The *Cantharus* group (Gastropoda: Buccinidae) on Almirante Leite Bank (Mozambique) with description of two new species and one new genus

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ABSTRACT. A new genus and two new species of deep water Buccinidae collected during MAINBAZA are described: *Pollia imprimelata* sp. nov. and *Micrologus mochatinctus* gen. & sp. nov., both from Almirante Leite Bank. *Pollia sowerbyana* (Melvill & Standen, 1903) is recorded from Madagascar and the variability of this species is discussed.

KEYWORDS. Mollusca, Gastropoda, Buccinidae, Pisaniinae, *Pollia*, Mozambique, MAINBAZA, new taxa.

INTRODUCTION. Ignored in the past, the Mozambique fauna has become the subject of intensive collecting and studies during the latest decades. It is obvious that Mozambique is blessed with a unique fauna, with components from the South African fauna as well as from the East African fauna, due to its geographical situation. Ridden up fragments from the deep water faunas are present, from the Natal Bassin (in the south) and the Somalian Bassin (in the north). In addition, a large number of species which are most probably endemic for the regio are known.
The second author participated in the recent MAINBAZA cruise in the Mozambique Channel. Part of the Admirante Leite Bank was investigated during this expedition, an area with strong currents resulting in difficult dredging and trawling conditions. Among many animals two particular species belonging to the *Cantharus* group attracted attention. One is recognized as belonging to an undescribed species of the genus *Pollia* Gray in Sowerby, 1834 and named *Pollia imprimelata* sp. nov. For the second species, which is distinct in spiral sculpture and columellar characteristics from all known *Cantharus* group species, we had to decide to describe a new genus because it seems out of place in any of the other known genera. This taxon is added to the East African fauna under the name *Micrologus mochatinctus* gen. & sp. nov.

Material is, unless otherwise stated, deposited in MNHN. The material is, unless being a type (which are allocated to catalogue numbers), unambiguously designated and retrievable by the combination of expedition acronym and station number.

ABBREVIATIONS

KF: collection Koen Fraussen, Belgium.
MHNM: Museu de Historia Natural de Maputo, Mozambique.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
JR: collection José Rosado, Portugal.
dd: empty shell, dead collected.
juv: juvenile or subadult shell.
DW: (drague Warén) Warén dredge.

SYSTEMATICS

BUCCINIDAE Rafinesque, 1815
Subfamily **Pisaniinae** Gray, 1857

Genus ***Pollia*** Gray in Sowerby, 1834

Pollia, Gray in Sowerby, 1834: pl. 237, fig. 12. Type species by monotypy: "*Triton undosus* Lamk." = *Buccinum undosus* Linnaeus, 1758 from the Indo-West Pacific, Recent.

For a discussion on the taxonomic position of *Pollia* we refer to Vermeij & Bouchet (1998: 472-473) and Vermeij, (2006: 85-86, 89-91).

Pollia imprimelata sp. nov.
Figs 7-11

Type material. Holotype, 19.9 mm, Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3167, 26°12'S, 35°02'E, 228-230 m deep, MNHN-23770.

Paratypes 1-7, 19.1-21.6 mm, same locality, MNHN-23771, MHNM, JR, KF-6129.
Paratype 8, 12.6 mm, juvenile (protoconch), same locality, MNHN-23771.

Type locality. Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3167, 26°12'S, 35°02'E, 228-230 m.

Material examined. Mozambique: Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3167, 26°12'S, 35°02'E, 228-230 m, 28 dd (9 jv.). - Stn DW3169, 26°11'S, 35°01'E, 450 m, 4 dd.

Range and habitat. Only known from the Almirante Leite Bank. Bathymetric range, all empty shells, between 228 and 450 m.
Syntopic with *Micrologus mochatinctus* sp. nov. on Almirante Leite Bank (MAINBAZA stn. DW3167 and DW3169).
Almirante Leite Bank is an area with strong currents overflowing a bottom of hard rocks. The habitat is characterized by the presence of rock, coral, sponges and gorgonians (Text Fig. 1).

Text Figure 1. Habitat of *Pollia imprimelata* sp. nov.

Description. Shell of medium size for genus (up to 21.6 mm in height). Shape semi-oval, spire rather conical. Teleoconch whorls 5 ½ in number, laterally flattened, suprasuturally with narrow, but clearly constricted area. Colour white to yellowish brown with brown spiral lines on top of axial sculpture.
Protoconch consisting of slightly more than 1 ¾ whorl, 2.2 mm high, 1.1 mm in diameter. Colour yellowish with brown spot on tip. Whorls rapidly increasing in size, last whorl big, convex. Surface smooth, rather glossy, but covered with numerous minute shallow holes. Transition to teleoconch marked by 3 or 4 fine incremental lines.

