.4′ S, 164°14.4′ E; depth 1 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable grossier; MNHN • 4 specimens, living; Stn KD567; 20°40.1′ S, 164°14.6′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et algues vertes filamenteuses; MNHN • 5 specimens, living; Récif de l'Infernet, Stn KR632; 20°37.5′ S, 164°14.7′ E; depth 8 m; 25 Sep. 2018; KOUMAC 2.1 leg.; bord du platier; DNA voucher, photographed alive (image LC242); MNHN-IM-2013-85357 • 3 specimens, dead; Chenal de la Passe de Koumac, Stn 1323; 20°40.9′ S, 164°14. 8′ E; depth 82–120 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 2 specimens, dead; Stn 937; 20°40′ S, 164°15′ E; depth 50–55 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; MNHN • 1 specimen, dead; Passe Deverd, Stn 1322; 20°45.2′ S, 164°15.2′ E; depth 53–71 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN • 1 specimen, dead; Chenal de la Passe de Koumac, Stn 1314; 20°39.8′ S, 164°15.3′ E; depth 30–63 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 5 specimens, living; Stn KD559; 20°46′ S, 164°15.5′ E; depth 12–14 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher; MNHN-IM-2019-8827 • 1 specimen, dead; around Plateau Karembé, Stn 1303; 20°30.7′ S, 164°15.9′ E; depth 0–8 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux, blocs; MNHN • 2 specimens, dead; Stn 936; 20°41′ S, 164°16′ E; depth 14–15 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 17 specimens, dead; Plateau Karembé, Stn 1286; 20°38′ S, 164°16′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles avec blocs; MNHN • 2 specimens, dead; Stn KD572; 20°45.8′ S, 164°16.1′ E; depth 22–23 m; 18 Nov. 2019; KOUMAC 2.3 leg.; sable grossier, coquilles; MNHN • 2 specimens, living; Stn KD510; 20°35.6′ S, 164°16.2′ E; depth 4–6 m; 30 Oct. 2019; KOUMAC 2.3 leg.; debris coralliens et sable grossier; DNA vouchers; MNHN-IM-2019-3431 and -3432 • 11 specimens, living; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.: sable fin gris à *Halophila*; MNHN • 3 specimens, dead; Stn KD582; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable, débris et herbier à *Thalassia*; MNHN • 1 specimen, dead; Stn KR1067; 20°38.4′ S, 164°16.5′ E; depth 18 m; 22 Nov. 2019; KOUMAC 2.3 leg.; plateforme sableuse et tombant de massif corallien intermédiaire; MNHN • 2 specimens, living; Stn KD554; 20°47′ S, 164°16.8′ E; depth 2–5 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et gros débris de coraux morts; MNHN • 2 specimens, living; Stn KD584; 20°35.4′ S, 164°16.8′ E; depth 7 m;

21 Nov. 2019; KOUMAC 2.3 leg.; sable, herbier à *Thalassia*, coraux vivants; MNHN • 12 specimens, living; Stn KD574; 20°43.5′ S, 164°16.9′ E; depth 12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; MNHN • 1 specimen, dead, Stn KR1037; 20°48.4′ S, 164°17′ E; depth 3 m; 12 Nov. 2019; KOUMAC 2.3 leg.; tombant interne de récif barrière et terrasse d'arrière récif; MNHN • 1 specimen, living; Stn KD550; 20°41′ S, 164°17.1′ E; depth 5–6 m; 10 Nov. 2019; KOUMAC 2.3 leg.; sable fin, coraux; MNHN • 13 specimens, living; Stn KD553; 20°47.9′ S, 164°17.2′ E; depth 5–10 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher; MNHN-IM-2019-8671 • 8 specimens, living; Stn KD583; 20°43.5′ S, 164°17.3′ E; depth 12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable fin; MNHN • 1 specimen, dead; Stn KS503; 20°37.5′ S, 164°17.4′ E; depth 2 m; 29 Oct. 2019; KOUMAC 2.3 leg.; no substratum data; MNHN • 40 specimens, living; Stn KR636; 20°39.6′ S, 164°17.5′ E; depth 2–5 m; 27 Sep. 2018; KOUMAC 2.1 leg.; fonds sableux; MNHN • 3 specimens, living; Stn KD587; 20°39.3′ S, 164°17.8′ E; depth 2 m; 22 Nov. 2019; KOUMAC 2.3 leg.; sable sombre, *Halophila*, *Caulerpa*, coraux, *Halimeda*; MNHN • 4 specimens, living; Stn KD547; 20°42.2′ S, 164°18.2′ E; depth 2–6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et herbier; MNHN • 5 specimens, dead; Stn KD552; 20°49.4′ S, 164°18.5′ E; depth 10–11 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 3 specimens, living; Stn KS520; 20°40.2′ S, 164°18.6′ E; depth 5 m; 22 Nov. 2019; KOUMAC 2.3 leg.; sable à *Caulerpa* et *Halophila*; MNHN • 2 specimens, dead; caye de sable devant Kaala-Gomen, Stn 1288; 20°40.0′ S, 164°19.0′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds meubles; MNHN • 1 specimen, living; Stn KB625; 20°46.2′ S, 164°22.6′ E; depth 3–4 m; 6 Nov. 2019; KOUMAC 2.3 leg.; fond vaseux à caulerpe, tombant de platier de récif frangeant; MNHN • 2 specimens, living; Stn 922; 20°51′ S, 164°24′ E; depth 12–13 m; 27 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 916; 20°56′ S, 164°28′ E; depth 13 m; 26 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Stn 905; 20°59′ S, 164°37′ E; depth 56–57 m; 26 Apr. 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Touho** • 33 specimens, living; parages de la Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 1 specimen, dead; Îlot Ouao (=Î. Camille), Stn 1246; 20°42.8′ S, 165°08.7′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbier; MNHN • 2 specimens, dead; Anse de Tiouandé, Stn 1267; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 6 specimens, living; abords de la Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN • 2 specimens, living; Baie de Touho, Stn 1250; 20°46.7′ S, 165°13.7′ E; depth 3–6 m; Sep. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN • 10 specimens, dead; Baie de Touho, Stn 1237; 20°46.9′ S, 165°13.8′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; sable fin et herbiers abrités; MNHN • 18 specimens, living; platform off the wharf of Touho, Stn 1242; 20°46.2′ S, 165°14.5′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, blocs, sable, herbiers; MNHN • 1 specimen, dead; between Baie de Touho and Îlot Atit, Stn 1240; 20°46.5′ S, 165°15′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; platier abrité, sable, herbier; MNHN • 4 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1264; 20°44.5′ S, 165°15.9′ E; depth 8 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse, dôme détritique; MNHN • 2 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1263; 20°45.0′ S, 165°16.0′ E; depth 6 m; Sep. 1993; Expédition Montrouzier leg.; sable vaseux avec patés coralliens; MNHN • 8 specimens, dead; Grand Récif Mengalia, Stn 1245; 20°45.2′ S, 165°16.3′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbiers; MNHN. – **Grande Terre**, **Bourail** • 11 specimens, dead; Lagon de Poé, Stn 1324; 21°36.9′ S, 165°22.7′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; fonds mixtes, herbier; MNHN. – **Grande Terre**, **Baie de St Vincent** • 4 specimens, living; Stn 214; 21°55′ S, 165°48′ E; depth 12 m; 20 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 216; 21°53′ S, 165°49′ E; depth 14 m; 21 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 212; 21°56′ S, 165°53′ E; depth 10 m; 20 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Stn 186; 22°04′ S, 166°00′ E; depth 11 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn 163; 22°12′ S, 166°08′ E; depth 15 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Nouméa** • 1 specimen, dead; Stn DE56;

22°08.4′ S, 166°07.7′ E; depth 19–20 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn DE54; 22°11.9′ S, 166°08.3′ E; depth 13 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, dead; Stn 51; 22°15′ S, 166°11′ E; depth 10 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn DE52; 22°15.1′ S, 166°11.3′ E; depth 9–10 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 8 specimens, living; Stn 50; 22°17′ S, 166°12′ E; depth 12 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Stn DE51; 22°16.8′ S, 166°12.5′ E; depth 10–11 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn DE50; 22°18.0′ S, 166°14.1′ E; depth 15–16 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, dead; Stn DE49; 22°19.8′ S, 166°14.5′ E; depth 19–20 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Grand Récif Aboré, Stn 1346; 22°21.9′ S, 166°16.1′ E; depth 5–6 m; 5 Oct. 1992; P. Bouchet leg.; fonds blanc; MNHN • 3 specimens, living; Stn 8; 22°23′ S, 166°18′ E; depth 15 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 7 specimens, dead; Quatre Bancs de l'Ouest, Stn 1510; 22°26.47′ S, 166°18.35′ E; depth 0–1 m; 26 Oct. 2000; Cosel and Trondlé leg.; drague à main; MNHN • 1 specimen, dead; Stn DE46; 22°23.4′ S, 166°18.8′ E; depth 10–11 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • ±20 specimens, dead; Récif Senez, Stn 1350; 22°17.9′ S, 166°19.6′ E; depth 3–6 m; 23 Nov. 1992; Bouchet and Marshall leg.; pente interne; MNHN • 3 specimens, dead; Stn 257; 22°22′ S, 166°20′ E; depth 9 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 7; 22°24′ S, 166°20′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 2 specimens, dead; Stn 258; 22°21′ S, 166°21′ E; depth 10 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 40+ specimens, living; Crouy; 22°21.5′ S, 166°21.7′ E; depth 1–6 m; 1990–2003; Claude Berthault leg.; MNHN • 20 specimens, living; Crouy; 22°21.5′ S, 166°21.7′ E; depth 1–6 m; 1990–2003; Berthault leg.; MNHN • 1 specimen, dead; SE Sèche Croissant, Stn 1508; 22°18.6′ S, 166°21.8′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main; MNHN • 25 specimens, dead; SE Sèche Croissant, Stn 1508; 22°18.6′ S, 166°21.8′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main; MNHN • 16 specimens, dead; SE Sèche Croissant, Stn 1507; 22°19.6′ S, 166°22.4′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main, récolte à vue; MNHN • 13 specimens, dead; Île aux Goélands, Stn 1503; 22°22.4′ S, 166°22.5′ E; depth 5-7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 33 specimens, living; Île aux Goélands; 22°22.4′ S, 166°22.8′ E; depth 0–4 m; 1997–1999; Claude Berthault leg.; MNHN • 9 specimens, living; Stn 281; 22°24′ S, 166°24′ E; depth 10 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 2; 22°19′ S, 166°24′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Îlot Maître, Stn 1361; 22°20.2′ S, 166°24.3′ E; depth 6 m; 24 Mar. 1993; P. Bouchet leg.; sable grossier dans herbier mixte; MNHN • 66 specimens, living; Stn DE43; 22°26.5′ S, 166°24.3′ E; depth 11–12 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 12 specimens, living; Îlot Maître, Stn 1501; 22°19.6′ S, 166°24.7′ E; depth 5–7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 9 specimens, living; Nouville Antenne F.C.R.; 22°16.17′ S, 166°24.77′ E; depth 0–3 m; 2000–2002; Claude Berthault leg.; MNHN • 11 specimens, living; Ile Ouen-Baie du Prony, Stn 64; 22°28′ S, 166°25′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 284; 22°26′ S, 166°25′ E; depth 6 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn DE42; 22°27.5′ S, 166°25.3′ E; depth 15 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 30 specimens, living; Anse aux Boeufs, Stn 1500; 22°16.06′ S, 166°25.4′ E; depth 4–6 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 15 specimens, living; Anse Vata, Stn 1516; 22°18.21′ S, 166°26.30′ E; depth 2–3 m; 30 Oct. 2000; Berthault, Cosel and Trondlé leg.; MNHN • 8 specimens, living; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 2 Dec. 2001; Berthault leg.; MNHN • 28 specimens, living; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 6 Jan. 2002; Berthault leg.; MNHN • 22 specimens, living; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 12 Feb. 2002; Berthault leg.; MNHN • 26 specimens, living; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 14 Apr. 2002; Berthault leg.; MNHN • 21 specimens, living; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 16 May 2002; Berthault leg.; MNHN • 1000+ specimens, living; Anse Vata; 22°18.1′ S,

166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 29 specimens, living; Baie des Citrons; 22°17.2′ S, 166°26.0′ E; depth 1–3 m; 30 Oct. 2000; Cosel and Trondlé leg.; sable fin, coraux; MNHN • 36 specimens, living; Baie des Citrons; 22°18.06′ S, 166°26.07′ E; depth 1–5 m; 7 Feb. 2002; Berthault leg.; MNHN • 150+ specimens, living; Baie des Citrons; 22°18.06′ S, 166°26.07′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 20 specimens, living; Baie des Citrons; 22°18.06′ S, 166°26.07′ E; depth 1–5 m; 21 Mar. 2002; Berthault leg.; MNHN • 3 specimens, dead; Ile Ouen-Baie du Prony, Stn 66; 22°28′ S, 166°27′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Plage Magenta; 22°16′ S, 166°28.12′ E; depth 0 m; 4 Jan. 2002; Claude Berthault leg.; MNHN • 19 specimens, living; Plage Magenta; 22°16′ S, 166°28.2′ E; depth 0–1 m; 1987–2003; Claude Berthault leg.; MNHN • 26 specimens, living; Baie de Sainte Marie-Îlot Uéré; 22°18.5′ S, 166°28.3′ E; depth 0–3 m; 1995-2003; Claude Berthault leg.; MNHN • 1 specimen, dead; Stn DE38; 22°33.6′ S, 166°28.6′ E; depth 22–24 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 83; 22°32′ S, 166°30′ E; depth 22 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn DE36; 22°35.5′ S, 166°32.0′ E; depth 17–19 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 8 specimens, dead; Ile Ouen-Baie du Prony, Stn 98; 22°36′ S, 166°32′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Ile Ouen-Baie du Prony, Stn 95; 22°31′ S, 166°33′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 226; 22°38′ S, 166°39′ E; depth 28 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 293; 22°42′ S, 166°41′ E; depth 20 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Ile Ouen-Baie du Prony, Stn 233; 22°35′ S, 166°46′ E; depth 30 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 544; 22°51′ S, 166°49′ E; depth 25 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Île des Pins** • 1 specimen, dead; Stn 590; 22°34′ S, 167°24′ E; depth 20 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 5 specimens, dead; Stn 591; 22°36′ S, 167°24′ E; depth 14 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands**, **Loyalty Ridge** • 3 specimens, living; Stn DW435; 20°21′ S, 166°08′ E; depth 32 m; 18 Feb. 1989; NO *Alis*-MUSORSTOM leg.; MNHN. – **Loyalty Islands**, **Ouvéa** • 1 specimen, dead; Lagon d'Ouvéa, Stn 1226; 20°32′ S, 166°24′ E; depth 21 m; 9 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 2 specimens, dead; Lagon d'Ouvéa, Stn 1225; 20°36′ S, 166°28′ E; depth 18 m; 7 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 1 specimen, living; Lagon d'Ouvéa, Stn 1224; 20°32′ S, 166°28′ E; depth 18 m; 11 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 7 specimens, living; Lagon d'Ouvéa, Stn 1233; 20°29.1′ S, 166°29.0′ E; depth 15 m; 12 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN • 7 specimens, living; Lagon d'Ouvéa, Stn 1222; 20°28′ S, 166°30′ E; depth 15 m; 12 Sep. 1992; NO *Alis*, Campagne PLOUVEAL leg.; MNHN • 11 specimens, living; Lagon d'Ouvéa, Stn 1218; 20°36′ S, 166°30′ E; depth 13 m; 7 Sep. 1992; NO *Alis*, Campagne PLOUVEAL leg.; MNHN • 1 specimen, dead; Lagon d'Ouvéa, Stn 1221; 20°29′ S, 166°31′ E; depth 10 m; 11 Sep. 1992; NO *Alis*-PLOUVEAL leg.; MNHN. – **Loyalty Islands**, **Lifou** • 1 specimen, living; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 1 specimen, dead; Baie du Santal, Baie de Gaatcha, Stn 1463; 20°55′ S, 167°03.3′ E; depth 20–30 m; 10 Nov. 2000; Atelier LIFOU 2000; dragages sable et débris coralliens; MNHN • 50+ specimens, living; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 1 specimen, dead; Baie du Santal, in front of Huneté, Stn 1414; 20°45.9′ S, 167°06.2′ E; depth 4–7 m; 20 Nov. 2000; Atelier LIFOU 2000 leg.; drague triangulaire; MNHN • 1 specimen, dead; Baie du Santal, to east of Pointe d'Easo, Stn 1418; 20°46.9′ S, 167°07.9′ E; depth 1–5 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable et herbier autour du wharf; MNHN • 2 specimens, dead; Baie du Santal, in front of Chépénéhé, Stn 1415; 20°47.1′ S, 167°09.1′ E; depth 3–7 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable; MNHN • 10 specimens, living; Baie du Santal, in front of Kiki, Stn 1411; 20°47.6′ S, 167°10.4′ E; depth 48 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable entre patates; MNHN • 4 specimens, living; Baie du Santal, NE of the Baie at Cila, Stn 1416; 20°49.2′ S, 167°10.7′ E; depth 5–7 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; drague; MNHN.

Description (Fig. 21)

Shell. Although variable in colour and patterning, *Rossiteria nucleus* is a distinctive species. Shell robust, of moderate size (adult diameter up to 12 mm), height and diameter usually approximately equal, occasionally slightly taller than wide; spire conical and suture rather shallowly indented; last adult whorl deep and evenly rounded; base umbilicate, but not widely so. Sculpture comprising unevenly spaced spiral cords, often with finer spiral lirae in their intervals; spiral elements crossed by close-set, curved, axial riblets producing a finely granular reticulation (Fig. 22B). Most distinctive are features of the aperture – columella thickened and concave, bulging into umbilicus; lower half of its inner lip bears 4–5 small, rounded nodules, increasing in size toward base; at junction of columella and basal lips there is a distinct notch which truncates the columella, creating a tooth-like bulge; interior of outer lip thick and bearing up to 20 close-set, in-running ridges. Edge of outer lip shallowly concave above periphery, but deeply notched below it (Fig. 22A); notch marked externally by a broader or deeper interval between spiral cords.

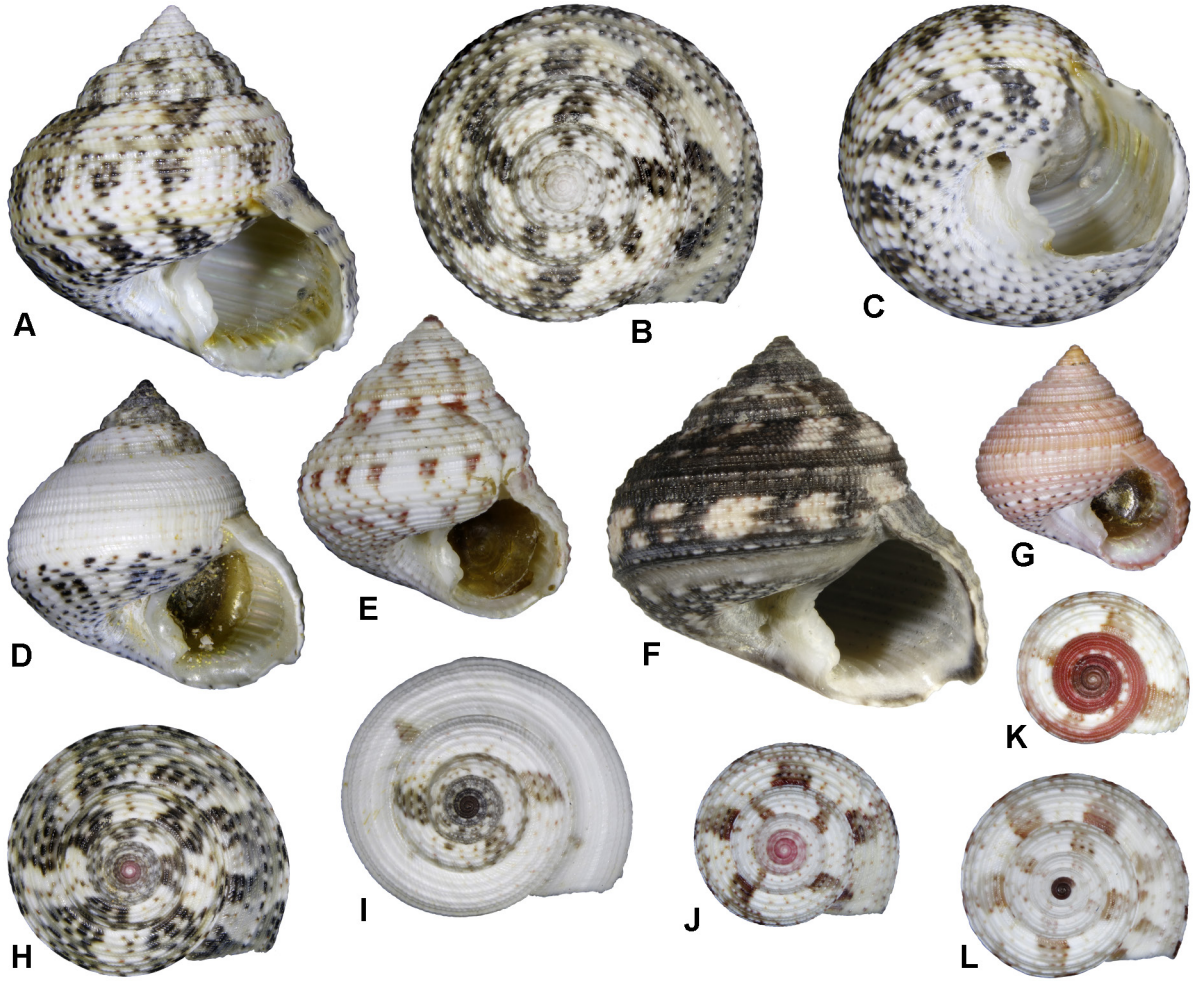

Fig. 21. *Rossiteria nucleus* (Philippi, 1850) (all MNHN). **A–C**. specimen with typical 'pepper and salt' coloration, Koumac, Stn KR636, diameter 10.0 mm. **D**. Pale specimen, Koumac, Stn KR636, diameter 8.5 mm. **E**. Elevated specimen, Lifou, Stn 1413, diameter 7.8 mm. **F**. Large specimen with aberrant sculpture (strong growth scar on fifth whorl suggests damage to mantle edge), Koumac, Stn KD536, diameter 10.9 mm. **G**. Pink specimen, Koumac, Stn KR217, diameter 6.2 mm. **H**. Specimen with typical colour pattern and pink apex, Koumac, Stn KR636, diameter 8.0 mm. **I–L**. Specimens showing variation in coloration of apex, Lifou, Stn 1413, diameters respectively 8.3 mm, 5.9 mm, 5.0 mm and 6.5 mm.

Colour. Colour and pattern highly variable; most common form a pepper and salt pattern of dark brownish to black marks on a whitish to pale fawn-brown ground; dark marks normally a mixture of blotches, axial bands and small spots; blotches frequently spirally aligned in subsutural, peripheral and/or mid-basal bands, smaller spots usually situated on spiral cords. Less frequently ground colour pale rose-pink (Fig. 21G); apical surface of whorls almost devoid of pigmentation in some individuals (Fig. 21D). Shell apex usually whitish, but protoconch and first 2–3 teleoconch whorls not infrequently pinkish, reddish, dark maroon-brown or almost black (Fig. 21I–L). Ground colour may include some buffish spiral bands and there may be evidence of a corneous periostracal layer with some orangish superficial deposit, particularly on base.

Protoconch (Fig. 22C). Typically umboniine, diameter ± 190 µm; apical beak present and confluent with terminal lip; apical bulb sculptured with an irregular network of threads, almost hexagonal in places, remainder with distinct subspiral threads; terminal lip weakly convex.

Operculum (Fig. 23A–B). Corneous, yellowish-brown; comprising relatively few, broad whorls and with long growing margin; surface with fine spiral microsculpture; peripheral fringe narrow, its radial striations indistinct, but sometimes evident where whorls overlap.

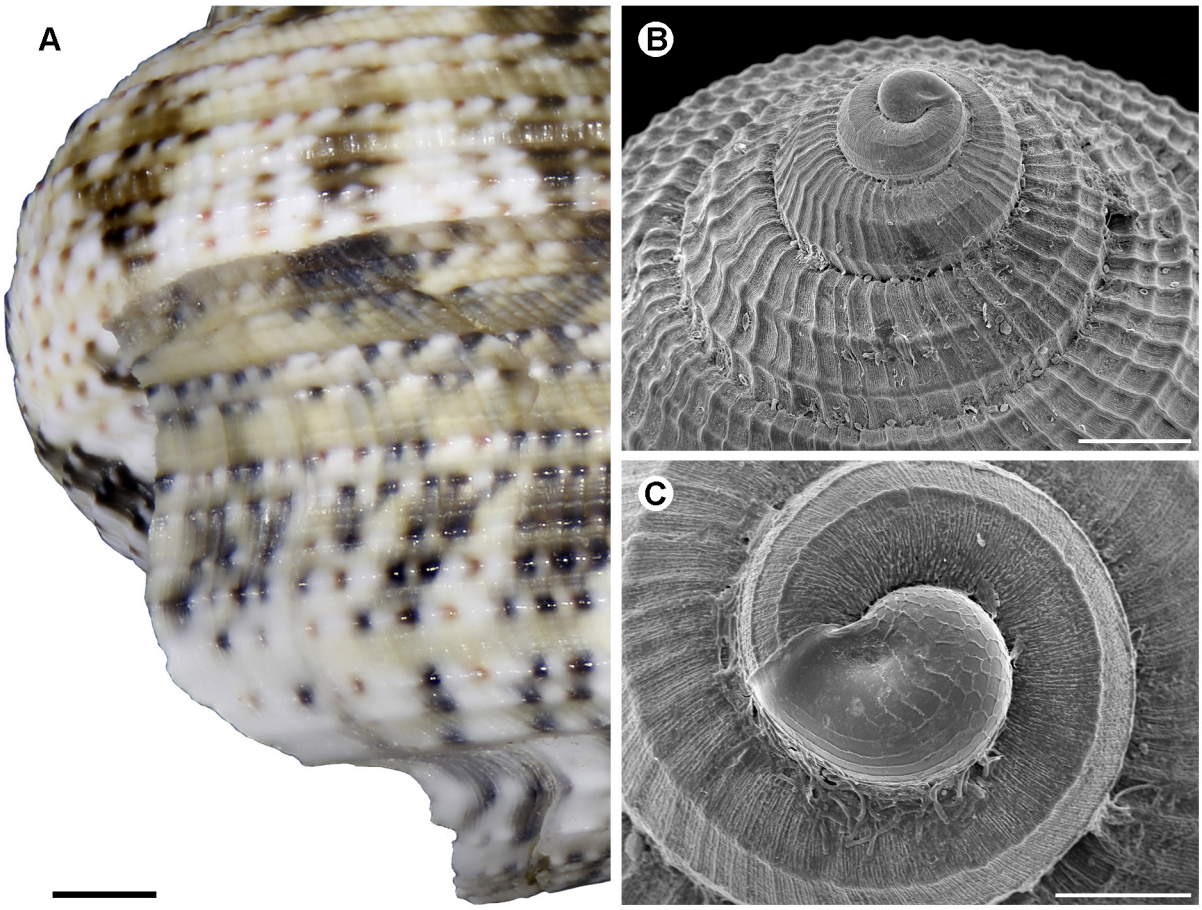

Fig. 22. *Rossiteria nucleus* (Philippi, 1850) (all MNHN). **A**. Side view of undamaged outer lip showing concave indentations above and below periphery, Koumac, Stn KR636. **B**. Oblique view of apical whorls, Koumac, Stn KD574. **C**. Protoconch, Koumac, Stn KD574. Scale bars: A = 1.0 mm; B = 250 µm; C = 100 µm.

Radula (Fig. 23C–F). Formula ∞+(1)+5+1+5+(1)+∞, with 30–40 transverse rows of teeth; rachidian trigonal, with bluntly rounded vestige of shaft; laterals 1–2 subtriangular, with convex outer margin and anterior shaft vestige, remaining laterals elongate-rectangular. Innermost marginal transitional, with stout base-plate and reduced shaft and cusp; remaining marginal teeth well developed, with narrow shaft

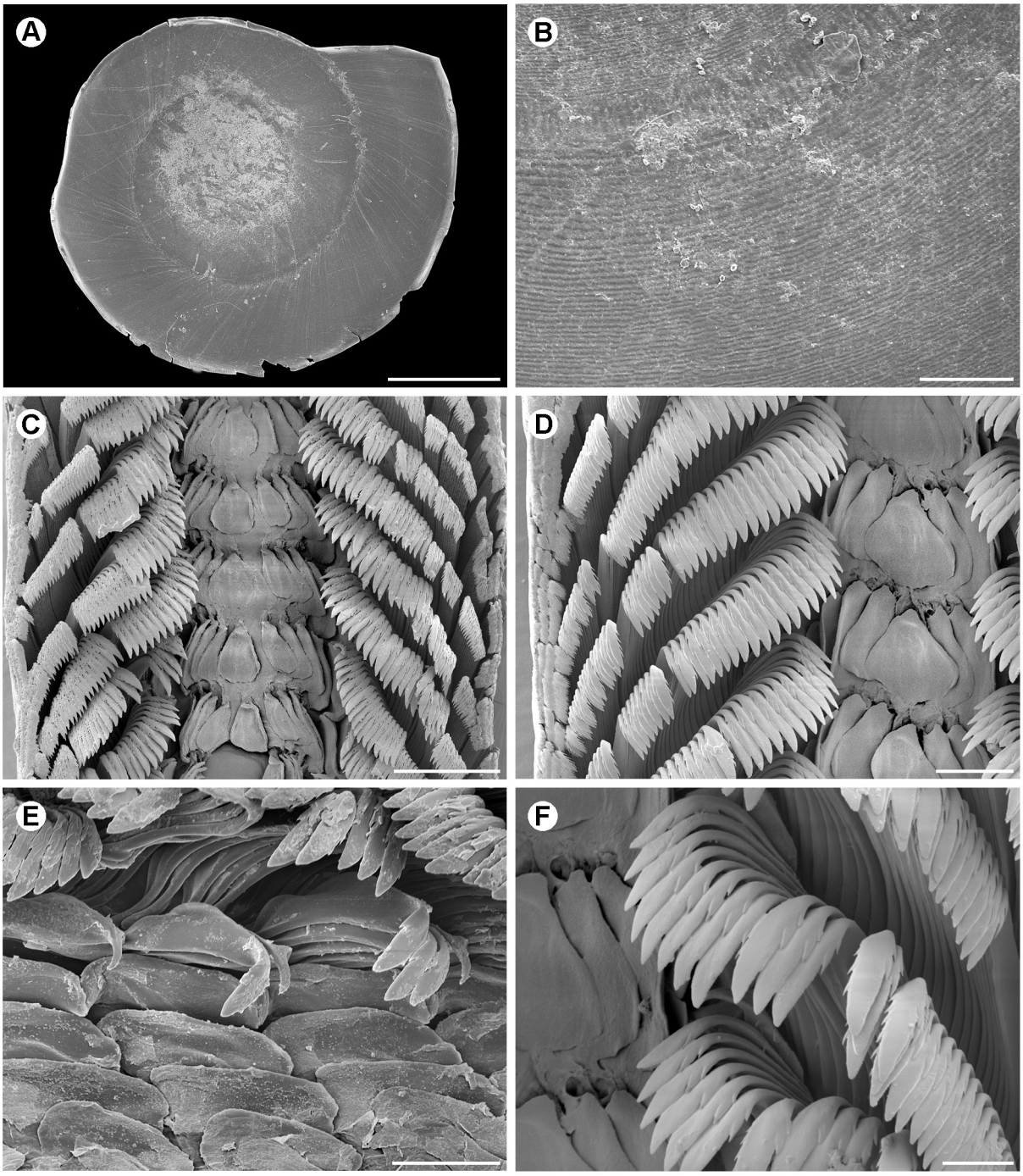

Fig. 23. *Rossiteria nucleus* (Philippi, 1850), Koumac, Stn KR636 (MNHN). **A**. Operculum. **B**. Spiral microsculpture on operculum. **C**. Radula, entire width. **D**. Radula, central field and left marginal teeth. **E**. Radula, latero-marginal transition. **F**. Radula, detail of inner marginal teeth. Scale bars: A = 1.0 mm; B–C = 100 µm; D–E = 50 µm; F = 25 µm.

and strongly recurved cusp; cusps of inner marginal series lanceolate with 2–3 small denticles at base of outer margin and 3–5 finer denticles along inner margin (usually hidden by tooth overlap); marginals 5–10 with largest cusps, gradually decreasing in size toward radula margin, and with more numerous, finer denticles, outermost ones with finely pectinate margins.

External anatomy (from photographs and rehydrated specimens) (Fig. 24). Snout long, tapering terminally, distal half with numerous slender, digit-like projections; mouth a narrow longitudinal slit; snout emerges from beneath well-developed frontal ridge running between cephalic tentacles; cephalic tentacles long and slender, micropapillate, left and right of similar size; eyestalks very long, their tips conspicuously expanded and containing large black eyes; left neck-lobe comprising ± 10 non-papillate digit-like projections; right neck-lobe well developed, rolled to form an elongate exhalant siphon; four micropapillate epipodial tentacles on each side, each with a well-developed stalked epipodial sense organ at its base, that of first epipodial tentacle usually posterior to tentacle base, sometimes lying midway between first and second tentacles; propodium broad, indented in mid-line and pinched in sub-terminally creating a lateral propodial lobe on each side; remainder of foot tapering to a point posteriorly. Snout dark, its digit-like projections whitish; cephalic and epipodial tentacles with fine transverse bands of dark and light pigment; sides of foot and sole translucent greyish-white, with irregular blackish markings and finer opaque cream spots; digits of left neck-lobe cream-white; right neck-lobe with fine, close-set, black and cream spots. Details of ctenidial morphology not clear in rehydrated material.

Habitat

Abundant and widely distributed in lagoonal habitats; living specimens low intertidal to a depth of 30 m (exceptionally 48 m around Lifou where there is no barrier reef), mostly associated with white and grey sandy substrata with seagrasses and green algae. Empty shells to 82 m in lagoon channels and passes.

Distribution (Fig. 25)

Southern Japan to the Philippines, Vietnam, eastern Thailand, Banda Sea, northern Australia, New Caledonia and Fiji. Also recorded from the Cocos-Keeling Islands in the eastern Indian Ocean (Orr Maes 1967). Records from further west in the Indian Ocean require confirmation. The absence of records from Bellona Plateau and the Lansdowne-Fairway Banks is puzzling.

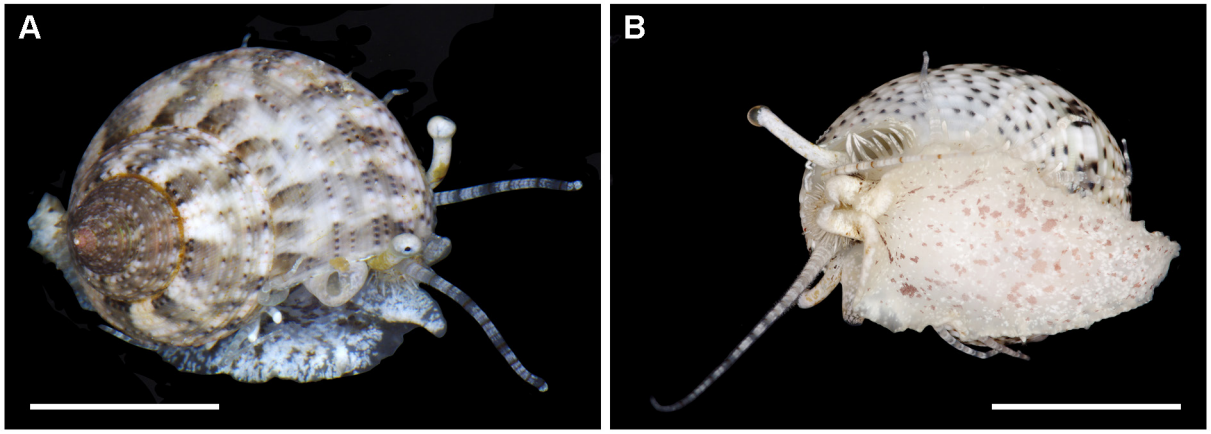

Fig. 24. *Rossiteria nucleus* (Philippi, 1850), living specimens. **A**. Antero-lateral view from right, Koumac, Stn KR632, image Laurent Charles (LC242) (MNHN-IM-2013-85357). **B**. Ventral view, Koumac, Stn KD516, image Laurent Charles (LC163) (MNHN). Scale bars = 5.0 mm.

Remarks

A feature rarely noted in this species is the presence of two distinct indentations in the outer lip, either side of the periphery (Fig. 22A), the one below the periphery more distinct. When the animal is active, the very long curving eyestalks with large, upwardly-directed eyes project beneath these indentations, extending upward, well beyond the aperture rim and providing the animal with a view of its surroundings while it is engaged in feeding.

As with *Trochus belcheri* Philippi, 1850 and *T. rotellaeformis* Philippi, 1850, I have been unable to trace the whereabouts of the type material of this species. Philippi gave no locality for the original material, and stated only that it came from the travels of Edward Belcher and was in the Silvanus Hanley collection. Fischer (1878 in 1875–1880) appears to have been the first to provide locality data, indicating that the species was abundant in New Caledonia. For this reason, I here designate Nouméa, New Caledonia to be the type locality for *Trochus nucleus* Philippi, 1850. In all probability, subsequent molecular studies will need such a designation in order to accurately apply the name.

Rossiteria pseudonucleolus Poppe, Tagaro & Dekker, 2006 from the Philippines closely resembles *R. nucleus* and, given the extent of intraspecific variation in shell shape, size and coloration evident in the New Caledonian material studied, it is difficult to evaluate the distinctness of the two in the absence of molecular data. *R. nucleolus* (Pilsbry, 1903) from Japan is a smaller species with a more depressed shell and weaker spiral sculpture (syntype illustrated by Higo *et al*. 2001: fig. G485).

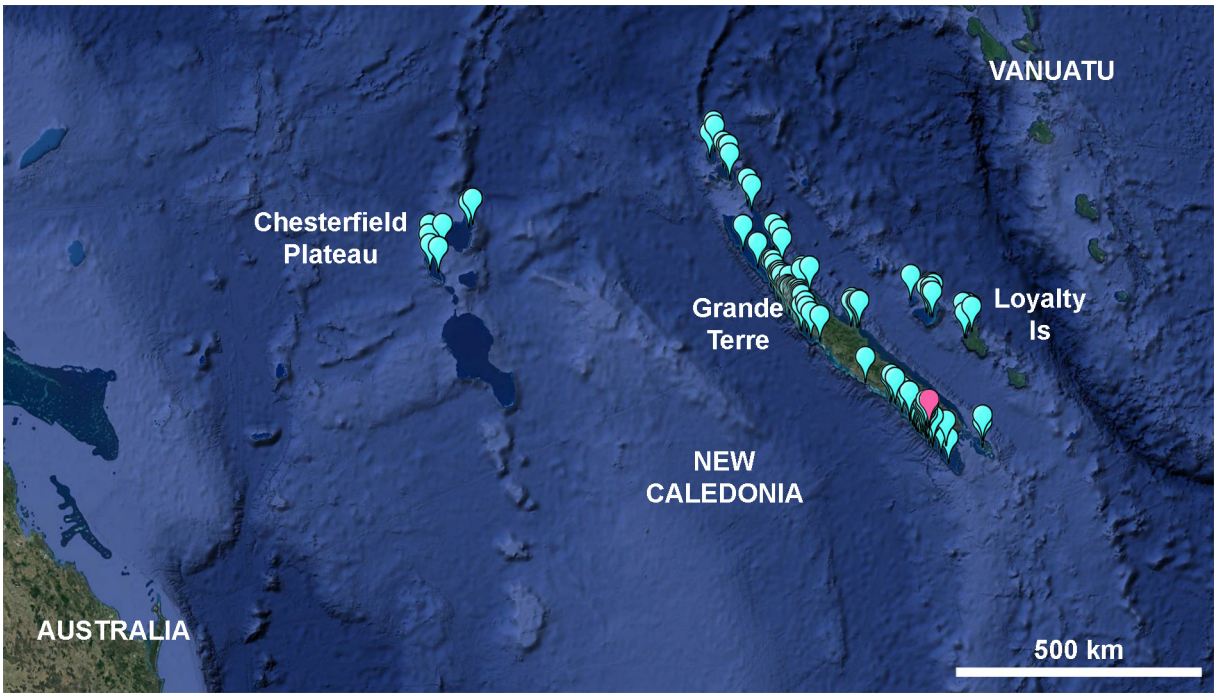

Fig. 25. Map of the Coral Sea showing records of *Rossiteria nucleus* (Philippi, 1850) from New Caledonia. Type locality (designated herein) indicated in pink.

Genus ***Sericominolia*** Kuroda & Habe, 1954

Ethminolia (*Sericominolia*) Kuroda & Habe, 1954: 84 [Japanese], 92 [English].

Type species

Minolia stearnsii Pilsbry, 1895 (original designation), Recent, Japan.

Diagnosis

Shell relatively thin, depressed turbiniform to trochoid-turbiniform, of moderate size (diameter up to 14.0 mm); whorls rounded or weakly shouldered, periphery at or below mid-whorl, base flatter; sculpture fine, comprising close-set spiral lirae and microscopic axial pliculae; umbilicus open, its rim thickened, usually (not always) with distinct internal funicle ending in reflected callus on columella lip, often differentially coloured; outer lip simple, interior smooth.

Operculum corneous, relatively thick, multispiral, but not tightly so; whorl overlap narrow, peripheral fringe narrow; spiral microsculpture lacking.

Radula with base-plates of rachidian and lateral teeth relatively robust; inner marginal tooth transitional with reduced cusp; cusps of marginals 3–10 largest, with a large bluntly lanceolate central denticle bearing 1–2 smaller denticles at its outer base.

Ctenidium bipectinate, anterior portion unattached.

Remarks

Sericominolia comprises an assemblage of small to medium-sized umboniine species, typically with relatively thin, somewhat glossy shells, a moderately raised spire, rounded periphery and indented suture, with a fine sculpture of close-set spiral lirae and microscopic axial pliculae on the adapical surface. The base is umbilicate and there may or may not be an umbilical funicle. The colour patten often varies greatly, but is commonly variegated or mottled, and narrow spiral capillary lines with opaque white flecks are frequent. The umbilical funicle is often differentially pigmented. Currently, only two species are referred to the genus, the type species *S. stearnsii* (Pilsbry, 1895) and *S. vernicosa* (Gould, 1861), both described from Japanese waters, but this number will undoubtedly grow as further species are studied in greater detail. Likely referable to this genus are *Minolia eilikrines* Melvill, 1891 from the Philippines, *Talopena gloriola* Iredale, 1929 from New South Wales and *Trochus vitiligineus* Menke, 1843 from temperate Australia.

Preliminary molecular studies (Williams *et al*. 2024) indicate that there is much cryptic diversity within *Sericominolia* with significant geographical substructure. At this stage, therefore, it is unwise to envisage wide-ranging species and multiple synonyms. Splitting rather than lumping is likely to be needed.

Material referable to *Sericominolia* is common shallow-water habitats in New Caledonia, but it has proved difficult to interpret. In addition to the already described *S. lifuana* (Fischer, 1878), I have identified two undescribed species which exhibit consistent differences that permit separation from *S. lifuana* s. s. These occur at somewhat greater depths than is typical for the largely lagoonal *S. lifuana*, and are instead associated with reef passes and habitats largely outside the lagoonal system. Even so, the remaining *Sericominolia* material, all here identified as *S. lifuana*, quite possibly represents a complex of cryptic taxa. There is considerable variation in size, spire height, width of the umbilicus and the strength of its funicle, as well as in shell pigmentation and pattern, and colour of the funicle. I have been unable to confidently delimit morphologically consistent units within this variation and consider that any further subdivision of this complex is best conducted in the light of molecular data. There is some evidence of geographic structure within this morphological variation, particularly between Chesterfield-Bellona material and Grande Terre material, but this too is difficult to evaluate given the geographical distance between the populations and the absence of molecular data.

Sericominolia lifuana (Fischer, 1878) status revised
Figs 26–28

Trochus (*Monilea*) *lifuanus* Fischer, 1878: 63. Type locality: "ins. Lifu" [Lifou], Loyalty Islands, New Caledonia (Pierre Lambert).

Monilea lifuana – Souverbie & Montrouzier 1879: 30, pl. 3 fig. 5. — Hedley 1899: 405; 1910: 353.
Talopena lifuana – Iredale 1929b: 171.
Monilea (*Monilea*) *lifuana* – Ladd 1966: 40, pl. 5 figs 13–14.
Trochus (*Monilea*) *lifuanus* – Herbert 1996: 428 [additional chresonymy], figs 38–40 [holotype].
Talopena vernicosa (non Gould, 1861) – Héros *et al*. 2007: 210.
Sericominolia vernicosa (non Gould, 1861) – Boutet *et al*. 2020: 152.

Material examined

Holotype (Fig. 26A–D)
NEW CALEDONIA • Loyalty Islands, Lifou; MHNBx 2004.TY.184.

