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Middle Miocene Modulidae (Gastropoda: Cerithioidea) from Indonesia, Java, Yogyakarta, near Wonosari

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ABSTRACT

Two species of the genus *Conomodulus* Landau, Vermeij & Reich, 2014 are described as new from the Middle Miocene Langhian beds from Wonosari (Indonesia, Java, Yogyakarta). Recent advances in modulid taxonomy based solely on shell characters are highlighted, both at generic level and at species level, with almost 40% of known modulid species described since the year 2000. We await molecular data to test the present generic/species concepts within the family.

Key words – Cerithioidea, Modulidae, Miocene, Indonesia, new species

INTRODUCTION

In this paper we continue the work of Dekkers et al. (2020), Merle et al. (2020), Landau et al. (2020a, 2020b, 2024) on the gastropod assemblage occurring at a locality close to the village of Wonosari, Gunung Kidul Regency, Special Region of Yogyakarta, Java, Indonesia and revisit Indonesian Miocene Modulidae, describing two new species. As discussed by Dekkers et al. (2020: 2), although the exact locality is unknown, the deposit is dated accurately to the Middle Miocene Langhian.

Until recently almost all Modulidae were placed in a single genus, *Modulus* J. E. Gray, 1842. Based on shell characters, Landau et al. (2014) proposed a supraspecific classification for the family. For the Indo-Pacific, the genus *Indomodulus* Landau, Vermeij & Reich, 2014 first appears in the early Miocene of Indonesia, after which there is no fossil record until the Pleistocene, and is today represented by a single, widely distributed Indo-Pacific species, *Indomodulus tectum* (Gmelin, 1791). Additionally, the genus *Conomodulus* Landau, Vermeij & Reich, 2014 occurs, thought to be restricted to the Miocene of Indonesia, but recently reported as still living in New Caledonia (Lozouet & Krygelmans, 2016).

In this paper we describe the modulids from the Middle Miocene Langhian locality of Wonosauri and introduce two new species.

Abbreviations:
H – height of the shell (shell length)
W – width of the shell at the broadest point
NHMW – Natural History Museum, Wien, Austria

TAXONOMY

Subclass Caenogastropoda Cox, 1960
Superfamily Cerithioidea Fleming, 1822
Family Modulidae P. Fischer, 1884
Genus *Conomodulus* Landau, Vermeij & Reich, 2014

Type species: *Modulus preangerensis* Martin, 1905, by original designation, Miocene, Indonesia. Gender masculine.

***Conomodulus altispira* sp. nov.**
(Plate 1 Figs 1-2)
urn:lsid:zoobank.org:act:475C4128-E251-4675-8E0F-59794949D485

Type species: *Strombus leurus* Woodring, 1928.

Holotype. – Indonesia, Wosonari, deposited NHMW 2024/0043/0009, H 18.7 mm, W 10.8 mm (Pl. 1 fig. 1).

Paratypes. – All from the type locality. Paratype 1 NHMW 2024/0043/0010, H 20.2 mm, width 11.9 mm (Pl. 1 fig. 2); paratype 2 NHMW 2024/0043/0011, H 18.6 mm, W 11.7 mm; paratype 3 NHMW 2024/0043/0012, subadult H 14.9 mm, W 8.9 mm; paratype 4 NHMW 2024/0043/0013, subadult H 13.8 mm, W 8.7 mm.

Other material. – NHMW 2024/0043/0014 (21).

Type locality. – Indonesia, Java, Special Region of Yogyakarta, Gunung Kidul Regency, Wonosari.

Type stratum. – Middle Miocene, Langhian portion of NN5.

Distribution. – Middle Miocene: central Java, Yogyakarta (this paper).

Description. – Shell large for genus, biconic; spire relatively tall, regularly conical; apical angle about 57-67°. Protoconch abraded in all specimens. Teleoconch of up to seven whorls. First 4-5 teleoconch whorls convex, bearing six primary spiral cords, abapical cord slightly stronger forming periphery just above suture; single narrow secondary cord intercalated in primary interspaces from fourth whorl. Suture linear, deeply impressed, narrowly canaliculate. On fifth whorl poorly defined axial folds appear, strengthening abapically to form about ten broad, low, opisthocline axial ribs on penultimate whorl, overrun by weakening spirals; spirals fade again before last whorl. Last whorl about 66-68% of total height, biconic, sharply angled at basal keel forming periphery; above keel very weakly convex, surface smooth in fully adult specimens; keel strengthened by cord in some specimens; below about ten very fine spiral cords to stronger mid-basal cord, 4-5 further cords from mid-basal cord to umbilicus of irregular strength; basal cords corrugated by weak axial collabral growth lines in some specimens. umbilicus very narrow, reduced to narrow chink in some specimens. Aperture ovate, outer lip sharp, prosocline in lateral view, weakly angled at peribasal cord, extremely finely and deeply lirate within; anal canal not developed; siphonal canal represented by broad, deep, rounded groove in columellar callus placed below columellar tooth. Columella moderately excavated in mid-portion, with strong, sharp, abapical columellar tooth. Columellar callus very narrow, erect, forming medial border of umbilicus, thin and adherent, poorly delimited in parietal area.

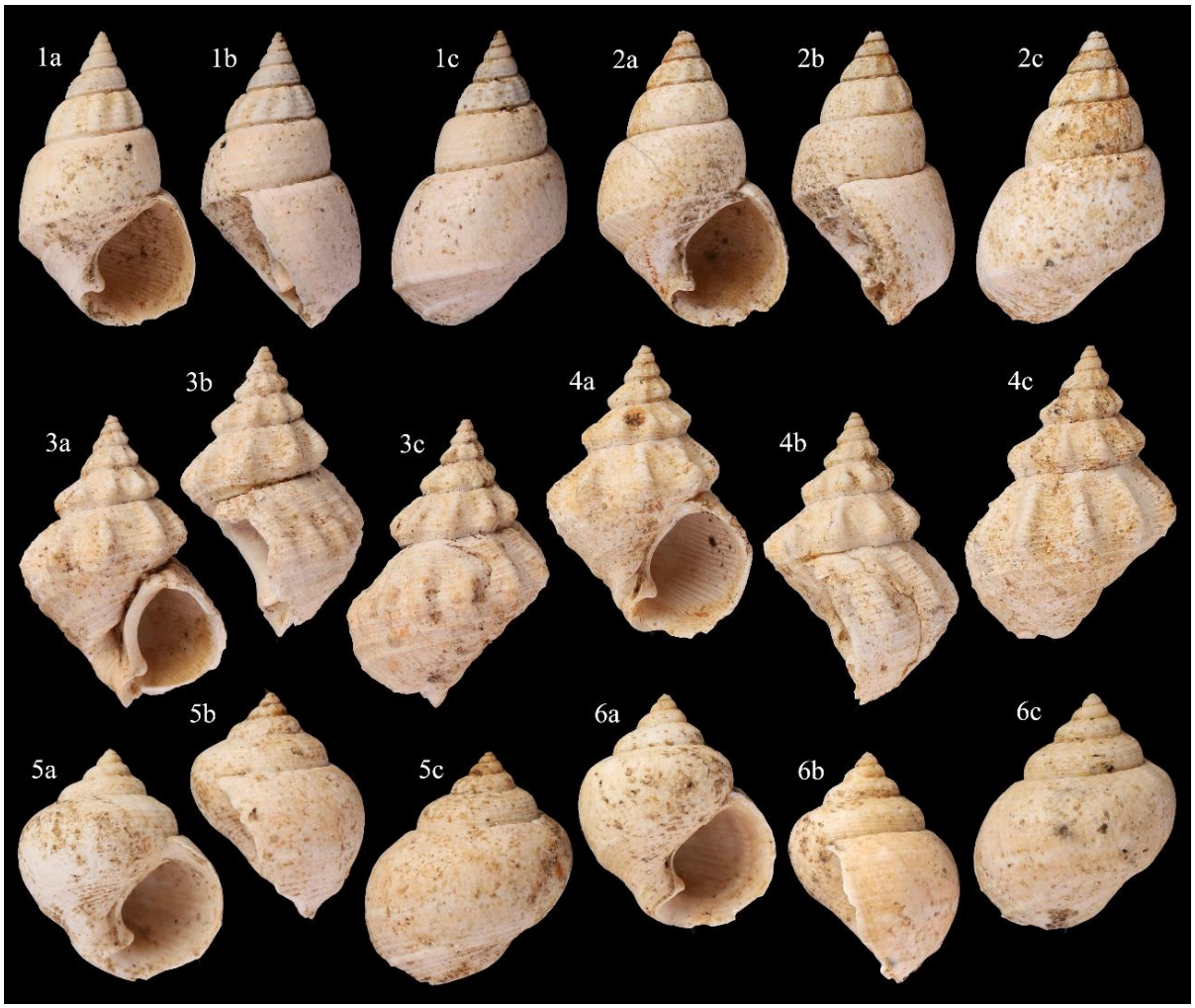

Plate 1. *Conomodulus* species. Figs 1-2. ***C. altispira*** sp. nov. Fig. 1. Holotype NHMW 2024/0043/0009, height 18.7 mm, width 10.8 mm. Fig. 2. Paratype 1 NHMW 2024/0043/0010, height 20.2 mm, width 11.9 mm. Figs 3-4. ***C. forticostatus*** sp. nov. Fig. 3. Holotype NHMW 2024/0043/0015, height 23.1 mm, width 13.6 mm. Fig. 4. Paratype 1 NHMW 2024/0043/0016, height 20.3 mm, width 13.4 mm. Figs 5-6. ***C. preangerensis*** (K. Martin, 1905). Fig. 5. NHMW 2024/0043/0018, height 11.7 mm, width, 10.9 mm. Fig. 6. NHMW 2024/0043/0019, height 11.8 mm, width 10.0 mm. All specimens from Indonesia, Java, Special Region of Yogyakarta, Gunung Kidul Regency, Wonosari, Middle Miocene, Langhian.

Etymology. – Name reflecting the unusually tall spire for the genus.

Comparison. – This new species is most like its older congener *Conomodulus renemai* Landau, Vermeij & Reich, 2014 from the Lower Miocene Burdigalian of Java, but differs in its larger maximum size (maximum height 20.2 mm vs. 6.8 mm), with more numerous spire whorls of which fewer (usually only one or two) have axial sculpture, and in its taller last whorl, which is smooth above the basal angulation, whereas the last whorl in *C. renemai* bears strong axial and spiral sculpture.

Conomodulus preangerensis (Martin, 1905) from the Middle and Upper Miocene of Indonesia is less closely similar to the new species, with a much lower spire and ovate last whorl only weakly angled mid-whorl, axial sculpture is weak throughout and close-set spiral cords persist onto the last whorl.

Discussion. – *Conomodulus altispira* sp. nov. is somewhat variable in adult sculpture but changes importantly with ontogeny. Subadult shells are similar in profile to *C. renemai* but can be distinguished by having axial ribs only on the last whorl (penultimate whorl of fully adult specimens). As the shell grows, axials and spirals fade, so that the last whorl is smooth above the basal keel, or almost so, and the last whorl becomes relatively tall biconic. In all fully adult specimens, axials have disappeared on the last whorl; a few weak spiral cords may persist in some, but in most the surface is smooth. The basal keel can be sharp or strengthened by a narrow peribasal cord. Basal sculpture is relatively constant; a stronger mid-basal cord, very fine cords between the peri- and mid-basal cords, a few stronger cords of irregular strength between mid-basal cord and umbilicus. The umbilicus is narrow in all specimens, in some reduced to a narrow groove. Apertural characters are constant; the lirae are very fine in all specimens.
Generic placement is based on its turbiniform biconic shape, tall spire, sculpture of axial folds that become subobsolete, and the presence of a marked groove delimiting the siphonal depression, characteristic of the genus *Conomodulus* Landau, Vermeij & Reich, 2014.

Conomodulus neocaledonensis Lozouet & Krygelmans, 2016, recently described from the extant faunas of New Caledonia, Ouen Island, is most like *C. renemai* in size, profile and sculpture, but differs in lacking the broad groove delimiting the siphonal depression characteristic of the genus. Nevertheless, we agree with Lozouet & Krygelmans (2016) in this generic placement being the least problematic. One further difference is that the extant species from New Caledonia seems to lack lirae within the outer lip. However, the presence/absence of lirae is of dubious generic and even species specific value in many gastropod groups. Petuch & Berschauer (2023) placed two extant species from the western Atlantic Florida Keys in *Conomodulus*; *Modulus lindae* Petuch, 1987 (holotype USNM 859825) and *Conomodulus lambi* Petuch & Berschauer, 2023 (2023, pl. 1 figs A-C). Both of these lack the groove delimiting the siphonal depression and, in our opinion, are more likely to represent somewhat derived *Modulus* species.

Conomodulus forticostatus sp. nov.
(Plate 1 Figs 3-4)
urn:lsid:zoobank.org:act:37FF16FF-7E2A-41B4-B97A-4F912DCA29C8

Holotype. – Indonesia, Wosonari, deposited NHMW 2024/0043/0015, height 23.1 mm, width 13.6 mm (Pl. 1 fig. 3).

Paratypes. – All from the type locality. Paratype 1 NHMW 2024/0043/0016, height 20.3 mm, width 13.4 mm (Pl. 1 fig. 4); paratype 2 NHMW 2024/0043/0017, height 15.7 mm, width 11.2 mm.

Other material. – Known from the type series only.

Type locality. – Indonesia, Java, Special Region of Yogyakarta, Gunung Kidul Regency, Wonosari.

Type stratum. – Middle Miocene, Langhian portion of NN5.

Distribution. – Middle Miocene: central Java, Yogyakarta (this paper).

Description. – Shell large for genus, biconic; spire relatively tall, coeloconoid in profile; apical angle initially 56-57°, later 63°. Protoconch abraded in all specimens. Teleoconch of up to seven angular whorls. First four teleoconch whorls convex, bearing five primary spiral cords, abapical cord forming periphery just above suture, with very fine secondary and tertiary spirals intercalated in primary interspaces from third whorl, interrupted or crossed by fine irregular collabral axial growth lines. Suture linear, narrowly impressed. On fourth whorl, abapical two cords equal in strength, forming periphery. On second half of fourth whorl axial ribs appear, strengthening rapidly abapically. Last three whorls with broad, flattened subsutural ramp, roundly angled at shoulder placed at about one-third whorl height, tapering rapidly below to suture. Axials weakly opisthocline, ten on penultimate whorl, narrow at adapical suture, widening towards shoulder, most prominent and swollen at periphery without tubercles. Last whorl 67-69% of total height, biconic, roundly angled at periphery; axial ribs tubercular at periphery, stopping abruptly just below periphery; base delimited by two stronger peribasal cords, equal strength mid-basal cord, cords of alternating strength between mid-basal cord and umbilicus. Finer spiral threads of secondary strength intercalated between peribasal cords and mid-basal cord; collabral axial growth lines weak; umbilicus narrow, widening with ontogeny. Aperture ovate, outer lip sharp, prosocline in lateral view, weakly angled at periphery, extremely finely and deeply lirate within; anal canal not developed; siphonal canal represented by broad, deep, rounded groove in columellar callus placed below columellar tooth. Columella weakly excavated in mid-portion, with strong, sharp, abapical columellar tooth. Columellar callus very narrow, strongly thickened in fully adult specimens, erect, forming medial border of umbilicus, continuing thickened and detached in parietal area.

Etymology. – Name reflecting the strong axial sculpture for the genus.

Comparison. – In sculpture the new species is most like *Conomodulus renemai* Landau, Vermeij & Reich, 2014, but is much larger (maximum height 23.1 mm vs. 6.8 mm), its last three whorls are roundly but strongly angled at the shoulder, and the axials ribs form tubercles at the shoulder of the last whorl. *Conomodulus altispira* sp. nov., with which it co-occurs, has a regularly conical spire and is immediately separated by the lack of sculpture on the last whorl, being smooth above the basal angulation.

Discussion. – *Conomodulus forticostatus* sp. nov. shows little intraspecific variability, mainly reflected in the changes that occur with ontogeny. As the shell grows, the columellar lip thickens and becomes sharply delimited from the base, detached in the parietal area and erect in the umbilical area.
This species is very characteristic, with its strongly biconic profile, coeloconoid spire, and strongly shouldered last three whorls with the axial ribs forming tubercles at the periphery. The generic description "Sculpture of axial folds not forming tubercles at shoulder,…" (Landau et al., 2014: 17) must be revised with the addition of this new species to the genus. Notwithstanding, the other shell characters agree well with this generic placement.

Conomodulus preangerensis (K. Martin, 1905)
(Plate 1 Figs 5-6)

Modulus preangerensis Martin, 1905: 221, pl. 46 fig. 671; Martin, 1928: 127.
Modulus preangerensis Martin – Van der Vlerk, 1931: 252; Ladd, 1972: 24, pl. 5 figs 19-21.
Modulus spec. nov.– Beets, 1941: 37.
Modulus preangerensis Martin, 1905 – Dharma, 2005: 306, pl. 118 fig. 15; Leloux & Wesselingh, 2009: 142, pl. 275 figs 14-15.
Conomodulus preangerensis (Martin, 1905) – Landau et al., 2014: 18, pl. 1 figs 99-108.

Material seen. – Indonesia, Wosonari. Maximum H 11.7 mm, W 10.1 mm. NHMW 2024/0043/0018-0019 (2), NHMW 2024/0043/0020 (16).

Distribution. – Middle Miocene: Kalimantan (Beets, 1941), central Java, Yogyakarta (this paper); late Middle Miocene: Java (Martin, 1905). Upper Miocene: Palau (Ladd, 1972), Kalimantan (new data, Throughflow Project).

Discussion. – As discussed by Landau et al. (2014: 17), this species is rather variable in profile and sculpture. The specimens from Wonosari are similar in size to specimens from other localities but have a more rounded last whorl, weaker spiral sculpture, and weaker lirae within the outer lip than the holotype (Landau et al., 2014: figs 99-100). Similar weakly sculptured specimens with rounded rather than angular last whorls were also reported from the Middle Miocene, lower Menkrawit beds, East Kalimantan (Landau et al., 2014: figs 103-104). We consider these forms to represent a single, rather variable, species.

CONCLUSIONS

Historically, modulid taxonomy has been rather conservative, almost all species placed in the single genus *Modulus* J. E. Gray, 1842. Following the familial generic revision of Landau et al. (2014) based solely on shell characters, there has been renewed interest in the family with the description of both further fossil and extant taxa. WoRMS (consulted 08-02-2024) lists 49 modulid species as being valid, of which 19 (39%) have been described since the year 2000 (excluding the two species described as new herein).

This has led to further insights in modulid palaeobiogeography. For example, the genus *Trochomodulus* Landau, Vermeij & Reich, 2014, when erected, was considered a Tropical American genus with a geological history ranging back to the early Miocene in the Caribbean (Landau et al., 2014: 7). Lozouet et al. (2020) showed it to have an eastern Atlantic origin, with one species present in the Lower Oligocene Rupelian and one in the Upper Oligocene Chattian of France.
Two genera were considered exclusively Indo-West Pacific by Landau et al. (2014): *Conomodulus* and *Indomodulus* Landau, Vermeij & Reich, 2014. In the Wonosari assemblage only *Conomodulus* is so far known. However, the two species described herein show the genus to be more diverse than previously thought (3 IWP species listed in WoRMS), and as these Pacific fossil assemblages become better known, this diversity is likely to increase. We are not aware of any molecular studies on this family to date to test these taxonomic hypotheses.

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RESPONSIBLE EDITOR
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Synonyms in a recently (2024) described fossil strombid species from Indonesia, Java (Gastropoda, Stromboidea, Strombidae), and comments on the validity of the new genus into which the species has been placed

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ABSTRACT

The Miocene genus *Javastrombus* Altaba, 2024 was described, including six new species from the same fossil beds in Indonesia, south central Java. Only a few weeks later V. Liverani (2024) described the same fossil named *Persististrombus bogoriensis*, so in a different genus. Five of the six fossil species described by Altaba are made synonym of the typespecies of his new genus by lack of clear differences, the minor differences mentioned are well within the variability of this species. *Persististrombus bogoriensis* Liverani, 2024 is synonymzed with *Javastrombus praegracilis* Altaba, 2024. Comments on the generic placement are made and *Javastrombus* is accepted herein.

Key words – Strombidae, *Javastrombus, Persististrombus, Thetystrombus,* taxonomy.

INTRODUCTION

Fossil Strombidae and Cypraeidae have roused a renewed interest of collectors and authors, especially the newly discovered beds in Indonesia render new species in an excellent quality of preservation. There is a sort of rat race going on in species descriptions, both Altaba and Liverani were, unaware of each other intentions, describing a new Miocene strombid species from Java. As Altaba, 2024 was published first, the name given to the species by Liverani becomes a synonym.
Both articles are interesting in the sense that the same species was placed in 2 different genera by the two authors, Altaba introduced a new genus, *Javastrombus,* for his six new species. In the paper of Liverani (2024), the new species is described in the genus *Persististrombus* Kronenberg & H. G. Lee, 2007.

Remark: The article of Altaba was written in the Catalan language, which is a pity as most of the readers of this article do not speak this language. Articles describing new taxa should preferably be written in the English language, so that it is understandable to most readers (this is also applicable for other languages as Dutch, French, German, Chinese, etc.).

Abbreviations:
AMD – (the collection of) Aart M. Dekkers, the Netherlands
CRA – (the collection of) C. R. Altaba, Spain
L – length of the shell
NHMW - Natural History Museum Vienna, Vienna, Austria

MATERIAL AND METHODS

Some of the material described here is deposited in the Natural History Museum Vienna (NHMW).
Matrix for geological dating was taken from three samples at random. Preparation for smear slides followed the standard method described by Perch-Nielsen (1985a, b). Nannofossil identifications were made using light-microscopy (Leica DMLP). All samples were investigated under 1000× magnification with parallel and crossed nicols. Biostratigraphic assignments were made in accordance with the nannoplankton zonation of Martini (1971).

GEOLOGICAL SETTING

The second author made a review of content of the matrix taken out of the aperture of the fossil shells. The sample contains common calcareous nannofossils with following species.