First whorl with 3 well developed primary spiral cords; a fine, fourth cord present in subsutural interspace. A single, fine secondary spiral cord appears along second whorl, situated in the middle of each interspace. Subsutural spiral cord increasing in strength, on third whorl almost as strong as other primary spiral cords; a fifth primary spiral cord partly concealed under suture with subsequent whorl. One subsutural secondary spiral cord becoming as strong as primary spiral cords along penultimate whorl, resulting in the presence of 2 spiral cords on subsutural slope which render a bilirate appearance and form a deep suture above axial ribs. Penultimate

whorl with 5 primary spiral cords, two subsutural ones slightly weaker, separated by a narrower interspace; a sixth primary spiral cord partly concealed under suture of subsequent whorl. Body whorl with about 40 spiral cords of different strength, 20 of them primary and secondary spiral cords of about same strength, alternating with about 20 finer tertiary spiral threads. First teleoconch whorl with 13 fine axial ribs; abapically, on the suprasutural adpression, becoming weaker, resulting in a suture with constricted appearance; interspaces of equal size or slightly broader. Subsequent whorls with 12 axial ribs. Ribs becoming gradually weaker, but slightly broader. Body whorl with 8 axial ribs, about 3 additional ribs, or traces of them, on prelabral varix. Last 1/4 part of body whorl covered with a broad, but weak prelabral varix. Whole surface covered with minute, sharp incremental lamellae.

Aperture oval, adapical part pinched. Columella strongly concave; callus thin, white, rather adherent to preceding whorl, covered with big lirae according to sculpture of preceding whorl, with a single adapical columellar lira and 3 strong, abapical columellar folds near transition to siphonal canal. Outer lip thin; ornamented with about 16 internal lirae of different strength, not according to sculpture of outer surface. Siphonal canal short, broad, open. Aperture and siphonal canal together slightly more than ½ of total shell length.

Animal and operculum unknown.

Comparision. *Pollia imprimelata* sp. nov. is characterized by the laterally slightly flattened whorls which give the spire a more conical appearance and, as a consequence, a more pinched adapical part of the aperture. The maximum diameter of each whorl is situated below the periphery. This shape is rather atypical for the genus.

The colour ranges from snow-white and off-white with some pale brownish bands to the presence of reddish brown spiral lines on top of the spiral sculpture, especially on the periphery and subsutural slope. Snow-white shells and coloured ones were found in the same haul (MAINBAZA stn. DW3167 and DW3169).

All known *Pollia* species differ by having a convex subsutural area and the slightly more rounded adapical part of the outer lip. (See below.)

Pollia sowerbyana (Melvill & Standen, 1903) (type locality: "Gulf of Oman and Mekran Coast, especially between Gwadûr and Jask, from 25-30 fathoms") (Fig. 13) is characterized by the convex, slightly shouldered whorls, the big axial ribs, the round rather than oval aperture with a weak adapical tabulation. The suture is distinct, suprasuturally slightly appressed. Specimens with a broad shape, or short spire, may have the appressed band partly concealed under the next whorl.

Pollia sowerbyana is similar in spiral sculpture, but differs by the convex teleoconch whorls which reach their maximum diameter near the shoulder (instead of below the sutural line), consequently the adapical part of the outer lip is broader and more tabulate where connected with the preceding whorl; the prelabral varix is stronger but narrower; the suprasutural constricted area is usually broader; the subsutural spiral cords are straight (rather than waved or twisted where crossing the axial ribs) and finer with a broader interspace; the number of axial ribs is smaller on the upper teleoconch whorls (about 10) but higher on the body whorl (10 including the prelabral varix); the columellar callus is broader, especially the adapical part which has a gently curved edge; the pattern usually consists of 2 broad bands (instead of fine lines) and it seems that the hairs on the periostracum are longer.

It may be possible that the more eastern species (Philippines: *P. vicdani*; Coral Sea and New Caledonia: *P. pellita*) have to be regarded as conspecific with *P. sowerbyana*. Further study may throw a light on this question but in the meantime we regard these taxa as distinct (see below).