Other material
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 2 specimens, dead; Plateau des Chesterfield, Stn DW122; 19°28′ S, 158°17′ E; depth 32 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW152; 19°52′ S, 158°20′ E; depth 51 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 4 specimens, dead; Plateau des Chesterfield, Stn DW156; 19°49′ S, 158°21′ E; depth 42 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW72; 19°15′ S, 158°21′ E; depth 32 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, living; Plateau des Chesterfield, Stn DW134; 19°31′ S, 158°22′ E; depth 47 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW144; 19°28′ S, 158°23′ E; depth 50 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW150; 19°54′ S, 158°25′ E; depth 39 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW155; 19°49′ S, 158°25′ E; depth 42 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 5 specimens, living; Plateau des Chesterfield, Stn DW166; 19°41′ S, 158°25′ E; depth 56 m; 2 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 3 specimens, dead; Plateau des Chesterfield, Stn DW101; 19°09′ S, 158°26′ E; depth 37 m; 27 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D45; 20°48.93′ S, 158°30.31′ E; depth 50 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D28; 19°24.18′ S, 158°31.40′ E; depth 51 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW103; 19°01′ S, 158°32′ E; depth 58 m; 27 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW50; 19°18.3′ S, 158°33.6′ E; depth 50 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau Chesterfield-Bellona, Stn D26; 19°10.72′ S, 158°34.95′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW40; 19°29′ S, 158°35′ E; depth 58 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D49; 20°58,20′ S, 158°35.00′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D24; 19°10.78′ S, 158°37.10′ E; depth 38 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW106; 19°09′ S, 158°43′ E; depth 62 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW38; 19°22′ S, 158°43′ E; depth 61 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW94; 19°06′ S, 158°50′ E; depth 36–53 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 5 specimens, dead; Plateau des Chesterfield, Stn DW82; 19°12′ S, 158°50′ E; depth 62 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield,

Stn DW61; 19°15′ S, 158°54′ E; depth 54 m; 24 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW91; 19°03′ S, 158°55′ E; depth 43 m; 26 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 3 specimens, dead; Plateau des Chesterfield, Stn DW34; 19°22′ S, 158°56′ E; depth 47 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Chesterfield Plateau, Stn DW59; 19°19′ S, 158°57′ E; depth 50 m; 24 Jul. 1988; B. Richer-ORSTOM, leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW84; 19°12′ S, 158°57′ E; depth 16–26 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau Chesterfield-Bellona, Stn D60; 21°48.65′ S, 159°27.95′ E; depth 45 m; Jul. 1984; CHALCAL 1 leg.; MNHN. – **d'Entrecasteaux Reefs – Lagon Nord – Belep** • 3 specimens, dead; Atoll de Surprise, Stn 445; 18°18′ S, 163°02′ E; depth 41 m; 28 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Atoll de Surprise, Stn 465; 18°22′ S, 163°05′ E; depth 45 m; 1 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Belep, Stn 1181; 19°24′ S, 163°15′ E; depth 45 m; 31 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Belep, Stn 1182; 19°27′ S, 163°16′ E; depth 48 m; 31 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 482; 18°59′ S, 163°31′ E; depth 33 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Belep, Stn 1118; 19°35′ S, 163°52′ E; depth 30 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Pouébo** • 1 specimen, dead; Stn 888; 20°22′ S, 164°38′ E; depth 20 m; 14 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre, Koumac** • 8 specimens, living; Stn KB631; 20°31.6′ S, 164°01.6′ E; depth 3 m; 8 Nov. 2019; KOUMAC 2.3 leg.; corail mort de tombant interne de platier de récif barrière, débris de pieds de tombant et zone d'épandage détritique; MNHN • 2 specimens, dead; Stn KB619; 20°30.8′ S, 164°01.9′ E; depth 12 m; 3 Nov. 2019; KOUMAC 2.3 leg.; bloc et débris au pieds de massif corallien d'arrière terrasse interne de récif barrière; MNHN • 3 specimens, living; Stn KS508; 20°30.8′ S, 164°01.9′ E; depth 12 m; 3 Nov. 2019; KOUMAC 2.3 leg.; bloc et débris au pieds de massif corallien d'arrière terrasse interne de récif barrière; MNHN • 2 specimens, living; Stn KB618; 20°30.8′ S, 164°01.9′ E; depth 12 m; 3 Nov. 2019; KOUMC 2.3 leg.; bloc et débris au pieds de massif corallien d'arrière terrasse interne de récif barrière; MNHN • 1 specimen, living; Stn KD533; 20°32.2′ S, 164°05.5′ E; depth 11 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 1 specimen, dead; Stn KB610; 20°34.7′ S, 164°06.2′ E; depth 2–3 m; 31 Oct. 2019; KOUMAC 2.3 leg.; arrière platier corallien de récif barrière et tombant interne de platier de récif barrière; MNHN • 1 specimen, dead; Stn KD563; 20°33.4′ S, 164°06.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 5 specimens, living; Stn KB609; 20°35.6′ S, 164°06.9′ E; depth 8–10 m; 31 Oct. 2019; KOUMAC 2.3 leg.; patch coralliens sur sable d'arrière terrasse de récif barrière; MNHN • 3 specimens, living; Stn KB608; 20°34.9′ S, 164°07.6′ E; depth 15 m; 31 Oct. 2019; KOUMAC 2.3 leg.; patch coralliens sur sable d'arrière terrasse de récif barrière; MNHN • 1 specimen, living; Stn KB621; 20°27.9′ S, 164°07.7′ E; depth 6 m; 3 Nov. 2019; KOUMAC 2.3 leg.; pente récifale de platier de récif frangeant d'îlot lagonaire; MNHN • 3 specimens, living; Stn KB643; 20°36.8′ S, 164°08.2′ E; depth 3 m; 14 Nov. 2019; KOUMAC 2.3 leg.; corail mort de tombant interne de récif barrière; MNHN • 1 specimen, dead; Stn KB624; 20°37.4′ S, 164°09′ E; depth 3 m; 5 Nov. 2019; KOUMAC 2.3 leg.; débris et corail mort de tombant interne de platier de récif barrière; MNHN • 1 specimen, living; Paagoumène, Stn 1289; 20°29.2′ S, 164°10.2′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, platier avec blocs; MNHN • 1 specimen, living; Passe du Baron, Stn KR644; 20°33.8′ S, 164°10.3′ E; depth unknown; 29 Sep. 2018; KOUMAC 2.1 leg.; fonds blancs; MNHN • 5 specimens, living; Passe du Baron, Stn 1307; 20°33.7′ S, 164°10.3′ E; depth 12 m; Oct. 1993; Expédition Montrouzier leg.; sable à *Heteropsammia*; MNHN • 7 specimens, living; Stn KD539; 20°34.1′ S, 164°10.6′ E; depth 11 m; 6 Nov. 2019; KOUMAC 2.3 leg.; algues brunes, éponges; MNHN • 1 specimen, dead; Îlot Rat, Stn KM200; 20°33.4′ S, 164°10.9′ E; depth 0 m; 12 Sep. 2018; KOUMAC 2.1 leg.; platier avec herbiers, coraux et sables fins; MNHN • 1 specimen, dead; Îlot Rat, Stn 1284; 20°33.7′ S, 164°11.0′ E; depth 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, fonds divers; MNHN • 1 specimen, living; Îlot de la Table, Stn KB502; 20°33.5′ S, 164°11.2′ E; depth 0 m; 31 Oct. 2019; KOUMAC 2.3 leg.; blocs et sable sur sable sur platier de récif frangeant; MNHN • 1 specimen, living; Stn KD556; 20°32.9′ S, 164°12.2′ E; depth 5–6 m; 11 Nov. 2019; KOUMAC

2.3 leg.; sable gris; MNHN • 1 specimen, living; Stn KD542; 20°38.6′ S, 164°12.7′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 7 specimens, living; Récif l'Infernet, Stn 1302; 20°35.8′ S, 164°12.7′ E; depth 9–10 m; Oct. 1993; Expédition Montrouzier leg.; pente interne; MNHN • 16 specimens, living; lagoon between the land and l'Infernet, Stn 1299; 20°34.4′ S, 164°13.0′ E; depth 12–14 m; Oct. 1993; Expédition Montrouzier leg.; dalle à gorgones, limon; MNHN • 4 specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 1 specimen, dead; NW Récif de l'Infernet, Stn KS504; 20°36.2′ S, 164°13.3′ E; depth 8 m; 30 Oct. 2019; KOUMAC 2.3 leg.; corail vivant sur pente de massif intermédiaire; MNHN • 4 specimens, living; Stn KS510; 20°34.3′ S, 164°13.5′ E; depth 10 m; 6 Nov. 2019; KOUMAC 2.3 leg.; dalle ensablée à gorgones, caulerpes, de lagon; MNHN • 2 specimens, living; Stn KB664; 20°40.2′ S, 164°13.8′ E; depth 3 m; 23 Nov. 2019; KOUMAC 2.3 leg.; corail mort de tombant interne de récif barrière; MNHN • 1 specimen, living; Stn KB662; 20°35.2′ S, 164°13.9′ E; depth 1 m; 21 Nov. 2019; KOUMAC 2.3 leg.; patchs coralliens dispersés, sur sable et débris; MNHN • 1 specimen, living; Passe Deverd, Stn KB622; 20°45.1′ S, 164°13.9′ E; depth 19–24 m; 4 Nov. 2019; KOUMAC 2.3 leg.; pieds de tombant corallien de passe de récif barrière; MNHN • 4 specimens, living; Stn KB639; 20°45.1′ S, 164°13.9′ E; depth 22 m; 13 Nov. 2019; KOUMAC 2.3 leg.; tombant externe de récif barrière; MNHN • 2 specimens, living; Stn KB623; 20°45.1′ S, 164°14′ E; depth 12 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable et débris dans sillon de pente externe de récif barrière dans passe; MNHN • 1 specimen, dead; Stn KD562; 20°45.2′ S, 164°14.2′ E; depth 1 m; 14 Nov. 2019; KOUMAC 2.3 leg.; débris coralliens; MNHN • 1 specimen, living; Stn KD561; 20°45.4′ S, 164°14.4′ E; depth 1 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable grossier; MNHN • 1 specimen, living; Récif de l'Infernet, Stn KS500; 20°36.6′ S, 164°14.4′ E; depth 3 m; 28 Oct. 2019; KOUMAC 2.3 leg.; patch corallien de terrasse sableuse d'arrière récif de massif corallien intermédiaire; MNHN • 1 specimen, living; Stn KD524; 20°36.4′ S, 164°14.6′ E; depth 8 m; 3 Nov. 2019; KOUMAC 2.3 leg.; sable, algues brunes, holothuries; MNHN • 4 specimens, living; Stn KB628; 20°37.5′ S, 164°14.7′ E; depth 2–3 m; 7 Nov. 2019; KOUMAC 2.3 leg.; tombant corallien de récif intermédiaire sur fond de sable; MNHN • 12 specimens, dead; Grand Récif de Koumac, Stn 1318; 20°41.4′ S, 164°14.8′ E; depth 20–30 m; Oct. 1993; Expédition Montrouzier leg.; pente externe; MNHN • 4 specimens, living; Grand Récif de Koumac, Stn 1318; 20°41.4′ S, 164°14.8′ E; depth 20–30 m; Oct. 1993; Expédition Montrouzier leg.; pente externe; MNHN • 10 specimens, dead; Passe de Koumac, east drop-off, Stn 1312; 20°40.4′ S, 164°14.9′ E; depth 26–40 m; Oct. 1993; Expédition Montrouzier leg.; suceuse fonds durs; MNHN • 4 specimens, living; Stn KS507; 20°41.7′ S, 164°14.9′ E; depth 13 m; 2 Nov. 2019; KOUMAC 2.3 leg.; plateforme corallienne de tombant externe de récif barrière; MNHN • 40+ specimens, living; Passe de Koumac, Stn 1310; 20°39.7′ S, 164°14.9′ E; depth 15 m; Oct. 1993; Expédition Montrouzier leg.; fonds dur; MNHN • 4 specimens, living; Stn KB634; 20°41′ S, 164°15.1′ E; depth 20–35 m; 11 Nov. 2019; KOUMAC 2.3 leg.; passe, tombant externe de récif barrière; MNHN • 4 specimens, dead; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; MNHN • 1 specimen, dead; l'Îlot Kendec, Stn 1330; 20°40.5′ S, 164°15.2′ E; depth 0.5–1.5 m; Oct. 1993; Expédition Montrouzier leg.; dalle corallienne, passées sableuses; MNHN • 80+ specimens, living; drop-off of l'Îlot Kendec, Stn 1308; 20°40′ S, 164°15.2′ E; depth 15–20 m; Oct. 1993; Expédition Montrouzier leg.; dalle; MNHN • 1 specimen, living; Stn KB513; 20°40.1′ S, 164°15.4′ E; depth 0 m; 14 Nov. 2019; KOUMAC 2.3 leg.; blocs sur platier de récif intermédiaire; MNHN • 2 specimens, dead; Stn KM302; 20°40.1′ S, 164°15.4′ E; depth 0 m; 9 Sep. 2018; KOUMAC 2.1 leg.; tâches de sable avec coraux vivants sur platier; MNHN • 80+ specimens, living; Passe Deverd, Stn 1319; 20°44.7′ S, 164°15.5′ E; depth 15–20 m; Oct. 1993; Expédition Montrouzier leg.; dalle; MNHN • 1 specimen, dead; Stn KD559; 20°46′ S, 164°15.5′ E; depth 12–14 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, living; Stn KD548; 20°40.3′ S, 164°15.7′ E; depth 11 m; 10 Nov. 2019; KOUMAC 2.3 leg.; sables gris, éponges; MNHN • 2 specimens, living; Stn KD558; 20°43.7′ S, 164°15.9′ E; depth 6 m; 13 Nov. 2019; KOUMAC 2.3 leg.; petits blocs et débris coralliens; MNHN • 1 specimen, living; around Plateau Karembé, Stn 1303; 20°37.7′ S, 164°15.9′ E; depth 0–8 m; Oct. 1993; Expédition

Montrouzier leg.; sable vaseux, blocs; MNHN • 6 specimens, living; Stn KS519; 20°40.4′ S, 164°15.9′ E; depth 18 m; 22 Nov. 2019; KOUMAC 2.3 leg.; gros débris coralliens avec turf algual et sable sur plateforme sous influence de passe; MNHN • 1 specimen, dead; Stn KS518; 20°40.1′ S, 164°15.9′ E; depth 15 m; 21 Nov. 2019; KOUMAC 2.3 leg.; fond dur corallien couvert de turf épais, cuvettes de sable, quelques coraux et gorgones éparses; MNHN • 8 specimens, living; Stn KB616; 20°44.7′ S, 164°15.9′ E; depth 13 m; 2 Nov. 2019; KOUMAC 2.3 leg.; sable et débris de pieds de patch récifal de passe; MNHN • 2 specimens, living; Stn KD572; 20°45.8′ S, 164°16.1′ E; depth 22–23 m; 18 Nov. 2019; KOUMAC 2.3 leg.; sable grossier, coquilles; MNHN • 1 specimen, living; Stn KD577; 20°45.8′ S, 164°16.2′ E; depth 21 m; 19 Nov. 2019; KOUMAC 2.3 leg.: fond dur, quelques algues brunes; MNHN • 2 specimens, living; Stn KB655; 20°41.1′ S, 164°16.2′ E; depth 3–6 m; 20 Nov. 2019; KOUMAC 2.3 leg.; marche corallienne de patch corallien; MNHN • 4 specimens, living; Stn KS511; 20°46.9′ S, 164°16.4′ E; depth 2–3 m; 7 Nov. 2019; KOUMAC 2.3 leg.; blocs et débris coralliens de zone d'épandage détritique d'arrière platier de récif barrière; MNHN • 17 specimens, living; Stn KD582; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable, débris et herbier à *Thalassia*; MNHN • 1 specimen, living; Stn KB627; 20°46.9′ S, 164°16.4′ E; depth 2–3 m; 7 Nov. 2019; KOUMAC 2.3 leg.; blocs et débris coralliens de zone d'épandage détritique d'arrière platier de récif barrière; MNHN • 3 specimens, living; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; MNHN • 7 specimens, living; Stn KS517; 20°41.1′ S, 164°16.5′ E; depth 10 m; 20 Nov. 2019; KOUMAC 2.3 leg.; dalle et sable blanc, pâtes coralliens éparse de lagon sous influence de passe; MNHN • 2 specimens, living; Pointe de Pandop, Stn 1298; 20°35.2′ S, 164°16.6′ E; depth 2–4 m; Oct. 1993; Expédition Montrouzier leg.; fonds durs; MNHN • 4 specimens, dead; Stn KD584; 20°35.4′ S, 164°16.8′ E; depth 7 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable, herbier à *Thalassia*, coraux vivants; MNHN • 2 specimens, living; Stn KD574; 20°43.5′ S, 164°16.9′ E; depth 12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; MNHN • 5 specimens, living; Stn KB637; 20°48.4′ S, 164°17′ E; depth 3 m; 12 Nov. 2019; KOUMAC 2.3 leg.; blocs et corail mort de tombant interne de récif barrière; MNHN • 3 specimens, living; Stn KB667; 20°39.5′ S, 164°17′ E; depth 1 m; 22 Nov. 2019; KOUMAC 2.3 leg.; herbier de phanérogames sur platier sableux de récif intermédiaire; MNHN • 2 specimens, living; Stn KD546; 20°41′ S, 164°17.1′ E; depth 6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et algues; MNHN • 3 specimens, dead; Stn KD583; 20°43.5′ S, 164°17.3′ E; depth 12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable fin; MNHN • 2 specimens, living; Stn KB603; 20°37.4′ S, 164°17.4′ E; depth 2 m; 29 Oct. 2019; KOUMAC 2.3 leg.; MNHN • 2 specimens, living; Stn KS503; 20°37.5′ S, 164°17.4′ E; depth 2 m; 29 Oct. 2019; KOUMAC 2.3 leg.; MNHN • 1 specimen, living; Stn KB601; 20°43.2′ S, 164°17.6′ E; depth 6 m; 29 Oct. 2019; KOUMAC 2.3 leg.; MNHN • 6 specimens, living; Stn KS501; 20°43.2′ S, 164°17.6′ E; depth 6 m; 29 Oct. 2019; KOUMAC 2.3 leg.; MNHN • 8 specimens, living; Stn KD587; 20°39.3′ S, 164°17.8′ E; depth 2 m; 22 Nov. 2019; KOUMAC 2.3 leg.; sable sombre, *Halophila*, *Caulerpa*, coraux, *Halimeda*; MNHN • 1 specimen, living; Stn KB670; 20°41.9′ S, 164°17.9′ E; depth 5 m; 23 Nov. 2019; KOUMAC 2.3 leg.; patch corallien et débris d'arrière récif intermédiaire; MNHN • 1 specimen, living; Stn KD551; 20°42.2′ S, 164°18.2′ E; depth 6 m; 10 Nov. 2019; KOUMAC 2.3 leg.; algues brunes; MNHN • 1 specimen, living; Stn KD547; 20°42.2′ S, 164°18.2′ E; depth 2–6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et herbier; MNHN • 2 specimens, living; Stn KD588; 20°38.7′ S, 164°18.2′ E; depth 3 m; 22 Nov. 2019; KOUMAC 2.3 leg.; sable, *Thalassia*, *Halimeda*, caulerpes, éponges, coraux; MNHN • 1 specimen, dead; Stn KD586; 20°39.3′ S, 164°19.7′ E; depth 3 m; sable grossier, *Halophila*, *Caulerpa*, éponges, *Halimeda*; 22 Nov. 2019; KOUMAC 2.3 leg.; MNHN. – **Grande Terre, Touho** • 1 specimen, dead; Grand Récif Mengalia, Stn 859; 20°40′ S, 165°02′ E; depth 25 m; 13 Jan. 1887; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; parages de la Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 5 specimens, dead; surroundings of l'Îlot Ouao (=Î. Camille), Stn 1255; 20°43′ S, 165°08′ E; depth 11 m; Sep. 1993; Expédition Montrouzier leg.; sable, dômes détritiques; MNHN • 12 specimens, living; Banc de Touho, Stn 1259; 20°44.6′ S, 165°13.7′ E; depth 15–35 m; Sep. 1993; Expédition Montrouzier leg.; tombants avec limon; MNHN • 4 specimens,

living; Baie de Touho, Stn 1237; 20°46.9′ S, 165°13.8′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; sable fin et herbiers abrités; MNHN • 14 specimens, living; Pointe Kombounou, Stn 1253; 20°46.6′ S, 165°14.1′ E; depth 2–3 m; Sep. 1993; Expédition Montrouzier leg.; algues photophiles, limon; MNHN • 12 specimens, living; platform off the wharf of Touho, Stn 1242; 20°46.2′ S, 165°14.5′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, blocs, sable, herbiers; MNHN • 2 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1266; 20°39.6′ S, 165°14.7′ E; depth 10–15 m; Sep. 1993; Expédition Montrouzier leg.; paté corallien; MNHN • 1 specimen, living; between Baie de Touho and Îlot Atit, Stn 1240; 20°46.5′ S, 165°15′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; platier abrité, sable, herbier; MNHN • 1 specimen, living; between aerodrome and Koé, Stn 1241; 20°48′ S, 165°15.7′ E; depth 0–2 m; Sep. 1993; Expédition Montrouzier leg.; platier battu; MNHN • 3 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1264; 20°44.5′ S, 165°15.9′ E; depth 8 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse, dôme détritique; MNHN • 13 specimens, living; Grand Récif Mengalia, Stn 1245; 20°45.2′ S, 165°16.3′ E; depth 0 m; Sep. 1993; Expédition Montrouzier leg.; marée, platier, sable, herbiers; MNHN • 9 specimens, living; Grand Récif Mengalia, Stn 1270; 20°45.0′ S, 165°16.5′ E; depth 10–35 m; Sep. 1993; Expédition Montrouzier leg.; pente externe; MNHN • 23 specimens, living; Tié Shoal, Stn 1271; 20°52.7′ S, 165°19.5′ E; depth 5–25 m; Sep. 1993; Expédition Montrouzier leg.; tombants, sables sur dalle; MNHN • 27 specimens, living, all juvenile; Tié Shoal, Stn 1271; 20°52.7′ S, 165°19.5′ E; depth 5–25 m; Sep. 1993; Expédition Montrouzier leg.; tombants, sable sur dalle; MNHN • 4 specimens, living; Passe de Touho, Stn 1272; 20°49.5′ S, 165°19.6′ E; depth 10 m; 6 Sep. 1993; Expédition Montrouzier leg.; fonds durs avec limon; MNHN. – **Grande Terre, Bourail** • 1 specimen, living; Lagon de Poé, Stn 1324; 21°36.9′ S, 165°22.7′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; fonds mixtes, herbier; MNHN. – **Grande Terre, Thio** • 1 specimen, dead; Stn 686; 21°34′ S, 166°16′ E; depth 33–35 m; 9 Aug. 1886; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 682; 21°34′ S, 166°19′ E; depth 36–37 m; 9 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 681; 21°35′ S, 166°20′ E; depth 33 m; 9 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Nouméa** • 2 specimens, living; Stn 60; 22°12′ S, 166°11′ E; depth 11 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn DE60; 22°13.6′ S, 166°14.1′ E; depth 21 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 30+ specimens, living; Canyon de la Dumbéa, Stn 1356; 22°19.7′ S, 166°15.4′ E; depth 20–23 m; 4 Dec. 1992; Bouchet and Marshall leg.; sable sous blocs; MNHN • 2 specimens, dead; Grand Récif Aboré, Stn 1346; 22°21.9′ S, 166°16.1′ E; depth 5–6 m; 5 Oct. 1992; P. Bouchet leg.; fonds blanc; MNHN • 10 specimens, dead; Récif Larégnère, Stn 1371; 22°19.9′ S, 166°17.6′ E; depth 12–16 m; 3 May 1993; P. Bouchet leg.; pente interne; MNHN • 5 specimens, living; Récif Senez, Stn 1350; 22°17.9′ S, 166°19.6′ E; depth 3–6 m; 23 Nov. 1992; Bouchet and Marshall leg.; pente interne; MNHN • 1 specimen, living; Récif Senez, Stn 1343; 22°17.8′ S, 166°19.9′ E; depth 7 m; 7 Sep. 1992; P. Bouchet leg.; pente interne; MNHN • 1 specimen, dead; Stn 7; 22°24′ S, 166°20′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 50+ specimens, living; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 8 specimens, living; Île aux Goélands, Stn 1368; 22°24.3′ S, 166°20.7′ E; depth 10 m; 16 Apr. 1993; P. Bouchet leg.; fonds blancs; MNHN • 2 specimens, dead; SE Sèche Croissant, Stn 1508; 22°18.6′ S, 166°21.8′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main; MNHN • 2 specimens, dead; SE Sèche Croissant, Stn 1507; 22°19.6′ S, 166°22.4′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; drague à main, récolte à vue; MNHN • 2 specimens, dead; Île aux Goélands, Stn 1503; 22°22.4′ S, 166°22.5′ E; depth 5–7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 1 specimen, dead; Stn 260; 22°18′ S, 166°23′ E; depth 23 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Pointe NW Île Nou, Stn 1348; 22°15.1′ S, 166°23.2′ E; depth 5–8 m; 12 Oct. 1992; Bouchet and Marshall leg.; sable grossier et blocs; MNHN • 3 specimens, dead; between Îlot Maître and Larégnère, Stn 1334; 22°20.1′ S, 166°23.2′ E; depth 16 m; 18 Jun. 1992; P. Bouchet leg.; fond de dalle avec sargasses; MNHN • 4 specimens, living; Îlot Maître, Stn 1502; 22°20.0′ S, 166°24.2′ E; depth 4 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 18 specimens, living; Îlot Maître, Stn 1361; 22°20.2′ S, 166°24.3′ E; depth 6 m;

24 Mar. 1993; P. Bouchet leg.; sable grossier dans herbier mixte; MNHN • 1 specimen, living; Stn 23; 22°24′ S, 166°25′ E; depth 10–18 m; 3 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 65; 22°29′ S, 166°26′ E; depth 24 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Baie des Citrons; 22°17.5′ S, 166°26.2′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 8 specimens, dead; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 30 specimens, living; Pointe Magnin, Stn 1355; 22°18.9′ S, 166°26.6′ E; depth 7–10 m; 3 Dec. 1992; Bouchet and Marshall leg.; bord du canyon, blocs sédiment; MNHN • 1 specimen, dead; Stn DE39; 22°31.9′ S, 166°28.1′ E; depth 33–34 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn DE70; 22°25.6′ S, 166°31.0′ E; depth 20–21 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 2 specimens, dead; Stn DE35; 22°36.5′ S, 166°33.8′ E; depth 16 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 99; 22°33′ S, 166°35′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Ile Ouen-Baie du Prony, Stn 226; 22°38′ S, 166°39′ E; depth 28 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands**, **Loyalty Ridge** • 1 specimen, dead; Ride des Loyauté, Stn DW430; 20°21′ S, 166°07′ E; depth 30 m; 17 Feb. 1989; NO *Alis*-MUSORSTOM 6 leg.; MNHN. – **Loyalty Islands**, **Lifou** • 1 specimen, living; Baie du Santal, Pointe Lefèvre [= Nem] Stn 1435; 20°55.2′ S, 167°00.7′ E; depth 5–30 m; 8 Nov. 2000; Atelier LIFOU 2000 leg.; tombants verticaux et surplombs; MNHN • 8 specimens, living; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 7 specimens, living; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1448; 20°45.8′ S, 167°01.6′ E; depth 20 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; aspirateur, fonds durs; MNHN • 2 specimens, dead; Baie du Santal, Cap Aimé Martin [=Acadro], Stn 1441; 20°46.4′ S, 167°02′ E; depth 20 m; 13 Nov. 2000; Atelier LIFOU 2000 leg.; surplomb sciaphile; MNHN • 2 specimens, living; Baie du Santal, between Cap Mandé and Cap Lefèvre [= Nem] Stn 1453; 20°54.6′ S, 167°02.1′ E; depth 21–30 m; 22 Nov. 2000; Atelier LIFOU 2000 leg.; tombant massif avec gorgones; MNHN • 2 specimens, living; Lifou, Baie du Santal, Récif Shelter, Stn 1432; 20°53.5′ S, 167°02.7′ E; depth 12–32 m; 4 Nov. 2000; Atelier LIFOU 2000 leg.; sable et nodules coralliens grossiers très érodés en bas du tombant; MNHN • 4 specimens, living; Baie du Santal, Baie de Gaatcha, towards Cap Mandé, Stn 1424; 20°54.9′ S, 167°03′ E; depth 4 m; 15 Nov. 2000; Atelier LIFOU 2000 leg.; sable fin et algues photophiles sur dalle; MNHN • 26 specimens, living; Baie du Santal, Baie de Gaatcha, Stn 1419; 20°55.6′ S, 167°04.5′ E; depth 5 m; 10 Nov. 2000; Atelier LIFOU 2000; limon sur dalle, algues photophiles; MNHN • 11 specimens, living; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 50+ specimens, living; Baie du Santal, NE of Baie de Gaatcha, Stn 1444; 20°55′ S, 167°05.2′ E; depth 9–20 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; pente alternant zones caillouteuses “mortes” et passées sableuses grossières; MNHN • 9 specimens, living; Baie du Santal, in front of Huneté, Stn 1426; 20°45.9′ S, 167°06.2′ E; depth 4–7 m; 20 Nov. 2000; Atelier LIFOU 2000 leg.; dalle et petites poches de séd.; MNHN • 8 specimens, dead; Baie du Santal, W of Pointe d’Easo, Stn 1451; 20°47.3′ S, 167°06.8′ E; depth 10–21 m; 19 Nov. 2000; Atelier LIFOU 2000 leg.; 2ème patate corallienne; MNHN • 10 specimens, living; Baie du Santal, W/SW of Pointe d’Easo, Stn 1430; 20°47.5′ S, 167°07.1′ E; depth 20–25 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; patates coralliennes, passées séd.; MNHN • 2 specimens, living; Lifou, Baie du Santal, W/SW de la Pointe d’Easo, Stn 1429; 20°47.5′ S, 167°07.1′ E; 8–18 m; 24 Nov. 2000; Atelier LIFOU 2000 leg.; patates coralliennes, passées séd.; MNHN • 7 specimens, living; Baie du Santal, Baie d’Huneté, Stn 1425; 20°46.8′ S, 167°07.2′ E; depth 4–5 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture sed.; MNHN • 17 specimens, living; Baie du Santal, in front of Peng, Stn 1423; 20°54′ S, 167°07.3′ E; depth 12 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; passées sableuse entre patates; MNHN • 1 specimen, dead; Lifou, Baie du Santal, off Peng, Stn 1443; 20°53.8′ S, 167°07.3′ E; depth 48–52 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; tombant; MNHN • 2 specimens, living; Baie du Santal, small bay west of Pointe d’Easo, Stn 1422; 20°47.1′ S, 167°07.4′ E; depth 4 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable sur dalle, patates; MNHN • 1 specimen, living; Baie du

Santal, east of Pointe d'Easo, Stn 1418; 20°46.9′ S, 167°07.9′ E; depth 1–5 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable et herbier autour du wharf; MNHN • 2 specimens, dead; Baie du Santal, off Îlot Huca Hutighé, Stn 1434; 20°52.5′ S, 167°08.1′ E; depth 5–21 m; 6 Nov. 2000; Atelier LIFOU 2000 leg.; fonds durs; MNHN • 1 specimen, living; Baie du Santal, between Îlot Huca Hutighé and coast, Stn 1421; 20°52.4′ S, 167°08.5′ E; depth 4 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; sable grossier sur dalle; MNHN • 1 specimen, dead; Baie du Santal, in front of Chépénéhé, Stn 1415; 20°47.1′ S, 167°09.1′ E; depth 3–7 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable; MNHN • 5 specimens, living; Baie du Santal, Pointe de Chépénéhé, Stn 1438; 20°47.7′ S, 167°09.4′ E; depth 6 m; 11 Nov. 2000; Atelier LIFOU 2000 leg.; tombant avec grandes passées sableuses; MNHN • 1 specimen, dead; Baie du Santal, Pointe de Chépénéhé, Stn 1439; 20°47.7′ S, 167°09.4′ E; depth 5–30 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; récoltes à vue; MNHN • 4 specimens, living; Baie du Santal, Pointe de Chépénéhé, Stn 1420; 20°47.7′ S, 167°09.4′ E; depth 4–5 m; 18 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture séd.; MNHN • 2 specimens, living; Baie du Santal, in front of Kiki, Stn 1427; 20°47.6′ S, 167°10.2′ E; depth 10 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable grossier et coraux vivants au pied des patates; MNHN.

Redescription (Fig. 26)

Shell. Thin, of moderate size (adult diameter up to 14 mm), wider than high, but spire height variable (H/D 0.73–0.86); spire whorls rounded, sometimes weakly shouldered; periphery a little below mid-whorl, rounded or weakly angled; sculpture fine, predominantly spiral; base rounded, narrowly umbilicate; teleoconch of up to 7.0 whorls. First teleoconch whorl with three narrow, spiral lirae (Fig. 27A), broadening during second whorl and increasing in number through intercalation of intermediaries; subsequent sculpture of low, close-set, spiral lirae separated by narrower intervals; lirae often alternating in strength as intermediaries arise; axial sculpture initially weak, close-set, microscopic threads only, later whorls with fine, regular, close-set, collabral pliculae, and irregular growth-lines; basal sculpture of fewer, broader, flat-topped lirae separated by narrow incised striae, axial pliculae much less distinct; lirae more close-set within umbilicus; umbilicus relatively narrow, its rim rounded, distinctly thickened and rendered pliculate by growth-lines; a strong funicle within umbilicus, above which is a deep sulcus underlying insertion on penultimate whorl. Aperture roundly quadrate; peristome interrupted in parietal region; base of columella considerably thickened at termination of umbilical rim with a second thickening above this at end of funicle, surface of thickenings microscopically granular; outer lip simple; interior smooth and weakly nacreous.

Colour. Colour and pattern highly variable; ground colour commonly mottled in pastel shades of pink and yellow-brown, with olive-green subsutural and peripheral blotches or axial flames and with white-flecked capillary lines on spiral lirae; blotches sometimes maroon, sometimes dark green; other specimens more uniformly coloured or with fine white and pink mottling or with bold spiral bands of colour; some juveniles whitish with distinctive pattern of three spiral bands of squarish brown blotches, one below suture, one at periphery and one on base (Fig. 26S–T); umbilical region pale and unpatterned, but reflected end of umbilical funicle olive-green, greyish-green or olive-brown, occasionally reddish, particularly in Chesterfield-Bellona Plateau material; funicle itself also often of the same colour.

Dimensions. Holotype, height 10.7 mm, diameter 13.6 mm (= largest specimen).

Protoconch (Fig. 27B). Typically umboniine, diameter ± 170–185 µm; apical beak present and confluent with terminal lip; apical bulb sculptured with oblique and subspiral threads creating an irregular quadrate network; terminal lip weakly convex.

Operculum (Fig. 27C–D). Corneous; multispiral, but with relatively few whorls; whorl overlap narrow, peripheral fringe not obviously striate; surface lacking spiral microsculpture.

Radula (Fig. 27E–F). Formula ∞+(1)+5+1+5+(1)+∞, with ±35–40 transverse rows of teeth; teeth of central field reduced, lacking shafts and cusps; rachidian base-plate broadly trigonal with blunt anterior edge; base-plates of inner lateral teeth expanded and bluntly rounded basally, outer anterior edge somewhat raised and ridge-like; outer laterals less trigonal and more elongate. Innermost marginal transitional, with reduced shaft and cusp; other marginal teeth well developed with strongly recurved cusp; cusps of inner marginal teeth with a large bluntly lanceolate central denticle bearing a robust pointed denticle at its outer base and a minute denticle at inner base (usually not visible due to tooth overlap); marginals 3–10 with largest cusps; cusps progressively smaller thereafter, the outermost ones with finely pectinate margins.

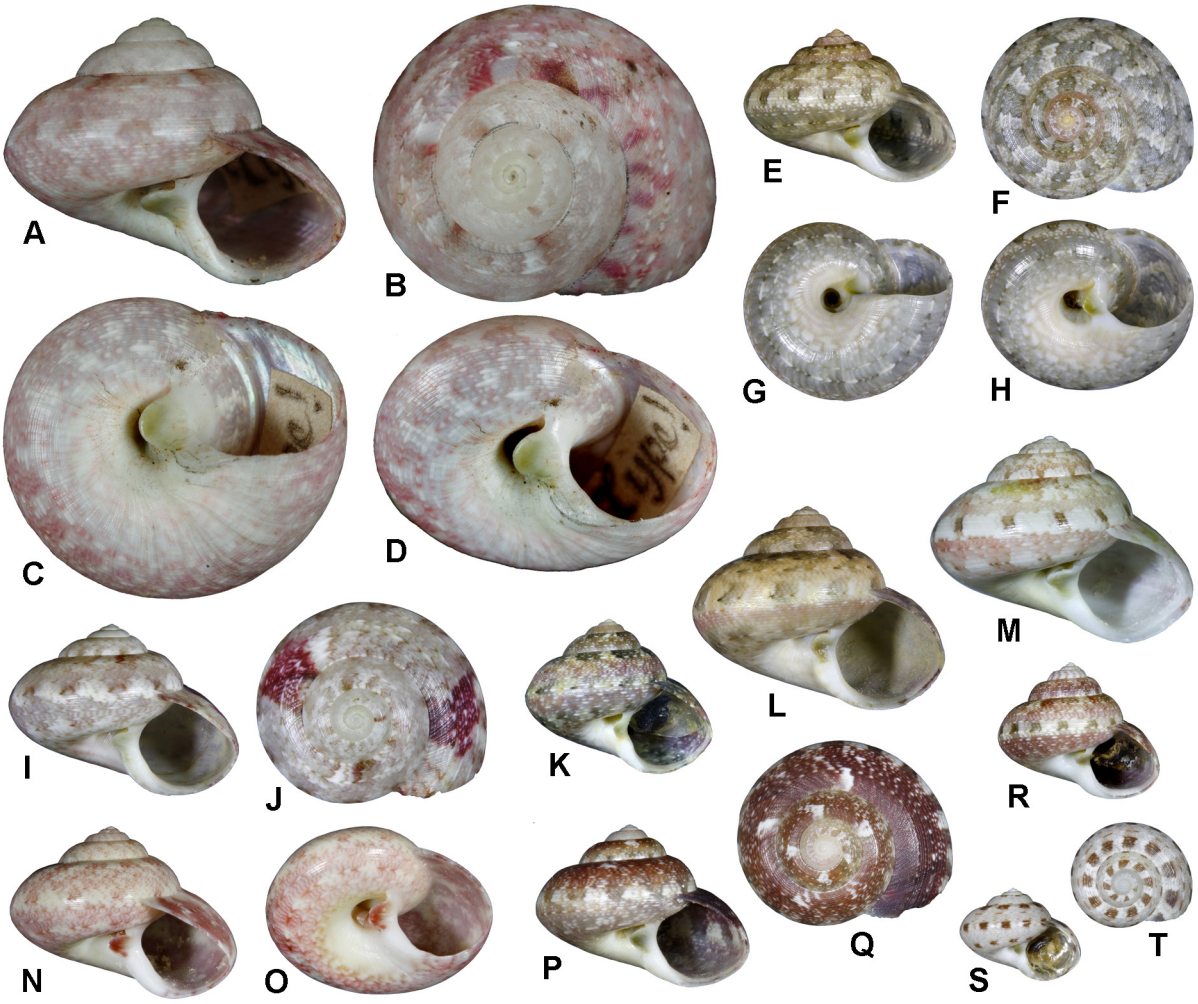

Fig. 26. *Sericominolia lifuana* (Fischer, 1878) (A–D: MHNBx 2004.TY.184; E–T: MNHN). **A–D**. Holotype of *Trochus* (*Monilea*) *lifuanus* Fischer, 1878, height 10.7 mm, diameter 13.6 mm (images courtesy of Laurent Charles). **E–H**. Koumac, Stn KD577, diameter 8.4 mm. **I–J**. Depressed specimen with bold maroon blotches, Koumac, Stn KM302, diameter 9.1 mm. **K**. Subadult specimen with distinct capillary lines, Koumac, Stn KD588, diameter 7.4 mm. **L**. Large elevated specimen, Koumac, Stn KD587, diameter 10.0 mm. **M**. Subglobose specimen, Chesterfield Plateaux, Stn DW59, diameter 10.4 mm. **N–O**. Specimen with red umbilical funicle, Chesterfield Plateaux, Stn DW72, diameter 9.0 mm. **P–Q**. Deeply pigmented specimen, Nouméa, Stn 260, diameter 8.5 mm. **R**. Small elevated specimen, Koumac Stn 1319, diameter 6.4 mm. **S–T**. Spotted specimen, Lifou, Stn 1419, diameter 4.8 mm.

External anatomy (from rehydrated specimens). Head with distinct forehead between cephalic tentacles; snout long, somewhat flared toward its tip with a transverse row of digit-like papillae halfway down anterior face, distal portion and edge of oral disk finely papillate; cephalic lappets not evident; cephalic tentacles long and slender, micropapillate, left and right of similar size; eyestalks long, their tips expanded and containing large black eyes; left neck-lobe a broad flap of tissue with a finely digitate margin, more extensive anteriorly; right neck-lobe well developed, rolled to form an exhalant siphon;

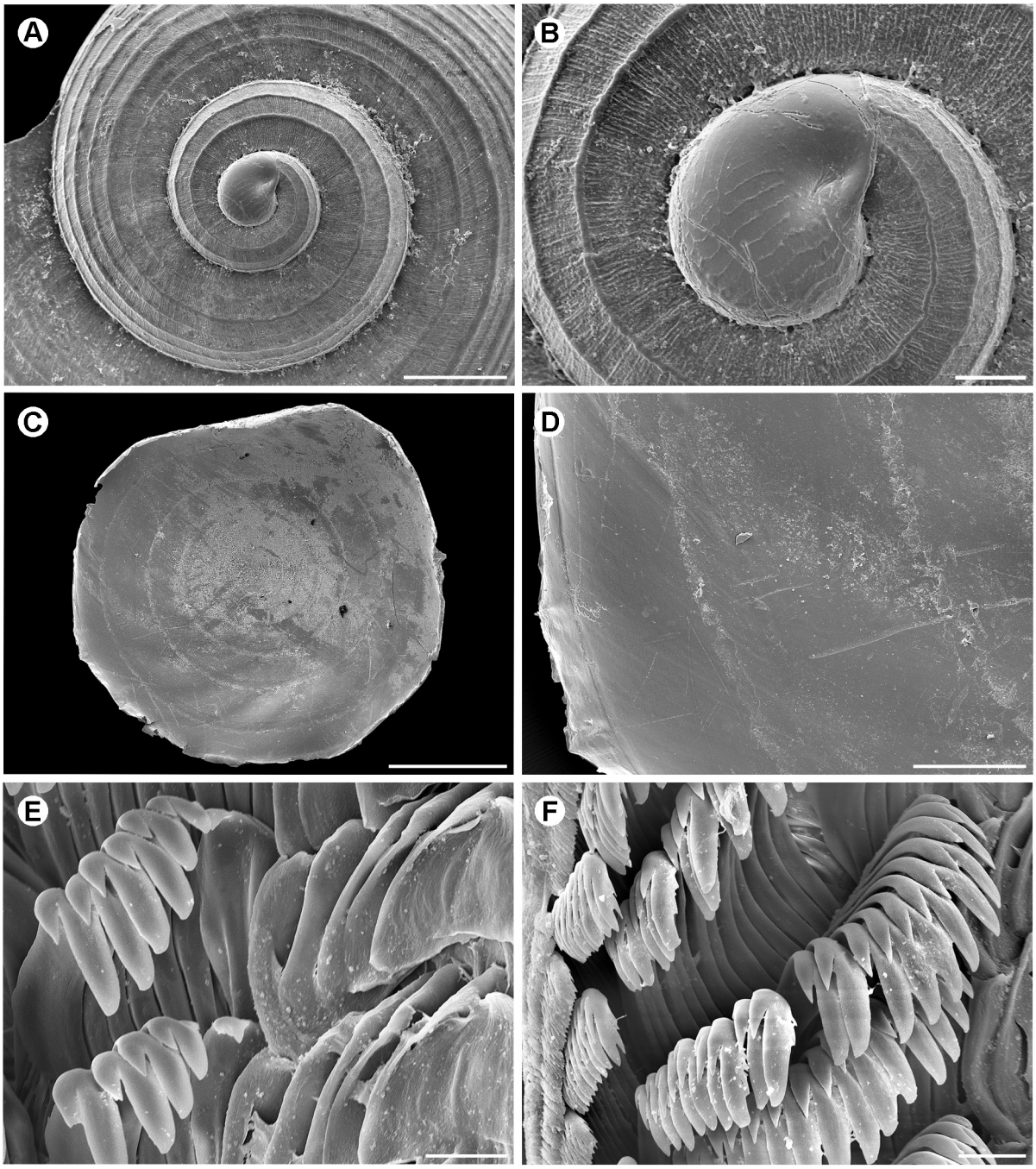

Fig. 27. *Sericominolia lifuana* (Fischer, 1878) (all MNHN). **A–B**. Apex and protoconch, Koumac, Stn KB634. **C–D**. Operculum, Koumac, Stn 1302. **E–F**. Radula, Koumac, Stn 1302. Scale bars: A = 250 µm; B = 50 µm; C = 1.0 mm; D = 200 µm; E–F = 25 µm.

four micropapillate epipodial tentacles on each side, each with a well-developed stalked epipodial sense organ near its base; an epipodial sense organ also present beneath each neck-lobe; propodium slightly indented in mid-line and somewhat pinched in sub-terminally creating a small lateral propodial lobe on each side; foot tapering to a point posteriorly. Head-foot mostly pale translucent buff, forehead somewhat darker; eyestalks and epipodial sense organs with opaque white pigmentation; cephalic and epipodial tentacles with faint transverse dark bands; sides of foot translucent, finely speckled with white. Ctenidium evidently bipectinate, anterior portion unattached.

Habitat

Common in the lagoon, but also ranging beyond the barrier reef; living specimens at depths of 0–65 m, mostly associated with coral debris and sandy substrata, often with seagrasses and green algae. Within the lagoon it occurs largely in the outer regions, from the intermediary reefs and islands to the barrier reef. Although common it seems not to occur in large numbers.

Distribution (Fig. 28)

Known primarily from the New Caledonian marine ecoregion. Records from Queensland (Iredale 1929b) and Tuvalu (Hedley 1899) require confirmation.

Remarks

Cernohorsky (1978) and Wilson (1993) considered *S. lifuana* to be a synonym of the Japanese *S. vernicosa* (Gould, 1861). In 1996, I expressed reservations about this synonymy (Herbert 1996: 430) and in light of the cryptic diversity mentioned above, I here maintain *S. lifuana* as a distinct species of *Sericominolia*.

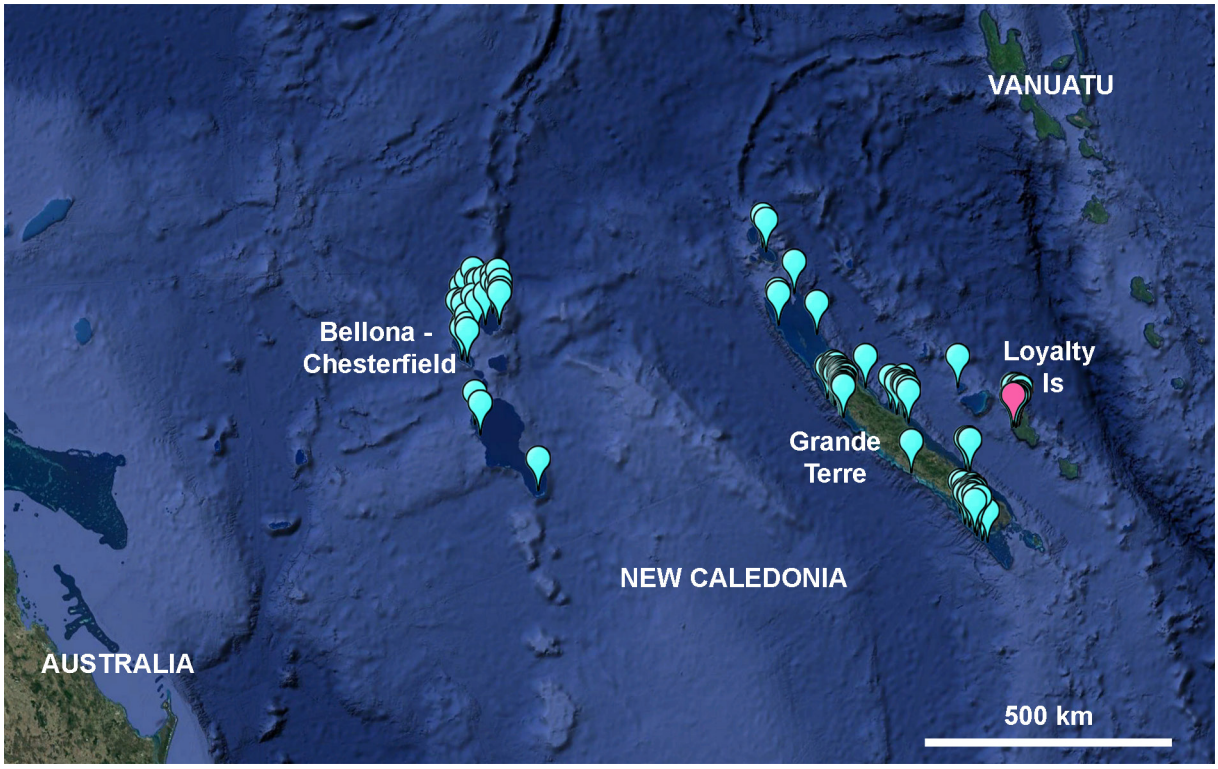

Fig. 28. Map of the Coral Sea showing the distribution of *Sericominolia lifuana* (Fischer, 1878). Type locality indicated in pink.

The material available, comprising ±1000 specimens, indicates that there is considerable variation in shell proportions and that these also change with growth, the last whorl descending somewhat more rapidly in adults. Larger specimens are thus proportionately taller. The holotype (diameter 13.6 mm) is evidently and exceptionally large specimen. The great majority are juveniles with a diameter of under 6.0 mm. Few specimens exceed 7.0 mm in diameter. In these the H/D ratio is 0.73–0.86, but it is often considerably less than this in juveniles.

Sericominolia porcata sp. nov.
urn:lsid:zoobank.org:act:4B02E408-3872-43A8-A336-1129B0323038
Figs 29–31

Diagnosis

Shell thin, small, spire low with distinctly shouldered whorls; umbilicus moderately broad, lacking funicle; sculpture of fine, close-set, spiral lirae; early whorls with low, broad axial ridges that render shoulder undulant; ridges evanesce during third whorl; later whorls with fine regular, close-set, collabral pliculae; umbilical rim at most weakly crenulated by growth-lines. Finely mottled in pastel shades and with white-flecked capillary lines.

Etymology

From the Latin '*porca*' f. – a ridge between furrows, and '*porcatus*' – ridged; in reference to the radially ridged sculpture of the apical whorls.

Material examined

Holotype (Fig. 29)
NEW CALEDONIA – **Loyalty Islands** • living specimen; Lifou, Baie du Santal, south of Cap Lefèvre [= Nem], Stn 1454; 20°56.6′ S, 167°02′ E; depth 15–18 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; tombant sciaphile; MNHN-IM-2000-38848.

Paratypes
NEW CALEDONIA – **Loyalty Islands** • 2 specimens, living; same data as for holotype; MNHN-IM-2000-38849 • 1 specimen, juvenile, living; Lifou, Baie du Santal, between Cap Wekutr and Cap Wajez, Stn 1455; 20°56.8′ S, 167°02.7′ E; depth 12–20 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; tombant; MNHN-IM-2000-38850.

Other material
NEW CALEDONIA – **Loyalty Islands** • 1 specimen, dead; Lifou, Baie du Santal, W of Pointe d'Easo, Stn 1451; 20°47.3′ S, 167°06.8′ E; depth 10–21 m; 19 Nov. 2000; Atelier LIFOU 2000 leg.; 2ème patate corallienne; MNHN.

Description (Fig. 29)

Shell. Thin, small (largest specimen, diameter 5.6 mm), wider than high (H/D ±0.64); spire low with stepped profile; periphery at mid-whorl, rounded or weakly angled; spire whorls distinctly shouldered; sculpture fine, predominantly spiral; base shallowly rounded with moderately broad umbilicus; teleoconch of up to 4.25 whorls. First teleoconch whorl bearing three crisp spiral lirae, with broad, widely-spaced, axial ridges developing toward end of whorl; middle lira strongest and forming shoulder at start of second whorl; lirae more numerous and ridges stronger thereafter, rendering shoulder undulant (Fig. 30A); whorls flattened above shoulder and flat-sided or weakly concave below it; axial ridges evanesce during third whorl and shoulder more rounded; later whorls more evenly rounded with sculpture of low, close-set, spiral lirae, finer below suture; axial sculpture (in addition to ridges) initially

comprising weak, close-set, microscopic threads only, later whorls with fine, regular, close-set, collabral pliculae and stronger, more widely-spaced growth-lines; basal sculpture of broad, flat-topped spiral lirae separated by narrow incised striae, axial pliculae much less distinct; lirae more close-set within umbilicus; umbilical rim rounded and slightly thickened, at most weakly crenulated by growth-lines; umbilicus steep-sided within, lacking a discernible funicle. Aperture roundly quadrate; peristome interrupted in parietal region; columella lip thickened at termination of umbilical rim, its surface microscopically granular; outer lip simple; interior smooth and weakly nacreous.

Colour. Pattern of white-flecked spiral capillary lines on a translucent, pale greyish, pinkish-brown or greenish ground with pinkish iridescence; shoulder of spire whorls with radiating white lines, often in pairs (Fig. 29E); umbilicus white, holotype with a trace of a yellowish band in umbilicus; protoconch white.

Dimensions. Holotype, height 3.6 mm, diameter 5.6 mm (= largest specimen).

Protoconch (Fig. 30B). As in *S. lifuana*, diameter ± 170 µm.

Operculum. As in *S. lifuana*.

Habitat

Near-shore, non-lagoonal habitats, at depths of 15–18 m (living specimens the same).

Distribution (Fig. 31)

Known only from the Santal Bay area, NW Lifou, Loyalty Islands.

Remarks

The low spire with shouldered whorls and undulant apical sculpture render *Sericominolia porcata* sp. nov. distinctive. Although some specimens referred to *S. lifuana* may show traces of such apical undulations, they are more elevated and have a distinct umbilical funicle. In all probability the available material comprises only juvenile and subadult specimens.

