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About a collection of *Anarithma* Iredale, 1916 species (Conoidea Mitromorphidae) from La Réunion, Mascarene Islands

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ABSTRACT Twelve mitromorphid species from La Réunion are tentatively attributed to the genus *Anarithma* Iredale, 1916, and revised on the ground of the Maurice Jay's collection conserved in the Muséum national d'Histoire naturelle, Paris, and of additional data given by the website "vieoceane" devoted to the marine gastropods fauna from La Réunion. Nine previously described species are formally revised in the genus *Anarithma*: *A. pamila* (Duclos, 1848), *A. lachryma* (Reeve, 1845), *A. maesi* Drivas etJay, 1986, *A. metula* (Hinds, 1843), *A. melvilli* Boyer, 2022, *A. inornata* (Hervier, 1900), *A. fischeri* (Hervier, 1900), *A*. cf. *salisburyi* (Cernohorsky, 1978), and *A. kilburni* Drivas et Jay, 1986. Two new species are described in the same genus: *A. aurea* n. sp. as sibling species of *A. metula*, and *A. borbonica* n. sp. as sibling species of *A. pamila*. The morph illustrated as *Mitromorpha poppei* Chino et Stahlschmidt in the website "vieoceane" is evidenced to belong to an undescribed species, and its allocation to *Anarithma* is made with reserve. Cases of possible hybridism and of possible uncomplete speciations are discussed.

KEY WORDS Mitromorphidae, *Anarithma*, *Mitromorpha*, *Lovellona*, species group, La Réunion, shell features, phenetic variability, sibling species, hybridism, speciation.

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INTRODUCTION

Some recent works did increase significantly the knowledge about the mitromorphid fauna from Central and Western Pacific, the most prominent being probably the two articles devoted by Chino & Stahlschmidt (2009, 2014) to the description of many new species from Western Pacific, and the revision achieved by Boyer (2022) focusing on the genus *Anarithma* Iredale, 1916 in the waters of the Philippines. Two other recent articles provided useful insights about the mitromorphid fauna from the Central and Western Pacific, that of Polhemus (2020) about the Hawaiian fauna, and that of Tardy & Stahlschmidt (2022) about the fauna from New Caledonia.

The mitromorphid fauna from Indian Ocean was not so much investigated in the same period, as the two major references in this field remain the simultaneous articles of Kilburn (1986) about the fauna of South Africa and Mozambique, and of Drivas & Jay (1986) about the fauna of La Réunion. A recent paper devoted by Horro et al. (2021) to the turrids from the Dhofar (southern Oman) gave an overview

of the restricted but original local mitromorphid fauna.

The present paper is devoted to a general revision of the diversified *Anarithma* fauna of La Réunion, on the ground of the Maurice Jay's collection conserved in MNHN and of additional data given by the website "vieoceane" dedicated to the marine fauna of this island. A similar duty is at work by J. Horro (Vigo, Spain) about the mitromorphid fauna from Mozambique, on the ground of important samplings performed over the years by J. Rosado (Maputo, Mozambique) and S. Gori (Livorno, Italy).

MATERIAL AND METHODS

The shell material studied from the M. Jay collection (MNHN) is mainly made of empty shells collected from various stations (mainly dived stations at 20–40 m, and few dredged stations down to 80–100 m) along several decades. Most of these shells are more or less worn away, and few individuals can be considered to be in good state (integrity of the shell morphology and of the colour shades). However in each of the separated morphs, some specimens allow to study the shell features in reliable conditions, and the number of specimens at hand in most of the lots as well as the diversified individual origins (mixed stations and depths) give a good view on the natural variability of the morphs.

This material being deprived of labels or associated comments, no geographical localities and no depths are evidenced for the lots. This gap was partially compensated by the data proposed in the website "vieoceane" and reported in the Distribution parts. All the specimens pictured in the plates were collected at reef levels off La Réunion, without depth datum except for the specimen of "*Anarithma*" aff. *poppei* (Chino & Stahlschmidt, 2009), which is said to have been collected at 100 m.

Due to the absence of information about the animal features (principally animal chromatism and radula morphology), the present study concerns the analysis and comparison of shell morphology and of shell chromatism. According to us, the extent of the information contained in these fields, together with the good amount of shells under study, both allow valuable demonstrations about the phenetics of the morphs, and reliable taxonomic conclusions.

ABBREVIATIONS AND ACRONYMS. ICZN: International Code of Zoological Nomenclature; AIM: Auckland Institute and Museum, Auckland, New Zealand; MHNG: Muséum d'Histoire Naturelle, Genève, Suisse; MM: Manchester Museum, Manchester, England, Great Britain; MNHN: Muséum national d'Histoire naturelle, Paris, France; NHMUK: Natural History Museum, London, England, Great Britain; NMST: National Museum of Nature and Science, Tokyo, Japan; MJC: Maurice Jay Collection (MNHN); SGC: Sandro Gori Collection, Livorno, Italy; FBC: collection of the first author, Montpezat, France; WRC: collection of the second author, Amantea, Italy; ad: adult; fms: fathoms; juv: juvenile; spm: specimen; L: length size.

RESULTS

Systematics

Superfamily CONOIDEA Fleming, 1822.
Family MITROMORPHIDAE Casey, 1904 (erected by Bouchet, Kantor, Sysoev et Puillandre, 2011)
Genus *Anarithma* Iredale, 1916

TYPE SPECIES. Usually considered by authors as *Clavatula metula* Hinds, 1843, (i.a.: Kilburn, 1986: 711; Cernohorsky, 1988: 65–66; WORMS AphialD 594417), but restored as *Mitra lachryma* Reeve, 1845 by Boyer (2022: 84), who demonstrated that the names *Clavatula metula* and *Mitra lachryma* are representing two well-distinctive species, and that *Mitra lachryma* must keep the precedence, being cited by Iredale as first representative reference of its new genus *Anarithma*. Being in the case of ICZN Art. 70.3.1 ("*selection of the nominal species previously cited as type species* [Articles 68, 69]"), the explicit reference to the ICZN rules was not required and the restoration of *Mitra lachryma* as type species of the genus *Anarithma* Iredale must be considered as valid.

Designation by monotypy.

Anarithma pamila (Duclos, 1848) (Figs. 1–8)

Columbella pamila Duclos, 1848: pl. 22, figs. 11, 12, no locality.
?*Cythara garretti* Pease, 1860: p. 147, sp. 89, no figure, Sandwich Islands.

?*Columbella sublachryma* Hervier, 1900: p. 382, pl. 14, fig. 1, Lifou.

?*Mitromorpha flammulata* Chino & Stahlschmidt, 2009: p. 67–68, 1 fig. in-text, pl. 3, figs. 1, 2, Kagoshima, Japan.

Type material. Lectotype MNHN–IM–2000–6410–1 (L = 6.7 mm) and five paralectotypes MNHN, attached label giving "Mazatlan" as locality.

Other material examined. NHMUK: *Cythara garretti* Pease, 1860: lectotype NHMUK 19627801 (Figs. 71, 72) and 3 paralectotypes NMHUK 1962781, Sandwich Islands, selected by Cernohorsky (1988: 68). MNHN: *Columbella sublachryma* Hervier, 1900: syntype MNHN–IM–2000–6380 (Figs. 79, 80), Lifou. MJC (selected as *A. pamila* or as *A*. cf. *pamila*) : La Réunion, 35 ad and subad spm (Figs. 1–8), L = 3.0–5.9 mm; 4 juv spm; La Réunion, 0–55 m. FBC: numerous spm, Central Philippines (Balicasag Island, Mactan Island and Aliguay Island), 50–150 m.

Description. No original description. See subsequent description in Boyer (2022: 90).

Type locality. Subsequently designated as "Balicasag Island, 50–150 m, Central Philippines", in Boyer (2022: 90).

Distribution. Known from Mozambique, Philippines, Papua-New-Guinea, Marshall Islands, Society Islands.

Remarks. As far as the shell morphology and chromatism are concerned, typical representants of *Anarithma pamila* (Duclos, 1848) are found in limited number in the waters of La Réunion (Figs. 1, 2) beside more numerous specimens mixing more or less typical features of *A. pamila* with typical features of the sibling species *A. lachryma*. Typical *A. pamila* is mainly characterized by a quite slender subpyriform outline, smooth upper mid-part of the dorsum with smooth spiral cords and poorly incised intervals, wide and thick and quite flat axial ribs on the ventral side, about obsolete on the dorsal side. Light-tan decoration, from honey to orange or light-khaki shade, laying on a white ground. Axial light-tan digitations are running on the two upper cords of the last whorl, both on ventral and dorsal sides; axial tan flames running in the intercostal grooves of the spire, same tan flames crossing spaced spiral lines or narrow tan bands on the body whorl; alternated tan marks recovering one in two axial ribs at the wider diameter of the ventral side of the body whorl, just below the two upper cords; larger and darker tan patch on the upper middle-part of the dorsum, with strong white crenulations upwards. Specimens selected as *A*. cf. *pamila* show one or several features more closely linking to the sibling species *A. lachryma*: more oval outline and quite wider aperture, more numerous, more spaced and more produced axial ribs, together with more browny tan shades in Figs. 3, 4; oval outline and no tan digitations running upwards beyond the second cord of the last whorl in Figs. 5, 6 ; more massive biconical outline, light brown shade in the upper left side of the dorsal patch, together with no evident tan digitations reaching the upper cord of the last whorl in Figs. 7, 8.

