Natica bouvieri Jousseaume, 1883 (Mollusca: Gastropoda: Naticidae) a forgotten species compared with *Natica canariensis* Odhner, 1931

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Abstract:
After nearly a hundred years of confusion, this paper intends to remove all remaining doubts about the attribution of the names *Natica bouvieri* Jousseaume, 1883 and *Natica canariensis* Odhner, 1932. Both refer to clearly distinct species and specimens can easily be separated from each other by the differences in the funicular callus and the operculum.

Abbreviations:
CFN: Private collection of Frank Nolf (Oostende, Belgium).
CJV: Private collection of Johan Verstraeten (Oostende, Belgium)
MNHN: Muséum national d'Histoire naturelle, Paris, France.
PEMARCO: Pêche Maritime du Congo.

H.: Height.
W.: Width.

dd: empty shells, dead taken material.
juv: juvenile.
lv: live taken material.
Stn: Station.

Introduction: Since my early studies on West African molluscs I have always been intrigued by a sample of five specimens of *Natica* sp. obtained from the PEMARCO-fishery off the Angolese coasts in 1972 (Pl. VII, Figs 48-56). The shells appeared to be slightly different from what is commonly called *Natica canariensis* Odhner, 1932.
During the past ten years we have become more and more acquainted with the name *Natica bouvieri* Jousseaume, 1883, which is used as a so-called correct name for *N. canariensis*, downgrading the latter to the rank of junior synonym (Hollman, personal communication). So, it was evident to search for the type of the forgotten *N. bouvieri*, kindly provided by Ph. Bouchet and V. Héros (MNHN) (Pl. IX). Moreover, I have been able to thoroughly study all the West African NATICIDAE from the MNHN-collections and as it could be expected both names – *N. canariensis* and *N. bouvieri* – were present on the labels used by different amateur and professional researchers. The purpose of my study was to investigate if both are different species and if really so, what the differences are. Identification of representatives of the family NATICIDAE is not as easy as one would like it to be because only few parameters can be used. The structure of the operculum and the umbilicus combined with the funicular are here considered the most suitable instruments, certainly when the radulae are not available for study.

Material examined:

***Natica canariensis* Odhner, 1932**
Lanzarote, Canary Islands, Spain, December 1964, 2 dd (CFN); Mauritania, NW Africa, 20°00' N/ 17°29' W, dredged at a depth of 72 m, 1 dd (CFN); Mauritania, NW Africa, 18°54' N/ 16°32' W, dredged by N.O. N'DIAGO Exp., Stn. 289 at a depth of 60 m, 1 juv dd (MNHN); Mauritania, NW Africa, 18°42' N/ 16°25' W, dredged by N.O. N'DIAGO Exp., Stn. 111 at a depth of 158 m, 29 October 1981, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 18°36' N/ 16°28' W, dredged by METEOR Exp., Stn. 119 at a depth of 70 m, 29 October 1981, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 18°00' N/ 16°08' W, dredged by METEOR Exp., Stn. 256 at a depth of 17 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 18°00' N/ 16°17' W, dredged by METEOR Exp., Stn. 259 at a depth of 50 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°48' N/ 16°21' W, dredged by METEOR Exp., Stn. 239 at a depth of 79 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°42' N/ 16°05' W, dredged by "N.O. N'DIAGO", Stn. 232 at a depth of 12 m, 1 juv dd + 1 dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°42' N/ 16°22' W, dredged by METEOR Exp., Stn. 226 at a depth