Calcidiscus leptoporus (Murray & Blackman 1898) Loeblich & Tappan, 1978
Calcidiscus tropicus (Kamptner, 1955) Varol 1989 sensu Gartner, 1992
Calcidiscus sp.
Coccolithus pelagicus (Wallich 1877) Schiller, 1930

Cyclicargolithus floridanus (Roth & Hay, in Hay et al., 1967) Bukry, 1971
Helicosphaera carteri (Wallich 1877) Kamptner, 1954
Helicosphaera minuta Müller (1981)

Reticulofenestra haqii Backman, 1978
Reticulofenestra minuta Roth, 1970 common
Reticulofenestra perplexa (Burns 1975) Wise1983
Reticulofenestra pseudoumbilicus (Gartner, 1967) Gartner, 1969
Sphenolithus abies Deflandre in Deflandre & Fert, 1954
Sphenolithus moriformis (Brönnimann & Stradner, 1960) Bramlette & Wilcoxon, 1967 common
Sphenolithus pseudoheteromorphus Fornaciari & Agnini 2009
Syracosphaera pulchra Lohmann, 1902
Thoracosphaera saxea Stradner, 1961
Triquetrorhabdulus milowii Bukry, 1971
Umbilicosphaera jafari Muller, 1974

Helicosphaera minuta Müller (1981) was first described from the Middle Miocene of the Philippines (Island Cebu), occurring in the upper NN5 and NN6. Zone marker for NN5 (*Sphenolithus heteromorphus*) could not be found in the sample, therefore we conclude that the sediment can be attributed to NN6, Serravallian. The co-occurrence of other nannofossils in the assemblage is supporting this attribution. The geological age is thus younger than for the genus *Spinatus* Dekkers, Liverani, Ćorić, S. J. Maxwell & Landau, 2020, which is from the Miocene, Langhian.

TAXONOMY

Class Gastropoda Cuvier, 1795
Superfamily Stromboidea Rafinesque, 1815
Family Strombidae Rafinesque, 1815

Genus *Javastrombus* Altaba, 2024
Type species *Javastrombus praegracilis* Altaba, 2024, by original designation

Original description. – Translated from the Catalan language: “Shell of moderate size or rather small in the context of Strombidae, rather graceful and moderately solid, with a row of 4 or 5 thin, rounded, more or less strong spines, orthogonal to the coiling axis or slightly inclined adapically or abapically, and regularly spaced on the shoulder of the last whorl; the first of these is small, while the central ones are the most developed.
Generally, there are also between one and three low spikes, in the abapical part of the dorsum; which are distinctly less prominent, are spirally aligned with the stromboid sinus and in some cases are joined by a faint spiral ridge. The spiral is conical, has about 7 or 8 whorls, forms an angle between 45º and 66º, and presents a regular growth until the last quarter of the last whorl, where it expands.
The body of the last whorl, before the expansion of the lip, varies from narrow to swollen. The lip is wing-shaped, little or moderately expanded and more or less thickened in part, but

has a rounded margin and very thin at the ends; it has a more or less marked prosocline inclination and a profile that goes from almost rectilinear to strongly curved; its posterior end is little or not at all prominent, forming a rather or rather deep posterior channel, after which it is inserted into the last turn; at the anterior end there is a very marked and strongly sinuous stromboid sinus, adjacent to the stromboid lobe, which is more or less prominent and more or less twisted forward. The posterior sinus is open, short and slightly or moderately reflected. The columella is wide, thickened and smooth; it is limited later by an angular shape, the result of the nodules of the spiral that become low, narrow and wide until they form this keel on the shoulder of the beginning of the last whorl. Adapically, the columella forms a callus that joins the lip, while covering the subsutural ramp of the beginning of the last whorl to a variable degree.
The external surface is almost smooth, without any granular areas; it is furrowed by colabral growth striae, which are irregular and weak, and are crossed by thin and numerous spiral cords, quite regular. These spiral cords are more marked on the subsutural ramp, up to the base of the spines of the crown, as well as on the last whorl of the teleoconch; very weakened, they can appear on areas of the dorsum. The protoconch is paucispiral, thin and conical, and consists of little more than two smooth turns (despite the good state of preservation, no micro sculpture can be seen). The beginning of the teleoconch is marked by the appearance of axial, orthocline, and very regular ribs, between which the spiral cords appear.
This axial sculpture reaches a limit between two and almost four turns from the aperture; from this limit there is a rapid transition to the sculpture of angular nodules, also regularly spaced, located more or less above the suture, which become the supracolumellar keel and then spikes in the last half whorl."

Comparison. – Translated from Altaba, 2024: "The genus is distinguished from *Persisti-strombus* Kronenberg & Lee, 2007 and *Afristrombus* Bandel, 2007, the morphologically closest genera, by its reduced size and delicate structure, the remarkable development of the apertural sinuses, a supracolumellar keel and the delicate spiral sculpture."
Altaba overlooked that *Afristrombus* Bandel, 2007 is unavailable (unavailable name under ICZN Art. 13.1.1 (no description), MolluscaBase), *Thetystrombus* Dekkers, 2008, with type species *Strombus latus* Gmelin, 1791, is the available name which should be used instead.

Discussion. – The genus *Javastrombus* was introduced by Altaba (2024), while Liverani (2024) attributed his sole species to *Persististrombus* Kronenberg & Lee, 2007. *Persististrombus*, type species *Strombus granulatus* Swainson, 1822, is a genus which arose in the Oligocene-Miocene of SW France (Lozouet & Maestrati, 1986) and spread to northern America where it is still represented in the eastern Pacific by *Persististrombus granulatus* (Swainson, 1822) and by fossil species in the Caribbean (as *Lentigo* Jousseaume, 1886. Jung & Heitz , 2001). Thus a western directed spread of species (what we currently know). But the discovery of a large Miocene species in Oman, described as *Strombus gijskronenbergi* Harzhauser, 2007, seems to form an eastern directed spread of the genus *Persististrombus*. *Strombus gijskronenbergi* unmistakably belongs to *Persististrombus* due to the heavy shoulder knobs and the form of the shell (the cast made of a topotype, see the relevant page on www.stromboidea.de), is very similar to the extant type species of *Persististrombus*.

Liverani (2024) placed his newly described species *Persististrombus bogoriensis* (as *P. bogoriense*, incorrect grammatical agreement of specific epithet) in this genus, but this was not based on morphologic similarities. He writes: "However, there are no proofs to link *P. bogoriense* sp. nov. directly to the tethyan lineage of *Persististrombus*, since no similar fossils have been found elsewere in older sediments". The placement by Liverani of his new species in *Persististrombus* was therefore not justified by solid arguments and *Javastrombus* is herein accepted as the proper genus, as used by Altaba (2024).
Altaba (2024) and Liverani (2024) do not compare *Javastrombus* with *Strombus* Linnaeus, 1758, the type genus of Strombidae from America. The shells of their new species are a kind of miniature versions of extant *Strombus* and of *Thetystombus* species, which are both primarily different by the lack of the small spines on the anterior end of the shells. *Thetystrombus* and *Persististrombus* are molecularly different, but are closely related branches (Irwin et al., 2024).
The size reflects the increasing size of shells from the Miocene to present day. *Antestrombus* Maxwell et al., 2020 from the Miocene of Florida, USA, is also similar to *Javastrombus* (also in size), species of that genus are lacking the spines on the anterior part of the shells too. During the Early to Middle Miocene a tropical worldwide oceanic current was running with a westward directed flow, but it is not very likely that *Javastombus* and *Antestrombus* have a shared, but as yet unknown, ancestor.

Javastrombus praegracilis **Altaba, 2024**
(Pl. 1 figs 1-7, Pl. 2 Figs 1-4, Pl. 3 Figs 5-7)

Javastrombus praegracilis Altaba, 2024
Javastrombus cylindratus Altaba, 2024 (**new synonym**)
Javastrombus kecil Altaba, 2024 (**new synonym**)
Javastrombus pinguis Altaba, 2024 (**new synonym**)
Javastrombus sondaicus Altaba, 2024 (**new synonym**)
Javastrombus subinermis Altaba, 2024 (**new synonym**)
Persististrombus bogoriensis Liverani 2024 (**new synonym**)

Plate 1. ***Javastrombus praegracilis*** **Altaba, 2024**. **Overview.** Figs 1-7. Details are mentioned in the legends of Pls 2-3. All photos taken from Altaba (2024).

Original description. – Translated from the Catalan language: "Shell of moderate size (holotype: 54.6 mm; paratypes: between 49.3 and 49.6 mm), quite graceful (as indicated by its specific name) and moderately solid, with a crown of 5 or 6 thin, rounded spines , short and wide, only slightly inclined adapically; there are 2 or 3 very low spines, much less prominent (some of them very poorly developed) and aligned on the abapical part of the back, along an incipient spiral ridge, with the stromboid sinus.

The spiral is conical and high, relatively long and narrow, with 8.2-8.6 whorls of regular growth and forms an angle of about 50º; the body of the last whorl, before the expansion of the lip, is quite narrow. The lip is wing-shaped, slightly expanded, and rather thickened in the middle, prosocline but almost straight throughout the central part; the margin is rounded, but very thin in the posterior sinus, which is broad, shallow and elongated forward. The posterior end of the lip is not prominent and is inserted in the last turn, where it covers up to half of the subsutural ramp; at the anterior end the stromboid sinus is very marked and deep, adjacent to the stromboid lobe, which is relatively large and well bent prosoclinally; the anterior sinus is less incised, a little elongated and well curved.

The columella is thickened and smooth, attached adapically to the lip above the keel at the shoulder. The external surface is almost smooth, with irregular growth striae, very fine spiral cords, a little more marked on the back, and on the other hand quite strong on the subsutural ramp, where there are 11 fairly regularly distributed that increase its thickness towards the suture (and 5-7 much weaker ones, interspersed); these continue along the spiral (in the most adapical part, visible in the spaces between the axial ribs). The protoconch consists of 2.4-2.5 apparently smooth whorls. The beginning of the teleoconch is marked by the appearance of axial, orthocline and very regular ribs, which extend along 3.2-4.2 whorls, and stop 2.5 whorls from the opening ; the subtriangular nodules (10 or 11 in the penultimate whorl) are regularly spaced and clearly located above the suture."

Holotype. – CRA-23130-1 in the author's malacological collection (Altaba 2024: 22)

Type locality. – Indonesia, Java, close to Jakarta, Serpong (Suradita).

Type stratification. – Middle Miocene according to Altaba, 2024, herein shown to be from the Serravallian (see section geological setting).

Comparison. – The species and the other (now) five simultaneously described synonyms were based on a collection of 24 examples in the author's collection (Altaba 2024: 22). Liverani's description was based on 45 specimens (Liverani 2024). Liverani did not recognize other species in his larger sample all originating from Bogor, Java, south of Jakarta, which is relatively close to the type locality and probably the same stratification.
In the collection of NHMW four examples have been seen (AMD), and about 20 in the author's collection (AMD).

Table 1. Sizes of types

	size of holotype mm	size range others mm	total nr of shells
J. praegracilis	54.6	49.3 – 49.6	4
J. pinguis	48.2	46.2 – 50.6	5
J. cylindratus	51.6	50.2 (only one)	2
J. kecil	43.2	35.0 – 42.0	5
J. subinermis	50.0	(holotype only)	1
J. sondaicus	54.5	47.3 – 55.7	4
P. bogoriensis	56.5	40 – 60	45

Note: Although Altaban (2024: 22) used 24 specimens, two paratypes were not listed in his species descriptions. All size ranges cover roughly the same range, from 35 mm to 60 mm for the largest.

Plate 2. *Javastrombus praegracilis* Altaba, 2024. Fig. 1. Holotype of *J. praegracilis*, L 54.6 mm. Fig. 2. holotype of *J. pinguis*, L 48.2 mm. Fig. 3. holotype of *J. cylindratus*, L 51.6 mm; Fig. 4. Holotype of *J. kecil* L 43.2 mm. All photos taken from Altaba (2024).

An overview of all new species described by Altaba (2024) is given on Plate 1, in Altaba they are shown on separate plates. On Plates 2-3 the holotypes of the new species are shown in larger size. This overview of the supposed "different" species clearly shows they are all very similar to the first described species (and type species of *Javastrombus*). There is only a very modest variation in shell width and the size of the spines especially on the anterior part of the shells. The only conclusion is they are all the same species.

Plate 3. *Javastrombus praegracilis* Altaba, 2024. Fig. 5. Paratype of *J. kecil*, L 39.3 mm. Fig. 6. Holotype of *J. subinermis*, L 50.0 mm. Fig. 7. Holotype of *J. sondaicus*, L 54.5 mm. All photos taken from Altaba (2024).

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RESPONSIBLE EDITOR
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New *Melo* Broderip, 1826 (Gastropoda: Volutidae) species from the Northern Territory and tropical Queensland, Australia

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ABSTRACT

Four new *Melo* Broderip, 1826 species are presented from tropical Eastern and Northern Australia: *Melo darwinensis* sp. nov. is present from the trawl grounds north of Darwin, Northern Territory; *Melo poonaensis* sp. nov. from the Great Sandy Straits, Queensland; *Melo swainreefensis* sp. nov. from the Swain Reefs, Queensland; and *Melo innisfailensis* sp. nov. from the trawl grounds off Innisfail, Queensland. Descriptions are based on shell morphology and comparisons are made with the previous recognized members of the genus *Melo* in the subject study area: Melo amphora ([Lightfoot, 1786]); *Melo georginae* (J. E. Gray, 1833); *Melo knighti* Jackson, 1954; *Melo peterstimpsoni* Cossignani & Allary, 2021; *Melo umbilicatus* Broderip, 1826. In this paper, we present hypotheses that will be used in subsequent papers that aim to explore the biogeographical zones and further investigate the diversity of Melo in Australia.

Key words – Volutidae, *Melo*, new species, taxonomy, Australia.

INTRODUCTION

Abbottsmith (1969) and Weaver & duPont (1970) were early workers who sought to highlight the diversity in Australian Volutidae, and while these authors did not describe new species, their insights have foreshadowed much of the Australian Volute diversity that is now being recognised. More recent revisions have led to confusion in the status of some Australian volutes, with Dharma (2023) erroneously synonymizing *Melo knighti* Jackson, 1954, a restricted coastal species that ranges from the northern Whitsundays to Mackay, central Queensland, originally described as a subspecies of *M. amphora*. Furthermore, Cossignani & Allary (2021) described *Melo peterstimpsoni* from the coasts of the Northern Territory, Darwin in particular, notwithstanding that the species is found predominantly in the Torres Strait of Northern Queensland. These studies, and other recent works (Morrison & Wells, 2005), have highlighted the need for a greater revision of Australian Melo, with a focus on the distribution and diversity of the complex, with a greater aim of understanding the complexity of Australian biogeography. This paper aims to provide a start, particularly in relation to the identification of molluscan endemism and recognition of intraprovince structures within the Solanderian Province (Petuch & Berschauer, 2021).

Abbreviations

BCC	Barbara Collins Collection, Machans Beach, Queensland.
BSRF	BlueSky Research Foundation, Trinity Beach, Queensland.
EHC	Eric Haughton Collection, Mackay, Queensland.
NMC	Nancy Marsilio Collection, Tully, Queensland.
RJC	Robert and Jean Ekert Collection, Whitsundays, Queensland.
VCC	Valda Cantamessa Collection, Proserpine, Queensland.
YZC	Yao Zheng Collection, Kardinya, Western Australia.
L.	Axial height of shell.
leg.	Legacy Collection.

Methods

This paper is grounded in comparisons of morphology and distribution. This approach has underpinned the recognition of many new species in molluscan families, and in particular, has been utilised in recent studies of Australian Volutidae (Cossignani & Allary 2021; Maxwell & Berschauer 2023; Field & Healy 2025; Zheng & Maxwell 2025a, 2025b, 2025c). The genetic material to test the taxonomic hypothesis proposed in this paper was available, but was not carried out due to a lack of financial resources needed to undertake the processing of that material.

Ethical note

There are several workers who have recently published on Australian Volutidae. The authors of this paper emailed these workers to inform them of this project. No conflicts were reported in their reply emails, nor were any offers to collaborate made, allowing this work to proceed.

TAXONOMY

Superfamily Volutoidea Rafinesque, 1815
Family Volutidae Rafinesque, 1815
Subfamily Amoriinae J. E. Gray, 1857
Tribe Melonini Pilsbry & Olsson, 1954
Genus *Melo* Broderip, 1826

Type species *Voluta melo* [Lightfoot], 1786 accepted as *Melo melo* ([Lightfoot], 1786) (type by absolute tautonymy)

***Melo darwinensis* sp. nov.**

(Pl. 1-4, Pl. 19 Fig. B, Pl. 20 Fig. B)

urn:lsid:zoobank.org:act:89B3E04A-DD5F-432E-BA96-1B724948FFC3

Holotype. – trawled off Darwin Harbour, Northern Territory, Australia, L 370 mm, leg. Barbara Collins (BSRF0031).

Paratypes. – Paratype 1 – trawled off Darwin Harbour, Northern Territory, Australia, L 410 mm (BCC).

Type locality. – Australia, trawl grounds off Darwin Harbour, Northern Territory.

Distribution. – The Trawl grounds off Darwin Harbour, Northern Territory, Australia.

Description. – Shell large, light and dorso-ventrally ovoid and compressed; protoconch large with four smooth whorls; penultimate whorl with small, hollow, wide triangular spines, the sides of which reach the suture, suture ramp to the shoulder steep with 8-9 large axially aligned sharp overlapping folds of the spines that become larger, foliated and cover the sutural ramp as the shell matures, but do not extend to the edge of the outer lip; dorsal body whorl smooth and ovate, with distinctive spines posteriorly and a well-developed columella fold anteriorly; ventral body whorl half the axial width of the shell posteriorly, gradually becoming a quarter of the width mid body, and a fifth the width of the shell anteriorly, columella callus well developed with three thick plaits, outer lip broad and rounded, extending past the spire to form a moderate posterior lobe that joins at the shoulder of the spire; colour of the shell burnt orange with a pale off white aperture that is bordered by orange.

Etymology. – Named after the type location of the type species.

Comparison. – *Melo darwinensis* differs from *M. petersimpsoni* and *M. umbilicatus* being more ovoid with shorter spines that are more foliated and overlapping, which not enclosing the spire, being more axially aligned. The spines that extend well onto the dorsum of the body whorl differentiate this species from *M. amphora*.

Melo innisfailensis sp. nov.

(Pl. 5-8, Pl. 19 fig. D, Pl. 20 fig. D)

urn:lsid:zoobank.org:act:C918DD45-F81E-4C8B-8DF0-61B3FA6D194B

Holotype. – Australia, Queensland, trawled off Feather Reef, off the coast of Innisfail, L 330 mm, leg. Barbara Collins, leg. Val and Don Harris (BSRF0032)

Paratypes. – Paratype 1, Australia, Queensland, trawled off Innisfail, L 370 mm (NMC).

Other material studied. – A specimen was seen from off Mooloolah, Queensland (RJC).

Type locality. – Trawl grounds of Feather Reef, off the coast of Innisfail, Queensland.

Distribution. – Specimens at hand indicate that *M. innisfailensis* is taken from the northern Feather Reef off Innisfail trawl grounds, and this may be extended as more material and information become available. The NMC material (Paratype 1) was taken off Innisfail, and the holotype was obtained from Val and Don Harris, who trawled the Townsville region during the 1980's.

Description. – Shell moderately solid and ovate with an inflated body whorl; protoconch with four whorls and mamillated; penultimate whorls with spines that are lost on the body whorl; body whorl with rounded shoulder and moderately deep sutures; dorsum rounded and obscures the spire in adults, with distinctive anterior columella folds; ventral body whorl smooth and approximately four fifths the width of the shell posteriorly, becoming contracted midbody to less than one fifth the width; columella with three distinctive plaits, and a wide rounded outer lip that extends well past the apex and joins mid whorl covering half the spire of the shell to form a lobe; the centre of the lobe forms the anterior sinus; body whorl dull orange and may have broad stripes, aperture pale orange.
Taxonomic Note: the holotype spire has some damage on the penultimate whorl, has a filed lip and is a subadult shell, which limited the spine development. In paratype 1 and other material examined, where the inwardly pointed spines continue to the body whorl they are often obscured by the rounded shoulders and the outer lip is flared.

Etymology. – Named after the type location of the type species.

Comparison. – *Melo innisfailensis* differs from all known Queensland Melo species by a rounded shoulder with a lack of spines, coupled with the wide anterior flaring outer lip.

Melo poonaensis sp. nov.

(Pl. 9-10, Pl. 19 Fig. F, Pl. 20 Fig. F)

urn:lsid:zoobank.org:act:8A274B16-D3D4-4C2A-99ED-B30602D164AB

Holotype. – intertidal, Poona, Queensland, L 208 mm, leg. Valda Cantamessa (BSRF0033).

Paratypes. – intertidal, Poona, Queensland, L 229 mm (VCC).

Other material. – Four other examples of *Melo poonaensis* were collected on intertidal sand flats by Valda Cantamessa in 1993, these were given to Grace Lumwan of Bowen.

Type locality. – Intertidal sand flats, Poona, Queensland, Australia.

Distribution. – At present, the species is known from the Great Sandy Strait, an area between the island of K'gari and the mainland of Queensland. This area is marked by sandy shallow water flats.

Description. – Shell large, heavy, dorsoventrally ovate and bulbus; protoconch large and smooth, which comprises the first five whorls; penultimate whorl and body whorl with 10-12 spines that carry almost to outer lip, spine hollow, regular, triangulate, acutely pointed and strongly reflected sideways towards and encasing the apex, increasing in size as the shell matures; sutures deep with a short ramp prior to the development of spines; dorsal body whorl smooth and rounded with no distinct shoulder, anterior columella folds distinct; ventral body whorl approximately one half the shell width posteriorly, gradually reducing in ratio towards the anterior; columella with three plaits which commence mid axially; outer lip well rounded, widest mid body, and does not extend past the apex of the shell; posterior sinus forms in line with the body whorl and is wide, concave and calloused; the posterior outer lip is rounded; colour burnt orange with a uniform creamy orange aperture.

Etymology. – Named after the type location.

Comparison. – *Melo poonaensis* differs from *M. umbilicatus* in being rounder and with spines that do not extend past the apex; furthermore, in *M. umbilicatus*, the outer lip is greatly flared, and the ventral body whorl is one-third the width of the shell which is greatly diminished at half the axial height. While *M. poonaensis* is similar in form and shape to *M. knighti*, the new species lacks the axially pointed spines and white aperture of that species. *M. georginae* is a larger and lighter-weighted shell than *M. poonaensis*, and its spines are axially aligned; the outer lip of *M. georginae* differs from *M. poonaensis* in being anteriorly flared rather than ovate. *M. amphora* differs from *M. poonaensis* in having a shoulder that is moderately acute and spines that do not extend onto the body whorl.