Pollia vicdani (Kosuge, 1984) (type locality: Philippines, Bohol, off Panglao, 120 fms.) is similar, but differs from *P. imprimelata* sp. nov. by the bigger number of axial ribs on the body whorl (the number of axial ribs on the upper spire whorls is the same) and the slightly more convex subsutural area and the slightly more rounded adapical part of the outer lip. The number of axial ribs on penultimate and body whorls seems to vary considerably in many *Pollia* species, but it is quite constant in Philippine populations of *P. vicdani*. We doubt this is a solid characteristic to distinguish these species or forms.

Pollia pellita Vermeij & Bouchet, 1998 (type locality: New Caledonia, Loyalty Ridge, 20°42'S, 167°00'E, 270 m) is similar to *P. imprimelata* sp. nov. in shape and pattern, especially the form from Coral Sea, but differs by the slightly more convex subsutural area and the slightly more rounded adapical part of the outer lip.

Pollia delicata (E. A. Smith, 1899) (type locality: Investigator "Station 237, lat. 13° 17' N., long. 93° 7' E., off Andaman Islands, 90 fath.") is similar, but differs from *P. imprimelata* sp. nov. by the smaller number of protoconch whorls (about 1), the clearly more convex whorls, the spiral sculpture which is fine and running straight near the subsutural slope (instead of being twisted when crossing the axial ribs).

Etymology. *Pollia imprimelata* sp. nov. is derived from *imprimere* (Latin, verb) meaning "press upon" in combination with *latus* (Latin) meaning "side", which refers to the slightly flattened lateral sides. The last letters of *imprimere* are contracted to avoid deviating pronunciation.

***Pollia* sp.**
Fig. 12

Material. Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3168, 26°12'S, 35°03'E, 87-90 m, 1 dd.

Remarks. The single dead collected specimen has a slightly damaged columellar part of the siphonal canal and is characterized by the protoconch which consist of a single whorl with a rather broad, but slightly flattened tip.

The shell is similar to *Pollia imprimelata* sp. nov. in spiral sculpture, but differs by the protoconch which consist of a single whorl (instead of 2 whorls) with a flattened tip, the more convex whorls resulting in a more convex adapical part of the aperture and a shape typical of the genus, the adapical part of the axial ribs which is weaker and the smaller adult size.

Pollia subcostata (Krauss, 1848) (type locality "In litore natalensi": South Africa, Natal, littoral), a species which also lives along the coast of Madagascar and Mozambique in shallow to fairly deep water, is easily distinguishable by the bigger spiral cords and by the body whorl with weak or absent axial sculpture. *P. subcostata* also has a thicker shell, a darker colour and a thick periostracum, but these three features may vary in the genus, according to bathymetric occurrence.

Micrologus gen. nov.

Type species. *Micrologus mochatinctus* sp. nov. (type locality: Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3169, 26°11'S, 35°01'E, 450 m deep).

Diagnosis. Shell rather small. Shape semi-oval; spire moderately high, fusiform; base slightly stretched. Protoconch paucispiral, consisting of about 1 smooth whorl; surface rather rough, covered with minute shallow holes. Transition to teleoconch indistinct, marked by the start of the sculpture of the teleoconch. Spiral sculpture fine, consisting of thin primary spiral cords (4 on first whorl, 5 on other spire whorls, 11 on body whorl). Spiral interspaces broad on periphery, with 1 (on upper spire whorls) to 3 (on fourth whorl to body whorl) fine secondary spiral threads of equal strength, occasionally 4.

Axial sculpture consisting of broad ribs with broad interspaces, running from suture to suture on spire whorls, from suture to just below midwhorl on body whorl.

Aperture large, ovate, adapically slightly pinched with a single columellar knob and a labral knob bordering the anal notch. Columella strongly concave, smooth and glossy, with an adapical columellar knob (bordering the anal notch) and a strong abapical columellar knob on transition to siphonal canal. Callus thin, smooth, glossy, broad; abapical part more developed, forming a broad layer well adherent to columella. Outer lip rounded, lip thick, edge sharp, with broad, but low internal knobs, not situated according to primary spiral cords on outer side; adapical knob slightly bigger, occasionally split; abapical knob slightly bigger, on transition to siphonal canal. This abapical knob not situated in front of abapical columellar knob but strongly diagonally orientated to each other. Labral varix low but broad, slightly prosocline. Siphonal canal short, broad, open.