of 79 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°30' N/ 16°21' W, dredged by METEOR Exp., Stn. 205 at a depth of 69 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°18' N/ 16°20' W, dredged by "N.O. N'DIAGO", Stn. 185 at a depth of 48 m, 1 juv dd + 1 dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°18' N/ 16°28' W, dredged at a depth of 95 m by "N.O N'DIAGO", Stn. 182, 2 juv dd (MNHN, ex coll. Richer de Mauritania, NW Africa, 17°18' N/ 16°29' W, dredged by METEOR Exp., Stn. 182 at a depth of 95 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Mauritania, NW Africa, 17°17' N/ 16°25' W, dredged by METEOR Exp., Stn. 60-77 at a depth of 85 m, 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); Cape Verde Islands, 16°01' N/ 23°04' W, dredged at a depth of 100-118 m, 1 juv dd (MNHN); Praia, São Tiago, Cape Verde Islands, in sand at low tide, 1992, 9 juv dd (MNHN, ex coll. P. Bernard); Cape Verde Islands, 16°01' N/ 23°00' W, dredged at a depth of 45 m, CALYPSO 1959 Exp., Stn. 74, 25 November 1959, 1 dd (MNHN); Cape Verde Islands, 1 juv dd (MNHN, coll. Petit/ H. Fischer); Cape Verde Islands, 15°26' N/ 13°14' W, CALYPSO 1959 Exp., Stn. 64, dredged at a depth of 100 m, 1 dd (MNHN); Senegal, 1 juv dd (MNHN, ex coll. H. Fischer); off Gorée, Dakar, Senegal, dredged at a depth of 50 m, 5 July 1955, 5 juv dd (MNHN, ex coll. Marche-Marchad); Bay of Gorée, Senegal, 6 December 1954, 1 dd (MNHN, ex coll. Marche-Marchad/ M. Staadt); off Dakar, Senegal, dredged at -4 m, 1 juv dd (MNHN, ex coll. Marche-Marchad); off Dakar, Senegal, dredged at a depth of 50 m, 5 juv dd (MNHN, ex coll. Marche-Marchad); south of Gorée, off Dakar, Senegal, dredged at a depth of 42 m, 2 April 1958, 1 juv dd (MNHN, ex coll. Marche-Marchad); SE of Gorée, Senegal, dredged in fine sand among rocks at -19 m, March 1975, 1 juv dd (CFN); Cap de Naze, Senegal, dredged at a depth of 30-50 m, 1987, 1 dd (MNHN, ex coll. M. Pin); Cap de Naze, Senegal, dredged at 30-50 m, 1 lv + 2 juv lv + 1 dd (MNHN); Bay of Rufisque, Senegal, GRUVEL Exp., dredged at 6-9 m, 3 April 1909, 1 dd (MNHN); N Casamance Abéné, Senegal, 13°02.3' N/ 17°08.5' W; dredged by "Louis Sauger" fishing boat in fine sand at -27 m, 25 March 1988, 1 dd (MNHN, ex coll. R. von Cosel); N Casamance, Kafountine, Senegal, 12°55.5' N/ 17°17.2' W, dredged by "Louis Sauger" in fine sand among rocks at a depth of 36 m, 27 March 1988, 1 juv lv (MNHN, ex coll. R. von Cosel); Senegal, 12°55' N/ 17°33' W, dredged in muddy sand at a depth of 65-75 m, "CALYPSO 1956" Exp., Stn. 4, 16 May 1956, 1 juv dd (MNHN); N Casamance, Senegal, 12°49' N/ 17°31.7' W, dredged by "Louis Sauger" fishing boat at 48-50 m, 29 March 1988, 1 dd (MNHN, ex coll. R. von Cosel); N Casamance, Senegal, dredged in fine sand at a depth of 50 m, 1995, 1 juv dd (CFN); Casamance, Senegal, 12°46.9' N/ 17°29.9' W**,** in fine sand, dredged at a depth of 45 m by "Louis Sauger" fishing boat, 29 March 1988, 1 juv dd (MNHN, ex coll. R. von Cosel); Casamance, Senegal, 12°32' N/ 17°28.8' W, dredged at a depth of 45 m by "Louis Sauger" fishing boat in fine sand at a depth of 45 m, 28 March 1988, 1 juv dd (MNHN, ex coll. R. von Cosel); Guinea-Bissau,Casamance–Essoukoudiak Bôlon border, dredged in sand among small boulders at 5-6 m, 1 juv dd (CFN); off Abidjan, Ivory Coast, 1 juv dd (MNHN, ex coll. Marche-Marchad); 1 juv dd (MNHN, ex coll. Richer de Forges, 1981); off Abidjan, Ivory Coast, 2 juv dd (MNHN, ex coll. Marche-Marchad); off Abidjan, Ivory Coast, dredged at a depth of 100 m, ORSTOM Exp., 5 dd (MNHN, ex coll. Le Loeuff); off Abidjan, Ivory Coast, dredged by N/O Reine Pokou, ORSTOM 1965-77 Exp., 3 dd (MNHN, ex coll. Le Loeuff); Gulf of Guinea, 10°19' N/ 16°33'40", dredged at a depth of 60-73 m, 1 juv dd (CFN); Cotonou, Benin, dredged by GRUVEL Exp., 23 March 1910, 10 juv dd (MNHN); Gulf of Guinea, 04°36' N/ 01°31' W, dredged at a depth of 50 m, "CALYPSO 1956" Exp., Stn. 25, 1 juv dd (MNHN, ex coll. Marche-Marchad); Mayumba, Gabon, dredged at a depth of 20-40 m, 28 dd (MNHN, ex coll. P. Bernard); Banana, Democratic Republic of the Congo, dredged by GRUVEL Exp., 28 April 1910, 1 juv dd (MNHN); off Pointe Kipundji, Democratic Republic of the Congo, 05°56' S/ 12°07' E, dredged in a muddy bottom at 22-25 m, ORSTOM Exp., 1969, 1 juv dd (MNHN); Ilha de Luanda, Angola, dredged at a depth of 40-60 m, 3 juv dd (CFN); Ilha de Luanda, Prov. Luanda, Angola, circalittoral, dredged at a depth of 40-60 m, 3 dd (MNHN, ex coll. S. Gofas, 1982-84); Point of Mussulo, Prov. Luanda, Angola, in shell deposits on the beach, 1983, 1 juv dd (MNHN, ex coll. S. Gofas); Bay of Lucira, Bissonga, Prov. Namibe, Angola, dredged among coral rubble at a depth of 10-20 m, 1 juv dd (MNHN, ex coll. S. Gofas); Praia Amelia, Namibe, Prov. Namibe, Angola, dredged at a depth of 40-60 ml, 1 juv dd (MNHN, ex coll. S. Gofas).

***Natica bouvieri* Jousseaume, 1883**

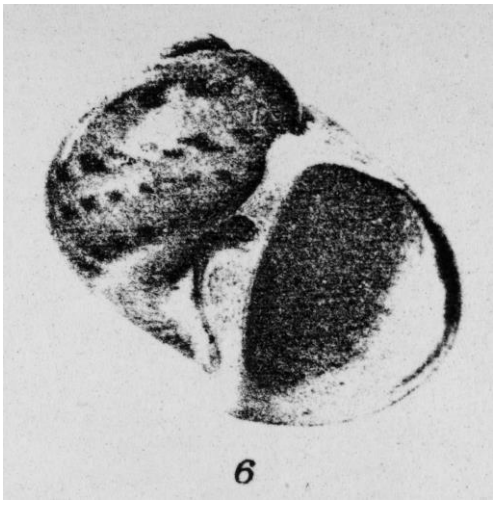
Mauritania, NW Africa, 19°42' N/ 17°01' W, dredged by "N.O. N'DIAGO", Stn. 354 at a depth of 98 m, 1981, 1 dd (MNHN); off Mauritania, NW Africa, 17°48' N/ 16°12' W, dredged at -35 m, 1981 2 lv (MNHN); Mauritania, NW Africa, 17°42' N/ 16°34' W, dredged by "N.O. N'DIAGO", Stn. 222 at a depth of 200 m, 1981, 1 dd (MNHN); Petite Côte, Senegal, 13°51' N/ 16°48' W,