Melo swainreefensis sp. nov.

(Pl. Figs 11-18, Pl. 19 Fig. G, Pl. 20 Fig. G)

urn:lsid:zoobank.org:act:9D54895D-6E89-497F-96C4-2326AF3B481C

Holotype. – collected dead in 1 m of water, Big Sandy Reef, Swain Reefs, Queensland, Australia, L 175 mm, leg. Uwe Weinreich (BSRF0034).

Paratypes. – Paratype 1 – collected dead on reef flats, Big Sandy Reef, Swain Reefs, Queensland, Australia, L 139 mm (YZC); Paratype 2 – Swain Reefs, Queensland, Australia, L 331 mm (RJC); Paratype 3 – trawled off Swain Reefs, Queensland, Australia, L 240 mm (EHC).

Type locality. – The type location is Big Sandy Reef, Swain Reefs, Queensland.

Distribution. – Known from lagoons and reef flats of the south Great Barrier Reef and nearby trawl grounds.

Description. – Shell solid, axially oblong and with cylindrical body whorl; protoconch small, mamillated with four whorls; penultimate whorl with 8 to 10 spines that increase in size but not extend to the dorsum, these spines are hollow and restricted to the shoulder, where they are hollow and axial in direction, the suture is shallow and the ramp to the acute shoulder becomes increasingly concave and smooth; the dorsum is smooth, with a distinctively striped columella fold anteriorly; ventral body whorl more than half the width of the shell anteriorly which diminishes mid-length to less than one-fifth the shell; columella with three distinct plaits, and folds that are evenly striped; posterior sinus is wide, located below the axial height of the spire, joins at the body whorl, and is shallow and straight; outer lip moderately rounded, widest at approximately one third the length; body whorl creamy white with a distinctive uniformly zig-zag pattern of axial rows at are smeared centrally, each line corresponds to a stripe on the spire, with the lines paired to a spine when present.

Etymology. – Named after the type location.

Comparison. – *Melo swainreefensis* differs from *M. georginae*, *M. umbilicatus*, and *M. poonaensis* in lacking the shoulder spines characteristic of those species where the spines extend onto the dorsum. *M. amphora* has more developed and wider spines on the spire, and lacks the distinctly concave sutural ramp to the shoulder, which creates a more acute shoulder in *M. swainreefensis*, nor does M. amphora has the evenly striped columella folds.

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RESPONSIBLE EDITOR

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Plate 1. ***Melo darwinensis*** **sp. nov.**, holotype, dorsal view, trawled off Darwin Harbour, Northern Territory, Australia. L 370 mm leg. Barbara Collins (BSRF0031).

Plate 2. ***Melo darwinensis*** **sp. nov.**, holotype, ventral view, trawled off Darwin Harbour, Northern Territory, Australia, L 370 mm leg. Barbara Collins (BSRF 0031).

Plate 3. ***Melo darwinensis*** **sp. nov.**, paratype 1, dorsal view, trawled off Darwin Harbour, Northern Territory, Australia, L 410 mm (BCC).

Plate 4. ***Melo darwinensis*** **sp. nov.**, paratype 1, ventral view, trawled off Darwin Harbour, Northern Territory, Australia, L 410 mm (BCC).

Plate 5. ***Melo innisfailensis*** **sp. nov.**, holotype, dorsal view, off Townsville, Queensland, Australia, L 330 mm, leg. Barbara Collins, leg. Val and Don Harris (BSRF0032).

Plate 6. ***Melo innisfailensis*** **sp. nov.**, holotype, ventral view, Trawled off Feather Reef, off the coast of Innisfail, Queensland, L 330 mm, leg. Barbara Collins, leg. Val and Don Harris (BSRF0032).

Plate 7. ***Melo innisfailensis*** **sp. nov.**, paratype 1, dorsal view, Trawled off Feather Reef, , off the coast of Innisfail, Queensland, Australia, L 370 mm (NMC).

Plate 8. ***Melo innisfailensis*** **sp. nov.**, paratype 1, ventral view, Trawled off Feather Reef, , off the coast of Innisfail, Queensland, Australia, L 370 mm (NMC).

Plate 9. ***Melo poonaensis*** **sp. nov.**, holotype, dorsal view, Poona, Queensland, Australia, intertidal sand flats, 1993, leg. Valda Cantamessa, L 208 mm (BSRF0033).

Plate 10. ***Melo poonaensis*** **sp. nov.**, holotype, dorsal view, Poona, Queensland, intertidal sand flats, 1993, leg. Valda Cantamessa, L 208 mm (BSRF0033).

Plate 11. ***Melo swainreefensis*** **sp. nov.**, holotype, dorsal view, collected dead in 1 m dead Big Sandy Reef, Swain Reefs, Queensland, L 175 mm, leg. Uwe Weinreich (BSRF0034).

Plate 12. ***Melo swainreefensis*** **sp. nov.**, holotype, ventral view, collected dead in 1 m dead Big Sandy Reef, Swain Reefs, Queensland, Australia, L 175 mm, leg. Uwe Weinreich (BSRF0034).

Plate 13. ***Melo swainreefensis*** **sp. nov.**, paratype 1, dorsal view, collected dead in 1 m dead Big Sandy Reef, Swain Reefs, Queensland, L 139 mm (YZC).

Plate 14. ***Melo swainreefensis*** **sp. nov.**, paratype 1, ventral view, collected dead in 1 m dead Big Sandy Reef, Swain Reefs, Queensland, Australia, L 139 mm (YZC).

Plate 15. ***Melo swainreefensis*** **sp. nov.**, paratype 2, dorsal view, on reef flat, Swain Reefs, Queensland, L 331 mm (RJC).

Plate 16. ***Melo swainreefensis*** **sp. nov.**, paratype 2, ventral view, on reef flat, Swain Reefs, Queensland, L. 331 mm (RJC).

Plate 17. ***Melo swainreefensis*** **sp. nov.**, paratype 3, dorsal view, trawled in deep water off the west side of the Swain Reefs, Queensland, Australia, L 240 mm (EHC).

Plate 18. ***Melo swainreefensis*** **sp. nov.**, paratype 3, ventral view, trawled trawled in deep water off the west side of the Swain Reefs, Queensland, Australia, L 240 mm (EHC).

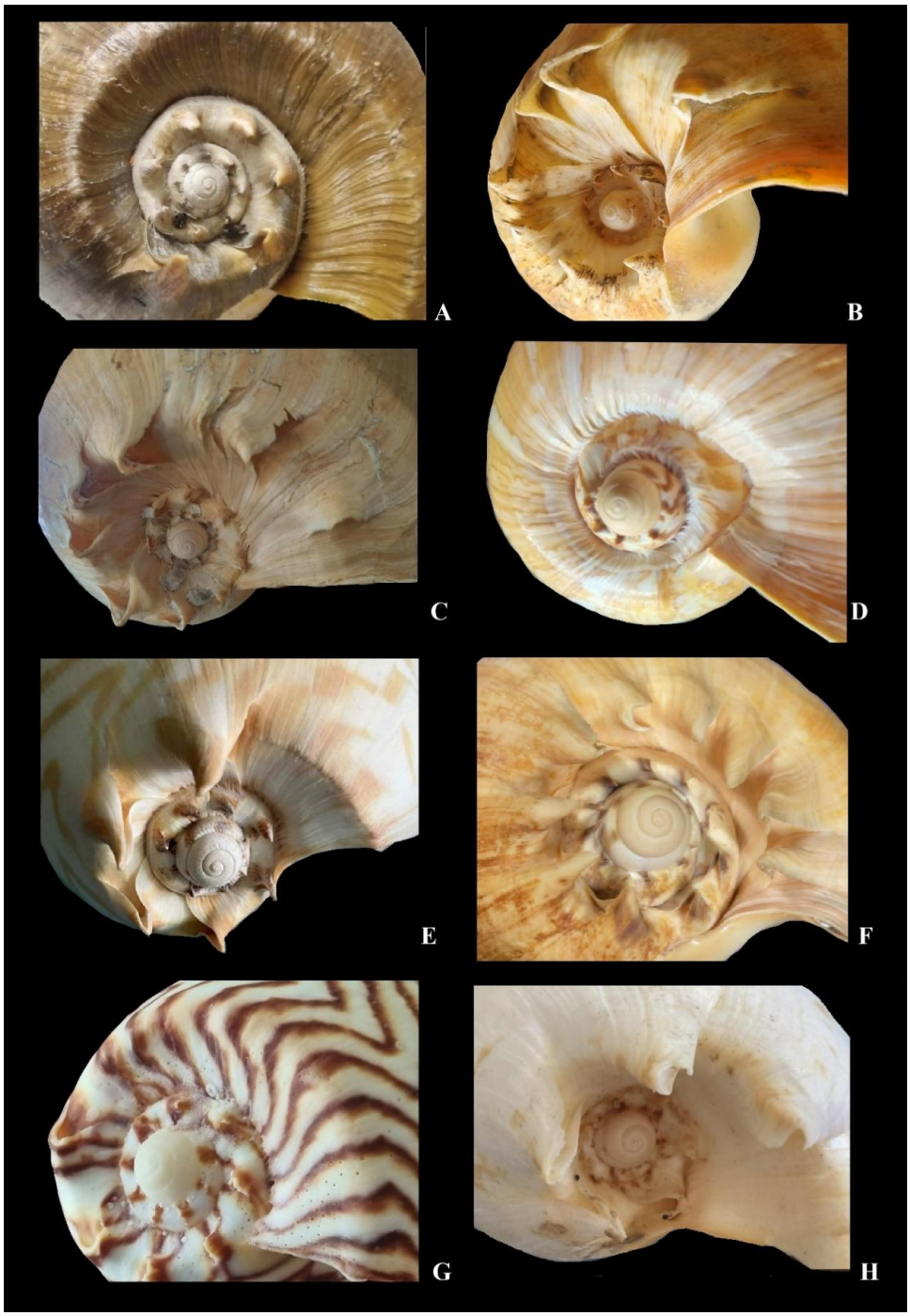

Plate 19. The Comparative images of *Melo* spires. A. ***M. amphora*** ([Lightfoot, 1786]), Kings Reef, Queensland, L 310 mm (NMC). B. ***M. darwinensis*** **sp. nov.**, holotype, Trawled off Darwin, L 375 mm (BSRF0031). C. ***M. georginae*** (J. E. Gray, 1833), trawled off the Sunshine Coast, L 410 mm (YZC). D. ***M. innisfailensis*** **sp. nov.**, holotype, trawled off Feather Reef, Queensland, L 370 mm (BSRF0032). E. ***M. knighti*** Jackson, 1954, Shoal Point, L 200 mm (EHC). F. ***M. poonaensis*** **sp. nov.**, holotype, Poona, L 208 mm (BSRF0033). G. ***M. swainreefensis*** **sp. nov.**, holotype, Big Sandy Reef, Swain Reefs, Queensland, L 175 mm (BSRF0034). H. ***M. umbilicatus*** Broderip, 1826, Kepple Bay, Queensland, L 316 mm (VCC). Not to scale.

Plate 20. Comparative *Melo* Study. A. ***M. amphora*** ([Lightfoot, 1786]), trawled off Innisfail, Queensland, L 370 mm (BCC). B. ***M. darwinensis*** **sp. nov.**, holotype, trawled off Darwin, L 375 mm (BSRF0031). C. ***M. georginae*** (J. E. Gray, 1833), trawled off the Sunshine Coast, L 410 mm (YZC). D. ***M. innisfailensis*** **sp. nov.**, Paratype 1, trawled off Innisfail, L 370 mm (NMC). E. ***M. knighti*** Jackson, 1954, Dingo Beach, L 266 mm (VCC). F. ***M. poonaensis*** **sp. nov.**, holotype, Poona, L 208 mm (BSRF0033). G. ***M. swainreefensis*** **sp. nov.**, paratype 2, Swain Reefs, L 331 mm (RJC). H. ***M. umbilicatus*** Broderip, 1826, trawled off Innisfail, Queensland, L 372 mm (BCC). Not to scale.

A new *Scabricola* species (Gastropoda, Mitridae) from Indonesia

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ABSTRACT

A new *Scabricola* species from Indonesia is described and discriminated from other members of the genus by shell characteristics. The new species is named after its ivory colour: *Scabricola dens* sp. nov. The new species is compared with similar species: *Scabricola albina* (A. Adams, 1853); *Scabricola lorenzi* Poppe & Tagaro, 2006; *Scabricola waltercernohorskyi* Marrow, 2024 and *Scabricola yaekoae* (T. Habe & Kosuge, 1966).

Key words – Mitridae, *Scabricola,* new species, Indonesia

INTRODUCTION

A new mitrid species is described, originating from Indonesia, West Nusa Tenggara, off Sumbawa Island. This new *Scabricola* species is a typical representant of a group of species within the genus with a slender fusiform shell (Fedosov et al, 2018 refrain from giving a formal diagnosis of the genus). The new species stands out from the other species in the group by its ivory color and other characteristics.

Abbreviations:
AMD – (the collection of) Aart M. Dekkers, Purmerend, the Netherlands
GS – (the collection of) Günter Stossier, Hamburg, Germany
MM – (the collection of) Max Marrow, Beaumaris, Victoria, Australia
MSNUP – Museo di Storia Naturale dell'Università di Pisa, Pisa, Italy
SG – (the collection of) Sandro Gori, Livorno, Italy
L – shell length
W – width of the shell at its broadest point

TAXONOMY

Family Mitridae J. E. Gray, 1857
Genus *Scabricola* Swainson, 1840

Type species *Mitra serpentina* Lamarck, 1811 [= *Scabricola variegata* (Gmelin, 1791)] (type by subsequent designation)

Scabricola dens sp. nov.

(Pl. 1 figs 1-3)
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Holotype. – Indonesia, West Nusa Tenggara, Sumbawa, off Medang Island, dived at 10-15 m, MSNUP-0425-MOL, L 29.6 mm W 10.6 mm (Pl. 1 fig. 1).

Paratypes. – All from Indonesia, West Nusa Tenggara, Sumbawa. Paratype 1, off Medang Island, dived at 10-15 m, L 32.5 mm W 12.8 mm, GS, (Pl. 1 fig. 2); paratype 2, off Labuan Bajo, dived at 5-10 m, subadult L 16.6 mm W 4.8 mm, AMD unnumbered; paratype 3, off Medang Island, dived at 5-10 m, L 28.0 mm W 10.5 mm, GS; paratype 4, Labuan Bajo, dived at 5 m, L 32.0 mm W 11.3 mm, GS, (Pl. 1 fig. 4); paratype 5, off Medang Island, dived at 5-10 m, L 28.2 mm W 10.1 mm, SG; paratype 6, off Medang Island, dived at 5-10 m, L 34.9 mm W 13.0 mm, SG; paratype 7, Labuan Bajo, dived, L 29.6 mm W 10.4 mm, MM.

Other material. – We have seen other material on photographs, from other collections, not mentioned here, which support the description of the new species.

Type locality. – Indonesia, West Nusa Tenggara, Sumbawa, off Medang Island.

Distribution. – Only known from Indonesia, Sumbawa.

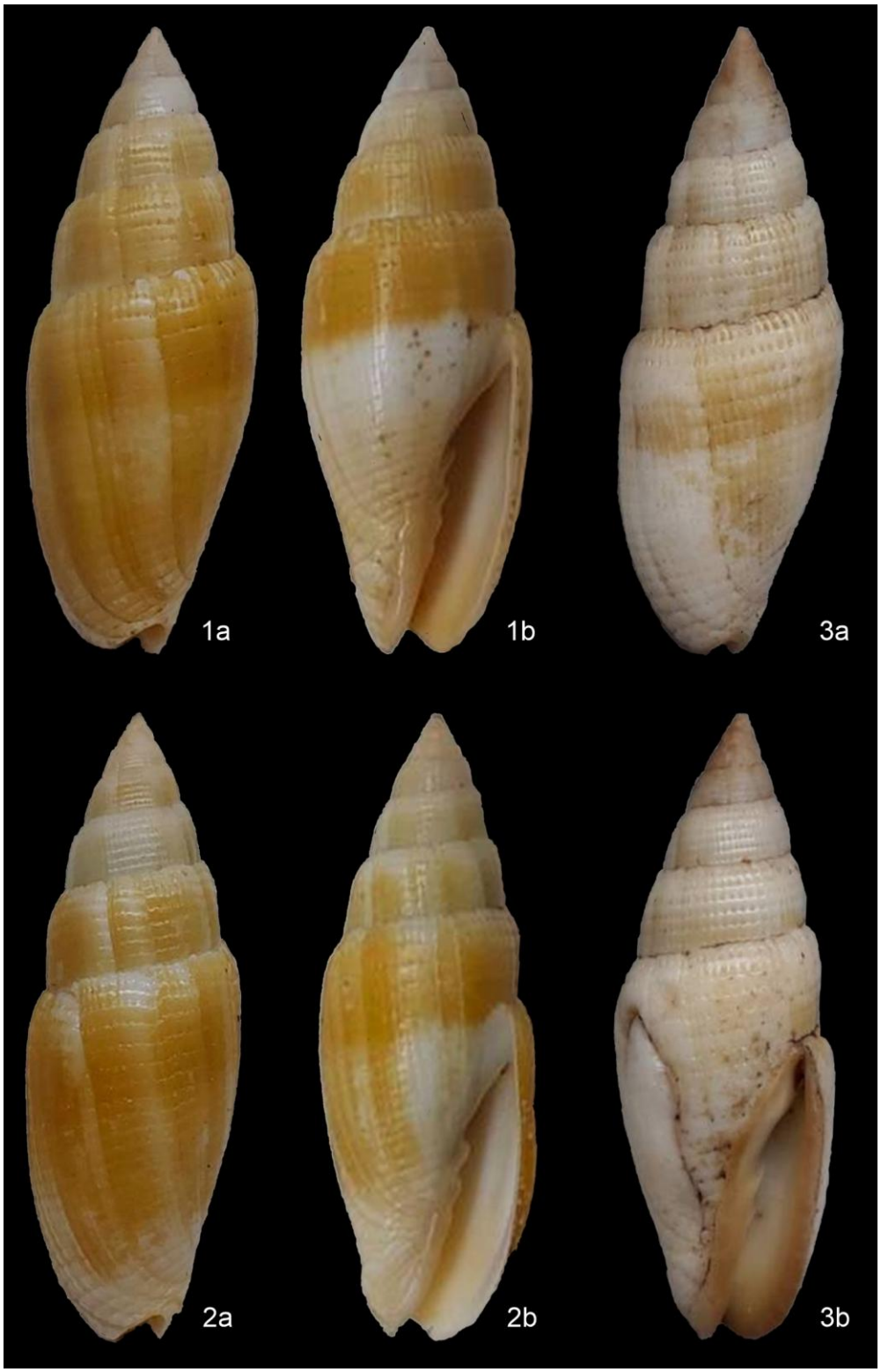

Plate 1. ***Scabricola dens*** **sp. nov.** Indonesia, Fig. 1. West Nusa Tenggara, Sumbawa, off Medang Island, dived at 10-15 m, MSNUP-0425-MOL, L 29.6 mm. Fig. 2. Paratype 1, off Medang Island, dived at 10-15 m, L 32.5 mm W 12.8 mm, GS. Fig. 3. Paratype 4, Labuan Bajo, dived at 5 m, L 32.0 mm W 11.3 mm, GS,

Description. – Shell average sized for genus, slender and fusiform, sturdy. Small protoconch. Spire whorls regularly increasing in size. Spire whorls with a small rounded shoulder and slightly concave, almost straight, sides. Marked, rather shallow, irregular sutures. The sculpture consists of many flattened spiral ribs, about 6 on the penultimate whorl, divided by pitted grooves. The pitted groves directly under the suture on the last whorl bear more or less axial aligned ribs. Last whorl slightly swollen. Aperture slightly less than half the shell length. Columella with thickened enamel, bearing 4 strong plaits. Outer lip sturdy, not very much thickened. Inside outer lip smooth, ivory coloured with a touch of a slightly darker tone. Siphonal canal small and not much reflected, almost not raised.
Shell colour plain ivory white, no axial flames, nor dots or coloured spiral bands. Periostracum ochre yellowish and rather well attached to the shell.

Etymology. – Name reflecting the color of ivory or tusks /dents from animals like Elephants.

Comparison. – *Scabricola dens* sp. nov. stands out for its plain ivory white color. Similar looking is *S. albina* (A. Adams, 1853), when the black periostracum is removed it also has a plain white shell, but this is of a more fresh snow white colour (Poppe & Tagaro, 2008: pl. 485 figs 6-7). It has straight, not pitted, groves and the form of the shell is more biconically and the shell is smaller, up to 33 mm. *S. lorenzi* (Poppe & Tagaro, 2006), described from the Philippines, is a larger shell (around 40 mm), has broad yellowish bands with spiral lines of red dots (Poppe & Tagaro, 2008: pl. 461 fig. 9a-b). *S. waltercernohorskyi* Marrow, 2024 (Marrow, 2004: pl. 2 fig. 5), described from Western Australia but also occurring in Indonesia, is basically a whitish shell with a broad irregularly brown stained band and 4-6 narrow spirals with brownish and whitish elongated dots. *S. yaekoae* (T. Habe & Kosuge, 1966), described from the Philippines, Mindanao (Poppe & Tagaro, 2008: pl. 461 fig. 1a-b) has also a whitish-ivory ground colour and the same pitted groves as in the new species, but has instead large light-brown axial flames decorating the shell.

Discussion. – This new species was only recently discovered and offered on the international shell market. The shells are all dived by local divers. The given location is often Indonesia, Sumbawa, Labuan Bajo, which is a small fishing village located on a mangrove surrounded small peninsula. The multitude of dived, colourful, shells offred on the international shell market are not living in the local mangroves. This implicates the real origin of the shells is from further away lacations, likely from the islands in front of Sumbawa.

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RESPONSIBLE EDITOR
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A new genus (Gastropoda, Strombidae) for a Miocene strombid from Jamaica with Tethyan or Proto Indo-Pacific aspects

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ABSTRACT

A new genus is proposed for the Miocene strombid species *Strombus leurus* Woodring, 1928. This new genus is named in honour of Woodring: *Woodringius*, for his valuable work on fossil assemblages.