The specific features of the populations attributed to *A. pamila* are more homogeneous in the Philippines, where no specimen intergrading with the sympatric *A. lachryma* was observed despite the vast amount of specimens under study, except for one unsure specimen observed from Mactan Island. Our interpretation about this situation is submitted in the next section about the species *A. lachryma* (Reeve, 1845).

Drivas & Jay (1986: 9, figs. 1d, 1e) are picturing and commenting two shells errouneously attributed respectively to "*A. metula* forma *stepheni* (Melvill et Standen, 1897)" and to "*A. metula* forma *sublachryma* (Hervier, 1899)", but matching the morphs attributed here to the *A. pamila*/*A. lachryma* complex. Due to the poor definition of the photos, to the distorted coloration, and to the lacking of dorsal views, supported identifications of these two shells do not seem really possible. *Anarithma stepheni* (Hervier, 1900) was proved to be in fact a junior synonym of *A. metula* (Hinds, 1843) and not a subspecies of it (see in Boyer, 2022 and below), whereas *A. sublachryma* (Hervier, 1900) is in fact suspected to be a sibling species of *A. pamila* and not a subspecies of *A. metula* (see in Boyer, 2022).

Anarithma lachryma (Reeve, 1845) (Figs. 9–12)

Mitra lachryma Reeve, 1845: pl. 32, fig. 258 (dorsal view only), no locality.

TYPE MATERIAL Lectotype NHMUK Reg. Nb. 1980107–1, L = 7.3 mm, and 2 paralectotypes NHMUK Reg. Nb. 1980107–2 & 3, L= 7.3 mm & 6.9 mm, no locality.

OTHER MATERIAL EXAMINED. MJC (selected as *A. lachryma* or as *A*. cf. *lachryma*): 18 ad and subad spm (Figs. 9–12), L = 4.0–5.8 mm; 2 juv spm; La Réunion, 12–55 m. FBC: numerous spm, Central Philippines (Mactan Isl., Balicasag Isl. & Aliguay Isl.), 50–150 m.

DESCRIPTION. Reeve, 1845, sp. 258 (English text): "*Shell ovate, attenuated at both ends, rather thin, spire short, somewhat obtuse; whorls longitudinally very finely ribbed at the upper part, transversely marked with obsolete raised stria; white, peculiarly painted at the back with a large orange-brown blotch; columella two- or three- plaited, plaits nearly obsolete; lip effused. Hab. - ?*".

TYPE LOCALITY. Subsequently designated as "*Balicasag Island, 50–150 m, Central Philippines*" in Boyer (2022: 89).

DISTRIBUTION. *Anarithma lachryma* is common in the Central Philippines, but it seems to be unusual in Papua New Guinea (MNHN, pers. obs.) like in Mozambique (Juan Horro, comm. pers.). In La Réunion, very few specimens are closely matching the typical features of *A. lachryma*, and numerous specimens look as intergrading to different degrees with the sibling species *A. pamila*. A specimen from Safaga, Egypt (FBC) looks as intergrading both forms as well. In Mozambique, the population attributable to *A. lachryma* seems to be more easily separable from *A. pamila*, but its protoconch seems to have slightly more inflated whorls than the population of *A. lachryma* from the Philippines.

REMARKS. Even if some specimens from La Réunion are closely matching the typical features attributed to the populations of *A. lachryma* from the Philippines, each of them are slightly splitting for one or several features. The specimen pictured in Figs. 9–10 presents well-spaced axial ribs with well-defined intercostal spiral cords on the ventral side, well-marked spiral cords separated by conspicuous grooves on the dorsal side, and short digitations just reaching the second cords of the last whorl, all features representative of typical *A. lachryma*, but the rest of the light-tan decoration of the dorsal side is more representative of the crossed pattern generally found in *A. pamila*, despite a darker patch located on the upper right side of the dorsum. The specimen pictured in Figs. 11, 12 is perfectly matching the typical features of *A. lachryma* for its shell morphology as well as for its chromatic figure, but the light-tan shade is matching the colour usually observed in *A. pamila*, quite far from the browny shade typically found in *A. lachryma*.

On the ground of these observations and of those made in the section "*A. pamila*", we submit the opinion that the morphs *A. pamila* and *A. lachryma* cannot be strictly separated in La Réunion on the ground of their shell characters, resulting in a much variable population sharing to different degrees the features attributed both to *A. pamila* and to *A. lachryma*, without evident phenetic discontinuity. Such a phenetic continuum suggests that the *A. pamila*/*A. lachryma* population ranging in La Réunion might be an ancestral specific clade from which *A. pamila* and *A. lachryma* did originate, or possibly an incipient radiation of species, with reproductive isolation not totally formed in the disbranching lineages.

Anarithma maesi Drivas et Jay, 1986 (Figs. 13–16)
Anarithma maesi Drivas et Jay, 1986: p. 9, 1 fig., La Réunion, 16–80 m.

TYPE MATERIAL Holotype MNHN–IM–2000–3088, L = 4 mm, La Réunion, 16–80 m.

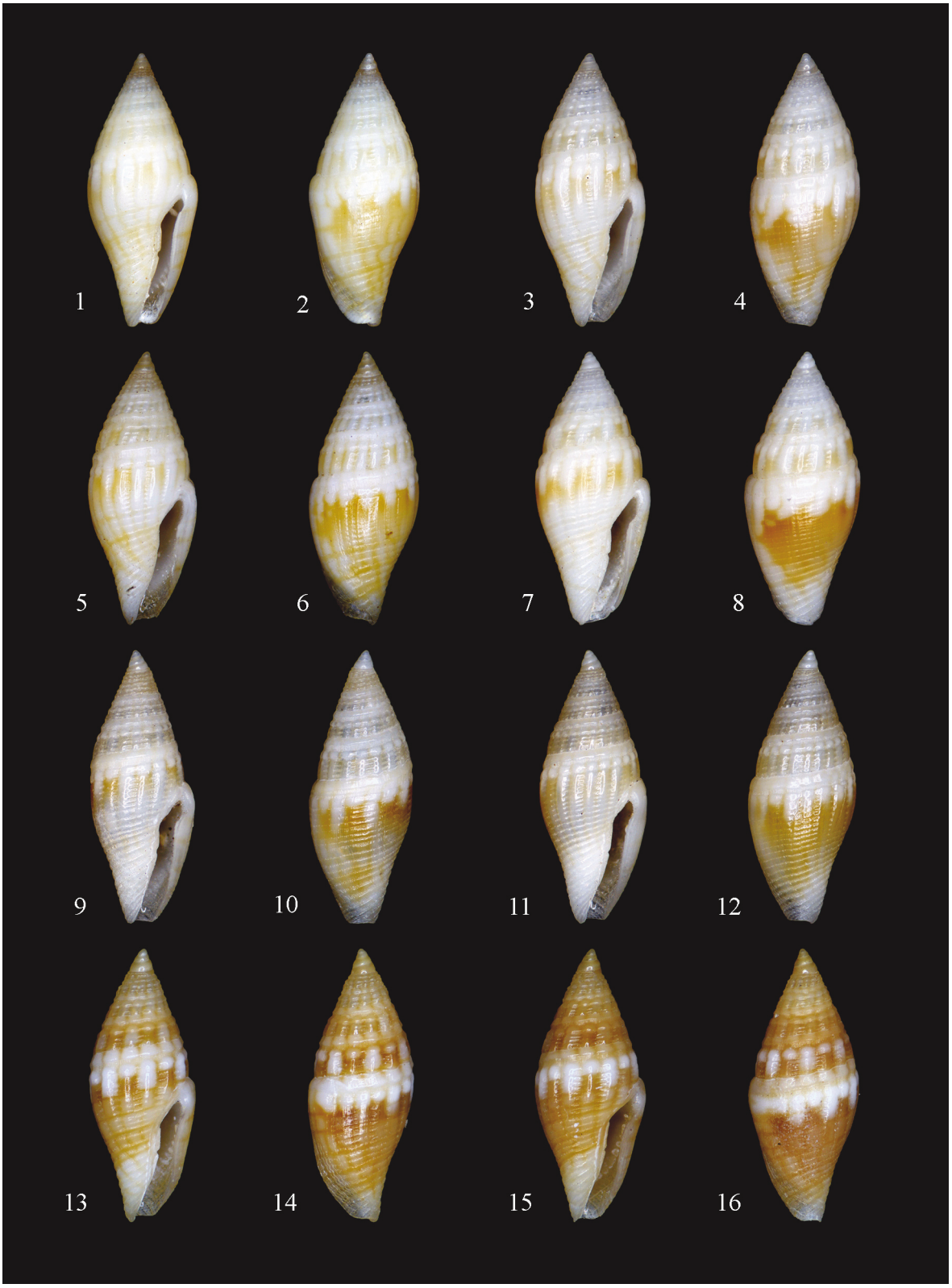
OTHER MATERIAL EXAMINED. MJC: 145 ad and subad spm (Figs. 13–16), L = 3.7–4.9 mm; 8 juv spm; La Réunion, 16–40 m.