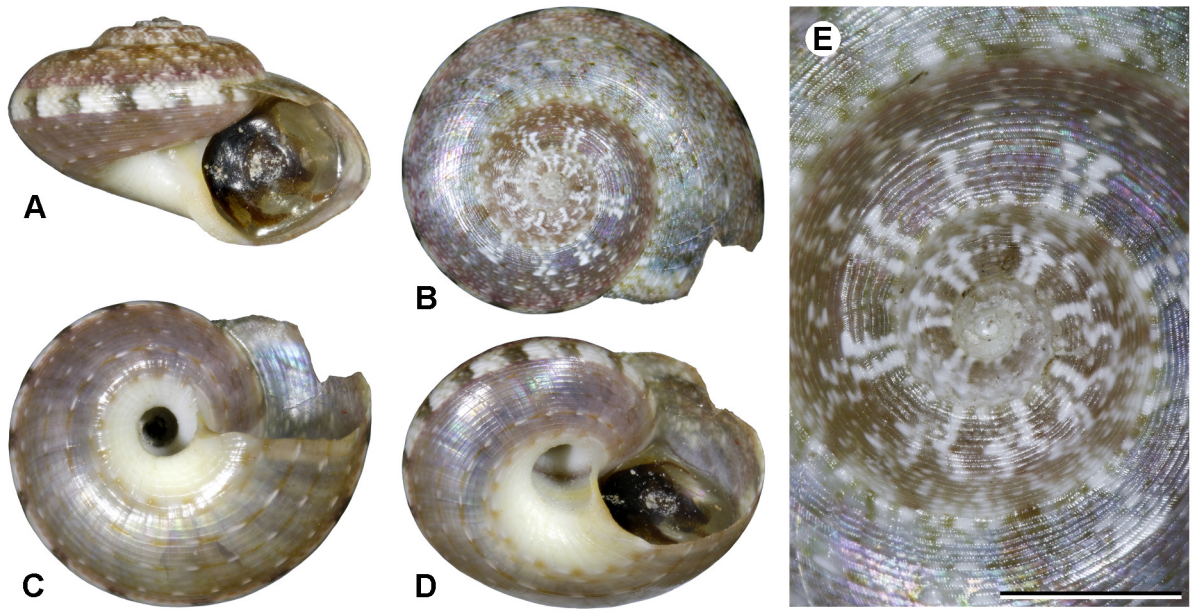

Fig. 29. *Sericominolia porcata* sp. nov. **A–D**. Holotype, Lifou, Loyalty Islands, Stn 1454, height 3.6 mm, diameter 5.6 mm (MNHN-IM-2000-38848). **E**. Close-up of apical whorls, holotype, scale bar = 1.0 mm.

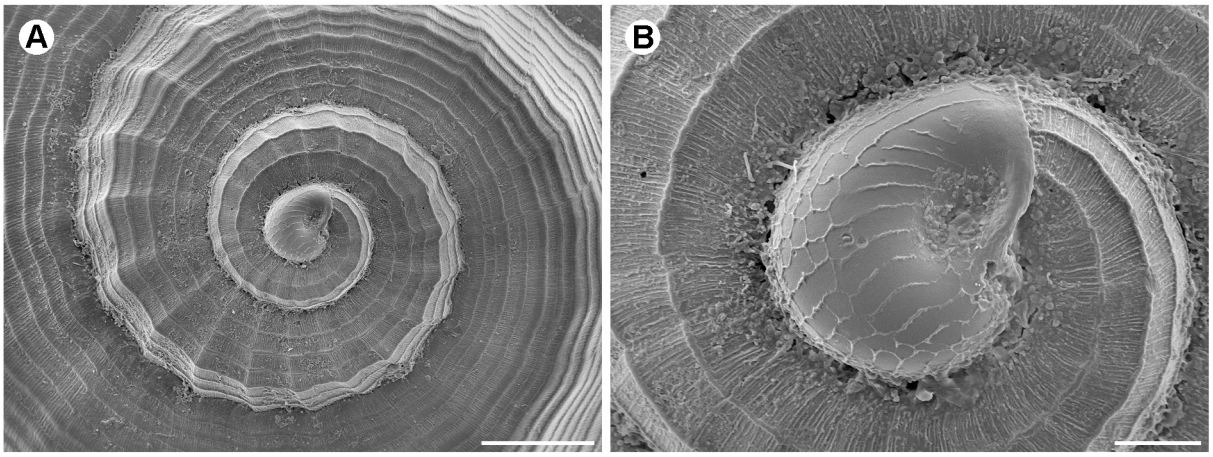

Fig. 30. *Sericominolia porcata* sp. nov., Lifou, Stn 1455 (paratype, MNHN-IM-2000-38850). **A**. Apical view of early spire whorls showing undulant sculpture. **B**. Protoconch. Scale bars: A = 250 µm; B = 50 µm.

Fig. 31. Map of the Loyalty Islands showing distribution of *Sericominolia porcata* sp. nov. Type locality indicated in pink.

Sericominolia safrocincta sp. nov.
urn:lsid:zoobank.org:act:D3F3F410-21ED-45DA-8F01-33337D121700
Figs 32–33

Diagnosis

Shell thin, diameter up to 9.0 mm, apex low and spire profile bluntly rounded; periphery weakly angled; base umbilicate; sculpture fine, predominantly spiral, comprising low, close-set, spiral lirae separated by narrower, incised striae; later whorls also with fine, close-set, collabral pliculae; umbilicus with rounded, thickened rim, at most a very low funicle within; colour pattern mottled and with fine capillary lines dotted with opaque white flecks; umbilicus white, with broad saffron-yellow band within.

Etymology

From the Arabic '*safra*', yellow, saffron, and the Latin '*cinctum*', a girdle or belt; in reference to the saffron-yellow band in the umbilicus.

Material examined

Holotype (Fig. 32A–D)
NEW CALEDONIA • empty shell; Bellona Plateau, Stn D58; 21°34.6′ S, 159°18.9′ E; depth 56 m; Jul. 1984; CHALCAL 1 leg.; MNHN-IM-2000-38851.

Paratypes
NEW CALEDONIA – **Chesterfield Plateau** • 1 specimen, dead; Stn DW128; 19°28′ S, 158°30′ E; depth 38 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN-IM-2000-38852 • 1 specimen, dead; Stn DW154; 19°52′ S, 158°27′ E; depth 35 m; 1 Aug. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN-IM-2000-38853. – **Grande Terre** • 1 specimen, living; Grand Récif de Koumac, Stn KL03; 20°40.5′ S, 164°12.9′ E; depth 50 m; 15 Sep. 2018–11 Nov. 2019; KOUMAC 2.3 leg.; pente externe de récif barrière, lumun-lumun; DNA voucher, photographed alive (image LC482); MNHN IM-2019-8540 • 1 specimen, living; same collection data as for preceding; MNHN-IM-2000-38854 • 1 specimen, living; Grand Récif de Koumac, Stn 1318; 20°41.4′ S, 164°14.8′ E; depth 20–30 m; Oct. 1993; Expédition Montrouzier leg.; pente externe; MNHN-IM-2000-38855 • 1 specimen, dead; Nouméa, Passe de Dumbéa, Stn 1339; 22°21.9′ S, 166°15.4′ E; depth 20 m; 17 Aug. 1992; P. Bouchet leg.; tombant récifal; MNHN-IM-2000-38856 • 1 specimen, living; Yaté, Stn 597B; 22°00′ S, 167°04′ E; depth 50–70 m; 5 Aug. 1986; B. Richer-ORSTOM leg.; MNHN-IM-2000-38857.

Other material
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 2 specimens, dead; Plateau Chesterfield-Bellona, Stn D26; 19°10.72′ S, 158°34.95′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW38; 19°22′ S, 158°43′ E; depth 61 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW82; 19°12′ S, 158°50′ E; depth 62 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Stn D62; 21°46.60′ S, 159°30.70′ E; depth 40 m; 26 Jul. 1984; CHALCAL 1 leg.; MNHN. – **Lansdowne-Fairway Banks** • 4 specimens, dead; Bancs Lansdowne–Fairway, Stn DW26; 20°22′ S, 161°05′ E; depth 62 m; 22 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN. – **Grande Terre, Koumac** • 1 specimen, dead; Grand Récif de Koumac, Stn KL22; 20°26.8′ S, 163°58.3′ E; depth 47 m; 16 Sep. 2018 – 19 Nov. 2019; KOUMAC 2.3 leg.; lumun-lumun, pente externe de récif barrière; MNHN • 12 specimens, dead; Grand Récif de Koumac, Stn 1331; 20°40.0′ S, 164°11.2′ E; depth 55–57 m; Oct. 1993; Expédition Montrouzier leg.; pente externe; MNHN SEM • 2 specimens, dead; Grand Récif de Koumac, Stn 1333; 20°40.0′ S, 164°11.2′ E; depth 30–60 m; Oct. 1993; Expédition Montrouzier leg.; pente externe; MNHN • 1 specimen, living; Grand Récif de Koumac, Stn KL25; 20°45.3′ S, 164°13.8′ E; depth 65 m;

16 Sep. 2018–10 Nov. 2019; KOUMAC 2.3 leg.; pente externe de récif barrière, lumun-lumun; MNHN • 2 specimens, dead; Chenal de la Passe de Koumac, Stn 1323; 20°40.9′ S, 164°14.8′ E; depth 82–120 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 1 specimen, dead; Passe de Koumac, Stn 1311; 20°40.4′ S, 164°14.9′ E; depth 10–60 m; Oct. 1993; Expédition Montrouzier leg.; fonds dur; MNHN • 3 specimens, dead; Passe de Koumac, east drop-off, Stn 1312; 20°40.4′ S, 164°14.9′ E; depth 26–40 m; Oct. 1993; Expédition Montrouzier leg.; suceuse fonds durs; MNHN • 2 specimens, living; Stn KB649; 20°48.4′ S, 164°16.1′ E; depth 42 m; 18 Nov. 2019; KOUMAC 2.3 leg.; pente externe de récif barrière; MNHN. – **Grande Terre, Nouméa** • 1 specimen, dead; Canyon de la Dumbéa, Stn 1356; 22°19.7′ S, 166°15.4′ E; depth 20–23 m; 4 Dec. 1992; Bouchet and Marshall leg.; sable sous blocs; MNHN. – **Loyalty Islands** • 1 specimen, dead; Lifou, Baie du Santal, off Cap Lefèvre [=Nem], Stn 1469; 20°54.2′ S, 167°00.4′ E; depth 70–130 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; dragages; MNHN.

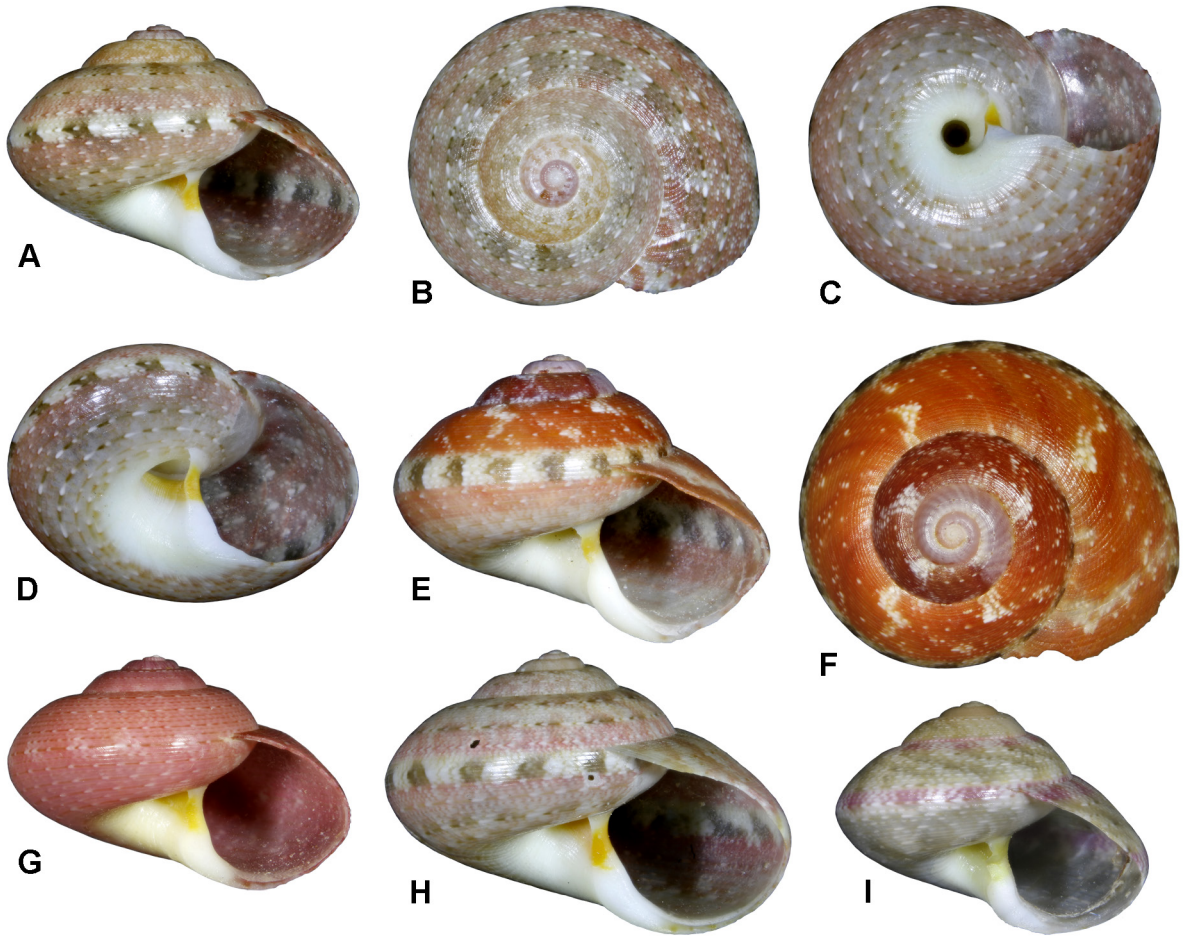

Fig. 32. *Sericominolia safrocincta* sp. nov. **A–D**. Holotype, Bellona Plateau, Stn D58, height 5.5 mm, diameter 7.5 mm (MNHN-IM-2000-38851). **E–F**. Specimen with bold red pigmentation, Chesterfield Plateau, Stn DW154, diameter 8.1 mm (paratype, MNHN-IM-2000-38853). **G**. Pink specimen with fine capillary lines, Nouméa, Stn 1339, diameter 7.3 mm (paratype, MNHN-IM-2000-38856). **H**. Large specimen with bold red pigmentation, Chesterfield Plateau, Stn DW128, diameter 8.7 mm (paratype, MNHN-IM-2000-38852). **I**. Grand Récif de Koumac, Stn 1318, diameter 6.7 mm (paratype, MNHN-IM-2000-38855).

Description (Fig. 32)

Shell. Thin, of moderate size (adult diameter up to 9.0 mm), wider than high (H/D 0.69–0.77); apex low and spire profile bluntly rounded, periphery below mid-whorl, weakly angled; suture indented but not strongly so; sculpture fine, predominantly spiral; base rounded, umbilicate; teleoconch of up to 5.25 whorls. First teleoconch whorl with three narrow spiral lirae, broadening during second whorl and increasing in number through intercalation of intermediaries; subsequent sculpture of low, close-set, spiral lirae separated by narrower, incised striae; lirae finer below suture; axial sculpture initially weak, close-set microscopic threads only, later whorls with stronger, close-set, collabral growth-lines, most distinct below suture; basal sculpture similar, but lirae narrower and with wider intervals; lirae more numerous around and within umbilicus; axial sculpture of base weak peripherally, strengthening medially to form fine, close-set pliculae around umbilicus; umbilical rim rounded, steep-sided within, without a funicle or with at most a very low one, above which is a shallow sulcus underlying insertion onto preceding whorl (Fig. 32D). Aperture obliquely quadrate; peristome interrupted in parietal region; columella lip thickened and with surface microscopically granular at termination of umbilical rim, weakly reflected at end of umbilical funicle when present; outer lip simple; interior smooth and weakly nacreous.

Colour. Pattern variable; usually finely mottled in shades of pale apricot, pink, or olive-green with fine capillary lines dotted with alternating opaque white and olive-green flecks; periphery usually with a broad whitish band with olive-green blotches; peri-umbilical region white, interior of umbilicus with a broad, saffron-yellow band; some specimens banded or blotched and others more uniformly coloured in pink to orange-red hues (Fig. 32G); protoconch usually whitish.

Dimensions. Holotype, height 5.5 mm, diameter 7.5 mm; largest specimen, diameter 9.0 mm.

Protoconch. As in *S. lifuana*, diameter 190–200 µm.

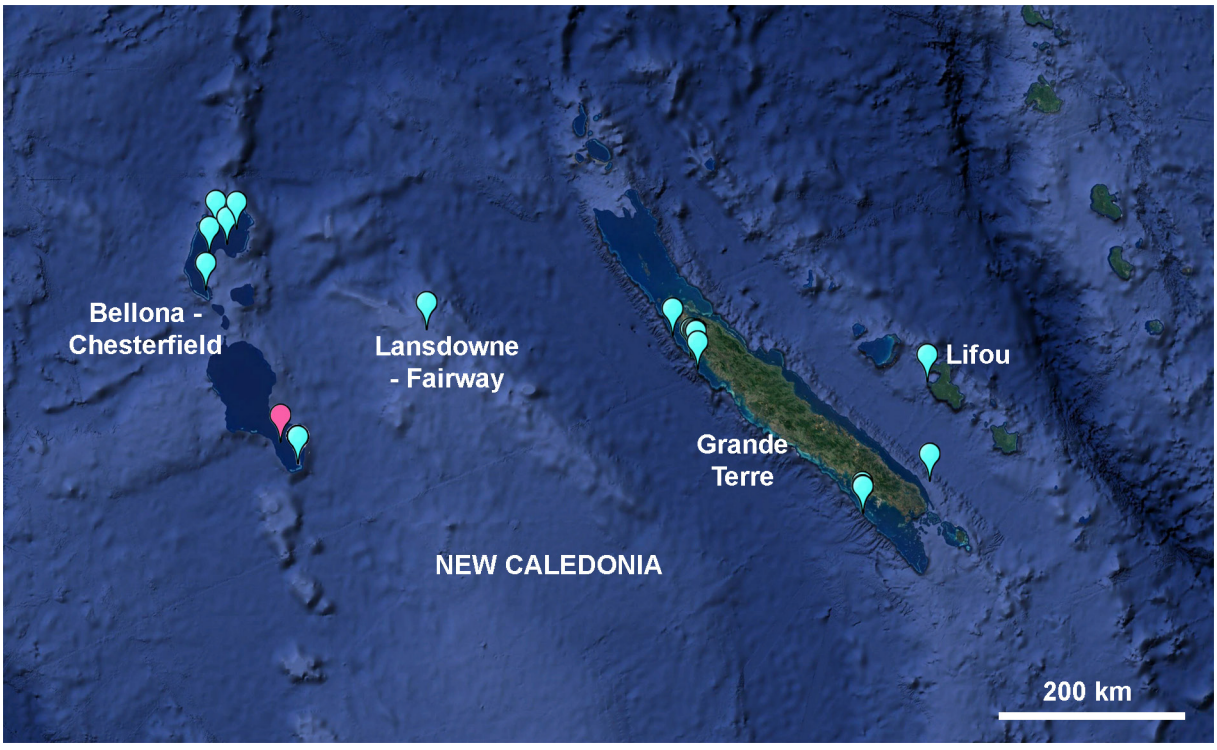

Fig. 33. Map of the eastern Coral Sea showing the distribution of *Sericominolia safrocincta* sp. nov. Type locality indicated in pink.

Operculum. As in *S. lifuana*.

Radula and external anatomy. Not examined.

Habitat

Mostly found in the deeper lagoon channels and passes, and on the outer slope of the barrier reef, at depths of 20–70 m (living specimens, 30–65 m).

Distribution (Fig. 33)

Known only from the New Caledonian marine ecoregion, ranging from the Chesterfield-Bellona Plateau and Lansdowne-Fairway Banks, to Grande Terre and the Loyalty Islands.

Remarks

Very similar to *Sericominolia lifuana*, but differs therefrom in having a more bluntly rounded apex, a broad saffron-yellow band in the umbilicus and at most a weak umbilical funicle that does not project into the umbilicus at the columella lip.

Genus ***Talopena*** Iredale, 1918

Talopena Iredale, 1918: 30.

Type species

Monilea incerta Iredale, 1912 (original designation), ?Quaternary to Recent, Kermadec Islands.

Diagnosis

Shell depressed turbiniform to trochoid-turbiniform, stout, size moderate (diameter up to 17.0 mm); whorls rounded, periphery below mid-whorl, base somewhat flatter; sculpture of spiral cords with fine axial pliculae in intervals; umbilicus open, bounded by a thickened spiral band with curved axial pliculae; interior of umbilicus with a low, broad funicle; columella lip thickened basally and at end of funicle; outer lip simple, its interior smooth.

Operculum corneous, relatively thick, multispiral, but not tightly so; whorl overlap narrow, peripheral fringe narrow; spiral microsculpture lacking.

Radula with base-plates of rachidian and lateral teeth relatively robust; inner marginal tooth transitional with reduced cusp; cusps of marginals 3–10 largest, long and spathulate, with shallow medial furrow and 1–2 small denticles at outer base.

Ctenidium bipectinate, anterior portion unattached.

Remarks

When proposing *Talopena*, Iredale (1918) provided no diagnostic characters and merely stated that his new genus represented ‘a well-marked austral series’ that he considered distinct from *Monilea* Swainson, 1840. Subsequently, Iredale (1929b) referred a further two species to *Talopena*, namely *Talopena gloriola* Iredale, 1929 and *Trochus lifuanus* Fischer, 1878, but these are species with much finer sculpture than *Monilea incerta* (Fig. 34D–G) and they lack a broad, peri-umbilical band with curved axial pliculae, and have a narrower funicle within the umbilicus. They are instead referable to *Sericominolia*. Both Thiele (1929: 57) and Wenz (1938: 319) considered *Monilea* and *Talopena* to be distinct at genus-level, whereas Keen (1960: 261) treated *Talopena* as a subgenus of *Monilea*. Subsequently, Marshall (1979) considered *Talopena* to be a synonym of *Monilea* s. s.

Having examined a large amount of '*Monilea* s. lat.' material from New Caledonia as well as type specimens of several of the taxa currently considered referable to *Monilea* (MolluscBase 2024), I believe *Talopena* to be distinct from *Monilea* and to represent a cluster of nominal species distributed over much of the central Indo-West Pacific, and extending into the eastern Indian Ocean. For comparison, I illustrate the holotypes of the type species of both genera (Fig. 34). In *Talopena*, the umbilicus is bounded by a single broad, thickened spiral band bearing close-set, curved axial plicae, whereas in *Monilea* such a band is lacking and the umbilical rim is sculptured by narrower cords similar to those on the base. A further difference is that the interior of the outer lip in *Monilea* bears strong in-running spiral ridges. In *Talopena* such ridges are absent and the interior of the outer lip is smooth. Sculpturally, the spiral cords on the spire whorls of *Monilea* are more distinctly beaded than they are in *Talopena*. An umbilical funicle is present in both genera, but its strength of development is evidently variable within both genera and within species. The holotype of the type species of *Monilea* has a particularly well developed umbilical funicle that terminates as a large callus pad extending from the mid-region of the columella (Fig. 34C).

In addition to *Talopena incerta*, *Talopena* also includes *Trochus belcheri* Philippi, 1850 of unknown provenance, *Trochus calyculus* Wood, 1828 of unknown provenance (figured syntype NHMUK 1878.6.3.1, Fig. 77A–C), *Monilea menkei* A. Adams, 1855 from Masbate Island, Philippines (holotype, NHMUK 1968180, Fig. 77D–F), *Trochus* (*Monilea*) *masoni* G. Nevill & H. Nevill, 1874, from the Andaman Islands and *Monilea philippii* A. Adams, 1855, from 'China Seas' (lectotype, NHMUK 1968181, Fig. 77G–I). Whether or not these all represent distinct species is a matter requiring further investigation. Smith (1879) was firmly of the opinion that *Trochus calyculus* and *T. masoni* were synonyms. More recently, Patterson *et al*. (2022) employed the name *Monilea masoni* for material from the Gulf of Manaar, but the specimen illustrated appears closer to *Monilea lentiginosa* A. Adams, 1853.

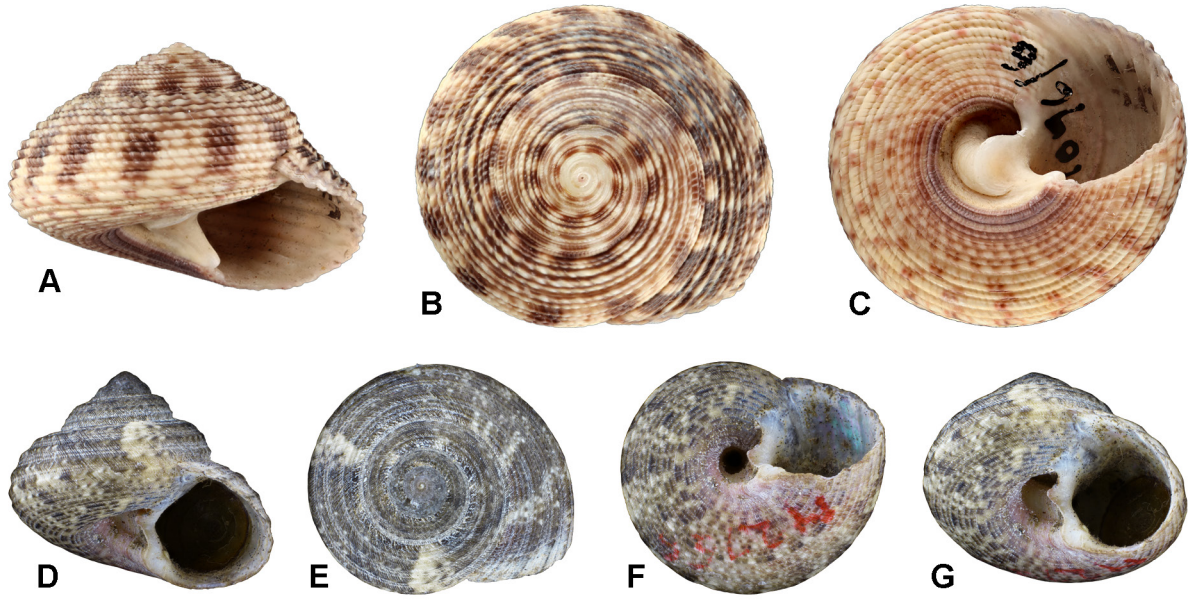

Fig. 34. Comparison of *Monilea* Swainson, 1840 and *Talopena* Iredale, 1918. **A–C**. *Monilea callifera* (Lamarck, 1822), holotype of *Trochus calliferus* Lamarck, 1822 (MHNG-MOLL-51504), height 10 mm, diameter 19 mm (images courtesy of Emmanuel Tardy). **D–G**. *Talopena incerta* (Iredale, 1912), holotype of *Monilea incerta* Iredale, 1912 (CMNZ M2755), height 7.8 mm, diameter 9.5 mm (not 10 × 9 mm as given by Iredale) (images courtesy of Paul Scofield and Mark Fraser).

Talopena apicina (Gould, 1861) comb. nov.
Figs 35–38

Monilea apicina Gould, 1861: 16. Type locality: Port Jackson [Sydney Harbour, New South Wales], leg. W. Stimpson; erroneous – here emended to Lansdowne Bank, eastern Coral Sea [20.167°S, 160.617°E].

Monilea apicina – Gould 1862: 154. — Pilsbry 1889–1890: 254. — Iredale 1924: 228. — Johnson 1964: 41, pl. 14 fig. 4 (holotype)
Isanda (*Parminolia*) *apicina* – Ladd 1966 (*partim*): 39, pl. 5 figs 3–4 (holotype).
Monilea incerta (non Iredale, 1912) – Héros *et al*. 2007: 209.
Parminolia apicina – Wilson 1993: 94.
Non *Parminolia apicina* – Iredale 1929a: 271. — Héros *et al*. 2007: 209 [= *Parminolia agapeta* (Melvill & Standen, 1896)].

Material examined

Holotype (Fig. 38A–D)
AUSTRALIA • Port Jackson [erroneous – see Remarks] USNM 24159.

Paratype (Fig. 38E)
AUSTRALIA • Port Jackson [erroneous] NHMUK 20210269.

Other material
NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 4 specimens, living; Plateau des Chesterfield, Stn DW147; 19°37′ S, 158°14′ E; depth 25 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW136; 19°31′ S, 158°16′ E; depth 37 m; 30 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW48; 19°18′ S, 158°27′ E; depth 44 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Plateau des Chesterfield, Stn DW42; 19°22′ S, 158°29′ E; depth 45 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 14 specimens, dead; Plateau des Chesterfield, Stn DW128; 19°28′ S, 158°30′ E; depth 38 m; 29 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 4 specimens, living; Plateau Chesterfield-Bellona, Stn D45; 20°48.93′ S, 158°30.21′ E; depth 50 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW76; 19°12′ S, 158°33′ E; depth 53 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D26; 19°10.72′ S, 158°34.95′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D49; 20°58.2′ S, 158°35.0′ E; depth 48 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 10 specimens, dead; Plateau des Chesterfield, Stn D39; 20°28.9′ S, 158°40.7′ E; depth 40 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW38; 19°22′ S, 158°43′ E; depth 61 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW79; 19°12′ S, 158°45′ E; depth 58 m; 25 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau des Chesterfield, Stn DW31; 19°25′ S, 158°45′ E; depth 57 m; 23 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D37; 19°54′ S, 158°46.3′ E; depth 50 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 23 specimens, dead; Plateau Chesterfield-Bellona, Stn D17; 19°11.9′ S, 158°55.8′ E; depth 44 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 11 specimens, living; Plateau des Chesterfield, Stn DW110; 19°09′ S, 158°56′ E; depth 40 m; 28 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 4 specimens, dead; Plateau Chesterfield-Bellona, Stn DW85; 19°12′ S, 158°56′ E; depth 32 m; 26 Jul. 1984; CHALCAL 1 leg.; MNHN • 4 specimens, dead; without further detail; CHALCAL 1 leg.; MNHN. – **Lansdowne-Fairway Banks** • 2 specimens, dead; Bancs Lansdowne–Fairway, Stn D8; 20°47.3′ S, 161°01.4′ E; depth 40 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Bancs Lansdowne–Fairway, Stn DW26; 20°22′ S,

161°05′ E; depth 62 m; 22 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN • 2 specimens, dead; Bancs Lansdowne–Fairway, Stn DW02; 20°50′ S, 161°37′ E; depth 62 m; 20 Jul. 1988; NO *Coriolis*-CORAIL 2 leg.; MNHN. – **d'Entrecasteaux Reefs – Lagon Nord – Belep** • 1 specimen, dead; Atoll de Huon, Stn 436; 18°06′ S, 162°50′ E; depth 45 m; 25 Feb. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 488; 18°53′ S, 163°30′ E; depth 38 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 487; 18°55′ S, 163°31′ E; depth 37 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Lagon Nord, Stn 481; 18°57′ S, 163°32′ E; depth 33 m; 2 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 518; 19°05′ S, 163°35′ E; depth 38 m; 5 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 1105; 19°40′ S, 163°57′ E; depth 25 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 12 specimens, living; Stn 1104; 19°42′ S, 163°59′ E; depth 22 m; 25 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Koumac** • 1 specimen, dead; Stn 947; 20°33′ S, 164°07′ E; depth 17–18 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Chenal de l'Infernet, Stn 1305; 20°36.2′ S, 164°11.0′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 1 specimen, dead; Chenal de l'Infernet, Stn 1306; 20°39.1′ S, 164°12.4′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 5 specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 1 specimen, dead; Stn KD568; 20°40.1′ S, 164°14.3′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques débris coralliens; MNHN • 2 specimens, dead; Stn KD567; 20°40.1′ S, 164°14.6′ E; depth 2 m; 16 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et algues vertes filamenteuses; MNHN • 1 specimen, dead; Chenal de la Passe de Koumac, Stn 1315; 20°40.7′ S, 164°14.7′ E; depth 66–87 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 8 specimens, dead; Chenal de la Passe de Koumac, Stn 1323; 20°40.9′ S, 164°14. 8′ E; depth 82–120 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 7 specimens, living; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; MNHN • 2 specimens, living; Stn KD559; 20°46′ S, 164°15.5′ E; depth 12–14 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher; MNHN-IM-2019-8826 • 1 specimen, living; Stn KD572; 20°45.8′ S, 164°16.1′ E; depth 22–23 m; 18 Nov. 2019; KOUMAC 2.3 leg.; sable grossier, coquilles; MNHN • 2 specimens, living; Stn KD554; 20°47′ S, 164°16.8′ E; depth 2–5 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et gros débris de coraux morts; MNHN • 2 specimens, living; Stn KD553; 20°47.9′ S, 164°17.2′ E; depth 5–10 m; 13 Nov. 2019; KOUMAC 2.3 leg.: sable blanc; DNA voucher; MNHN-IM-2019-8778. – **Grande Terre**, **Bourail** • 7 specimens, dead; Lagon de Poé, Stn 1324; 21°36.9′ S, 165°22.7′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; fonds mixtes, herbier; MNHN. – **Grande Terre**, **Baie de St Vincent** • 1 specimen, dead; Stn 186; 22°04′ S, 166°00′ E; depth 11 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 4 specimens, dead; Stn 162; 22°13′ S, 166°09′ E; depth 10 m; 18 Sep. 1984; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Nouméa** • 9 specimens, living; Stn DE56; 22°08.4′ S, 166°07.7′ E; depth 19–20 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 3 specimens, dead; Stn 51; 22°15′ S, 166°11′ E; depth 10 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 50; 22°17′ S, 166°12′ E; depth 12 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 49; 22°19′ S, 166°14′ E; depth 10 m; 25 May 1984; B. Richer-ORSTOM leg.; MNHN • 11 specimens, living; Grand Récif Aboré, Stn 1346; 22°21.9′ S, 166°16.1′ E; depth 5–6 m; 5 Oct. 1992; P. Bouchet leg.; fonds blanc; MNHN • 1 specimen, living; Stn DE62; 22°16.8′ S, 166°16.6′ E; depth 32–34 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 5 specimens, living; Stn 8; 22°23′ S, 166°18′ E; depth 15 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Quatre Bancs de l'Ouest, Stn 1511; 22°26.5′ S, 166°18.3′ E; depth 0–1 m; 26 Oct. 2000; Cosel and Trondlé leg.; platier, marée basse, récolte à vue; MNHN • 7 specimens, living; Quatre Bancs de l'Ouest, Stn 1510; 22°26.47′ S, 166°18.35′ E; depth 0 m; 26 Oct. 2000; Cosel and Trondlé leg.; hand dredge; MNHN • 1 specimen, dead; Stn 257; 22°22′ S, 166°20′ E; depth 9 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 7; 22°24′ S, 166°20′ E; depth 14 m; 21

May 1984; B. Richer-ORSTOM leg.; MNHN • 10 specimens, dead; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 5 specimens, dead; Île aux Goélands, Stn 1368; 22°24.3′ S, 166°20.7′ E; depth 10 m; 16 Apr. 1993; P. Bouchet leg.; fonds blancs; MNHN • 4 specimens, living; Stn 4; 22°23′ S, 166°21′ E; depth 9 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 40 specimens, living; Crouy; 22°21.5′ S, 166°21.7′ E; depth 1–6 m; 1990–2003; Claude Berthault leg.; MNHN • 7 specimens, living; SE Sèche Croissant, Stn 1508; 22°18.6′ S, 166°21.8′ E; depth unknown; 25 Oct. 2000; Cosel and Trondlé leg.; hand dredged; MNHN • 10 specimens, dead; Île aux Goélands, Stn 1503; 22°22.4′ S, 166°22.5′ E; depth 5–7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 1 specimen, living; Stn 21; 22°23′ S, 166°23′ E; depth 10 m; 23 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 22; 22°26′ S, 166°23′ E; depth 11 m; 23 May 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 281; 22°24′ S, 166°24′ E; depth 10 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 283; 22°27′ S, 166°24′ E; depth 13 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 64; 22°28′ S, 166°25′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 2 specimens, dead; Stn DE38; 22°33.6′ S, 166°28.6′ E; depth 22–24 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 82; 22°33′ S, 166°29′ E; depth 10 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn DE36; 22°35.5′ S, 166°32.0′ E; depth 17–19 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 12 specimens, living; Ile Ouen-Baie du Prony, Stn 98; 22°36′ S, 166°32′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Ile Ouen-Baie du Prony, Stn 95; 22°31′ S, 166°33′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 6 specimens, living; Stn DE35; 22°36.5′ S, 166°33.8′ E; depth 16 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 4 specimens, living; Ile Ouen-Baie du Prony, Stn 99; 22°33′ S, 166°35′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Ile Ouen-Baie du Prony, Stn 159; 22°38′ S, 166°36′ E; depth 17 m; 24 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Île Ouen – Baie du Prony, Stn 161; 22°34′ S, 166°38′ E; depth 20 m; 24 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn DE30; 22°35.8′ S, 166°39.6′ E; depth 12–13 m; 28 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 7 specimens, living; Grand Récif Sud, Stn 293; 22°42′ S, 166°41′ E; depth 20 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 294; 22°44′ S, 166°42′ E; depth 21 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 308; 22°46′ S, 166°43′ E; depth 18 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 233; 22°35′ S, 166°46′ E; depth 30 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Grand Récif Sud, Stn 341; 22°49′ S, 166°46′ E; depth 19 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 340; 22°48′ S, 166°47′ E; depth 27 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 339; 22°46′ S, 166°48′ E; depth 26 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 312; 22°42′ S, 166°49′ E; depth 26 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 544; 22°51′ S, 166°49′ E; depth 25 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 336; 22°42′ S, 166°51′ E; depth 26 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Île des Pins** • 1 specimen, dead; Stn 589; 22°32′ S, 167°24′ E; depth 31 m; 18 Jul. 1985; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands**, **Loyalty Ridge** • 1 specimen, dead; Ride des Loyauté, Stn DW433; 20°20′ S, 166°09′ E; depth 24 m; 18 Feb. 1989; NO *Alis*-MUSORSTOM 6 leg.; MNHN. – **Loyalty Islands**, **Lifou** • 1 specimen, dead; Baie du Santal, in front of Kiki, Stn 1411; 20°47.6′ S, 167°10.4′ E; depth 48 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable entre patates; MNHN • 1 specimen, dead; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN.

Redescription (Fig. 35)

Shell. Robust, of moderate size (diameter up to 11.6 mm); profile variable, globose-lenticular to trochoid-turbiniform (H/D 0.74–0.89); teleoconch of up to 6.25 whorls; periphery rounded, situated slightly below mid-whorl; suture level with periphery, often narrowly channelled on later spire whorls, usually not descendant prior to insertion of outer lip, or only slightly so; base umbilicate. Early teleoconch whorls with 3–4 fine spiral cords; three primary cords evident at end of third whorl, the uppermost one delimiting a flattened shoulder (Fig. 36A); a fourth level with abapical suture; intervals between cords with a secondary intermediary cord on fourth/fifth whorl; ± 3 secondary cords arising on shoulder during fifth whorl; subsequent whorls with cords of three orders as tertiaries arise between secondaries, totalling 10–14 on penultimate whorl; shoulder less evident on penultimate whorl and evanescing completely on last whorl; cords with asymmetrically triangular profile (roundly wedge-shaped), their intervals lacking spiral microlirae; axial sculpture of fine, close-set, prosocline pliculae throughout (Fig. 36A), progressively coarser with growth resulting in fine beading on cords on last whorl; base with 10–12 lower, more evenly sized and more rounded spiral cords, progressively more distinctly beaded by axial pliculae toward umbilicus. Umbilicus moderate to narrow, its margin defined by a wide thickened band with relatively fine, curved, axial pliculae; interior of umbilicus with a broad funicle above which is a deep channel. Aperture roundly quadrate, peristome interrupted in parietal region; columella lip thick, with a reflected lobe at end of umbilical funicle and a thickened, somewhat granular pad at end of peri-umbilical band, often notched; a weak tooth often present at columella base; parietal region with some callus deposition at insertion of columella, but generally without an expanded callus lobe; outer lip simple, thicker internally, its edge scalloped by spiral cords, strongly prosocline above periphery, orthocline below; interior nacreous in live-collected specimens, lacking in-running spiral ridges.

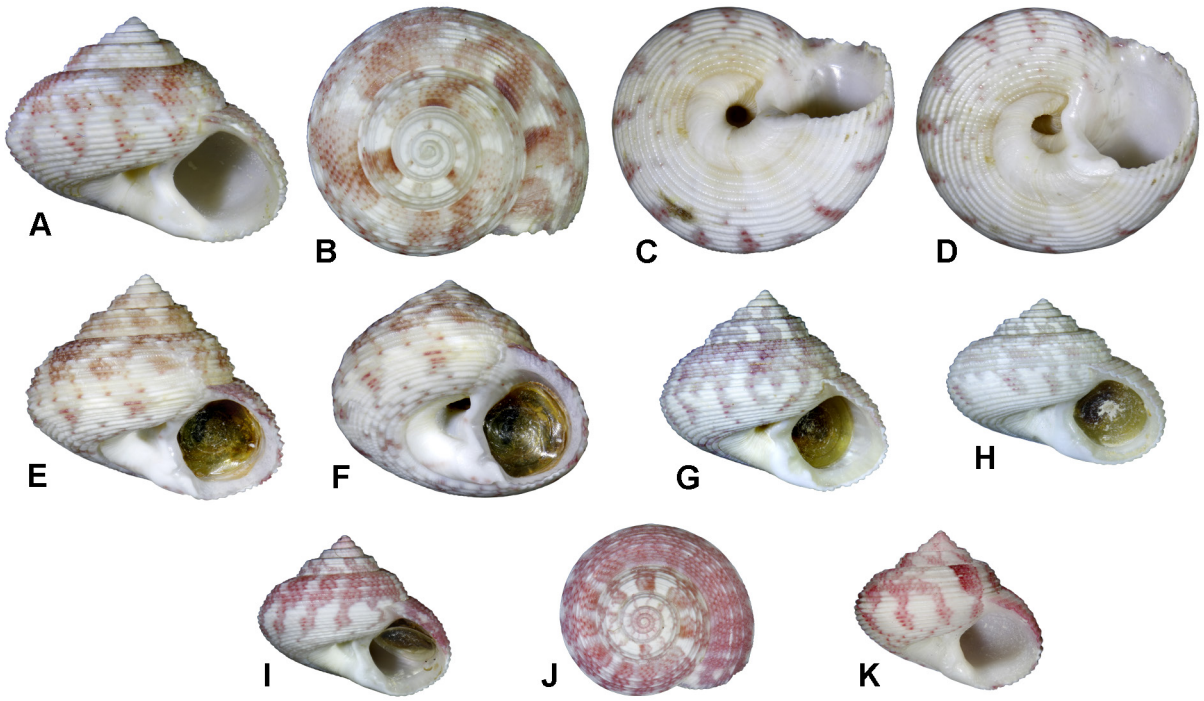

Fig. 35. *Talopena apicina* (Gould, 1861) (all MNHN). **A–D**. Largest specimen, Nouméa, Stn 98, diameter 11.6 mm. **E–F**. Specimen with distinct columella features, Koumac, Stn 1305, diameter 10.6 mm. **G–H**. Elevated and depressed specimens from same sample, Nouméa, Stn DE56, diameters 9.4 and 9.0 mm, respectively. **I–J**. Densely patterned specimen, Nouméa, Crouy, diameter 8.0 mm. **K**. Pink specimen, Koumac, Stn KD553, diameter 7.8 mm.

Colour. Shell lustreless; colour pattern variable; ground colour pale, variously mottled with blotches, irregular axial bands, flecks and spots in shades of white, pink and maroon-brown; base usually less heavily pigmented, but frequently with pigment blotches extending around periphery; peri-umbilical band whitish often with corneous periostracal layer; lobe at end of umbilical funicle white, never yellow. Some specimens more finely patterned or washed in shades of pink.

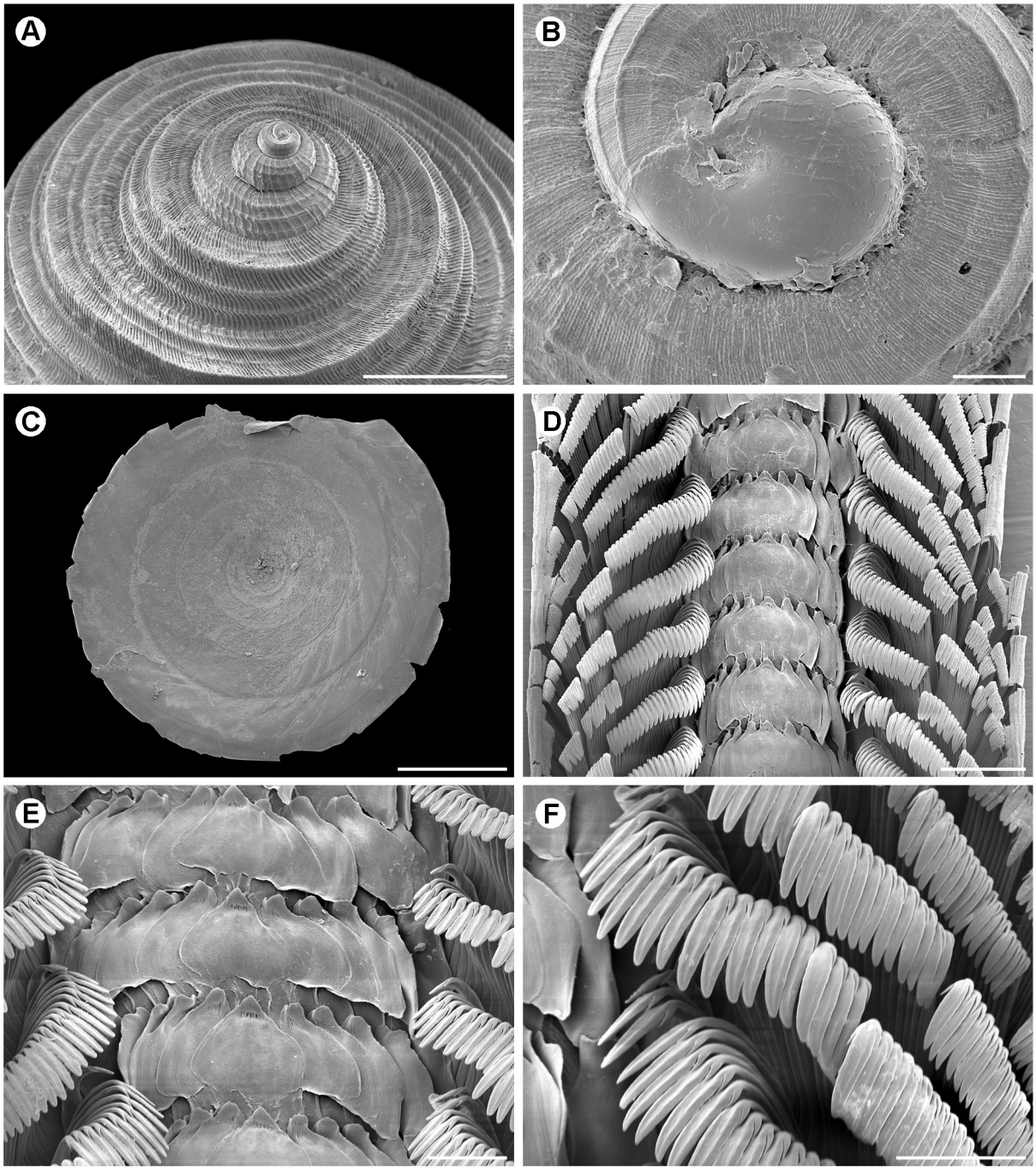

Fig. 36. *Talopena apicina* (Gould, 1861) (all MNHN). **A**. Oblique view of apex. **B**. Protoconch. **C**. Operculum. **D**. Radula, entire width. **E**. Radula, central field and latero-marginal transition. **F**. Radula, inner marginal teeth. A. Nouméa, Stn 233; B–F. Nouméa, Crouy. Scale bars: A, C = 1.0 mm; B, E–F = 50 μm; D = 100 μm.

Protoconch (Fig. 36B). Typically umboniine; diameter 180–195 µm; white; apical beak present and confluent with terminal lip; apical bulb with irregular subradial threads, further subspiral threads evident towards suture; terminal lip weakly convex.

Operculum (Fig. 36C). Corneous, moderately thick, yellowish-brown; multispiral, but with rather few whorls and with relatively long growing margin; peripheral fringe narrow, with only faint radial striation; surface lacking spiral microsculpture.

Radula (Fig. 36D–F). Formula ∞+(1)+5+1+5+(1)+∞, with ±40 transverse rows of teeth; teeth in central field with distinct overlapping base-plates, but shafts and cusps lacking; rachidian subcordate with bluntly rounded vestige of shaft on anterior edge; first lateral with broad convex outer margin, pinched in anteriorly (shaft vestige); remaining laterals similar, but with progressively less convex outer margin. Innermost marginal transitional, with stout base-plate and reduced shaft and cusp; other marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner marginal teeth long and spathulate with shallow medial furrow and 1–2 small pointed denticles at outer base (also on inner base, but usually not visible due to tooth overlap); marginals 3–10 with longest cusps; cusps progressively less elongate thereafter and with more numerous, finer denticles.

External anatomy. As for *Talopena maestratii* sp. nov.; dorsal area of eyestalks and eye, forehead, snout papillae, neck-lobes and sides of foot with opaque white pigmentation.

Habitat

Largely associated with sandy substrata in channels within the lagoonal system; living specimens 0–50 m, but mostly at depths of 5–35 m, empty shells to 82 m in reef passes.