Key words – Strombidae, new genus, Jamaica, Miocene

INTRODUCTION

Strombus is a relatively young genus which is spread in Florida, the Caribbean to Brazil and in the tropical part of East Pacific. Although it has only few recent species, the genus is very well known. The fossil record shows a plethora of species that has been described by workers in the early part of last century and later by Petuch and others for the Floridian Plio-Pleistocene radiations (Petuch, 1991; Petuch, 1994; Petuch & Drolshagen, 2011; Landau, Kronenberg, Herbert & Silva, 2011). Recent research has shown the Early Miocene ancestor (Maxwell et al., 2020).

Browsing through the older works describing fossil assemblages of gastropods with Strombidae, the author stumbled on the description of *Strombus leurus* Woodring, 1928: 326, pl. 24 figs 3-5. Described in his work on the Miocene fossils of Bowden, Jamaica. Though never seen in hand, this apparently rare fossil shell has many characters not shared with members of *Strombus* Linnaeus, 1758. There is nothing similar to *Strombus leurus* in the Florida fossil record. Two distinct faunal provinces are recognized (Petuch, 2004) that are of interest for this extinct species. Florida was the faunal center for the Caloosahatchian

Paleoprovince and *S. leurus* was recorded from Jamaica, which was in the Gatunian Paleoprovince. Each province had its own distinctive molluscan fauna, with very little, if any, faunal overlap. Even today the boundary between Cuba, the Bahamas, and Florida is still seen as the faunal boundary between the Carolinian and Caribbean Provinces. Biogeography is important, and particularly with evolutionary patterns and radiations. Petuch has written entire books on these important biogeographical patterns, with "Cenozoic Seas" (Petuch, 2004) being a good example of important research on the biogeography of the Caribbean area.
The Gatunian Province has much more Tethyan influence than in the Caloosahatchian Province. The Gatunian Province covered two oceans (the Central American Seaway still existed) and extended from California to northern Chile on the Pacific side and from southern Mexico to southern Brazil on the Atlantic side. The Caloosahatchian Province only extended from Florida and the Gulf of Mexico northward to Massachusetts.

The proposed new genus is compared with *Strombus* Linnaeus, 1758 and the Indo-Pacific genera *Labiostrombus* Oostingh, 1925, *Gibberulus* Jousseaume, 1888 and *Canarium* Schumacher, 1817. The shell is characterized by smooth body whorl, absence of spines, ascending undilated outer lip, long posterior canal, very shallow stromboid notch, inner lip dented inside. It deserves a generic rank of its own which is herein provided for.

Abbreviations
L – Length of the shell
W – Width of the shell
USNM – United States national Museum

TAXONOMY

Superfamily Stromboidea Rafinesque, 1815
Family Strombidae Rafinesque, 1815

Woodringius gen. nov.

Plate 1 Fig. 1a-c
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Type species: *Strombus leurus* Woodring, 1928.

Material. – The type species was based on thee specimens, the holotype is in the Smithsonian National Museum of Natural History, nr. USNM MO 369474. Holotype (Pl. 1 Fig. 1a-c) L 61.2 mm W 29.4 mm (apex and pillar broken), largest paratype 68.5 mm (apex, pillar and outerlip broken).

Type stratum. – Miocene.

Distribution. – Only known from the Miocene of Jamaica (the type species).

Description. – Shell medium-sized for a strombid and relatively slender. Spire moderately high, conical, suture not indented. Teleoconch whorls, except body whorl, bearing low, broad varices, which generally are eroded. Accentuated growth lines on all spire whorls; spiral striae often hardly visible and gradually disappearing. Body whorl smooth. Aperture narrow, widening at the anterior end. Columella almost straight. Inner lip and parietal wall thickly coated with callus. Anterior part of the inner labrum bearing several low but strong and short lirae well within aperture. Outer lip extending upward beyond suture of preceding whorl, forming a long and slender posterior canal. Stromboid notch on outer lip very shallow, obsolete. Shell not shouldered, but a gently sloping upper part of the body whorl.

Comparison. – *Woodringius* gen. nov. contains only its type species. The shell of this species is not similar to shells of the genus *Strombus* Linnaeus, 1758. Members of this American only genus are generally shouldered, most of them bearing spines on the spire whorls and directly separatable from the new genus.
Woodringius gen. nov. has similarities with the Western Pacific radiation of *Labiostrombus* Oostingh, 1925 (type species *Strombus epidromis* Linnaeus, 1758 [subsequent designation Cossmann, 1904: 9]). Especially the Pliocene species *Labiostrombus denti* (L. R. Cox, 1948) from Northern Borneo, Malaysia. This species differs in being of larger size, having a deeper strombid notch, having clear axial ribs on the spire, and lacking the lirae on the inside of the labrum. *Labiostrombus kemedjingensis* (Martin, 1916) from the Lower Miocene of Central Java, Indonesia, has the same characters as the Pliocene *L. denti*.
The genus *Gibberulus* Jousseaume, 1888 (type species *Strombus gibberulus* Linnaeus, 1758 [by monotypy]) has similar smooth body whorls, but has a deep stromboid notch and a distinct anal canal, and is lacking the axial ribbing on the spire whorls, in *Woodringius* gen. nov. they bear spiral lines and broad ribbed axials.
The early whorls *of Woodringius leurus* bear tiny knobs and varices like in some present-day species of the genus *Canarium* Schumacher, 1817. Also, the slender shell, the distinct anal canal, and the smooth ending of the apertural edge are shared with members of this genus. However, *Canarium* species are generally much smaller and more shouldered, and therefore not similar to the newly proposed genus.

Woodring (1928: 326) already noted the strange appearance of the shell he described as *Strombus leurus*: “This species looks so strange for an American *Strombus* that it seems rash to place it in the same genus with *Strombus pugilis*. Nothing like it is known either fossil or living in America, but when the Oriental species are considered it is seen that all the distinctive features of *leurus*—smooth later whorls, absence of spines, ascending undilated outer lip, and very shallow stromboid notch—are found in living species referred to *Strombus*, though no one of them combines them in the exceptional manner of *leurus*. Perhaps this combination deserves generic or subgeneric rank, but it would be necessary to consider so many species that time is not available to make the required comparative study”. I concur with Woodring 1928: this species deserves a genus of its own, which is herein provided for.

Discussion. – *Strombus leurus* was previously regarded to be a member of the genus *Labiostrombus* by Petuch (1982: 285,300), *Oostrombus* by Petuch (1988) and Bandel (2007: 141), or of the genus *Strombus* s.s. by Maxwell et al. (2020: 22) & Dekkers (2023: 23).

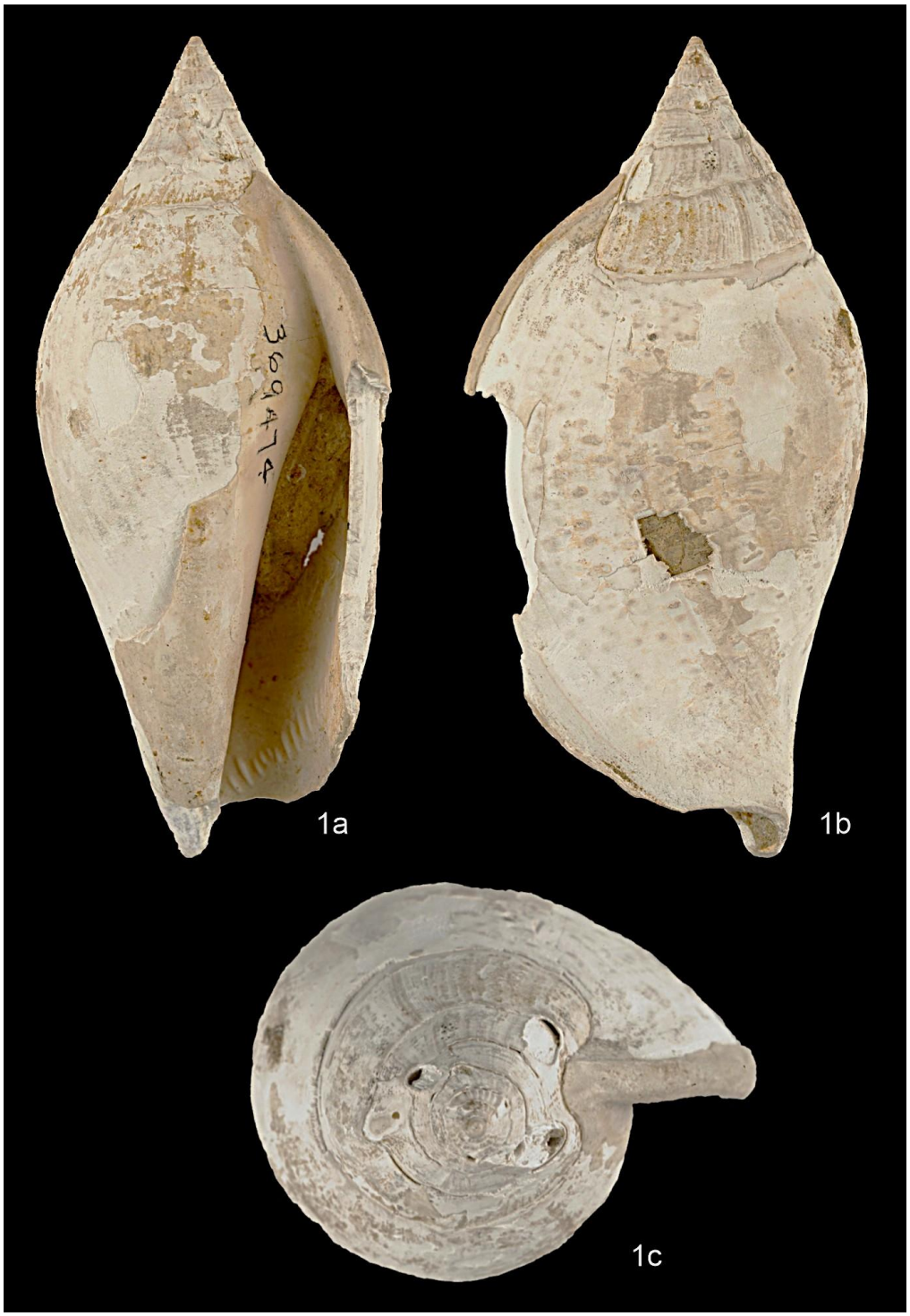

Plate 1. Fig. 1a-c. ***Woodringius leurus*** (Woodring, 1928). Holotype, USNM MO 369474. Shell L 61.2 mm W 29.4 mm.
Image courtesy of the Smithsonian National Museum of Natural History.

Specimen GUID *Strombus leurus*: http://n2t.net/ark:/65665/32ce90917-58b5-4a34-ab2a-430fd8c2849c

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A new and elegant *Vexillum* species (Gastropoda, Costellariidae) from Indonesia: *Vexillum praeclarum* sp. nov.

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ABSTRACT

A new slender and elegant *Vexillum* species from Indonesia, Sumbawa, is described. It is compared with some similar, but different, brown banded species: *Vexillum obeliscus* (Reeve, 1844), *Vexillum sculptile* (Reeve, 1845), *Vexillum jackylenae* R. Salisbury & E. Guillot de Suduiraut, 2006 and *Vexillum alvinobalani* E. Guillot de Suduiraut, 1999).

Key words – Costellariidae, *Vexillum,* Indonesia, Pacific, taxonomy

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INTRODUCTION

After the publication of *Vexillum indolyratum* Dekkers, 2024, a new species is described again, coming from off Sumbawa Island, Indonesia, or its surroundings. These shells are all dived by local gypsy divers. The given location is Labuan Bajo, Sumbawa, Indonesia, which is a small fisherman village located on a mangrove surrounded small peninsula. The multitude of dived, colorful, shells can never live in the mangroves; this implicates the location is from further

away, likewise from the islands in front of Sumbawa. Huang (2024) in his recent article describing four new Vexillum species uses Labuan Bajo as type locality in error, likewise following the labels provided with the bought shells. Dekkers & S.J. Maxwell (2024) use Indonesia, Sumbawa Island as type locality, thus not the exact place as that is not registered, which is followed herein, as in my previous article (Dekkers, 2024).

Abbreviations
AMD – (the collection of) Aart M. Dekkers, Purmerend, the Netherlands
GS – (the collection of) Günter Stossier, Hamburg, Germany
HD – (the collection of) Henk Dekker, Winkel, the Netherlands
MNHN – Muséum National d'Histoire Naturelle, Paris, France
MSNUP – Museo di Storia Naturale dell'Università di Pisa, Pisa, Italy
L – Length of the shell (shell length)
W – width of the shell at the broadest point

METHODS

This study uses acquired shells. The study is based on empty shells freshly caught by local fishermen from off Sumbawa Island, Indonesia. The new species is compared to *V. obeliscus* (Reeve, 1844) and *V. sculptile* (Reeve, 1845), Both are variable, wide spread Indo-Pacific species which probably are two complexes of species. Photos by the author, Olympus digital camera OM-D 5II with 30mm macro lens, unless otherwise stated.

TAXONOMY

Family Costellariidae MacDonald, 1860
Genus *Vexillum* Röding, 1798
Type species *Vexillum plicatum* Röding, 1798 (= *Voluta plicaria* Linnaeus, 1758) by subsequent designation, Woodring, 1928

***Vexillum praeclarum* sp. nov.**
(Pl. 1 Figs 1-2)
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Description. – Medium, slender and solid shell, between around 23 to 28 mm in height. Mean L/W ratio (N=11, Table 1) 3.52. Whorls regularly enlarging up to the pre-ultimate whorl, where the diameter of the whorl starts to enlarge slightly but visibly less than linear. Apex very small and dark brown, directly followed by lighter colored first teleoconch whorls, soon becoming darker with a white band just above the suture which is representative of the mid-whorl white band on the body whorl.
In total (excluded the embryotic whorls) about twelve whorls. The whorls bears 17 to 20 round edged axial opisthocline (leaning backwards relative to the direction of growth) ribs on the upper part (and bending back like forming and S on the lower part) . Many small flat topped

spiral parts in the interstices of the axial ribs. The spirals are lower than the axials which lie on top of the spirals. The mid-whorl white band covers two spirals and an the space between them. There are about 8 on the pre-ultimate whorl and the upper part of the body whorl, then 2 white ones, followed by 5 brown spirals, then 2 smaller white spirals followed by around 8 a bit granular lighter brown spiral. The last part is about 5 white spiral lines on the fasciole. Aperture slightly less than the length of the shell. Columella without enamel, in shell color including the banding, bearing 3 evenly spaced white lirae. Above the first lirae a white colored field, partly coincident with the small white band, the "costellarid apertural entrance field", enters the aperture. Apertural rim thin.
Inside aperture shiny and the dark color of the outer spart of the body whorl shining through. Deep inside the entrance, many typical costellarid lirae are visible. Long and slender siphonal canal. Siphonal canal slightly bends to the left, almost straight.

Holotype. – Indonesia, off Sumbawa Island, MSNUP-0525-MOL, L 27.4 mm W 7.8.

Paratypes. – All from the type locality. Table 1 entries used to determine the L/W ratio.
All other paratypes not measured.

Table 1. Sizes of types

	Repository	figured	length	width	L/ W ratio
Holotype	MSNUP-0525-MOL	Fig. 1	27.4 mm	7.8 mm	3,51
Paratype 1	MNHN-IM-2022-2439	Fig. 2	27.1 mm	7.8 mm	3,47
Paratype 2	AMD unnumbered	-	26.2 mm	7.8 mm	3,41
Paratype 3	AMD unnumbered	-	26.05 mm	7.15 mm	3,64
Paratype 4	AMD unnumbered	-	25.9 mm	7.0 mm	3,70
Paratype 5	AMD unnumbered	-	25.7 mm	7.2 mm	3,57
Paratype 6	AMD unnumbered	-	24.3 mm	7.05 mm	3,45
Paratype 7	AMD unnumbered	-	24.1 mm	6.6 mm	3,65
Paratype 8	AMD unnumbered	-	23.4 mm	6.6 mm	3,55
Paratype 9	AMD unnumbered	-	23.3 mm	6.9 mm	3,38
Paratype 10	AMD unnumbered	-	22.9 mm	6.8 mm	3,37
				mean	**3.52**

Other paratypes (all from the type locality): GS paratypes 11-25; AMD paratypes 26-33; HD paratypes 34-35 (nr. 50487), 36 (nr. 52715), 37-39 (nr. 53281).

Type locality. – Indonesia, off northern side of Sumbawa Island.

Distribution. – At present the new species is only known from off the northern side of Sumbawa Island, Indonesia.

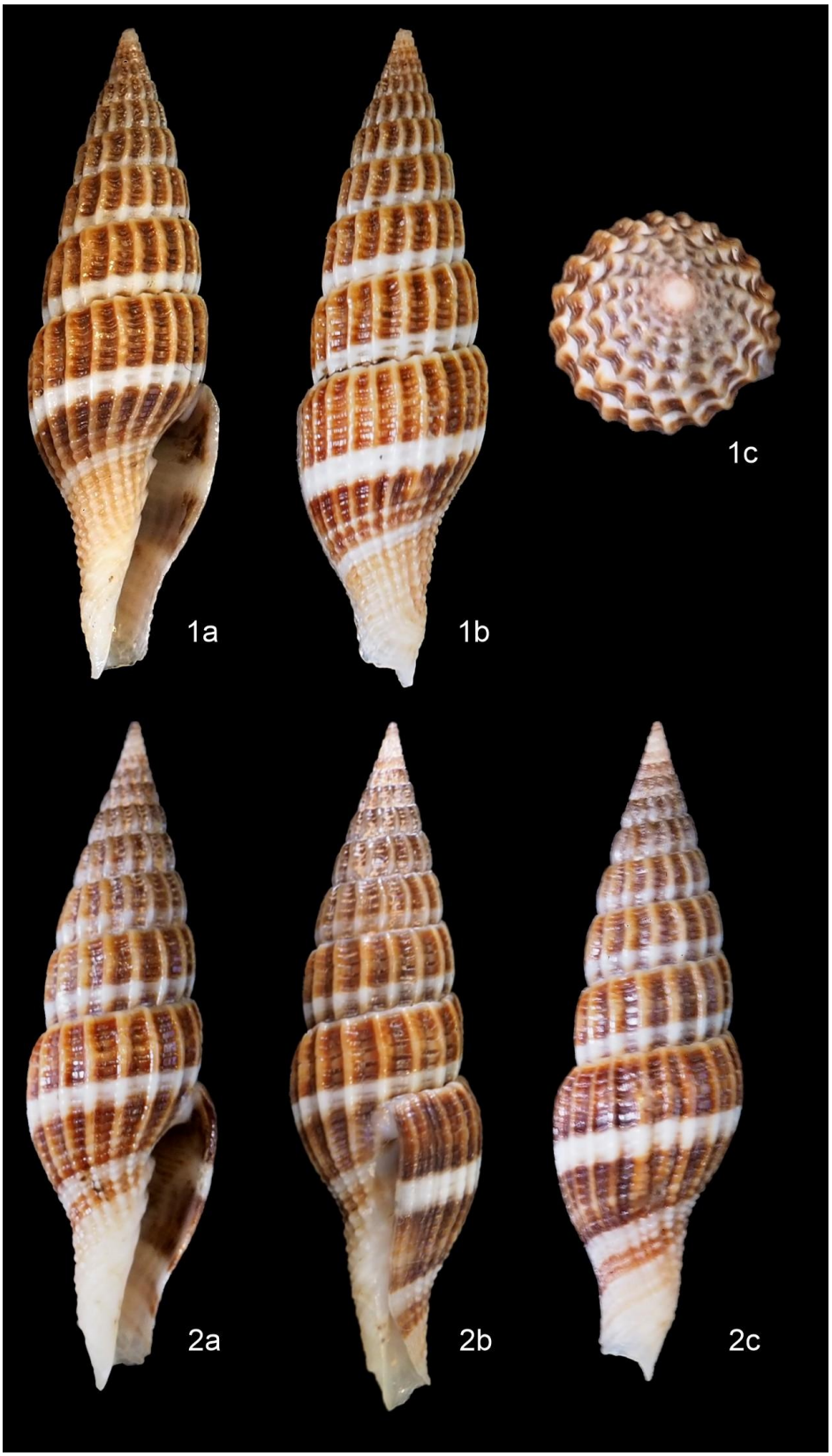

Plate 1. ***Vexillum praeclarum*** **sp. nov.** Indonesia, off Sumbawa Island. Fig. 1. Holotype, MSNUP-0525-MOL, L 27.4 mm, 1c from above. Fig. 2. Paratype 1, MNHN-IM-2022-2439, L 27.1 mm.

Habitat. – Not known. The species are said to be dived at 5 m depth (fide the labels accompanying the shells).

Etymology. – The name is derived from *clarus* (clear, bright) combined with *prae*. This elegant species is part of a plethora of brown-white banded species, but it clearly (hence *clarus*) stands out from other brown banded species by the elegant shape.

Comparison. – The new species is distinguished from *Vexillum obeliscus* (Reeve, 1844) (type locality: Philippines, Negros) by the typical coloration which is darker brown in the new species, the white band on the spire whorls is closer to the suture, the colour of the siphonal canal is distinctly fading to white at the anterior end and not having the same brown color. The new species siphonal canal is more slender and longer and the sculpture in *V. obeliscus* is more cancellated. Both species are of rather similar size (*V. obeliscus* generally 22-30 mm). Remark: *Vexillum riccardoi* T. Cossignani, 2024, recently described from Madagascar, is nothing more than a local variant of *V. obeliscus*. *Vexillum riccardoi* is on average slightly longer and broader than specimens from the Philippines. The lectotype of *V. obeliscus*, illustrated in Salisbury et al., 2024 (pl. 7 fig. 4), is very similar to *V. riccardoi*, I herewith synonymize this latter species with *V. obeliscus*.
The new species *V. praeclarus* sp. nov. is distinguished from *Vexillum sculptile* (Reeve, 1845) (type locality: Philippines, Island of Ticao; Reeve, 1845, pl. 35, species no. 290) by its larger size (syntypes of *V. sculptile* 16.1 and 17.0 mm), the much lighter color (a kind of light brown bands) and the sculpture in *V. sculptile* is more cancellated.
The new species is distinguished from *Vexillum jackylenae* R. Salisbury & E. Guillot de Suduiraut, 2006 (type locality: Philippines, Sulu Sea, Mindanao Island, Aliguay Island; Salisbury & Guillot de Suduiraut 1999: pl. 5 figs 1-3) by the sharper and clearer white encircling band on 2 cords whereas it is a 1-cord-sharp band and then fading thereunder in *V. jackylenae*, and also the siphonal canal is different (see the remark at the comparison with *V. obeliscus*). The new species is distinguished from *Vexillum alvinobalani* E. Guillot de Suduiraut, 1999 (type locality: Philippines, Balicalasag Island; holotype figs 1-2 in Guillot de Suduiraut, 1999) by having only 1 small white encircling band whereas *V. alvinobalani* has two broader white bands on the body whorl.

