

***Pusionella haasi* Dautzenberg, 1912 a junior synonym of *Pusionella valida* (Dunker, 1852) (Mollusca: Gastropoda: Clavatulidae)**

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Keywords: Mollusca, Gastropoda, CLAVATULIDAE, *Pusionella haasi*, *Pusionella valida*, junior synonym.

Abstract: *Pusionella haasi* Dautzenberg, 1912 should merely be regarded as a junior synonym of *Pusionella valida* (Dunker, 1852). This conclusion was made after an extensive study of the turrids in the collections of the MNHN.

Abbreviations:

CFN: Private collection of Frank Nolf (Oostende, Belgium).

MNHN: Muséum national d'Histoire naturelle (Paris, France).

Discussion: With the aim to compare *Pusionella valida* (Dunker, 1852) with *P. haasi* Dautzenberg, 1912 we here reproduce the original descriptions of both species, followed by comments by the authors.

***Pusionella valida* (Dunker, 1852)**

= *Bullia valida* Dunker, 1852

= *Fusus candidus* Philippi, 1848 (based upon a juvenile specimen)

= *Pusionella grandis* A. Adams, 1853

(Pl. I, Figs 1-4; Pl. II, Figs 5-10; Pl. III, Figs 11-19; Pl. IV, Figs 20-26; Pl. V, Figs 27-32)

'*B. testa oblongo-turrita, apice acuminata, valida et ponderosa, unicolore pallide sordideque flava, striis incrementi longitudinalibus subtilissimis instructa, paene laevigata; anfractibus 11-12 sutura haud callosa divisis, superne rotundato-angulatis, subgradatis, medio leviter excavatis, superioribus transversim bi-vel tristriatis, ultimo dimidiam testae partem fere adaequante, basin versus transversim lineolato; rostro acuticarinato et lamelloso, late emarginato; apertura ovato-oblonga, superne et inferne angustata, in medio parum dilatata; labro simplici acuto; faucibus albis laevigatis; columella parum callosa. – Long. 75, latit. vel diam, max 26 mm.*

Exstat in mus. clar. Reents Hamburgensis.

Habitat in Oceano Pacifico?

Haec cochlea ad Bullias, genus Grayanum inter Buccina quaedam et Terebras ambiguum quasi intermedium adnumeranda est, ad eas vero species pertinens, quae suturis callosis omnino carent, qua de causa affinitatem maximam

praebet cum Terebris genuinis. Docet autem haec forma singularis Bullias, respectu habito testarum, a Terebris limitibus arctis haud separatas esse.'

Dunker (1858) remarked that this special shell had a doubtful type locality (Pacific Ocean with question mark). He provisionally placed it in the genus *Bullia* Gray in Griffith & Pidgeon, 1834 according to characteristics making a link between the genus *Buccinum* and the genus *Terebra*. This decision was based upon the absence of a callous suture. However, Dunker stated that his shell also had some similarities to the genus *Pusionella* Gray, 1847.

***Pusionella haasi* Dautzenberg, 1912**
(see text figure below p.3 of this paper)

'*Testa solida, ponderosa, ovato-elongata. Spira mediocris, acuta, versus apicem valde attenuata. Anfr. 11 planulati, paululum gradati ac sutura impressa juncti: primi leves, decorticati, sequentes striis transversis parum conspicuis et in anfr. ultimis evanescentibus ornati. Anfr. ultimus basin versus attenuatus, ibi transversim striatus et carinam basalem acutam praebens. Apertura elongata in caudam mediocrem apertamque desinens; columella paululum arcuata, inferne acuta, superne callo adnato nitidissimoque incrassata. Labrum acutum late sed haud profunde sinuatum. Operculum corneum, flabelliforme, nucleo medio-laterali interno.*

Color sub epidermide fusco sordide griseus. Apertura intus fuscescens, versus basin vero pallidior.

Altit., 40; diam maj. 17 millim.; apertura, 19 millim. alta, 9 millim. lata.'

Solid shell, heavy and ovally elongate. Spire rather elevated, attenuated, ending in a sharp point. About 11 flattened whorls, somewhat gradually increasing and separated by a distinct suture. First whorls smooth and decorticated, the following whorls provided with weak decurrent striae, gradually disappearing on the last whorls. The body whorl is very high, attenuated at the base and crossed by several decurrent grooves, followed by a sharp carina.

The aperture is elongate, subcanaliculated at the top, at the base ending in a rather moderate siphonal canal, well opened and deeply excised. Columella slightly bent, pointed at the base and provided with a narrow callus thickened higher up on the parietal wall. Outer lip sharp and slightly sinuous. Operculum corneous with an internal medio-lateral nucleus.

Colour: greyish brown under a brown periostracum. Mouth also brown but paler anteriorly.

Type locality: Bay of Namibe, Angola. Dredged at a depth of 15-35 m.

Further on, Dautzenberg pointed out the differences with *Pusionella vulpina* (Born, 1780): the squat form, the more elongate higher spire ending in a sharp point, the whorls gradually setting up and the prominent last whorl with a much higher aperture.

None of the revising authors such as Strebel (1914), Powell (1966) or Tucker (2004) mentioned any similarities between *P. valida* and *P. haasi*, though both species live in the same area (Namibe, Angola). Of course, it should be considered that only a very limited number of specimens was studied by Strebel and Dautzenberg. Dautzenberg probably introduced his species because Dunker's type specimens of Dunker deposited in the collection of Reents (Hamburg) (79.7 mm) and the Löbbecke-collection (71.1 mm) were in a very poor condition and as such they appeared very different from the fine specimens from Namibe (Angola), described as *P. haasi*. These shells were also much larger than those of *P. haasi* (40 mm). Though Dautzenberg also possessed two specimens of *P. valida* (57.8 mm and 53.2 mm) (Strebel, pl. III, figs 3-4) he did not remark the similarity to his *P. haasi*.

Surprisingly, *P. haasi* is dealt with by Strebel as 'Vereinzette Formen' (= rare forms) in a separate chapter containing several questionable species. The two shells that he received in loan from Dautzenberg were probably juvenile with intact periostracum and as a consequence totally different from the giant specimens of *P. valida* with eroded periostracum. Remarkably, Strebel did not figure *P. haasi*.

One of the typical characteristics of *P. valida* is the presence of parallel dark brown lines in the olive-brown periostracum, which usually still remain in the oblique folds of giant or faded specimens.

Another important feature especially in adult specimens is the length of the last whorl, which takes more than half of the total length. The whorls are also rather straight and not as

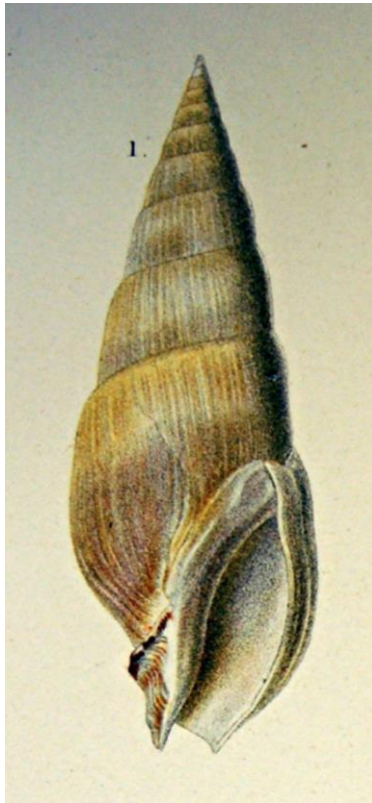
bulbous as in *P. vulpina*. However, both features are rather variable and one certainly needs a large series of specimens to observe the differences with a similar species such as *P. vulpina* (Pl. VI, Figs 33-37 ; Pl. VII, Figs 38-44).

The whorls of *P. valida* are provided with spiral grooves above the suture and particularly above the selenizone, which forms a sharp ridge at the base of the last whorl. The spiral grooves on the surface of *P. vulpina* are deeper and they are present on both the upper and lower part of the whorls. Its shell has a variable colour, from creamy white to various shades of brown. *Pusionella valida* has a more constant colour: pinkish or creamy brown under an olive-brown periostracum.

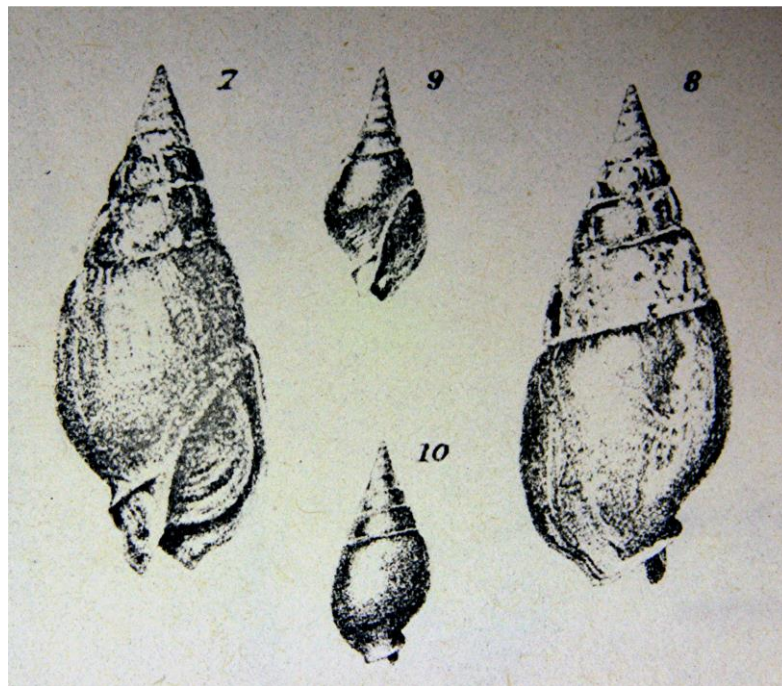
Acknowledgements: I am especially grateful to Virginie Héros & Philippe Bouchet for making the samples of turrids from the MNHN available for study. David Monsecour (Aarschot, Belgium) and Johan Verstraeten (Oostende, Belgium) made many constructive comments.