Distribution (Fig. 37)

Known to date only from the New Caledonian marine ecoregion, but widely distributed within this, ranging from the Chesterfield-Bellona Plateau and Lansdowne-Fairway Banks, to the d'Entrecasteaux

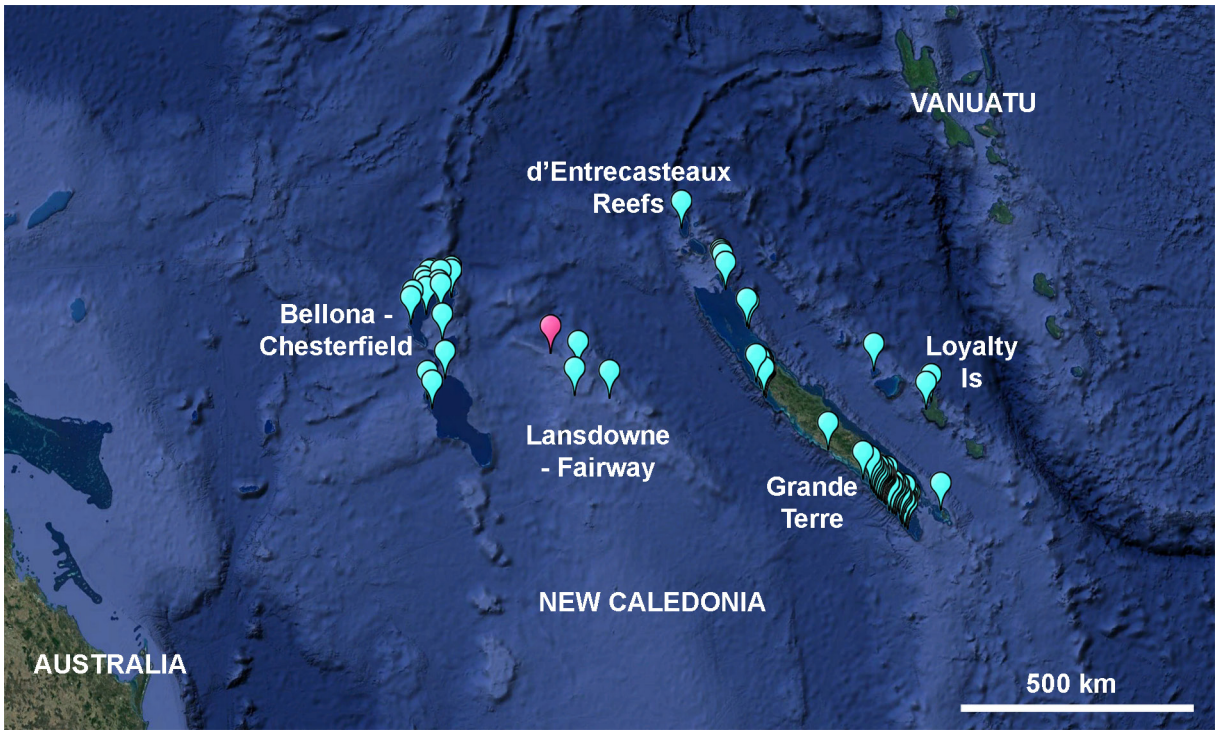

Fig. 37. Map of the Coral Sea showing the distribution of *Talopena apicina* (Gould, 1861). Emended type locality indicated in pink.

Reefs and Belep, Grande Terre, and the Loyalty Islands. Records of *Monilea apicina* and *Parminolia apicina* from other areas require confirmation and may in fact represent *Parminolia agapeta*.

Remarks

Following Iredale (1924; 1929a), *Monilea apicina* Gould, 1861, supposedly from New South Wales, has long been considered an earlier name for *Minolia agapeta* Melvill & Standen, 1896. Iredale (1924) speculated that Gould's original material of the then unfigured *M. apicina* was lost, however, the holotype (USNM 24159) has since been illustrated twice, by Johnson (1964: 41, pl. 14 fig. 4) and by Ladd (1966: 40, pl. 5 figs 3–4), and I illustrate it again here (Fig. 38A–D). The NHMUK material referred to by Iredale (1924) also remains present (Fig. 38E). It is clearly conspecific with the USNM holotype. These illustrations reveal that *Monilea apicina* is not conspecific with *Minolia agapeta*, the latter (see *Parminolia agapeta* above) has a smaller (diameter 4.5 mm vs 6.0 mm) and more elevated shell, with fewer, more undulant spiral cords, and a narrower umbilicus with a weaker peri-umbilical cord and interior funicle.

The original material of *Monilea apicina* was collected during the US North Pacific Exploring Expedition (USNPEE) and the published locality was given as 'Port Jackson' [Sydney Harbour, New South Wales]. However, Hedley (1908: 464) indicated that the species had not been recognised within the Australian fauna and I am unaware of any subsequent records of the species from south-eastern Australia. The 'Port Jackson' locality is almost certainly erroneous. Instead, Ladd (1966) noted that the USNM holotype was labelled 'Coral Sea' and the USNPEE visited this region immediately after leaving Sydney in January, 1854, passing a shoal where a dredge haul was undertaken on January 20, at 20°07′ S, 160°37′ E (Lansdowne Bank) containing 'twelve species of bivalves and one hundred and five of univalves' (Johnson 1964: 22).

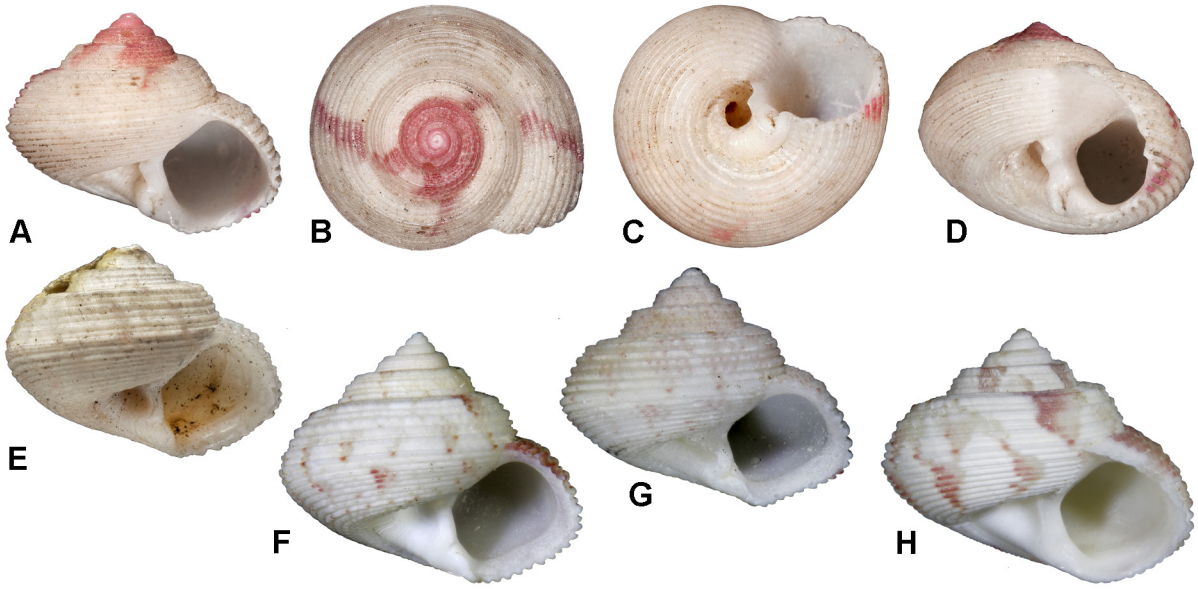

Fig. 38. *Talopena apicina* (Gould, 1861). **A–D**. Holotype of *Monilea apicina* Gould, 1861, height 4.7 mm, diameter 6.0 mm (USNM24159; images courtesy of Ellen Strong and Yolanda Villacampa). **E**. Paratype of *Monilea apicina* Gould, 1861, height 4.7 mm, diameter 6.0 mm (NHMUK 20210269; image courtesy of Kevin Webb, NHM Photo Unit. © The Trustees of the Natural History Museum, London). **F–H**. Similarly sized specimens (MNHN). **F**. Lansdowne-Fairway Banks, Stn DW26, diameter 6.6 mm. **G**. Chesterfield-Bellona Plateau, Stn D17, diameter 6.4 mm. **H**. Chesterfield-Bellona Plateau, Stn D37, diameter 6.8 mm.

Comparison of the holotype of *Monilea apicina* with the material listed above, including similarly-sized specimens from the Chesterfield-Bellona Plateau and the Lansdowne Bank (Fig. 38F–H), clearly indicates conspecificity and the holotype is simply a juvenile specimen of a species referable to *Talopena*. Above, I provide a redescription of the species based on live-collected adult specimens. *Talopena apicina* differs from *T. maestratii* sp. nov. in being smaller (max. diameter 11.7 mm vs 17.0 mm) and in having slightly weaker spiral cords of 2–3 alternating orders, the intervals between which are narrower and lack spiral microlirae; the axial sculpture on the last adult whorl is also more distinct in *T. apicina*, rendering the spiral cords finely beaded. In addition, the pliculae on the peri-umbilical band are much finer, the colour pattern generally more pinkish and the reflected callus at the end of the umbilical funicle is white, never yellow.

To correct the erroneous original locality, I here designate the type locality for *Monilea apicina* Gould, 1861, to be the location of the USNPEE dredge haul taken on January 20, 1854, at 20°07′ S, 160°37′ E [20.167° S, 160.617° E], Lansdowne Bank in the eastern Coral Sea.

Talopena maestratii sp. nov.
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Figs 39–43

Monilea cf. *menkei* – Héros *et al*. 2007: 209.

Diagnosis

Talopena maestratii sp. nov. is characterised by its relatively large and robust shell bearing crisp, evenly sized spiral cords with fine, close-set spiral microlirae in their intervals; cords undulant rather than beaded; parietal region with callus lobe at insertion of columella; thickened peri-umbilical band bears coarse pliculae and termination of umbilical funicle frequently yellow.

Etymology

Named for Philippe Maestrati (MNHN), in recognition of his enormous contribution to our knowledge of marine molluscan diversity, particularly in New Caledonia, through his many years of field work in the region, from Expédition Montrouzier (1993) to KOUMAC 2.3 (2019).

Material examined

Holotype (Fig. 39A–D)
NEW CALEDONIA • empty shell; Koumac, Stn 942; 20°37′ S, 164°13′ E; depth 15 m; 28 Apr. 1988; B. Richer-ORSTOM leg.; MNHN-IM-2000-38858.

Paratypes
NEW CALEDONIA – **Grande Terre**, **Poum** • 1 specimen, living; Stn 1004; 20°10′ S, 163°58′ E; depth 15 m; 2 May 1988; B. Richer-ORSTOM leg.; MNHN-IM-2000-38859. – **Grande Terre**, **Koumac** • 1 specimen, living; Stn KD518; 20°34.7′ S, 164°12.5′ E; depth 5–6 m; 1 Nov. 2019; KOUMAC 2.3 leg.: sable gris à *Halophila*; MNHN-IM-2000-38860 • 1 specimen, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN-IM-2000-38861 • 2 specimens, living; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; DNA vouchers; MNHN-IM-2019-9731 and -9732 (image PM751). – **Grande Terre**, **Nouméa** • 2 specimens, living; Grand Récif Sud, Stn 546; 22°53′ S, 166°52′ E; depth 33 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN-IM-2000-38862.

Other material

NEW CALEDONIA – **Lagon Nord – Belep** • 4 specimens, living; Lagon Nord, Stn 542; 19°06′ S, 163°10′ E; depth 50 m; 6 Mar. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Lagon Nord, Stn 1157; 19°10′ S, 163°10′ E; depth 48 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Lagon Nord, Stn 1197; 19°36′ S, 163°22′ E; depth 41 m; 1 Nov. 1989; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 1094; 19°54′ S, 163°41′ E; depth 26 m; 24 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 3 specimens, dead; Stn 1063; 20°03′ S, 163°47′ E; depth 31 m; 23 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1128; 19°31′ S, 163°52′ E; depth 26 m; 26 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 1072; 19°56′ S, 164°02′ E; depth 20 m; 23 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1073; 20°00′ S, 164°03′ E; depth 28 m; 23 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Poum** • 2 specimens, dead; Stn 1024; 20°06′ S, 163°50′ E; depth 26 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 3 specimens, living; Stn 1027; 20°03′ S, 163°51′ E; depth 29 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 1015; 20°10′ S, 163°52′ E; depth 25 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 1008; 20°11′ S, 163°53′ E; depth 27 m; 2 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1010; 20°09′ S, 163°57′ E; depth 16 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 989; 20°18′ S, 163°57′ E; depth 21 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1019; 20°06′ S, 163°58′ E; depth 23–24 m; 3 May 1988; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 985; 20°20′ S, 163°58′ E; depth 15–17 m; 30 Apr. 1988; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Koumac** • 2 specimens, living; Passe du Baron, Stn 1307; 20°33.7′ S, 164°10.3′ E; depth 12 m; Oct. 1993; Expédition Montrouzier leg.; sable à *Heteropsammia*; MNHN • 2 specimens, dead; Chenal de l'Infernet, Stn 1305; 20°36.2′ S, 164°11.0′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 18 specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 3 specimens, living; around l'Îlot Kendec, Stn 1309; 20°40.5′ S, 164°13.4′ E; depth 18 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 1 specimen, dead; near Passe de Koumac, Stn KR627; 20°38.6′ S, 164°13.5′ E; depth 12 m; 24 Sep. 2018; KOUMAC 2.1 leg.; MNHN • 1 specimen, dead; drop-off of l'Îlot Kendec, Stn 1308; 20°40′ S, 164°15.2′ E; depth 15–20 m; Oct. 1993; Expédition Montrouzier leg.; dalle; MNHN • 1 specimen, dead; Passe Deverd, Stn 1322; 20°45.2′ S, 164°15.2′ E; depth 53–71 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN • 2 specimens, dead; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; MNHN. – **Grande Terre**, **Touho** • 1 specimen, living; Grand Récif Mengalia, Stn 871; 20°36′ S, 165°00′ E; depth 27 m; 13 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Mengalia, Stn 866; 20°38′ S, 165°03′ E; depth 26 m; 13 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; parages de la Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 1 specimen, dead; Grand Récif Mengalia, Stn 857; 20°36′ S, 165°09′ E; depth 31 m; 12 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; around Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; SEM; MNHN • 1 specimen, dead; Chenal de Touho, Stn 1261; 20°46.5′ S, 165°15.75′ E; depth 45–56 m; Sep.1993; Expédition Montrouzier; sable détritique; MNHN. – **Grande Terre**, **Poindimié** • 1 specimen, dead; Stn 765; 21°14′ S, 165°42′ E; depth 35 m; 8 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Canala** • 1 specimen, dead; Stn 755; 21°12′ S, 165°48′ E; depth 43 m; 7 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 708; 21°24′ S, 166°05′ E; depth 34–35 m; 10 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Baie de St Vincent** • 1 specimen, dead; Stn 218; 21°52′ S, 165°46′ E; depth 15 m; 21 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 217; 21°53′ S, 165°47′ E; depth 16 m; 21 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 199; 22°02′ S, 166°00′ E; depth 50 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn 185; 22°05′ S, 166°02′ E; depth 15 m; 19 Sep. 1984; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Nouméa** • 1 specimen, living;

Stn DE57; 22°10.6′ S, 166°07.1′ E; depth 18–19 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; Stn s/n; 22°17′ S, 166°08′ E; depth 10–30 m; Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Stn 4; 22°23′ S, 166°21′ E; depth 9 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 14 specimens, living; Crouy; 22°21.5′ S, 166°21.7′ E; depth 1–6 m; 1990–2003; Claude Berthault leg.; MNHN • 1 specimen, dead; Stn 259; 22°20′ S, 166°22′ E; depth 18 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 3; 22°21′ S, 166°22′ E; depth 15 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 253; 22°22′ S, 166°23′ E; depth 16 m; 7 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE66; 22°21.5′ S, 166°23.4′ E; depth 23 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Stn 2; 22°19′ S, 166°24′ E; depth 14 m; 21 May 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 281; 22°24′ S, 166°24′ E; depth 10 m; 9 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, living; Stn DE42; 22°27.5′ S, 166°25.3′ E; depth 15 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, dead; channel Îlot Maître, Stn 1335; 22°19.7′ S, 166°26.6′ E; depth 20–24 m; 2 Dec. 1992; P. Bouchet, Campagne LAGON leg.; tubes d'Eunicidae avec épibiontes; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 63; 22°26′ S, 166°26′ E; depth 20 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 3 specimens, living; Île Ouen-Baie du Prony, Stn 66; 22°28′ S, 166°27′ E; depth 15 m; 20 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 5 specimens, living; Stn DE70; 22°25.6′ S, 166°31.0′ E; depth 20–21 m; 30 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 5 specimens, living; Ile Ouen–Baie du Prony, Stn 84; 22°30′ S, 166°31′ E; depth 17 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn DE36; 22°35.5′ S, 166°32.0′ E; depth 17–19 m; 29 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Ile Ouen-Baie du Prony, Stn 95; 22°31′ S, 166°33′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Ile Ouen-Baie du Prony, Stn 99; 22°33′ S, 166°35′ E; depth 14 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Ile Ouen-Baie du Prony, Stn 100; 22°33′ S, 166°35′ E; depth 15 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Ile Ouen-Baie du Prony, Stn 101; 22°31′ S, 166°36′ E; depth 18 m; 21 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 8 specimens, living; Île Ouen–Baie du Prony, Stn 161; 22°34′ S, 166°38′ E; depth 20 m; 24 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Ile Ouen-Baie du Prony, Stn 226; 22°38′ S, 166°39′ E; depth 28 m; 22 Oct. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn DE30; 22°35.8′ S, 166°39.6′ E; depth 12–13 m; 28 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 1 specimen, living; Grand Récif Sud, Stn 293; 22°42′ S, 166°41′ E; depth 20 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand Récif Sud, Stn 291; 22°38′ S, 166°44′ E; depth 31 m; 26 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn DE26; 22°32.3′ S, 166°46.5′ E; depth 20–22 m; 28 Apr. 1987; B. Richer de Forges-IRD leg.; MNHN • 3 specimens, living; Grand Récif Sud, Stn 304; 22°40′ S, 166°48′ E; depth 27 m; 27 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 544; 22°51′ S, 166°49′ E; depth 25 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Ile Ouen-Baie du Prony, Stn 150; 22°30′ S, 166°50′ E; depth 62–68 m; 24 Aug. 1984; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Grand Récif Sud, Stn 548; 22°56′ S, 166°55′ E; depth 32 m; 15 Jul. 1985; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Grand Récif Sud, Stn 324; 22°24′ S, 167°03′ E; depth 39 m; 28 Nov. 1984; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Grand Récif Sud, Stn 405; 22°38′ S, 167°20′ E; depth 27 m; 23 Jan. 1985; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands** • 1 specimen, dead; Lifou, Baie du Santal, ridge SE of Pointe Aimé Martin [= Acadro], Stn 1462; 20°47.1′ S, 167°03.2′ E; depth 70–120 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; dredged; MNHN.

Description (Figs 39–40)

Shell. Robust, moderate to large for the genus (diameter up to 17.0 mm), globose-lenticular to trochoid-turbiniform (H/D 0.75–0.89); teleoconch of up to 7.0 whorls; periphery rounded, situated slightly below mid-whorl; suture level with or slightly above periphery, somewhat channelled on later spire whorls

and slightly descendant immediately prior to insertion of outer lip; base umbilicate. Early teleoconch whorls with three primary spiral cords; uppermost cord beginning to define a shoulder during third whorl; secondary cords developing on shoulder and between primary cords during fourth whorl; cords subequal in strength at end of fifth whorl, crisply defined with triangular profile, 6–7 in number; limited subsequent intercalation of further cords, penultimate whorl with 8–9 cords; intervals between cords with fine, close-set spiral microlirae (Fig. 40A); axial sculpture of fine, close-set pliculae throughout, most obvious on mid-spire whorls (Fig. 40B), becoming coarser on last adult whorl; cord crests irregularly undulant rather than beaded; cord intervals with an additional intermediary on last adult whorl in some specimens; base with ± 12 lower, more rounded spiral cords, progressively more distinctly beaded by axial pliculae toward umbilicus. Umbilicus of variable width, usually moderate to narrow, its margin defined by a broad thickened band with relatively coarse, curved, axial folds and faint, spiral threads; interior of umbilicus with broad funicle above which is a deep channel. Aperture roundly quadrate, peristome interrupted in parietal region; columella lip thick, with reflected lobe at end of umbilical funicle and thickened, somewhat granular pad at end of peri-umbilical band; a weak tooth often present at columella base; parietal region with thick, rounded lobe of callus adjacent to insertion of columella; outer lip simple, its edge scalloped by spiral cords, strongly prosocline above periphery, orthocline below; interior nacreous in live-collected specimens, lacking in-running spiral ridges, but with external sculpture evident through nacre.

Colour. Shell somewhat lustreless; colour pattern very variable; commonly mottled in shades of charcoal-grey, cream and white, often with subsutural and peripheral blotches and irregular axial bands; base usually less heavily pigmented; peri-umbilical band white to cream, sometimes with sparse reddish

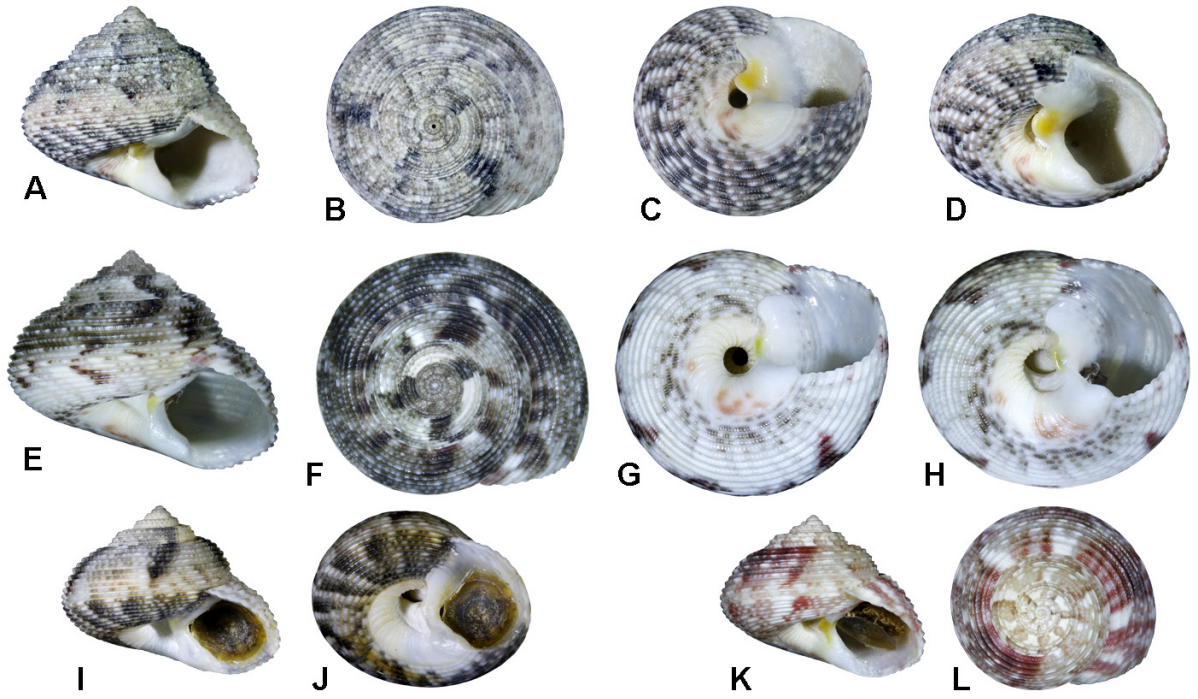

Fig. 39. *Talopena maestratii* sp. nov. **A–D**. Holotype, Koumac, Stn 942, height 12.7 mm, diameter 15.0 mm (MNHN-IM-2000-38858). **E–H**. Large subadult specimen with slightly immature callus, Koumac, Stn 1304, diameter 16.9 mm (paratype, MNHN-IM-2000-38861). **I–J**. Subadult specimen with dense basal pigmentation, Koumac Stn KD518, diameter 13.6 mm (paratype, MNHN-IM-2000-38860). **K–L**. Specimen with reddish-brown pigmentation, Nouméa, Stn 546, diameter 12.7 mm (paratype, MNHN-IM-2000-38862).

marks; lobe at end of umbilical funicle bright yellow in adults. Specimens from the Nouméa area often with more brownish and red/pink mottling. Occasional specimens with apical surface almost uniformly white save for a pink tip to spire.

Dimensions. Holotype, height 12.7 mm, diameter 15.0 mm; largest specimen, diameter 17.0 mm.

Protoconch (Fig. 40C). Typically umboniine, diameter ± 195 µm; white; apical beak present and confluent with terminal lip; apical bulb sculptured with subradial threads, further subspiral threads evident towards suture, the two interacting to form a rectangular network; terminal lip weakly convex.

Operculum (Fig. 41A–B) and radula (Fig. 41C–E). As in *T. apicina*.

External anatomy (mostly from rehydrated specimens) (Fig. 42). Head with distinct forehead between cephalic tentacles; snout moderately long, distal half with numerous slender papillae; cephalic lappets not evident; cephalic tentacles slender, micropapillate, left and right of more or less similar size; eyestalks thick, the tip of each conspicuously expanded and containing a large black eye; left neck-lobe with ± 12 digits, well developed anteriorly, progressively smaller posteriorly; right neck-lobe well developed, rolled to form a long exhalant siphon; four micropapillate epipodial tentacles on each side, with a stalked epipodial sense organ near base of each; a stalked epipodial sense organ also present

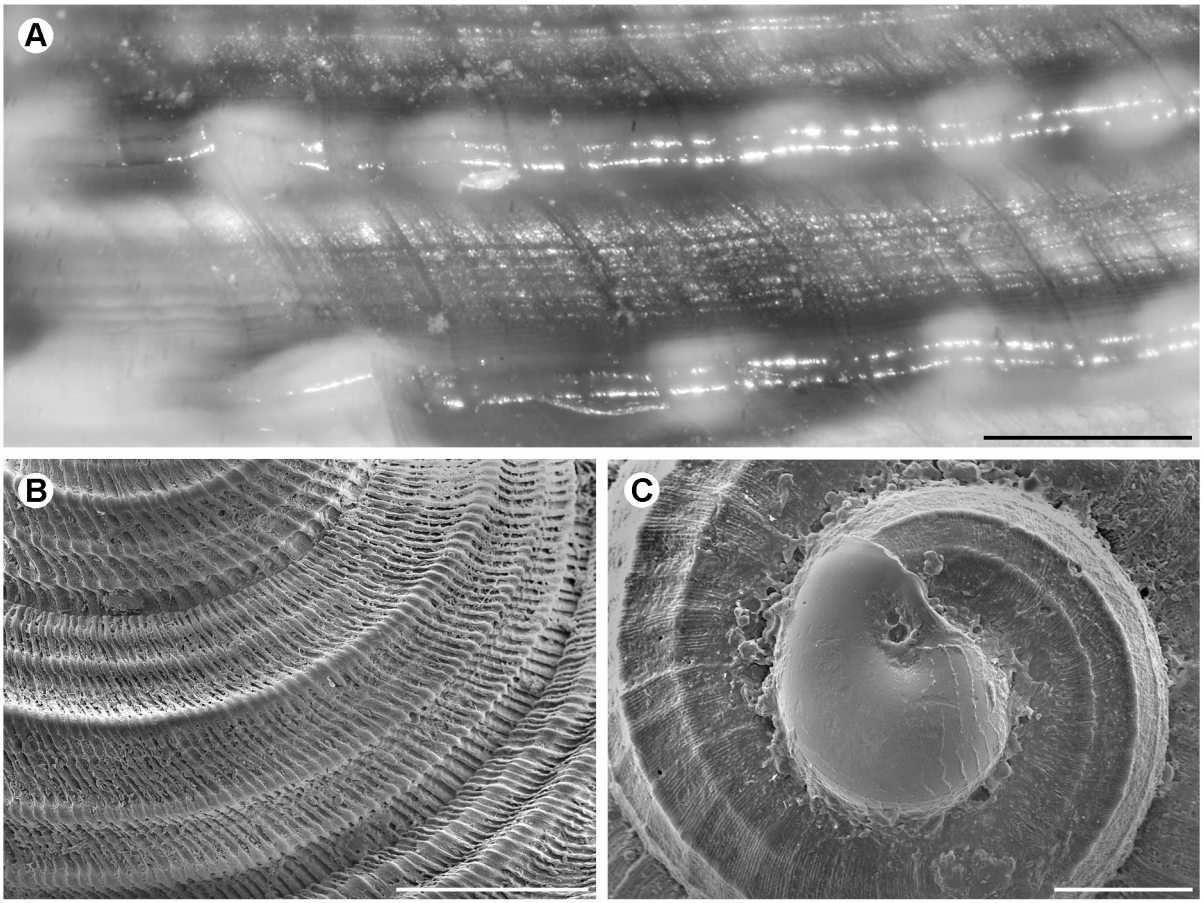

Fig. 40. *Talopena maestratii* sp. nov. **A**. Detail of sculpture near start of last adult whorl showing microscopic spiral lirae between spiral cords, Koumac, Stn 1304 (paratype, MNHN-IM-2000-38861). **B**. Axial sculpture on spire, Touho, Stn 1251 (MNHN). **C**. Protoconch, Touho, Stn 1251 (MNHN). Scale bars: A–B = 0.5 mm; C = 100 µm.

beneath each neck-lobe; propodium indented in mid-line with a lateral propodial lobe on each side; foot flattened with broad sole, tapering posteriorly. Head-foot mostly whitish; forehead, snout and sides of foot with some darker pigmentation. Ctenidium bipectinate, its tip unattached.

Habitat

Most samples were obtained on the inner edge of the barrier reef, largely associated with sandy substrata; also in channels within the lagoonal system; living specimens at depths of 6–50 m, empty shells to 70 m.

Distribution (Fig. 43)

Known only from New Caledonia (Belep, Grande Terre and Lifou). Only one specimen has been found on Lifou, perhaps due to the absence of a lagoon around the island.

Remarks

Characters separating *Talopena maestratii* sp. nov. from the co-occurring *T. apicina* are given in the Remarks for the latter species. Although the distributions of the two species overlap extensively on

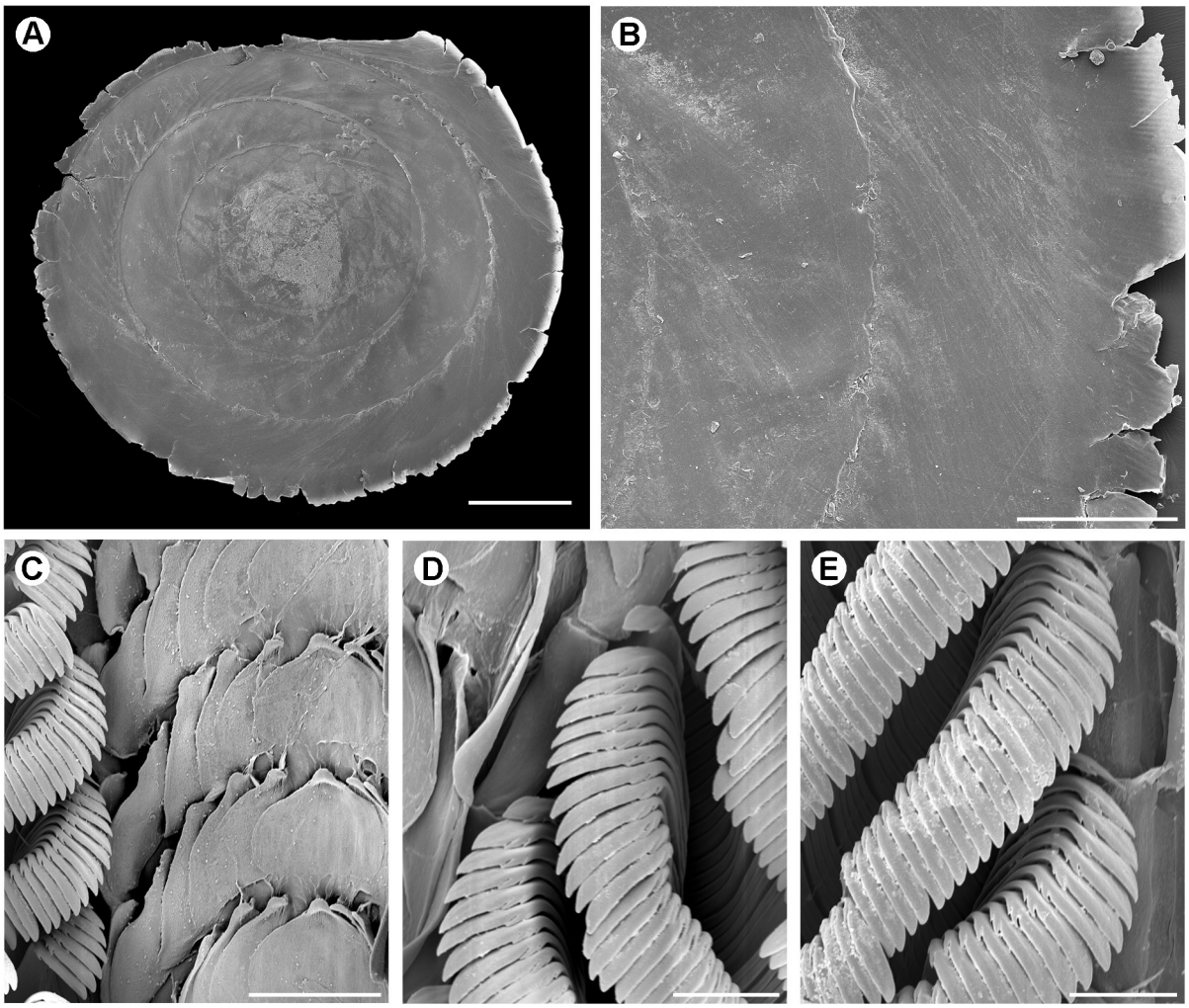

Fig. 41. *Talopena maestratii* sp. nov. **A**. Operculum. **B**. Detail of operculum sculpture. **C**. Radula, central field and inner marginal teeth. **D**. Latero-marginal transition showing reduced cusp of innermost marginal tooth. **E**. Spathulate inner marginal teeth. A–B. Koumac, KD518 (paratype, MNHN-IM-2000-38860). C–E. Nouméa, Stn 161 (MNHN). Scale bars: A = 1.0 mm; B = 0.5 mm; C = 100 µm; D–E = 50 µm.

Grande Terre and there are many samples available for both species, they have only been collected alive at the same station on five occasions. That *T. maestratii* has not been found on the Chesterfield-Bellona Plateau or the Lansdowne-Fairway Banks, and has been collected only once in the Loyalty Islands suggests that it favours sediments with a significant terrigenous component.

Talopena incerta (Iredale, 1912), type species of the genus and evidently endemic to Raul Island in the Kermadec group, does not attain such a large size as *T. maestratii* sp. nov. (maximum diameter 14 mm fide Marshall 1979), and has fewer, more rounded primary spiral cords (only five above and including the periphery on the last adult whorl, Fig. 34D–G).

Talopena calyculus (Fig. 77A–C) of unknown provenance is of similar size to *T. maestratii* sp. nov., but is more depressed, has weaker, less angular spiral cords, stronger axial sculpture between the cords, and a less prominent umbilical funicle with almost no reflection at the columella lip. *Talopena belcheri* (Philippi, 1850) has been reported widely in the literature under the name *Monilea belcheri* (cf. Watson 1886: 71; Ladd 1966: 41; Cernohorsky 1972: 41, pl. 8 fig. 11; Tantanasiriwong 1978: 5, fig. 24; Fukuda 1993: 25, pl. 7 fig. 73, 1995: 35; Wilson 1993: 94, pl. 11 figs 20a–b; Higo *et al*. 1999: 67; Sasaki 2000: 83. fig. 135; Poppe *et al*. 2006: 108, pl. 57 figs 1–2; Poppe & Tagaro 2008: 198, pl. 44 figs 5, 8–9); however, the original description and figure of this species (Philippi 1850: 148 and 1850 in 1846–1855: pl. 44 fig. 3) strongly suggest that it is referable to *Talopena* rather than *Monilea*. The original material was of unknown provenance, but was said to have come from the collection of Sylvanus Hanley. Attempts to trace this material in the NHMUK and the museums in Cambridge and Leeds have proved unsuccessful. In the absence of type material for comparison, *T. belcheri* is difficult to evaluate, but the figure shows

Fig. 42. *Talopena maestratii* sp. nov., living animal (subadult), Koumac, Stn KD578, shell diameter approx. 12 mm, image Philippe Maestrati (PM751) (paratype, MNHN- IM-2019-9732).

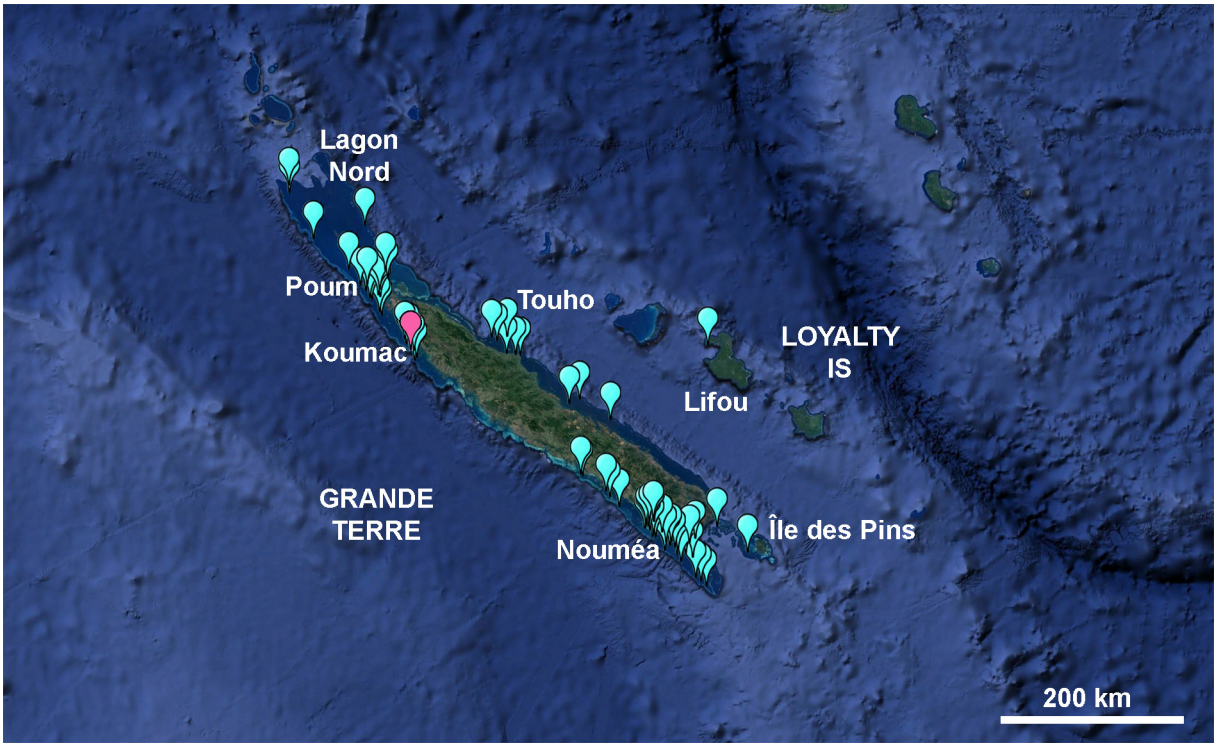

Fig. 43. Map of New Caledonia showing the distribution of *Talopena maestratii* sp. nov. Type locality indicated in pink.

a shell with a more depressed profile than *T. maestratii*, sparsely spotted with pink and with a reddish-brown peri-umbilical band.

The shell of *T. masoni* from the Andaman Islands is less elevated (H/D < 0.70) than *T. maestratii* sp. nov., has very unequal spiral cords (of two or three orders) on the spire whorls and has a distinct narrow groove at the outer edge of the peri-umbilical band. *T. menkei* from the Philippines (Fig. 77D–F) has a more obviously beaded sculpture with less angular primary spiral cords and more distinct secondary cords in their intervals, and finer more numerous cords on the base. In *T. philippii* from 'China Seas' the spiral sculpture is much less well developed and the umbilicus is more occluded by the reflected columella callus (Fig. 77G–I).

'*Talopena*' *tramieri* (Poppe, Tagaro & Dekker, 2006) comb. nov.
Figs 44–46

Pseudominolia tramieri Poppe, Tagaro & Dekker, 2006: 109, pl. 74 figs 1–4. Type locality: Caubian Island, Philippines.

Pseudominolia tramieri – Hasegawa 2018: 122, fig. 5m–n.

Material examined

NEW CALEDONIA – **Plateau Chesterfield-Bellona** • 1 specimen, dead; Plateau Chesterfield-Bellona, Stn D50; 21°04.4′ S, 158°40.7′ E; depth 70 m; Jul. 1984; CHALCAL 1 leg.; MNHN. – **Lansdowne-Fairway Banks** • 1 specimen, dead; Bancs Lansdowne–Fairway, Stn D9; 20°44.5′ S, 161°02′ E; depth

75 m; Jul. 1984; CHALCAL 1 leg.; MNHN • 1 specimen, dead; Bancs Lansdowne–Fairway, Stn D10; 20°36.09′ S, 161°05.82′ E; depth 87 m; Jul. 1984; CHALCAL 1 leg.; MNHN. – **Lagon Nord** • 2 specimens, living; Stn 1174; 19°21′ S, 163°14′ E; depth 53 m; 31 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 1168; 19°16′ S, 163°09′ E; depth 50 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN • 4 specimens, living; Stn 1156; 19°10′ S, 163°13′ E; depth 55 m; 30 Oct. 1989; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Koumac** • 1 specimen, dead; Chenal de la Passe de Koumac, Stn 1315; 20°40.7′ S, 164°14.7′ E; depth 66–87 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 2 specimens, dead; Chenal de la Passe de Koumac, Stn 1323; 20°40.9′ S, 164°14.8′ E; depth 82–120 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 1 specimen, dead; Passe de Koumac, east drop-off, Stn 1311; 20°40.4′ S, 164°14.9′ E; depth 10–60 m; Oct. 1993; Expédition Montrouzier leg.; fonds durs; MNHN • 1 specimen, dead; Passe Deverd, Stn 1322; 20°45.2′ S, 164°15.2′ E; depth 53–71 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN. – **Grande Terre**, **Touho** • 3 specimens, living; Chenal au NE du Banc de Touho, Stn 1260; 20°44′ S, 165°14′ E; depth 49–59 m; Sep.1993; Expédition Montrouzier leg.; sable coquillier; MNHN • 2 specimens, dead; Chenal de Touho, Stn 1261; 20°46.5′ S, 165°15.75′ E; depth 45–56 m; Sep.1993; Expédition Montrouzier; sable détritique; MNHN. – **Grande Terre**, **Poindimié** • 1 specimen, dead; Stn 788; 21°02′ S, 165°35′ E; depth 33 m; 9 Jan. 1987; B. Richer-ORSTOM leg.; MNHN • 2 specimens, dead; Stn 765; 21°14′ S, 165°42′ E; depth 35 m; 8 Jan. 1987; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Canala** • 1 specimen, dead; Stn 730; 21°17′ S, 165°55′ E; depth 40–43 m; 12 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 713; 21°23′ S, 166°01′ E; depth 34–35 m; 11 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, living; Stn 714; 21°21′ S, 166°02′ E; depth 37–38 m; 11 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Thio** • 1 specimen, dead; Stn 682; 21°34′ S, 166°19′ E; depth 36–37 m; 9 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Grande Terre**, **Yaté** • 1 specimen, dead; Stn 621; 22°01′ S, 166°53′ E; depth 55–56 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN • 1 specimen, dead; Stn 620; 22°02′ S, 166°56′ E; depth 50–52 m; 6 Aug. 1986; B. Richer-ORSTOM leg.; MNHN. – **Loyalty Islands** • 2 specimens, dead; Lifou, Baie du Santal, ridge SE of Pointe Aimé Martin [= Acadro], Stn 1462; 20°47.1′ S, 167°03.2′ E; depth 70–120 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; dredged; MNHN.

Description (Fig. 44)

Shell. Of moderate size (largest specimens 8–10 mm in diameter); spire whorls with 4–5 primary spiral cords (some intervals with a weaker intermediary cord) crossed by numerous fine, close-set, strongly prosocline axial threads. In addition, there are microscopic spiral lirae between the spiral cords; these interact with the axial threads to produce a fine, micro-granular sculpture – more obvious in some specimens than others. Base with finer, more close-set spiral sculpture. Umbilicus of moderate width and distinctive in having a strong, deep-set and relatively narrow spiral funicle that ends as a strong, tongue-shaped projection one quarter to one third of the way down columella. A deep, narrow channel separates this funicle from base of preceding whorl. A second, weaker, funicle lies just within rim of umbilicus, terminating as a more rounded projection near base of columella.

Colour. Pattern variable; usually pale, variously mottled with shades of yellow-ochre, with darker orange-yellow to brown blotches, particularly below suture; occasionally with a pinkish-orange wash in parts; spiral cords commonly flecked with white. Base paler and less boldly patterned; umbilicus whitish, upper funicle evidently never pigmented.

Protoconch (Fig. 45B). Typically umboniine, diameter ± 190 μm; apical beak present and confluent with terminal lip; apical bulb sculptured with an irregular, open network of threads, remainder with traces of subspiral threads; terminal lip weakly convex.

Operculum (Fig. 45C–D). Corneous, multispiral; whorls relatively narrow, separated by a well-defined groove; peripheral fringe with faint radial striation; spiral microsculpture lacking.

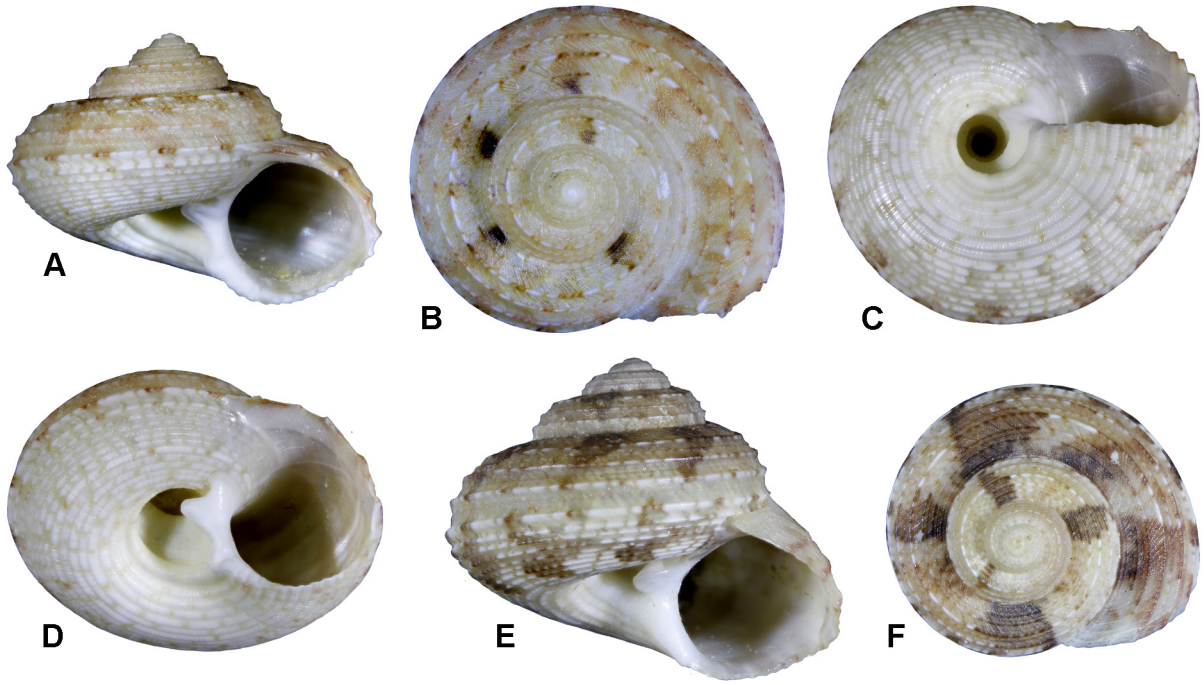

Fig. 44. '*Talopena*' *tramieri* (Poppe, Tagaro & Dekker, 2006) (all MNHN). **A–D**. Lagon Nord, Stn 1156, height 6.0 mm, diameter 8.5 mm. **E**. Canala, Stn 713, height 7.3 mm, diameter 9.0 mm. **F**. Thio, Stn 682, diameter 7.2 mm.

Radula (Fig. 45E–F). Formula ∞+(1)+5+1+5+(1)+∞, with ±45 transverse rows of teeth; teeth of central field reduced; rachidian base-plate broad, roundly quadrate its anterior edge recurved with vestige of shaft in centre; base-plates of inner lateral teeth expanded and bluntly rounded basally, outer anterior edge somewhat raised; outer laterals more quadrate. Innermost marginal transitional, with reduced shaft and cusp, and shouldered medial face; other marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner marginal teeth with large bluntly lanceolate central denticle bearing a small pointed denticle at its outer base and an even smaller, more slender one at inner base (usually not visible due to tooth overlap); marginals 3–10 with largest cusps; cusps progressively smaller thereafter, outermost ones with finely pectinate margins.

External anatomy (from rehydrated specimens). Limited detail evident; eyestalks well developed, their tips expanded and containing large black eyes; left neck-lobe digitate, digits perhaps branched; right neck-lobe well developed, margin entire, rolled to form an exhalant siphon; four micropapillate epipodial tentacles on left side, a similar number presumed on right. Epipodium and sides of foot densely speckled with pale pigmentation. Ctendium appearing bipectinate, its tip free.