Comparison. The diagnosis is based on the single known species, described below. Therefore we do not know the magnitude of variation within the genus. Based on known variability in other genera of the *Cantharus* group we may assume with some certainty that the way the spiral cords are arranged is a solid diagnostic feature, as well as the convex shape of the teleoconch whorls and the narrow siphonal area without constricted base. Contrary to the strength of the primary spiral cords, the width/length index and the size are features variable in most other related genera.

Hesperisternia Gardner, 1944 (type species: *Hersperisternia waltonia* Gardner, 1944: 445-447, from the Miocene of Florida), has a similar sculpture consisting of fine spiral cords and a columellar fold on the transition to the siphonal canal. The strongly sculptured species of that genus look much different at first glance, but the more subtly sculptured species like *H. multangula grandanus* (Abbott, 1986) and *H. shaskyi* (Berry, 1959) have a similar spiral sculpture consisting of a few primary spiral cords with many fine secondary spiral threads of equal strength in the interspaces. *Hesperisternia* species differ from the new genus by the presence of 3 dominant spiral cords on the periphery (while in *Micrologus* gen. nov. all primary spiral cords, also on the base, are of a rather equal strength); the secondary spiral cords of unequal strength, the decreasing number of axial ribs towards the body whorl; the presence of well developed sculpture in the aperture and the shorter, slightly twisted siphonal canal with a slightly more pronounced umbilical fissure and a slightly more constricted area between base and siphonal canal.

Hesperisternia waltonia Gardner, 1944 (type locality: "No. 3742, Shell Bluff, Shoal River, Walton County, Florida"), the type species of the genus, is described with 3 protoconch whorls while Recent species of that genus have 1 to 1 ¾ protoconch whorls.

Hesperisternia shaskyi (Berry, 1959) (type locality: south off Guaymas, Sonora), which is in fact not a typical species of its genus, is ornamented with a spiral sculpture most similar to *Micrologus* gen. nov. (evenly spaced primary spiral cords, secondary spiral cords of more or less equal strength) and a weakly sculptured aperture, but differs (apart from the broad shape and distinct range) by the more constricted shape of the base, the shorter siphonal canal and by the broad spiral cords on the siphonal canal.

The range of *Hesperisternia* is restricted to East Pacific and West Atlantic warm waters (at present no Indo-West Pacific species are known) while *Micrologus* gen. nov. is known from eastern Africa which is the other side of the planet).

For a detailed account on the fossil and recent *Hesperisternia* species we refer to Vermeij (2006: 81-82, 89-91).

Pollia Gray in Sowerby, 1834 (type species: *Buccinum undosum* Linnaeus, 1758: 740) may look similar in shape and size, but differs by the spiral sculpture consisting of cords of a rather irregular strength, the more oval shape with shorter siphonal canal and the presence of sculpture on the columella.

Cancellopollia Vermeij & Bouchet, 1998 (type species: *Cancellopollia gracilis* Vermeij & Bouchet, 1998: 480-483) differs by the more oval shape and the bigger spiral cords of unequal strength.

Species with a similar columellar callus, for example *Pollia shepstonensis* Tomlin, 1926, *Buccinum cinis* Reeve, 1846 and *Triton egregia* Reeve, 1844, all of uncertain generic placement (often placed in *Engina* J. E. Gray, 1839 or *Prodotia* Dall, 1924), may look similar in size, shape and colour, but differ by the broader spiral cords, especially on the base and by the presence of knobs or lirae on the columella.

Etymology. *Micrologus* gen. nov. is named after the book "Micrologus", written in 1026 by Guido d'Arezzo and one of the two most popular books about music in medieval times. The musical notation (staff notation) introduced in that work is still used nowadays. The name refers to the fine spiral lines of the shell, which are 5 in number when counting the secondary spiral threads and adjacent primary spiral cords, which is similar to, and the same number of the staff notation. This sculpture is also present on the base of the shell, contrary to other known genera in the group, but similar to the ensemble of staffs on a score.

Micrologus mochatinctus sp. nov.
Figs 1-6

Type material. Holotype, 15.0 mm, Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3169, 26°11'S, 35°01'E, 450 deep, MNHN-23772.
Paratype 1, 9.5 mm, juvenile (protoconch), same locality, MNHN-23773.
Paratypes 2-5, 13.4-13.8 mm, same locality, MNHN-23773, MHNM, JR, KF-6130.