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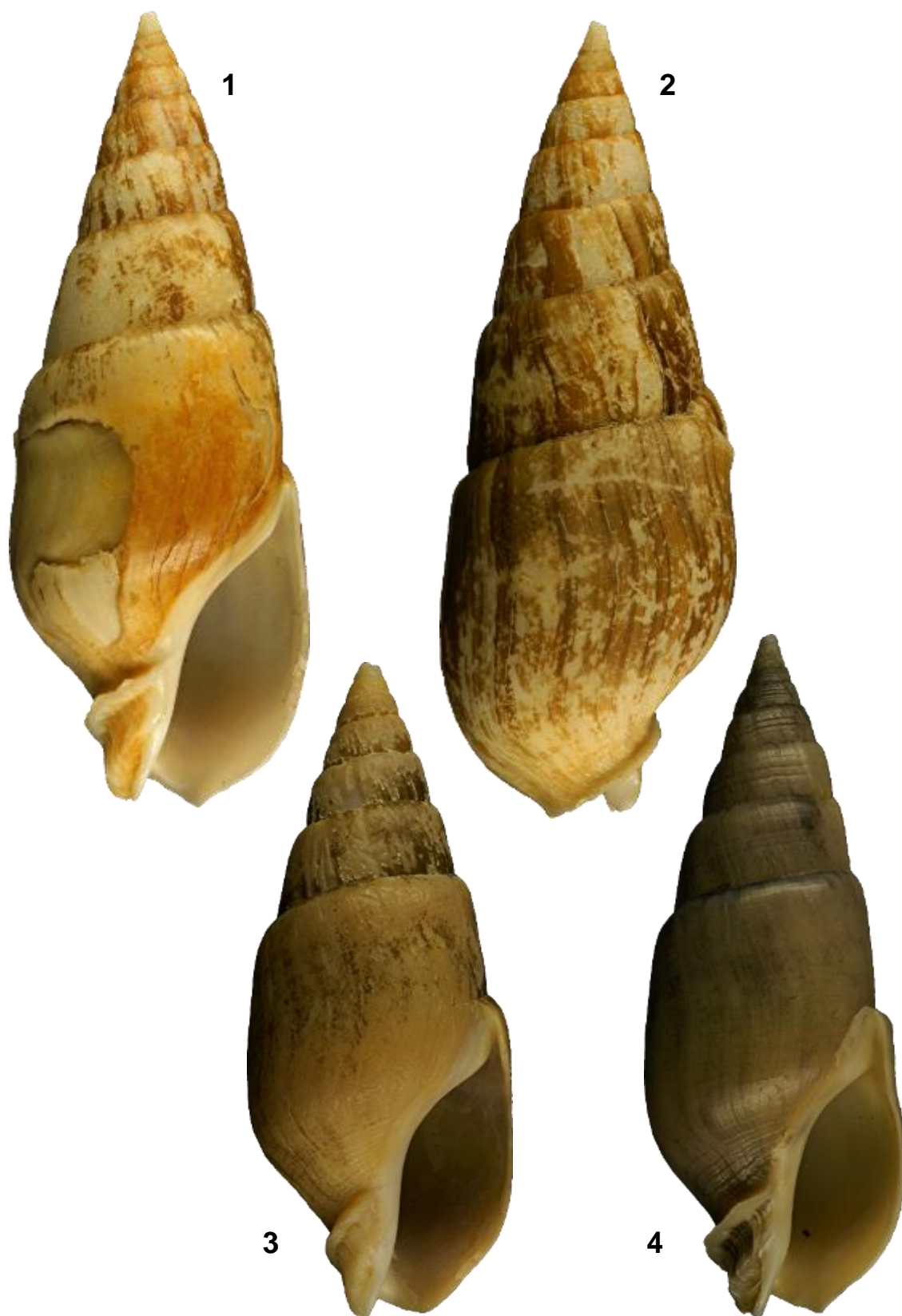
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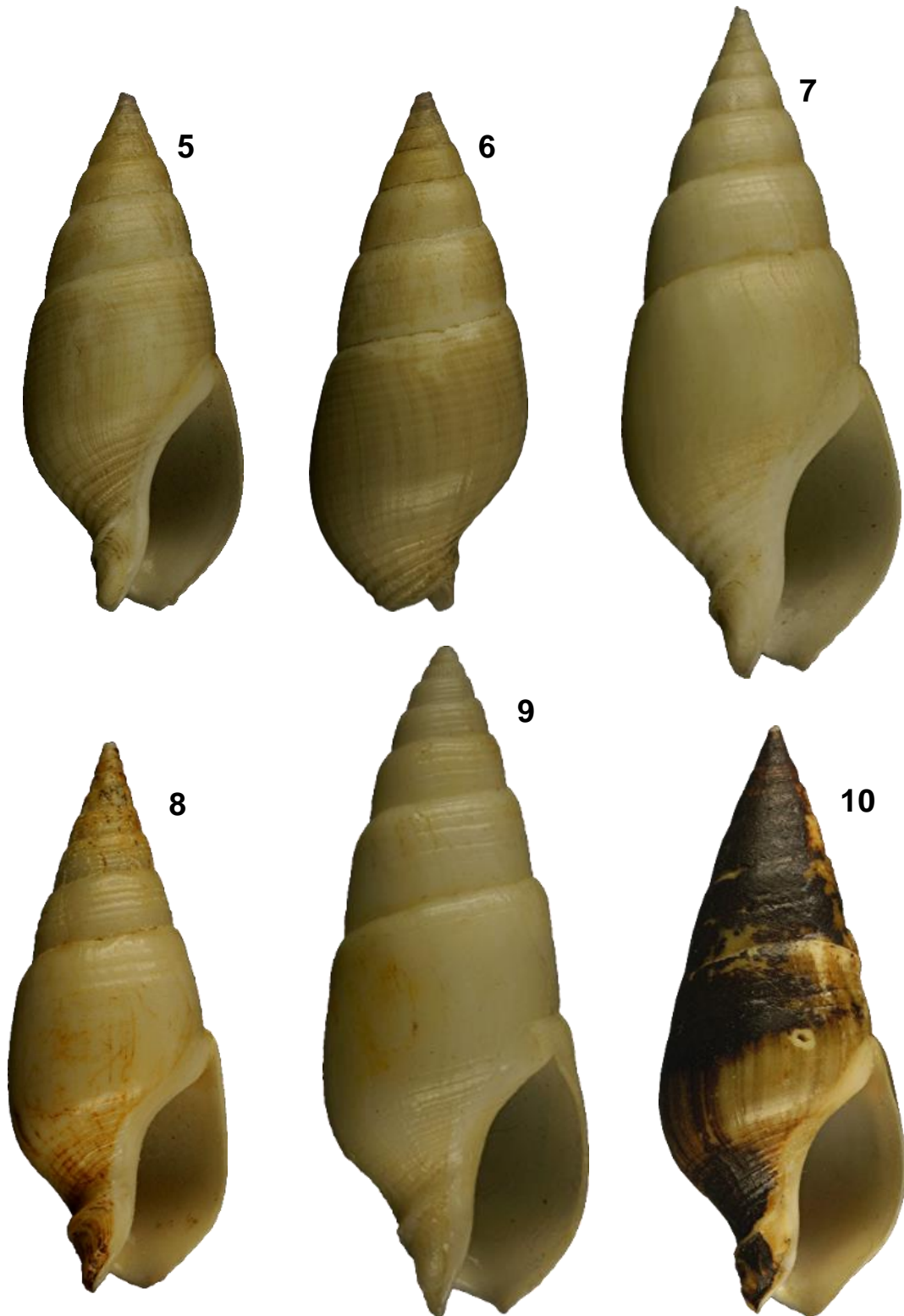
***Bullia valida* Dunker, 1858 from: *Novitates Conchologicae. Mollusca Marina. Beschreibung und Abbildung neuer oder wenig gekannter Meeres-Conchylien*, by Dr. W. Dunker. Cassel. 1858-1870. Pl. XXXIV, figs 1-2.**



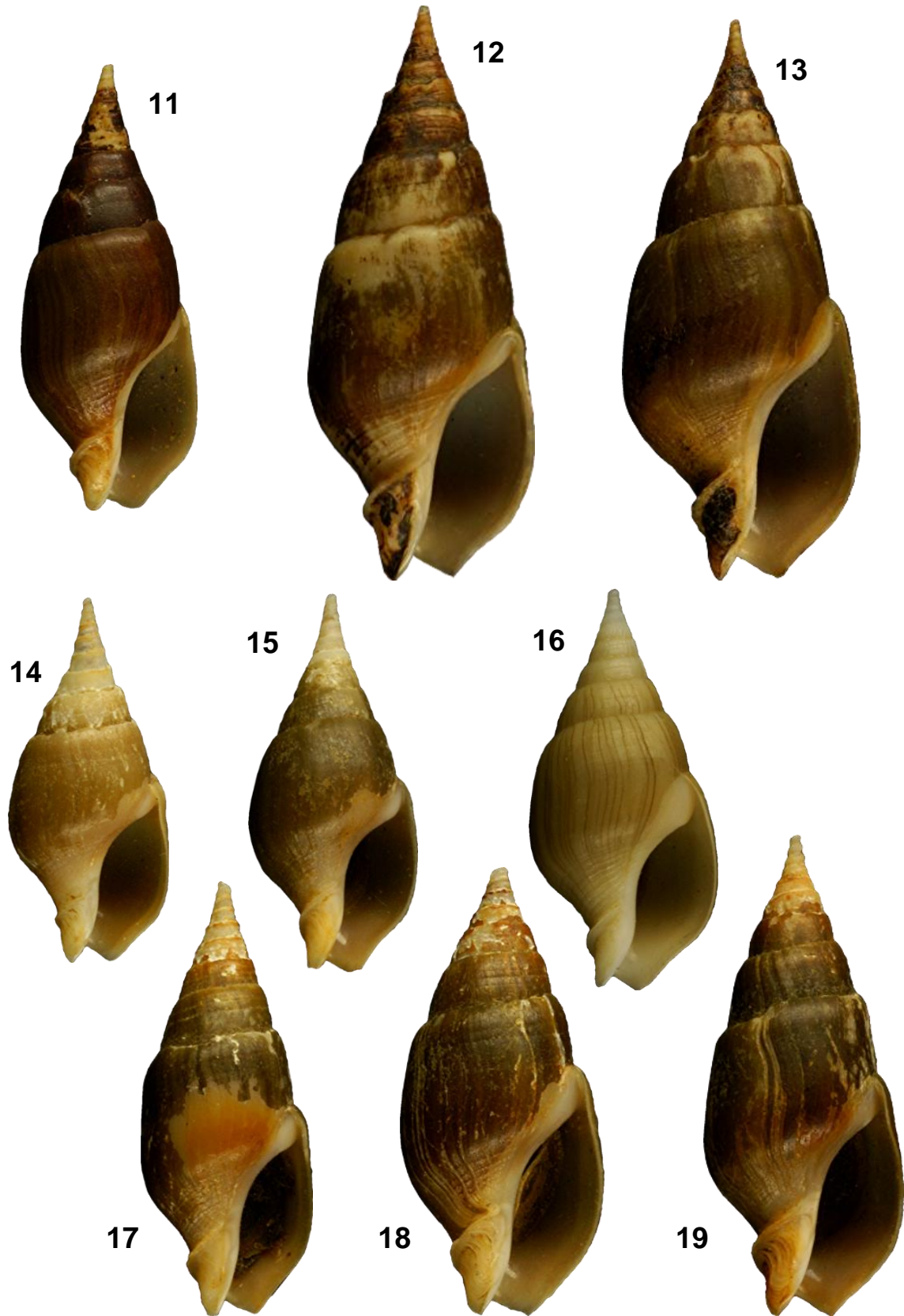
***Pusionella haasi* Dautzenberg, 1912. Plate I, figs 7-10 (9-10 : juvenile specimens) of Mission Gruvel sur la côte occidentale d'Afrique (1909-1910). Mollusques marins. *Annales de l'Institut Océanographique de Monaco*, 5 : 13-111, 3 pls.**



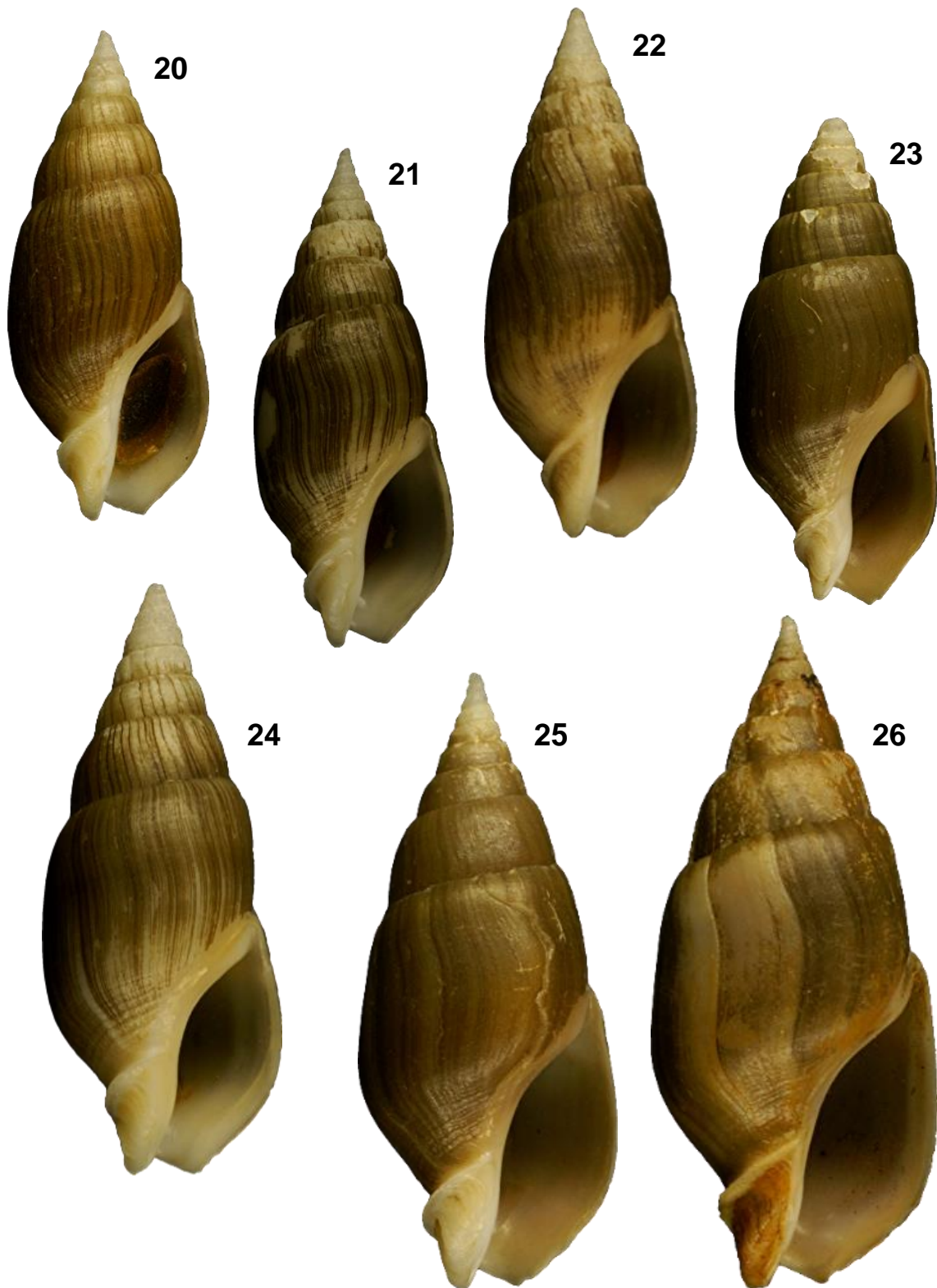
PI. I. Figs 1-4: *Pusionella valida* (Dunker, 1852). CFN; 1-2 Praia Amelia, Prov. Namibe, Angola. On infralittoral rocks. 1964. 70.28 mm; Pinta Beach, Port Alexander, Prov. Namibe, Angola. Among infralittoral rocks. 1964; 3: 54.34 mm; 4: 56.82 mm.