Habitat

New Caledonian material mostly associated with the deeper regions of the lagoon and passes exiting the lagoon; at depths of 33–82 m (living 35–55 m).

Distribution (Fig. 46)

Previously known from the Philippines (Poppe *et al*. 2006) and Ogasawara Islands (Hasegawa 2018), here recorded also from the Chesterfield-Bellona Plateau, Lansdowne-Fairway Banks, Lagon Nord, Grande Terre and Loyalty Islands.

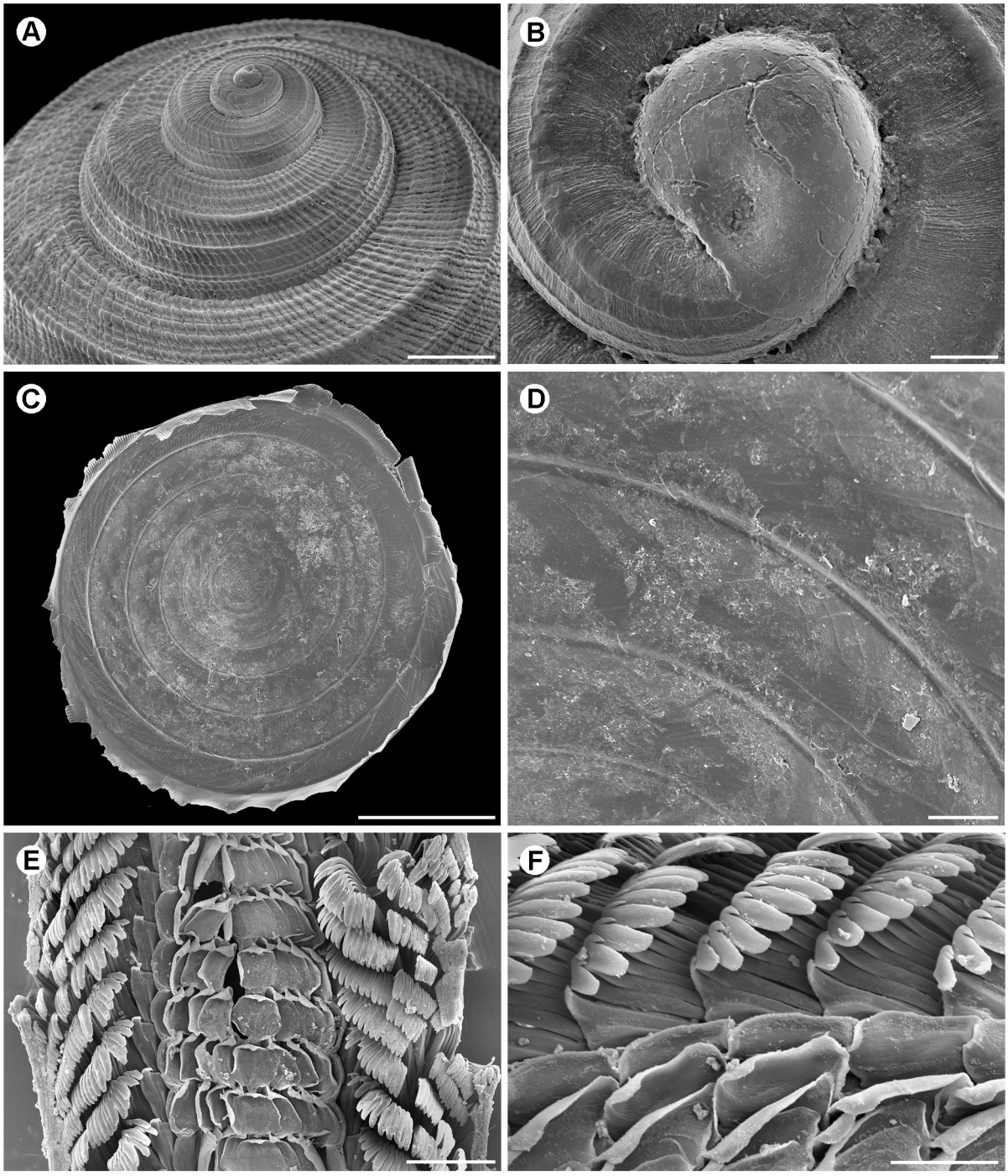

Fig. 45. '*Talopena*' *tramieri* (Poppe, Tagaro & Dekker, 2006) (all MNHN). **A**. Sculpture of apical whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum lacking spiral microsculpture. **E**. Radula, entire width. **F**. Radula, latero-marginal transition. A–B. Canala, Stn 730. C–F. Belep, Stn 1156. Scale bars: A = 0.5 mm; B, F = 50 µm; C = 1.0 mm; D–E = 100 µm.

Remarks

Poppe *et al*. (2006) referred this species to *Pseudominolia* Herbert, 1992, but did so only provisionally, pending further study. The presence of a distinct funicle in the umbilicus, and features of the radula (marginal teeth with spathulate cusps) and external anatomy (bipectinate ctenidium with unattached tip) are not consistent with referral to *Pseudominolia*. However, to which genus the species would be more appropriately referred is far from clear. The shell sculpture is not dissimilar to that of *Kanakina glaphyrella* gen. et comb. nov., but the eyestalks are long and the eyes large. The overall facies of the shell seem to be intermediate between *Parminolia* and *Talopena*. As an interim measure, pending the acquisition of molecular data, I have chosen to refer the species to *Talopena*, with which the radula morphology and external anatomy are largely consistent, on account of there being a strong funicle within the umbilicus and a thickened peri-umbilical band, albeit not as pronounced as in other *Talopena* species.

Differs from *Talopena maestratii* sp. nov. and *T. apicina* in having fewer, weaker and more widely-spaced spiral cords. In addition, the spire whorls are not so strongly shouldered and the suture is never sunken. Furthermore, in '*T*'. *tramieri* the umbilical funicle is stronger and more sharply defined, and the peri-umbilical band is less well developed. *'Ethalia' electra* Herbert, 1992 from north-eastern South Africa is somewhat similar, but in that species the spiral cords are finer and more numerous, and the umbilical funicle is not as strongly developed.

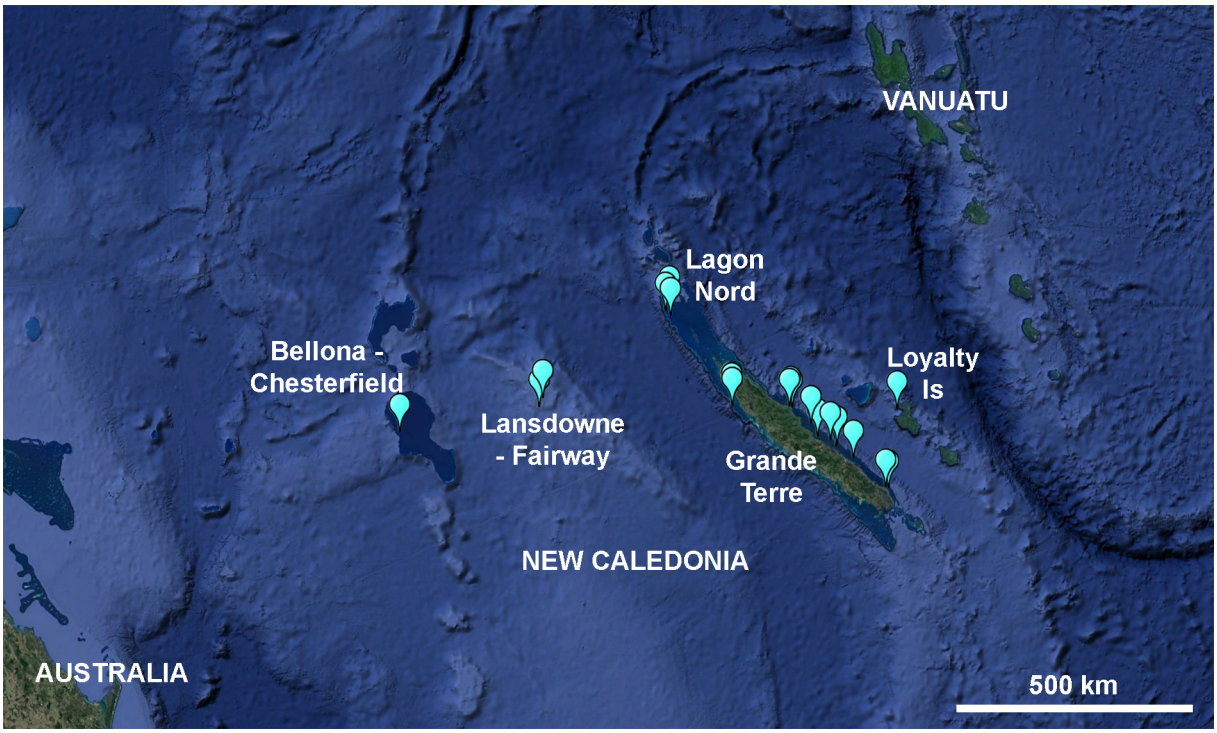

Fig. 46. Map of the Coral Sea showing the distribution of '*Talopena*' *tramieri* (Poppe, Tagaro & Dekker, 2006) in the New Caledonian marine ecoregion.

Umboniinae — Group 2

Radula typically umboniine (formula ∞+(1)+5+1+5+(1)+∞), with reduced teeth in the central field, but in this group the cusps of the marginal radular teeth are not spathulate or lanceolate with a single elongate primary denticle, but rather more palmate or trigonal and the central denticle is not massively larger than the lateral denticles (Figs 49D, 52D, 54F, 64F, 69E). The genera *Inkaba* Herbert, 1992 and *Pseudominolia* Herbert, 1992 from the western Indian Ocean are also referable to this group.

Genus ***Ethaliella*** Pilsbry, 1905

Ethaliella Pilsbry, 1905: 115.

Type species

Ethalia floccata G.B. Sowerby III, 1903 (original designation), Recent, Japan.

Diagnosis

Shell small (diameter <10 mm), lenticular to trochoid-turbiniform, umbilicate; smooth or with fine, close-set spiral cords; axial sculpture weak; umbilical rim thickened, often radially plicate and sometimes with a tongue-like parietal callus lobe; umbilical funicle absent.

Operculum corneous, multispiral with outer whorls relatively broad; peripheral fringe narrow, radially striate; spiral microsculpture present.

Radula with base-plates of rachidian and lateral teeth thin, broadly expanded laterally and extensively overlapping, anterior edge with vestige of shaft; inner marginal tooth transitional, cusps of marginals 3–8 largest, somewhat palmate; central denticle rounded, not conspicuously larger than others; denticles on outer margin long and pointed.

Remarks

The observations in the above diagnosis concerning the operculum, radula and external anatomy relate to *E. rhodomphala* (Souverbie, 1875). That they also apply to the type species remains to be established.

Ethaliella rhodomphala (Souverbie, 1875)
Figs 47–51

Trochus (*Monilea*) *rhodomphalus* Souverbie in Souverbie & Montrouzier, 1875: 36, pl. 4 fig. 3. Type locality: "ins. Lifou", Loyalty Islands, New Caledonia (Pierre Lambert).

Trochus rhodomphalus – Fischer 1878: 210; 1879 in 1875–1880: 392. pl. 117 fig. 3.
Monilea (*Minolia*) *rhodomphala* – Pilsbry 1889–1890: 262, pl. 41 figs 22–24.
Minolia rhodomphala – Melvill & Standen 1897: 414.
Ethaliella rhodomphala – Pilsbry 1905: 116. — Héros *et al*. 2007: 209.
Trochus (*Monilea*) *rhodomphalus* – Herbert 1996: 430, figs 41–43, lectotype.

Material examined

Lectotype (Fig. 47A–C)
NEW CALEDONIA • Lifou, Loyalty Islands; Lambert leg.; MHNBx 2004.TY.190.1 (designated by Herbert 1996: 430).

Paralectotypes
NEW CALEDONIA • 1 specimen; Lifou, Loyalty Islands; Lambert leg.; MHNBx 2004.TY.190.2 • 1 specimen; Lifou, Loyalty Islands; Lambert leg.; specimen located since Herbert (1996); MHNBx 2009.2378.

Other material

NEW CALEDONIA – **Grande Terre**, **Koumac** • 2 specimens, dead; Stn KD563; 20°33.4′ S, 164°6.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 2 specimens, living; Stn KD534; 20°32.4′ S, 164°07.2′ E; depth 16 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc, éponges, *Halophila*, algues brunes, *Halimeda*; MNHN • 2 specimens, dead; Chenal de l'Infernet, Stn 1305; 20°36.2′ S, 164°11.0′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 70+ specimens, living; Chenal de l'Infernet, Stn 1306; 20°39.1′ S, 164°12.4′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 6 specimens, living; Stn KD542; 20°38.6′ S, 164°12.7′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 2 specimens, living; Stn KS521; 20°38.4′ S, 164°13.2′ E; depth 16 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sable blanc à *Halophila*; DNA voucher, photographed alive (image PM872); MNHN-IM-2019-10194 • 50+ specimens, living; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 3 specimens, living; Stn KD541; 20°39′ S, 164°13.3′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sable gris; DNA voucher; MNHN-IM-2019-7703 • 2 specimens, dead; around l'Îlot Kendec, Stn 1309; 20°40.5′ S, 164°13.4′ E; depth 18 m; Oct. 1993; Expédition Montrouzier leg.; sable gris; MNHN • 10 specimens, living; Stn KD516; 20°39.2′ S, 164°13.5′ E; depth 10 m; 1 Nov. 2019; KOUMAC 2.3 leg.; sable gris; DNA vouchers; MNHN-IM-2019-3570 and -3571 • 1 specimen, living; Stn KS522; 20°39.3′ S, 164°13.6′ E; depth 15 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sable blanc à *Halophila*; MNHN • 1 specimen, dead; Passe de Koumac, east drop-off, Stn 1311; 20°40.4′ S, 164°14.9′ E; depth 10–60 m; Oct. 1993; Expédition Montrouzier leg.; fonds durs; MNHN • 4 specimens, living; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; MNHN • 6 specimens, living; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; MNHN • 3 specimens, living; Stn KD574; 20°43.5′ S, 164°16.9′ E; depth 12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable gris à *Halophila*; DNA voucher; MNHN-IM-2019-8588 • 2 specimens, living; Stn KD583; 20°43.5′ S, 164°17.3′ E; depth 12 m; 21 Nov. 2019; KOUMAC 2.3 leg.; sable fin; MNHN • 20 specimens, living; Stn KD552; 20°49.4′ S, 164°18.5′ E; depth 10–11 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; DNA voucher, photographed alive (image PM652); MNHN-IM-2019-8779. – **Grande Terre**, **Touho** • 2 specimens, living; near the Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 2 specimens, living; around Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN. – **Grande Terre**, **Bourail** • 3 specimens, dead; lagoon of Poé, Stn 1324; 21°36.9′ S, 165°22.7′ E; depth 0–2 m; 1 Sep. 1993; Expédition Montrouzier leg.; fonds mixtes, herbier; MNHN. – **Grande Terre**, **Nouméa** • 5 specimens, dead; Récif Senez, Stn 1350; 22°17.9′ S, 166°19.6′ E; depth 3–6 m; 23 Nov. 1992; Bouchet and Marshall leg.; pente interne; MNHN • 7 specimens, dead; Grand Récif Aboré, Stn 1347; 22°23.6′ S, 166°20.1′ E; depth 10 m; 8 Oct. 1992; P. Bouchet leg.; vase sableuse sur dalle; MNHN • 3 specimens, dead; Île aux Goélands, Stn 1503; 22°22.4′ S, 166°22.5′ E; depth 5-7 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 1 specimen, dead; Anse Vata; 22°18.21′ S, 166°26.30′ E; depth 1–5 m; 6 Jan. 2002; Claude Berthault leg.; MNHN • 4 specimens, dead; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN. – **Loyalty Islands** • 1 specimen, dead; Lifou, Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 1 specimen, dead; Lifou, Baie du Santal, Baie de Gaatcha, Stn 1463; 20°55′ S, 167°03.3′ E; depth 20–30 m; 10 Nov. 2000; Atelier LIFOU 2000; dragages sable et débris coralliens; MNHN • 2 specimens, dead; Lifou, Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN.

Description (Fig. 47)

Shell. Of small to moderate size (diameter up to 7.6 mm, but most specimens < 6.0 mm); low turbiniform to trochoid-turbiniform; periphery rounded or weakly angled, at or below mid-whorl; whorls occasionally

weakly shouldered; early whorls with 3–4 distinct spiral cords (Fig. 48A); these becoming more numerous and more close-set on subsequent whorls through intercalation of intermediaries; sculpture on last two whorls distinctive, comprising numerous fine, close-set spiral cords, rendered somewhat wavey by indistinct growth-lines; subsutural cord of middle spire whorls often slightly larger and rendered undulant or even weakly beaded by low subsutural pliculae; this evanescing on last adult whorl; axial sculpture comprising only aforementioned growth-lines and microscopic axial threads. Base more glossy, with weaker spiral sculpture, almost smooth in some specimens; umbilicus of moderate width, steep-sided, its margin thickened and radially plicate; interior of umbilicus lacking an obvious funicle, but columella lip substantially thickened.

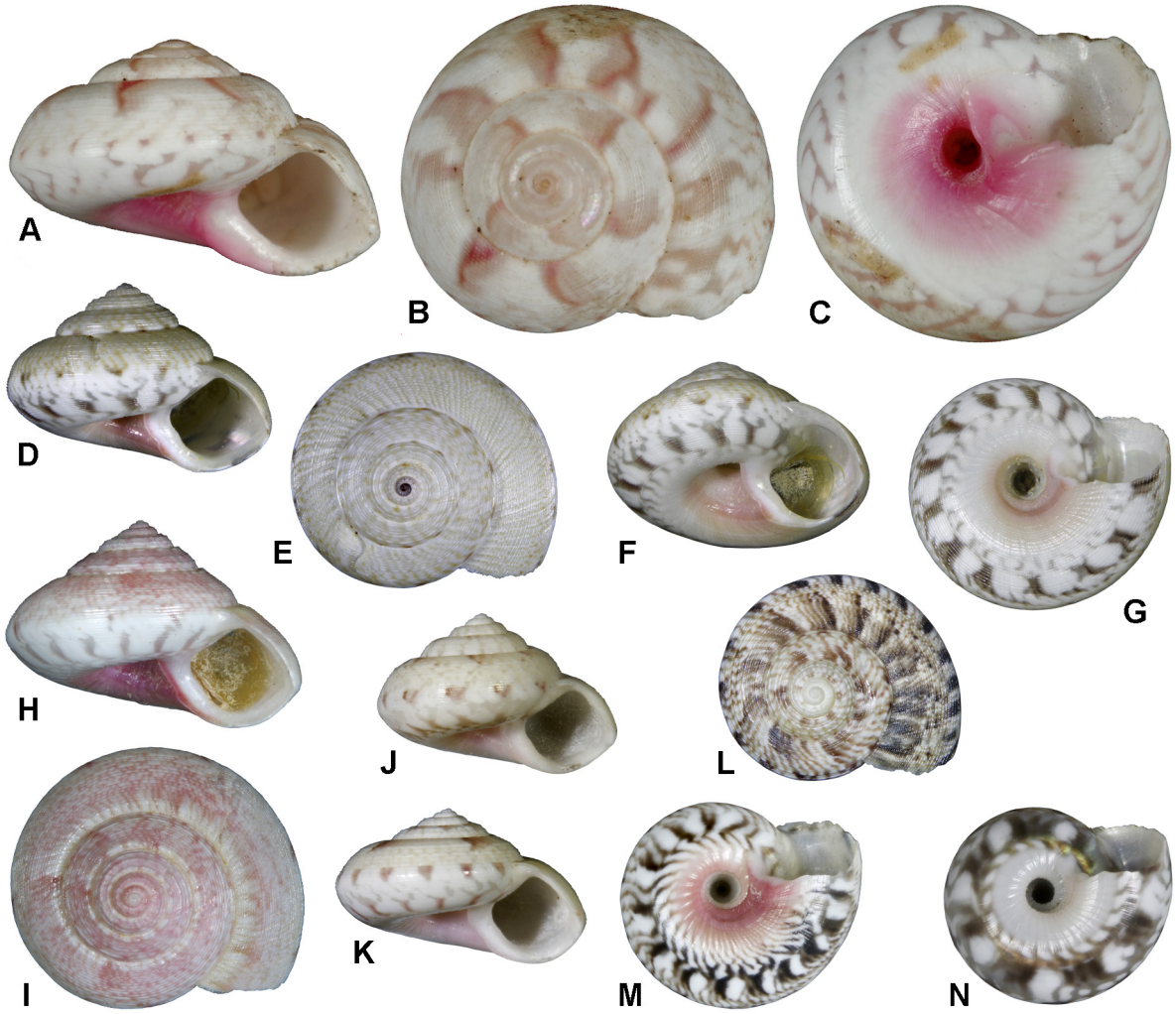

Fig. 47. *Ethaliella rhodomphala* (Souverbie, 1875) (A–C: MHNBx 2004.TY.190.1; D–N: MNHN). **A–C**. Lectotype of *Trochus* (*Monilea*) *rhodomphalus* Souverbie, 1875, Lifou, height 5.0 mm, diameter 7.6 mm (images courtesy of Laurent Charles). **D–G**. Conical specimen with dark apex, Koumac, Stn KD583, height 3.9 mm, diameter 5.4 mm. **H–I**. Conical specimen with pale pink colour pattern, Koumac, Stn 1304, height 4.3 mm, diameter 6.0 mm. **J–K**. Specimens with less elevated spire and somewhat shouldered whorls, Koumac, Stn 1306, diameters 4.9 and 5.1 mm respectively. **L–M**. Heavily pigmented specimen with bright pink umbilical rim, Koumac, Stn KD516, diameter 4.9 mm. **N**. Subadult specimen lacking pink colour around umbilicus, Koumac, Stn 1304, diameter 4.6 mm.

Colour. Pattern variable; ground colour pale, variously mottled with shades of yellowish-brown to greyish-brown, often with darker blotches below suture and at periphery, occasionally more uniformly pale pink; base often more boldly patterned with irregular radiating and anastomosing brown markings separating opaque white blotches; umbilicus and its rim pale to deep pink, but extent of this coloration variable and often absent in immature specimens (Fig. 47N); protoconch and apical whorls usually whitish, occasionally yellowish, pink, brown or almost black (Fig. 47E).

Protoconch (Fig. 48B). Typically umboniine, diameter 170–180 μm; apical beak present and confluent with terminal lip; apical bulb sculptured with an irregular open network of threads, almost hexagonal in places, remainder with fine subspiral threads; terminal lip weakly convex.

Operculum (Fig. 48C–D). Corneous, multispiral, but outer whorls relatively broad and with long growing margin; peripheral fringe relatively narrow, radially striate; spiral microsculpture present, but indistinct.

Radula (Fig. 49). Formula ∞+(1)+5+1+5+(1)+∞, with 35–40 transverse rows of teeth; teeth of central field reduced, base-plates thin; rachidian base-plate ovate; base-plates of lateral teeth more

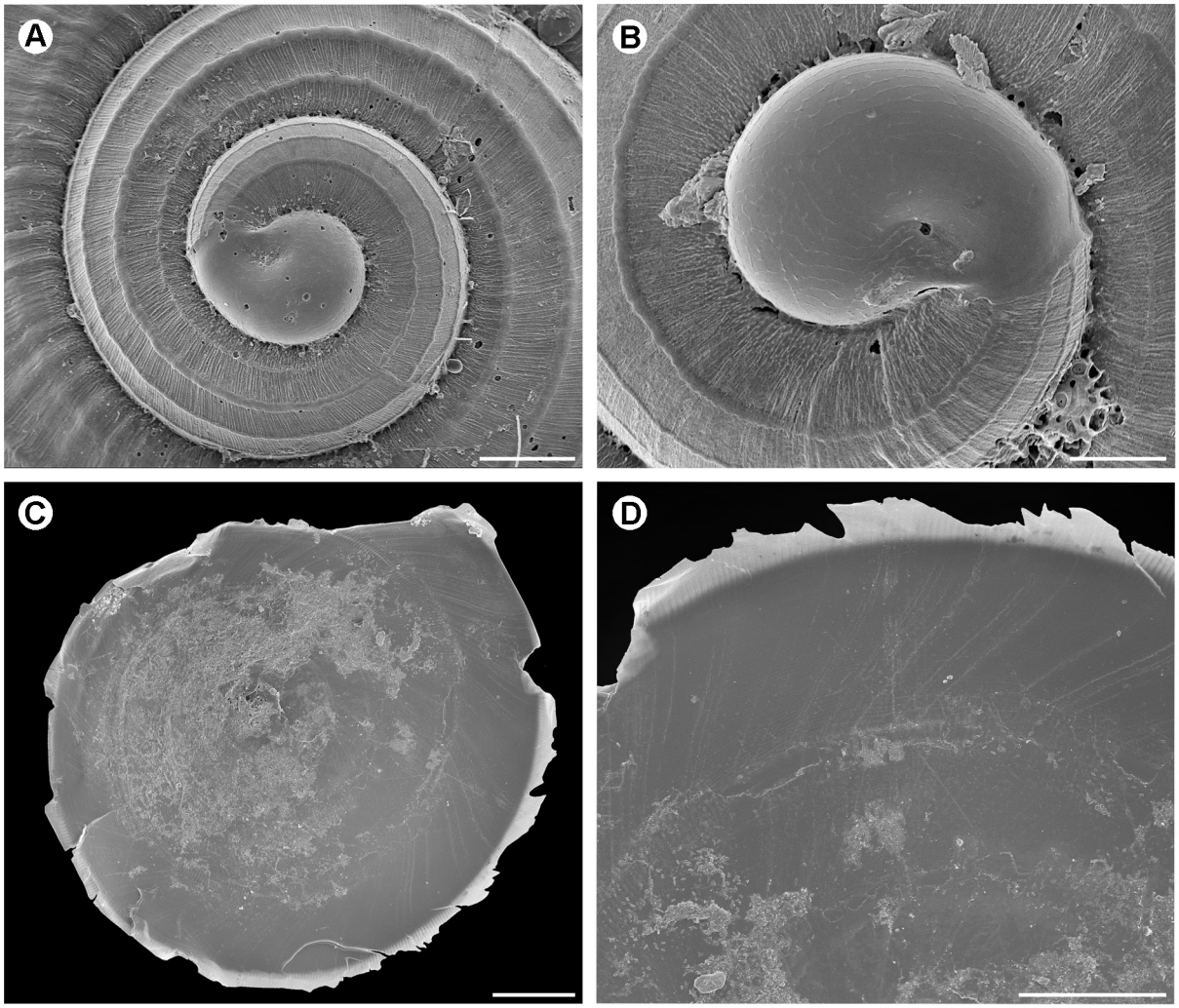

Fig. 48. *Ethaliella rhodomphala* (Souverbie, 1875) (all MNHN). **A**. Apical whorls, Koumac, Stn KD560. **B**. Protoconch, Koumac, Stn KD560. **C–D**. Operculum, Koumac, Stn KD574. Scale bars: A = 100 μm; B = 50 μm; C = 250 μm; D = 200.

trigonal, broadly expanded laterally and extensively overlapping, anterior edge slightly raised and with small pointed shaft vestige. Innermost marginal transitional, with truncate vestige of shaft; remaining inner marginals with well-developed shafts and recurved cusps; cusps of marginals 3–8 largest, somewhat palmate; central denticle rounded, not conspicuously larger than others, 3 or more long, pointed denticles on outer margin and further shorter, pointed denticles on inner margin; marginal cusps progressively smaller and more finely denticulate toward radula margin.

External anatomy (from photographs and rehydrated specimens) (Fig. 50). Head with distinct forehead between cephalic tentacles; snout cylindrical, with a cluster of subterminal papillae on each side; no cephalic lappets evident; cephalic tentacles slender, that on right perhaps longer; eyestalks well developed, very long, with white internal pigment blotches and large black eye at tip. Left neck-lobe small, comprising only ± 4 slender digits behind eyestalk; right neck-lobe rolled to form well-developed exhalant siphon; four epipodial tentacles posterior to neck-lobes on each side, each evidently with a basal epipodial sense organ. Anterior of foot indented in midline, laterally expanded and pinched in behind this. Head-foot translucent white with frequent blotches of opaque white pigment, sides of snout and foot also with black blotches. Tip of ctenidium free.

Habitat

Mostly associated with white and grey sandy substrata in the outer portions of the lagoon; at depths of 2–27 m, living specimens 9–16 m.

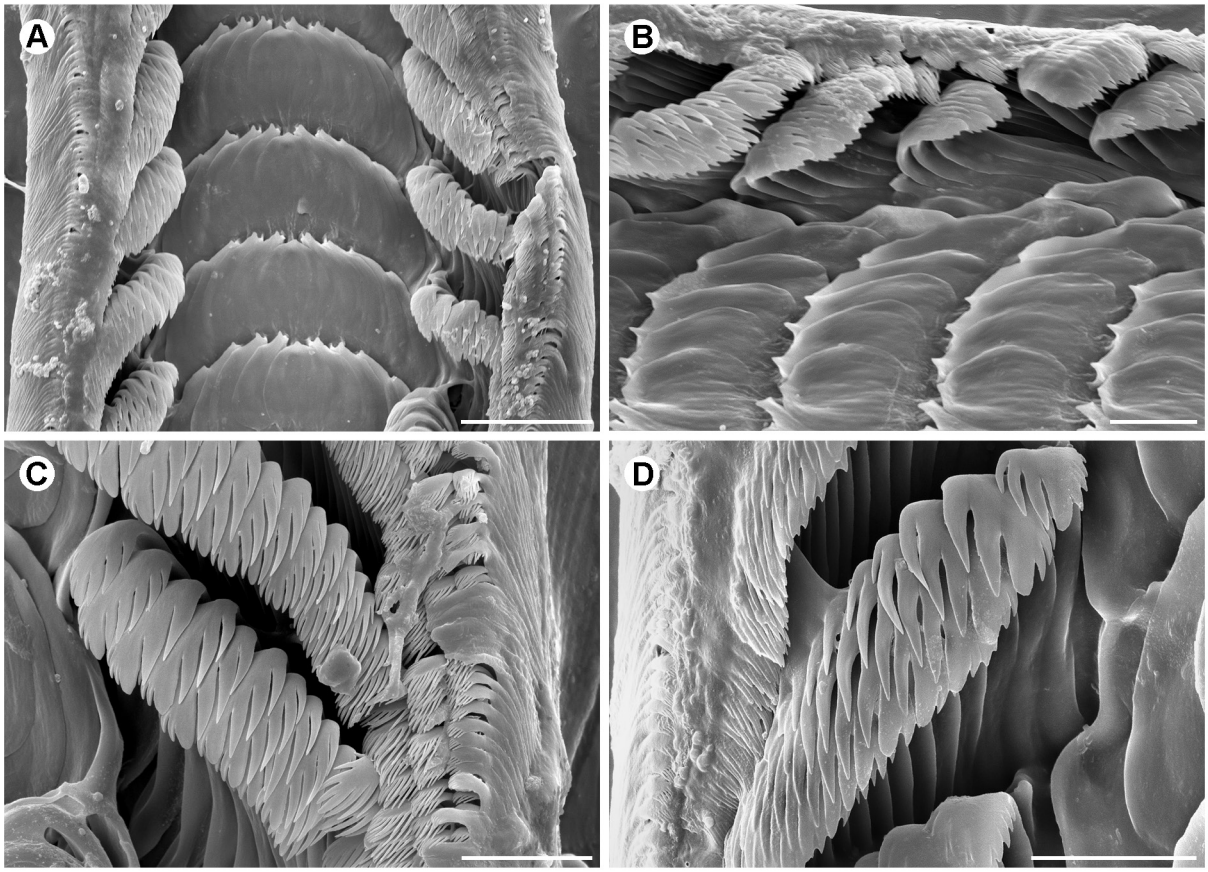

Fig. 49. *Ethaliella rhodomphala* (Souverbie, 1875), radula (all MNHN). **A**. Entire width of radula, Koumac, Stn 1306. **B**. Oblique view of latero-marginal transition, Koumac, Stn 1306. **C**. Marginal series, Koumac, Stn KD574. **D**. Inner marginal teeth, Koumac, Stn 1306. Scale bars: A = 50 µm; B = 25 µm; C–D = 20 µm.

Distribution (Fig. 51)

To date recorded only from the New Caledonian marine ecoregion (Grande Terre and the Loyalty Islands).

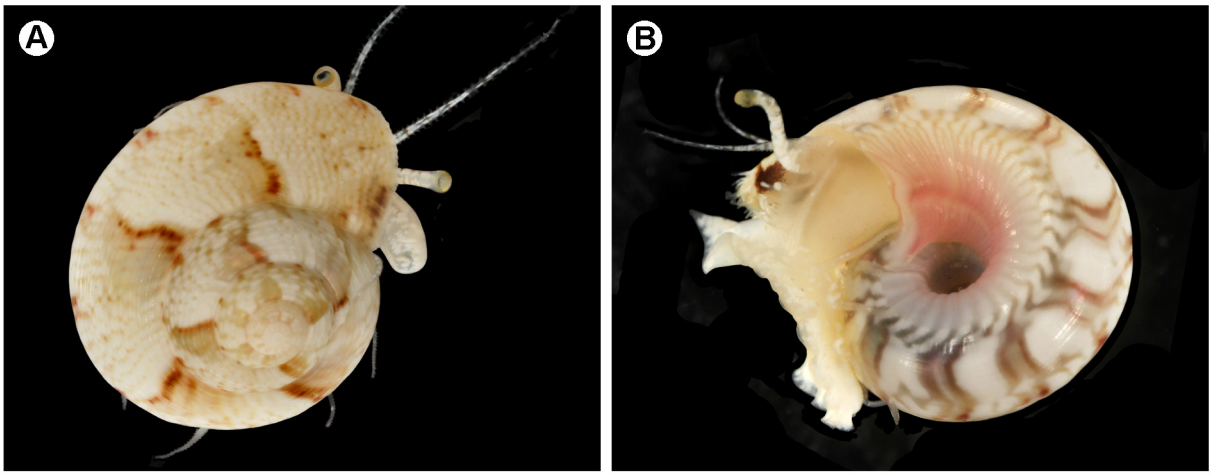

Fig. 50. *Ethaliella rhodomphala* (Souverbie, 1875), living animal, Koumac, Stn KD552, shell diameter ± 5.0 mm (MNHN-IM-2019-8779) (image PM652).

Fig. 51. Map of New Caledonia showing the distribution of *Ethaliella rhodomphala* (Souverbie, 1875). Type locality (approximate) indicated in pink.

Remarks

Fischer (1878 and 1979 in 1875–1880) drew attention to the similarity between this species and *Trochus rotellaeformis* Philippi, 1850, but noted that the figure of *T. rotellaeformis* given by Philippi (Philippi 1850 in 1846–1855: pl. 44 fig. 2) did not show the pink coloration seen in the umbilical region of *T. rhodomphalus*. As a result, Fischer was unable to conclude that they were conspecific, preferring to wait to see if further samples would establish whether or not the umbilicus of New Caledonian material was invariably pink. The answer to this question is that the intensity of the pink coloration of the umbilicus of *E. rhodomphala* is variable, intense in some, very faint in others, and frequently absent in juvenile and subadult specimens (Fig. 47G, M–N). This character cannot thus be used to eliminate possible synonymy. However, Philippi also stated that the base of *T. rotellaeformis* was perfectly smooth. In contrast, the base of *E. rhodomphala*, although more glossy than the apical surface, almost always retains some spiral sculpture and the peri-umbilical region bears fine radial riblets or even coarser pliculae. Thus, questions remain regarding the synonymy of the two names. No locality was cited for *T. rotellaeformis* other than that the material reportedly came from Captain Cook's travels and was in the Sylvanus Hanley collection. The uncertainty regarding the identity of Philippi's taxon can only be resolved by examination of the type material, but attempts to trace this in the NHMUK and the museums in Cambridge and Leeds have proved unsuccessful. In the absence of type material, I consider *Trochus rotellaeformis* Philippi, 1850 to be a nomen dubium.

Earlier (Herbert 1996), I discussed similarities between *Ethaliella rhodomphala* (Souverbie, 1875) and *Ethalia rhodomphala* E.A. Smith, 1903 from the Maldives, *Ethalia floccata* G.B. Sowerby III, 1903 from Japan, *Isanda pulchella* A. Adams, 1855 from the Philippines and *Ethalia capillata* Gould, 1862 from China, all currently referred to *Ethaliella* (MolluscaBase 2024). I concluded that *E. rhodomphala* (Souverbie, 1875) might be a synonym of and earlier name for *E. floccata*. Having now examined a good deal more New Caledonian material, I no longer consider this likely. Undoubtedly the two are similar, but the Japanese species has a less elevated spire, weaker spiral sculpture above the periphery, a completely smooth base, a more funnel-shaped umbilicus, a distinct parietal callus lobe and lacks pink colour in the umbilical region (Sasaki 2000). Furthermore, the New Caledonian material never exhibits the typical colour pattern of *E. floccata*, including a band of strongly opisthocline red-brown lines below the suture, followed by a spiral row of red-brown blotches at mid-whorl (Higo *et al*. 2001: fig. G468, holotype, NHMUK 1903.12.7.15).

The secondary homonymy resulting from the referral of both *Trochus* (*Monilea*) *rhodomphala* Souverbie, 1875 and *Ethalia rhodomphala* E.A. Smith, 1903 to *Ethaliella* remains to be resolved. Pilsbry (1905) considered it likely that the Japanese *E. floccata* was nothing more than a variety of Smith's *Ethalia rhodomphala*, in which case a replacement name is already available for Smith's taxon. I have not seen sufficient material of these taxa to be able to evaluate this and it remains an issue requiring further investigation.

Ethaliella rhodomphala (Souverbie, 1875) shows considerable variation in size and shape. Specimens from Grande Terre are generally smaller than the lectotype from Lifou and the whorls are less distinctly shouldered. In addition, the peri-umbilical pigmentation of Lifou specimens is generally of a deeper pink colour. However, the material available from Lifou is limited and of poor quality, and these differences are thus difficult to evaluate. Occasional specimens from Grande Terre have a more intensely pigmented umbilical rim (Fig. 47M) and some have a lower, less conical profile with somewhat shouldered whorls (Fig. 47J–K). Although conical specimens from Grande Terre may ultimately prove to be a distinct and undescribed species, presently I refrain from describing them as such pending the availability of an adequate quantity of fresh Loyalty Islands material and supporting molecular data.

Genus ***Ethminolia*** Iredale, 1924

Ethminolia Iredale, 1924: 228.

Type species

Ethminolia probabilis Iredale, 1924 (original designation), Recent, SE Australia. Generic fossil record: Quaternary to Recent (Paleobiology Database 2024) (Fig. 52).

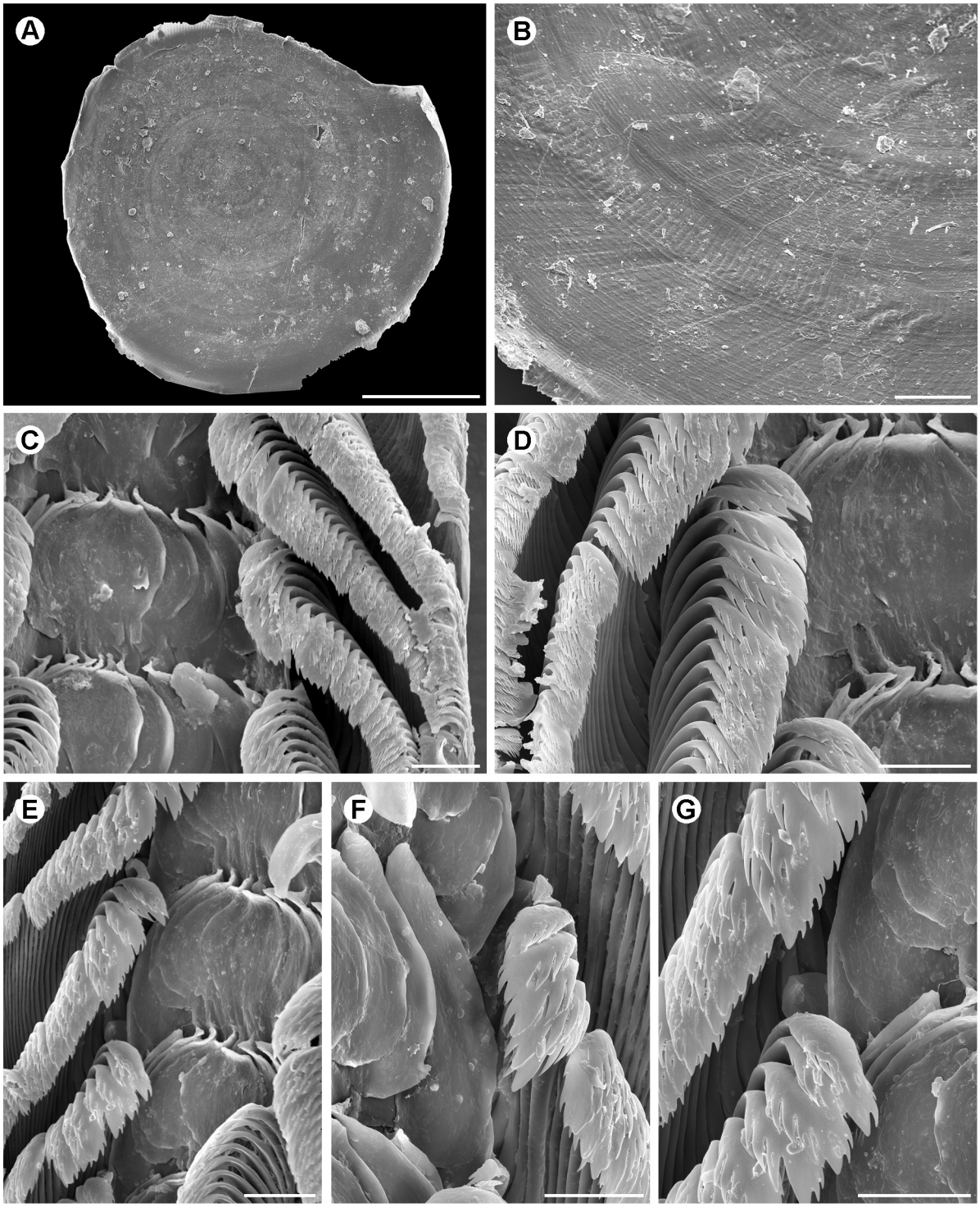

Fig. 52. *Ethminolia probabilis* Iredale, 1924, operculum and radula, Twofold Bay, New South Wales (NMW 1955.158). **A**. Entire operculum. **B**. Microsculpture of operculum. **C–G**. Radula. Scale bars: A = 0.5 mm; B = 100 μm; C, E = 25 μm; D, F–G = 20 μm.

Diagnosis

Shell small (diameter usually < 10 mm), width considerably greater than height; whorls rounded, often shouldered; sculpture of spiral lirae or cords with microscopic axial threads; umbilicus broad, its rim rounded and not thickened, lacking an internal funicle; outer lip simple, interior nacreous, without in-running ridges.

Operculum corneous, multispiral with well-developed, radially striate peripheral fringe, striations remaining evident on earlier whorls; spiral microsculpture present.

Radula with base-plates of rachidian and lateral teeth thin, narrowing anteriorly, outer edge rounded, raised anteriorly and somewhat twisted; fifth lateral scarcely evident; inner marginal tooth transitional with reduced cusp; cusps of inner marginals short and broad, 2–10 largest, coarsely dentate, central denticle asymmetrical and somewhat broader; additional narrower denticles on both margins.

Ctenidium unknown.

Remarks

This diagnosis of *Ethminolia* is tentative as the type species remains poorly known. In an attempt to remedy this, I have examined the radula and operculum of topotypic material from the Melvill-Tomlin collection (NMW) and here provide illustrations thereof for the first time (Fig. 52). The cusp morphology of the inner marginal teeth differs significantly from that of *Ethalia*, *Sericominolia* and *Talopena* and other genera belonging to Group 1. Many of the species currently referred to *Ethminolia* will doubtless prove referable to other genera when studied in more detail. I refer the following new species to *Ethminolia* with some hesitation since although the shell is somewhat similar to that of *E. probabilis*, as are the cusps of the inner marginal teeth, I could not discern either spiral microsculpture on the operculum, nor an intermediary inner marginal tooth.

Ethminolia hickmanae sp. nov.
urn:lsid:zoobank.org:act:3F15988B-094D-44F8-ADA4-93FFBE1C7399
Figs 53–56

Diagnosis

Shell very small with low spire and rounded whorls; base widely umbilicate; sculpture of 6–8 low spiral cords, widely-spaced axial riblets and microscopic axial threads; umbilicus lacking funicle, its rim evenly rounded; aperture circular, peristome subradial, almost complete, outer lip simple. Colouration highly variable; usually mottled with dark and light spots, blotches and flames; spiral cords commonly spotted, dark on light and light on dark.

Etymology

Named for Prof. Carole Hickman, University of California Museum of Paleontology, in recognition of her excellent research on trochoidean vetigastropods.

Material examined

Holotype (Fig. 53A–C)
NEW CALEDONIA – **Grande Terre** • living specimen; Koumac, Stn KD561; 20°45.4′ S, 164°14.4′ E; depth 1 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable grossier; MNHN-IM-2000-38863.

Paratypes
NEW CALEDONIA – **Grande Terre** • 5 specimens, living; same data as for holotype; MNHN-IM-2000-38864 • 4 specimens, living; Koumac, Stn KD530; 20°32.1′ S, 164°11′ E; depth 10 m; 4

Nov. 2019; Koumac 2.3 leg.; sable, algues brunes, *Halimeda*; DNA vouchers: MNHN-IM-2019-3872, -3873, -3874 and -3875 (image LC282) • 1 specimen, living; same collection data as for preceding; MNHN-IM-2000-29842 • 1 specimen, living; Koumac, Stn KD547; 20°42.2′ S, 164°18.2′ E; depth 2–6 m; 8 Nov. 2019; KOUMAC 2.3 leg.; sable grossier et herbier; DNA voucher, photographed alive (image LC395); MNHN-IM-2019-8228 • 3 specimens, dead; Touho, vicinity of Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN-IM-2000-38865 • 3 specimens, living; Nouméa, off Nouville, Stn 1345; 22°16.1′ S, 166°23.7′ E; depth 15 m; 1 Oct. 1992; P. Bouchet leg.; sable grossier sous vase limoneuse, herbiers; MNHN-IM-2000-38866.

Other material

NEW CALEDONIA – **Grande Terre**, **Koumac** • 1 specimen, dead; Stn KD539; 20°34.1′ S, 164°10.6′ E; depth 11 m; 6 Nov. 2019; KOUMAC 2.3 leg.; algues brunes, éponges; MNHN • 1 specimen, dead; Stn KD556; 20°32.9′ S, 164°12.2′ E; depth 5–6 m; 11 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 2 specimens, dead; lagoon between the land and l'Infernet, Stn 1299; 20°34.4′ S, 164°13.0′ E; depth 12–14 m; Oct. 1993; Expédition Montrouzier leg.; slabs with gorgonians, silt; MNHN • 1 specimen, dead; Passe Deverd, Stn 1321; 20°44.7′ S, 164°14.9′ E; depth 90–115 m; Oct. 1993; Expédition Montrouzier leg.; muddy sand; MNHN • 8 specimens, dead; lagoon between the land and l'Infernet, Stn 1300; 20°35.6′ S, 164°15.2′ E; depth 10–11 m; Oct. 1993; Expédition Montrouzier leg.; sable gris vaseux; MNHN • 1 specimen, dead; Stn KD505; 20°34.3′ S, 164°15.2′ E; depth 2–4 m; 29 Oct. 2019; KOUMAC 2.3 leg.; sablo-vaseux coquillé; MNHN • 14 specimens, dead; Stn KD501; 20°36.2′ S, 164°15.2′ E; depth 11 m; 28 Oct. 2019; KOUMAC 2.3 leg.; vase; MNHN • 14 specimens, living; channel of the Passe de Koumac, Stn 1314; 20°39.8′ S, 164°15.3′ E; depth 30–63 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 1 specimen, dead; Stn KD525; 20°36.7′ S, 164°15.3′ E; depth 12 m; 3 Nov. 2019; KOUMAC 2.3 leg.; vase dense; MNHN • 50+ specimens, dead; channel of the Passe de Koumac, Stn 1313; 20°38.8′ S, 164°15.6′ E; depth 33–38 m; Oct. 1993; Expédition Montrouzier leg.; vase à turritelles; MNHN • 10 specimens, dead; Stn KD503; 20°36.6′ S, 164°15.9′ E; depth 8 m; 28 Oct. 2019; KOUMAC 2.3 leg.; sablo-vaseux; MNHN • 1 specimen, dead; Stn KD575; 20°38.9′ S, 164°15.8′ E; depth 35 m; 19 Nov. 2019; KOUMAC 2.3 leg.; vase; MNHN • 3 specimens, dead; Stn KD504; 20°34.7′ S, 164°16′ E; depth 4–5 m; 29 Oct. 2019; KOUMAC 2.3 leg.; vase et coquilles; MNHN • 2 specimens, dead; Stn KD508; 20°37.8′ S, 164°16.4′ E; depth 16 m; 30 Oct. 2019; vase; MNHN • 1 specimen, dead; Stn KD578; 20°43.8′ S, 164°16.4′ E; depth 11–12 m; 19 Nov. 2019; KOUMAC 2.3 leg.; sable fin gris à *Halophila*; MNHN • 9 specimens, dead; Stn KD545; 20°40.2′ S, 164°16.6′ E; depth 25 m; 8 Nov. 2019; KOUMAC 2.3 leg.; vase dense; MNHN • 8 specimens, dead; Stn KR1038; 20°40.5′ S, 164°17.7′ E; depth 13 m; 12 Nov. 2019; KOUMAC 2.3 leg.; sable vaseux à *Caulerpa*; MNHN • 2 specimens, dead; Stn KD573; 20°44.5′ S, 164°18.4′ E; depth 25–27 m; 19 Nov. 2019; KOUMAC 2.3 leg.; vase; MNHN • 6 specimens, dead; Stn KD512; 20°44.9′ S, 164°20.4′ E; depth 15–16 m; 31 Oct. 2019; KOUMAC 2.3 leg.; vase grise; MNHN. – **Grande Terre**, **Touho** • 1 specimen, dead; around the Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 4 specimens, dead; Baie de Touho, Stn 1250; 20°46.7′ S, 165°13.7′ E; depth 3–6 m; Sep. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN • 8 specimens, dead; channel NE of Banc de Touho, Stn 1260; 20°44′ S, 165°14′ E; depth 49–59 m; Sep.1993; Expédition Montrouzier leg.; sable coquillier; MNHN. – **Grande Terre**, **Nouméa** • ± 50 specimens, living; Nouméa, off Nouville, Stn 1345; 22°16.1′ S, 166°23.7′ E; depth 15 m; 1 Oct. 1992; P. Bouchet leg.; sable grossier sous vase limoneuse, herbiers; MNHN • 1 specimen, dead; channel Îlot Maître, Stn 1335; 22°19.7′ S, 166°26.6′ E; depth 20–24 m; 2 Dec. 1992; P. Bouchet, Campagne LAGON leg.; eunicid tubes with epibionts; MNHN. – **Loyalty Islands** • 1 specimen, dead; Lifou, Baie du Santal, off Peng, Stn 1443; 20°53.8′ S, 167°07.3′ E; depth 48–52 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; drop-off; MNHN.