DESCRIPTION. See the original description in Drivas & Jay (1986: 9).

TYPE LOCALITY. La Réunion, 16–80 m.

DISTRIBUTION. *Anarithma maesi* Drivas et Jay is only known for now from La Réunion and from the waters of Mozambique.

REMARKS. *Anarithma maesi* Drivas et Jay, 1986 clearly belongs to the *A. lachryma*/*A. pamila* species group. For its shell morphology, *A. maesi* is distinguished only by its slightly stronger and less numerous axial ribs, but its distinctive status is overall evidenced by its shell chromatism, with a widely spread caramel colour on most of the shell, with two



Figures 1, 2. *Anarithma pamila*, L = 5.9 mm. Figures 3, 4. *A*. cf. *pamila*, L = 5.1 mm. Figures 5, 6. *A*. cf. *pamila*, L = 5.2 mm. Figures 7, 8. *A*. cf. *pamila*, L = 5.2 mm. Figures 9, 10. *A*. cf. *lachryma*, L = 5.8 mm. Figures 11, 12. *A. lachryma*, L = 5.8 mm. Figures 13, 14. *A. maesi*, L = 4.8 mm. Figures 15, 16. *A. maesi*, L = 4.9 mm.

ranks of deep white knobs (alternatively short and long for the lower rank) at the top of the last whorl. A white lacuna is ranging at the base of the shell. The protoconch is light caramel shaded, versus deep white in the *A. pamila*/*A. lachryma* population. A darker caramel area is occurring under or between the lower rank of deep white knobs. Despite the vast amount of material examined, *A. maesi* proves to be poorly variable and it is easily separable from the *A. pamila*/*A. lachryma* population on the ground of its colour pattern. In worn away and discoloured shells, the separation of the *A. maesi* individuals from the population of *A. pamila*/*A. lachryma* is quite difficult or most often impossible.

Anarithma metula (Hinds, 1843) (Figs. 17–24)

Clavatula metula Hinds, 1843: p. 44; no type figure; no locality.
Columbella (*Seminella*) *pacei* Melvill & Standen, 1896: p. 274–275, pl. IX, fig. 5; Lifu.
Columbella (*Seminella*) *stepheni* Melvill & Standen, 1897: 407 (replacement name of *C. pacei*).
Columbella dibolos Barnard, 1964: p. 17, fig. 1f; Natal, 40 fms.

TYPE MATERIAL. Holotype NHM Reg. Nb. 1879.2.26.81, L = 3.85 mm, no locality.

OTHER MATERIAL EXAMINED. MM: 1 syntype de *Columbella* (*Seminella*) *stepheni* Melvill et Standen, 1897 Reg. Nb. MANCH.EE.3765, Lifu; NMW: 10 syntypes de *C. stepheni* Reg. Nb. 1955.158.00374–00375; MJC: 193 ad and subad spm (Figs. 17–24) L = 2.9–4.5 mm; 19 juv spm; La Réunion, 12–45 m; FBC: numerous spm, Central Philippines (Balicasag Island, Mactan Island, Aliguay Island), 50–150 m; SGC: Mirissa, Sri Lanka, 20–40 m, several spm.

DESCRIPTION. Hinds, 1843, p. 44: "*Clav. testá ovatá, acuminatá; anfractibus quinis planulatis, obsoletè costulatis, transversim striatis, pallidè rufo fasciatis; suturâ lineâ elevatâinstructâ; apertura lineari; labro subinflexo; canali subnullo. Axis 2 lin. Hab. - ?*".

TYPE LOCALITY. Subsequently designated as "Balicasag Island, 50–150 m, Central Philippines" by Boyer (2022: 85).

DISTRIBUTION. *Anarithma metula* (Hinds, 1843) has a wide Indo-Pacific distribution, its occurrence being verified from South Africa to the Marshall Islands, and from Southern Oman to the Tuamotu. However its presence remains to be confirmed from peripheral areas (Red Sea and Gulf of Oman, Southern Australia, Hawaii, New Caledonia, Southern Japan, Society Islands, etc) and the occurrence of allopatric/sympatric sibling species remains to be fully checked (see below).

REMARKS. As far as the shell morphology and chromatism are concerned, the population of *A. metula* observed from La Réunion looks as perfectly matching the typical features of the species. Its phenetic variability in La Réunion (Figs. 17–24) is similar to the variability checked at large scale from the Philippines.

Anarithma metula is correctly identified in Drivas & Jay (1986: 8, fig. 1).

Anarithma aurea n. sp. (Figs. 25–28)
https://zoobank.org:act:F1B1EFAE-A15F-4599-B349-94AB9DF017E0

TYPE MATERIAL. Holotype MNHN–IM–2000–38525 (Figs. 25, 26), L = 3.80 mm, 26 paratypes MNHN, 4 paratypes FBC (Figs. 27, 28), 4 paratypes WRC, L = 2.70–3.85 mm, La Réunion.

OTHER MATERIAL EXAMINED. FBC: few similar specimens observed from the Central Philippines (Mactan and Balicasag), 50–150 m.

DESCRIPTION. On the basis of the holotype (Figs. 25, 26): Sub-oval biconical outline with beaded sculpture, protoconch of 4.2 whorls with quite produced nucleus; thick axial ribs, protruding spiral cords bearing conspicuous nodules at the level of the two upper cords of the last whorl and of the upper cord of the antepenultimate whorl, the nodules of the upper spiral rank of the two last whorls looking as rings of equal rounded beads, Aperture short and moderately widened, inner labrum faintly thickened, long narrow and sinous anal canal, two moderate packed folds at mid-part of the columellar side. Light golden decoration on the antepenultimate whorl and on the upper part of the last whorl, darker and extending downwards on the dorsal part of the last whorl, golden spiral lines running between the cords in the lower half-part of the last whorl; the protoconch is opaque deep white, like the upper rank of spiral beads both on the ventral

and the dorsal sides, and like the second rank of spiral beads on the dorsal side; the rest of the shell surface is vitreous greyish-white.

Type locality. La Réunion, 12–70 m.

Distribution. For now, *Anarithma aurea* n. sp. is known from La Réunion, where it is quite common, and from scarce specimens collected in Central Philippines (Mactan and Balicasag). From these data, we can infer that the species is widely distributed, at least from the Philippines to southwestern Indian Ocean, but generally confused with the more common sibling species *A. metula*.

Etymology. From the golden colour decorating the two last whorls of the shell.

Remarks. *Anarithma aurea* (Figs. 25–28) differs from *A. metula* mainly by conspicuous and equal rounded nodules on the upper spiral cords of the two last whorls of the shell, by its narrower labial lip, by its long, narrow and sinuous anal canal, and overall by the uniform golden colour spreading over the two last whorls, with a spiral rank of deep white beads at the top of the last whorl. In *A. metula* (Figs. 17–24), the upper nodules are generally coarser, not so equal and rounded; the labial lip is thicker; the anal canal is shorter, wider and facing the axis of the aperture; darker honey-tan or tan-orange axial marks on a whitish ground are alternatively occurring on the top of one in two ribs of the spire whorls and of the ventral side of the last whorl, with a darker wide patch laying on the dorsal part of the last whorl, turning browny upwards in its crenulated part. The design of the colour pattern in *A. aurea* is clearly not homologous with the design found in *A. metula*, and despite the numerous shells examined in this group from the waters of La Réunion, no intergrade was observed.

Drivas & Jay (1986: 8, fig. 1a) reported this population as "*A. metula* forma *iki* (Kay, 1979)", from the fact that the Kay's species *Mitrolumna iki* shows a comparable colour pattern. Polhemus (2020: fig. 10) gives a good macro-photo of a representative specimen of *A. iki* (Kay, 1979) from Hawaii: the outline of the shell, the poorly thickened inner labrum and the narrow and long sinuous anal canal of *A. iki* are similar to what is observed in *A. aurea*, but the shell sculpture of *A. iki* is lower and thinner, showing a waffle, puckered or embossed appearance better than a beaded one, and the size of the shell is much larger, sizing 7.3 mm in the Polhemus specimen versus 2.70–3.85 mm in *A. aurea*. Moreover, the colour pattern is more spreading in *A. iki*, presenting a darker yellow-mustard opaque shade versus a light golden vitreous one in *A. aurea*.