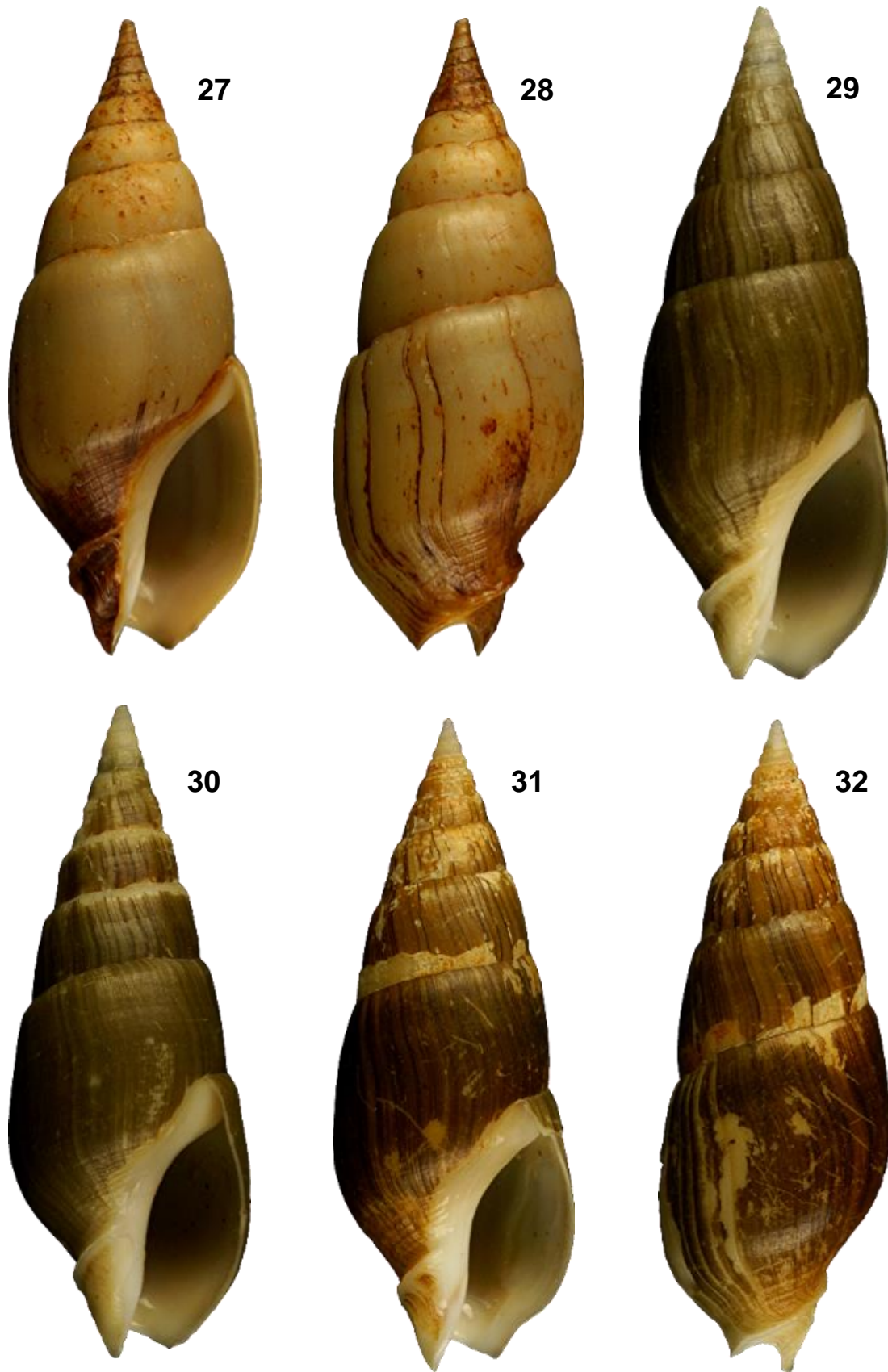
Pl. II. Figs 5-10: *Pusionella valida* (Dunker, 1852). CFN; 5-6: Senegal, W Africa. In sand; 5-6: 33.23 mm; 7: 47.62 mm; 8-10: North of Angola. Dredged by fishermen; 8: 41.08 mm; 9: 45.77 mm; 10: 43.05 mm.



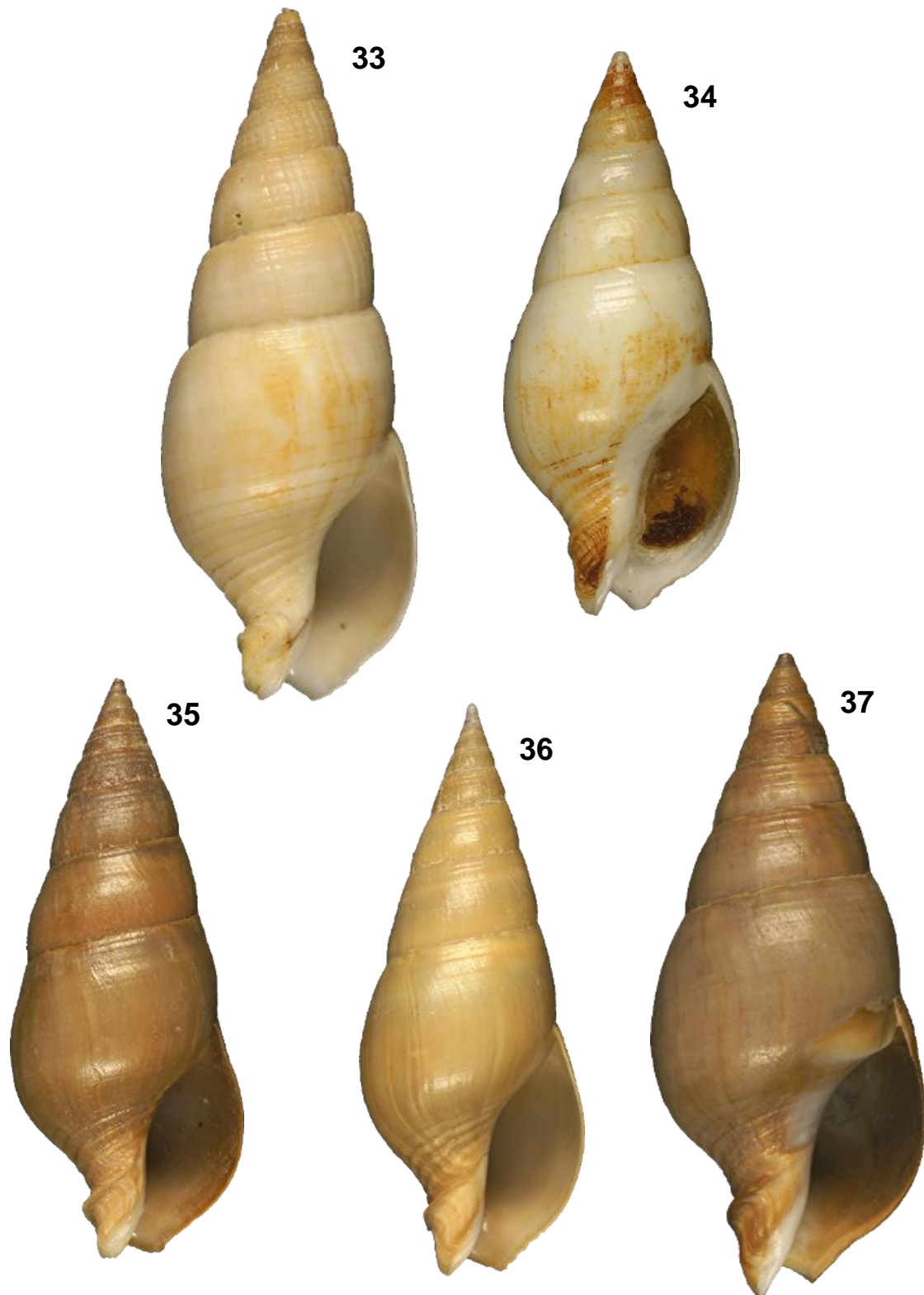
Pl. III. Figs 11-19: *Pusionella valida* (Dunker, 1852). MNHN. Praia Amelia, Prov. Namibe, Angola. Dredged at a depth of 50 m. 1985; 11: 27.62 mm; 12: 38.02 mm; 13: 37.04 mm; 14-19: Bay of Namibe, Prov. Namibe, Angola. Dredged at a depth of 8 m. MNHN; 14: 18.96 mm; 15: 19.48 mm; 16: 21.58 mm; 17: 24.84 mm; 18: 25.92 mm; 19: 29.88 mm.



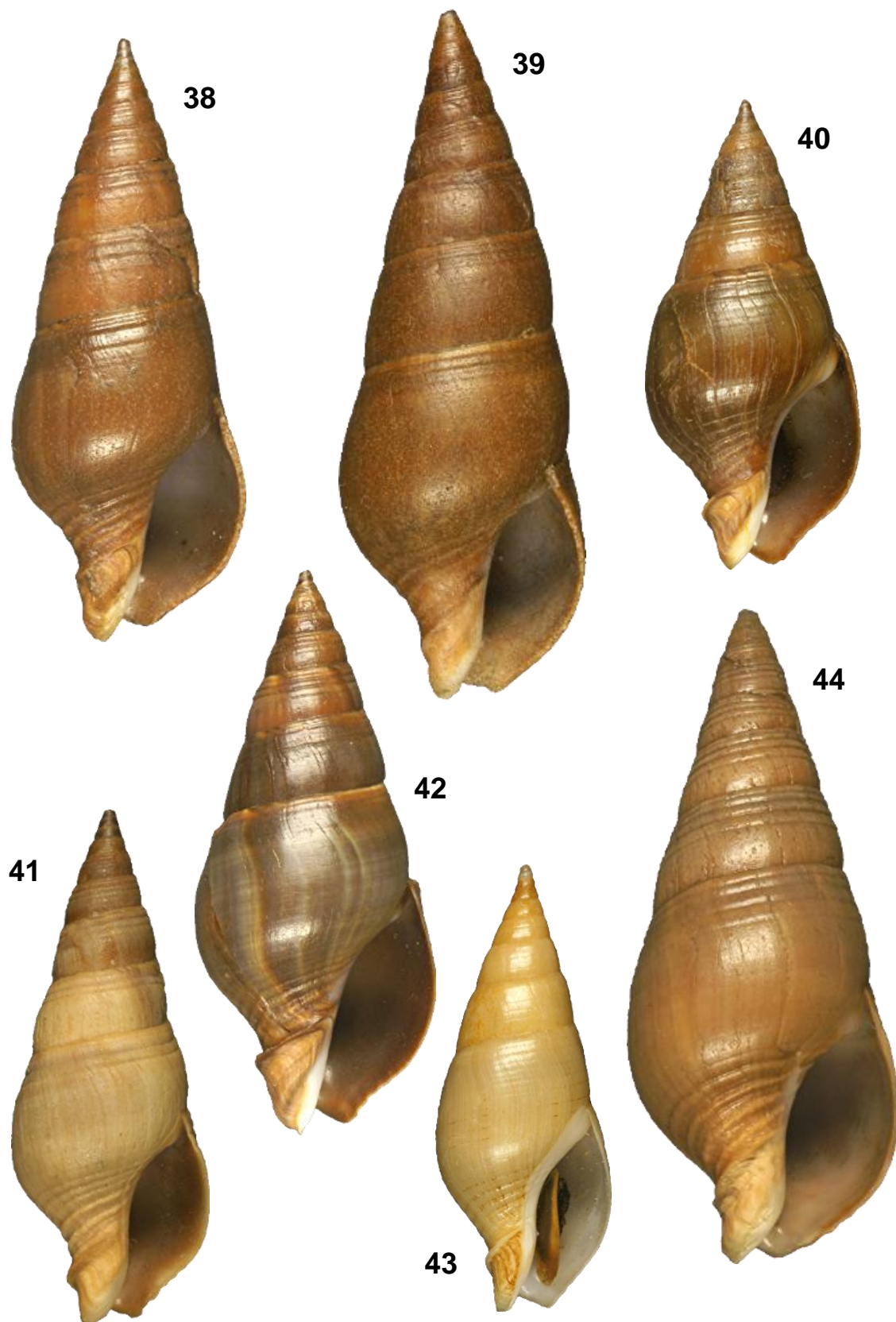
Pl. IV. Figs 20-26: *Pusionella valida* (Dunker, 1852). MNHN. Baia do Baba, Prov. Namibe, Angola. Dredged at a depth of 13 m. 1985; 20: 30.39 mm; 21: 32.56 mm; 22: 33.49 mm; 23: 31.78 mm; 24: 33.17 mm; 25: 37.70 mm; 26: 40.03 mm.