FIJI • 1 specimen, dead; Viti Levu, west lagoon, Stn BS43; 17°51.6′ S, 177°13.4′ E; depth 26 m; 19 Oct. 1998; NO *Alis*, SUVA 2 leg.; eunicid tubes with epibionts; MNHN.

Description (Fig. 53)

Shell. Very small (adult diameter up to 2.3 mm), wider than high (H/D 0.62–0.70); spire low, whorls evenly rounded periphery at mid-whorl, suture strongly indented; sculpture predominantly of low, evenly-spaced, spiral cords; base rounded, widely umbilicate; teleoconch of up to 3.3 whorls. First teleoconch whorl with three fine spiral lirae, strengthening during second whorl and appearing more cord-like, increasing to 6–8 in number by intercalation of intermediaries; axial sculpture comprising close-set, microscopic axial threads with additional stronger, widely-spaced axial riblets producing regular net-like cancellation (Fig. 54A); riblets raised to form small nodules where they cross spiral cords; sculpture similar on subsequent whorls, but axial riblets less regularly spaced; basal sculpture similar, but cords thinner and more numerous towards and within umbilicus; umbilical rim evenly rounded, rendered weakly plicate by axial riblets. Aperture circular; peristome almost radial, briefly interrupted in parietal region; outer lip simple; interior nacreous.

Colour. Colour and pattern highly variable; ground colour ranging from dirty white to dark purplish-brown, variously mottled with darker and lighter spots, blotches and flames; pale specimens frequently

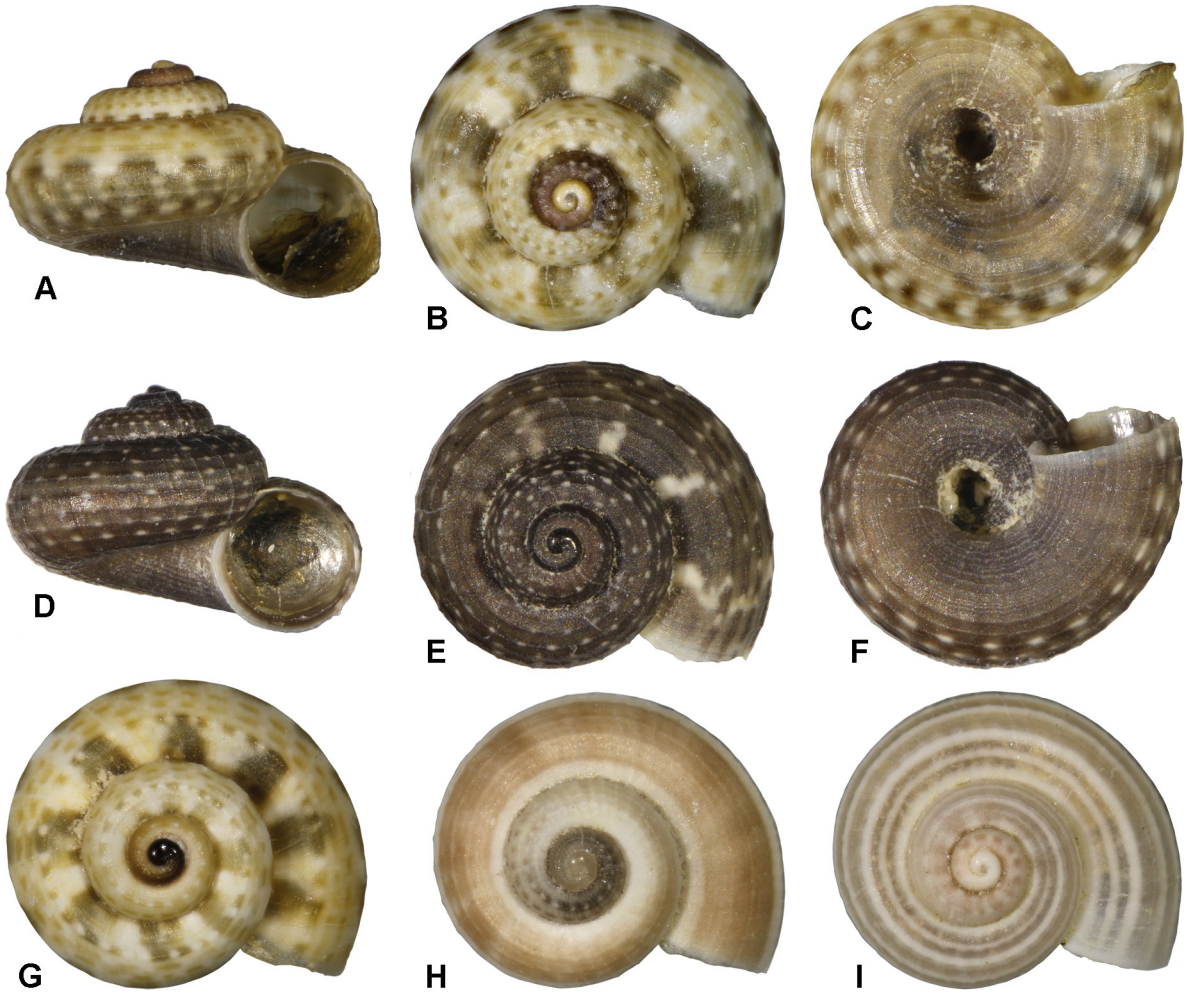

Fig. 53. *Ethminolia hickmanae* sp. nov. **A–C**. Holotype, Koumac, Stn KD561, height 1.3 mm diameter 2.0 mm (MNHN-IM-2000-38863). **D–F**. Dark specimen, Koumac, Stn KD530, height 1.2 mm, diameter 1.70 mm (paratype, MNHN-IM-2000-29842). **G–I**. Further colour variations, Nouméa, Stn 1345, diameters 1.70 mm, 1.66 mm and 1.65 mm, respectively (paratypes, MNHN-IM-2000-38866).

with darker marks radiating from suture and with blotches at periphery; spiral cords commonly spotted with white, particularly below periphery; rare specimens with candy-stripe pattern (Fig. 53I); protoconch usually whitish or pale, occasionally almost black (Fig. 53G).

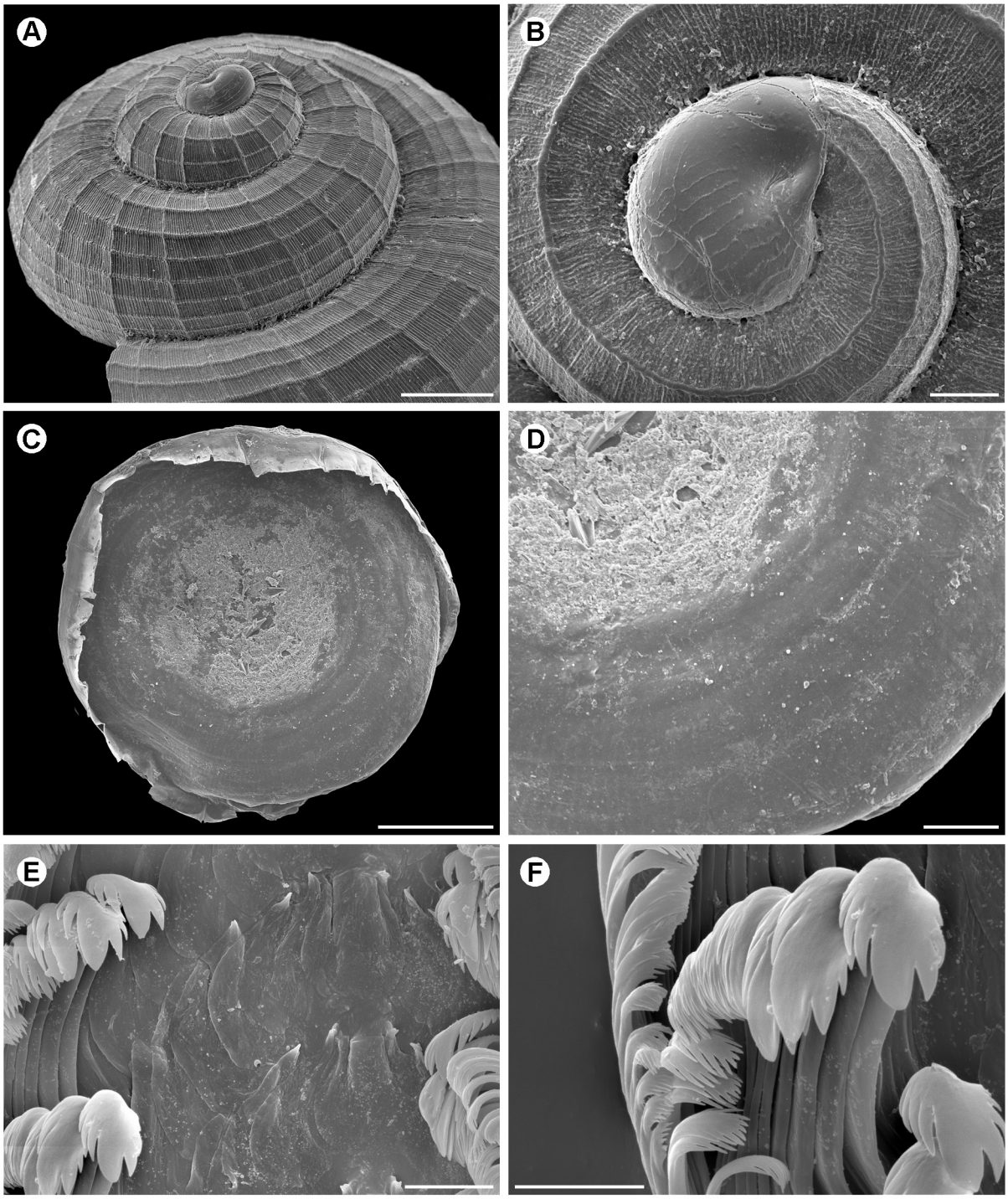

Fig. 54. *Ethminolia hickmanae* sp. nov. **A**. Oblique view of apex. **B**. Protoconch. **C–D**. Operculum. **E–F**. Radula. A–B. Koumac, Stn KD545. C–F. Nouméa, Stn 1345 (paratype, MNHN-IM-2000-38866). Scale bars: A, C = 200 µm; B = 50 µm; D–E = 50 µm; F = 10 µm.

Dimensions. Holotype, height 1.3 mm, diameter 2.0 mm; largest specimen, diameter 2.3 mm.

Protoconch (Fig. 54B). Typically umboniine, diameter 160–180 µm; apical beak present and confluent with terminal lip; apical bulb sculptured with oblique threads crossed by subspiral threads; terminal lip weakly convex.

Operculum (Fig. 54C–D). Corneous; multispiral with relatively narrow whorls; no spiral microsculpture evident; peripheral fringe rather broad, its radial striations remaining evident on earlier whorls.

Radula (Fig. 54E–F). Formula ∞ + 5 + 1 + 5 + ∞, ± 20 transverse rows of teeth; teeth in central field reduced to very thin, overlapping base-plates, inner ones with a mere vestige of shaft anteriorly; fifth lateral subquadrate. Transitional latero-marginal tooth not evident. Marginal teeth well developed with narrow shaft and strongly recurved cusp; cusps of inner marginal teeth ovate, with rounded central denticle and three progressively smaller, more pointed denticles on each side; marginal teeth progressively smaller toward radula margin and with more finely denticulate cusps.

External anatomy (Fig. 55). Little detail evident in rehydrated specimens, but photographs of living animals indicate that the right eyestalk is larger than the left one.

Fig. 55. *Ethminolia hickmanae* sp. nov., living specimen, Koumac, Stn KD547, shell diameter ± 1.8 mm (paratype, MNHN-IM-2019-8228) (image LC395).

Habitat

Mostly found as dead shells in mud and silt washed into lagoonal channels and passes, but living specimens associated with rather more sandy substrata; at depths of 1–90 m (living 1–30 m).

Distribution (Fig. 56)

Known from New Caledonia (Grande Terre and Lifou) and Fiji. A similar distribution to that of *Ethalia lampra* (above).

Remarks

Ethminolia durbanensis (Kilburn, 1977) from the south-western Indian Ocean has a similar profile, but it attains a much larger size (diameter ±5.0 mm), has shouldered whorls and an angled and crenulate umbilical rim. *Ethminolia probabilis* Iredale, 1924 from south-eastern Australia is larger still (diameter up to 8.0 mm) and has distinctly shouldered whorls and more close-set spiral sculpture (Fig. 78D–G). *Solariella pygmaea* Poppe, Tagaro & Dekker, 2006 from the Philippines has a shell of similar overall facies and comparable size to that of *E. hickmanae* sp. nov., but it is much taller (H/D 0.95 vs <0.70). Referral of *E. hickmanae* to *Ethminolia* is provisional.

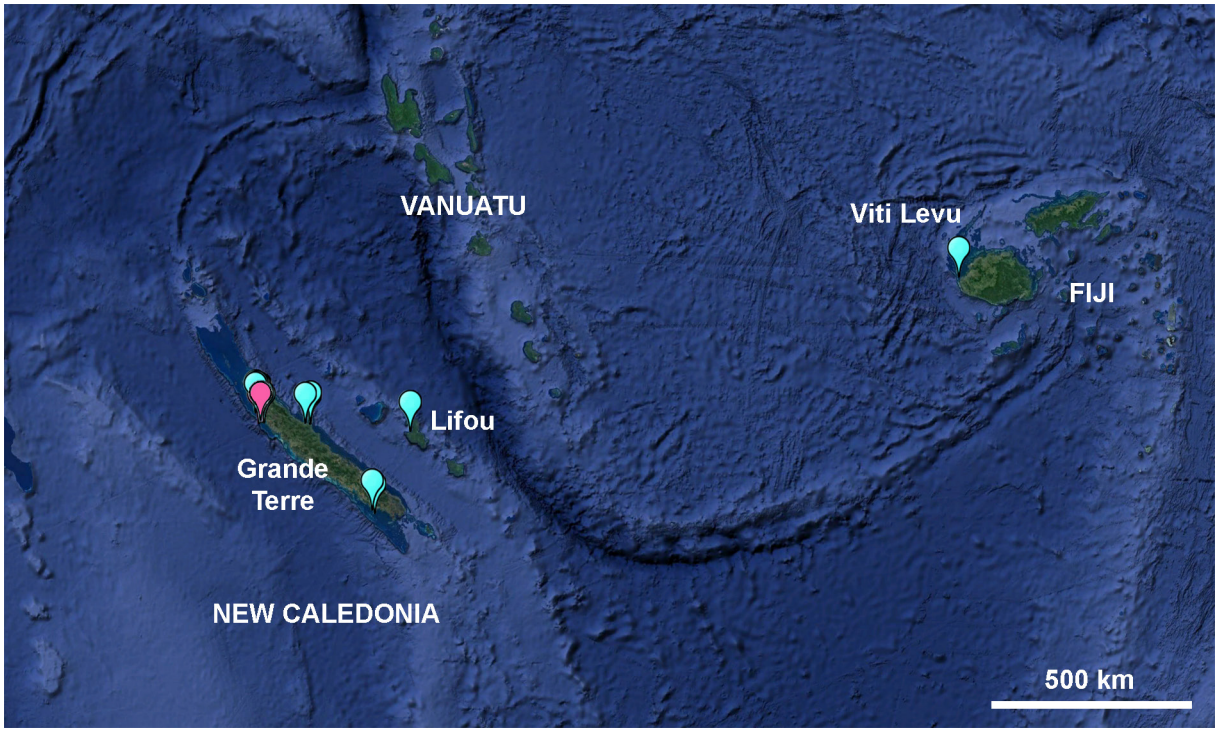

Fig. 56. Distribution of *Ethminolia hickmanae* sp. nov. Type locality indicated in pink.

Genus ***Tylorhaphe*** gen. nov.
urn:lsid:zoobank.org:act:A38706D5-CFD1-4CE0-AE02-16E86950F65E

Type species

Tylorhaphe luteopicta gen. et sp. nov.

Diagnosis

Shell small (diameter <7.5 mm), depressed trochiform, umbilicate; subsutural cord well developed, beaded or with raised nodules; periphery roundly angled or keeled; peri-umbilical region with radiating pliculae and often with strong spiral cords; umbilical margin angled, delineated by beaded cord; umbilicus lacking funicle; outer lip often descendant in mature specimens and aperture with low subterminal thickening internally and externally, and with shallow subperipheral concavity; protoconch relatively large (diameter 195–230 µm).

Operculum corneous, multispiral with well-developed, radially striate peripheral fringe; spiral microsculpture present.

Radula with well-defined tooth base-plates in central field, that of rachidian quadrate; inner marginal tooth transitional, its cusp reduced, with small denticles; second marginal clearly the largest tooth, with robust cusp bearing large sharply triangular central denticle with additional smaller denticles at its base on both sides.

Etymology

From the Greek words '*tylos*' (*τύλος*), m., a knob or nodule, and '*rhaphe*' (ραφή), f., a seam; in reference to the beaded subsutural sculpture. Gender feminine.

Remarks

This new genus equates to Clade 1 of Williams *et al*. (2024), which includes sequence data for one of the paratypes of the type species (MNHN-IM-2009-23261). Whereas umboniines generally live in shallow-water habitats (mostly intertidal to a depth of 50 m), species of *Tylorhaphe* gen. nov. primarily inhabit deeper-water environments, extending to over 300 m. Additional species that may prove to belong to this genus include *Solariella illustris* Sturany, 1900 from the Red Sea and *Solariella nektonica* Okutani, 1961 from Japan.

The genus *Inkaba* Herbert, 1992 from the south-western Indian Ocean is similar in having beaded subsutural sculpture, but its radula differs in that there is no one dominant marginal tooth and the cusps of the inner marginals are ovate rather than trigonal, and have denticles of more uniform size, without a large, sharply triangular central denticle. In addition, the latero-marginal plate is cuspless in *Inkaba* and the operculum lacks spiral microsculpture. In the genus *Antisolarium* Finlay, 1926 from New Zealand, the shell is of similar size to *Tylorhaphe* gen. nov. and it has a beaded cord at the shoulder and around the umbilicus, but the radula differs in that the marginal teeth have a triangular expansion of the tooth shaft beneath the recurved cusp, creating a distinct food groove (pers. obs.). In addition, no one marginal tooth is dominant and the cusps of the inner marginals are elongate-ovate rather than triangular, and they have a bluntly rounded central denticle with a series of smaller, more uniformly sized denticles on the outer margin.

Tylorhaphe alisae gen. et sp. nov.
urn:lsid:zoobank.org:act:C1DE0A17-BDCD-4895-A918-27D5E858555B
Figs 57–59

Ethminolia nektonica (non Okutani, 1961) – Poppe *et al*. 2006: 108, pl. 56 figs 1, 3 (not 4).
Ethminolia impressa (non G. Nevill & H. Nevill, 1869) – Héros *et al*. 2007: 209.

Diagnosis

Smaller, more elevated and with less angular whorls than both *Tylorhaphe luteopicta* gen. et sp. nov. and *T. wallacei* gen. et sp. nov. Umbilicus wider than that of *T. fritillaria* gen. et sp. nov. and base with radial colour pattern rather than spots.

Etymology

Named for the NO *Alis*, on board which living specimens of this species were dredged.

Material examined

Holotype (Fig. 57A–D)
NEW CALEDONIA – **Grande Terre** • empty shell; Koumac, Passe Deverd, Stn 1322; 20°45.2′ S, 164°15.2′ E; depth 53–71 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN-IM-2000-38867.

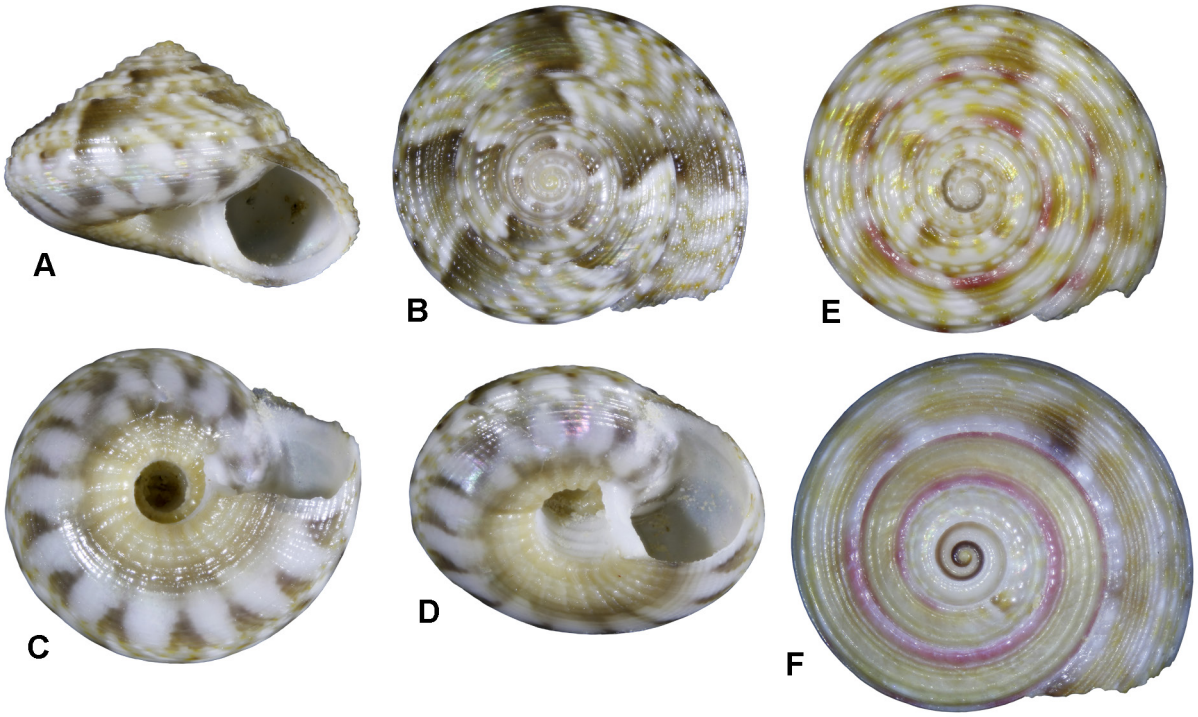

Fig. 57. *Tylorhaphe alisae* gen. et sp. nov. **A–D**. Holotype, Koumac, Stn 1322, height 2.9 mm, diameter 4.3 mm (MNHN-IM-2000-38867). **E**. Paratype, Île des Pins, Stn DW4708, diameter 4.5 mm (MNHN-IM-2000-38870). **F**. Paratype with pink subsutural cord and dark apex, Touho, Stn 1249, diameter 5.0 mm (MNHN-IM-2000-38869).

Paratypes

NEW CALEDONIA – **Grande Terre** • 1 specimen, dead; same data as for holotype; MNHN-IM-2000-38868 • 2 specimens, dead; Passe de Touho, Stn 1249; 20°49.0′ S, 165°19.0′ E; depth 80–140 m; Sep. 1993; Expédition Montrouzier leg.; muddy sand and mud; MNHN-IM-2000-38869 • 2 specimens, living; SW of Île des Pins, Stn DW4708; 22°44.7′ S, 167°21′ E; depth 68–71 m; 17 Aug. 2016; NO *Alis*-KANACONO leg.; DNA vouchers; MNHN-IM-2013-69254 and -69275 • 1 specimen, dead; same collection data as for preceding; MNHN-IM-2000-38870.

Other material

NEW CALEDONIA – **Grande Terre** • 6 specimens, dead; Chenal de la Passe de Koumac, Stn 1314; 20°39.8′ S, 164°15.3′ E; depth 30–63 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 1 specimen, dead; Chenal au NE du Banc de Touho, Stn 1260; 20°44′ S, 165°14′ E; depth 49–59 m; Sep.1993; Expédition Montrouzier leg.; sable coquillier; MNHN.

Description (Fig. 57)

Shell. Small (diameter up to 5.0 mm), trochiform, relatively solid, spire of moderate height (H/D = 0.65-0.70); teleoconch of up to 4.5 whorls; periphery roundly angled, situated below mid-whorl; suture level with periphery; base somewhat flattened, with moderately wide umbilicus. First teleoconch whorl with three indistinct, rounded spiral cords; upper one strengthens during second whorl becoming shoulder-like; two cords below this, one at mid-whorl, one level with abapical suture; an additional beaded subsutural cord arises during third whorl and shoulder cord weakens (Fig. 58A); additional intermediary cords arise with growth, but subsutural, mid-whorl and peripheral cords remain somewhat stronger; last adult whorl with 6–8 secondary cords between subsutural cord and mid-whorl cord, with finer spiral threads in their intervals; axial sculpture weak, comprising only low subsutural pleats on mid-spire whorls causing beading of subsutural cord, these becoming more irregular and evanescing with growth; microsculpture of axial threads throughout. Base with fine spiral cords, broader and flatter in middle of base, but strengthening around umbilicus; axial sculpture of collabral growth-lines, sinuous below periphery, some strengthening and becoming pleat-like around umbilicus; umbilicus of moderate width, with angled rim delineated by strong cord beaded by radiating pleats; sides of umbilicus steep, sometimes slightly overhung by rim, with 3–4 low spiral cords within; a funicle lacking. Aperture subquadrate; peristome interrupted in parietal region; columella stout, with a low nodule at its base overlying a notch at junction of columella and basal lips; outer lip slightly descendant at full maturity, and with shallow subperipheral concavity; interior of outer lip smooth, somewhat thickened within.

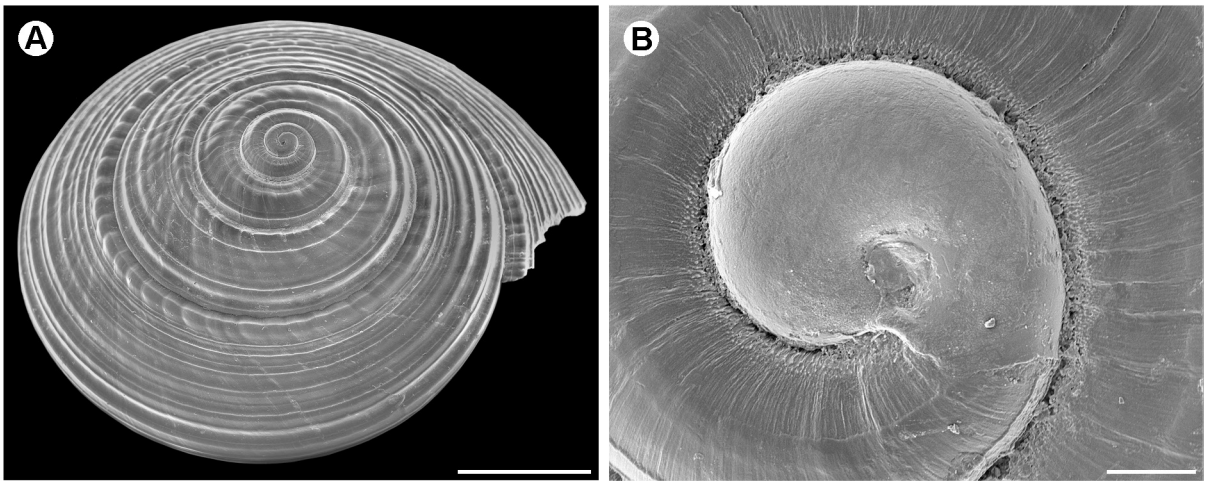

Fig. 58. *Tylorhaphe alisae* gen. et sp. nov., Koumac, Stn 1314 (MNHN). **A**. Oblique apical view. **B**. Protoconch. Scale bars: A = 1.0 mm; B = 50 µm.

Colour. Pattern comprising fine zig-zag axial lines or flames in yellow and white, often with additional bold, brown subsutural blotches; beaded subsutural cord distinctly pinkish in some specimens (Fig. 57F); middle of base with a bold radiating pattern of alternating white and brown or pinkish trigonal marks; peri-umbilical region straw-yellow; interior of umbilicus whitish; protoconch and apical whorls translucent whitish to pale yellow or greyish, shoulder cord often dotted with opaque white spots; early teleoconch whorls sometimes with dark peripheral band (Fig. 57F); moderately glossy throughout.

Dimensions. Holotype, height 2.9 mm, diameter 4.3 mm; largest specimen, diameter 5.0 mm.

Protoconch (Fig. 58B). Somewhat worn, but evidently similar to that of *Tylorhaphe luteopicta* gen. et sp. nov.; diameter ± 200 µm.

Operculum, radula and external anatomy. Unknown.

Habitat

Known only from the deeper lagoon channels and passes; living specimens at depths of 68–71 m, empty shells 59–80 m.

Distribution (Fig. 59)

All material studied was obtained from Grande Terre, but similar specimens from the Philippines are probably conspecific (see Remarks below).

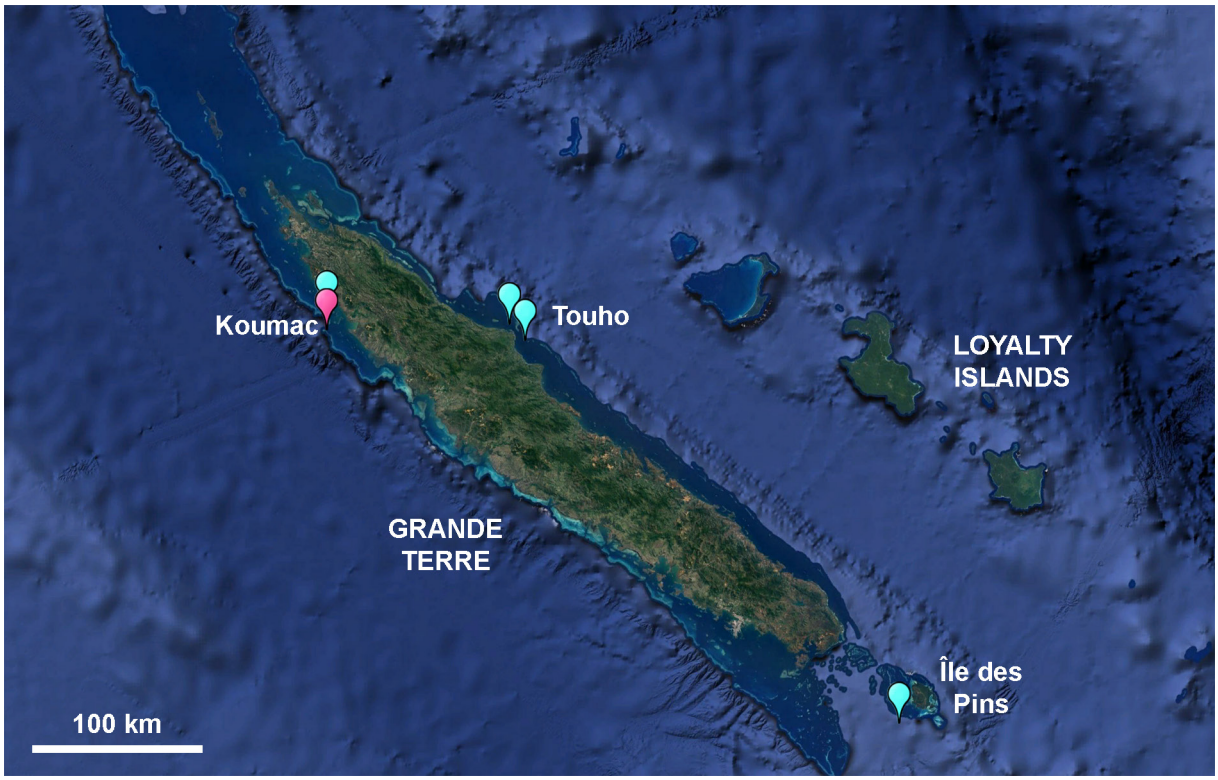

Fig. 59. Map of New Caledonia showing the distribution of *Tylorhaphe alisae* gen. et sp. nov. Type locality indicated in pink.

Remarks

My referral of this species to *Tylorhaphe* gen. nov. is provisional. The only specimens collected alive were preserved for molecular study and I have not been able examine the external anatomy, operculum and radula to establish whether these exhibit features consistent with *Tylorhaphe.* Though smaller and less depressed than that of *T. luteopicta* gen. et. sp. nov., the shell of *T. alisae* gen. et. sp. nov. also has a distinctly beaded subsutural cord, and exhibits the same sculptural ontogeny and umbilical morphology.

Ethaliella rhodomphala is superficially similar, but in that species the whorls have a more evenly rounded profile and lack an enlarged beaded subsutural cord. In *T. alisae* gen. et. sp. nov. the spiral sculpture is generally coarser, particularly the cords at and just above the periphery, and those surrounding the umbilicus. In addition, the peri-umbilical region is straw-yellow rather than pink and has coarser radiating pleats, and the umbilicus itself has a more strongly angled rim, steeper sides and coarser internal spiral sculpture.

Perhaps the most similar species is *Solarium impressum* G. Nevill & H. Nevill, 1869 from Sri Lanka, currently referred to *Ethminolia* Iredale, 1924 sensu lato (lectotype designated by Herbert 1992: 449, figs 11–113). However, that species has a more stepped spire profile with coarser subsutural beading and a more angular periphery. I consider it probable that *S. impressum* is also referable to *Tylorhaphe* gen. nov.

The Philippine material identified as *Ethminolia nektonica* (Okutani, 1961) by Poppe *et al*. (2006) appears very similar to *T. alisae* gen. et sp. nov. and is I believe likely to be conspecific, indicating that the species ranges beyond the New Caledonian region.

Tylorhaphe fritillaria gen. et sp. nov.
urn:lsid:zoobank.org:act:0796CFF5-6E23-4D66-A341-5D5729E68949
Figs 60– 62

Diagnosis

Resembles *Tylorhaphe alisae* gen. et sp. nov., but with a narrower umbilicus, the rim of which conspicuously overhangs the underlying umbilical cavity; rim pleated, but peri-umbilical spiral sculpture lacking; basal colour pattern of numerous white blotches on a pale maroon-brown ground is distinctive.

Etymology

From the Latin '*fritillus*, *fritillaria*', dice box, spotted; in reference to the spotted colour pattern of the base, reminiscent of that of the flowers of the plant *Fritillaria meleagris* L. (Liliaceae).

Material examined

Holotype (Fig. 60)

NEW CALEDONIA – **Grande Terre** • empty shell; Koumac, Passe Deverd, Stn 1322; 20°45.2′ S, 164°15.2′ E; depth 53–71 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN-IM-2000-38871.

Paratypes

NEW CALEDONIA – **Loyalty Islands, Lifou** • 3 specimens, dead; Baie du Santal, Récif Shelter, Stn 1461; 20°54′ S, 167°02′ E; depth 100–120 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; drague; MNHN-IM-2000-38873.

Description (Fig. 60)

Shell. Small (diameter up to 4.0 mm), trochiform, relatively solid, spire height moderate (H/D = 0.65-0.75); teleoconch of up to 4.75 whorls; periphery roundly angled, situated close to mid-whorl; suture level with periphery; base relatively narrowly umbilicate. First teleoconch whorl with four fine spiral lirae; two stronger cords develop during second whorl, one at shoulder, the other between this and abapical suture; a third spiral cord arises below adapical suture during third whorl, strengthening and becoming beaded on subsequent whorls; shoulder cord becomes progressively less distinct during fourth whorl and additional spiral lirae develop between cords, particularly between subsutural cord and vestige of shoulder cord; peripheral cord emerges from suture at on last whorl, delineating upper limit of peripheral angulation; whorl profile distinctly concave between peripheral and supraperipheral cords, flatter between supraperipheral and subsutural cords; axial sculpture weak, comprising only indistinct growth-lines, most noticeable in final quarter whorl, microsculpture of axial threads throughout. Base with 3–4 spiral cords below periphery, its mid-region smoother with only collabral growth-lines, sinuous below periphery; peri-umbilical region with strong pleats radiating from umbilical rim, but without spiral sculpture; umbilicus relatively narrow, its rim thickened and roundly angled, crenulated by radiating pleats; sides of umbilicus steep, greatly overhung by umbilical rim, with low spiral cords within; a funicle lacking. Aperture subquadrate; peristome interrupted in parietal region; columella stout, with a

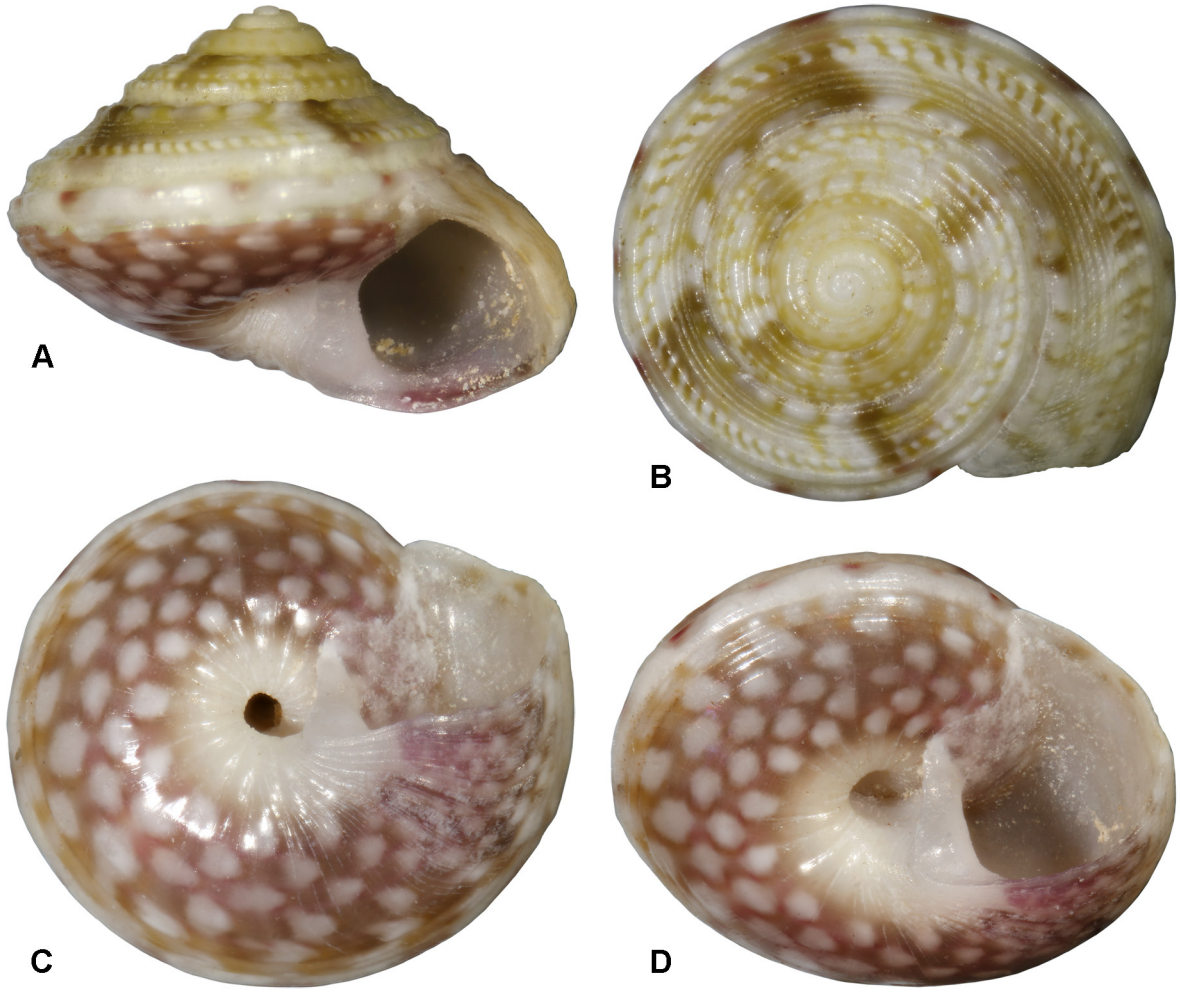

Fig. 60. *Tylorhaphe fritillaria* gen. et sp. nov. **A–D**. Holotype, Koumac, Stn 1322, height 2.5 mm, diameter 3.6 mm (MNHN-IM-2000-38871).

low bulge at its base and a shallow notch at end of thickened umbilical rim, at junction of columella and basal lips; outer lip not descendant in material available, shallowly indented below periphery; interior of outer lip smooth, somewhat thickened within.

Colour. Pattern variable; ground colour typically whitish, mottled with spots, blotches and lines in shades of brownish-yellow to olive-brown; a spiral band of narrow, alternately white and brownish-yellow axial lines above supraperipheral cord; peripheral cord with small, widely-spaced, maroon-red spots; base with a maroon-brown ground densely spotted with white blotches; umbilical rim and columella whitish. Some specimens more uniformly pale orange above periphery, with pinkish subsutural, shoulder and peripheral cords. Basal ground colour turning rose-pink in older post-mortem specimens.

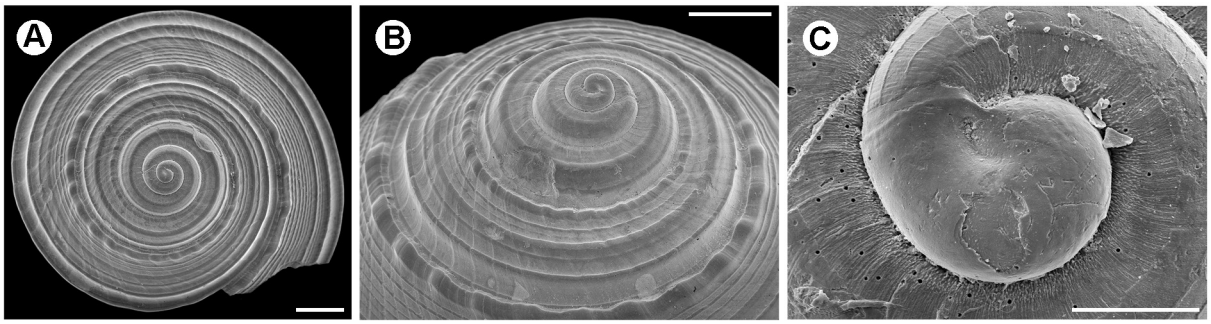

Fig. 61. *Tylorhaphe fritillaria* gen. et sp. nov., Lifou, Stn 1461 (paratype, MNHN-IM-2000-38873). **A**. Apical view of spire. **B**. Oblique view of spire, scale bar = 0.5 mm. **C**. Protoconch. Scale bars: A–B = 0.5 mm; C = 100.

Fig. 62. Map of New Caledonia showing the distribution of *Tylorhaphe fritillaria* gen. et sp. nov. Type locality indicated in pink.

Dimensions. Holotype, height 2.5 mm, diameter 3.6 mm; largest specimen, diameter 4.0 mm.

Protoconch (Fig. 61C). Somewhat worn, but evidently similar to that of *Tylorhaphe luteopicta* gen. et sp. nov.; diameter ± 195 µm.

Operculum, radula and external anatomy. Unknown.

Habitat

Known only from off-shore habitats and deeper lagoon channels and passes; at depths of 71–100 m; living specimens unknown.

Distribution (Fig. 62)

Known only from New Caledonia (Grande Terre and Loyalty Islands).

Remarks

As with *Tylorhaphe alisae* gen. et sp. nov., my referral of this species to *Tylorhaphe* gen. nov. is provisional as data regarding its radula morphology are wanting. However, conchological features, in particular the ontogeny of the spiral sculpture, the strongly beaded subsutural cord, the angular periphery and the morphology of the umbilical region, are consistent with those of *Tylorhaphe* gen. nov. Its small size, narrow umbilicus without peri-umbilical spiral cords, and distinctive basal colour pattern render it easily separable from other species in the genus. The most similar species, *T. alisae*, has a broader umbilicus bordered by distinct spiral cords, and its umbilical rim does not overhang the underlying umbilical cavity to the same extent.

Tylorhaphe luteopicta gen. et sp. nov.
urn:lsid:zoobank.org:act:EDA653AC-62B0-4D55-A15E-F49763DA184C
Figs 63–65

Diagnosis

Closest to *Tylorhaphe wallacei* gen. et sp. nov., but lacking well-defined axial sculpture and with more distinctly angled periphery; umbilicus also wider and its rim does not overhang the underlying cavity.

Etymology

From the Latin words '*luteus*', yellow, and '*pictus*', painted; in reference to the yellow subsutural blotches.

Material examined

Holotype (Fig. 63A–D)
NEW CALEDONIA – **Grande Terre** • living specimen; north of Île des Pins, Stn CP4688; 22°29′ S, 167°31′ E; depth 278–353 m; 14 Aug. 2016; NO *Alis*-KANACONO leg.; MNHN-IM-2000-38874.

Paratypes
NEW CALEDONIA – **Bellona Plateau** • 2 specimens, living; Bellona Plateau, Stn DW5047; 22°03′ S, 158°48′ E; depth 280–300 m; 23 Sep. 2017; NO *Alis*-KANADEEP leg.; MNHN-IM-2000-38875. – **Grande Terre** • 1 specimen, living; off Île Toupéti, Stn CP3806; 21°42′ S, 166°34′ E; depth 307–309 m; 5 Sep. 2011; NO *Alis*-EXBODI leg.; DNA voucher; MNHN-IM-2009-23261 • 3 specimens, living; south of Île des Pins, Stn CP4674; 22°48′ S, 167°29′ E; depth 302–311 m; 13 Aug. 2016; NO *Alis*-KANACONO leg.; DNA vouchers; MNHN-IM-2013-64730, -68704 and -68912 • 2 specimens, living; same collection data as for preceding; MNHN-IM-2000-38876 • 1 specimen, living; north of Île

des Pins, Stn CP4687; 22°29′ S, 167°30′ E; depth 256–268 m; 14 Aug. 2016; NO *Alis*-KANACONO leg.; DNA voucher; MNHN-IM-2013-63127 • 1 specimen, living, north of Île des Pins, Stn CP4688; 22°29′ S, 167°31′ E; depth 278–353 m; 14 Aug. 2016; NO *Alis*-KANACONO leg.; DNA voucher; MNHN-IM-2013-63115.

SOLOMON ISLANDS • 3 specimens, living; north of Malaita, Stn DW1768; 08°21′ S, 160°42′ E; depth 194–286 m; 28 Sep. 2001; NO *Alis*-SALOMON 1 leg.; MNHN-IM-2000-38877.

Other material

LORD HOWE CHAIN • 1 specimen, dead; Capel Bank, Stn CP4929; 25°07′ S, 159°50′ E; depth 270 m; 3 Sep. 2017; NO *Alis*-KANADEEP leg.; MNHN.

SOLOMON ISLANDS • 11 specimens, dead; north of Malaita, Stn DW1768; 08°21′ S, 160°42′ E; depth 194–286 m; 28 Sep. 2001; NO *Alis*-SALOMON 1 leg.; MNHN.

NEW CALEDONIA – **Grande Terre** • 1 specimen, dead; SW of Île des Pins, Stn DW4702; 22°45′ S, 167°18′ E; depth 290–307 m; 17 Aug. 2016; NO *Alis*-KANACONO leg.; MNHN • 1 specimen, dead; SW of Île des Pins, Stn DW4706; 22°47′ S, 167°24′ E; depth 343–355 m; 17 Aug. 2016; NO *Alis*-KANACONO leg.; MNHN • 1 specimen, dead; south of Île des Pins, Stn DW4672; 22°47′ S, 167°26′ E; depth 290–310 m; 13 Aug. 2016; NO *Alis*-KANACONO leg.; MNHN • 1 specimen, dead; SW of Île des Pins, Stn DW4695; 22°47′ S, 167°27′ E; depth 200–290 m; 15 Aug. 2016; NO *Alis*-KANACONO leg.; MNHN.