Anarithma aurea must be considered as a twin species of *A. iki*, which is apparently restricted to islands of northern and central Pacific (Polhemus, 2020: 9). *Anarithma aurea* can be considered also as a sibling species of *A. metula*, and to belong to the *A. metula* species group, beside its twin species *A. iki* from northern and central Pacific, and beside the uncommon species *A. bulbosa* Boyer, 2022 more closely matching *A. metula* and described from Balicasag (Philippines). From these recent discoveries, we suspect that further sibling or twin species may occur in this *A. metula* species group.

Anarithma melvilli Boyer, 2022 (Figs. 29, 30)

Anarithma melvilli Boyer, 2022: 87–88, figs. 39–50, Balicasag, 50–150 m.

Type material. Holotype MNHN–IM–2000–35624, L = 5.0 mm, and 62 paratypes FBC, Balicasag, 50–100 m.

Other material examined. MJC: 8 ad and subad spm (Figs. 29, 30), L = 4.5–5.25 mm; 2 dubious ad spm with shorter and inflated protoconchs, L = 5.0 mm. FBC: numerous spm, Central Philippines (Mactan Island, Balicasag Island & Aliguay Island), 50–150 m.

Description. See the original description in Boyer (2022: 87–88).

Type locality. Balicasag, 50–150 m.

Distribution. *Anarithma melvilli* Boyer, 2022 was initially thought to have a widespread Indo-Pacific distribution, but deeper observations lead to recognize the frequent confusion made with the twin species *A. inornata* (Hervier, 1900), which is tackled below. The distribution of *A. melvilli* seems to be in fact more limited than claimed previously, and its typical form is only documented for now from Philippines and Indonesia, with an extension to La Réunion for a population deprived of yellow honey dots on the upper cord of the shell whorls.

Remarks. The population here reported from La Réunion presents most of the original features of *A.*

melvilli (quite large slender size, quite slender protoconch with 3.5–4 whorls and tiny pointing nucleus, quite slender/squarred dark brown marks at the top of the axial ribs, frequent dark brown patch or flames connecting the ribs marks on the dorsum), with the exception of the ring of yellow honey dots on the upper cord of the whorls, totally lacking in the population of La Réunion, whereas it is about constant and well-marked in the typical population from the Philippines.

Two "dubious specimens" present the chromatic features and usual large size of *A. melvilli*, but their outline looks to be slightly more inflated, and overall their protoconch look to be shorter (3.4 whorls), with more bulging nucleus. These two features are better matching the sympatrical twin species *A. inornata* (Hervier, 1900) tackled below, and our two "dubious specimens" look as intergrading between *A*. cf. *melvilli* and this twin species. We have no definitive explanation about this situation: hybridation occurrences are possible when two closely allied species are living in sympatry, but a case of uncomplete speciation may occur as well in the waters of La Réunion, whereas full speciation might have succeeded in Western Pacific populations, where the morphs *A. melvilli* and *A. inornata* look to range in allopatry (Philippines/Indonesia for *A. melvilli*; Papua-New Guinea, Vanuatu and New Caledonia for *A. inornata*).

Anarithma inornata (Hervier, 1900) (Figs. 31, 32)

Columbella stepheni var. *inornata* Hervier, 1900: 386–387, Lifou.

Mitromorpha inornata (Hervier, 1900) in Tardy & Stahlschmidt, 2022: 173, fig. 48, Lifou, New Caledonia.

TYPE MATERIAL. Apparently a lot of specimens belonging to the Hervier's collection or to the R.P. Goubin's collection (?) was observed by P. Stahlschmidt in MNHN (E. Tardy, pers. comm.), but this lot was not documented and controlled as type lot, and no specimen was selected as lectotype or neotype.

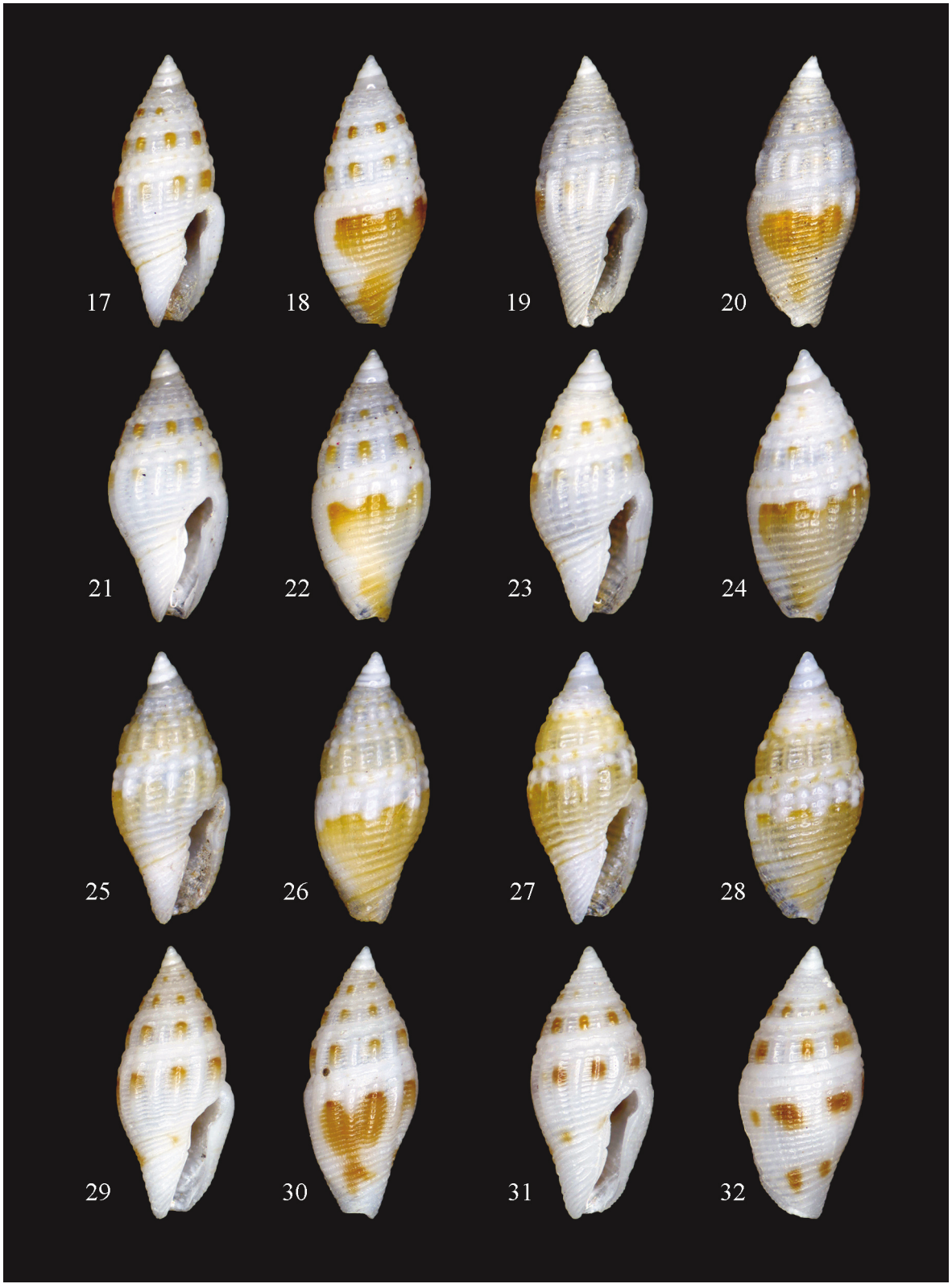
OTHER MATERIAL EXAMINED. E. Tardy, pers. comm: ventral/dorsal photos of 3 spm from Ile des Pins, southern New Caledonia (MNHN general collection), L = 4.6–5.9 mm. MJC: 10 ad and subad spm (Figs. 31, 32), L = 4.0–4.7 mm, La Réunion, 12 m.

DESCRIPTION. Hervier (1900, pp. 386–387): "*Varietas α* inornata*, J. H. Galbe plus globuleux, test plus épaissi; les points bruns sont plus petits, mieux arrondis sur les tours supérieurs et forment, sur le dernier tour, une seconde série située près de la base. La large tache brune triangulaire ne se montre pas dans cette variété qui se trouve aussi à Lifou, où le R.P. Goubin en a recueilli une dizaine d'exemplaires*".

TYPE LOCALITY. Lifou (Loyalty Islands).