PI. V. Figs 27-32: *Pusionella valida* (Dunker, 1852). CFN; 27-28: Farol das Lagostas, North Luanda, Angola. Dredged at a depth of 28 m. 35.26 mm; 29-32: Bay of Lucira, Prov. Namibe, Angola. In gravel. Dredged at a depth of 25 m. 1964; 29: 37.38 mm; 30: 41.04 mm; 31-32: 40.99 mm.



Pl. VI. Figs 33-37: *Pusionella vulpina* (Born, 1778). CFN; 33: Cap Vert, Senegal; 50.89; 34-37: Petite Côte, Joal, Senegal. Dredged at a depth of 15 m. 1985; 34: 43.23 mm; 35: 44.06 mm; 36: 43.94 mm; 37: 46.58 mm.



Pl. VII. Figs 38-44: *Pusionella vulpina* (Born, 1778). CFN; 38-39: Pointe Idolo, Cap Esterias, Gabon. In sand among rocks at low tide; 38: 39.89 mm; 39: 50.46 mm; 40-42: Trois Rivières; Port Gentil, Gabon. On sandbar at a depth of 5 m; 40: 31.92 mm; 41: 35.55 mm; 42: 42.42 mm; 43-44: Bay of Pointe-Noire, Republic of Congo. Dredged at a depth of 6 m in muddy sand; 43: 30.90 mm; 44: 47.43 mm.

The presence of *Laevicardium pictum* (Ravenel, 1861) (Mollusca: Bivalvia: Cardiidae) off São Tomé and Príncipe, Gulf of Guinea

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Keywords: Mollusca, Bivalvia, CARDIIDAE, *Laevicardium pictum*, Gulf of Guinea, amfiatlantic species.

Abstract: The species '*Liocardium pictum* Ravenel, 1861' is insufficiently known as state by Hylleberg (2004), especially because the type is lost. This species is known from the West Atlantic (Bermuda to Brazil), but this paper reports its presence at the Islands of São Tomé & Príncipe in the Gulf of Guinea confirming sporadic earlier observations not yet published.

Abbreviations:

CFN: Private collection of Frank Nolf (Oostende, Belgium).

LV: Left valve.

RV: Right valve.

Discussion: As the type of *Laevicardium pictum* (Ravenel, 1861) is lost it could be considered an unknown species (Hylleberg, 2004), but after Clench & Smith (1944) selected a lectotype this name was commonly used in literature and till now no other name seems to be available for the shell that is discussed and figured in this paper.

The following is a short diagnosis:

***Laevicardium pictum* (Ravenel, 1861)
= *Liocardium pictum* Ravenel, 1861
= *Laevicardium fiski* Richards, 1954**

Obliquely oval to triangular in shape, moderately thin, polished and only moderately inflated. Smooth and glossy with faint radial commarginal lines. The umbones are very low. The sculpture consists of faint radial and concentric lines. The margins are finely serrated on about half of the shell. The ligament is small. Lunule and escutcheon are not defined. The periostracum is very inconspicuous. Exterior with a weak iridescent sheen, white or cream with delicate shades of pink, brown dots or zigzag lines, umbones often pink. Interior glossy and creamy white with shades of pink, yellow, purple or brown. Umbonal area purplish. A special colour form has strong, brown, zigzag streaks. Dredged in muddy substrates between 6 and 150 m deep.

Geographic range: Bermuda, North Carolina to Florida, West Indies, Central America, South America (from Venezuela to Brazil).

Length: varying between 15 and 20 mm.

No reports from the Gulf of Guinea (West Africa) are made in literature. We feel there is no need to create a subspecies for the specimens living off the Islands of São Tomé and Príncipe as shells from this area are completely identical to those from the West Atlantic in outline, pattern as well as in colour. So, we can conclude this is really a true amfiatlantic species.

Laevicardium pictum can be compared with the following species :

Laevicardium brasilianum (Lamarck, 1819) [(= *L. serratum brasilianum* (Lamarck, 1819) fide Hylleberg (2004)]
= *Cardium brasilianum* Lamarck, 1819

Valves obliquely suboval (16 x 18 mm) and inflated. Colour usually yellowish with brown zigzag lines. Outer surface smooth and shiny. Periostracum thin. It lives in sandy bottoms and calcareous algae in shallow water from 75 to 150 m.

The shells are similar to *L. pictum*, but they are larger, more convex, less oblique and with higher umbones.

Geographic range: Brazil.

Laevicardium sybariticum (Dall, 1886) [(= *L. serratum sybariticum* (Dall, 1886) fide Hylleberg (2004)]
= *Cardium serratum* var. *sybariticum* Dall, 1886

Shell thin, small, inflated, subquadrate, smoothish, creamy-white with delicate shades of pink with the umbones deep pink. Sculpture of microscopic growth lines and many minutely fine radial riblets.

Periostracum thin and rather smooth. Interior white with pink shades in the upper part. Ligament small. Lunule and escutcheon ill-defined.

Size: from 9 to 17 mm in height.

This is a rather rare deep-water shell. It is distinguished from the species above by the characteristically salmon coloured umbones. It is more inflated than *L. pictum*, more delicate and elongate in shape, while *L. pictum* is flatter, scarcely inflated and quite triangular in shape.

Geographic range: North Carolina to the Lower Caribbean, French Guiana and Brazil. Bermuda.

In muddy substrates between 35 and 300 m deep.

Acknowledgements: I wish to thank J.-E. Ghyoot (Destelbergen, Belgium) for making several specimens of *Laevicardium pictum* from the Island of Principe available for study. Johan Verstraeten (Oostende, Belgium) and David Monsecour (Aarschot, Belgium) punctually read the manuscript and made constructive comments on the text.

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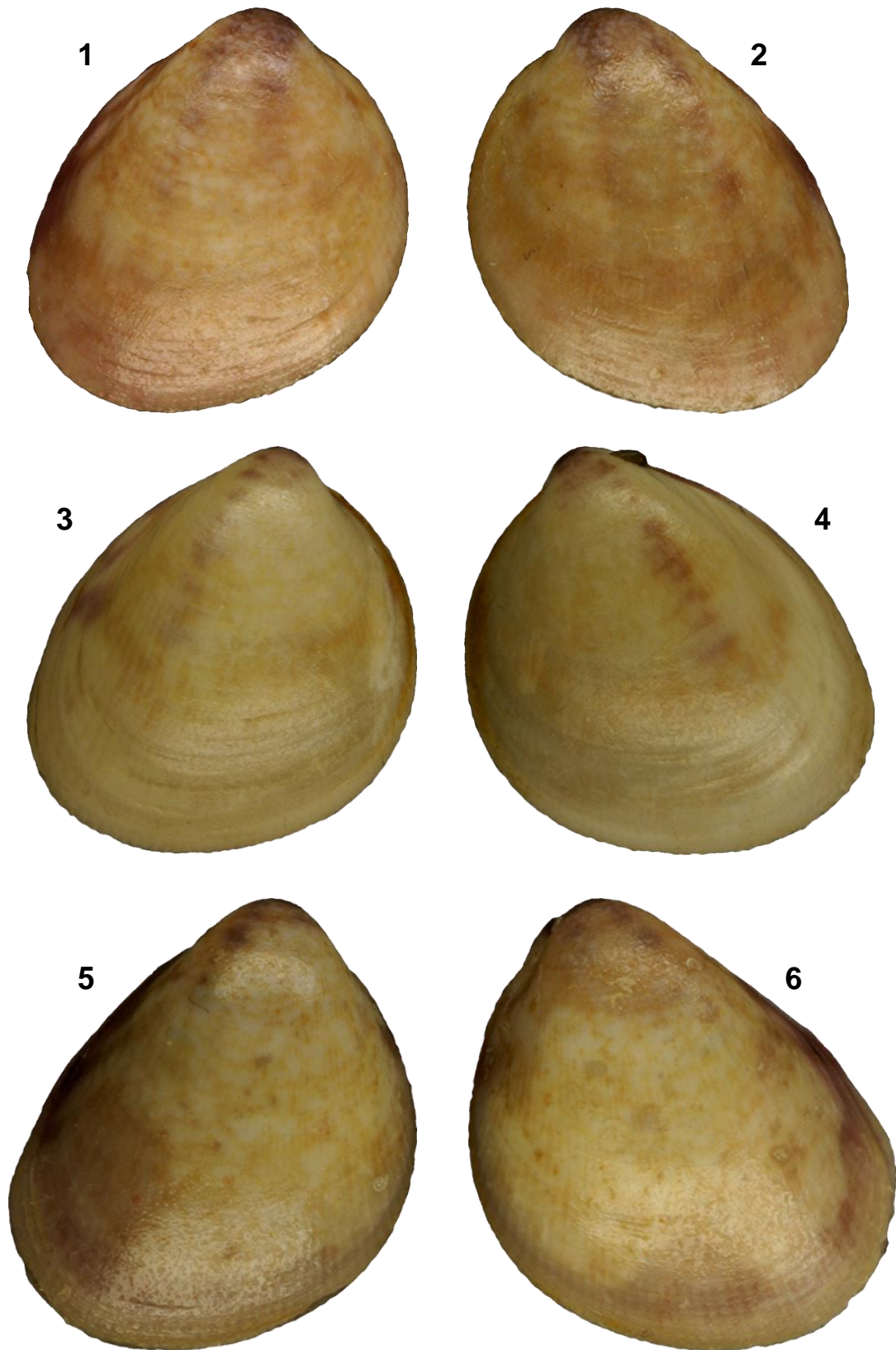


Plate I. Figs 1-6: *Laevicardium pictum* (Ravenel, 1861). Island of Principe, São Tomé & Príncipe, Gulf of Guinea. Dived at a depth of 12 m. In sand. December 2009. CFN; 1-2: H. 13.51 mm L. 12.90 mm; 1: RV; 2: LV; 3-4: H. 14.85 mm L. 14.13 mm; 3: RV; 4: LV; 5-6: H. 16.56 mm L. 15.13 mm; 5: RV; 6: LV.