dredged at -7 m, 1981, 10 juv lv (MNHN, ex coll. K. Leung Tack); off Anse Bernard, Dakar, Senegal, dredged at a depth of -35 m, September 1958, 1 dd (MNHN, ex coll. Marche-Marchad); Casamance, Senegal, trawled at a depth of 60 m, 7 lv (CJV); Cap de Naze, Senegal, trawled at a depth of 40 m, 1987, 3 lv (CFN) ; Cape Verde Islands, 1 dd (MNHN, syntype, ex coll. Jousseaume); Guinea-Bissau, trawled by fishermen in a muddy bottom at a depth of 30-50 m, 2007, 4 lv (CJV); Cape Verde Islands, Sylvana Expedition 1913, 2 juv lv (MNHN); Porto Grande, Cape Verde Islands, November 1976, 1 dd (CFN, ex coll. G. Saunders); off Abidjan, Ivory Coast, dredged at a depth of -70 m, 1 dd (MNHN); off Abidjan, Ivory Coast, dredged at a depth of 50 m, 22 November 1966, 1 dd (MNHN, ex coll. Le Loeuff-ORSTOM); off Abidjan, Ivory Coast, 1 lv (MNHN, ex coll. Marche-Marchad); off Abidjan, Ivory Coast, trawled by shrimpers at a depth of 50 m, 19 October 1967, 3 lv (CFN, ex coll. J. Gourayeb); Port Gentil, Gabon, trawled by local fishermen at a depth of 40 m, 4 dd (CJV); Pointe Padrou, Banana, Democratic Republic of the Congo, dredged at a depth of 25 m, Gruvel Expedition, 4 May 2010, 1 juv lv (MNHN); Cape Morro, Angola, trawled by Belgian fishermen (PEMARCO) at a depth of 92 m, 1972, 5 dd (CFN); Ilha de Luanda, Prov. Luanda, Angola, circalittoral at -120 m, 1 dd (MNHN, ex coll. S. Gofas); Radiale de Punta das Lagostas, Angola, dredged in a muddy bottom at a depth of 30-50 m, 1 lv + 2 dd (MNHN, ex coll. S. Gofas); Lagostas, Angola, dredged at -30 m, 14 lv (CFN); Namibe, Prov. Namibe, Angola, ex pisce, in the stomach of *Lophius* sp., 1983, 4 crabbed specimens (MNHN, ex coll. S. Gofas); off Walvisbaai, Namibia, SW Africa, trawled by Belgian fishermen at a depth of 40 fms, 1973, 1 dd (CJV, ex CFN).

Diagnosis:

***Natica canariensis* Odhner, 1931**
(Pl. I, Figs 1-8; Pl. II, Figs 9-17; Pl. III, Figs 18-25; Pl. IV, Figs 26-33)

Original description: '*Gehäuse mittelgross, kugelförmig, mit kleinem, papillenförmigem Gewinde und grosser letzter Windung, glatt, glänzend, Frabe gelbbraun, Apex kastanienbraun; letzte Windung mit 4 Spiralserien von dunkler braunen Flecken, zwei oberhalb, zwei unterhalb der Mittellinie der Windung, die beiden mittleren einander genähert. Nabelgegend und innere Lippe weiss; äussere Lippe in der Mitte gelbbraun; das Innere der Mündung hell braunviolett. Sutur wenig tief, vorn leicht absteigend, mit feinen Radialleisten. Mündung halbkreisförmig. Spindelrand oben und in der Mitte callös, im ganzen aber konkav, unten eine vorspringende Ecke mit der Unterlippe bildend. Nabelcallus stark, nach oben breiter, abgeflacht, den Nabel halb erfüllend, durch eine breite Bucht von dem etwas vorgezogenem Parietalcallus getrennt. Ein unten deutlicher, nach oben verschwindender Umbilicalkiel zieht von der unteren Ecke des Mündungsrandes nach oben in den halb offenen Nabel hinein.*
In der ganzen Gestalt und in der Ausbildung des Nabels erinnert diese neue Art am meisten an die westindische Natica canrena *LINNÉ*, *die (nach DAUTZENBERG & FISCHER, 1906) auch bei den Kap Verde-Inseln vorkommt. Bei* N. canariensis *is aber der Nabelwulst flach and mehr nach oben im Nabel verlagert, die Windungen sind nicht an der Sutur abgeflacht, der Mündungsrand hat unten eine scharfe Ecke, und die Zeichnung ist verschieden, sodass die vorhandene Form eine sehr charakteristiche Art bildet*.'



From: Odhner, N., 1931. Beiträge zur Malakozoologie der Kanarischen Inseln. Lamellibranchien, Cephalopoden, Gastropoden. Archiv för Zoologi, 23 A (14). Plate 1, fig. 6. *Natica canariensis*, nov. sp.

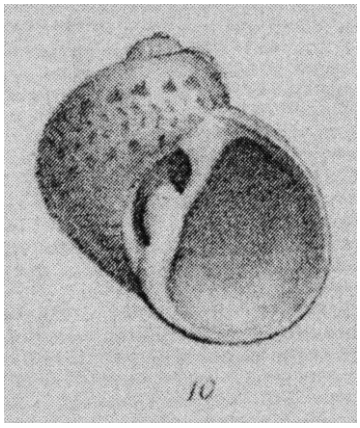
Syn.: *Natica reneae* Saunders, 1978
Original description: '*Shell globose and slightly wider than long, rather thin and glossy, sculptured with fine axial growth lines, which are more distinct at the suture, consisting of up to four whorls, the last being about 90% of the total length. The spire is low and rounded and the umbilicus is deep and spiral with strong funicule. Colouration varies in relation to the maturity of the shell. Early whorls have a narrow band of white at the suture and below this a* (sic) *zone of pale mustard yellow. The zone consists of four spiral bands of alternating colour intensity. A final white zone extends into the umbilicus. At the lower margin of each band is a line of small*

orange spots. The aperture of the shell is white but showing brown on the outer wall deeper inside. As the shell matures the spots become obsolete then are discontinued while the banding of the coloured zone becomes indistinct. Axial growth lines become stronger and may be accentuated by discontinuations of colour. Traces of a light brown semi opaque periostracum were present on two specimens.'