DISTRIBUTION. The distribution of *Anarithma inornata* (Hervier, 1900) seems to be restricted to southwestern Pacific (specimens documented from Papua-New Guinea to Vanuatu, Lifu and Ile des Pins, southern New Caledonia) and to southwestern Indian Ocean (specimens documented from La Réunion and from Mozambique), but the species seems to be lacking in the Philippines and in Indonesia, where it seems to be replaced by the twin species *A. melvilli* Boyer, 2022, described from Balicasag (Central Philippines). As the phenetic separation of these two species is quite subtle in some cases, the populations from all these places deserve to be checked more deeply, and further investigations will possibly prove that the distribution ranges of both species may overlap in some places of Indo-West Pacific, what looks to occur in La Réunion.

REMARKS. In its typical population from New Caledonioa, *Anarithma inornata* differs from *A. melvilli* by its more rounded outline and less produced sculptures, its shorter protoconch (for *A. inornata*: about 3.0–3.5 whorls in New Caledonia; for *A. melvilli*: about 3.5–4 whorls in the Philippines) with more bulging nucleus (versus narrower and pointing in *A. melvilli*), its more rounded uniformly dark brown marks making a single ring on the spire whorls and two rings on the last whorl (versus more slender dark marks in *A. melvilli*, frequently darker in their upper part) and the total absence of dark brown patch or flames connecting the ring of marks on the dorsum of the last whorl (versus frequent connection in *A. melvilli*). In its typical populations from New Caledonia, *A. inornata* generally shows a series of numerous, tiny and packed dull honey dots on the upper cord of the whorls (versus series of fewer, larger, and more spaced yellow honey dots in the typical population of *A. melvilli* in the Philippines). In the waters of La Réunion, *A. inornata* looks to be pretty smaller than *A. melvilli* (L = 4.0–



Figures 17, 18. *Anarithma metula*, L = 4.1 mm. Figures 19, 20. *A. metula*, L = 5.2 mm. Figures 21, 22. *A. metula*, L = 3.8 mm. Figures 23, 24. *A. metula*, L = 3.1 mm. Figures 25, 26. *A. aurea* sp. nov., holotype MNHN, L = 3.8 mm. Figures 27, 28. *A. aurea* n. sp., paratype 1, L = 3.1 mm. Figures 29, 30. *A. cf. melvilli*, L = 5.2 mm. Figures 31, 32. *A. inornata*, L = 4.3 mm.

4.7 mm for *A. inornata*, versus 4.5–5.25 mm for *A. melvilli*), whereas both species share about the same large length size in Western Pacific.

The population recognized as *A. inornata* in La Réunion is totally matching the *A. inornata* population documented from Ile des Pins (southern New Caledonia) by Tardy & Stahlschmidt (2022: 173, fig. 48), except for its smaller size range (shells of 4.0–4.7 mm in La Réunion, versus 4.6–5.9 mm in Ile des Pins: E. Tardy, comm. pers.) and for lacking tiny and packed dull honey dots on upper cord of the whorls. The shape of the protoconch is about the same in La Réunion (3.2–3.5 whorls) than in New Caledonia. Despite its poor quality, the ventral view given by Drivas & Jay (1986: 1b) for their "*A. metula* forma *inornata* (Hervier, 1899)" seems to match really the *A. inornata* population from La Réunion (quite rounded outline, low sculpture, rounded dark brown marks).

In their typical definition, respectively referring to populations from the Philippines and from New Caledonia, *A. inornata* and its twin species *A. melvilli* are phenetically well-distinct, even if on the ground of subtle features, but their separation seems to be less drastic in La Réunion. Not only few intergrading specimens are occurring (see in the previous section about *A. melvilli*), but we observe also the absence of honey dots on the upper cord of the whorls, in the two local morphs, whereas the presence of this feature is about constant both in the *A. melvilli* population from the Philippines (few number large and spaced yellow honey dots) and in the *A. inornata* population from New Caledonia (numerous tiny and packed dull honey dots). A situation of uncomplete speciation in La Réunion is questionned, as well as possible cases of hybridism (see in the previous section *A. melvilli*).

The promotion of the subspecific epithet "*inornata*" at the species rank proposed by Tardy & Stahlschmidt (2022: 173) is pertinent (ICZN Art. 17, 23.3.1 and 46.1), but the presentation of a complementary description of the species concept was neglected, despite the fact that the implicitly referred Hervier's description is uncomplete and ambiguous: in particular, Hervier does not say a word about the shell sculpture of its "variety", whereas the sibling species previously described as *A. fuscafenestrata* (Chino et Stahlschmidt, 2014) is only differing from *A. inornata* by the absence of axial sculpture. As *A. fuscafenestrata* was described from Vanuatu, this species may prove to range also in Lifu, and the Hervier's species concept deserves to be clarified at least from this point of view. In the same way, Tardy & Stahlschmidt did not demonstrate that the shell lot they examined in MNHN and said to belong to the "Hervier collection" (E. Tardy, pers. comm.) was really a type lot, and they did not select a lectotype or a neotype (ICZN Art. 16.4) in view to stabilize the species concept and to avoid the possible pitfall coming from a composite type lot. In the frame of expected complementary revision, the explicit mention of novelty will deserve also to be made (ICZN Art. 16.1). These provisional reserves are based on ICZN Art. 23.3.6 and they plead in favor of full identification of the taxon and of full validity of the species name.

Anarithma borbonica n. sp. (Figs. 33–40)
https://zoobank.org:act:019994C7-D2FF-4322-99B6-AFD18A689752

TYPE MATERIAL. Holotype MNHN–IM–2000–38526 (Figs. 33–36), L = 3.9 mm, 92 paratypes MNHN, 4 paratypes FBC (Figs. 37–40), 4 paratypes WRC, L = 3 .4–5.7 mm, La Réunion.

OTHER MATERIAL EXAMINED. Photos of similar shells from Mozambique communicated by J. Horro. See below for the identity of this material.

DESCRIPTION. On the basis of the holotype (Figs. 33–36): slightly subpyriform biconical outline; protoconch of 4.2 whorls with quite produced nucleus; few thick axial ribs, numerous packed spiral cords, faintly nodulose on the spire and on the two upper ranks of the last whorl, smooth on the rest of the last whorl. Aperture quite long and much narrow, inner labrum strongly thickened, short anal canal, two low folds packed at mid-part of the columellar side. Poorly designed light-tan golden marks at the top of one in two ribs on the ventral side of the last whorl, bordered by a light-orange thin fringe upwards; a large opaque light-bronze patch of uniform colour on the dorsal side of the last whorl, with few poorly defined low crenels, bordered by a continuous deep orange thin fringe upwards; vitreous greyish-white spire with very light golden shade on its upper part; whitish protoconch.

TYPE LOCALITY. La Réunion, no depth data.

Distribution. For now, *Anarithma borbonica* n. sp. is only known from La Réunion, where it seems to be quite common but often confused with the other morphs belonging to the *A. pamila*/*A. lachryma* population. A similar form is occurring in Mozambique, presently under revision by J. Horro. However the form from Mozambique is presenting a continuous series of well-defined tan-orange crenels all around the top of the last whorl, with deep-orange fringes on their upper sides, and also presents such crenels on the spire whorls. So the population from Mozambique may well constitute a sibling species of *A. borbonica*. The study of additional features (such as the animal chromatism, the radula morphology and the protoconch pattern) would help to check the point, together with observation of possible populations from Madagascar and from the Comores.

Etymology. From the type locality of La Réunion, previously named as "Isle Bourbon" in the old times.

Remarks. *Anarithma borbonica* is similar to *A. pamila* for its shell morphology, mainly for its quite subpyriform outline and its quite smooth dorsal last whorl, and it differs only by its distinctive chromatic pattern of large patch of uniform opaque light-bronze colour on the dorsum of the last whorl.

Anarithma borbonica is erroneously reported as "*A. metula* forma *nitescens* (Hervier, 1899)" in Drivas & Jay (1986: 8, fig. 1c). In fact, *Columbella lachryma* var. *nitescens* Hervier, 1900 is better referring to a morph from Lifu matching the *A. pamila* species concept, due to the smooth dorsum described by Hervier for his variety, and the bronze-draped morph here described as *A. borbonica* is not reported from New Caledonia or more generally from Western Pacific.

Anarithma fischeri (Hervier, 1900) (Figs. 41–44)

Columbella fischeri Hervier, 1900: 389–390, pl. 14, fig. 8, Lifou.

Type material. Syntype MNHN–IM–2000–6970, L = 5.0 mm, Lifou.

Other specimens examined. MJC: 32 ad and subad spm (Figs. 41–44), 1 juv spm, L = 4.5–5.8 mm, La Réunion, 12–50 m. FBC: numerous spm, Central Philippines (Mactan, Balicasag, Aliguay), 50–150 m.