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RESPONSIBLE EDITOR
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A note on *Tellina anomala* Born, 1778 (Bivalvia, Psammobiidae)

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ABSTRACT

Recently, a catalogue was published on the Bivalvia described by Born, 1778-1780. The types of *Tellina anomala* Born, 1778 are figured, it is herein shown to be a junior synonym of *Asaphis deflorata* (Linnaeus, 1758), instead of *Asaphis violascens* (Forsskål, 1775) as presumed previously.

Key words – Psammobiidae, *Asaphis*, synonymy

INTRODUCTION

The nomenclature of Mollusca is advancing for 267 years, after Linnaeus well-known publication in 1758. Especially the publications of the 18th and 19th centuries are often problematic, insufficient descriptions and poor illustrations, if any at all. This results in different opinions about the identity of the described species. A catalogue of Bivalvia described by Born in 1778-1780 is therefore very welcome, as published with very good photographs by Eschner et al., 2025. The present note provides clarification on the taxonomic status of *Tellina anomala* Born, 1778, based on figures of the type material.

TAXONOMY

Family Psammobiidae

***Tellina anomala* Born, 1778**

Tellina anomala Born, 1778: 20–21
Tellina anomala – Born, 1780: 31–32

Asaphis violascens (Forsskål, 1775) – Willan, 1993 (in part): 6, fig. 15
Asaphis violascens (Forsskål, 1775) – Eschner et al., 2025: 1729, fig. 31A-H

Born did not figure his new species *Tellina anomala*. Eschner et al. (2025: fig. 31) figured the original Born shells in colour, still preserved in the Natural History Museum Vienna, Austria. There are two specimens, a cream coloured shell with yellow umbonal region (NHMW-ZOO-MO-14020; Eschner et al., 2025: fig. 31A-D) and a dirty pale orange one with orange coloured umbonal region (NHMW-ZOO-MO-14019; Eschner et al., 2025: fig. 31E-H). Both specimens have intense purple colour at the inside posterior part and along the hinge region. The first one (NHMW-ZOO-MO-14020) is designated lectotype by Willan (1993: 6, fig. 15), so the other specimen is a paralectotype. Looking at the photographs of both specimens reveals that they belong to two different species. The lectotype is a specimen of the tropical Western Atlantic species now called *Asaphis deflorata* (Linnaeus, 1758). The paralectotype belongs to the Indo-Pacific species *Asaphis violascens* (Forsskål, 1775).

Willan (1993: 6) regarded the lectotype to be a specimen of *Asaphis violascens*, which identification was followed by Eschner et al., 2025. However, the fine radial ribs of the lectotype makes it doubtless that it belongs to *A. deflorata* instead. Born's *Tellina anomala* is therefore a junior synonym of *A. deflorata* and not of *A. violascens*.

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Notes on the nomenclature of two species of Septaria (Gastropoda, Neritidae)

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ABSTRACT

Lamarck in 1816 figured and named *Navicella lineata* and *Navicella tessellaria*, they are at present considered two forms of the same species. A few years later Lamarck (1822) changed the spelling of the latter name to *Navicella tessellata*, without giving an explanation. Since that time authors have been using all three species names for the species involved, often with the wrong year of publication. On top of that, some authors added to the confusion by omitting one "l" in the name, forming the erroneous subsequent spelling *tesselata*. As both names *lineata* and *tessellaria* were published in the same work, a First Reviser action is needed to establish the name to be used. As we did not find a previous correct selection in the literature, we herein select the name *Navicella tessellaria* Lamarck, 1816 to take precedence over *Navicella lineata* Lamarck, 1816. Furthermore, the synonymy of *Septaria tessellaria* is revised. As a result of this revision, *Septaria atra* (Reeve, 1842) is newly recognized as an earlier name for *Septaria clypeolum* (Récluz, 1843). *Septaria dravadica* Prashad, 1934 is found to be a new synonym of *Septaria tessellaria*.

Key words – Gastropoda, Neritidae, Septaria, nomenclature, synonymy

INTRODUCTION

The Neritidae is a family with a long geological history. A larger part of this family lives in shallow water along shorelines in saltwater. Some species are adapted to live in brakish to fresh water, e.g. species in the genera *Neritina* Lamarck, 1816 and *Clithon* Montfort, 1810. One of the brackish to fresh water genera, *Septaria* J. B. Férussac, 1807, does not possesess the typical neritiform shells, but developed a limpet shaped shell instead. The calcareous neritid operculum is reduced in *Septaria* and found internally. With a large foot they cling to rocks and stones in streams, from river mouths upstream to some distance inland. They produce egg cases with are locally deposited on stones, branches, or other shells. The genus *Septaria* is easily recognized, but the different species are more difficult to discriminate. The shells are variable in shape, because the shape is adapted to the surface they live on, and the environment is in every river a bit different. The status of all the species present in *Septaria* was investigated by Haynes (2001). She regarded 13 species as valid, despite the existence of a large number of available names of more than 50. Eichhorst (2016: 811) recognized 14 species, so one additional species. This additional species was synonymized earlier with *Septaria tessellaria* (Lamarck, 1816) by Haynes (2001). Splitting of a different species out of *S. tesellaria* as another species makes it necessary to establish the correct name for it. The correct name for this species is here researched and established. The name *S. tessellaria* is not very well established in the literature, so this name, its author and correct publication date is also determined.

Abbreviations

BG – (Collection of) Bavius Gras, Leeuwarden, the Netherlands
HD – (Collection of) Henk Dekker, Winkel, the Netherlands
leg. – Collected by

TAXONOMY

Superfamily Neritoidea Rafinesque, 1815
Family Neritidae Rafinesque, 1815
Subfamily Neritininae Poey, 1852
Genus *Septaria* Férussac, 1807
Type species *Patella borbonica* Bory de Saint-Vincent, 1804 (by original designation)

Septaria tessellaria (Lamarck, 1816)

(Pl. 1 Figs 2-4, Pl. 2 Figs 1-9, Pl. 3 Figs 1-18)

Synonymy:
Navicella tessellaria Lamarck, 1816: pl. 456 figs 3a-b, 4a-b
Navicella lineata Lamarck, 1816: pl. 456 fig. 2a-b
Navicella tessellata Lamarck, 1822: 182 sp. 3
Septaria navicula Férussac, 1827: 413
Navicella compressa W.H. Benson, 1836: 749-750
Navicella entrecastauxi Récluz, 1842: 380
*Navicella variabili*s Récluz, 1843: 155

Navicella maculifera Mousson, 1849: 85-86, pl. 12 fig. 13
Navicella eximia Reeve, 1856: Species 26, pl. 6 fig. 26a-b
Navicella orientalis Reeve, 1856: Species 33, pl. 8 fig. 33a-b
Navicella reticulata Reeve, 1856: Species 20, pl. 5 fig. 20a-b
Navicella livesayi Dohrn, 1858: 135
Navicella squamata Dohrn, 1858: 135
Navicella tessellata var. subrostrata von E. von Martens, 1881: 38, pl. 7 figs 16-17
Navicella tessellata var. oblonga von E. von Martens, 1881: 39, pl. 8 figs 1-3
Navicella tessellata var. compressa von E. von Martens, 1881: 39, pl. 8 figs 4-9
Septaria dravadica Prashad, 1934: 6, pl. 2 figs 1-4 [**syn. nov.**]

Distribution. – Southern India, Sri Lanka, Thailand, Vietnam, Taiwan, southern Japan, Philippines, Indonesia, Papua New Guinea, and the Solomon Islands; its presence in Queensland is likely, but unconfirmed (Eichhorst, 2016: 839). Eichhorst (2016: 839) also mentions “Natal, South Africa and probably Madagascar” as localities for this species, but we are not aware that this species actually lives in this area.

Material studied in our collections:
INDONESIA: BALI, BADUNG REGENCY: Nyanyi Beach, Jeh Poh Estuary, leg. HD (HD 5327, 2 ex.); BULELENG REGENCY: Kaliasem, leg. BG (BG 9513, 9 ex.); Celukan Bawang, leg. BG (BG 9540, 2 ex.); East of Kalibukbuk, leg. W.C. Regter (BG 3188, 10 ex.); Northeast of Bukti, leg. HD (HD 56071, 1 ex.); KARANGASEM REGENCY: Ulakan, leg. BG (BG 8383, 1 ex.);
SULAWESI, GORONTALO PROVINCE: Bune Beach, leg. BG (BG 1120, 5 ex.);
SUMATRA, ACEH PROVINCE: Batu Putih, leg. BG (BG 1731, 18 ex.); Meukek, leg. BG (BG 1732, 11 ex.); Air Dingin, leg. BG (BG 4933, 1 ex.);
BENGKULU PROVINCE: Pasir Bengkulu River, leg. BG (BG 1119, 9 ex.); Luak Limau, near village Lubuk, leg. BG (BG 4252, 2 ex.); Batang Anai River, near bridge, leg. BG (BG 4164, 20 ex.); Mara River, leg. BG (BG 4480, 11 ex.);
WEST SUMATRA PROVINCE: Beremas River, leg. BG (BG 491, 1 ex.); Banda River, near Pasir Gurung, leg. BG (BG 1118, 1 ex.); Cindakir River, at river mouth near bridge, leg. BG (BG 4166, 4 ex.); Lubuh River, near bridge, leg. BG (BG 6984, 15 ex.); Carolin River estuary, leg. BG (BG 6986, 5 ex.);
SUMBAWA, BIMA REGENCY: Bontong, leg. BG (BG 4330, 2 ex.); Punti, leg. BG (BG 4390, 1 ex.);
JAPAN: OKINAWA ISLAND: Yontanzan, leg. Femorale (BG 3191, 3 ex.);
MALAYSIA: TIOMAN ISLAND: port on northwest coast, leg. H. Morrison (BG 3180, 7 ex.);
PHILIPPINES: BOHOL ISLAND, BALICASAG ISLAND, leg. Conchology Inc. (BG 3160, 3 ex.); CEBU, leg. unknown (HD 36268, 1 ex.);
SRI LANKA: SOUTHERN PROVINCE: Madampe Lake, leg. Femorale (BG 3192, 2 ex; BG 3193, 7 ex.);
TAIWAN: HUALIEN COUNTY: Shoufong township, Shuilien River, leg. BG (BG 5447, 5 ex.); MAOLI COUNTY: Tongshiao township, leg. Yu-Shiu YEN (BG 5282, 1 ex.); NEW TAPEI CITY COUNTY: Wanli, river under Wanli Junior High School bridge, leg. BG (BG 5119, 4 ex.); PINGTUNG COUNTY: Checheng township, Suchung River, leg. BG (BG 4796,

22 ex.); TAINAN COUNTY: Tainan, leg. Yu-Shiu YEN (BG 6300, 3 ex.); TAOYUAN COUNTY: Gonglia, leg. Hao YANG (HD 44604, 1 ex.);
THAILAND: GULF OF THAILAND: Laem Thachi 0.5 km SE of lighthouse, leg. BG (BG 8879, 1ex.); PHUKET: Kamala Bay: Kamala Beach, leg. BG & HD (BG 1121, 20 ex. & HD 4343, 19 ex.); SAMUI: Lamai Beach, leg. F. De Donder (BG 3182, 4 ex.); Maenam, leg. T. Cordell (BG 5463, 5 ex.).

Plate 1. Original figures and legends presented by Lamark, 1816, plate 456. Fig. 1a-d. ***Navicella elliptica***. Fig. 2a-b. ***Navicella lineata***. Fig. 3a-b. ***Navicella tessellaria***. Fig. 4a-b. Eadem major aut varietas [= The same larger or a variety].

Nomenclature. – Lamarck described in 1816 two very similar *Navicella* species: *Navicella lineata and Navicella tessellaria*. No description is given, only a name and figures of both species (Pl. 1 Figs 2-4). Both are rather small, limpetform, narrow, and had their origin in India. They were differentiated by Lamarck (1822) primarily on shell pattern and to a lesser extent on shell shape. *Navicella lineata* with longitudinal color stripes and *N. tessellata* with a tented or checkered pattern.
Except for a few authors, most authors overlooked the fact that Lamarck (1822: 182) changed the spelling to *Navicella tessellata*, refering to his earlier figure of *N. tessellaria* (1816: pl. 456 fig. 4a-b). He regarded his earlier other figure (1816: pl. 456 fig. 3a-b) as a variety. Lamarck replaced his earlier *tessellaria* with *tessellata*, without giving any explanation, so an unjustified emendation (ICZN Art. 33.2.3). Some authors (e.g. Haynes, 2001b: 188; Eichhorst, 2016: 838) use the spelling *tesselata*, an incorrect subsequent spelling (ICZN Art. 33.3), adding to the confusion. A list of these species names and genera used in the course of years for this species can be found in Appendix 1.

Lamarck introduced the names *Navicella lineata* and *N. tessellaria* in the same work. Both names are now regarded to be based on the same species (Haynes, 2001b: 191). To establish which name takes precedens, one needs a First Reviser (ICZN Art. 24.2). Haynes (2001b: 191), followed by Eichhorst (2016: 840), considered E. von Martens (1881) as First Reviser. But E. von Martens (1881:) does not mention the name *N. tessellaria* at all in this work, he uses the later name *N. tessellata*. This means that E. von Martens cannot be considered as First Reviser for the names *tessellaria* and *lineata*. As we did not find a previous correct selection in the literature, we herein select the name *Navicella tessellaria* Lamarck, 1816 to take precedence over *Navicella lineata* Lamarck, 1816, following the intention of E. von Martens, 1881.
Besides the inconsistent use of the mentioned Lamarckian species names, this species, very variable in form and color pattern, was described as new by a number of subsequent authors, resulting in a large number of synonyms. The photos of the types of *Septaria dravadica* Prashad, 1934 are now available online (for links see MolluscaBase), they show that this name is also a synonym of *S. tessellaria*.

Generic names. – The first species in the neritid genus *Septaria* were described by Linnaeus and others in the limpet genus *Patella* Linnaeus, 1758. Later, the name of choice became *Navicella* Lamarck, 1809. E. von Martens (1897: 83) and Bourne (1908: 816) resurrected the senior name *Septaria* Férussac, 1807. The genus name *Catillus* J. E. Gray, 1847 was also used in the past for *Septaria* species, but it is a much later name and invalid (a junior homonym of *Catillus* Brongniart, 1822). We do not consider subgenera within *Septaria* justified. We agree with Holthuis (1995) and others to consider *Septaria* to be a genus within the Neritidae, not as separate family Septariidae, because its shell morphology and anatomy match other Neritidae.

Separation of *Septaria clypeolum* (Récluz, 1843) from *S. tessellaria* (Lamarck, 1816) . – A number of authors, e.g. Tryon (1888: 81-82) and Haynes (2001b: 188) in her review of the genus *Septaria*, have considered *Septaria clypeolum* a form or just a synonym of *S. tessellaria*. In contrast, G. B. Sowerby II (1850), Récluz (1850) and Reeve (1856) treated *S. clypeolum* (Récluz, 1843) as a valid species. G. B. Sowerby II (1850) shows the opercula of both species

(Pl. 2 Figs 5 & 12). Eichhorst (2016: 819) recognized *S. clypeolum* (Récluz, 1843) as valid species which could be discriminated from *S. tessellaria* (Lamarck, 1816). This distinction is based on differences in shell shape and structure as well as the different opercula of both species. This means that all synonyms attributed by authors to *S. tessellaria* needed to be re-examined. After careful literature study we separated the synonyms of these two previous mixed-up species.

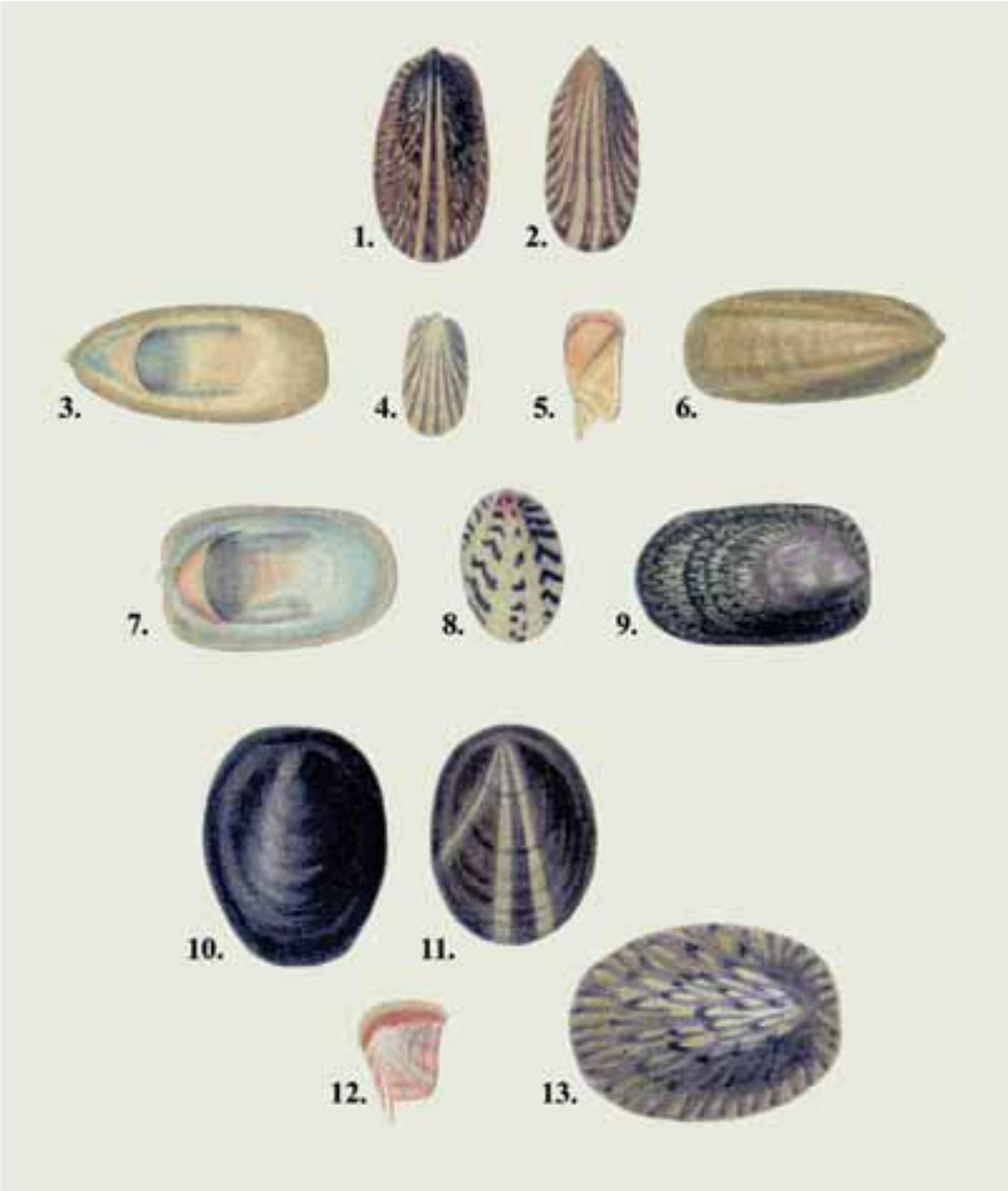

Plate 2. G.B. Sowerby II's (1850) illustrations. Figs 1-6. ***Septaria lineata***. Figs 7-9. ***Septaria tessellaria***. Figs 10-13. ***Septaria clypeolum***. Image courtesy Tom Eichhorst.

Septaria atra (Reeve, 1842)

(Pl. 2 Figs 10-13, Pl. 4 Figs 1-7)

Synonymy:
Navicella atra Reeve, 1842: 135, pl. 199 fig. 4
Navicella radiata Reeve, 1842: 135, pl. 199 fig. 7
Navicella recluzii Reeve, 1842: 135, pl. 199 fig. 6
Navicella clypeolum Récluz, 1843: 157-158
Navicella ambigua Récluz, 1850: 376
Navicella caerulescens G.B. Sowerby II, 1850: 550, pl. 118 fig. 29, pl. 118bis figs 36-38
Navicella insignis Reeve, 1856: Species 21, pl. 5 fig. 21a-b

Distribution. – The distribution of this species includes the Philippines and Borneo (Eichhorst, 2016: 819).

Material studied in our collections:
INDONESIA: PAPUA: Yapen Islands Regency, Yapen Island, near Serui, Woru River, leg. D. Smits, ex coll. J. Frentrop (BG 3172, 8 ex);
PHILIPPINES: BALUT ISLAND, BALICASAG ISLAND, leg. Conchology, Inc. (BG 6291, 1 ex.); CEBU ISLAND: North of Argao City, leg. Conchology Inc. (HD 33930, 7 ex.); MINDANAO ISLAND: Butuan, leg. J.S. Tuyor (HD 33940, 1 ex.); Zamboanga del Sur Province, Negrus, Bagu Naga, ex coll. R.P.A. Voskuil (BG 3189, 5 ex.); SAMAR ISLAND: Tinabanan, leg. R.M. Auxillo (BG 8215, 1 ex.);
TAIWAN: TAOYUAN COUNTY: Xinwu, Fuxing Creek, leg. Kuang-Hwa HU (BG 8996, 1 ex.).

Nomenclature. – We studied the original descriptions and figures for the species described and the opinions of previous writers. Eichhorst (2016: 820) only mentioned *Navicella clypeolum* and *N. caerulescens* (with the wrong author Récluz, 1850) as names attributed to this species. We discovered that three older names exist for the species recognized as *S. clypeolum*: *Navicella atra*, *N. radiata,* and *N. recluzii*, all described by Reeve in 1842. These three Reeve names were already synonymized with *N. clypeolum* by Récluz (1850: 376). We select herein as First Reviser *Navicella atra* Reeve, 1842 as taking precedence over both *N. radiata* and *N. recluzii*.

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Thanks to Tom Eichhorst for his permission to use parts of his book Neritidae of the World, Volume 2 (2016). Thanks to the Biodiversity Heritage Library for making literature available.