Natica canariensis is rarely figured in shell books or papers (Ardovini, R. & Cossignani, T., 2004; Dixon, M. & Ryall, P., 1985; Fernandes, F. & Rolán, E., 1993; Hernández, J.M., Rolán, E. & Swinnen, F., 2011; Rolán, E., 2005). Bernard (1984) figures it as *Natica marochiensis* ('*may be* N. canariensis*?*') (pl. 20, fig. 81b) and a similar confusion is created by Poppe & Goto (1991) whose *N. maroccana* (Chemnitz, 1781) (sic), illustrated on pl. 17, fig. 12 is *Natica canariensis* Odhner, 1931.

Geographic distribution: from the Canary Islands, the Cape Verde Islands and Mauritania to Namibe (South Angola).

***Natica bouvieri* Jousseaume, 1883**
(Pl. V, Figs 34-41; Pl. VI, Figs 42-47; Pl. VII, Figs 48-56; Pl. VIII, Figs 57-64, Pl. IX, Figs 65-66:



syntype; Pl. X, Figs 67-72)

Syn.: *Natica aimei* Jousseaume, 1884

Jousseaume described *N. bouvieri* without a figure in 1883 (*Bull. Soc. Zool. Fr*., 8 : XXXV) and redescribed it as *N. aimei*, thereby using the same diagnosis and a figure as *N. aimei* in 1884 (*Bull. Soc. Zool. Fr*., 9: 181, pl. 4, fig. 10).

Original description: '*Testa subglobosa, solida, laevi, lutea, circum umbilicum alba, maculis castaneis quatuor seriatis transversim tesselata; suturis albescentibus; spira brevi, acuminata; anfractibus 5; convexis, circum suturam striatis ; apertura semi-circulari, fauce violaceo; callo spirali crosso, albo inferiorem umbilici partem occupante, sulco angusto extus cincto.*
Dimensions: Long. 29 mm; grand diam. 28 mm; petit diam. 20 mm; ouverture, grand diam. 20 mm; petit diam. 13 mm.
Coquille solide, ombiliquée, subglobuleuse, un peu allongée transversalement et à sommet assez saillant. A sa surface lisse et vernissée, on aperçoit, à la loupe, des très fines stries transverses, qui, en approchant de la suture, augmentent un peu de volume et s'aperçoivent sans le secours de la loupe. Sa couleur, d'un blanc pur, autour de l'ombilic, et d'un jaune chamois très clair dans le reste de son étendue, est relevée par des macules d'un brun foncé disposées en quatre bandes circulaires. L'antérieure, placée entre la partie blanche et la jaune, est formée de macules presque carrées séparées par des espaces blanc-jaunâtre, à peu près de même dimension. Les deux bandes intermédiaires sont formées de taches plus longues que larges, obliquement dirigées en sens inverse, de sorte que, prolongées, elles viendraient se réunir en formant un angle dont l'ouverture serait dirigée vers le péristome, la zone qui sépare ces deux bandes est un peu plus étroite que celle qui les sépare de l'antérieur; la quatrième bande ou postérieure, séparée des précédentes par un espace beaucoup plus large, est formée de macules ne présentant aucune régularité, surtout en approchant de l'ouverture. La spire est formée de 5 tours ½ dont le développement est régulier et rapide. La suture qui les sépare, assez profonde et nettement accusée, est bordée en dehors d'une petite bande blanche dont la dimension augmente avec la progression de la spire. Les trois premiers, lisses, luisants et d'un corné un peu brunâtre, forment à l'extrémité un petit sommet peu saillant. Les suivants, très près de la suture, sont ornés d'une série linéaire de petites taches brunes qui, au début, situées près de la suture, deviennent centrales dans la dernière partie de l'avant-dernier tour.
L'ombilic, assez ouvert et toujours plus large et plus profond en arrière, est entouré d'une partie anguleuse qui prend en avant une forme de bourrelet peu saillant; sur sa paroi interne s'élève un funicule semi-cylindrique et saillant, se déroulant en spirale allongée. Il est séparé de la marge de l'ombilic par un sillon qui va en diminuant insensiblement de largeur et surtout de profondeur d'arrière en avant.
L'ouverture semi-linéaire et blanche sur les bords, présente intérieurement une coloration d'un rouge violacé dans toute la partie qui correspond à la partie jaunâtre de la surface externe, alors que celle qui correspond à la zone blanche qui entoure l'ombilic reste blanche. Le péristome, continu et blanchâtre, est placé dans

un plan très peu oblique à l'axe; son bord externe, assez épais, droit et mousse, décrit à peu près la moitié d'un arc de cercle. Le columellaire, presque droit et échancré au centre, se relève à ses extrémités, surtout à la postérieure qui forme, sur l'avant-dernier tour, une large et épaisse callosité, s'unissant à l'extrémité du bord précédent.
Opercule?
Habitat. *Les quelques individus, que j'ai vu de cette espèce, ont été recueillis par. M.A. Bouvier, qui a eu l'amabilité de m'offrir l'exemplaire qui a servi à cette description. Je le prie d'en accepter la dédicace. J'espère que la Mission scientifique, qui explore actuellement cette contrée, aura recueilli avec l'animal cette intéressante espèce que je n'ai vu figurer dans aucune collection.*'

Natica bouvieri is only occasionally mentioned but never illustrated in modern literature. No traces of the name *N. bouvieri* can be found in the '*Revision on the Classification of Recent Naticidae*' by Torigoe et al. (2011). Robin (2008) figures a specimen of *Natica canariensis* provided with the caption '*N. bouvieri*'.

Geographic distribution: *N. bouvieri* is found in the same area as *N. canariensis*, which means from Mauritania in the north, the Cape Verde Islands and until Namibe (Angola) in the south. It seems to be absent in the Canary Islands as no specimens could be localised.

Discussion: comparison between *N. canariensis* and *N. bouvieri*
Instead of repeating useless characteristics of both species in detail I prefer to summarise the most important common features and to list those which are suitable for differentiation.
Both species are globose, slightly wider than tall, proportionally thin, fairly glossy with a low spire and finely plicate sutures. The deep umbilicus is largely filled with a thick funicle producing a long, pinched callus pad, which is linked to a thinner parietal callus by means of a deep sulcus.
Body whorl light yellowish brown to tan, overlaid with four spiral bands consisting of darker brown chevrons or squares. A narrow white spiral band runs immediately below the suture, and a broader white zone borders the lowest of the four spiral bands at the base. Calluses glossy white. Aperture cream or light brown, occasionally tinged with violet.
The operculum is shelly white and calcareous, the inner margin slightly scabrous.