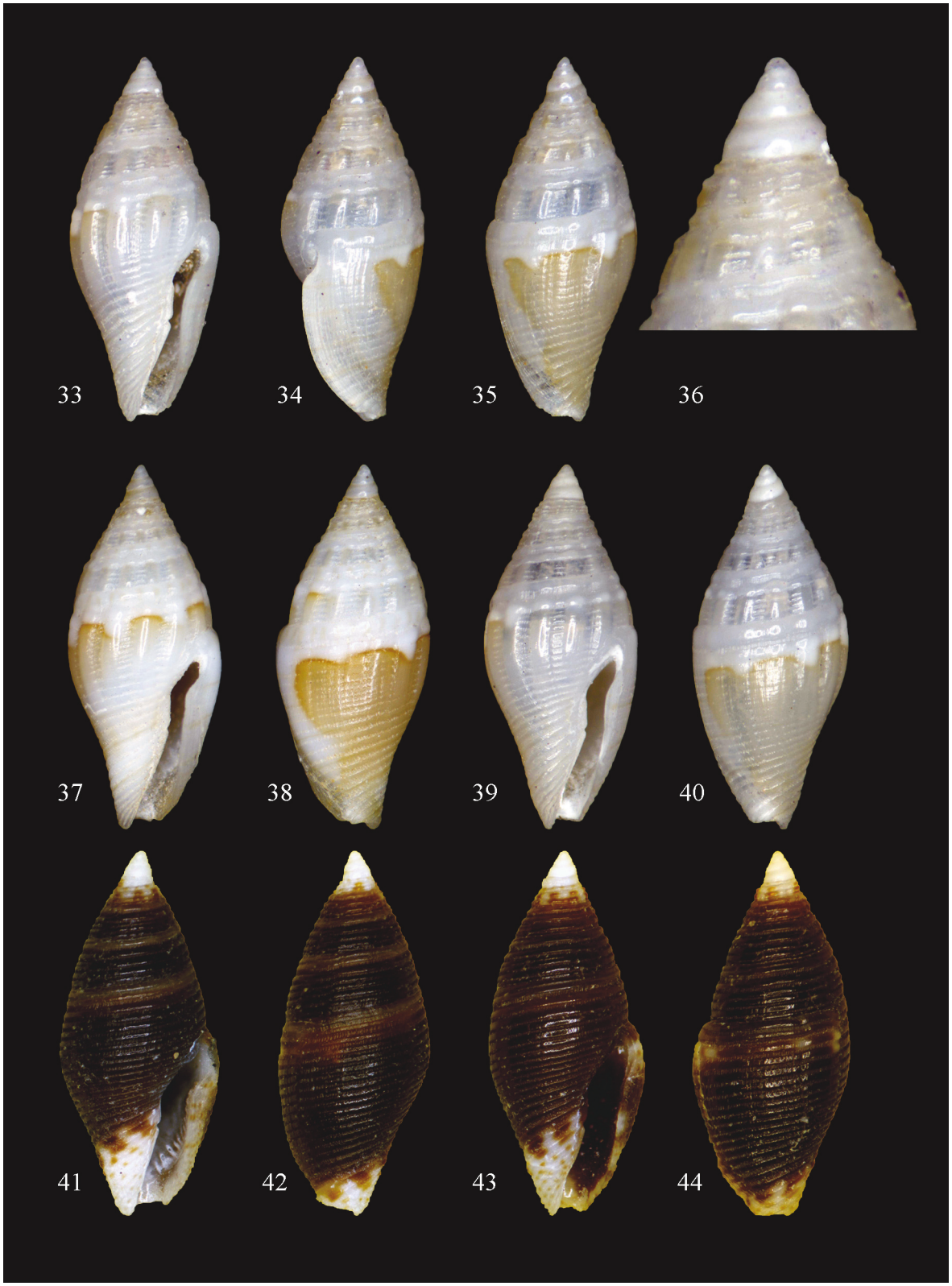
Description. Hervier (1900: 389–390): "*T. parva, ovata, utrinque attenuata, slidula; castanea, in paice et basi albo tincta. Anfr. 7–8 (apice fracto); piores superstantes 3–4, albi, sulcati; sequentes convexi, sutura lineari crassiuscula confuè discret, striis spiralibus subaequalibus undique sulcati, lirisque subelevatis circumcincti, in interstitiis minutissimè striolis sub lente apertis incisi. Ultimus anfractus 2/3 totius longitudinis subaequano, convexus, regulariter attenuatus, omninò sulcatus et liratus, in canalem brevem, apertum desinens. Apertura angusta, obliqua, intus albo-fulvescens; columella flexuosa, supernè subconcava, in medio incisione unica sulcata. Labrum externè varicosè inflatum, superne crassè angulatum et albo-maculatum, versus medium subplano-convexum; sub suturam apertè sinousum, in margine subcrenulatum et plicatum. Long. 5–7 millim. Diam, max. 2.50–3.50 millim. Hab. Insula Lifou. Vidi 8 specimina a R.P. Goubin, S.M. collecta, quorum 5 adulta, 3 verò juniora*".

Type locality. "*Lifou*", Loyalty Islands, New Caledonia.

Distribution. *Anarithma fischeri* (Hervier, 1900) is common in the Philippines, and it is also ranging in Papua-New Guinea, the Marshall Islands and New Caledonia. Kilburn (1986) did not report the species from South Africa and Mozambique (1986), but *A. fischeri* reaches however the waters of Mozambique, even if uncommon in the place (J. Horro, pers. comm.). *Anarithma fischeri* looks to be more common in the waters of La Réunion, but it was apparently not reported from other places of the Indian Ocean until now.

Remarks. For its whole shell morphology, including its sharp pyramidal multispiral protoconch, *A. fischeri* fully belongs to the genus *Anarithma*, and for its flat cords and the absence of axial ribs, it looks as very similar to the unribbed species *A. fuscafenestrata* Chino et Stahlschmidt, 2014. But its black shell chromatism with brown shades at the top of the body whorls and white base with crenulated pattern is unusual in the genus *Anarithma* and it rather reminds the basic pattern found in the genus *Lovellona*, if not by certain aspects some Atlantic/Mediterranean species usually classified in the genus *Mitromorpha*. About this point, see the remarks in Boyer (2022: 94).

Drivas & Jay (1986: 10) are correctly identifying the species.



Figures 33–36. *Anarithma borbonica* n. sp., holotype MNHN, L = 3.9 mm. Figures 37, 38. *A. borbonica* sp. nov., paratype 1, L = 4.4 mm. Figures 39, 40. *A. borbonica* sp. nov., paratype 2, L = 4.5 mm. Figures 41, 42. *A. fischeri*, L = 5.8 mm. Figures 43, 44. *A. fischeri*, L = 5.2 mm.

Anarithma cf. ***salisburyi*** (Cernohorsky, 1978) (Figs. 45–47)

Mitrolumna salisburyi Cernohorsky, 1978: 66–67, figs. 10–12, Oahu, Hawaiian Islands.

Type material. Holotype AIM/TM–1342, L = 4.0 mm, and 5 paratypes in various collections, Oahu, Hawaiian Islands, 32 fms.

Other material examined. MJC: 4 ad spm (Figs. 45–47), L = 4.2–4.8 mm, La Réunion, 54 m. CFB: 1 ad spm, L = 3.5 mm, Balicasag, Philippines, 50–150 m.

Description. See the original description in Cernohorsky (1978: 66–67).

Type locality. Oahu, Hawaiian Islands, 32 fms.

Distribution. Polhemus (2020) reports *Anarithma salisburyi* (Cernohorsky, 1978) from the Hawaiian Archipelago (52–91 m), Marquesas Islands and the Tuamotu, and Boyer (2022: 93, 94, figs. 121, 122) reports as *A*. cf. *salisburyi* a similar morph from Balicasag (Central Philippines) which fully matches the present morph from La Réunion.

Remarks. The typical population of *A. salisburyi* from the Hawaiian Archipelago is illustrated by Polhemus (2020: fig. 11) through a well-descriptive photo. It differs from the twin form found in La Réunion and in the Philippines by its more finely chopped and more waffled sculpture, and by its slightly more slender protoconch. The outline of the teleoconch, the details of the aperture and the colour pattern are identical in the two forms. From these elements, it seems that two quite diverging populations are respectively ranging in Central Pacific and in Indo-West Pacific, but in the present state no evidence is acquired about their phyletic relation, as they could be allopatric twin species as well as just geographical populations of the same species.