Type locality. Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3169, 26°11'S, 35°01'E, 450 m deep.
Material examined. Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3167, 26°12'S, 35°02'E, 228-230 m, 5 dd (1 fragment). - Stn DW3169, 26°11'S, 35°01'E, 450 m, 8 dd (1 juv., 4 fragments).

Range and habitat. Only known from Almirante Leite Bank. Bathymetric range, all empty shells, between 228 and 450 m.
Syntopic with *Pollia imprimelatus* sp. nov. on both DW3167 and DW3169 stations.
Almirante Leite Bank is an area with strong currents overflowing a bottom of hard rocks. The habitat is characterized by the presence of rock, coral, sponges and gorgonians (Text Fig. 1).

Description. Shell small (up to 15.0 mm). Shape semi-oval, spire fusiform, base slightly stretched. Axial sculpture dominant in combination with accentuated spiral pattern. Protoconch paucispiral, consisting of about 1 smooth whorl with rather rough surface. Transition to teleoconch indistinct, marked by a fine incremental line and the start of the sculpture of the teleoconch. Teleoconch with 5 ¼ whorls. Colour white with brown spiral bands; upper spire whorls white, with small brown dots on axial ribs in between spiral cords; spiral interspaces of lower spire whorls and body whorl ornamented with broad, chocolate brown spiral bands, usually darker on axial ribs, secondary spiral threads usually brown, primary spiral cords snow-white. Narrow band along subsutural slope and tip of siphonal canal snow-white.
First teleoconch whorl with 4 fine spiral cords, 2 subsutural ones slightly finer, interspaces of equal size. Second whorl with 5 primary spiral cords, abapical one rather big, gradually decreasing in strength towards upper suture, adapical spiral cord finer. Third whorl with a single fine secondary spiral thread (holotype) or cord (paratype 1) in the middle of each spiral interspace. Spiral interspaces gradually becoming broader, at first on periphery; number of secondary spiral threads increasing to 3 on fourth whorl and body whorl. Spiral sculpture fine, of equal strength along the whorl, occasionally slightly higher when crossing axial ribs; primary spiral cords evenly spaced also on base, slightly narrower on subsutural slope; secondary spiral threads of equal strength.
First teleoconch whorl with 11 narrow axial ribs; abapically slightly weaker or ended, resulting in a rather constricted suture; interspaces broad. Axial ribs gradually becoming broader, their number slightly increasing to 10 on second whorl, 9 on third whorl. Penultimate whorl with 11 axial ribs, body whorl with 13 ribs, including prelabral varix. Axial ribs running from suture to just below periphery on body whorl.
Aperture large, ovate, adapically slightly pinched with a single columellar knob and a labral knob bordering the anal notch. Columella concave, smooth and glossy, with an adapical columellar knob (bordering the anal notch) and a strong abapical columellar knob on transition to siphonal canal. Callus thin, smooth, glossy, broad; abapical part more developed, forming a broad layer well adherent to columella. Outer lip

rounded, lip thick, edge sharp, with broad but low internal knobs, not situated according to primary spiral cords on outer side; adapical knob slightly bigger, occasionally split; abapical knob slightly bigger, on transition to siphonal canal. This abapical knob is not situated in front of the abapical columellar knob, but strongly diagonally orientated abapically of it. Labral varix low but broad, slightly prosocline. Siphonal canal short, broad, open.
Animal and operculum unknown.

Comparison. *Micrologus mochatinctus* sp. nov. is characterized by the fine spiral sculpture consisting of equally spaced primary spiral ribs of equal strength with the interspaces ornamented with 3 (occasionally 4) fine secondary spiral threads of equal strength, in combination with a smooth columella.

All possibly similar species of other groups differ by the presence of stronger spiral cords on the base and by the presence of knobs and lirae on the columella.

Etymology. *Micrologus mochatinctus* sp. nov. is derived from "mocha", originally Mocha in Yemen where coffee has been exported since ancient times, now used for a mixture of coffee and chocolate, and for expressing the brown colour; in combination with "tinctus" (Latin), meaning "a dye".