***N. canariensis*:** Specimens are consistently wider than high with an average H./L. ratio of 0.939 (measured in 21 specimens).
The main difference with *N. bouvieri* is the structure of the umbilicus and the funicle (Pl. X, Fig. 67). The funicular callus in *N. canariensis* broadens towards the basal lip of the aperture and becomes glossy, flattened and narrowly elongated downwards. This feature results in a very narrow sulcus between the funicular and the parietal callus.
The body whorl is decorated with 3-4 bands of brown blotches – chevrons or squares – alternating with white interstices. A broad white zone clearly borders the lowest of the four spiral bands at the base.
The operculum of *N. canariensis* is more semicircular in outline (Pl. X, Fig. 67, 69, 70). It has a smooth and glossy surface and it is different from the operculum in *N. bouvieri* because of its comma-like excavation in its central part near the collumellar margin of the shell, thereby creating a thickened and raised nucleus which is discoloured because of a sandy accretion. From the outer margin to the centre, two thin raised spiral ribs positioned in a broad groove run parallel with a very heavy rib.

N. bouvieri: Specimens tend to be higher than wide with an average H./W. ratio of 0.986 (measured in 22 specimens), several shells showing a ratio above 1.0. Moreover, specimens are smaller than those of *N. canariensis*. The largest measured specimen has the following sizes: H. 19.73 W. 19.64 mm (Senegal), while specimens of *N. canariensis* easily exceed 25-30 mm.
The funicle only slightly broadens towards the opening of the umbilicus, ending in a rounded semicircular funicular callus, leaving a large gap between the funicular and the parietal callus (Pl. X, Fig. 68).
Three – rarely four – rows of brown blotches on the body whorl. Intermittent white dots are practically absent in most specimens. The light brown colour gradually merges into a cream coloured area at the base of the last whorl instead of being distinctly defined.
The operculum differs from that of *N. canariensis* by its more semi-ellipsoid form (Pl. X, Figs 68, 71, 72). It is higher than wide and the glossy surface is encrusted with microscopic granules and very faint light grey radial striae. The raised nucleus in the anterior part of the operculum is flattened, not prominent and has the same form as the operculum itself, clearly visible by the presence of a slight pinch.
The operculum is bordered by a thin ridge followed by a broad and thick rib separated by a deep groove.

Conclusion: *N. canariensis* and *N. bouvieri* are two different species, clearly differentiated by the structure of the umbilicus and the funicle and certainly the operculum in live collected specimens. It is nearly incredible that *Natica bouvieri* was forgotten for more than 130 years. This fact can be explained by the similarity of both species' characteristics and their occurrence in the same geographic area. However, it is surprising to ascertain that only figures of *N. canariensis* can be retrieved in literature. So, we have to admit *N. bouvieri* is not as common as could be expected. Once again, both species are an example of twin species creating much confusion among shell collectors.