Drivas & Jay (1986: 9) are erroneously identifying the present morph as "*Anarithma alphonsiana* (Hervier, 1899)", which one belongs to the same polychromatic group but has a much different shell morphology, with larger slender outline, short conical spire and long body whorl, very long and very narrow aperture, more beaded sculpture on its spire and on the upper part of its body whorl, and quite different organization of the colour pattern. Boyer (2022: 93–94, figs. 117–122) does compare *A*. cf. *salisburyi* with the sibling species *A. iozona* (Hervier, 1900) described from New Caledonia, and with *A. alphonsiana*, described also from New Caledonia and reported from Micronesia and from the Philippines.

The species is erroneously named as *Mitromorpha iozona* (Hervier, 1900) in the "vieoceane" website, which displays two descriptive photos.

Anarithma kilburni Drivas et Jay, 1986 (Figs. 48–53)

Anarithma kilburni Drivas & Jay, 1986: 9, 1 fig. in-text, La Réunion, 20–80 m.

Mitromorpha thalaoides Chino & Stahlschmidt, 2014: 24–25, 1 fig, Lifu, Loyalty Islands, 8–18 m.

Type material. Holotype MNHN–IM–2000–3040, L = 3.1 mm, and 4 paratypes in various collections, La Réunion, 20–80 m.

Other material examined. MJC: 152 ad and subad spm (Figs. 48–53), L = 2.9–4.0 mm, and 4 juv spm, La Réunion, 20–80 m.

Description. See the original description in Drivas & Jay (1986: 9).

Type locality. La Réunion, 20–80 m.

Distribution. *Anarithma kilburni*, initially only recognized from La Réunion, is now also reported from Mozambique, the Philippines, Micronesia and Vanuatu.

Remarks. A similar form was described from Lifu as *Mitromorpha thalaoides* Chino et Stahlschmidt, 2014, which was reported to range also in Vanuatu, Micronesia and the Philippines. Boyer (2022: 94) replaced this species in *Anarithma*, and he compared it with *A. kilburni*, said to differ from *A. thalaoides* by a squat, bulbous and twisted protoconch of 2.25 whorls looking better as lecithotrophic (versus 2.50 whorls looking better as planktotrophic in *A. thalaoides*), and by a full-white color instead of the honey flames on a creamy ground observed in *A. thalaoides*. In fact the protoconch shape and length look to be quite variable in *A. kilburni*, and honey flames are also occurring in the population from La Réunion (Figs. 48–53). So in reality, the populations from West Pacific and that from southwestern Indian Ocean seem all to

present the same range of natural variability throughout the Indo-West Pacific waters and we propose to place *A. thalaoides* in the synonymy of *A. kilburni*.

"*Anarithma*" aff. ***poppei*** (Chino et Stahlschmidt, 2009) (Fig. 54)

Mitromorpha poppei Chino & Stahlschmidt, 2009: 71–72, 1 fig. in-text, pl. 6, figs. 1, 2, Aliguay Island, Philippines, 100 m.

TYPE MATERIAL. Holotype NMST–76877, L = 11.8 mm, Aliguay Island, Southern Philippines, 100 m, and 5 paratypes from Bohol and Balicasag, Central Philippines, in various collections.

OTHER MATERIAL EXAMINED. The photography of a shell specimen (Fig. 54) displayed under reference number 3527 as "*Mitromorpha poppei* Chino & Stahlschmidt, 2009" by the website "vieoceane", L = 8.5 mm, La Réunion, 100 m.

DESCRIPTION. See the original description in Chino & Stahlschmidt (2009: 71).

TYPE LOCALITY. Aliguay Island, Philippines, 100 m.

DISTRIBUTION. The nominal species "*Anarithma*" *poppei* is only known for now from the Philippines. The present morph from La Réunion clearly belong to an allied species, which possibly ranges also in the Philippines (see below).

REMARKS. Boyer (2022: 92–93) placed *Mitromorpha poppei* Chino & Stahlschmidt, 2009 in the C series of the genus *Anarithma* (= "lecithotrophic diverging species"), but this placement was made with reserve due the rhomboidal outline of the shell and its heavy costal sculpture contrasting with the typical features of *Anarithma* (*A. lachryma* as type species of the genus).

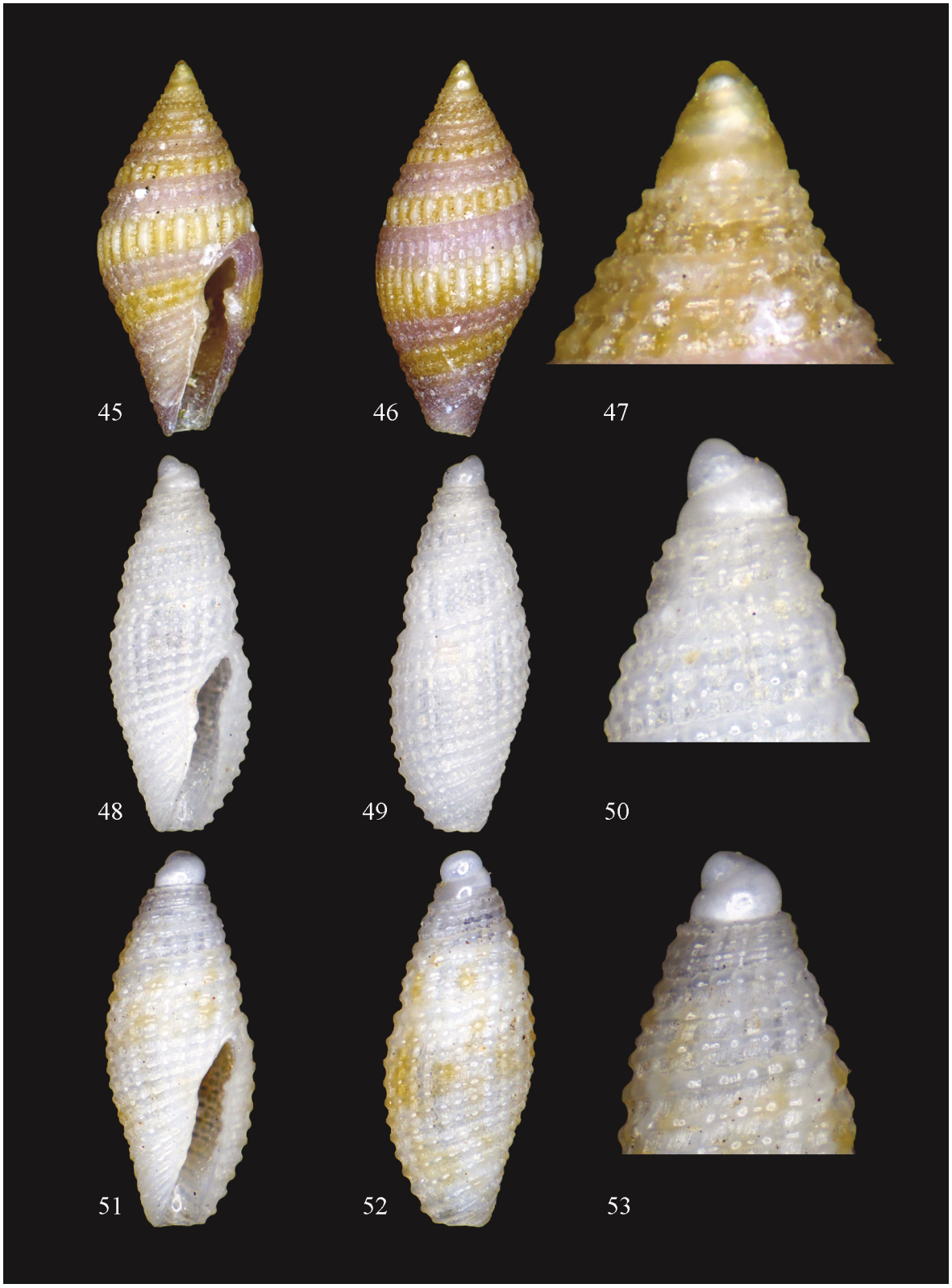
The specimen attributed to "*Mitromorpha poppei* Chino & Stahlschmidt, 2009" by the website "vieoceane" (Fig. 54) was not reported in the 1986 article of Drivas & Jay, and it was probably collected in the next. This specimen was not found in the M. Jay's collection and it is studied here on the ground of the photography displayed by the website "vieoceane". This specimen differs from *Anarithma poppei* by its smaller size (8.5 mm versus 11.8 mm), its more biconical outline, its much higher pointing spire, its bigger and bulbous protoconch, its wider oval aperture, its thicker and flatter cords on the anterior half-part of the last whorl, its less concave columellar border and its two subequal plaits located lower on the columella. In every respect, the morph *M.* aff. *poppei* from La Réunion looks as very close, if not conspecific, with the paratype 4 of *Mitromorpha poppei* from Balicasag illustrated in plate 6, fig. 2 by Chino & Stahlschmidt. (2009: 82). We consider the morph from La Réunion illustrated herein (Fig. 54) as belonging to an undescribed species which possibly deserves the placement in a new mitromorphid genus.