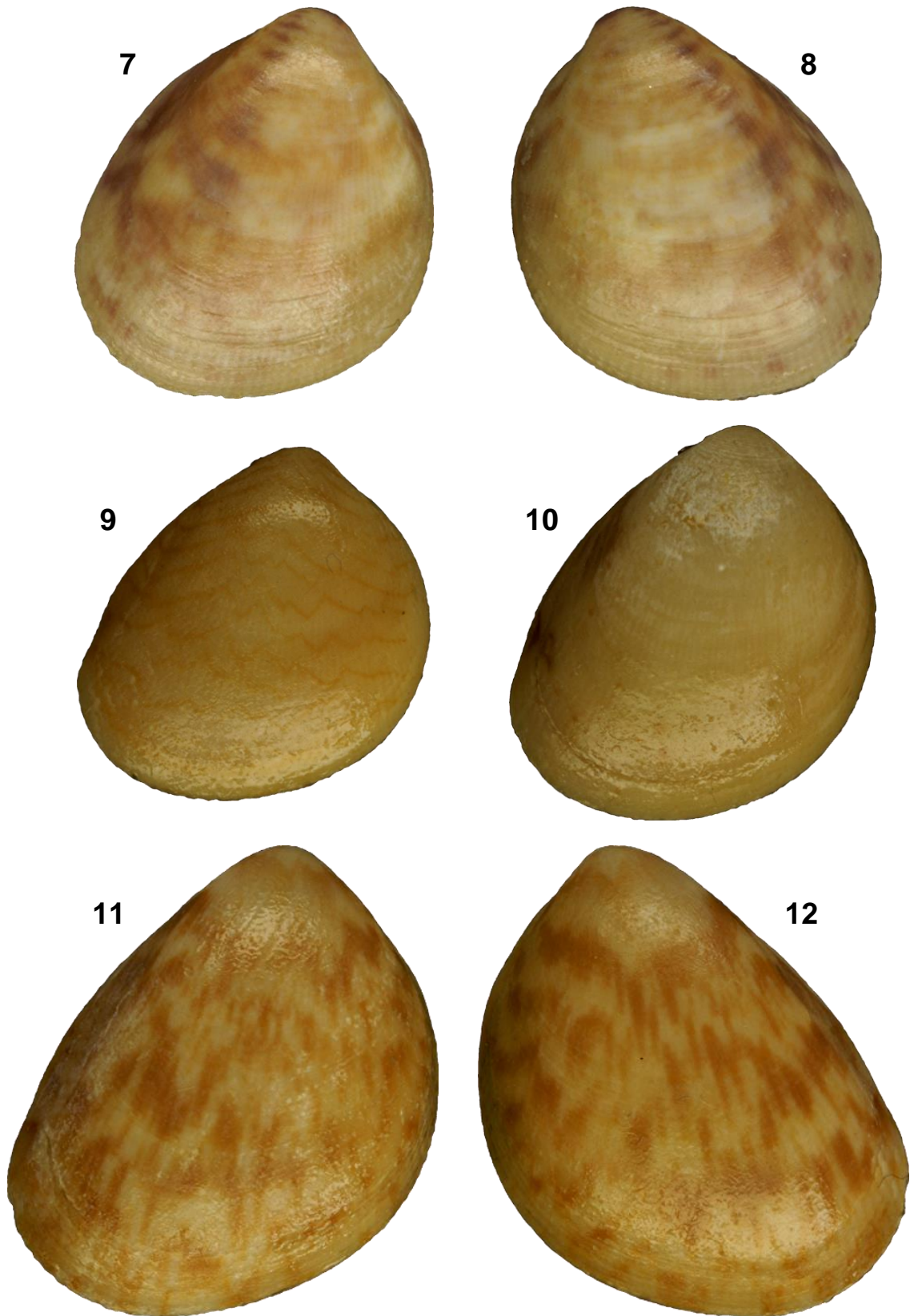


Plate II. Figs 7-12: *Laevicardium pictum* (Ravenel, 1861). CFN; 7-8: Island of Principe, São Tomé & Príncipe, Gulf of Guinea. Dived at a depth of 12 m. In sand. December 2009. H. 17.04 mm L. 14.79 mm; 7: RV; 8: LV; 9-12: Florida Keys, USA. 1968; 9: H. 15.88 m L. 14.84 mm. RV; 10: H. 19.09 mm L. 17.13 mm. RV; 11-12: 21.84 mm L. 19.74 mm; 11: RV; 12: LV.

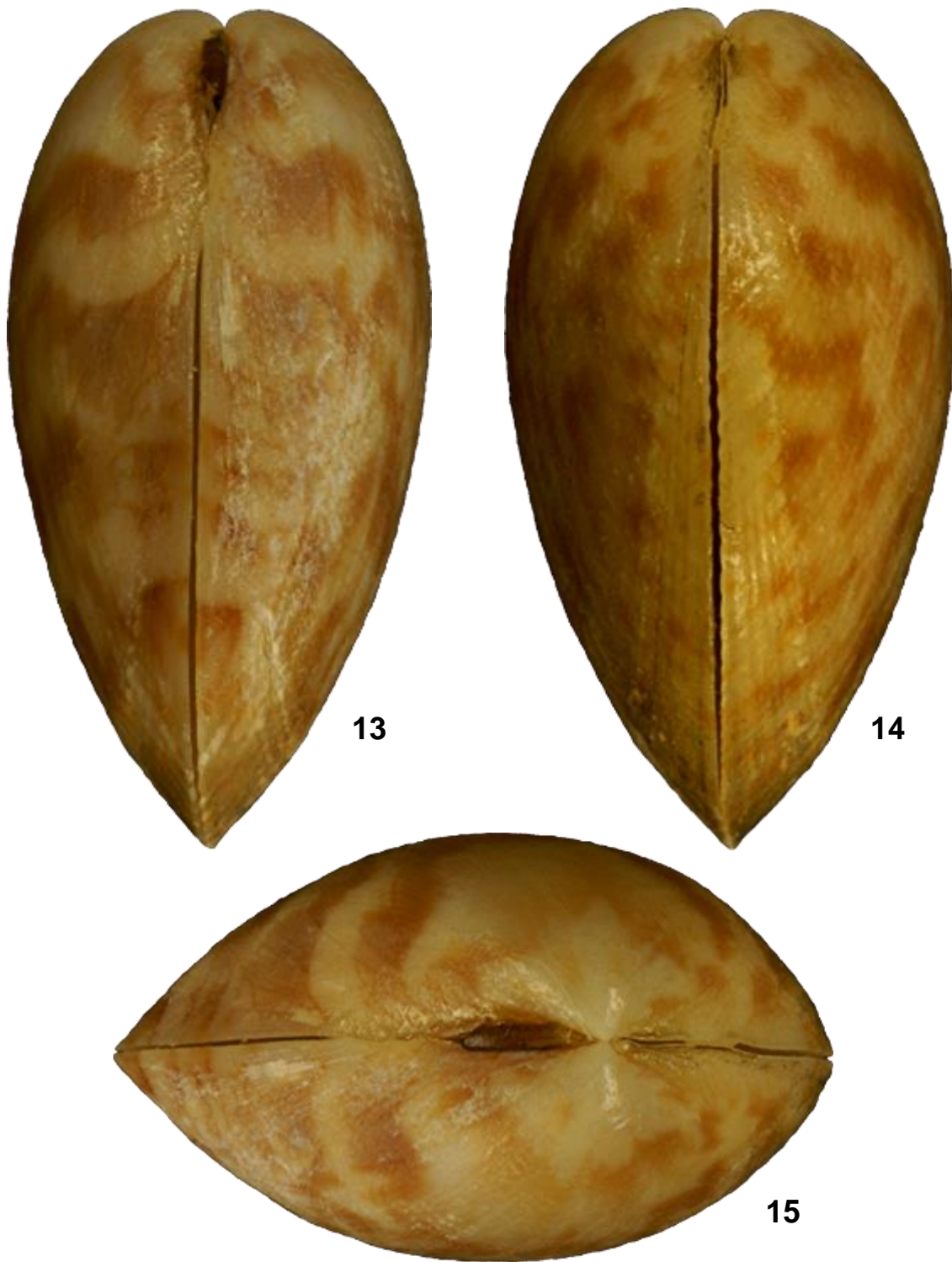


Plate III. Figs 13-15: *Laevicardium pictum* (Ravenel, 1861). Florida Keys. 1968. H. 21.84 mm L. 19.74 mm. CFN; 13: posterior side; 14: anterior side; 15: upper area with umbo and ligament.

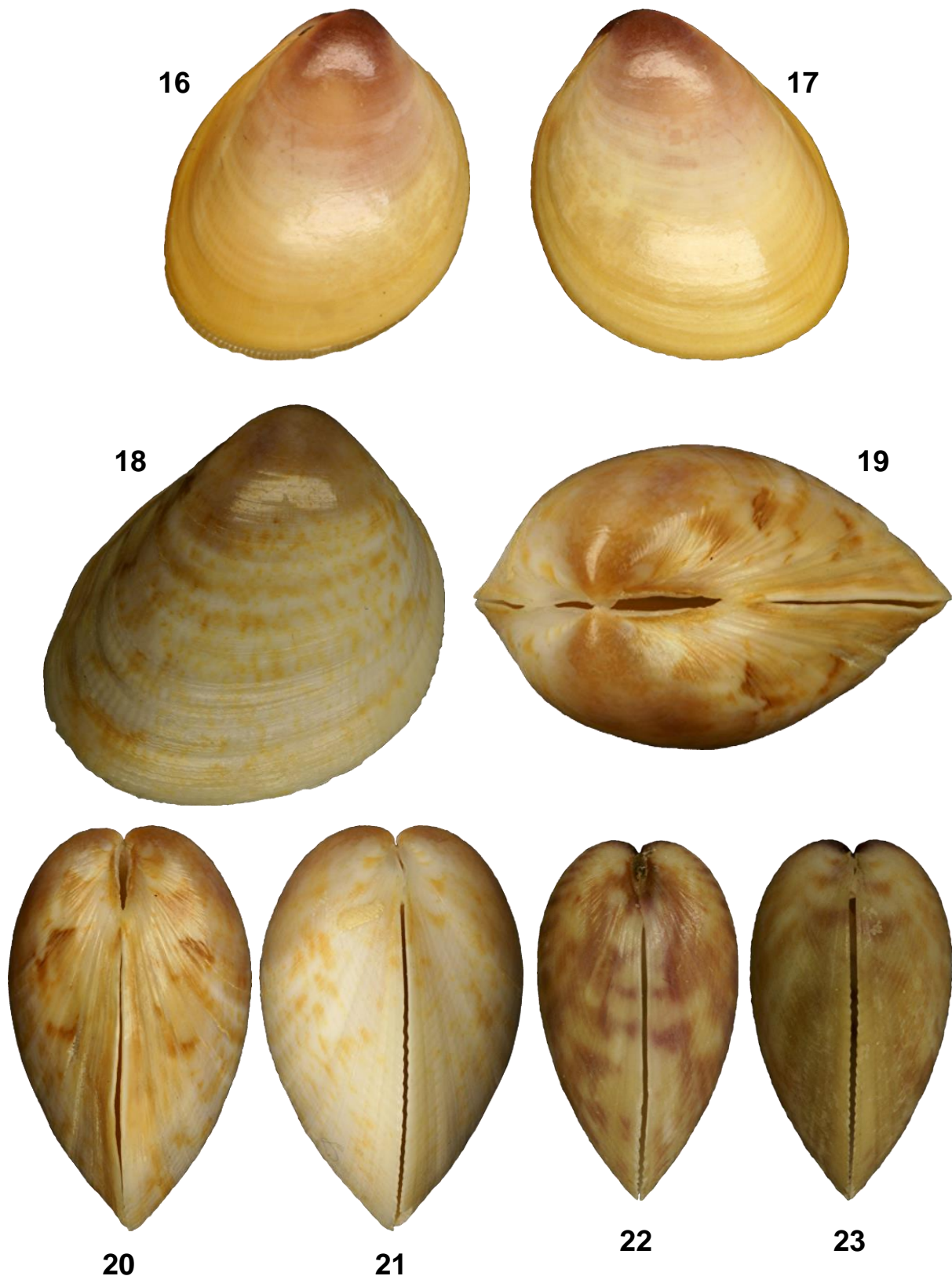


Plate IV. Figs 16-17: *Laevicardium sybariticum* (Dall, 1886). Espírito Santo, Brazil. On algae bottom. Dredged at a depth of 62 m. January 1998. H. 14.06 mm L. 12.26 mm. CFN; 16: RV; 17: LV. Figs 18-21: *Laevicardium brasilianum* (Lamarck, 1819). Trawled by fishermen off Fernando de Noronha Archipelago, Brazil. H. 21.84 mm L. 19.74 mm. CFN; 18: RV; 19: upper area with umbo and ligament; 20: posterior side; 21: anterior side; 22-23: *Laevicardium pictum* (Ravenel, 1861). Island of Principe, São Tomé & Príncipe, Gulf of Guinea. Dived at a depth of 12 m. In sand. December 2009. H. 17.04 mm L. 14.79 mm. CFN; 22: posterior side; 23: anterior side.

A new genus and species of “*Drillia*-like” turrids (Mollusca: Gastropoda: Drilliidae) from Senegal

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Keywords: *Trachydrillia*, Mollusca, Gastropoda, DRILLIIDAE, Senegal, W Africa, new taxa.