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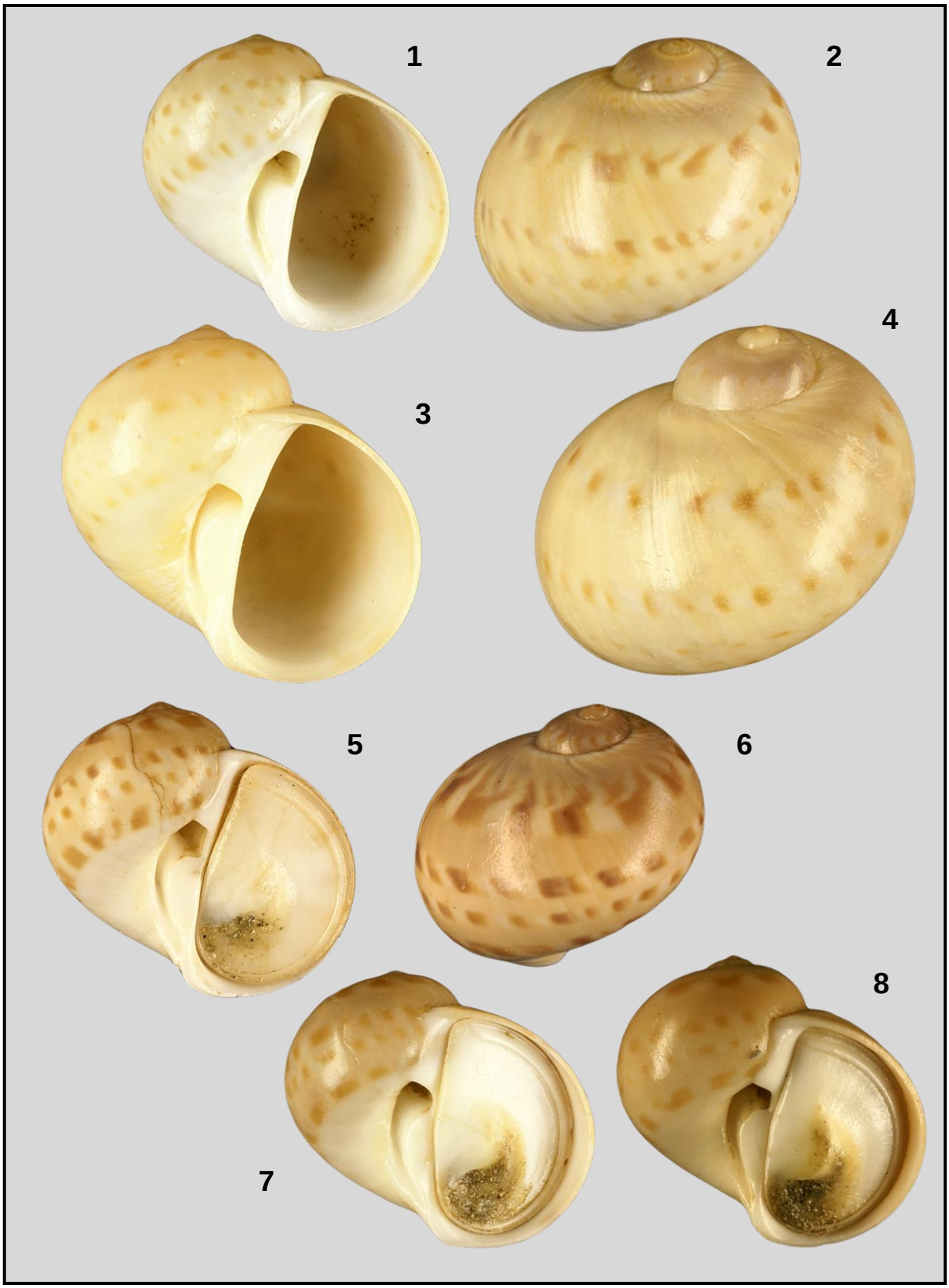
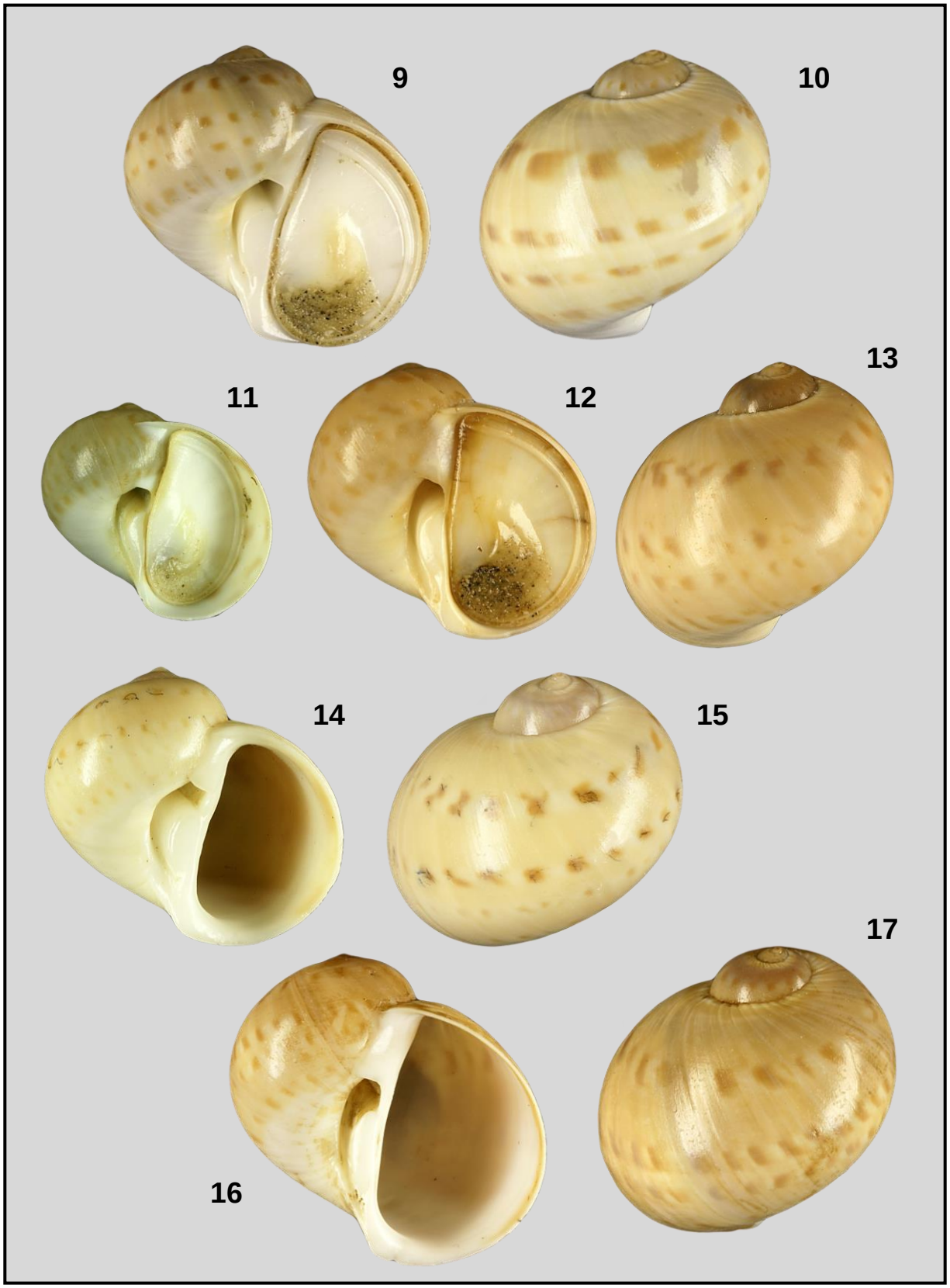
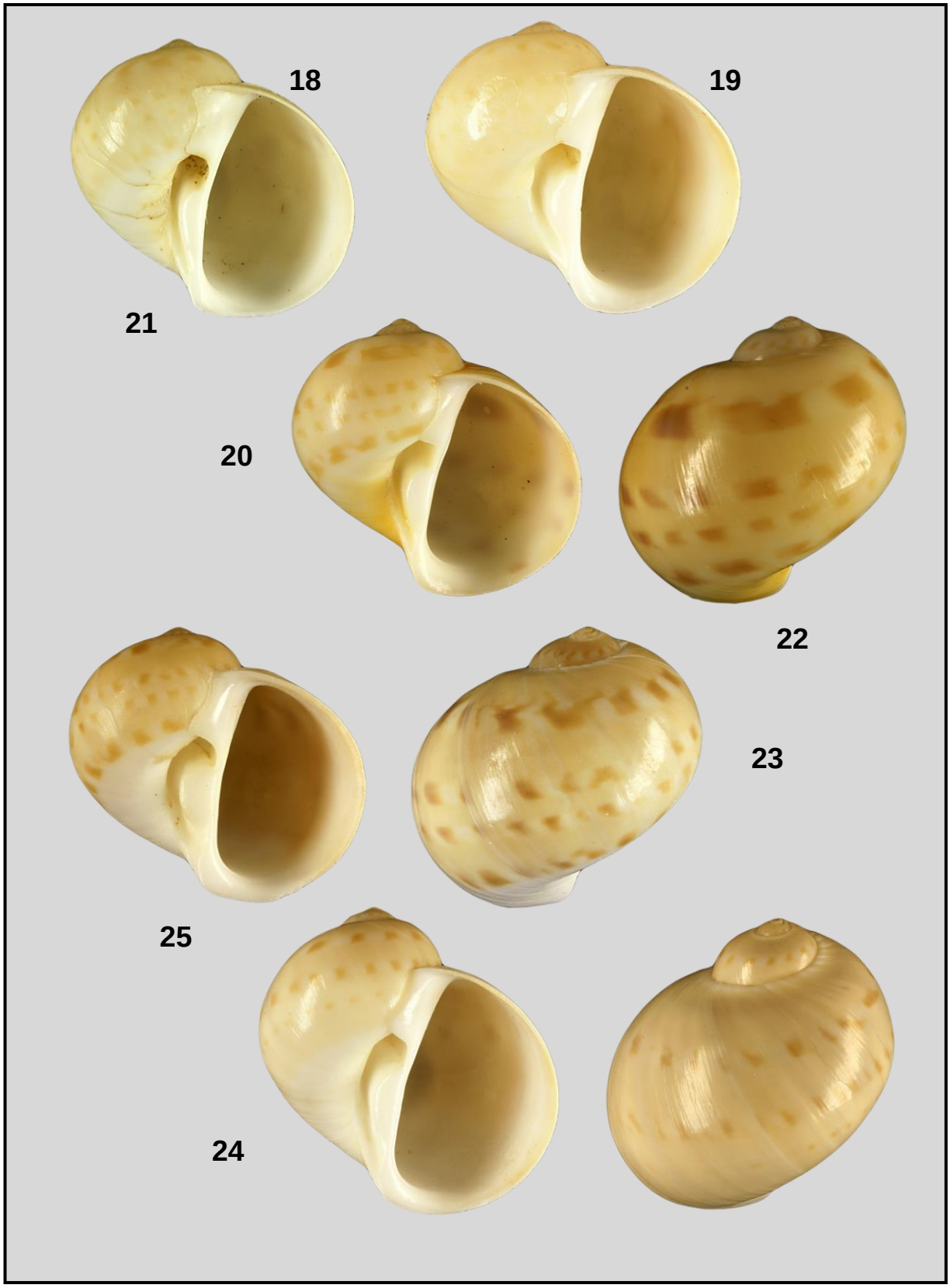