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Plate 3. ***Septaria tessellaria*** (Lamarck, 1816) (from Eichhorst, 2016: 854, plate 254). Figs 1a-c, 2a-b. Without periostracum, 16 mm, Thailand. Figs 3a-b, 4a-b, 5-8. Without periostracum, 19-29 mm, Malaysia. Fig. 9a-b. 19 mm, Indonesia. Figs 10-13. All without periostracum, 18 mm, Sri Lanka. Figs 14-16. 17-18 mm, Philippines. Fig. 17. Shows details of the operculum of shell in fig. 9. Fig. 18. Shows the aperture and septum of shell in fig. 1. Specimens in figs 3,6,12,15 are color forms named *lineata* by Lamarck, 1816.

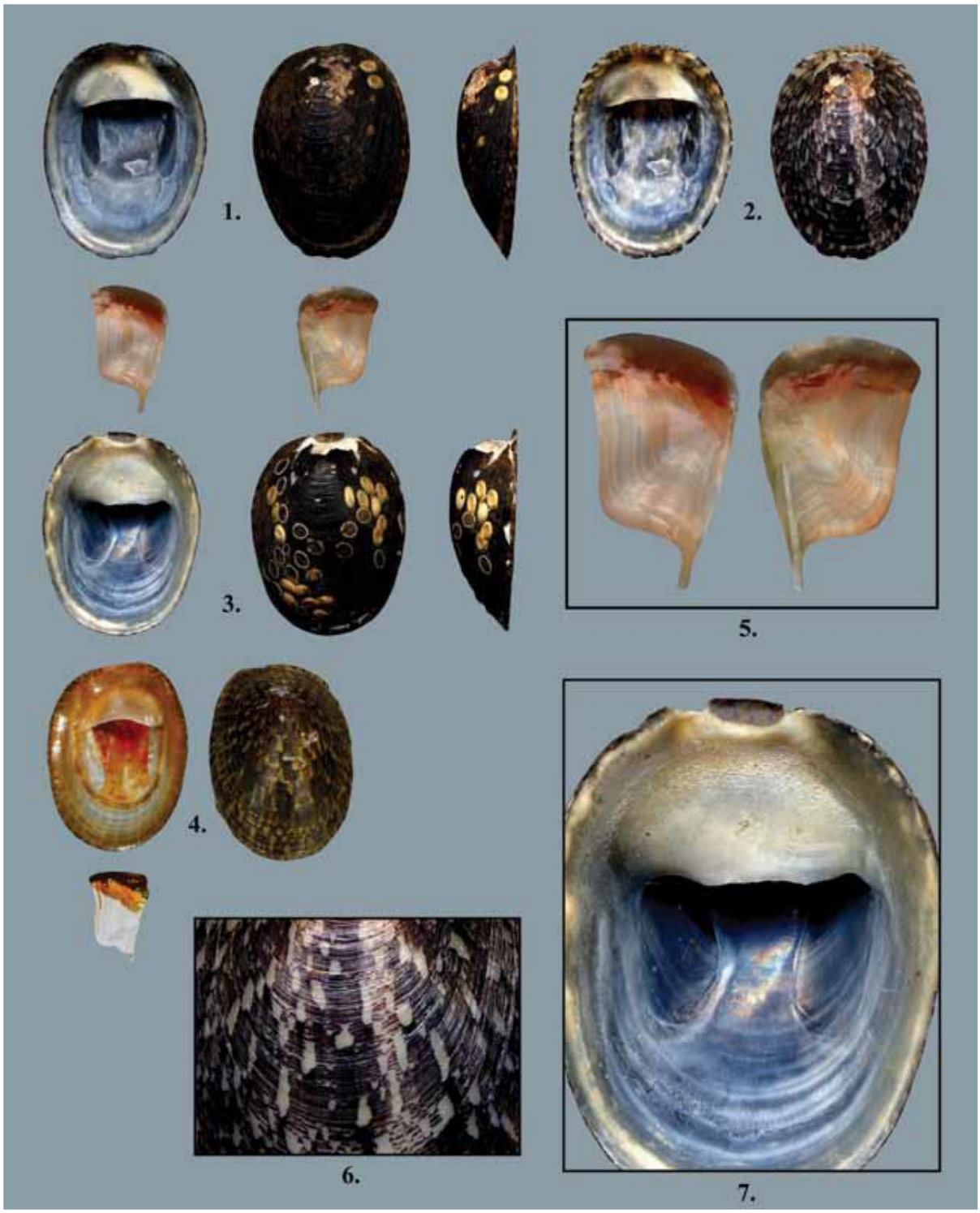

Plate 4. ***Septaria atra*** (Reeve, 1842) (from Eichhorst, 2016: 844, plate 244): Figs 1a-c, 2a-b. Without periostracum. Fig. 3a-c. 15 mm, Philippines, Biliran Island. Fig. 4a-b. 14 mm, Japan. Fig. 5. Shows details of the operculum of shell in fig. 1. Fig. 6. Shows the color pattern without periostracum of shell in fig. 2. Fig. 7. Shows the aperture and septum of shell in fig. 3.

Appendix 1. Overview of used names for *Septaria tessellaria* (Lamarck, 1816)*

Navicella lineata Lamarck, 1816: pl. 456 fig. 2a-b
Navicella tessellaria Lamarck, 1816: pl. 456 figs 3a-b, 4a-b
Navicella lineata Lamarck, 1816 – Lamarck, 1822: 182 sp. 2
Navicella tessellata Lamarck, 1822: 182 sp. 3
Navicella lineata Lamarck, 1816 – Récluz, 1841: 377
Navicella tesselata Lamarck, 1822 – Récluz, 1841: 380-382
Navicella lineata Lamarck, 1822 – Sowerby, 1850: 550, pl. 118 figs 21-25
Navicella tessellata Lamarck, 1822 – Sowerby, 1850: 550, pl. 118 figs. 26-28
Navicella lineata Lamarck, 1816 – Récluz, 1850: 375
Navicella tessellata Lamarck, 1816 – Récluz, 1850: 375
Catillus (Septaria) lineatus (Lamarck, 1816) – H. & A. Adams, 1854: Vol. 1: 387; Vol. 3: pl. 42 fig. 4
Navicella tessellata Lamarck, 1822 – Reeve, 1856: pl. 6 species 27
Navicella lineata Lamarck, 1816 – Reeve, 1856: pl. 8 species 31
Navicella tessellata Lamarck, 1822 – E. von Martens, 1881: 37-41, pl.7 figs 8-17, pl. 8 figs 1-9
Navicella lineata Lamarck, 1822 – Tryon, 1888: 82, pl. 29 fig. 58
Navicella tessellata Lamarck, 1822 – Tryon, 1888: 81, pl. 29 fig. 57
Septaria tessellata Lamarck, 1822 – E. von Martens, 1897: 86
Septaria lineata lineata (Lamarck, 1816) – Baker, 1923: 151-152
Septaria lineata tessellata (Lamarck, 1816) – Baker, 1923: 151-152
Septaria tesselata (Lamarck, 1816) – Rensch, 1934: 417
Septaria tesselata (Lamarck, 1822) – Riech, 1937: 68-69
Septaria tessellaria (Lamarck, 1816) – Connolly, 1939: 601-603, pl. 17 figs 20-21
Navicella tessellata Lamarck, 1822 – Mermod, 1953: 134-135, fig. 156
Septaria lineata (Lamarck, 1816) – Van Benthem Jutting, 1956: 317-318 figs 4, 33
Septaria lineata (Lamarck, 1816) – Van Benthem Jutting, 1959: 58-59
Septaria lineata (Lamarck, 1816) – Van Benthem Jutting, 1963: 429-430
Septaria tessellaria (Lamarck, 1816) – Kensley, 1973: 54-55
Septaria lineata (Lamarck, 1816) – Starmühlner, 1974: 111-118, pl. 2 fig. 10-13
Septaria lineata (Lamarck, 1816) – Starmühlner, 1976: 544-548, pl. 13 fig. 144-147
Septaria (Navicella) lineata (Lamarck, 1816) – Komatsu, 1986a: 41, pl. 8 fig. 6
Septaria (Navicella) lineata (Lamarck, 1816) – Komatsu, 1986b: 174, fig. 12
Septaria lineata (Lamarck, 1816) – Subba Rao, 1989: 41-42, figs 49, 50
Septaria lineata (Lamarck, 1816) – Haynes, 1984: 18, pl. 11 figs 34-35, pl. 12 fig. 36
Septaria tesselata (Lamarck, 1816) – Haynes, 1993: 287
Septaria tessellaria (Lamarck, 1816) – Appleton, 1996: 17
Septaria lineata (Lamarck, 1816) – Delsaerdt, 1998: 38
Septaria (Navicella) lineata (Lamarck, 1816) – Okutani, 2000: 111, pl. 55
Septaria tessellata (Lamarck, 1816) – Haynes, 2001a: 64, 65 2 figs
Septaria tesselata (Lamarck, 1816) – Haynes, 2001b: 188-191, figs 17-19, 23-27
Septaria tesselata (Lamarck, 1816) – Kano, Y. et al., 2011: 259-260
Septaria tessellata (Lamarck, 1816) – Kano, Y. et al., 2013: 379-380
Septaria tesselata (Lamarck, 1816) – Eichhorst, 2016: 838-840, pl. 254
Septaria tesselata (Lamarck, 1816) – Abdou, 2021: 28, 37, 39

* This list is far from complete, but it is adequate to show the inconsistancies in the use of the species name, as *lineata*, *tessellaria*, *tessellata*, *tesselata*.

A new *Scutarcopagia* Pilsbry, 1918 species (Bivalvia, Tellinidae) from Indonesia, with notes on other species in this genus

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ABSTRACT

A species of *Scutarcopagia* Pilsbry, 1918 from Indonesia and the Philippines is described as new species. Other species in this genus are discussed. *S. elizabethae* (Pilsbry, 1918) from Hawaii and *S. delicatula* (Selli, 1974) from the Red Sea are at present regarded as synonyms of *S. scobinata* (Linnaeus, 1758) but herein restored as valid species. The group of elongated species, which are now also recognised as part of the genus *Scutarcopagia*, have been reclassified into the genus *Tellinella* Mörch, 1853. The genus-group name *Smithsonella* Afshar, 1969, which has as type species one of those elongated species, is a synonym of *Tellinella*. *Tellina* (*Arcopagia*) *cratitia* A. A. Gould, 1861 is demonstrated to be a nomen dubium.

Key words – Tellinidae, *Scutarcopagia*, taxonomy, new species Indonesia, Philippines

INTRODUCTION

The Tellinidae is a family of bivalves that includes numerous species, all divided into various subfamilies and genera (Huber et al., 2015). One of the many genera is the genus *Scutarcopagia* Pilsbry, 1918. It is characterized by an *Arcopagia*-like shell form, but it has the outer sculpture formed by many small scales. This kind of sculpture of scales is not unique for this genus, but also several elongated tellinid species possess a similar sculpture, ranging from non, partial covered, to totally scales covered shells. Given their distinctly different and extremely elongated shells, I do not regard them as *Scutarcopagia* species in this respect, I follow the earlier authors predating Huber et al. (2015), and think they belong to *Tellinella* Mörch, 1853. The genus *Scutarcopagia* contains only a few species, *S. scobinata* (Linnaeus,

1758), *S. linguafelis* (Linnaeus, 1758), *S. elizabethae* (Pilsbry, 1918) and *S. delicatula* (Selli, 1974). The first two species were already recognized by many previous authors, the latter two are not well-known. A new species is being introduced alongside them.

Abbreviations

H	Height of the shell measured from the apex to dorsal margin
L	Length of the shell
T	Thickness of shell, both valves
HD	(collection of) Henk Dekkers, Winkel, the Netherlands
MSNUP	Museo di Storia Naturale dell'Università di Pisa, Pisa, Italy

TAXONOMY

Superfamily Tellinoidea Blainville, 1814
Family Tellinidae Blainville, 1814
Subfamily Tellininae Blainville, 1814

Scutarcopagia Pilsbry, 1918

Type species: *Tellina scobinata* Linnaeus, 1758 (type by original designation).

Synonym: *Smitharcopagia* Afshar, 1969, type species *Tellina linguafelis* Linnaeus, 1758 (type by original designation).

I agree with Huber et al. (2015: 581) that *Smitharcopagia* Afshar (1969: 48), introduced as a subgenus of *Arcopagia* T. Brown, 1827, is a synonym of *Scutarcopagia*. The type species *Tellina linguafelis* has a similar form, sculpture and hinge characteristics as *Tellina scobinata*.

The *Tellina pulcherrima* G. B. Sowerby I, 1825 (Pl. 2 figs 2a-d) species group possess a sculpture of concentric ridges, which are nearly completely expressed as scales. In this sense they are similar in sculpture to *Scutarcopagia* species. Huber et al. (2015: 581) their arguments that elongate shells of *Scutarcopagia scobinata* (Huber et al., 2015: 174, figs lower row) are close in form to some of the elongate shells of species within this *Tellina pulcherrima* group is not followed here. The shell form of *S. scobinata*, and other typical *Scutarcopagia* species, is much more rounded than the *T. pulcherrima* species group. This is probably the result of a different way of living, meaning they will have a different position when buried in the sediment. Several species which Huber et al. (2015: 581) considered to belong to *Tellinella* Mörch, 1853 (*T. dissimilis* Deshayes, 1855; *T. philippii* (Philippi, 1844); *T. regina* (Salisbury, 1934); *T. severnsi* Huber et al., 2015) do also possess scales in their sculpture, but the scales do not cover all parts of the shell. *Tellinella* sensu Huber et al., 2015 therefore already contains species with commarginal sculpture of ridges, and species with ridges partly presented as scales. The genus *Tellinella* has now been expanded to include elongated species whose entire shells are covered in scales. The *Tellina pulcherrima* species group is therefore herein regarded as belonging to the genus *Tellinella* and not as before (Huber et al., 2015: 581) to *Scutarcopagia*. Resulting in the new combinations: *Tellinella pulcherrima* (Sowerby I, 1825), *T. monika* (Huber et al., 2015), *T. nelly* (Huber et al., 2015),

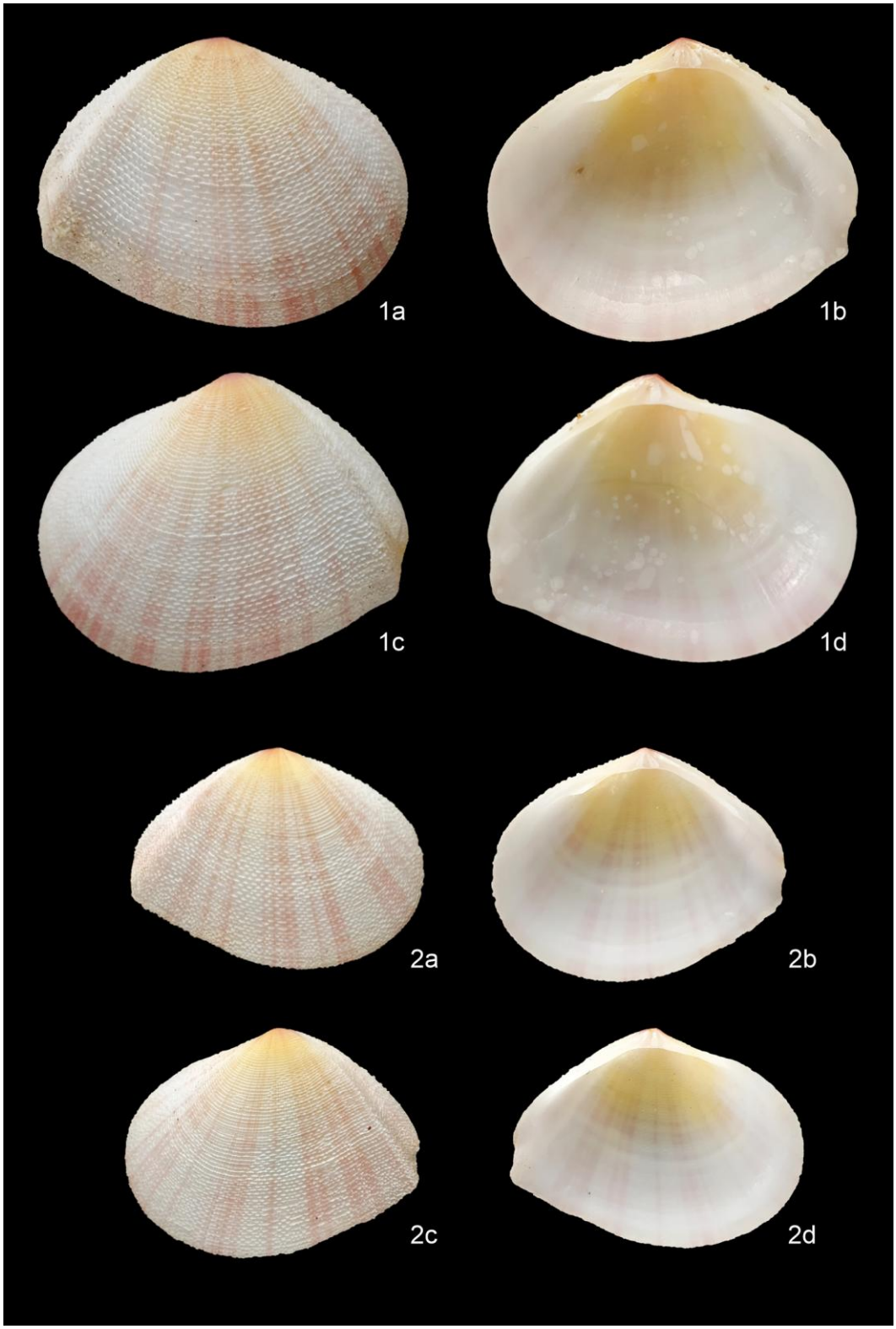
T. semiaspera (Deshayes, 1855), *T. squamulosa* (A. Adams, 1850) and *T. verrucosa* (Hanley, 1844).

Afshar (1969: 38) introduced the subgenus *Smithsonella* in the genus *Tellina* Linnaeus, 1758, with as type species *Tellina pulcherrima* G. B. Sowerby I, 1825 (Pl. 2 figs 2a-d). Since there appears to be no justification for recognising *Smithsonella* as a valid genus or subgenus, it is herein considered synonymous with *Tellinella*.

There is also discussion on the status of two described species of *Scutarcopagia*. *S. delicatula* (Selli, 1974) (Pl. 4 Figs 1-2), endemic to the Red Sea, is considered to be a synonym of *S. scobinata* (Pl. 3 Figs 1-2) by Huber et al. (2015: 581). But comparing a number of specimens from the Red Sea and from elsewhere in the Indo-Pacific revealed that the scales on Red Sea specimens are consistently much finer. Therefore, Red Sea specimens were considered a separate subspecies by Mienis (2006: 7, fig. 2) and as valid species by Rusmore-Villaume (2008: 246, 247 figs) and Blatterer (2019: 125, fig. 18a-f). I agree with the latter view that *S. delicatula* is a valid species. The figure given by Oliver (1992: pl. 30 fig. 1a-b) is a clear specimen of *S. scobinata* and therefore not originating from the Red Sea, the locality of his figured shell is not mentioned in his book. The coarse sculptured form of *S. scobinata* (Pl. 3 Fig. 1a-d) is not found in the Red Sea. However, there are some finer sculptured shells of this species found in its range (Pl. 3 Fig. 2a-b), which may indicate that *S. scobinata* is a species complex, but no molecular data is available to solve this problem.

Another species regarded as valid is *Scutarcopagia elizabethae* (Pilsbry, 1918), described as *Tellina* (*Arcopagia*) *elizabethae* Pilsbry (1918: 331, pl. 22 fig. 8) from Hawaii (Pl. 5 Figs 1-2). It was regarded as valid species by Mienis (2006: 7), but as synonym by Huber et al. (2015: 581). It is more similar to the Red Sea species *S. delicatula* in having finer scales, than to *S. scobinata* which has typical larger sized scales. Furthermore, this Hawaiian species differs from both *S. scobinata* and *S. delicatula* in being snow-white inside (Pl. 5 Figs 1b,d & 2b,d), instead of being yellowish coloured, and in the more accentuated ridge on the posterior side. Next to *S. elizabethae*, also *S. scobinata* might occur in Hawaii, as Severns (2011: 478, pl. 219 fig. 8) figures a typical specimen of the latter, although without mentioning locality details.

Mienis (2006: 7) mentions the subspecies *Scutarcopagia scobinata cratitia* (A. A. Gould, 1861)as a subspecies from southern Japan, with sculpture finer than typical *S. scobinata*. This species of 15 mm in length was described as *Tellina* (*Arcopagia*) *cratitia* A. A. Gould (1861, vol. 8: 29) from Japan, the RyuKyu Islands, 15 m depth. Gould mentions “Analogous to *T. scobinata*, but no species has been described with similar sculpture, which is much like that of *Venus marica*.”. No types of this species were recognized (Johson, 1964: 61). Looking at the Japanese tellinids described and figured by Okutani, 2017, a suitable candidate for the Gould



Pl. 1. ***Scutarcopagia radiisolis*** **sp. nov.** Fig. 1a-d. Holotype, Indonesia, Sumbawa, dived 5-10 m depth, July 2025, L 43.2 mm, MSNUP-0225-MOL. 1a-b right valve, 1c-d left valve. Fig. 2a-d. Paratype 1, Indonesia, Sumbawa, dived 5 m depth, L 34.3 mm, HD 56055. 2a-b right valve, 2c-d left valve.

species might be *Afsharius patagiatus* (Prashad, 1932) (Okutani, 2017: pl. 547 fig. 6). It is a tellinid, and sculpture looks a bit similar to the venerid *Timoclea marica* (Linnaeus, 1758).

However, since this is merely speculation and there are no type specimens, Gould's name should be regarded as a nomen dubium.

Scutarcopagia radiisolis sp. nov.

(Plate 1 Figs 1-2)

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Description. – Shell ovate, anteriorly widely rounded, posteriorly truncated. On the outside of the right valve a distinct ridge is running from the umbo towards the posteroventral margin, on the outside of the left valve this is a shallow groove. Shell clearly flexuous near the posterior margin. Lunula present, depressed, elongate, larger on left valve than right valve. Lunule in left valve is fused with the anterior lateral tooth and is when closed being partially overlapped by the lunula of the right valve. Sculpture consisting of fine radial striae, crossed by much stronger developed commarginal lamellae. On the umbo the lamellae are continuous, gradually changing into connected and unconnected fine scales, giving a very rough appearance. The pallial sinus is large, extending for 2/3 of shell length, pointing to the anterior side, partially confluent with the pallial line.
The shell is white, with the apex coloured dark red. The red colour changes rapidly into yellow, which fades towards the ventral margin to white. Narrow pinkish-red coloured rays run from the apex towards the ventral margin. Inner side umbonally yellow, with the pinkish-red coloured rays visible through the shell.