Description (Fig. 63)

Shell. Small (diameter up to 6.5 mm), depressed-trochiform (H/D 0.50–0.63); teleoconch of up to 4.75 whorls; periphery sharply angled and keel-like, situated close to mid-whorl; suture level with periphery; base widely umbilicate. First teleoconch whorl rounded with 3–4 spiral lirae, the upper one strongest and strengthening further during second whorl where it delineates a distinct shoulder; remaining lirae evanescing by start of third whorl; early axial sculpture comprising only thin, rather widely-spaced axial threads (in addition to typical umboniine axial microsculpture); these strengthening to become distinct axial pliculae during second whorl, forming beads on shoulder cord; a low subsutural cord arises during third whorl, strengthening rapidly thereafter and developing strong, widely-spaced nodules (Fig. 64A); shoulder cord evanescing during fourth whorl and replaced by a smooth supraperipheral cord lying between periphery and nodular subsutural cord, but slightly closer to periphery; interval between subsutural and supraperipheral cords a broad, bevelled slope, almost flat, with 2–3 secondary cords developing close to subsutural cord; axial sculpture of bevelled slope comprising low, indistinct axial pliculae (sometimes reduced to faint growth-lines only), but more distinct and more close-set immediately prior to outer lip; interval between supraperipheral cord and periphery distinctly concave, mostly smooth, but additional spiral lirae may develop in last half whorl; periphery strongly angled, crested by 2–3 fine spiral lirae. Base with additional low spiral cords below periphery, but its mid-region smooth or with only incised striae between low broad cords; peri-umbilical region with 2–3 strong cords, innermost of which delineates angular umbilical rim; cords pleated or beaded by distinct radiating pliculae; umbilicus relatively broad (± 0.30 of maximum shell diameter) with steep-sided walls bearing fine spiral lirae; funicle lacking. Aperture obliquely D-shaped, peristome interrupted in parietal region; columella pillar slightly thickened, its inner portion with micropustular surface; parietal callus not conspicuously thickened; outer lip descending below periphery immediately prior to insertion, its interior somewhat thickened and sometimes with traces of pustules and in-running ridges; interior otherwise smooth and nacreous with external sculpture evident through transparency; outer lip with shallow subperipheral concavity in mature specimens; thickening of outer lip also evident externally as a slight subterminal swelling; largest individuals may exhibit a similar varix-like swelling at ± 0.3 whorl behind outer lip (Fig. 63E).

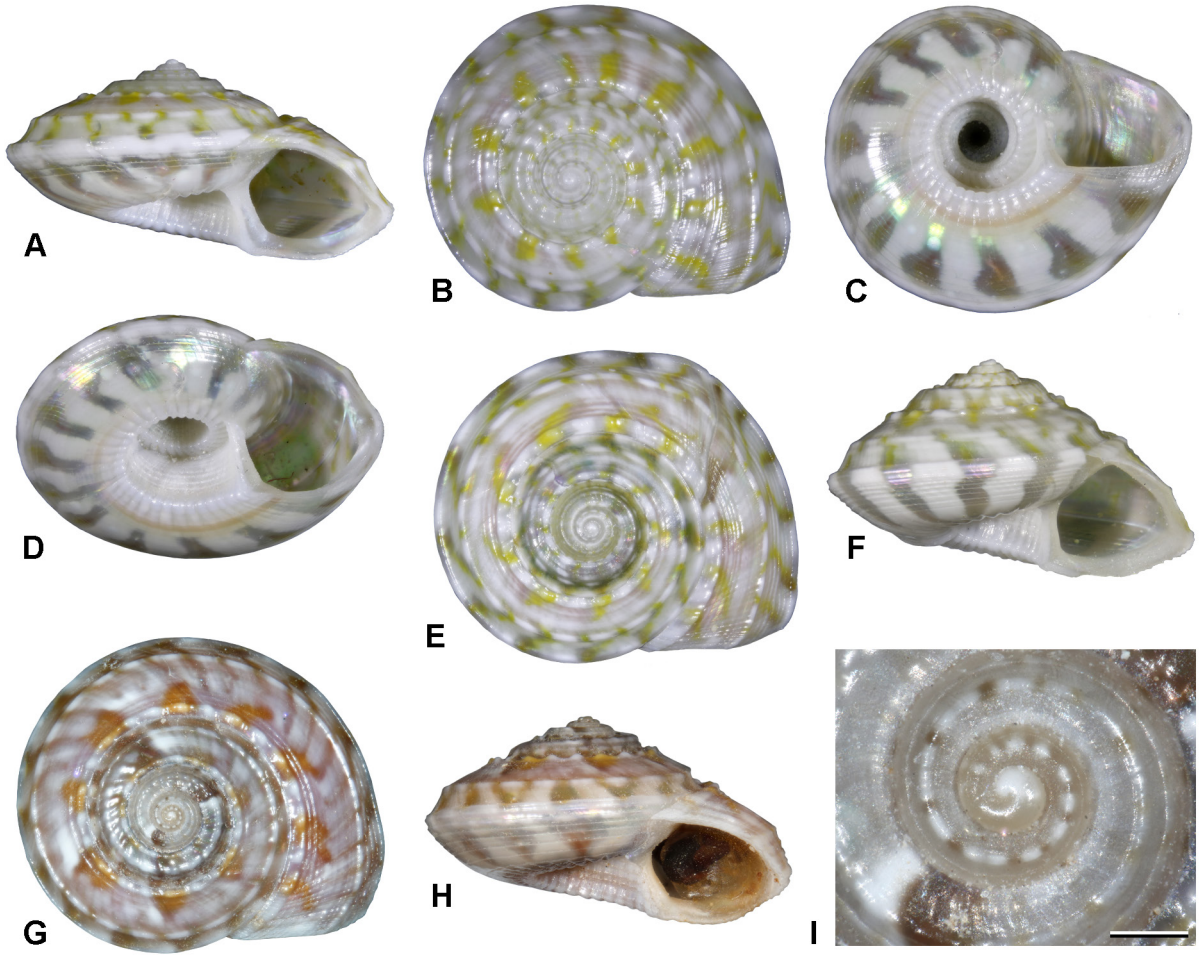

Fig. 63. *Tylorhaphe luteopicta* gen. et sp. nov. **A–D**. Holotype, Île des Pins, Stn CP4688, height 3.0 mm, diameter 5.9 mm (MNHN-IM-2000-38874). **E**. Specimen with additional varix ± 0.3 whorl behind outer lip, Île des Pins, Stn CP4674, diameter 6.3 mm (paratype, MNHN-IM-2000-38876). **F**. Elevated specimen, Chesterfield Plateau, Stn DW5047, height 3.4 mm, diameter 5.4 mm (paratype, MNHN-IM-2000-38875). **G–I**. Solomon Islands specimen with slightly pinkish tint, Stn DW1768, diameter 6.0 mm (paratype, MNHN-IM-2000-38877), scale bar = 250 µm.

Colour. Shell glossy throughout; ground colour whitish, sometimes with a faint pink tinge; colour pattern comprising bright yellowish blotches below suture and at periphery, the two sometimes joined to form axial flames; sometimes also with larger grey-brown blotches; spiral cords with opaque white dots and dashes; base with radiating nacreous or pale brownish blotches separated by white ground colour, peri-umbilical region sometimes with thin, pale brown spiral line; cord at umbilical rim white; apical whorls translucent whitish to pale greyish-white (rarely pinkish), first whorl with a row of opaque white dots at shoulder (Fig. 63I); apical bulb of protoconch opaque white. In specimens from the Solomon Islands the ground colour may have a more distinct pale pinkish wash (Fig. 63G–H).

Dimensions. Holotype, height 3.0 mm, diameter 5.9 mm; largest specimen, diameter 6.5 mm.

Protoconch (Fig. 64B). Typically umboniine, diameter ± 195–210 µm; apical beak present and confluent with terminal lip; apical bulb mostly worn, but with traces of an irregular network of fine threads; terminal lip weakly convex and slightly thickened.

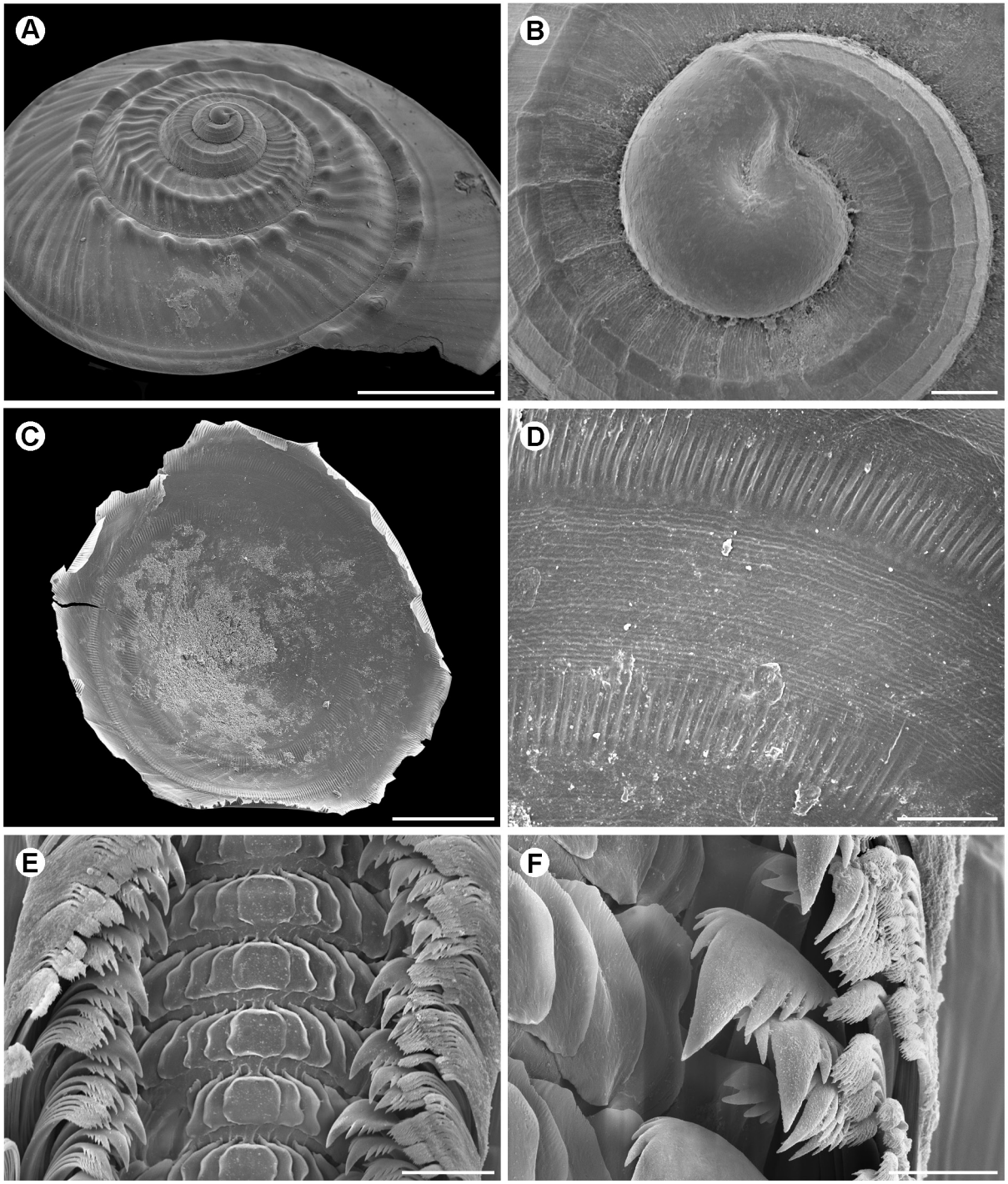

Fig. 64. *Tylorhaphe luteopicta* gen. et sp. nov. **A**. Oblique view of apical whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum showing microscopic spiral sculpture. **E**. Radula, half row. **F**. Radula, latero-marginal transition. A–B. Solomon Islands, north of Malaita, Stn DW1768 (paratype, MNHN-IM-2000-38877). C–F. New Caledonia, south of Île des Pins, Stn CP4674 (paratype, MNHN-IM-2000-38876). Scale bars: A = 1.0 mm; B, E = 50 µm; C = 0.5 mm; D = 100 µm; F = 20 µm.

Operculum (Fig. 64C–D). Corneous; multispiral; peripheral fringe radially striate; radial striations remaining where whorls overlap; surface with distinct spiral microsculpture.

Radula (Fig. 64E–F). Formula ∞+(1)+5+1+5+(1)+∞, with 30–35 transverse rows of teeth; teeth of central field reduced, but base-plates remaining moderately robust; rachidian base-plate broad, roundly quadrate; base-plates of lateral teeth progressively more trigonal, expanded and bluntly rounded basally, extensively overlapping and with outer anterior edge somewhat raised; fifth lateral more quadrate. Innermost marginal transitional, base-plate robust, shaft reduced, cusp with approx. 5 small denticles of similar size; second marginal clearly the largest tooth, with robust cusp bearing large triangular central denticle with 3–5 smaller denticles at its base on each side; cusps of subsequent marginals similar, but progressively smaller and more finely denticulate.

External anatomy (from rehydrated specimen). Head with distinct forehead between cephalic tentacles; snout moderately long, cylindrical, distally papillate; cephalic lappets not evident; cephalic tentacles long and slender, micropapillate, eyestalks long, their tips conspicuously expanded and containing large black eyes; left neck-lobe small, digitate; right neck-lobe rolled to form exhalant siphon; epipodial tentacles micropapillate, number on each side not determined, epipodial sense organs evident; propodium indented in mid-line with a lateral propodial lobe on each side; foot flattened with broad sole, tapering posteriorly. Head-foot translucent cream-white with some opaque white pigmentation on snout, eyestalks, propodial lobes, sides of foot and metapodium.

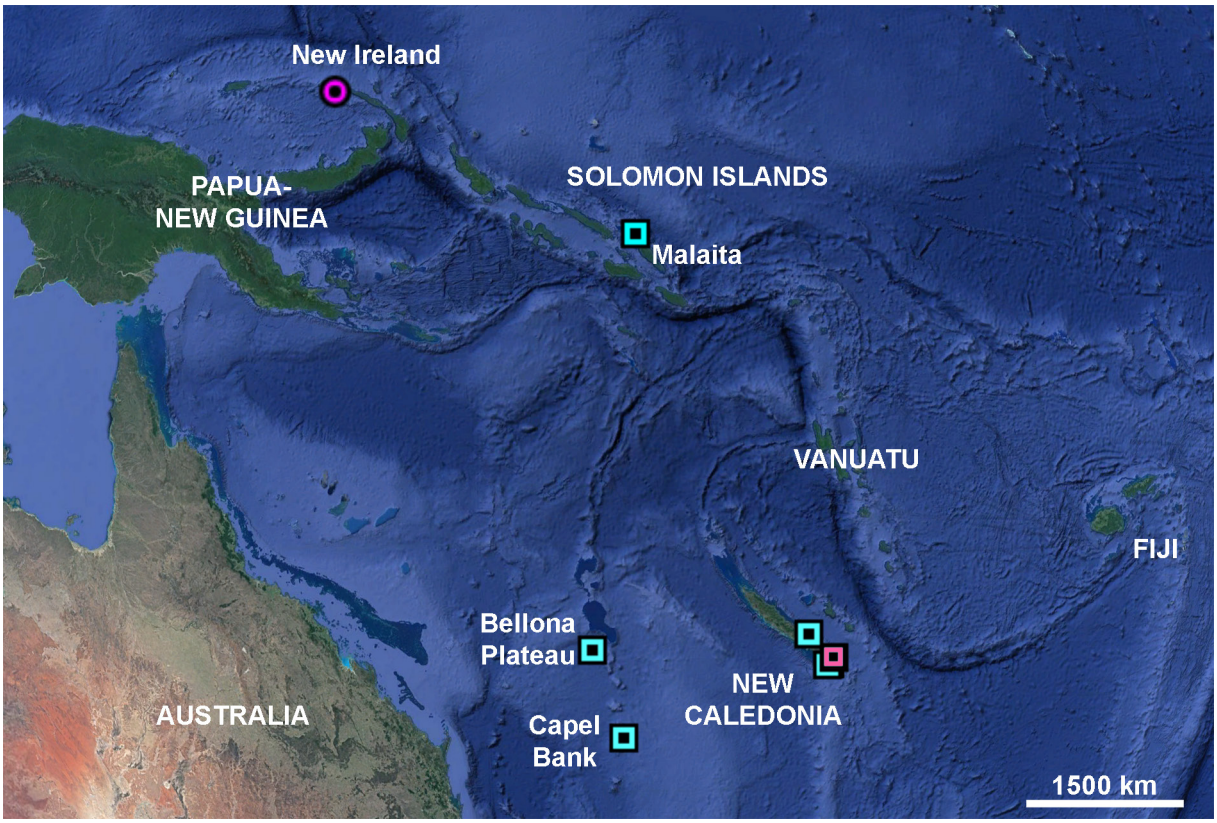

Fig. 65. Map showing the distribution of *Tylorhaphe luteopicta* gen. et sp. nov. (squares) and *T. wallacei* gen. et sp. nov. (circle). Type localities indicated in pink.

Habitat

Living specimens at depths of 268–307 m (empty shells 268–343 m); details of substratum not recorded.

Distribution (Fig. 65)

Known from the northern Lord Howe Ridge to New Caledonia and the Solomon Islands.

Remarks

Resembles *Tylorhaphe wallacei* gen. et sp. nov., but lacks the finely beaded, reticulate sculpture, thickened and extended parietal callus lobe and narrow alternating axial colour pattern of that species. In addition, the periphery of *T. luteopicta* gen. et sp. nov. is more distinctly keeled, the interval between the periphery and supraperipheral cord is smooth and more concave, and the umbilicus is broader (± 0.30 vs 0.22 of maximum shell diameter) and its rim is less overhanging.

Tylorhaphe wallacei gen. et sp. nov.
urn:lsid:zoobank.org:act:1FC6F4A9-1000-4B89-8C68-C22A43FE818D
Figs 65–67

Diagnosis

Closest to *Tylorhaphe luteopicta* gen. et sp. nov., but with stronger sculpture, including distinct axial pliculae; periphery less strongly angled; umbilicus narrower, its rim with a strong spiral cord that overhangs the underlying cavity.

Etymology

I take pleasure in naming this remarkably beautiful species in honour of Alfred Russel Wallace (1823–1913), in recognition of his pioneering contribution to biogeography and evolutionary biology.

Material examined

Holotype (Fig. 66)

PAPUA NEW GUINEA • living specimen; New Ireland, south of Selapiu Island, Stn DW4473; 02°43′ S, 150°36′ E; depth 93–149 m; 4 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN-IM-2000-38878.

Paratypes

PAPUA NEW GUINEA – **New Ireland** • 9 specimens, living; south east of Selapiu Island, Stn DW4467; 02°44′ S, 150°35′ E; depth 213–287 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN-IM-2000-38879 • 1 specimen, living; same data as for holotype; DNA voucher; MNHN-IM-2023-58751 • 6 specimens, living; same data as for holotype; MNHN-IM-2000-38880 • 2 specimens, living; south of Selapiu Island, Stn DW4462; 02°43′ S, 150°36′ E; depth 90–201 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; DNA vouchers; MNHN-IM-2013-58616 and -58617 • 1 specimen, living; south of Selapiu Island, Stn DW4466; 02°43′ S, 150°36′ E; depth 204–272 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; DNA voucher; MNHN-IM-2023-58916 • 5 specimens, living; south of Selapiu Island, Stn DW4474; 02°43′ S, 150°36′ E; depth 90–185 m; 4 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN-IM-2000-38881.

Other material

PAPUA NEW GUINEA – **New Ireland** • 37 specimens, living; south of Selapiu Island, Stn DW4472; 02°43′ S, 150°36′ E; depth 87–144 m; 4 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN • 26 specimens, living; south of Selapiu Island, Stn DW4465; 02°43′ S, 150°36′ E; depth 90–228 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN • 2 specimens, living; south of Selapiu Island, Stn DW4462; 02°43′ S,

150°36′ E; depth 90–201 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN • 1 specimen, living; south of Selapiu Island, Stn DW4466; 02°43′ S, 150°36′ E; depth 204–272 m; 3 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN • 29 specimens, living; south of Selapiu Island, Stn DW4474; 02°43′ S, 150°36′ E; depth 90–185 m; 4 Sep. 2014; NO *Alis*-KAVIENG 2014 leg.; MNHN.

Description (Fig. 66)

Shell. Small (diameter up to 6.7 mm), depressed-trochiform (H/D 0.57– 0.6); teleoconch of up to 5.0 whorls; periphery roundly angled, situated just below mid-whorl; suture slightly above periphery; base umbilicate, somewhat flattened. First teleoconch whorl rounded with circa three indistinct spiral cords; shoulder develops and strengthens during second and third whorl; two strong cords arise near end of third whorl, one subsutural the other supraperipheral; subsutural cord initially beaded by prosocline subsutural pliculae, but beading progressively stronger with growth and last whorl with strong nodules on subsutural cord; supraperipheral cord remaining more finely beaded, beads aligned with axial pliculae; interval between subsutural and supraperipheral cords a broad, bevelled slope, almost flat, sculptured with finer secondary cords and further intermediaries, initially few but becoming more numerous and more close-set with growth, up to 10 on last whorl; bevelled slope with distinct, close-set, strongly prosocline pliculae which become finer and even more close-set on last whorl; interaction of spiral and axial element producing a finely beaded reticulation; circa three peripheral spiral cords at start of last whorl.

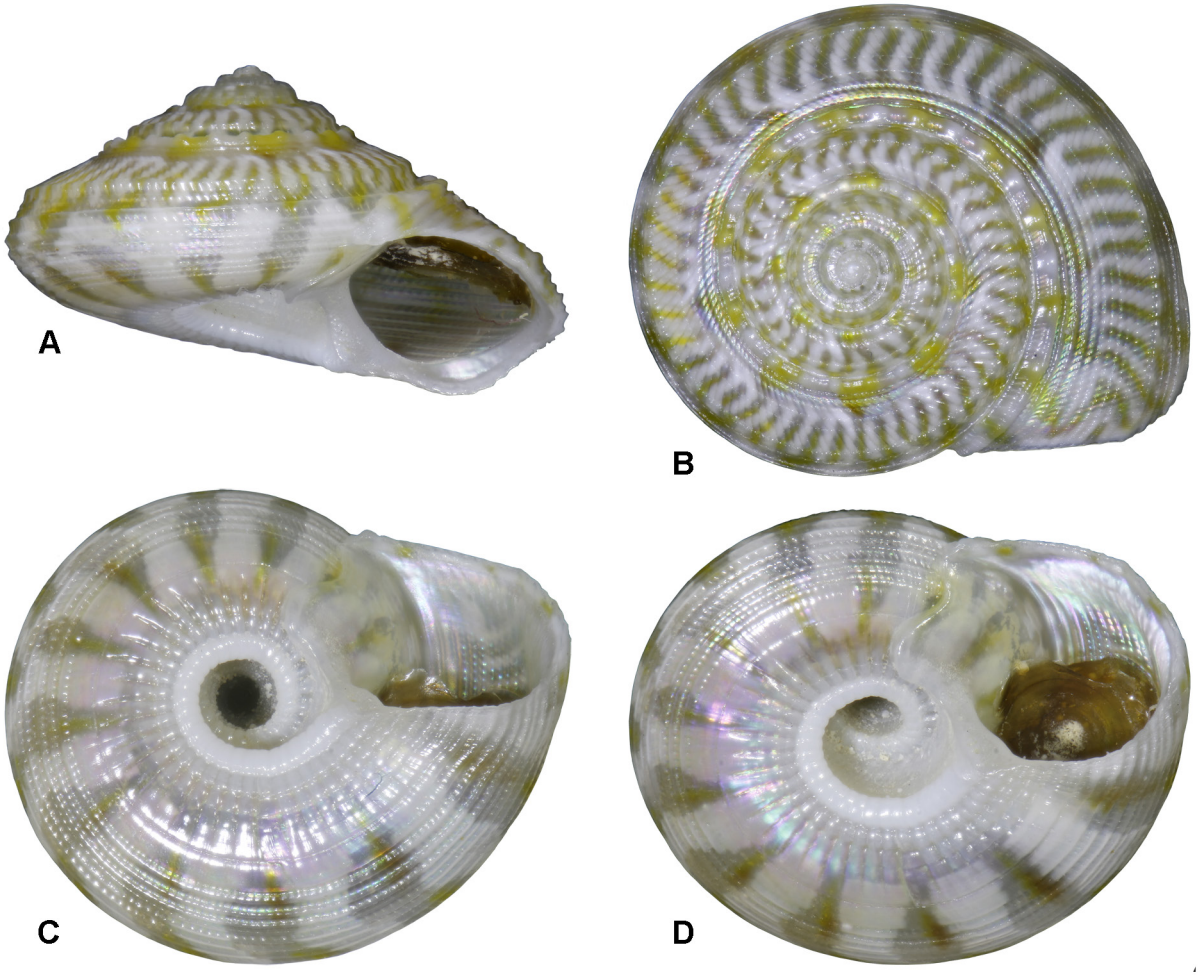

Fig. 66. *Tylorhaphe wallacei* sp. nov. holotype, off Selapiu Island, New Ireland, Papua New Guinea, Stn DW4473, height 3.8 mm, diameter 6.5 mm (MNHN-IM-2000-38878).

Base with similar, but finer cords, all with pliculate intervals; spiral sculpture usually weaker in mid-region of base (not always), but strengthens considerably toward umbilicus with 2–4 strong cords, innermost of which is largest and forms umbilical rim; all peri-umbilical cords rendered nodular by strong axial pliculae radiating from umbilicus. Umbilicus relatively narrow (± 0.22 of maximum shell diameter), steep-sided and deep; its walls retaining traces of spiral and axial sculpture, and overhung by cord at umbilical rim; funicle lacking. Aperture roundly quadrate; peristome interrupted in parietal region; columella pillar thick with a slight basal swelling and micropustular surface; parietal lip thickened with callus and extending outward as a rounded lobe above insertion of columella; surface of lobe microshagreened sometimes with indistinct in-running ridges in the most mature individuals; edge of lobe slightly thickened and with a step-like drop to underside of preceding whorl; outer lip descending steeply immediately prior to its insertion, its interior somewhat thickened and with traces of in-running ridges; interior otherwise smooth and nacreous with external sculpture evident through transparency; outer lip with shallow subperipheral concavity in mature specimens; thickening of outer lip also evident externally as a slight subterminal swelling.

Colour. Shell glossy throughout; colour pattern comprising bold bright yellowish subsutural blotches; bevelled slope with alternating yellowish and opaque white axial lines; bolder blotches in similar colours at periphery and extending onto base in a radiating pattern; peri-umbilical region white; apical whorls translucent whitish to pale yellowish-grey, first whorl with a row of opaque white dots at shoulder; apical bulb of protoconch opaque white; yellow colour may turn a pale apricot-brown *post mortem* in some individuals.

Dimensions. Holotype, height 3.8 mm, diameter 6.5 mm; largest specimen, diameter 6.7 mm.

Protoconch (Fig. 67B). As in *Tylorhaphe luteopicta* gen. et sp. nov., but slightly larger, diameter 220–230 μm.

Operculum (Fig. 67C–D). Corneous; multispiral; peripheral fringe radially striate; radial striations remaining where whorls overlap; surface with distinct spiral microsculpture.

Radula (Fig. 67E–F). Very similar to that of *Tylorhaphe luteopicta* gen. et sp. nov.; cusp of transitionary innermost marginal trigonal with three small pointed denticles; second marginal clearly the largest tooth, its cusp with a strong triangular central denticle bearing smaller lateral denticles at its base on both sides.

External anatomy (from rehydrated specimens, condition poor). Head with distinct forehead between cephalic tentacles; snout moderately long, cylindrical, distal third bearing long slender papillae; cephalic lappets not evident; cephalic tentacles long and slender, micropapillate, eyestalks long, their tips conspicuously expanded and containing large black eyes; left neck-lobe small, digitate; right neck-lobe rolled to form exhalant siphon; details of epipodial structure not clear; foot evidently broad with lateral propodial lobes on each side, tapering posteriorly. Head-foot translucent cream-white with some opaque white pigmentation on snout, eyestalks, right neck-lobe, sides of foot, and metapodium.

Habitat

Dredged on muddy sand; at depths of 144–213 m (living specimens the same).

Distribution (Fig. 65)

Known only from off the southern coast of Selapiu Island, New Ireland, Papua New Guinea [Bismarck Sea]. Although dredging at similar depths was undertaken at other localities off north-western New Ireland, this species was only collected in this very limited area. Nevertheless, at this locality the species appears moderately abundant.

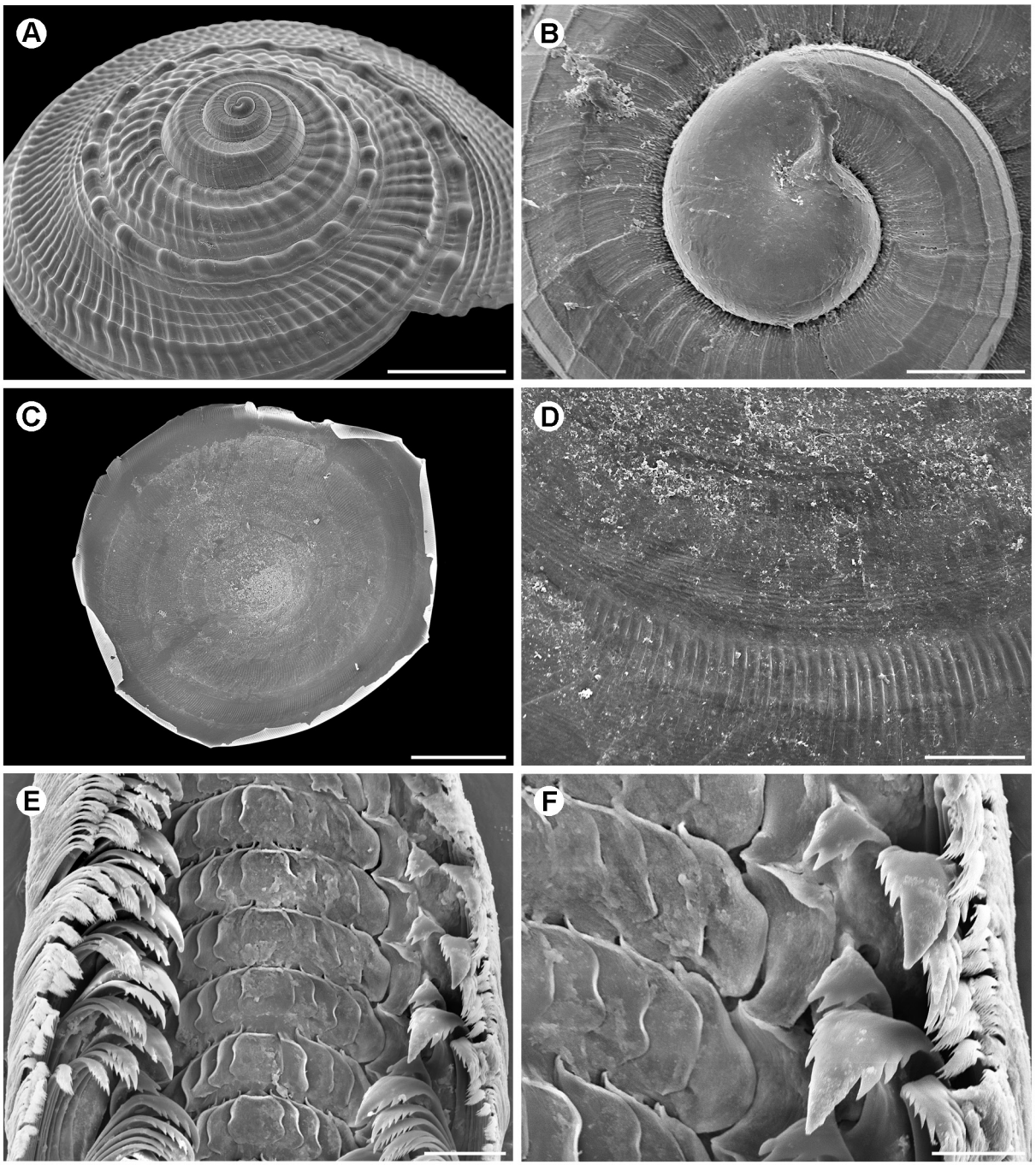

Fig. 67. *Tylorhaphe wallacei* gen. et sp. nov., Selapiu Island, New Ireland. **A**. Oblique view of apical whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum showing microscopic spiral sculpture. **E**. Radula, entire width. **F**. Radula, latero-marginal transition. A–B. Stn DW4474 (paratype, MNHN-IM-2000-38881). C–F. Stn DW4473 (paratype, MNHN-IM-2000-38880). Scale bars: A = 1.0 mm; B, D = 100 µm; C = 0.5 mm; E = 50 µm; F = 25 µm.

Remarks

A highly distinctive, sculpturally ornate species. Most similar to *Tylorhaphe luteopicta* gen. et sp. nov.

Genus ***Vanitrochus*** Iredale, 1929

Vanitrochus Iredale, 1929a: 272, 294.

Type species

Solariella tragema Melvill & Standen, 1897 (original designation), Recent, New Caledonia.

Diagnosis

Shell very small (height up to 3.0 mm), elevated turbiniform, whorls rounded or weakly shouldered; sculpture of spiral cords crossed by axial riblets producing fine, regular cancellation; umbilicus open, margin rounded, funicle lacking; outer lip simple, its interior smooth.

Operculum corneous, multispiral, but outer whorls relatively broad and with long growing margin; peripheral fringe broad, with well-developed radial striation; spiral microsculpture distinct.

Rachidian and lateral teeth with laterally rounded, extensively overlapping base-plates; inner marginal tooth transitional, lacking cusp; cusps of marginals 2–5 large, somewhat palmate, with ±5 slender, acuminate denticles, middle one slightly larger.

Remarks

Two species of *Vanitrochus* occur in New Caledonia. Whilst they are similar, they can be readily distinguished using shell characters (details given below). *Vanitrochus tragema* is usually found in the more sandy portions of the lagoon nearer to the barrier reef, whereas *V. semiustus* (Fischer, 1879) is more frequent in muddy and silty environments in the nearshore parts of the lagoon and near mangrove habitats at river mouths. They have not been found alive at the same sampling stations. Both exhibit a strong 'swimming' escape response.

Vanitrochus species are infaunal, and are able to burrow rapidly into the soft surface sediment layer. Hickman (2008) documented an undescribed tropical Western Australian *Vanitrochus* species living in coarse grained skeletal carbonate substrata, feeding by epipsammic browsing on the microbiome coating the sediment grains.

Two species currently referred to *Conotalopia* Iredale, 1929 may also ultimately prove to belong to *Vanitrochus* – *Conotalopia ornata* (G.B. Sowerby III, 1903) and *C. singaporensis* (Pilsbry, 1889). They show little resemblance to the type species of *Conotalopia*, *Minolia henniana* Melvill, 1891 (Fig. 78H–K).

Vanitrochus semiustus (Fischer, 1879)

Figs 68–70, 71A, 72A, C–D

Trochus (*Minolia*) *semiustus* Fischer, 1879: 23. Type locality: Ouagap and Kua-Kue, Grande Terre, New Caledonia.

Trochus (*Minolia*) *semiustus* – Fischer 1886: 73, pl. 1 fig. 6.
Monilea (*Minolia*) *semiusta* – Pilsbry 1889–90: 270, pl. 41 fig. 36.
Vanitrochus semiustus – Iredale 1929a: 272, 295. — Alldredge & King 1977.

Material examined

Syntypes

NEW CALEDONIA – **Grande Terre** • 30 specimens, Ouagap and Kua-Kue; MNHN-IM-2000-31305. (https://science.mnhn.fr/institution/mnhn/collection/im/item/2000-31305)

Other material

NEW CALEDONIA – **Grande Terre, Ouégoa** • 1 specimen, living; LPR-NC Diahot, Stn KD589; 20°16.5′ S, 164°17.7′ E; depth 1 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sédiment sombre sablo-vaseux à *Halophila*; DNA voucher; MNHN-IM-2019-10162 • ±100 specimens, living; environs of Diahot estuary, Stn KD590; 20°16.6′ S, 164°18.2′ E; depth 1 m; 23 Nov. 2019; KOUMAC 2.3 leg.; sédiment sombre sablo-vaseux à *Halophila*; MNHN • 4 specimens, living; LPR-NC Diahot estuary, Stn KR981; 20°16.9′ S, 164°18.3′ E; depth unknown; 22 Nov. 2019; KOUMAC 2.3 leg.; DNA vouchers; MNHN-IM-2019-10140 (image PM832), -10143, -10144 and -10145. – **Grande Terre, Koumac** • 17 specimens, dead; Paagoumène, Stn 1289; 20°29.2′ S, 164°10.2′ E; 0 m; Oct. 1993; Expédition Montrouzier leg.; marée, platier avec blocs; MNHN • 2 specimens, living; Stn KD539; 20°34.1′ S, 164°10.6′ E; depth 11 m; 6 Nov. 2019; KOUMAC 2.3 leg.; algues brunes, éponges; MNHN • 2 specimens, dead; Stn KD556; 20°32.9′ S, 164°12.2′ E; depth 5–6 m; 11 Nov. 2019; KOUMAC 2.3 leg.; sable gris; MNHN • 1 specimen, dead; Stn KB629; 20°35.5′ S, 164°12.9′ E; depth 10 m; 7 Nov. 2019; KOUMAC 2.3 leg.; patch corallien de fond sableux lagonaire; MNHN • 3 specimens, living; Stn KS510; 20°34.3′ S, 164°13.5′ E; depth 10 m; 6 Nov. 2019; KOUMAC 2.3 leg.; dalle ensablée à gorgones, caulerpes, de lagon; MNHN • 1 specimen, dead; Stn KD505; 20°34.3′ S, 164°15.2′ E; depth 2 m; 29 Oct. 2019; KOUMAC 2.3 leg.; sablo-vaseux coquillé; MNHN • 1 specimen, dead; Chenal de la Passe de Koumac, Stn 1314; 20°39.8′ S, 164°15.3′ E; depth 30–63 m; Oct. 1993; Expédition Montrouzier leg.; sable coquillier vaseux; MNHN • 1 specimen, living; Stn KD548; 20°40.3′ S, 164°15.7′ E; depth 11 m; 10 Nov. 2019; KOUMAC 2.3 leg.; sable gris et éponges; DNA voucher, photographed alive (image LC474); MNHN-IM-2019-8510 • 100+ specimens, living; Anse de Koumac [Baie de Ouanap], Stn 1277; 20°34.0′ S, 164°16.0′ E; depth 0–2 m; Oct. 1993; Expédition Montrouzier leg.; fonds meubles, herbiers; MNHN • 5 specimens, dead; Anse de Koumac [Baie de Ouanap], Stn 1278; 20°34.0′ S, 164°16.0′ E; depth 0–2 m; Oct. 1993; Expédition Montrouzier leg.; fonds durs; MNHN • 7 specimens, living; Koumac [Pandop] marina, Stn KS513; 20°34.9′ S, 164°16.4′ E; depth 4 m; 18 Nov. 2019; KOUMAC 2.3 leg.; vase; DNA vouchers; MNHN-IM-2019-9565 (image PM710) and -9566 • 1 specimen, living; Stn KB667; 20°39.5′ S, 164°17′ E; depth 1 m; 22 Nov. 2019; KOUMAC 2.3 leg.; herbier de phanérogames sur platier sableux de récif intermédiaire; DNA voucher; MNHN-IM-2019-10142 • 11 specimens, living; Stn KD557; 20°41.4′ S, 164°17.1′ E; depth 4–5 m; 11 Nov. 2019; KOUMAC 2.3 leg.; sable grossier, algues brunes, holothuries; MNHN • 1 specimen, dead; Stn KD551; 20°42.2′ S, 164°18.2′ E; depth 6 m; 10 Nov. 2019; KOUMAC 2.3 leg.; algues brunes; MNHN • 1 specimen, dead; Stn KB625; 20°46.2′ S, 164°22.6′ E; depth 3–4 m; 6 Nov. 2019; KOUMAC 2.3 leg.; fond vaseux à caulerpe, tombant de platier de récif frangeant; MNHN. – **Grande Terre, Touho** • 8 specimens, dead; Anse de Tiouandé, Stn 1267; 20°43.4′ S, 165°02.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 50+ specimens, living; parages de la Thiem, Stn 1268; 20°45.2′ S, 165°08.0′ E; depth 9–11 m; Sep. 1993; Expédition Montrouzier leg.; sable fin; MNHN • 30+ specimens, living; abords de la Baie de Touho, Stn 1251; 20°46.0′ S, 165°13.0′ E; depth 6–15 m; Sep. 1993; Expédition Montrouzier leg.; vase, sable, herbiers; MNHN • 1 specimen, dead; Banc de Touho, Stn 1259; 20°44.6′ S, 165°13.7′ E; depth 15–35 m; Sep. 1993; Expédition Montrouzier leg.; tombants avec limon; MNHN • 100+ specimens, living; Baie de Touho, Stn 1250; 20°46.7′ S, 165°13.7′ E; depth 3–6 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse; MNHN • 4 specimens, dead; Baie de Touho, Stn 1237; 20°46.9′ S, 165°13.8′ E; depth 0–1 m; Sep. 1993; Expédition Montrouzier leg.; sable fin et herbiers abrités; MNHN • 14 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1264; 20°44.5′ S, 165°15.9′ E; depth 8 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse, dôme détritique; MNHN. – **Grande Terre, Nouméa** • 3 specimens, dead; off Nouville, Stn 1345; 22°16.1′ S, 166°23.7′ E; depth 15 m; 1 Oct. 1992; P. Bouchet leg.; sable

grossier sous vase limoneuse, herbiers; MNHN • 40 specimens, living; Anse aux Boeufs, Stn 1500; 22°16.06′ S, 166°25.4′ E; depth 4–6 m; 21 Oct. 2000; Cosel and Trondlé leg.; MNHN • 6 specimens, dead; Baie des Citrons; 22°18.06′ S, 166°26.07′ E; depth 1–5 m; 17 Feb. 2002; Claude Berthault leg.; MNHN • 2 specimens, dead; Baie des Citrons; 22°18.06′ S, 166°26.07′ E; depth 1–5 m; 21 Mar. 2002; Claude Berthault leg.; MNHN • 20+ specimens, dead; Baie des Citrons; 22°17.5′ S, 166°26.2′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 60+ specimens, living; Anse Vata; 22°18.1′ S, 166°26.4′ E; depth 1–5 m; 1987–2007; Claude Berthault leg.; MNHN • 1 specimen, dead; Baie de Sainte Marie – Îlot Uéré; 22°18.5′ S, 166°28.3′ E; depth 0–3 m; 1995-2003; Claude Berthault leg.; MNHN.

Description (Figs 68, 71)

Shell. Closely resembles that of *V. tragema* and is of similar size (height up to 3.0 mm). However, in *V. semiustus* the whorls are more rounded with almost no shoulder (compare Fig. 71A and B). Additionally, the uppermost spiral cord is of similar size to the other cords (Fig. 69A) and the axial pliculae are not as coarse as they are in *V. tragema*.

Colour. In terms of coloration, the shell of *V. semiustus*, although very variably patterned, is usually considerably more heavily pigmented than that of *V. tragema*; commonly with a darker band below the suture and at the periphery, broken up by pale spots; base also often with a spiral band of whitish blotches; some specimens with a paler ground, variously patterned or mottled with darker spots, blotches and axial bands. Interior nacre distinct.

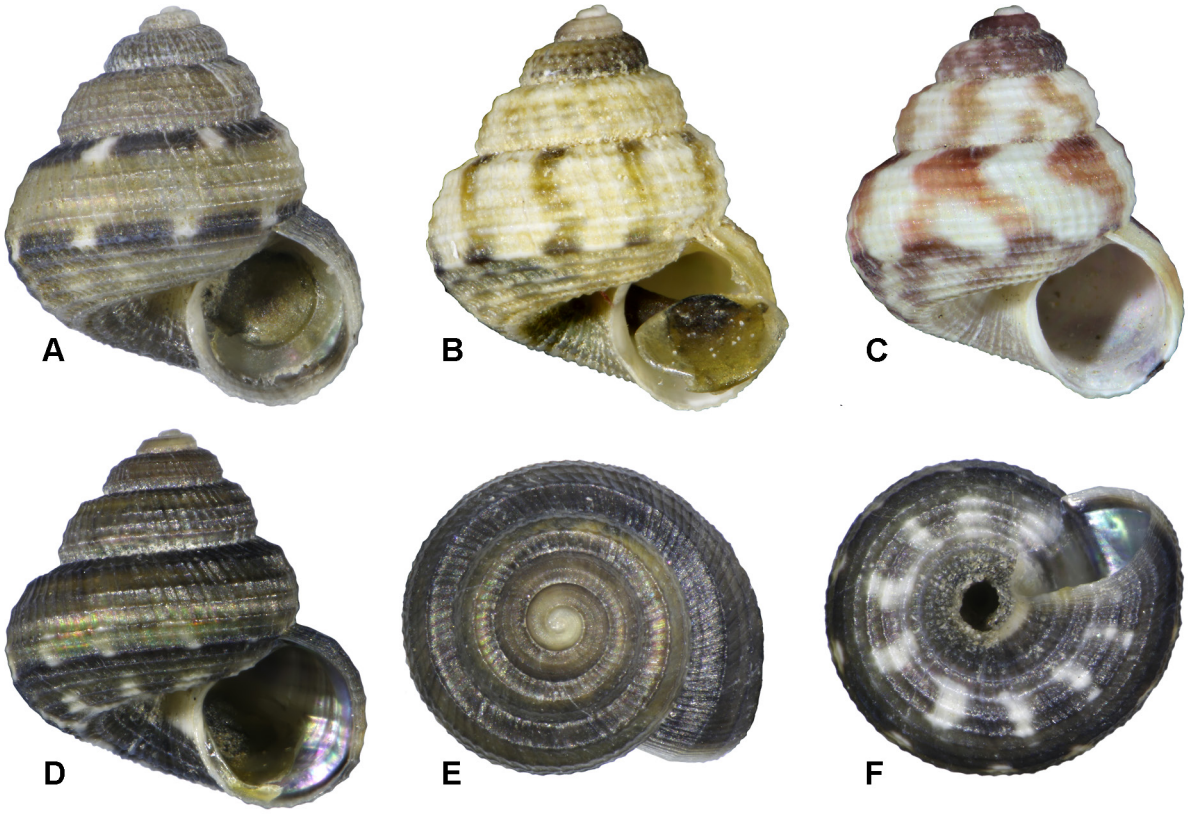

Fig. 68. *Vanitrochus semiustus* (Fischer, 1879) (all MNHN). **A**. Height 2.7 mm, diameter 2.35 mm. **B**. Height 2.8 mm, diameter 2.35 mm. **C**. Height 2.9 mm, diameter 2.5 mm. **D–F**. Height 2.9 mm, diameter 2.7 mm. A, D–F. Ouégoa, environs of Diahot estuary, Stn KD590. B. Koumac, Stn KD557. C. Nouméa, Anse Vata.

Protoconch (Fig. 69B). Typically umboniine, diameter ± 170 µm; apical beak present and confluent with terminal lip; apical bulb sculptured with an irregular network of threads, almost hexagonal in places, remainder with distinct subspiral threads; terminal lip weakly convex.

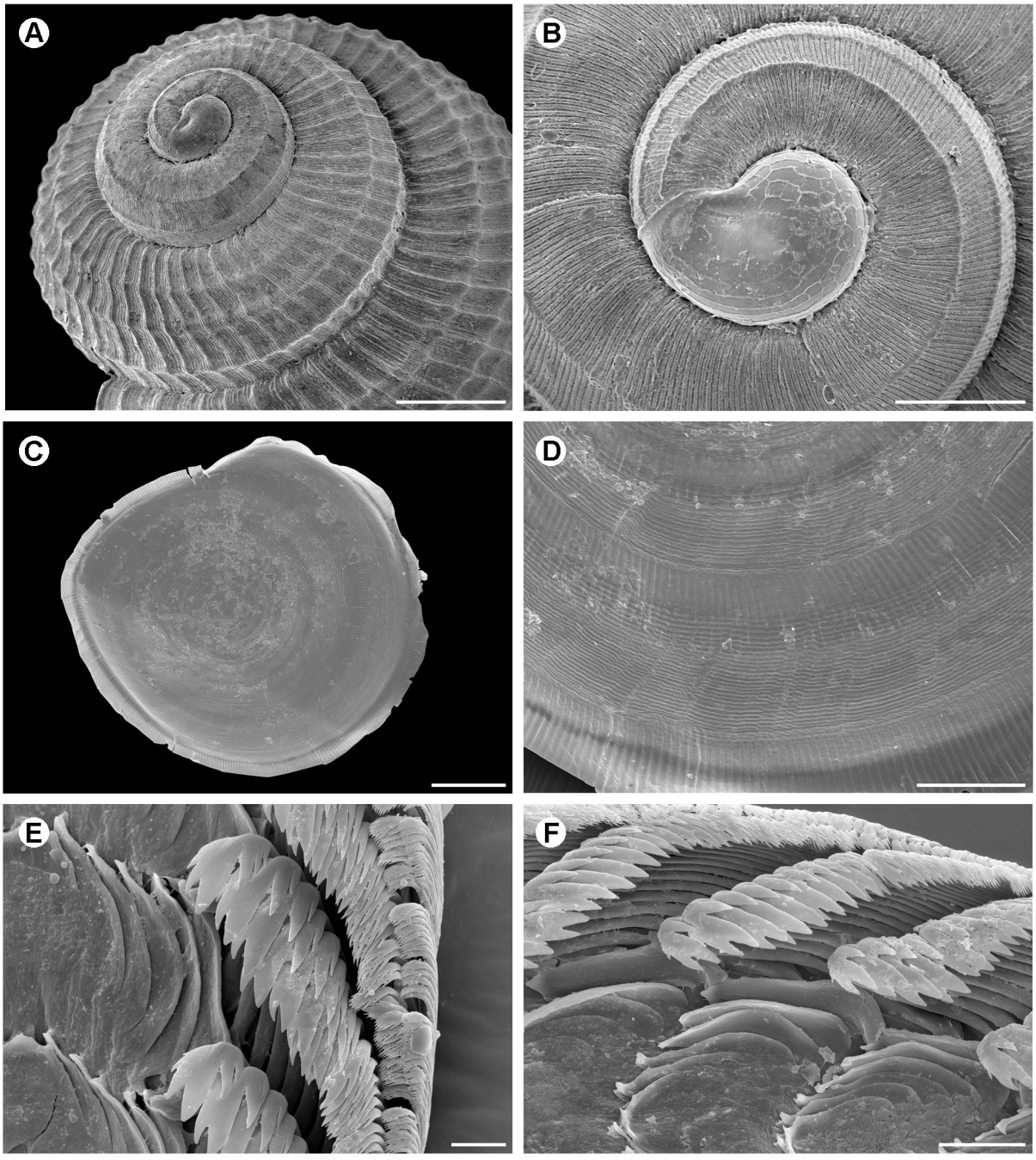

Fig. 69. *Vanitrochus semiustus* (Fischer, 1879) (all MNHN). **A**. Oblique view of apical whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum to show microscopic spiral threads. **E**. Radula half row. **F**. Radula, oblique view of later-marginal transition. A–B. Koumac, Stn KD557. C–F. Ouégoa, Stn KD590. Scale bars: A = 250 µm; B, D = 100 µm; C = 200 µm; E = 10 µm; F = 20 µm.