Abstract: Specimens of an unusual species belonging to the family DRILLIIDAE were found in fairly deep water off the coast of Senegal. They proved to be different from any other species of West African turrids. Therefore, a new genus *Trachydrillia* and a new species *Trachydrillia denizi* n. sp. are created, described and figured.

Abbreviations:

CFD: Private collection of Francisco Déniz (Tenerife, Canary Islands, Spain).

CFN: Private collection of Frank Nolf (Oostende, Belgium).

CFS: Private collection of Frank Swinnen (Lommel, Belgium).

RBINS: Royal Belgian Institute for Natural Sciences, Brussels, Belgium.

Introduction: About ten specimens of an unknown turrid were found by dredging between Dakar and St. Louis (Senegal) at occasional moments during the previous decade. None of them were in perfect condition, particularly concerning the protoconch, although the specimens were trawled alive. Study of the radula was impossible as the animals had not been preserved. These shells proved to be very different from any other *Drillia* or *Clavatula* two genera that are richly represented in W Africa. Fortunately, the operculum (glued on cotton wool), was saved and allowed us to classify this species in the family DRILLIIDAE. Of course the operculum is only of secondary importance as a taxonomic characteristic, for after all, its shape is consequent upon the shape of the aperture. Opercular growth is achieved by means of a logarithmic spiral by the addition of concentric or eccentric rings.

Though the genus name *Drillia* has usually been used very extensively in a conventional manner to cover any turrid with a tall spire and a truncated body-whorl it was not satisfactory to use this genus name for these turrids. The shells

are so unlike any other turrid that it appeared appropriate to introduce a new genus name instead of arbitrarily classifying this species in an existing genus. In the future, study of the radula in live caught specimens may reveal the exact position of this taxon in the systematics of the turrid-shells.

Turrids are perceived to be the most difficult group to study. Investigations are complicated because of the large number of supraspecific taxa that have been described (Powell, 1966; Bouchet, 1990; Sysoev, 1993 for Recent taxa; Taylor, 1993; Bouchet & Rocroi, 2005; Millard, 2008). Moreover, the extraordinary species diversity (Sysoev, 1991) further complicates their systematics. Tucker (2004) provided a catalogue of the primary taxonomic literature. However, this was only a descriptive and not a critical review of synonyms. His purpose was mainly to report the current status of literature in order to facilitate future biological and systematic studies of the turrids.

Up to now no definitive keys have been set down to differentiate the large number of genera used in the family DRILLIIDAE Olsson, 1964 [= Clavidae Casey, 1904 (invalid)] (Bouchet & Rocroi, 2005).

Results:

Trachydrillia new genus

Type species: *Trachydrillia denizi* new species

Description: Shells rather large (about 40-45 mm), elongate fusiform with a tall spire and a rather truncated body whorl. Corroded structure, oblique axial ribs and especially a subsutural cord bordered by a moderately deep shoulder sulcus. Secondary ribs between main axial ribs crossed by numerous threads causing a microsculpture of microscopic granules. Periostracum very thin, olive-grey and relatively shiny. Posterior sinus rather shallow and broad. Aperture ovate, broad, glossy and porcellaneous. Outer lip widely flaring but not variced. Entrance of the aperture constricted by a slight parietal callus pad.

Leaf-shaped operculum with a subterminal nucleus (Pl. III, Fig. 15).

The new genus is similar to *Cymatosyrinx* Dall, 1889 (CLAVATULIDAE) but the latter has a glossy appearance, a higher body whorl and a less elongate fusiform shell compared with *Trachydrillia*.

Derivation of name: The prefix '*Trachy-*' in *Trachydrillia* is derived from Greek and means 'rough'. It is used because of the typical surface of the adult shell.

***Trachydrillia denizi* new species**

(Pl. I, Figs 1-4; Pl. 5-8; Pl. III, Figs 9-15)

Type material:

Holotype: Between St. Louis and Dakar, Senegal, W Africa. Trawled at a depth of 200-292 m by Guzman, navigating the '*MP Sampayo*', between 15°42' N. and 16°04' N. - 17°01' W. June 1997. 38.95 mm. RBINS (IG.31712; catalogue number in DaRWIN database: MT2324)
Pl. I, Figs 1-2.

Paratypes: Between St. Louis and Dakar, Senegal, W Africa. Trawled at a depth of 200-292 m by Guzman, navigating the '*MP Sampayo*', between 15°42' N. and 16°04' N. - 17°01' W. June 1997.

- Paratype 1: 42.26 mm (CFS) (Pl. I, Figs 3-4)
- Paratype 2: 45.19 mm (CFD) (Pl. II, Figs 5-6)
- Paratype 3: 43.64 mm (CFD) (Pl. II, Figs 7-8)
- Paratype 4: 42.38 mm (CFD) (Pl. III, Figs 9-10)
- Paratype 5: 24.57 mm (CFN) (Pl. IV, Figs 11-12) (juvenile specimen)

Shell rather large (25-45 mm), with an elongate fusiform tall spire and a truncated body whorl. Calcareous, dull surface with corroded structure. Protoconch unknown as no perfect specimens were obtained. However, we suppose that it consists of about 2-2.5 smooth whorls. The broken protoconch in some of the specimens was stopped by the animal with secondary shelly substance creating a false protoconch (Pl. III, Figs 13) showing a paucispiral nipple-like nuclear shell within the next whorl. These characteristics make us suppose a short-swimming life of the larval shell.

The number of postnatal whorls is 7.5-8, the last whorl taking slightly more than the half of the total length. The convex whorls are sculptured with 14-15 moderately prominent oblique axial ribs particularly developed at the shoulder of the last whorl, yet rather flattened and badly eroded on earlier whorls. The shoulder is weakly

angular. Between the main ribs secondary axial ribs are crossed by numerous faint spiral lirae causing a microsculpture of very minute granules, especially visible on the higher part of the whorls but gradually disappearing from the shoulder towards the lower half of each whorl. The suture is distinct and constricted. It is bordered by a rather heavy subsutural cord followed by a rather narrow but moderately deep shoulder sulcus. The siphonal canal is short, although this is a relative characteristic as some specimens may have a longer canal. There is a minor false umbilicus. The back of the anterior canal is slightly grooved by one or more parallel incisions. The posterior sinus is rather shallow and broad. The aperture is ovate, broad, glossy and porcellaneous, the outer lip widely flared but not variced. The entrance of the aperture is constricted by a slight parietal callus pad. The very thin olive-grey periostracum has a silky gloss and only partly covers the surface of the shell as it is worn in the oblique ribs of adult shells. The operculum (Pl. III, Figs 15) is leaf-shaped with a subterminal nucleus.

Colouration: chalky white with any trace of a certain pattern or colouration. Borders of the outer lip and the columellar side of the inner lip are yellowish white.

Animal and radula are unknown.

Measurements: H. 41-42 mm L. 43-45 mm.

Derivation of name: The species is named after Francisco Déniz (Gran Canaria, Canary Islands), who first recognized it as an undescribed species.

Habitat: Unknown.

Locus typicus: Senegal.

Discussion: The present species is rather unique among all other turrids from West Africa and it is difficult to compare it with any other turrid from this area. The shells have some characteristics in common with species in *Clionella* and *Toxiclionella*, but these genera belong to CLAVATULIDAE and the operculum is certainly not clavatulid-like. The new genus shows a slight similarity to *Cymatosyrinx* Dall, 1889, a genus represented by many species in eastern USA (Eocene to Pleistocene), the Galapagos Islands (Pleistocene), Bermuda, the Gulf of Mexico, tropical western America (Recent), Japan (Recent) and a restricted number of species in the Mediterranean Sea, the Azores and NW Africa (Powell, 1966). Shells of the genus *Cymatosyrinx* Dall, 1889 are similar to *Trachydrillia*, but the general shape and outline are different, certainly as shells of

Cymatosyrinx have more extending oblique ribs, as for instance within *Cymatosyrinx centimata* (Dall, 1889), *C. nodulosa* (Jeffreys, 1882) and *Cymatosyrinx impolita* Kuroda & Oyama in Kuroda, Habe & Oyama, 1971.



***Cymatosyrinx impolita* Kuroda & Oyama in
Kuroda, Habe & Oyama, 1971**

Most representatives of the genus *Cymatosyrinx* (a subgenus of *Cerodrillia* Bartsch & Rehder, 1939 according to Vaught, 1989) have a smooth glossy surface. In fact, we can suppose many of

the species classified as *Cymatosyrinx* may belong to another genus.

Distribution range: Only known from Senegal.

Conclusion: The new genus *Trachydrillia* and the new species-name *T. denizi* are attributed to elongate fusiform shells with a tall spire and a rather truncated body whorl. The shells have a corroded structure, oblique axial ribs and especially a subsutural cord bordered by a moderately deep shoulder sulcus. Between the main oblique ribs tiny secondary ribs are crossed by numerous threads causing a micro-sculpture of tiny granules showing through a very thin olive-grey periostracum. The posterior sinus is rather shallow and broad. The aperture is ovate and broad, glossy and porcellaneous. The outer lip is widely flaring but not variced. Posteriorly, the entrance of the aperture is constricted by a slight parietal callus pad.

Acknowledgements: We especially thank Francisco Déniz (Gran Canaria, Canary Islands, Spain) for offering the above shells in loan for description and illustration. He was the first to remark the unique characteristics of this new species. Johan Verstraeten (Oostende, Belgium) made critical notes and comments on the text. David Monsecour (Aarschot, Belgium) thoroughly read and corrected the article.

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Plate I. Figs 1-4: *Trachydrillia denizi*. Between St. Louis and Dakar, Senegal, W Africa. Trawled at a depth of 200-292 m by Guzman navigating the 'MP Sampayo' between 15°42' N. and 16°04' N. - 17°01' W. June 1997; 1-2: holotype. 38.95 mm; 3-4: paratype 1 (CFS). 42.26 mm.



Plate II. Figs 5-8: *Trachydrillia denizi*. Between St. Louis and Dakar, Senegal, W Africa. Trawled at a depth of 200-292 m by Guzman navigating the 'MP Sampayo' between 15°42' N. and 16°04' N. - 17°01' W. June 1997; 5-6: paratype 2 (CFD). 45.19 mm; 7-8: paratype 3 (CFD). 43.64 mm.



Plate III. Figs 9-15: *Trachydrillia denizi*. Between St. Louis and Dakar, Senegal, W Africa. Trawled at a depth of 200-292 m by Guzman navigating the 'MP Sampayo' between 15°42' N. and 16°04' N. - 17°01' W. June 1997; 9-10: paratype 4 (CFD). 42.38 mm; 11-12: paratype 5 (juvenile specimen; CFN). 24.57 mm; 13: partly broken protoconch stopped with secondary shelly substance; 14: operculum; 15: labial profile and apertural features (holotype).

Confirmation of the presence of *Calliostoma gubbiolii* Nofroni, 1984 (Mollusca: Gastropoda: Calliostomatidae) in the north of Angola

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Keywords: Mollusca, Gastropoda, *Calliostoma gubbiolii*, *Calliostoma hernandezi*, Angola, West Africa, geographic distribution.

Abstract: The present paper reports on two specimens of *Calliostoma gubbiolii*, trawled by Belgian fishermen (PEMARCO), off Quicombo (North Angola) in the second half of the previous century. This confirms the important range extension mentioned by Rolán & Ryall (1999). In fact, *C. gubbiolii* is usually only known from a relative limited area between the south of the Iberian Peninsula and the Canary Islands. It is here compared with the similar *Calliostoma hernandezi* Salazar & Gubbioli, 1993, which cohabits in the southern part of its geographic area and at the same depth.

Abbreviations:

CFN: Private collection of Frank Nolf (Oostende, Belgium).

CFS: Private collection of Frank Swinnen (Lommel, Belgium)

H.: Height.

L.: Length.

PEMARCO: Pêche Maritime du Congo.

Discussion: Nofroni (1984) described *C. gubbiolii* as a new species from the circumlittoral ground off S. Pedro de Alcantara (Málaga, Spain, Mediterranean Sea) at a depth between 60 and 90 m. During three years of fishing 17 specimens were found. Later on, many (60) specimens were caught from off Torre del Mar (Málaga, Spain) (Vega Luz, 1988). This locality was 75 km away from the type locality. No specimens were found between the two areas and it seems both localities can be regarded as isolated. Remarkable differences were noted both in size and in the depth at which these specimens had been collected. Most specimens from Torre del Mar were trawled between 40 and 65 metres. The average size of these shells exceeded the height and maximum diameter of the largest specimen examined by Nofroni (Torre del Mar: max. H. 21.8 mm, max. L. 18.7 mm; S.