Holotype. – Indonesia, Sumbawa. Dived 5-10 m depth, July 2025, ex HD 55850, H 34.4 mm L 43.2 mm T 15.5 mm, MSNUP-0225-MOL, Pl. 1 Fig. 1a-d.

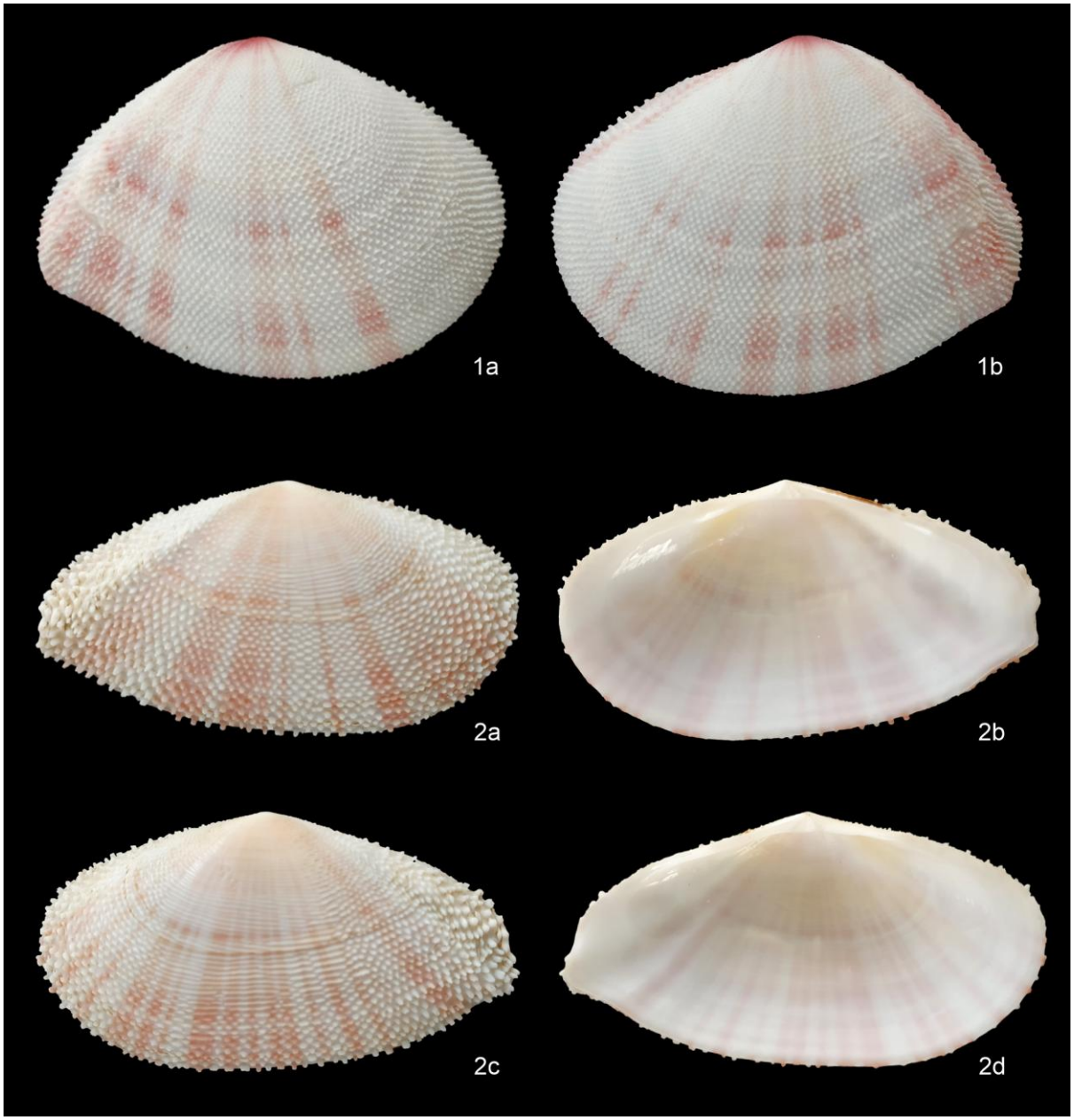
Paratypes. – Paratype 1, from type locality, dived 5 m depth, no date (obtained September 2025), H 26.8 mm L 34.3 mm T 10.7 mm, HD 56055, Pl. 1 Fig. 2a-d. Paratype 2, from type locality, dived 5-10 m depth, October 2025, L 26.6 mm, HD 56072.

Non-type material. – Philippines, N. Cebu, Daanbantayan, Maya, 0-28 m depth, April 2010, HD 55328.

Type locality. – Indonesia, Sumbawa.

Distribution. – Known from Indonesia, Sumbawa and from the Philippines, northern Cebu.

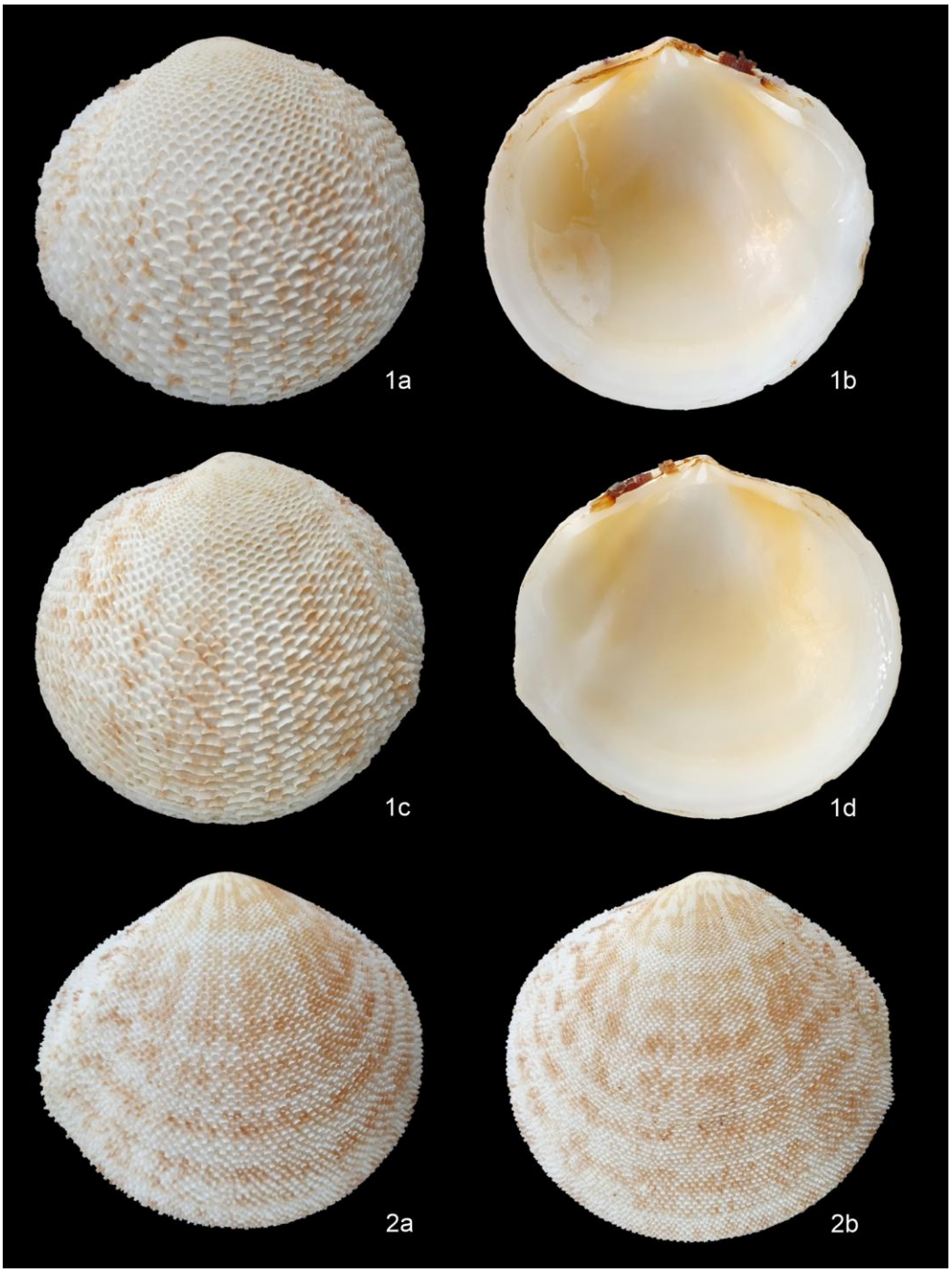
Etymology. – The red apex gradually becoming yellow combined with the red coloured rays gives the idea of sun rays, in Latin radiis solis, here combined to *radiisolis*. A noun in apposition. Noodt (1819: 130) was also inspired by the sun for choosing the name for his new species, *Tellina solaris*, but it turned out to be a synonym of *Scutarcopagia linguafelis*. Huber et al. (2015: 581).



Pl. 2. Fig. 1a-b. ***Scutarcopagia linguafelis*** (Linnaeus, 1758), Philippines, Mindoro Island, 1980-90's, L 49 mm, HD 37360. 1a right valve, 1b left valve. Fig. 2a-d. ***Tellinella pulcherrima*** (G. B. Sowerby I, 1825), Australia, Queensland, Turkey beach, dived, L 52 mm, HD 56015. 2a-b right valve, 2c-d left valve.

Comparison. – The new species *Scutarcopagia radiisolis* sp. nov. is most similar to *S. linguafelis* (Pl. 2 Fig. 1), but differs from it in having a shorter shell, a more pronounced posterior ridge and the presence of yellow colour below the umbo, absent in *S. linguafelis*. Noodt (1819: 130 nr. 367.25, pl. [3] fig.) described and figured *Tellina solaris* as a new species. This name was earlier mentioned by Röding (1798: 187), but this is a nomen nudum. Checking the description and figure in Noodt, I agree that *T. solaris* is a synonym of *S. linguafelis*, it was listed as such by Huber et al. (2015: 581).

From *S. scobinata* (Pl. 3 Figs 1-2) the new species differs in its more elongate shell, the more produced posterior ridge and the much finer scales which are straighter than the strongly curved scales in *S. scobinata*. The colour is also different between *S. radiisolis* sp. nov. and *S. scobinata*, the first one has continues pinkish-red radials in contrast to the brown interrupted radials in the latter, which is lacking the red umbo present in the new species.



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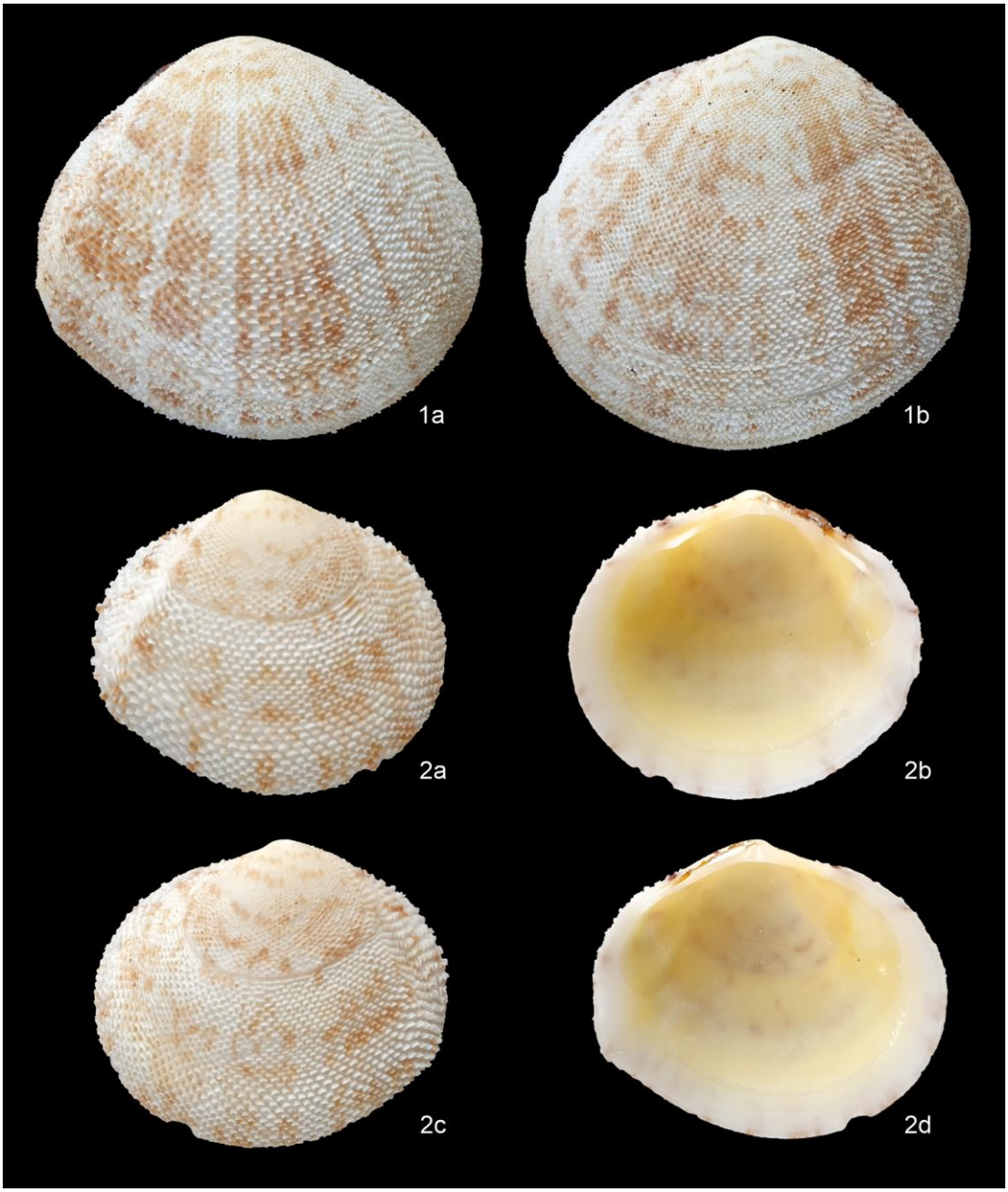
Pl. 3. *Scutarcopagia scobinata* (Linnaeus, 1758). Fig. 1a-d. Typical coarse sculptured specimen, Mauritius, St. Gilles, lagoon, L 50 mm, HD 20686. 1a-b right valve, 1c-d left

valve. Fig. 2a-b. Finer sculptured form, Philippines, Olango Island, dived in shallow water, August 2010, L 64 mm, HD 26352. 2a right valve, 2b left valve.



Pl. 4. ***Scutarcopagia delicatula*** (Selli, 1974). Egypt, Red Sea, Makadi Bay, 28 September 1999, coll. by H. Dekker, HD 3378. Fig. 1a-b. L 58 mm. 1a right valve, 1b left valve. Fig. 2a-d. Juvenile specimen, L 35 mm. 2a-b right valve, 2c-d left valve.

Pl. 5. ***Scutarcopagia elizabethae*** (Pilsbry, 1918). Fig. 1a-d. Hawaii, Oahu, dived, in sand, 20 m depth, L 47 mm, HD 36701. 1a-b right valve, 1c-d left valve. Fig. 2a-d. Hawaii, Oahu, L 47 mm, HD 20841. 2a-b right valve, 2c-d left valve.

Remarks. – The holotype and paratype 1 were said to come from Indonesia, Sumbawa, Labuan Bajo. In September 2023, Bavius Gras and I conducted a visit to this small fishing

village. It is situated on a small peninsula, for access connected with a dam to the coast. The peninsula is completely lined with fishermen's houses, surrounded by muddy sediments and on the lagoon side are mangroves. This indicates clearly that this village, which is frequently used as origin of shells from Indonesia by Indonesian shell dealers, is wrong. Making inquiries from the only shell dealer we met on this island revealed that shells actually originated from the smaller islands offshore Sumbawa, but also shells had their origine elsewhere in Indonesia. Therefor the type locality is here assumed to be Sumbawa.
The situation for Bungin Island, from which paratype 2 was said to originate, is similar, visited by us in May 2024. But around/near this island and nearby Kaung Island there are sand flats present. If shells in the shell trade originate from these flats is unknown, as we could not inspect them because of high tide. Shells discarded from meals by local people on Bungin Island consisted of *Anadara*'s (>90%), with a few venerid species and the strombids *Canarium anatellum* (Duclos, 1844) and *Laevistrombus turturella* (Röding, 1798). So, not any species which are regularly being sold by Indonesian shell dealers were among this locally collected shells.

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A new *Bursa* Röding, 1798 species (Gastropoda, Bursidae) from southern India

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ABSTRACT

A species of *Bursa* Röding, 1798 from southern India, Tamil Nadu state, is described as new species, *Bursa pongalia* sp. nov.

Key words – Bursidae, *Bursa*, India, new species

INTRODUCTION

The Bursidae is a rather species rich (sub)tropical family in the Gastropoda. The so called "frog shells" are morphologically well distinguishable from other tonnoidean families by the presence of a posterior exhalant siphon forming a posterior canal of several millimeter protruding from the shells. Many species are relatively large sized, but the smaller species are more difficult to identify. The genus *Bursa* Röding, 1798 contains 11 living species and 5 extinct species (MolluscaBase, 2025). Previously, the genus contained several subgenera (Cossignani, 1994), but they ar now mostly regarded as separate genus, following the results of the molecular study of Sanders et al. (2020). Here we are describing a new species in the genus *Bursa* from India. It was previously confused with the similar sized *Bufonaria margaritula* (Deshayes in Bélanger, 1833), *Bursa rugosa* (G. B. Sowerby II, 1835) and *Bursa davidboschi* Beu, 1987.

Abbreviations

L	Height of the shell measured from the apex to the end of the canal
W	Width of the shell
AMD	(collection of) Aart M. Dekkers, Purmerend, the Netherlands
HD	(collection of) Henk Dekker, Winkel, the Netherlands
MNHN	Muséum national d'Histoire naturelle, Paris, France
MSNUP	Museo di Storia Naturale dell'Università di Pisa, Pisa, Italy
NBC	Naturalis Biodiversity Center, Leiden, the Netherlands

TAXONOMY

Superfamily Tonnoidea Suter, 1913 (1825)
Family Bursidae Thiele, 1925
Bursa Röding, 1798

Type species: *Bursa monitata* Röding, 1798 [= *Bursa bufonia* (Gmelin, 1791)] (type by subsequent designation).

***Bursa pongalia* sp. nov.**

(Pl. 1 Figs 1-2. Pl. 2 figs 1-3)
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Bursa davidboschi Beu, 1987 – Patterson Edward et al., 2022: 150, text fig. [non Beu, 1987]

Description. – Shell of small to moderate size for the genus, thick and solid, with relatively tall, conic spire with almost straight outlines produced by the aligned varices up its edges, and with a short, open anterior canal, twisted strongly to the right (viewed laterally), producing a prominent, strongly curved, nodulous fasciole. Varices getting broader towards the anterior end of the shell, bearing many tiny but well visible raised nodules where crossed by the primary spiral cords. These nodules are axially aligned at the dorsal part and like checker-board fields divided on the ventral part of the varices.
Spiral sculpture of 2 prominent, primary cords on spire whorls and on the body whorl, not very widely spaced; with 2-3 low secondary cord towards the anterior end of the body whorl. These secondairy cords bear a row of minute, brownish, nodules. Weaker tertiary threads on the first strong spiral rib, and many low, narrow, poorly defined, faintly nodulous spiral threads on subsutural ramp and anterior canal. Axial ribs on the subsutural ramp start weak, but getting broader towards the first strong spiral rib where it forms humps on the crossing.

Aperture almost round, with reflected lips, uniform pale white inside, the two primary spiral ribs are visible as dark areas through the shell. Columella and plicae on the anterior part of the columella white; the part of the columella at the underside of the body whorl swelling is less thick and the yellow-brownish ground color of the shell shines through. The plicae on the columella are many, relatively simple, straight and narrow. Columella relatively narrow over parietal area but spreading more widely at maximum of columellar curvature. Outer lip with

scalloped outer margin and 10 low strong folds inside, the folds are grouped into 5 pairs. Posterior tubes straight, round, with a small straight opening on the ventral side, open at the end, moderately long, protruding beyond the spire outline, bending upwards several millimeters above the varices.
External surface dull, cream to pale brownish yellow, with many small, bright, brownish maculations on spiral cords, upper part of sutural ramp, and anterior canal.
Protoconch tiny and rounded, pinkish, with 2 additional pinkish nodulous whorls; the last of these early whorls bears the first varices. Operculum not available.

Holotype. – India, Tamil Nadu, Keelakarai, trawled 30-35 m depth, April 2025, ex AMD unnumbered, L 33.1 mm W 23.8 mm, MSNUP-0325-MOL.

Paratypes. – **India, Tamil Nadu, Keelakarai.** Paratype 1. By net, 30-35 m depth, July 2025, ex HD 55988, L 44 mm W 28 mm, MNHN-IM-2022-2438; Paratype 2. Trawled, 30-35 m depth, Dec. 2024, HD 54076, L 45 mm W 28 mm; Paratype 3. Trawled, 30-35 m depth, June 2022, HD 48479, L 31 mm W 21 mm; Paratype 4. Trawled at 30-35 m. Januari 2024, AMD unnumbered, L 30.1 mm W 20.1 mm;
India, Tamil Nadu, Chinna Muttom. Paratype 5. Trawled, 50-60 m depth, Dec. 2018, HD 43317, L 44 mm W 29 mm, figured in Patterson Edward et al., 2022: 150;
India, Tamil Nadu, Koothan Kuzhi. Paratype 6. By net, 20-25 m depth, January 2023, AMD unnumbered, L 27.6 mm W 19.1 mm; Paratype 7. By net, 20-25 m depth, March 2022, HD 48216, L 52 mm W 31 mm; Paratype 8. By net, 30-35 m depth, June 2022, HD 49049, L 32 mm W 23 mm; Paratype 9. By net, 20-25 m depth, Jan. 2025, HD 54596, L 45 mm W 31 mm;
India, Tamil Nadu, Ervadi. Paratype 10. Trawled, 30-50 m depth, Aug. 2022, HD 48611, L 33 mm W 22 mm; Paratype 11. Trawled, 30-50 m depth, Sept. 2022, HD 49145, L 34 mm W 23 mm; Paratype 12. Trawled, 30-50 m depth, no date, AMD unnumbered, L 33.4 W 22.2 mm;
India, Tamil Nadu, Parangipettai. Paratype 13. Trawled, Juli 2025, AMD unnumbered, L 35.0 mm W 24.1 mm;
India, Tamil Nadu, Rameswaram. Paratype 14. Trawled, 20-25 m depth, April 2023, AMD unnumbered, L 32.5 mm W 21.3 mm;
India, Tamil Nadu, Manapad. Paratype 15. By net, 20-25 m depth, June 2024, HD 52634, L 44 mm W 29 mm.