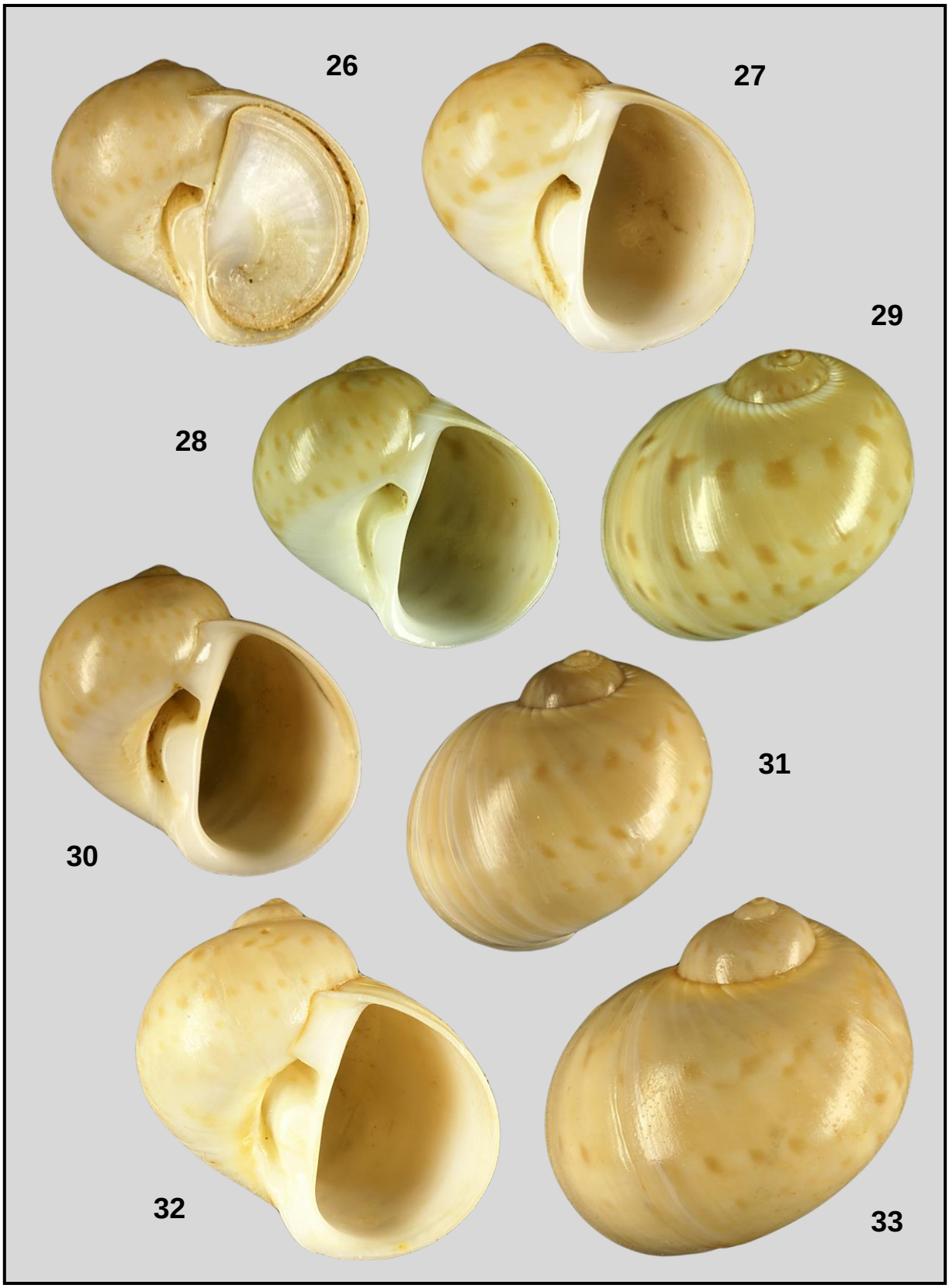
Pl. I. Figs 1-8: *Natica canariensis* Odhner, 1931. CFN; 1-4: off Arrecife, Lanzarote, Canary Islands. Trawled by fishermen. 5 January 1970; 1-2: H. 23.44 mm L. 24.81 mm; 3-4: H. 32.40 mm L. 33.72 mm; 5-8: off Cape Blanco, Mauritania, NW Africa. Trawled at a depth of 45 m. August 1982; 5-6: H. 23.64 mm L. 25.45 mm; 7: H. 23.79 mm L. 26.15 mm; 8: H. 25.28 mm L. 27.58 mm.