Pedro de Alcantara: max. H. 16.1 mm, max. L. 15.1 mm). All specimens were collected on muddy sand mixed with detritus and other molluscs including *Calliostoma zizyphinum* (Linnaeus, 1758), *Coralliophila squamosa* (Bivona Ant. in Bivona And, 1838) and *Orania fusulus* (Brocchi, 1814) (Vega Luz, 1988). Bruins (1985) mentioned *C. gubbiolii* from Algarve (Portugal) as an East Atlantic species. Later on, Scaillet & Delongueville (1990), reported a specimen from M'Diq (Morocco), trawled at a depth of 30-40 m. Rolán & Ryall (1999) were the first authors to mention the presence of *C. gubbiolii* in Angola. Belgian fishermen (PEMARCO) trawled two specimens off Quicombo (North Angola) in 1966 (Pl. I, Figs 1-3 & Pl. II, Figs 4-6). These specimens completely match shells from the south of the Iberian Peninsula (Pl. III, Figs 12-17; Pl. V, Figs 18-23) the Canary Islands (Pl. III, Figs 7-11) and NW Africa.

Calliostoma gubbiolii can be compared with *C. granulatum* (Born, 1778) but it is smaller, it has a slightly coeloconid profile (whereas *C. granulatum* is very coeloconoid), fewer spiral cords, the base of the carina is decorated with jutting tubercles giving the basal outline a salient, waving outline and finally it has a smaller number of granules on the cords. The dimensional ratio H./L. is also higher than in *C. granulatum*, which is less slender. Only juvenile specimens of the latter show a slight similarity to adult *C. gubbiolii*. These differences are confirmed by thorough examinations of the radula. Both species live in a detritus circumlittoral zone of South Spain and no intermediates between both forms have been recorded so far.

Calliostoma hernandezi Salazar & Gubbioli, 1993 is a West African species with a relative similarity to *C. gubbiolii*. It is mentioned and figured here as it cohabits in the southern part of its geographic area. Although it was described as a species with type locality Senegal and Guinea Conakry, specimens are also known from Ivory

Coast (Pl. VI, Fig. 28), Gabon (Pl. VI, Figs 24-26) and northern Angola (Pl. VI, Fig. 27).

C. hernandezii has a smaller number of spiral basal cords. The nodules of the peripheral cord are all equal in size and shape.

Distribution range: *C. gubbiolii* lives from South Spain, Algarve (South Portugal), northern

Morocco to the Canary Islands and northern Angola. There are no records available from the area between Morocco and Angola.

Acknowledgements: David Monsecour (Aarschot, Belgium) was helpful in correcting the English text and Johan Verstraeten made critical notes.

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Geographic range of *Calliostoma gubbiolii* Nofroni, 1984 ◆

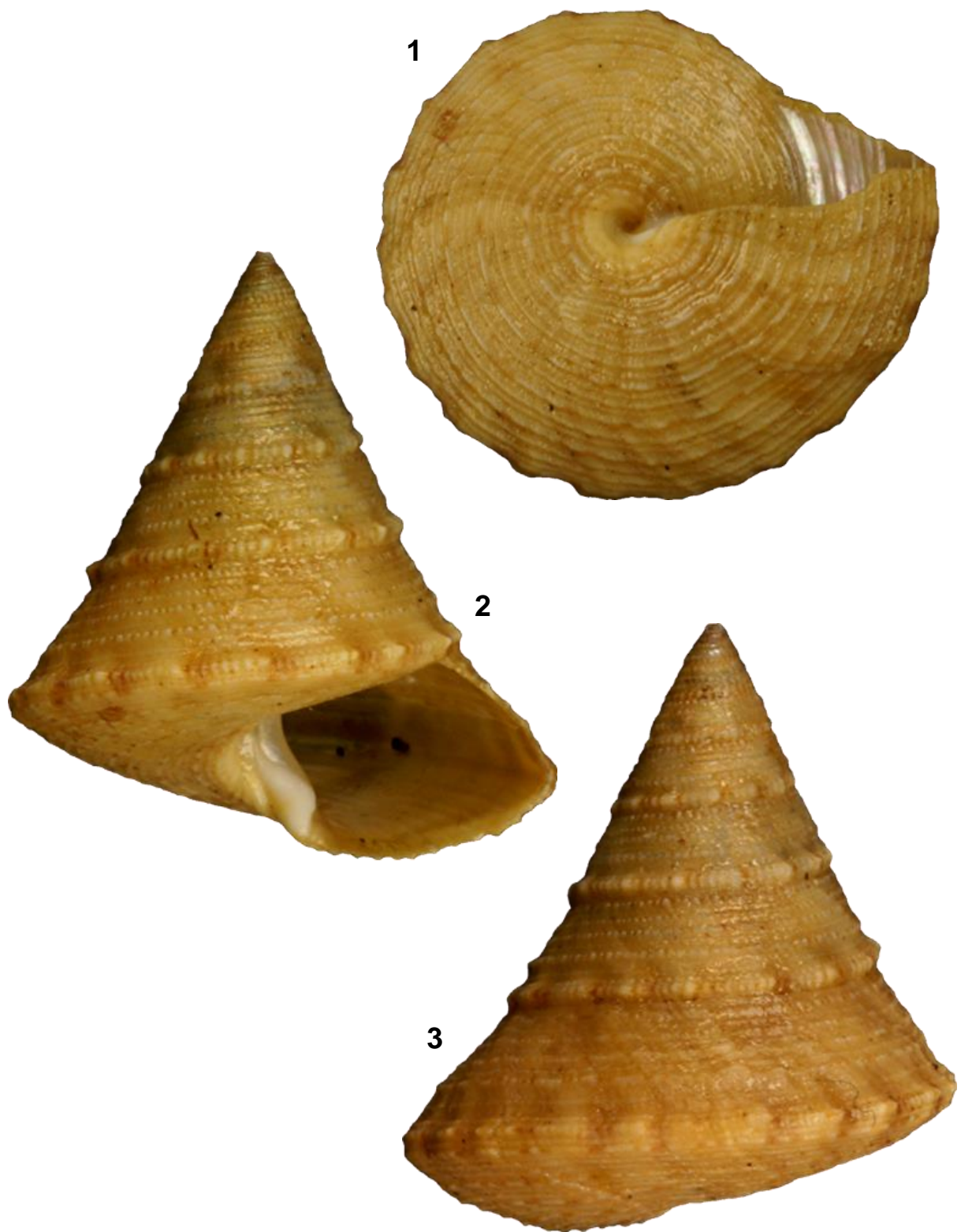


Plate I. Figs 1-3: *Calliostoma gubbiolii* Nofroni, 1984. Quicombo, Angola. Trawled by Belgian fishermen (PEMARCO). 1966. H. 17.94 mm L. 16.22 mm. CFN.



Plate II. Figs 4-6: *Calliostoma gubbiolii* Nofroni, 1984. Quicombo, Angola. Trawled by Belgian fishermen (PEMARCO). 1966. H. 21.26 mm L. 19.16 mm. CFN.

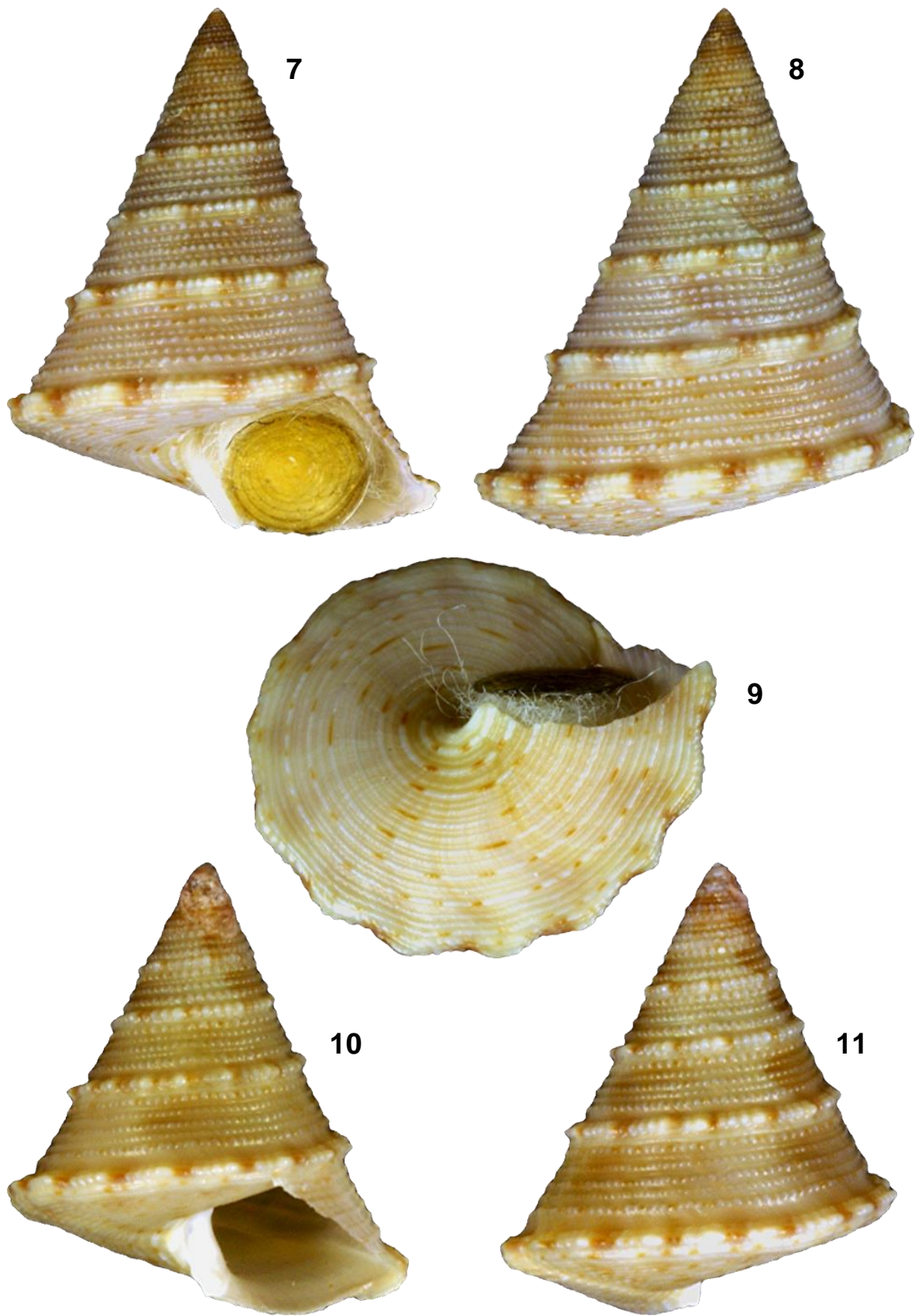
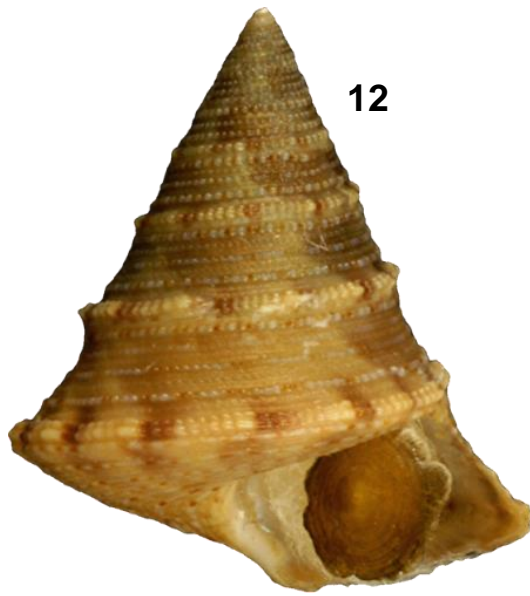
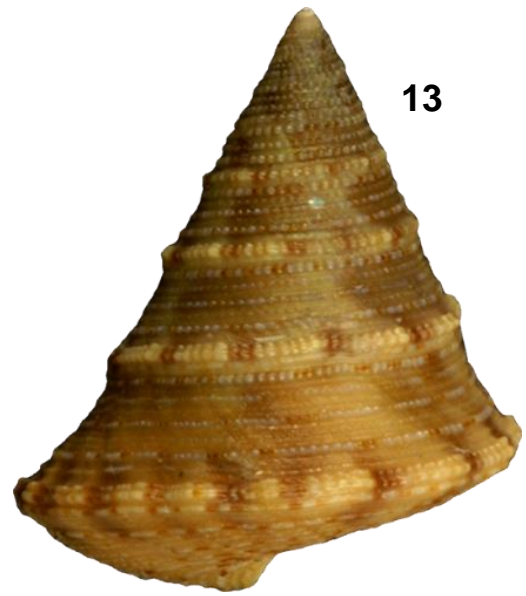


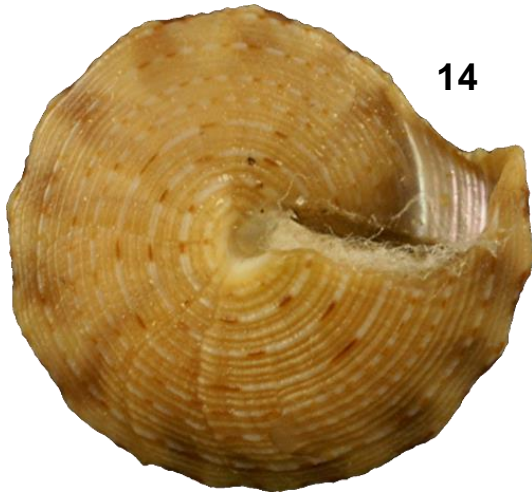
Plate III. Figs 7-11: *Calliostoma gubbiolii* Nofroni, 1984. CFS; 7-9: Canary Islands, Spain. 28°10'44" N./ 15°45'22" W. 1994. H. 19.47 mm L. 15.97 mm; 10-11: Candelaria, Tenerife, Canary Islands, Spain. Trawled at a depth of 100 m. H. 11.68 mm L. 10.33 mm.