DISCUSSION

With 12 attributed species (one with reserve), the *Anarithma* fauna of La Réunion proves to be much diversified, and to be clearly dominant in local mitromorphid assemblage. The genus *Lovellona* Iredale, 1917 is represented only by few worn away specimens of *L. atramentosa* (Reeve, 1845) (Figs. 55, 56), and the genus *Mitromorpha* Carpenter, 1865 is only represented by one specimen of *M. oliva* Chino et Stahlschmidt, 2009 (Figs. 57–59). Naturally, the M. Jay's collection and the references given by the website "vieoceane" cannot be considered as exhaustive. Deep levels species ranging lower than 40-50 m are clearly underrepresented due to the sampling technics used by M. Jay and collaborators, and even at upper reef levels the low number of specimens sampled in some mitromorphid species (4 specimens in *A.* cf. *salisburyi*, 1 specimen in "*A.*" aff. *poppei*, 1 specimen in *Mitromorpha oliva*) leads to consider that the saturation of the sampling results is not reached and that further mitromorphid species are surely occurring off La Réunion. However the structure of the mitromorphid population in the waters of La Réunion is probably correctly reported by the over-representation of the genus *Anarithma* and by the very low representation of the genera *Lovellona* and *Mitromorpha*.

As far as the genus *Anarithma* is concerned, seven species groups can be distinguished in the waters of La Réunion:

the *A. lachryma* species group represented by *A. lachryma* and its twin morph *A. pamila*, together



Figures 45–47. "*Anarithma"* cf. *salisburyi*, L = 4.8 mm. Figures 48–50 : *A. kilburni*, L = 3.5 mm.
Figures 51–53 : *A. kilburni*, L = 3.0 mm.

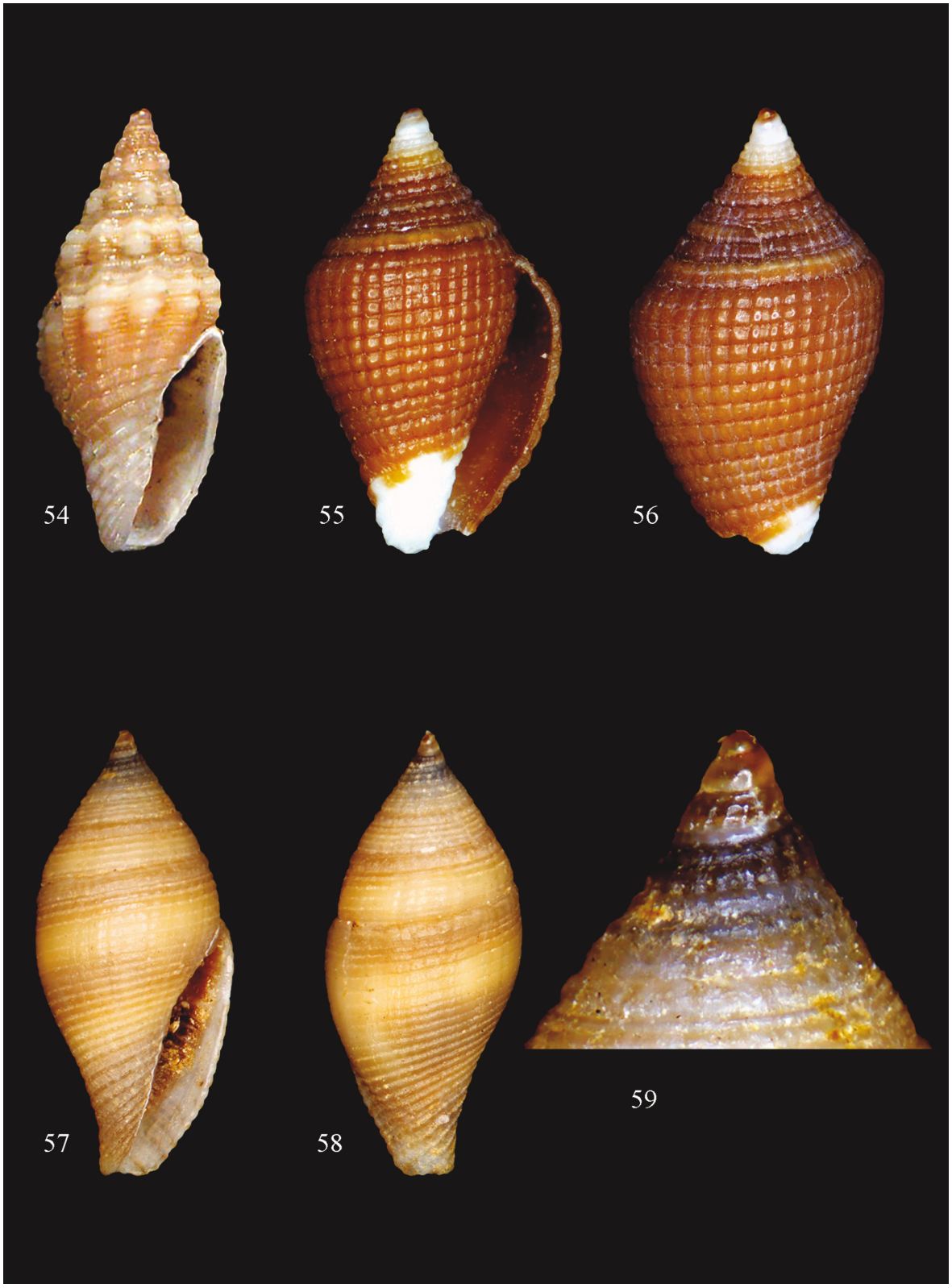


Figure 54. "*Mitromorpha*" aff. *poppei*, L = 8.5 mm. Figures 55, 56. *Lovellona atramentosa* (juv. specimen), L = 5.3 mm. Figures 57–59. *Mitromorpha oliva*, L = 8.9 mm.

with their sibling species *A. maesi* and *A. borbonica*. Several other species described from Western Pacific (from Japan to New Caledonia) look to belong to this species group (Boyer, 2022: 91);

the *A. metula* species group represented by the twin species *A. metula* and *A. aurea*. *A. bulbosa* Boyer, 2022, a twin species of *A. metula* only known from the Philippines, belongs to this species group, as well as *A. iki*, a twin species of *A. aurea* which is said to have a quite wide range of distribution in Central Pacific (Polhemus, 2020: 9);

the *A. inornata* species group represented by *A. inornata* and *A. melvilli*. The unribbed species *A. fuscafenestrata* described from Vanuatu but recognized also from Central Pacific and from Central Philippines, belongs also to this group of twin species;

the *A. fischeri* species group represented only by *A. fischeri* at the scale of Indo-Pacific, due to its very original colour pattern remembering the pattern found in several *Lovellona* species (Boyer, 2022: 94);

the *A. alphonsiana* species group only represented by *A*. cf. *salisburyi* in La Réunion, but uniting *A. alphonsiana*, known from New Caledonia and Micronesia to the Central Philippines, *A. iozona* described from New Caledonia, *A. salisburyi* described from Hawaii and possibly distributed from Central Pacific to the Philippines and to La Réunion, and *A. purpurata* (Chino & Stahlschmidt, 2009), described from the Philippines but also reported from Micronesia;

the *A. kilburni* species group represented only by the very original species *A. kilburni*, now proved to range from La Réunion to Western Pacific;

the "*A*." *poppei* species group, possibly deserving an autonomous status at the generic level and represented in La Réunion by an undescribed species "*A*." aff. *poppei*. This species group is uniting otherwise "*A*." *poppei*, "*A*". *ambigua* (Chino et Stahlschmidt, 2009) and "*A*." *pylei* (Chino et Stahlschmidt, 2014), all only known for now from the Central Philippines (Boyer, 2022: 92–93).

The important occurrence of twin and sibling species in this *Anarithma* assemblage suggests that further undiscriminated twin and sibling species remain to discover in the genus, specially among the quite disparate forms grouped under the names *A. lachryma*/*A. pamila*, *A. metula* and *A. inornata*/*A. melvilli.* Cases of possible hybridism and of possible uncomplete speciations may also occur in these species groups. Such hypothesis deserve further investigation, based on more important shell material, and overall on comparative data about the animal chromatism, the radula and the internal anatomy.

ACKNOWLEDGEMENTS

We are indebted to the MNHN team of Malacology for the loan of the Mitromorphidae collection of the late Dr Maurice Jay (La Réunion), to Juan Horro (Vigo, Spain) for useful discussions about the mitromorphid radiations in southwestern Indian Ocean, and to Dan Polhemus (Hawaii) for kind help. Special thanks are due to Emmanuel Tardy (MHNG) for useful information and for giving a series of ventral/dorsal photos of specimens of *Anarithma inornata* collected off Ile des Pins (southern New Caledonia).

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