Type locality. – India, Tamil Nadu, Keelakarai.

Distribution. – Only known from south east India, several fishing communities, mostly from the southern part of Tamil Nadu. The species is trawled on a sandy and detrically bottom around 20-50 meters deep, mostly 20-30 meters.

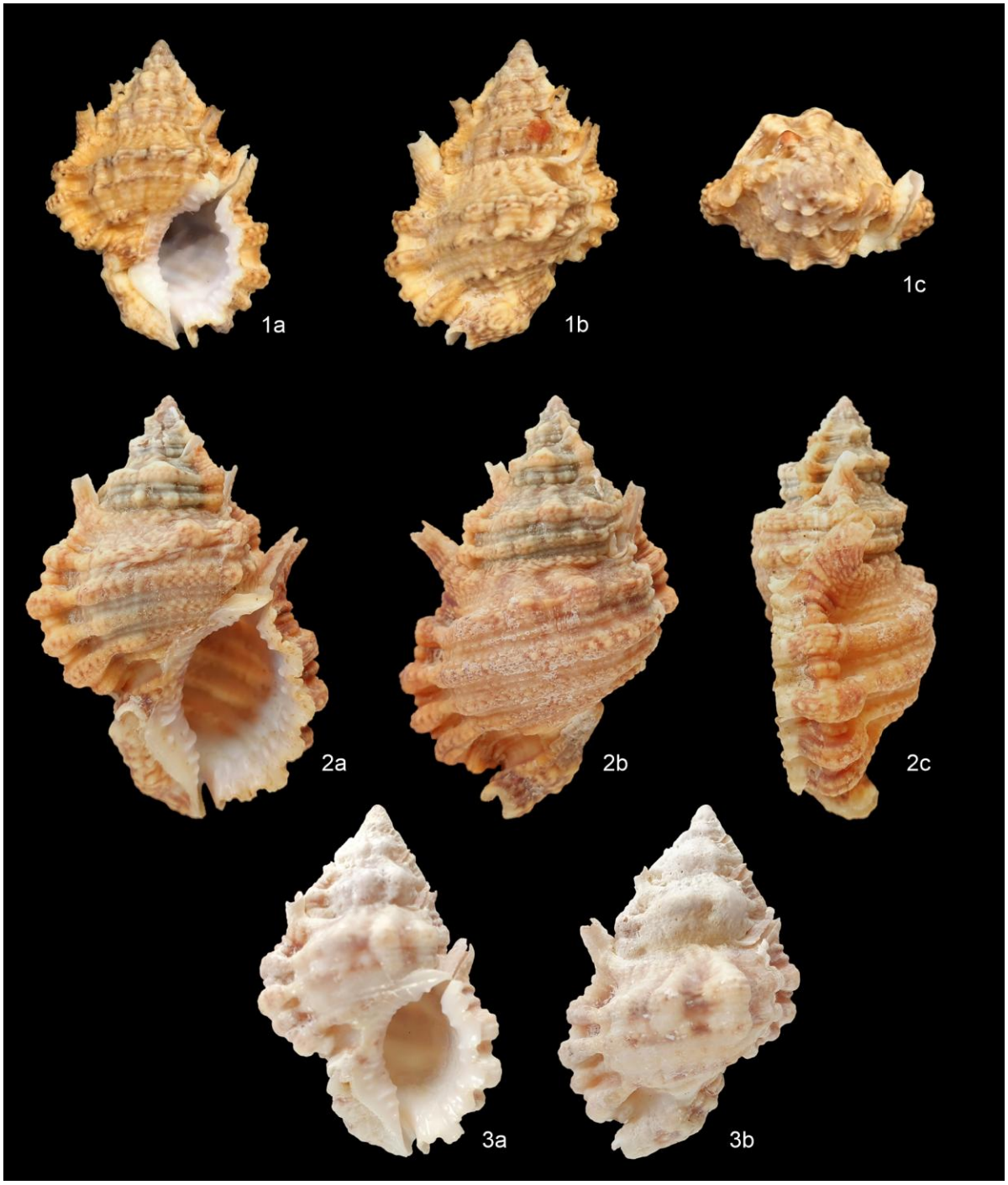

Plate 1. *Bursa* species. Fig. 1a-c. ***Bursa pongalia*** sp. nov., holotype, MSNUP-0325-MOL, India, Tamil Nadu, Keelakarai, L 33.1 mm. Fig. 2a-c. ***Bursa pongalia*** sp. nov., paratype 9, India, Tamil Nadu, Koothan Kuzhi, L 45 mm, HD 54596. Fig. 3a-b. ***Bursa davidboschi*** Beu, 1987, Yemen, al-Mahrah, Damqawt, crabbed, 3 October 1995, leg. H. Dekker, L 37.6 mm, HD 9319.

Etymology. – Named after the Indian Pongal feast. Pongal is a harvest festival from South India and marks the auspicious beginning of Uttarayana (the northward movement of the sun, which causes the days to become longer again). A noun in apposition.

Comparison. – The available specimens of *Bursa pongalia* sp. nov. were mostly offered by Moses Milton Annai Raj, an India based dealer of shells, selling with export permits, on several occasions during the last years. This seller works with local fisherman, mostly in the state Tamil Nadu, a state that has a south eastern coastline.
The Indian representative of *Bufonaria margaritula* (Deshayes in Bélanger, 1833) is often offered too by him. This species has much broader varices, narrower spiral ribbing and two slightly stronger spiral ribs that end in a sharp point on the varices, best visible on the body whorl.
Bursa rugosa (G.B. Sowerby II, 1835) is rather similar, but darker colored, with 4 primary spiral ribs that run on the varices, and only one posterior tube, on the body whorl apertural end. Furthermore, this species is found in the Eastern Pacific.
Bursa davidboschi Beu, 1987, with type locality Oman, Masirah Island, is the most similar species in form and sculpture (Cossignani, 1994: 47, text figs). Cossignani correctly listed the distribution as Gulf of Aden from Oman to Somalia, omitting the Philippines as mentioned by Beu (1987: 321) in the original description of this species. In *B. davidboschi* the spiral ribs are weak on the whorls outside the varices, but in *B. pongalia* sp. nov. they are strongly developed, giving a much rougher structure. The axial knobs in *B. davidboschi* are therefore more appearant than in *B. pongalia* sp. nov. The aperture in fresh specimens of *B. davidboschi* is pale pink colored, in *B. pongalia* sp. nov. it is dirty white. The distribution of *B. davidboschi* is also different, it is known from Oman and the Gulf of Aden: Northern Somalia and southern Yemen. The mainland of India and the Arabian Sea are situated inbetween their respective distribution areas, which is a distance of about 1.600-2.000 km.

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We thank Moses Milton Annai Raj for offering shells from India for us to study, among which this new species.

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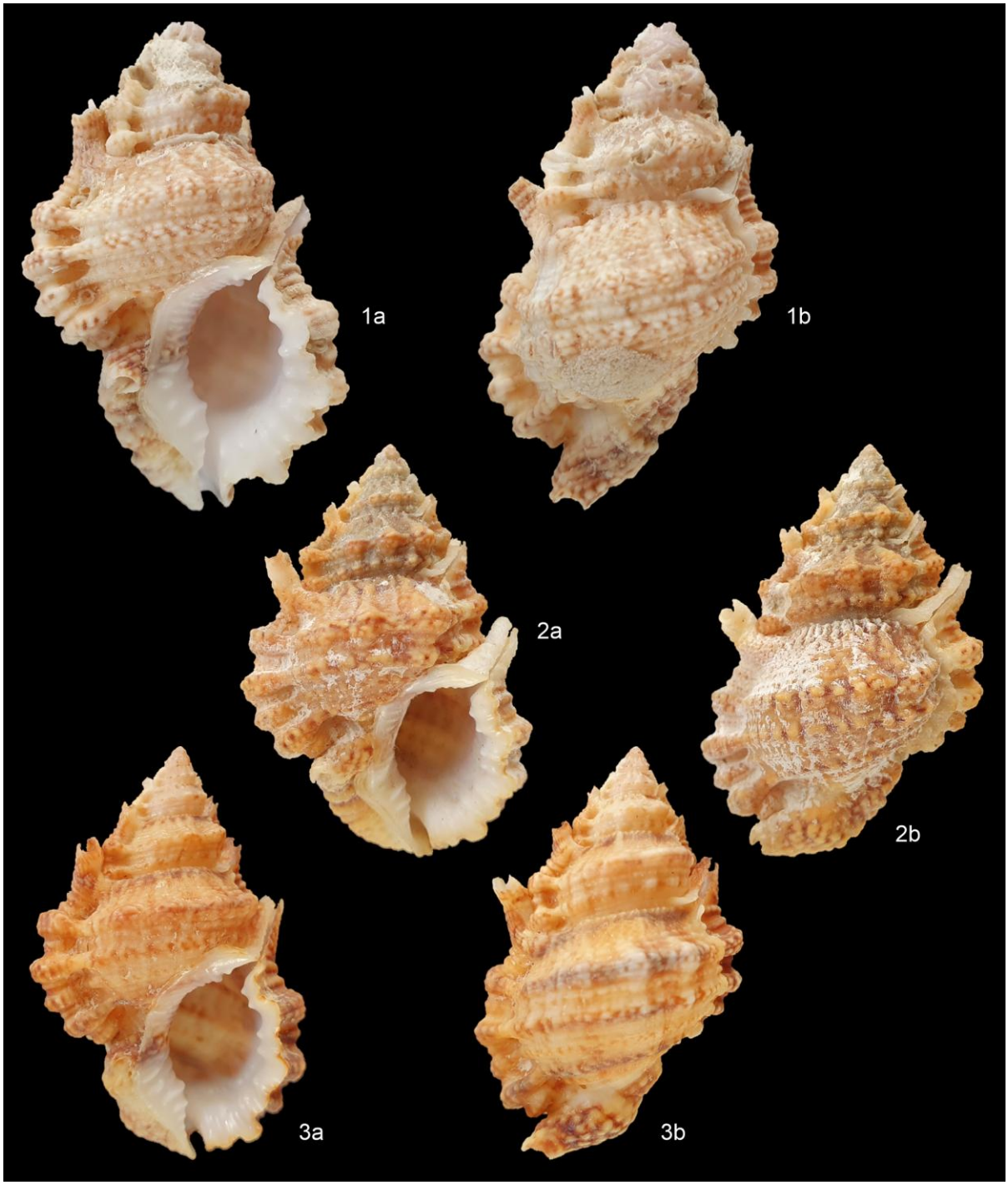

Plate 2. ***Bursa pongalia*** **sp. nov.** Fig. 1a-b. India, Tamil Nadu, Koothan Kuzhi, paratype 7, L 52 mm, HD 48216. Fig. 2a-b. India, Tamil Nadu, Manapad, paratype 15, L 44 mm, HD 52634. Fig. 3a-b. India, Tamil Nadu, Keelakarai, paratype 1, L 44 mm, MNHN-IM-2022-2438.

A new record for *Dosinia indica* Fischer-Piette & Métivier, 1971 (Bivalvia, Veneridae)

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ABSTRACT

I studied material in my private collection from the genus *Dosinia*. As this is a very difficult genus within the Veneridae, this was not done properly earlier. Among the species present was one valve from India which was now recognized as *Dosinia indica* Fischer-Piette & Métivier, 1971. Apart from the original description, no other specimens are reported, this is the second specimen known.

Key words – Veneridae, *Dosinia indica*, India, distribution

INTRODUCTION

The Veneridae is a species rich family in the Bivalvia. Many species are relatively large sized and several of them are important food sources. Although many venerid species are rather well-known, that is not the case for the genus *Dosinia* Scopoli, 1777, especially those from the Indo- Western Pacific. The genus *Dosinia* forms together with the genera *Cordiopsis* Cossmann, 1910 †; *Cyclinella* Dall, 1902; *Dosinobia* H. J. Finlay & Marwick, 1937 †; *Kakahuia* Marwick, 1927 † and *Kaneharaia* Makiyama, 1936 † the subfamily Dosiniinae Deshayes, 1853 (MolluscaBase, 2025). The genus *Dosinia* is a species rich genus, with 101 living species recorded and 41 fossil species (MolluscaBase, 2025). There are additional names for 4 living and 9 fossil species listed with an uncertain status. As only a small part of names for fossils is entered into MolluscaBase at this moment, the amount of fossil species known will be much larger.

The most recent overview of this genus is given by Huber (2010), who also gives many figures of them. A previous extensive review of this genus by Fischer-Piette & Delmas (1967) is lacking figures of many species, the illustrated ones only have b/w figures with not many details visible. So apart from Huber & Fischer-Piette & Delmas their publications, one also has to study all the original works from mostly the 19th century to be able to form an opinion on the identifications of a number of species.
After long neglecting the living species of *Dosinia* in my private collection, I finally had the courage to study them better. One of the more interesting species recognized is highlighted.

TAXONOMY

Family Veneridae
Genus *Dosinia* Scopoli, 1777
Type species: *Chama dosin* Scopoli, 1777 (type by monotypy)
[= *Dosinia concentrica* (Born, 1778)]
Subgenus *Asa* Basterot, 1825
Type species: *Venus lincta* Pulteney, 1799 (type by monotypy)

***Dosinia* (*Asa*) *indica* Fischer-Piette & Métivier, 1971**

(Pl. 1 Fig. 1a-e)

Dosinia (Asa) indica Fischer-Piette & Métivier, 1971: 1284, text fig. 2
Dosinia (Asa) indica – Ramakrishna et al., 2004: 29
Dosinia (Asa) indica – Huber, 2010: Excel listing

This species is very little reported in the literature, e.g. missing from the bivalve book by Subba Rao, 2017. Originally the species was based on one left valve only, the holotype. It was collected in India, Andhra Pradesh, Visakhapatnam. A photo of this holotype can be found on the website of the Zoological Survey of India.

A paired specimen of this species was bought from Moses Milton Annai Raj in 2023. Unfortunately, the right valve was broken in tiny fragments when it arrived, although it was carefully wrapped. Curiously, the holotype was also broken during handling according to Fischer-Piette & Delmas (1971), showing the fragility of this thin shelled species. The left valve remaining measures 25.2 mm high, 24.5 mm wide and 6.3 mm thick. The color outside is off white, changing gradually to yellow at the umbo, inside similar colored as the shell is translucent. The sculpture consists of fine regular commarginal lamellar ribs (Pl. 1 Fig 1b). In the middle part the ribs are rather thick, near the anterior and posterior margin they become thin. Where the ribs reach the escutcheon they are slightly elevated forming a denticulated ridge. Lunula impressed but not very deeply. Details of the pallial sinus and adductor muscle scars are accentuated in Pl. 1 Fig. 1d. The rather narrow hinge is typical for many dosiniids (Fig. 1e). The shell was obtained by net, 20-25 m depth, in India, Tamil Nadu, Cuddalore. It is now stored in my collection with nr. 51697.

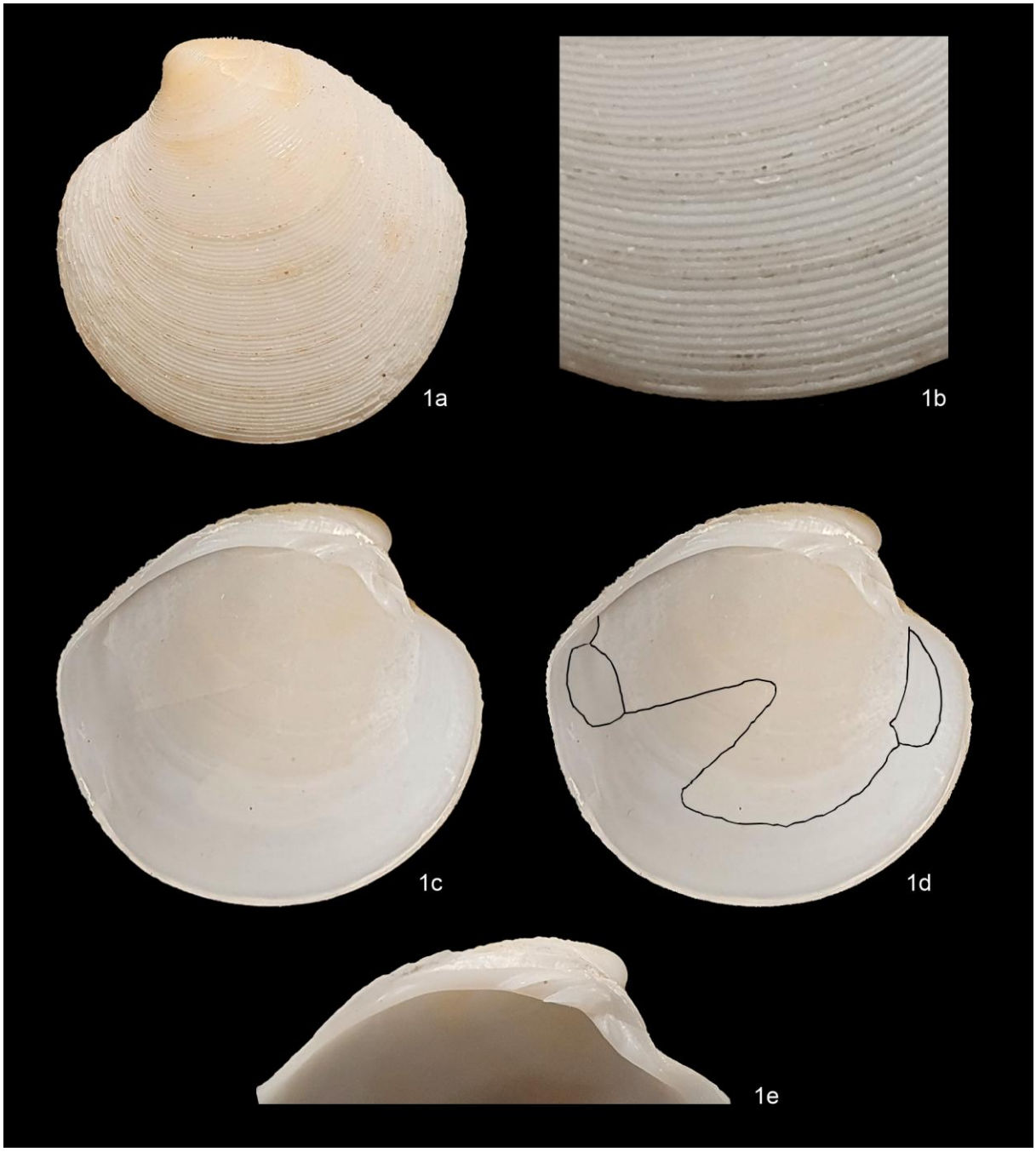

Plate 1. *Dosinia indica* Fischer-Piette & Métivier, 1971. India, Tamil Nadu, Cuddalore, 2023. Coll. author, nr. 51697. Fig. 1a-b. Outside of left valve, with details of sculpture in 1b. Fig. 1c-d. Inner side of left valve, with pallial sinus and adductor muscle scars accentuated in 1d. Fig. 1e. Details of hinge showing the cardinal teeth and the ligament attachment area.

The newly reported specimen herein extends the known range of this rare species with about 760 km to the SW from its type locality. Hopefully in future more specimens of this species will be found, as this note may help in identification.

ACKNOWLEDGEMENTS
I thank Moses Milton Annai Raj for offering shells from India, among which this shell.

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NOTES

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General

Articles are subjected to peer review. Papers must be written in Britsch English and use the metric system. Please submit your manuscript by e-mail, for addresses see the inside of the front cover. Your manuscript has to be submitted as a MS Word file with tables and figure legends included. Figures should be sent as separate files. If files are too large to be send by e-mail (>20 Mb), use e.g. www.wetransfer.com.

General guidelines for manuscript preparation

The text should be in Times New Roman 12 pt font.
Preferred abbreviations “sp. nov.”, “gen. nov.”, “comb. nov.”, etc.

References

- Write journal names in full.
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  - Book:
    Lorenz, F. & Fehse, D. (2009). The living Ovulidae. A manual of the families of allied cowries: Ovulidae, Pediculariidae and Eocypraeidae. Hackenheim: Conchbooks. 651 pp.
  - Book chapter:
    ter Poorten, J. J. (2011). Cardiidae. Pp. 186-255. In: G. T. Poppe, ed. Philippine marine mollusks, vol. 4. Hackenheim: ConchBooks. 676 pp.

References in the text

Author names are followed by year of publication and page and/or figure. Possible are “Lorenz & Fehse (2009: 109, pl. 143 figs 1-8)”or “(Lorenz & Fehse, 2009: 109, pl. 143 figs 1-8)”. Two authors are mentioned and connected by "&". Three, or more, authors are abbreviated to only the first author followed by "et al.".

Figures

Text figures for e.g. habitat photos are numbered separately. Figures can be combined to form plates, each plate starting with nr. 1. Figures of the same specimen (shell) should be numbered with letters, e.g. 8a, 8b, 8c. Use Arial 11 pt to number all the figures on the plate. Maximum size for plates is 155 × 190 mm (300 dpi). The legend should fit on the same page, so reduce the plate height to fit more extensive legends. Figures should be submitted preferably as tif or high quality jpg.

Figure legends

Please follow this example.
Plate 2. Comparable other species of *Ministrombus*. Fig. 1a-b. ***M. variabilis*** (Swainson, 1820), Thailand, Gulf of Thailand, Ban Talokapo, leg. B. Gras, H 46.5 mm, AMD STR3613A. Fig. 2a-b. ***M. caledonicus*** S. J. Maxwell, 2022, New Caledonia, Noumea, H 36.9 mm, AMD STR2602.

Locations

Locations should be arranged in declining order, e.g. first the country, then the region, then exact place, etc.

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