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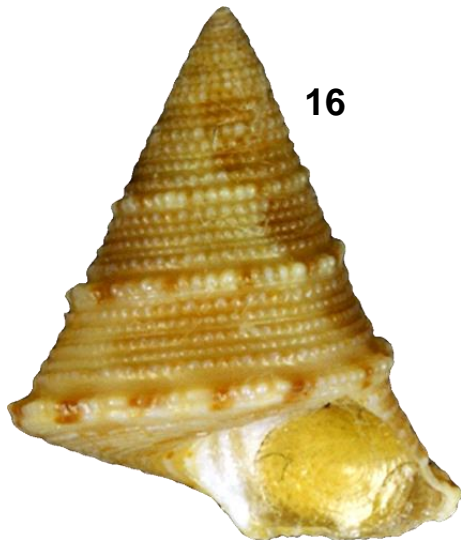
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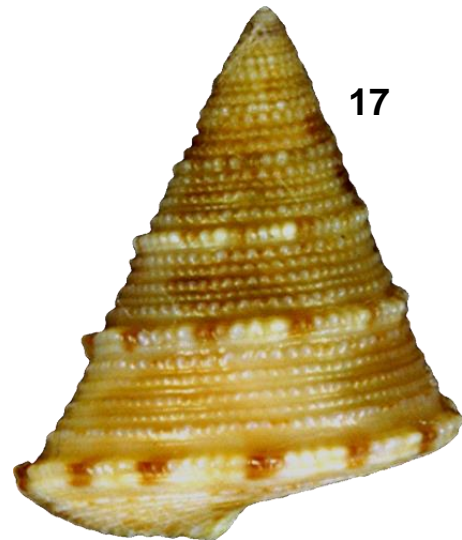
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Plate IV. Figs 12-17: *Calliostoma gubbiolii* Nofroni, 1984; 12-14: Lagos, Ponta da Piedade, Algarve, Portugal. From gill nets on a muddy false coral bottom at a depth of 58 m. September 2009. CFN. H. 16.01 mm L. 14.45 mm; 15-17: Lagos Portugal. Trawled at a depth of 40 m. CFS. H. 12.80 mm L. 10.47 mm.

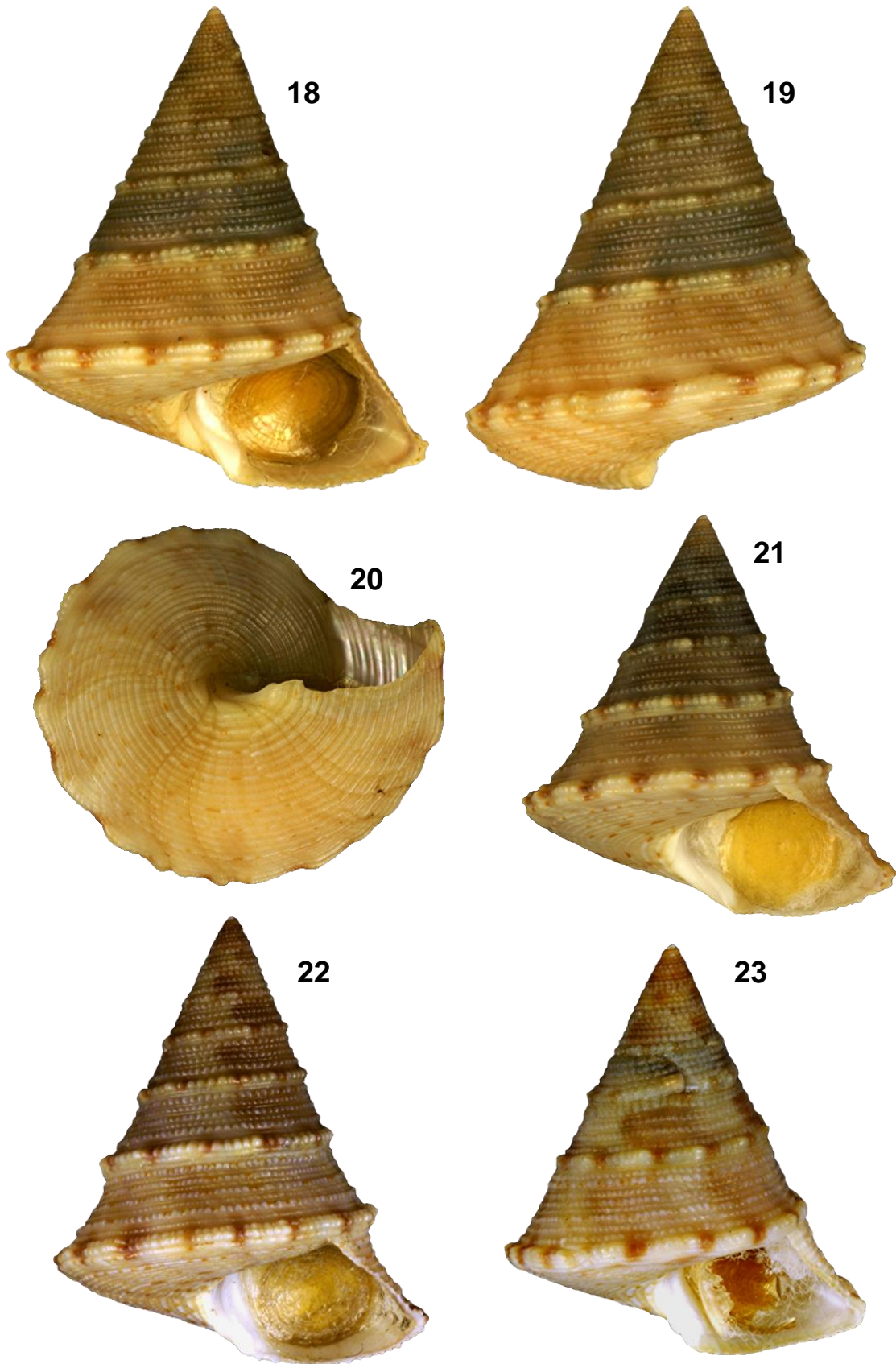


Plate V. Figs 18-23: *Calliostoma gubbiolii* Nofroni, 1984. CFS; 18-21: Málaga, Spain. Trawled at a depth of 120 m. 1991; 18-20: H. 20.03 mm L. 17.99 mm; 21: H. 17.78 mm L. 16.63 mm; 22: Málaga, Spain. Dredged at a depth of 60 m. H. 19.83 mm L. 16.50 mm; 23: Trawled at a depth of 40 m off Marbella, Spain. On muddy bottom. August 1985. H. 16.63 mm L. 14.35 mm.

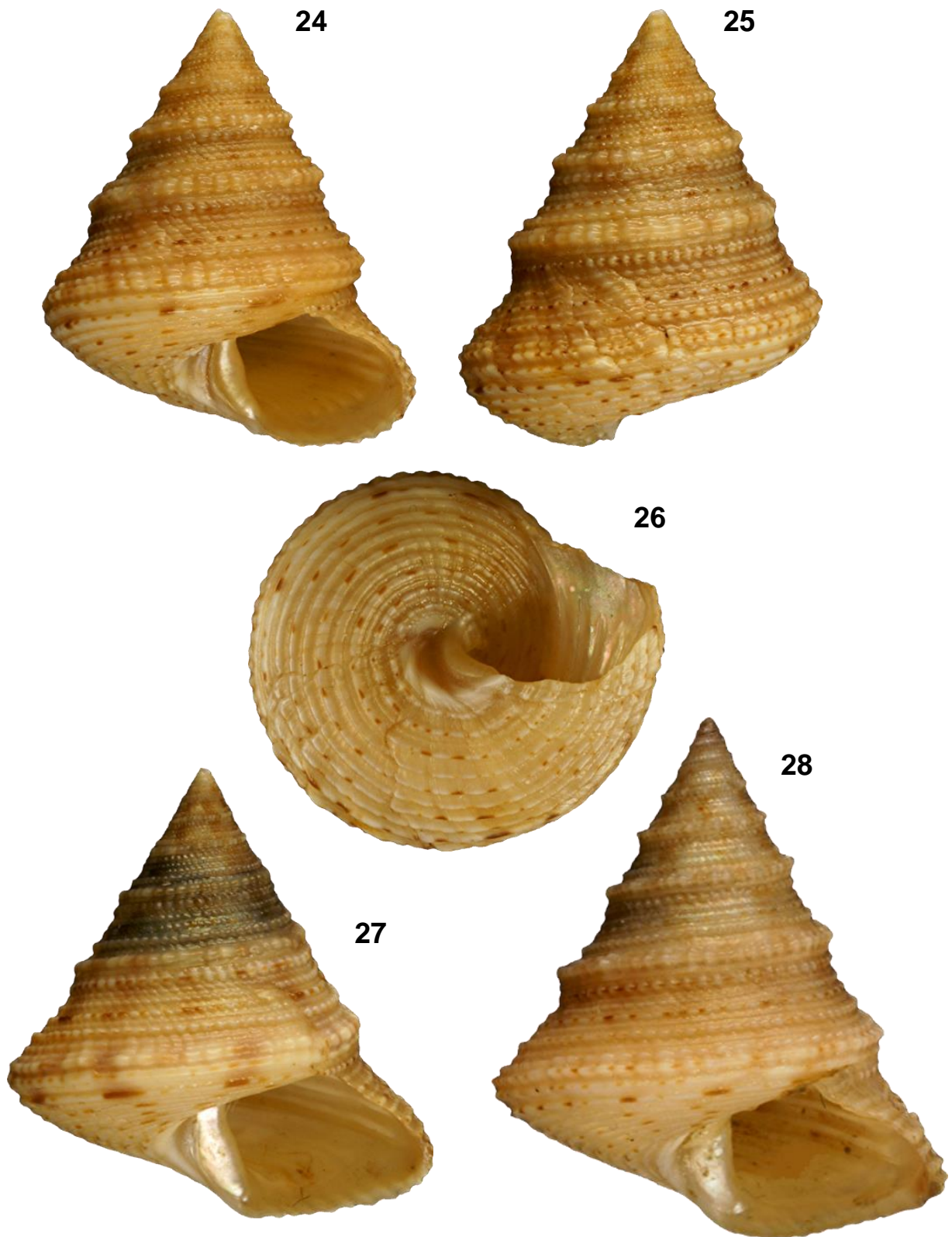


Plate VI. Figs 24-28: *Calliostoma hernandezii* Salazar & Gubbioli, 1993. CFN; 24-26: Libreville, Gabon. Dredged at a depth of 35 m at 60 km offshore. H. 20.34 mm L. 17.66 mm; 27: Quicombo, Angola. Trawled by Belgian fishermen (PEMARCO). 1973. H. 20.69 mm L. 19.35 mm; 28: Off San Pédro, Ivory Coast. Trawled at a depth of 70 m. October 2002. H. 23.28 mm L. 20.27 mm.