Operculum (Fig. 69C–D). Corneous, multispiral, but with rather few whorls and with relatively long growing margin; peripheral fringe broad and with microscopic radial striation; spiral microsculpture distinct.

Radula (Fig. 69E–F). As in *V. tragema* below.

External anatomy (mostly from rehydrated specimens, augmented by photographs of living specimens, Fig. 72A–B). Head with distinct forehead between cephalic tentacles; snout moderately long, with subterminal papillae; cephalic tentacles long and slender, micropapillate, right and left of similar size; eyestalks long and up-turned, their tips expanded and containing large black eyes; left neck-lobe comprising 4–6 non-papillate, digit-like projections; right neck-lobe well developed, rolled to form exhalant siphon; four micropapillate epipodial tentacles on each side, each with a dark, stalked epipodial sense organ near base; epipodial sense organs could not be discerned beneath neck-lobes; propodium slightly indented in mid-line with a small lateral propodial lobe on each side; foot flattened with broad sole, tapering posteriorly. Head-foot mostly pale translucent white with scattered opaque cream-white pigment spots; forehead and snout with some blackish pigmentation, sometimes also in columellar region above epipodium; cephalic and epipodial tentacles with white transverse bands of spots; epipodial sense organs dark.

Habitat

Mostly associated with muddy substrata, seagrasses and algae, in the inner portions of the lagoon and near estuarine habitats; living specimens at depths of 1–11 m, empty shells washing to 30 m or more in lagoon passes.

Distribution (Fig. 70)

Recorded only from New Caledonia (Grande Terre) and Queensland (Iredale 1929a).

Fig. 70. Map of Grande Terre showing the distribution of *Vanitrochus semiustus* (P. Fisher, 1879) in New Caledonia. Type locality indicated in pink.

Remarks

Minolia padangensis Thiele, 1925 from the west coast of Sumatra closely resembles *V. semiustus*, but Thiele considered the latter to have a different colour pattern and somewhat coarser sculpture. Given that *V. semiustus* exhibits considerable variation in colour and pattern, the significance of these differences needs to be re-evaluated. In any event, Thiele's species is clearly not referable to *Minolia* A. Adams, 1860 [Solariellidae] and should instead be referred to *Vanitrochus*.

Another similar species is *Cyclostoma* (*Japonia*) *musiva* Gould, 1859, a poorly known species thought to be from Japan and currently believed to be a terrestrial species referable to *Japonia* Gould, 1859 (Cyclophoridae) (MolluscaBase 2024). However, although similar, the lectotype of *C. musiva* at MCZ (Malacology 169253) is twice the size of *V. semiustus* (height >6.0 mm). (https://mczbase.mcz.harvard.edu/guid/MCZ:Mala:169253).

Alldredge & King (1977) recorded this species from Lizard Island, Queensland, although their observation that it occurred predominantly in coarse sand in the deep lagoon suggests that the material was in fact *V. tragema*.

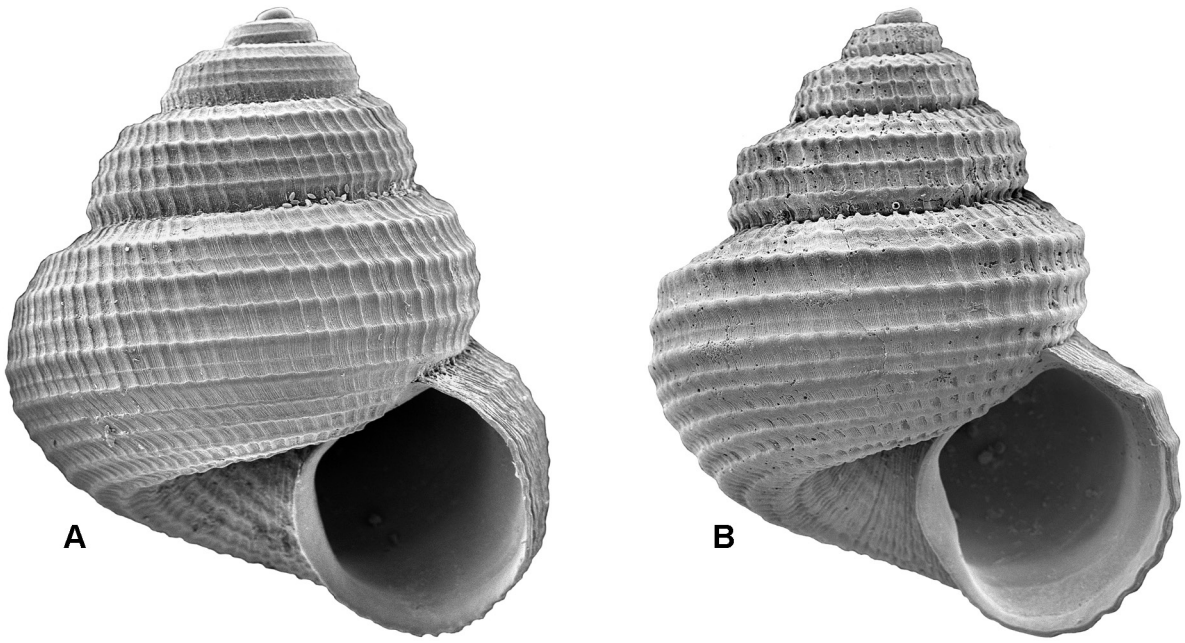

Fig. 71. Comparison of shells of New Caledonian *Vanitrochus* species. **A**. *V. semiustus* (Fischer, 1879), Koumac, Stn KD557 (MNHN). **B**. *V. tragema* (Melvill & Standen, 1896), Lifou, Stn 1413 (MNHN). Note more rounded whorls of *V. semiustus* and shouldered whorls of *V. tragema* with stronger spiral cords. Dimensions of both, height 2.7 mm, diameter 2.3 mm.

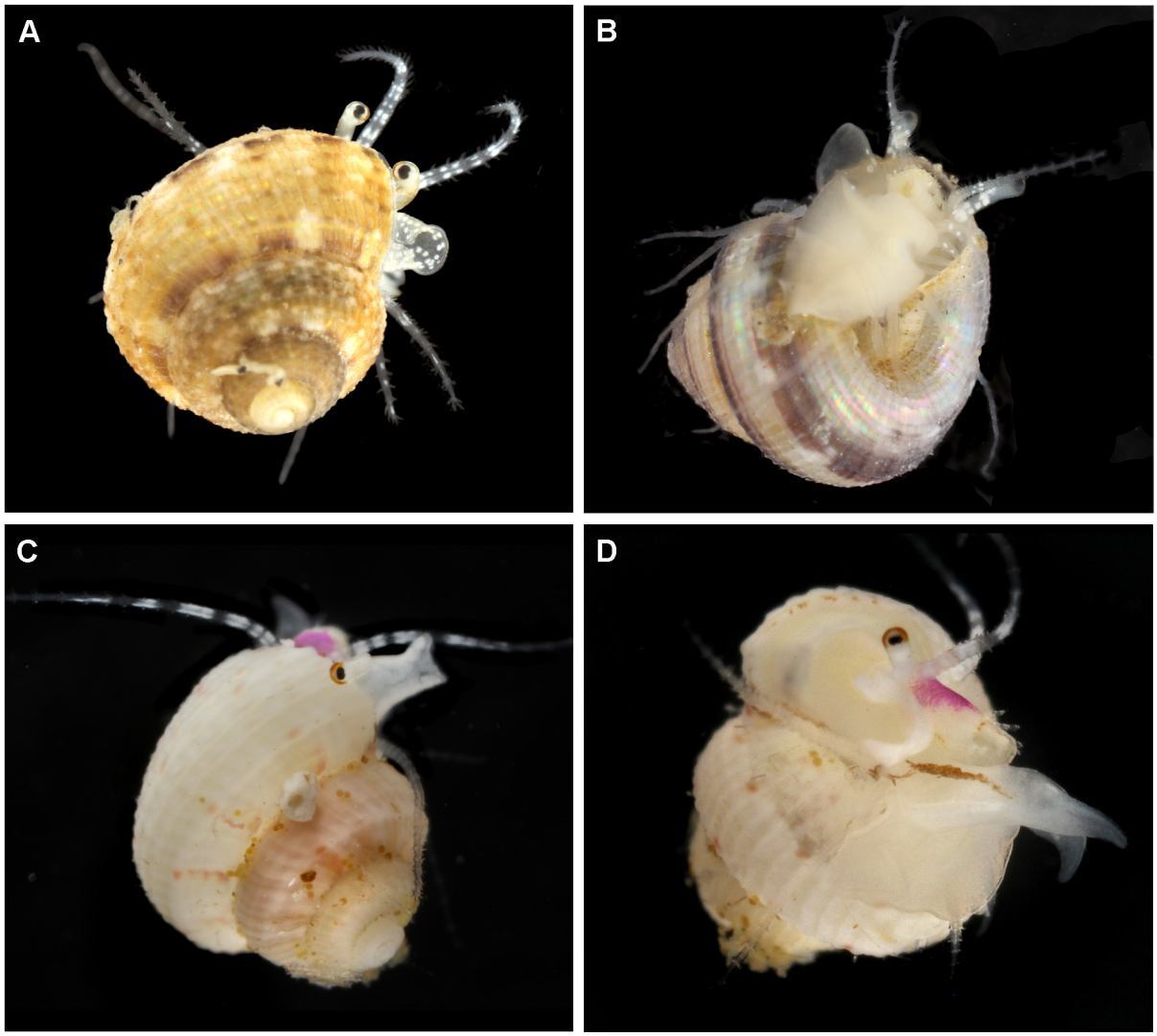

Fig. 72. *Vanitrochus* species, living animals, shell diameter ± 2.3 mm. **A**. *V. semiustus* (Fischer, 1879), Koumac [Pandop] marina, Stn KS513 (MNHN-IM-2019-9565) (image PM710). **B**. *V. semiustus*, Ouégoa, Diahot estuary, Stn KR981 (MNHN-IM-2019-10140) (image PM832). **C–D**. *V. tragema* (Melvill & Standen, 1896), Koumac, Stn KD560 (MNHN-IM-2019-8842) (image PM674).

Vanitrochus tragema (Melvill & Standen, 1896)

Figs 71B, 72B, 73–76

Solariella (*Conotrochus*) *tragema* Melvill & Standen, 1896: 313, pl. 11 fig. 78. Type locality: Lifou, Loyalty Islands, New Caledonia (Hadfield).

Monilea tragema – Hedley 1899: 405.

Vanitrochus tragema – Iredale 1929a: 272, 295. — Herbert 1989: 371, fig. 1g (lectotype), fig. 4d–f. — Wilson 1993: 95, text fig. — Héros *et al*. 2007: 210.

Vanitrochus cf. *tragema* – Poppe *et al*. 2006: 114, pl. 71 fig. 3.

Material examined

Lectotype (designated by Herbert 1989) (Fig. 73D)
NEW CALEDONIA • Loyalty Islands, Lifou; Hadfield leg.; NMW.1955.158.01503.

Paralectotypes
NEW CALEDONIA • 1 specimen; Loyalty Islands, Lifou; Hadfield leg.; NMW.1955.158.00148 • 2 specimens; Loyalty Islands, Lifou; Hadfield leg.; MM.EE.3792 and MM.EE.7908.

Other material
NEW CALEDONIA – **Grande Terre, Koumac** • 2 specimens, living; Stn KD532; 20°31.3′ S, 164°04′ E; depth 12–13 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; DNA vouchers; MNHN--IM-2019-7646 and -7647 • 4 specimens, dead; Stn KD533; 20°32.2′ S, 164°05.5′ E; depth 11 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc nu; MNHN • 7 specimens, living; Stn KD563; 20°33.4′ S, 164°06.3′ E; depth 5 m; 15 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN • 1 specimen, living; Stn KD534; 20°32.4′ S, 164°07.2′ E; depth 16 m; 5 Nov. 2019; KOUMAC 2.3 leg.; sable blanc, éponges, *Halophila*, algues brunes, *Halimeda*; MNHN • 1 specimen, dead; Stn KB608; 20°34.9′ S, 164°07.6′ E; depth 15 m; 31 Oct. 2019; KOUMAC 2.3 leg.; patch coralliens sur sable d'arrière terrasse de récif barrière; MNHN • 13 specimens, dead; Chenal de l'Infernet, Stn 1306; 20°39.1′ S, 164°12.4′ E; depth 11–13 m; Oct. 1993; Expédition Montrouzier leg.; fonds blancs; MNHN • 1 specimen, dead; Chenal de l'Infernet, Stn 1304; 20°38.6′ S, 164°13.2′ E; depth 12–15 m; Oct. 1993; Expédition Montrouzier leg.; sable gris, dalle; MNHN • 1 specimen, dead; Stn KD541; 20°39′ S, 164°13.3′ E; depth 11 m; 7 Nov. 2019; KOUMAC 2.3 leg.; sables gris; MNHN • 2 specimens, dead; Récif de l'Infernet, Stn KB600; 20°36.6′ S, 164°14.4′ E; depth 1 m; 28 Oct. 2019; KOUMAC 2.3 leg.; corail mort, corail vivant, débris de tombant interne de massif corallien intermédiaire, corail mort, débris, qq coraux vivants de platier de massif corallien intermédiaire; MNHN • 1 specimen, dead; Passe Deverd, Stn 1321; 20°44.7′ S, 164°14.9′ E; depth 90–115 m; Oct. 1993; Expédition Montrouzier leg.; sable vaseux; MNHN • 3 specimens, living; Stn KD560; 20°45.6′ S, 164°15.2′ E; depth 5–9 m; 14 Nov. 2019; KOUMAC 2.3 leg.; sable blanc et quelques algues brunes; DNA voucher, photographed alive (image PM674); MNHN-IM-2019-8842 • 3 specimens, dead; Stn KD552; 20°49.4′ S, 164°18.5′ E; depth 10–11 m; 13 Nov. 2019; KOUMAC 2.3 leg.; sable blanc; MNHN. – **Grande Terre, Touho** • 1 specimen, dead; Lagon du Grand Récif Mengalia, Stn 1266; 20°39.6′ S, 165°14.7′ E; depth 10–15 m; Sep. 1993; Expédition Montrouzier leg.; paté corallien; MNHN • 40+ specimens, dead; Lagon du Grand Récif Mengalia, Stn 1264; 20°44.5′ S, 165°15.9′ E; depth 8 m; Sep. 1993; Expédition Montrouzier leg.; vase sableuse, dôme détritique; MNHN • 4 specimens, dead; Lagon du Grand Récif Mengalia, Stn 1263; 20°45.0′ S, 165°16.0′ E; depth 6 m; Sep. 1993; Expédition Montrouzier leg.; sable vaseux avec patés coralliens; MNHN. – **Grande Terre, Nouméa** • 5 specimens, dead; Récif Senez, Stn 1350; 22°17.9′ S, 166°19.6′ E; depth 369 m; 23 Nov. 1992; Bouchet and Marshall leg.; pente interne; MNHN. – **Loyalty Islands, Lifou** • 8 specimens, dead; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1450; 20°45.8′ S, 167°01.6′ E; depth 27–31 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 1 specimen, dead; Baie du Santal, north of Cap Aimé Martin [= Acadro], Stn 1449; 20°45.8′ S, 167°01.6′ E; depth 17 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; brossages; MNHN • 2 specimens, living; Baie du Santal, Baie de Gaatcha, towards Cap Mandé, Stn 1424; 20°54.9′ S, 167°03.0′ E; depth 4 m; 15 Nov. 2000; Atelier LIFOU 2000 leg.; sable fin et algues photophiles sur dalle; MNHN • 1 specimen, dead; Baie du Santal, entre le Cap Wekutr et le Cap Wajez, Stn 1410; 20°56.7′ S, 167°03.1′ E; depth 2–4 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; bord du platier; MNHN • 9 specimens, dead; Baie du Santal, Baie de Gaatcha, Stn 1436; 20°55.5′ S, 167°04.2′ E; depth 20 m; 10 Nov. 2000; Atelier LIFOU 2000 leg.; patate corallienne sur tombant; MNHN • 1 specimen, dead; Baie du Santal, Baie de Gaatcha, Stn 1419; 20°55.6′ S, 167°04.5′ E; depth 5 m; 10 Nov. 2000; Atelier LIFOU 2000; limon sur dalle, algues photophiles; MNHN • 100+ specimens, living; Baie du Santal, in front of landing beaches at Drueulu, Stn 1413; 20°55.3′ S, 167°05.0′ E; depth 3–10 m; 26 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 4 specimens, dead; Baie du

Fig. 73. *Vanitrochus tragema* (Melvill & Standen, 1896). **A–C**. Koumac, Stn KD563, height 2.5 mm, diameter 2.3 mm (MNHN). **D**. Lectotype of *Solariella* (*Conotrochus*) *tragema* Melvill, & Standen, 1896, Lifou, height 2.5 mm, diameter 3.1 mm (NMW.1955.158.01503). **E**. Koumac, Stn KD534, height 2.3 mm, diameter 2.0 mm (MNHN). **F**. Lifou, Stn 1420, height 2.35 mm, diameter 2.05 mm (MNHN). **G**. Lifou, Stn 1413, height 2.55 mm, diameter 2.1 mm (MNHN). **H–I**. Lifou, Stn 1413, height 2.8 mm, diameter 2.35 mm (MNHN). **J**. Lifou, Stn 1413, height 2.85 mm, diameter 2.43 mm (MNHN).

Santal, W/SW of Pointe d'Easo, Stn 1430; 20°47.5′ S, 167°07.1′ E; depth 20–25 m; 9 Nov. 2000; Atelier LIFOU 2000 leg.; patates coralliennes, passées séd.; MNHN • 1 specimen, dead; Baie du Santal, Baie d'Huneté, Stn 1425; 20°46.8′ S, 167°07.2′ E; depth 4–5 m; 17 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture sed.; MNHN • 8 specimens, dead; Baie du Santal, off Peng, Stn 1423; 20°54′ S, 167°07.3′ E; depth 12 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; passées sableuses entre patates; MNHN • 4 specimens, dead; Baie du Santal, off Peng, Stn 1412; 20°54.2′ S, 167°07.4′ E; depth 2–5 m; 14 Nov. 2000; Atelier LIFOU 2000 leg.; fonds meubles; MNHN • 6 specimens, living; Baie du Santal, in front of Chépénéhé, Stn 1415; 20°47.1′ S, 167°09.1′ E; depth 3–7 m; 25 Nov. 2000; Atelier LIFOU 2000 leg.; sable; MNHN • 8 specimens, living; Baie du Santal, Pointe de Chépénéhé, Stn 1420; 20°47.7′ S, 167°09.4′ E; depth 4–5 m; 18 Nov. 2000; Atelier LIFOU 2000 leg.; dalle avec couverture séd.; MNHN • 1 specimen, living; Baie du Santal, in front of Kiki, Stn 1411; 20°47.6′ S, 167°10.4′ E; depth 48 m; 23 Nov. 2000; Atelier LIFOU 2000 leg.; sable entre patates; MNHN.

Description (Figs 71, 73)

Shell. Resembles that of *Vanitrochus semiustus* and is of similar size (height up to 3.0 mm). Differs in that whorls are distinctly shouldered, with spiral cord delineating shoulder stronger than other cords

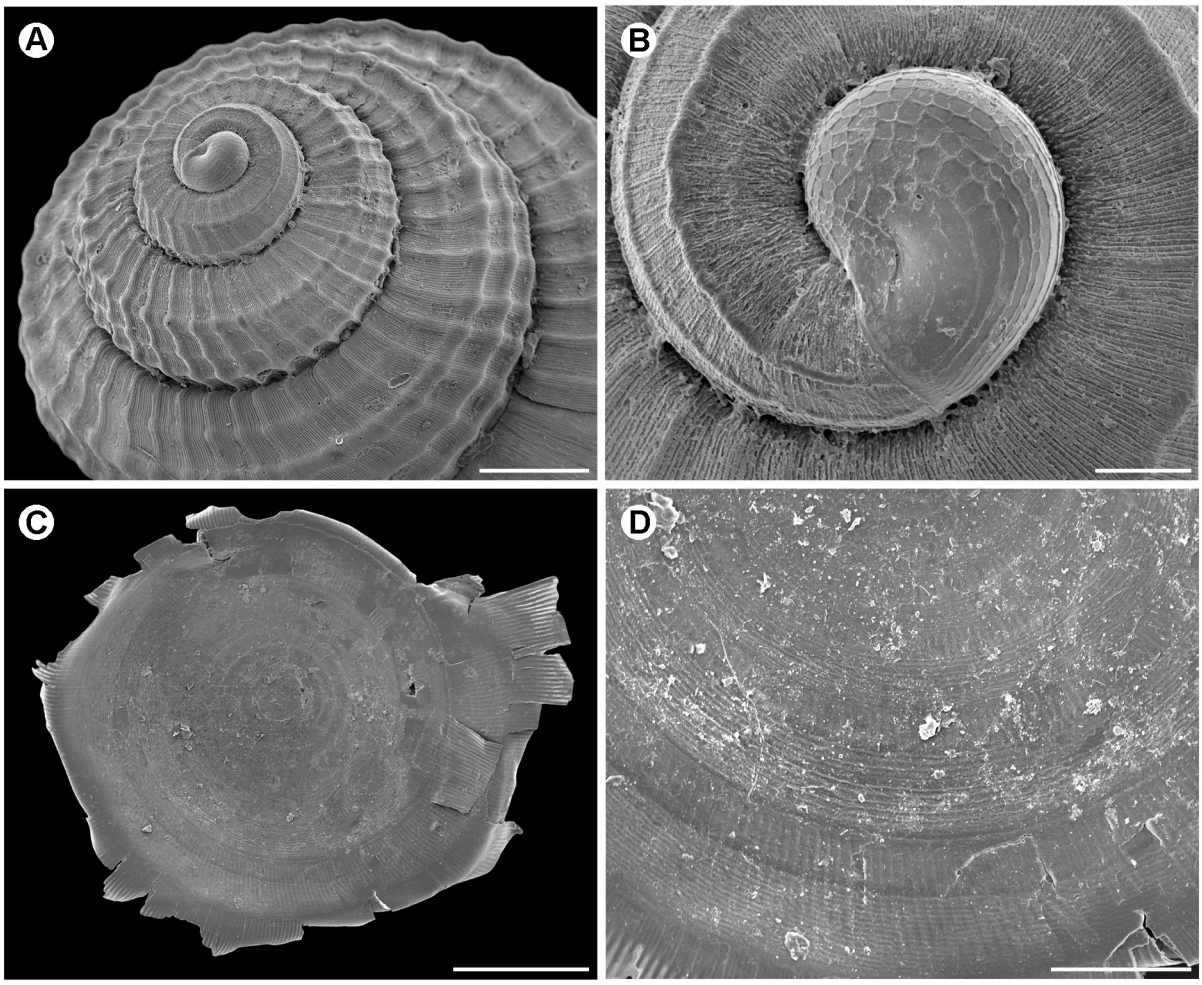

Fig. 74. *Vanitrochus tragema* (Melvill & Standen, 1896) (all MNHN). **A**. Oblique view of apical whorls. **B**. Protoconch. **C**. Operculum. **D**. Detail of operculum to show microscopic spiral threads. A–B. Koumac, Stn KD563. C–D. Lifou, Stn 1424. Scale bars: A, C = 250 μm; B = 50 μm; D = 100 μm.

(Fig. 71B). Axial sculpture on apical whorls also stronger, resulting in coarser beading on spiral cords (Fig. 74A).

Colour. Colouration highly variable; pattern rarely as dark as that of *V. semiustus*; commonly whitish with blotches on shoulder in shades of brown, olive-green or pinkish-red; smaller spots at periphery, and base with broad, mottled subperipheral band with rays radiating inward toward but not into umbilicus. Occasional specimens uniformly whitish (Fig. 73E), others with flecks of pigment on spiral cords (Fig. 73H) or almost bicoloured (Fig. 73J). Interior nacreous, but less distinctly so than in *V. semiustus*.

Protoconch (Fig. 74B). Typically umboniine, diameter 160–170 μm; apical beak present, confluent with terminal lip; apical bulb sculptured with an irregular network of threads, almost hexagonal in places, remainder with distinct subspiral threads; terminal lip weakly convex.

Operculum (Fig. 74C–D). Corneous, multispiral, but outer whorls relatively broad and with long growing margin; peripheral fringe broad, with well-developed radial striation; spiral microsculpture distinct.

Radula (Fig. 75). Formula ∞+(1)+5+1+5+(1)+∞, with 20–25 transverse rows of teeth; teeth of central field reduced; rachidian base-plate rounded, with indistinct vestige of shaft at centre of anterior

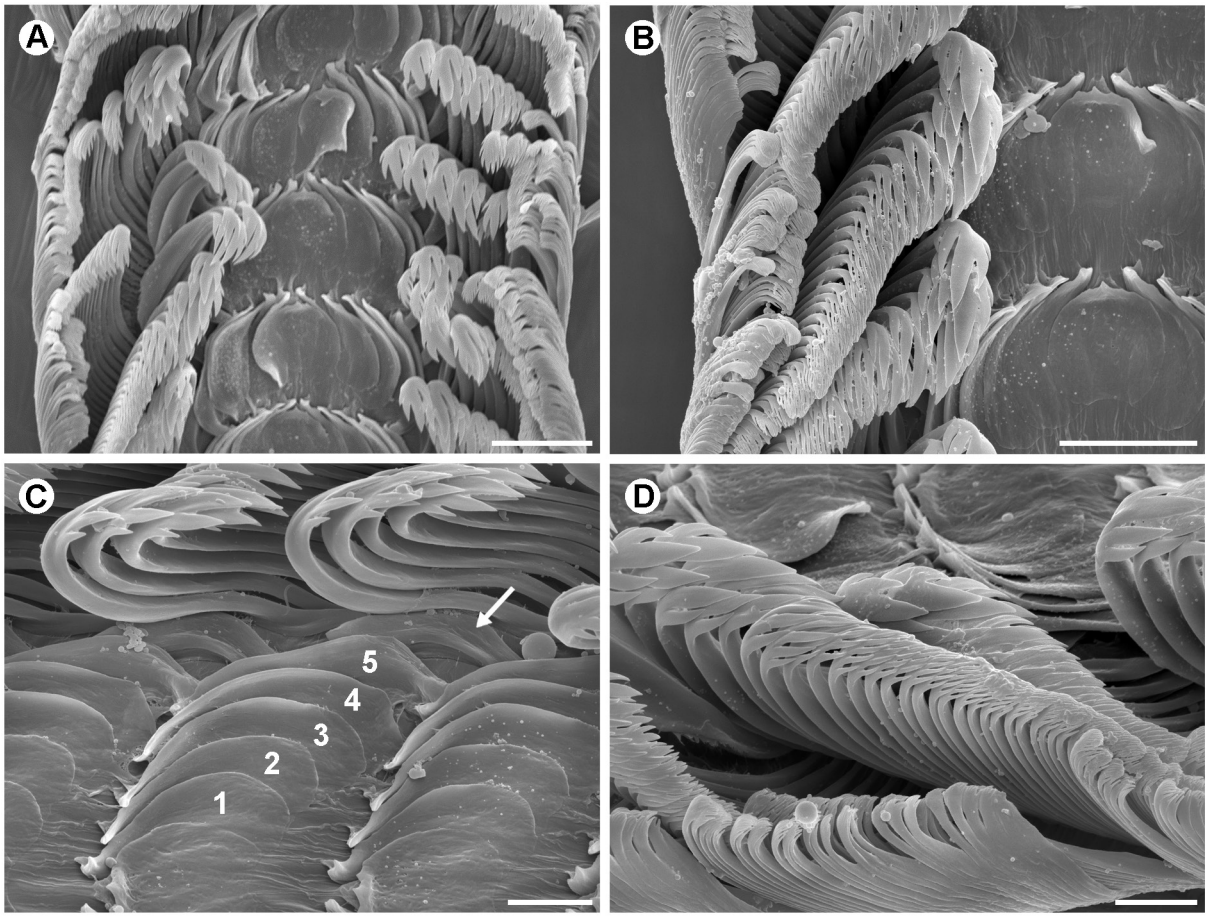

Fig. 75. *Vanitrochus tragema* (Melvill & Standen, 1896), radula, Koumac, Stn KD563 (all MNHN). **A**. Full width of radula. **B**. Half width of radula. **C**. Oblique view of lateral to inner marginal transition, lateral teeth numbered 1–5, transitional innermost marginal arrowed. **D**. Oblique view of marginal teeth. Scale bars: A = 25 μm; B = 20 μm; C–D = 10 μm.

edge; base-plates of lateral teeth thin, extensively overlapping, outer edge rounded and raised anteriorly, leading to narrow shaft vestige. First marginal tooth transitional, lacking shaft and cusp (Fig. 75C arrow), its base-plate arched and with a longitudinal medial hollow to accommodate shaft of outer neighbour. Subsequent inner marginal teeth well developed with a narrow shaft and strongly recurved cusp; cusp deeply divided into five (usually) lanceolate denticles, middle one largest; cusps of marginal teeth progressively smaller toward edge of radula and with more slender, more numerous denticles; outermost marginals with finely pectinate margins.

External anatomy (Fig. 72C–D). As for *V. semiustus* above. Photograph of living animal showing purple pigmentation on snout.

Habitat

Mostly associated with white, sandy substrata toward the outer portions of the lagoon; living specimens at depths of 4–16 m, exceptionally to 48 m, empty shells washing to 90 m or more in lagoon passes.

Distribution (Fig. 76)

Described from the Loyalty Islands, with additional rather sparse records from Grande Terre (perhaps often overlooked). Recorded also from Tuvalu (Hedley 1899), and Queensland (Iredale 1929a; Wilson 1993). A tentatively identified specimen from the Philippines (Poppe *et al*. 2006) also appears correct.

Remarks

Vanitrochus geertsi Poppe, Tagaro & Dekker, 2006 from the Philippines has fewer, coarser spiral cords and appears very similar to *Monilea* (*Minolia*) *singaporensis* Pilsbry, 1889, with which it merits closer comparison. Hedley's record of a specimen of *V. tragema* from Tuvalu with a height of 4.5 mm (Hedley 1899) is exceptional and requires confirmation.

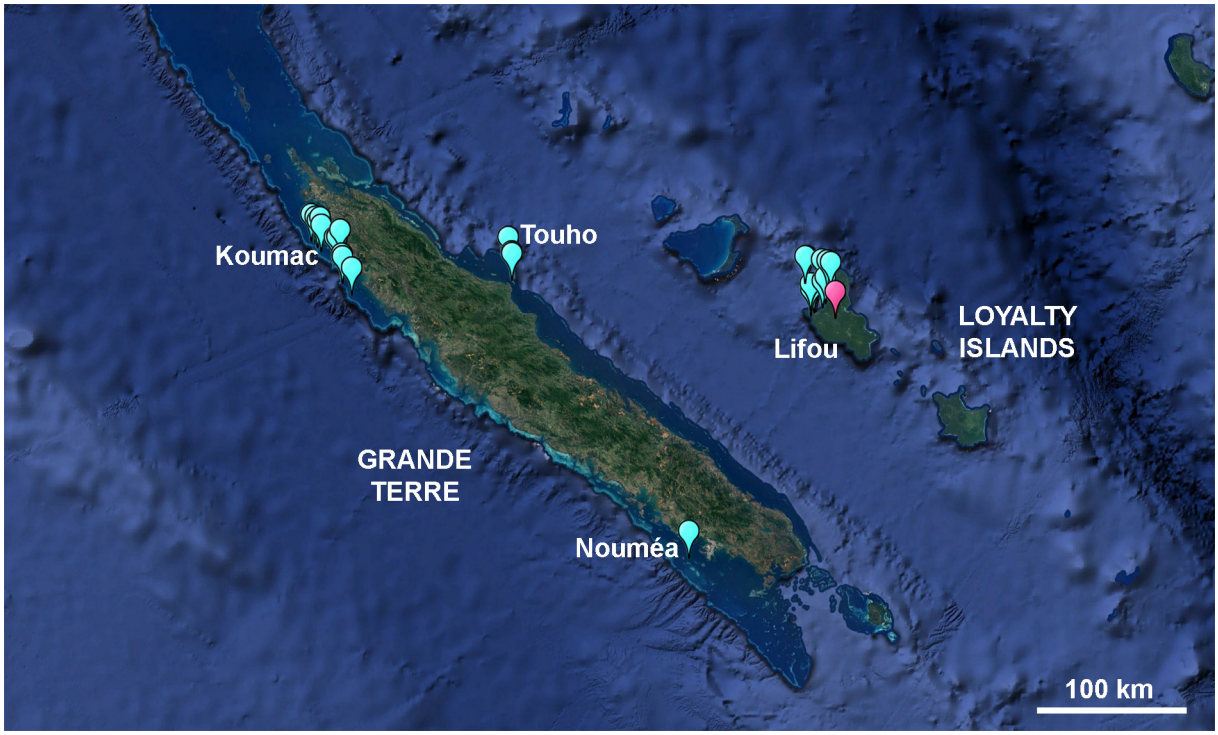

Fig. 76. Map showing the distribution of *Vanitrochus tragema* (Melvill & Standen, 1896) in New Caledonia. Type locality (approximate) indicated in pink.

Specimens examined and illustrated for comparison

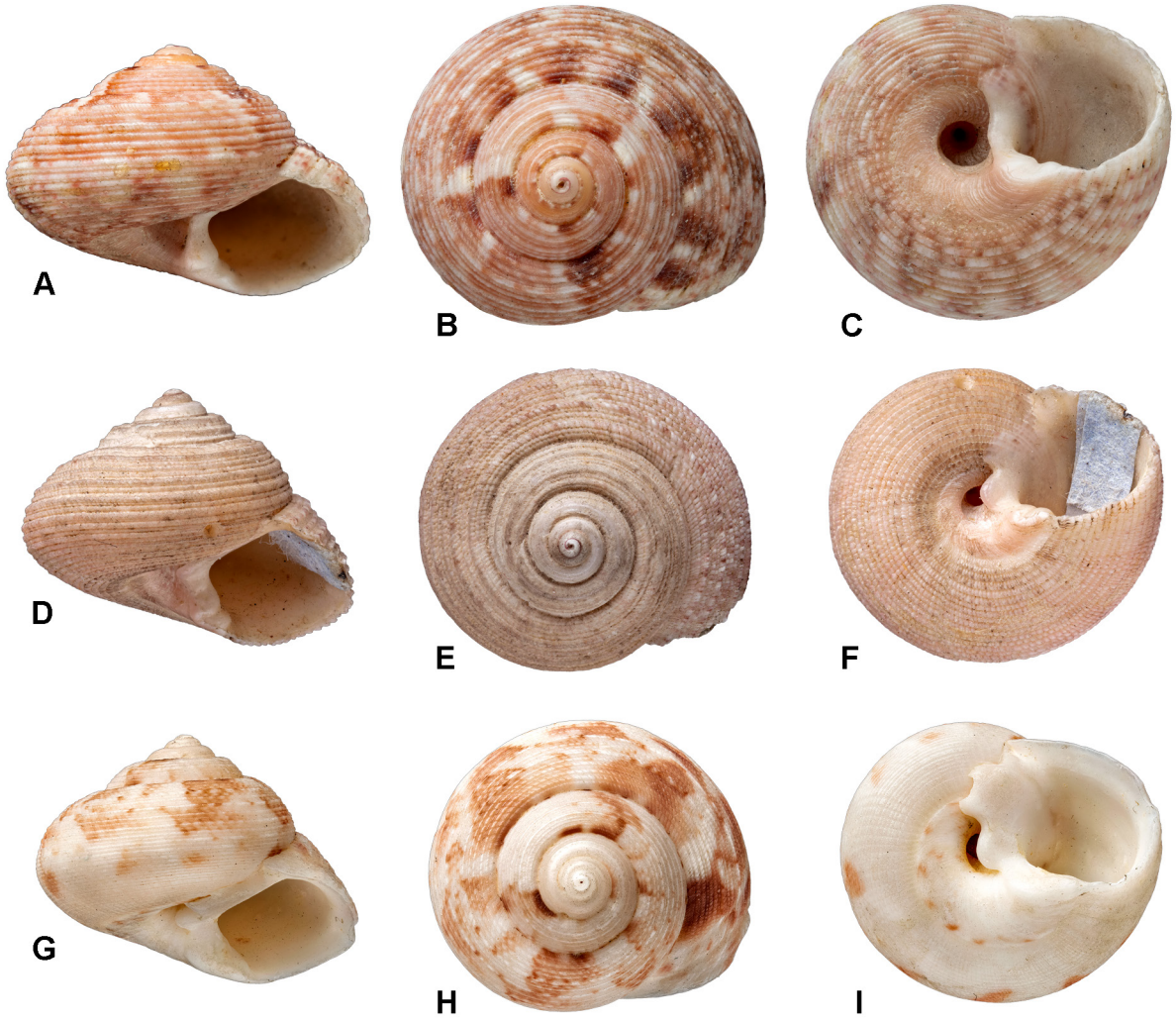

Fig. 77. Specimens examined and illustrated for comparison. **A–C**. Figured syntype of *Trochus calyculus* W. Wood, 1828, diameter 17.1 mm (NHMUK 1878.6.3.1). **D–F**. Holotype of *Monilea menkei* A. Adams, 1855, diameter 15.5 mm (NHMUK 1968180). **G–I**. Lectotype of *Monilea philippii* A. Adams 1855, diameter 15.0 mm, designated by Herbert (1992: 449) (NHMUK 1968181). Images courtesy of Kevin Webb, NHM Photo Unit. © The Trustees of the Natural History Museum, London.

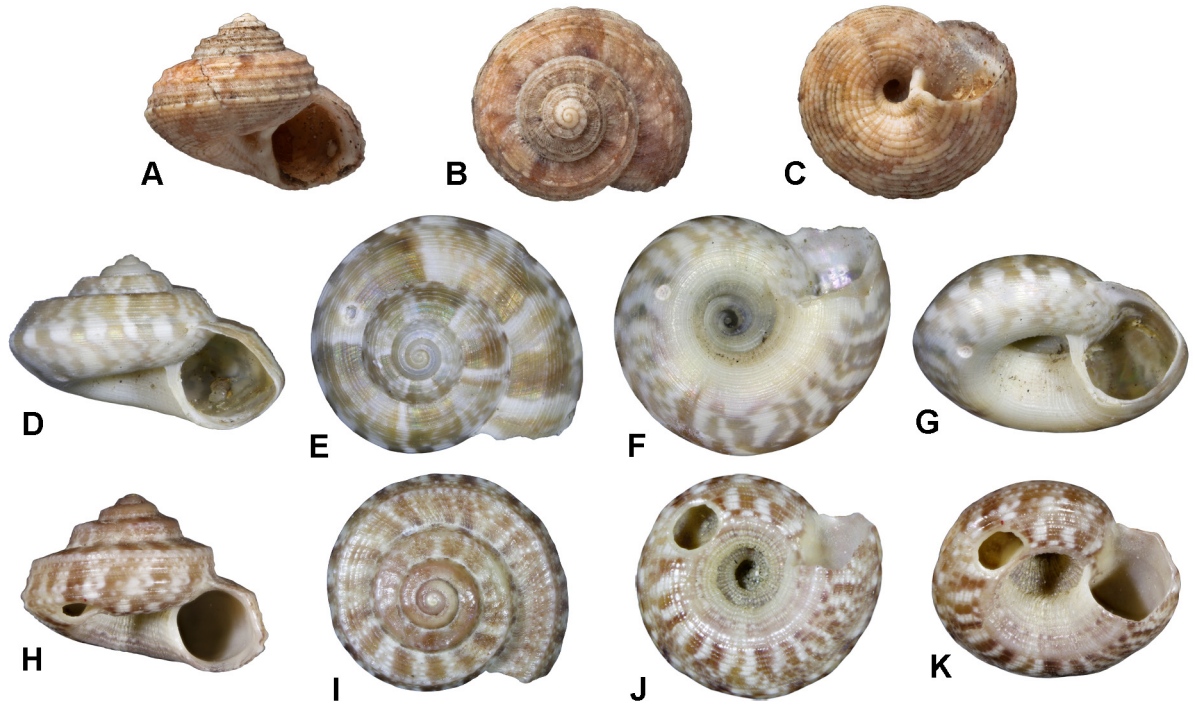

Fig. 78. Specimens examined and illustrated for comparison. **A–C**. Holotype of *Monilea pusilla* A. Adams, 1853, provenance unknown, H. Cuming Collection (NHMUK 1968101), height 3.2 mm, diameter 4.0 mm. Images courtesy of Kevin Webb, NHM Photo Unit. © The Trustees of the Natural History Museum, London. **D–G**. Topotype of *Ethminolia probabilis* Iredale, 1924, Two-fold Bay, New South Wales, Australia, diameter 5.0 mm (NMW.1955.158). **H–K**. Syntype of *Minolia henniana* Melvill, 1891, Magnetic Island, Queensland, Australia, diameter 4.3 mm (NMW.1955.150.00117).

Discussion

Prior to this study, the total number of umboniine trochids recorded from New Caledonia (EEZ 1.4 million km^2) stood at 11 species (Héros *et al*. 2007). Herein the total recorded is now 19 species (excluding *Tylorhaphe wallacei* gen. et sp. nov., from the Bismarck Sea). All seven of the umboniine species originally described from New Caledonia were collected again during recent surveys, and in living condition. In addition, three species are recorded for the first time from the New Caledonian marine ecoregion (*Ethalia lamprus*, *Talopena apicina* and '*T.*' *tramieri*) and a further eight new species, described herein, were discovered. The bulk of this fauna comprises shallow-water species inhabiting the unconsolidated sediments in the lagoons and lagoonal channels within the barrier reef system, some ranging a little further onto the outer slope of the reef. One, however, *Vanitrochus semiustus*, favours somewhat more muddy sediments and ranges into brackish waters adjacent to estuarine mangroves. In contrast, *Tylorhaphe* gen. nov. represents a deeper water umboniine radiation living at depths in excess of 50 m and even over 300 m.

The diversity of Umboniinae in the New Caledonian marine ecoregion is comparable to that recorded for Japan (20 species, Sasaki 2000) and Australia (19 species, Wilson 1993) and somewhat more than the total for the Philippines (17 species, Poppe *et al*. 2006) and South Africa (11 species, Herbert 2015). The geographical extent of these regions varies greatly, however, as does their latitudinal range with Japan and Australia spanning 20 and 30 degrees of latitude respectively and extending from cool

Table 1. Distribution of New Caledonian Umboniinae in relation to other regions of the tropical West Pacific. NC = New Caledonian marine ecoregion; SWP = islands in the south-western Pacific; Aus. = Australia; Phil. = Philippines; Jap. = Japan. Species in bold type are potentially endemic to the New Caledonian ecoregion, based on the data currently available.

Species	**Western Pacific Region**				
	NC	**SWP**	**Aus.**	**Phil.**	**Jap.**
***Ethalia anomphala* sp. nov.**	X	–	–	–	–
Ethalia lampra	X	X	–	–	–
Ethalia montrouzieri	X	–	–	–	–
Ethaliella rhodomphala	X	–	–	–	–
Ethminolia hickmanae sp. nov.	X	X	–	–	–
Kanakina glaphyrella gen. et comb. nov.	X	X	X	X	–
Parminolia agapeta	X	X	–	–	–
Rossiteria nucleus	X	X	X	X	X
Sericominolia lifuana	X	?	–	–	–
***Sericominolia porcata* sp. nov.**	X	–	–	–	–
***Sericominolia safrocincta* sp. nov.**	X	–	–	–	–
Talopena apicina	X	–	–	–	–
***Talopena maestratii* sp. nov.**	X	–	–	–	–
'*Talopena*' *tramieri*	X	–	–	X	X
Tylorhaphe alisae gen. et sp. nov.	X	–	–	X	–
***Tylorhaphe fritillaria* gen. et sp. nov.**	X	–	–	–	–
Tylorhaphe luteopicta gen. et sp. nov.	X	X	–	–	–
Vanitrochus semiustus	X	–	X	–	–
Vanitrochus tragema	X	X	X	X	–

temperate to subtropical (Japan), and temperate to tropical (Australia) climatic regions. In contrast, the New Caledonian marine ecoregion spans less than 10 degrees of latitude and lies almost entirely within the tropics. Other tropical regions for which figures are available have considerably fewer umboniine species (Thailand 8 species, Wells *et al*. 2021; Red Sea 9 species, Dekker & Orlin 2000).

The degree of species endemicity within the New Caledonian umboniine fauna is difficult to assess for several reasons. Firstly, because the umboniine fauna of neighbouring regions is poorly documented – for example, the samples collected in Vanuatu during the SANTO 2006 Expedition (Bouchet *et al*. 2011) remain to be studied. Secondly, due to uncertainty regarding the accuracy of the identification of some of the records from other regions. Thirdly, because future molecular studies may demonstrate: a) that species currently believed to be widely distributed are in fact complexes of morphologically similar species (e.g., *Rossiteria nucleus*) and b) that species currently treated as distinct sister taxa may in fact be conspecific (see below). As things stand (Table 1), it seems that nine species are possible New Caledonian endemics, *Ethalia anomphala* sp. nov., *E. montrouzieri*, *Ethaliella rhodomphala*, *Sericominolia lifuana*, *S. porcata* sp. nov., *S. safrocincta* sp. nov., *Talopena apicina*, *T. maestratii* sp. nov. and *Tylorhaphe fritillaria* gen. et sp. nov.

Only one umboniine species occurring in New Caledonian marine ecoregion, *Rossiteria nucleus*, appears to be widespread in the western Pacific, extending also into the eastern Indian Ocean. However, molecular studies have shown that *Astralium rhodostomum* (Lamarck, 1822), another shallow-water vetigastropod with a similar distribution, exhibits a complex pattern of fine-scale, archipelagic endemism and is not in fact a single species (Meyer *et al*. 2005). With this in mind, I have designated a type locality for *R. nucleus*,

Table 2. Distribution of Umboniinae species within sub-regions of the New Caledonian marine ecoregion. C-B = Chesterfield-Bellona Plateau; L-F = Lansdowne-Fairway Banks; ELN = d'Entrecasteaux Reefs and Lagon Nord; GT = Grande Terre; LI = Loyalty Islands.

Species	**Sub-region**				
	C-B	**L-F**	**ELN**	**GT**	**LI**
Ethalia anomphala sp. nov.	X	X	X	X	–
Ethalia lampra	–	–	–	X	X
Ethalia montrouzieri	X	–	X	X	X
Ethaliella rhodomphala	–	–	–	X	X
Ethminolia hickmanae sp. nov.	–	–	–	X	X
Kanakina glaphyrella gen. et comb. nov.	–	–	–	X	X
Parminolia agapeta	–	–	–	X	X
Rossiteria nucleus	X	–	X	X	X
Sericominolia lifuana	X	–	X	X	X
Sericominolia porcata sp. nov.	–	–	–	–	X
Sericominolia safrocincta sp. nov.	X	X	–	X	X
Talopena apicina	X	X	X	X	X
Talopena maestratii sp. nov.	–	–	X	X	X
'*Talopena*' *tramieri*	X	X	X	X	X
Tylorhaphe alisae gen. et sp. nov.	–	–	–	X	–
Tylorhaphe fritillaria gen. et sp. nov.	–	–	–	X	X
Tylorhaphe luteopicta gen. et sp. nov.	X	–	–	X	–
Vanitrochus semiustus	–	–	–	X	–
Vanitrochus tragema	–	–	–	X	X

such that the name can be applied with greater geographical precision in future molecular studies. Three species, *Ethalia montrouzieri*, *Parminolia agapeta* and *Rossiteria nucleus* have very similar siblings occurring in the Philippines, namely *Ethalia catharinae* Poppe, Tagaro & Dekker, 2006, *Parminolia vanwalleghemi* (Poppe, Tagaro & Dekker, 2006) and *Rossiteria pseudonucleolus* Poppe, Tagaro & Dekker, 2006. The closeness of these relationships needs to be studied from a molecular perspective.

Table 2 details the distribution of umboniine species within the New Caledonian marine ecoregion. Only *Talopena apicina* and '*T.*' *tramieri* have been found throughout the ecoregion (B, Lansdowne-Fairway Banks, Lagon Nord and d'Entrecasteaux Reefs, Grande Terre and Loyalty Islands). *Ethalia montrouzieri* and *Rossiteria nucleus* are also widespread, but are puzzlingly absent from the Lansdowne-Fairway Banks. *Talopena maestratii* sp. nov. is not known from the Chesterfield-Bellona Plateau and Lansdowne-Fairway Banks, and its distribution is mostly limited to the lagoon system of Grande Terre. Conversely, *Ethalia anomphala* sp. nov. occurs primarily on the isolated reefs of the Chesterfield-Bellona Plateau, Lansdowne-Fairway Banks and Lagon Nord (only three dead shells known from Grande Terre), a distribution pattern also exhibited by some species of *Spondylus* (Lamprell & Healy 2001) and suggesting a preference for sediments of bioclastic rather than terrigenous origin. Nine species, *Ethalia lampra*, *Ethaliella rhodomphala*, *Ethminolia hickmanae* sp. nov., *Kanakina glaphyrella* gen. et comb. nov., *Parminolia agapeta*, *Sericominolia porcata* sp. nov., *Tylorhaphe alisae* gen. et sp. nov., *T. fritillaria* gen. et sp. nov., *Vanitrochus tragema* and *V. semiustus* are known within New Caledonia only from Grande Terre and/or the Loyalty Islands, but for most of these there are additional records from other south-western Pacific localities, albeit that some require confirmation.

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