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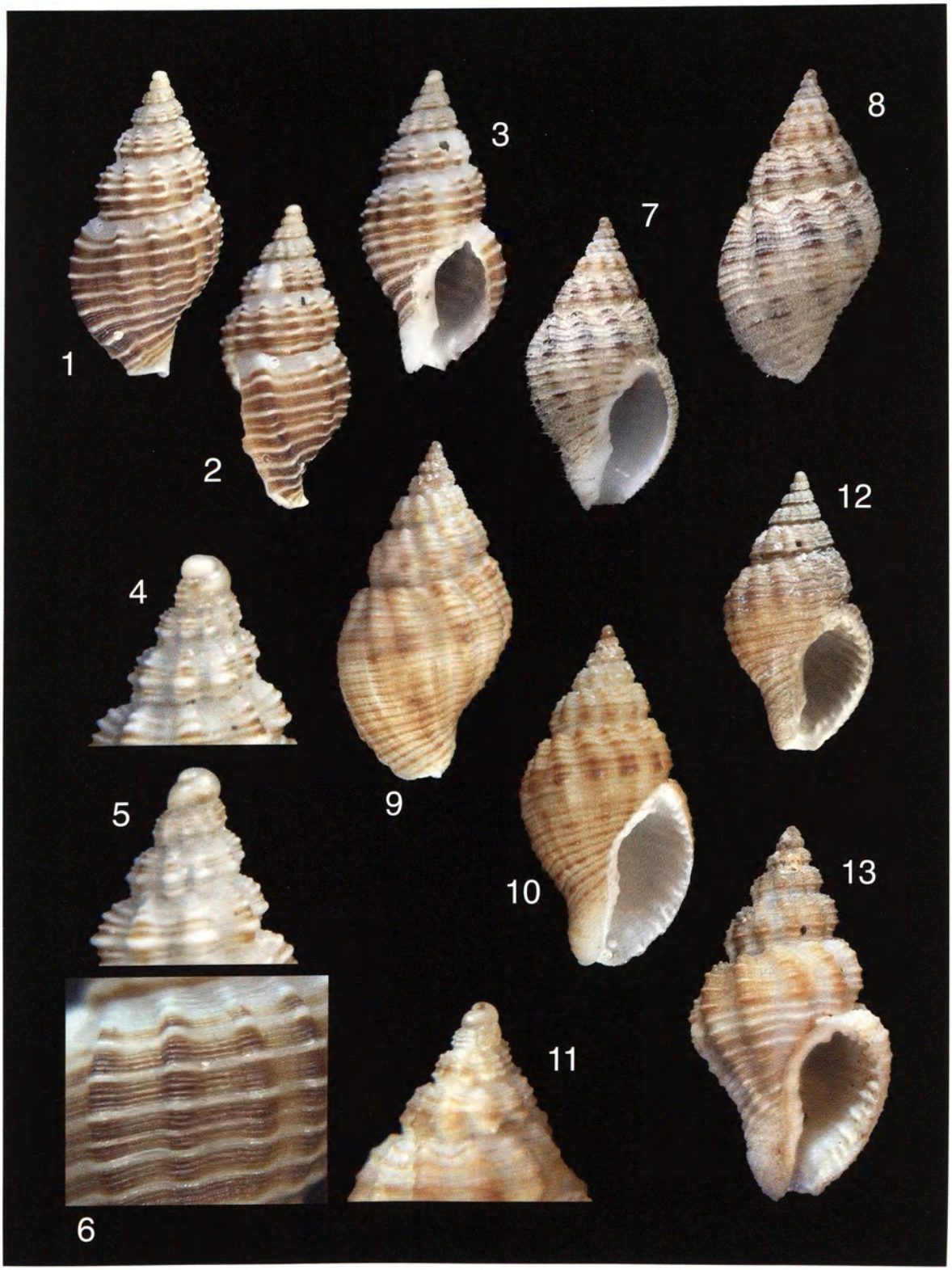
Figures 1-13

1-6. *Micrologus mochatinctus* gen. & sp. nov., holotype MNHN-23772, 15.0 mm, Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3169, 26°11'S, 35°01'E, 450 m deep.
7-11. *Pollia imprimelata* sp. nov.
7-8. Holotype MNHN-23770, 19.9 mm, Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3167, 26°12'S, 35°02'E, 228-230 m deep; **9-10.** Paratype 1, MNHN-23771, 21.3 mm, same locality;
11. Protoconch of paratype 8, MNHN-23771, diameter 1.1 mm, same locality.
12. *Pollia* sp., 17.6 mm, Mozambique Channel, Almirante Leite Bank, MAINBAZA stn. DW3168, 26°12'S, 35°03'E, 87-90 m deep, MNHN.
13. *Pollia sowerbyana* (Melvill & Standen, 1903), northwestern Madagascar, between Majunga and Cape St. André, MIRIKY stn CP3260, 15°35'S, 45°45'E, 179-193 m deep, MNHN.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