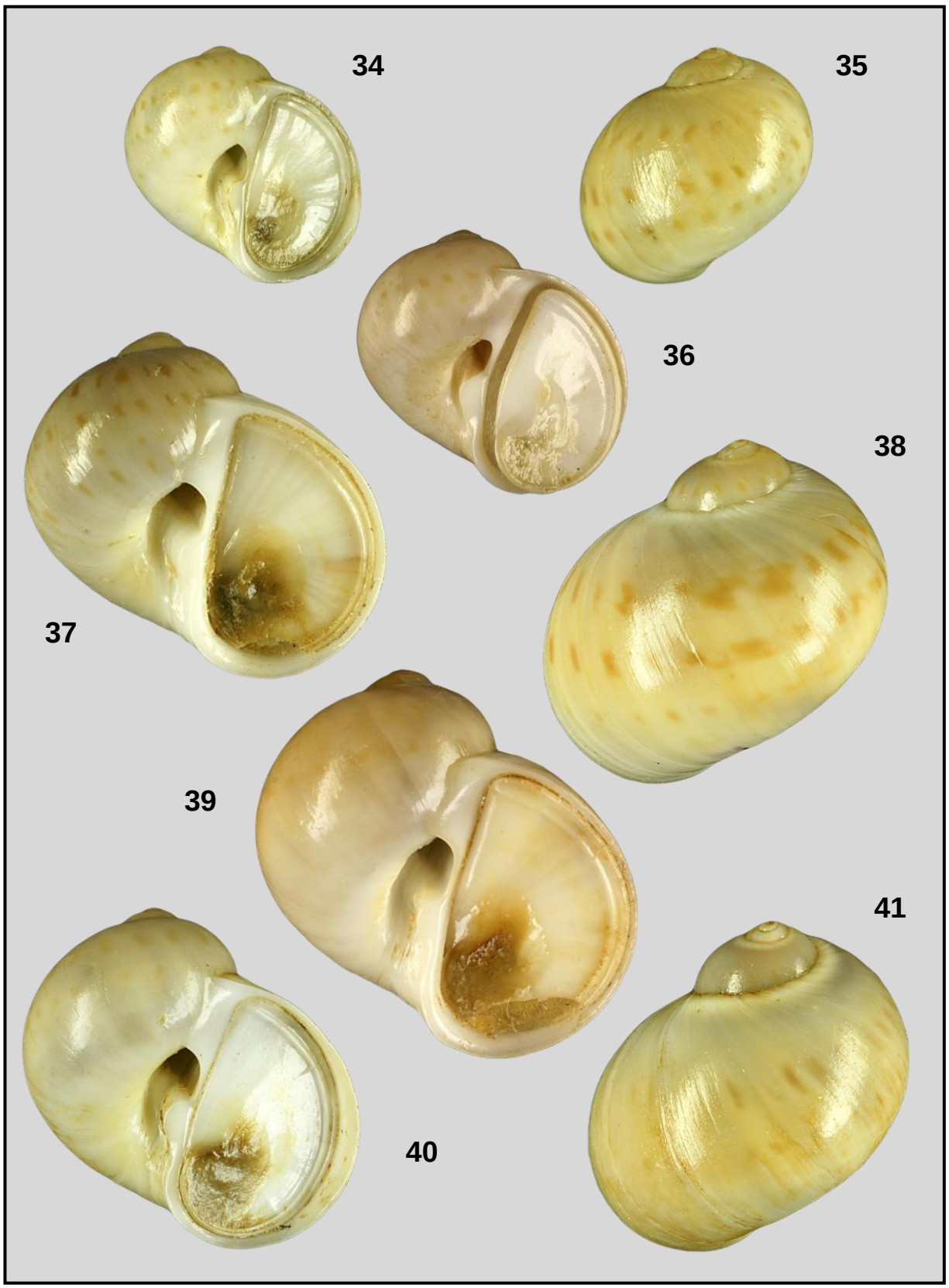
Pl. II. Figs 9-17: *Natica canariensis* Odhner, 1931; 9-10: Cape Verde Islands. 15°26.5‘ N/ 13°14’ W. Dredged at a depth of 100 m. 1959. MNHN. H. 21.15 mm L. 22.84 mm; 11-17: Cap de Naze, Senegal. Dredged at a depth of 40 m. 1987. CFN; 11: H. 11.42 mm L. 12.38 mm; 12-13: H. 25.35 mm L. 25.94 mm; 14-17: N Casamance, Senegal. 12°49’ N/ 17° 31.7’ W. Trawled at a depth of 49 m. 29 March 1988. MNHN; 14-15: H. 25.01 mm L. 26.92 mm; 16-17: H. 28.43 mm L. 29.11 mm.



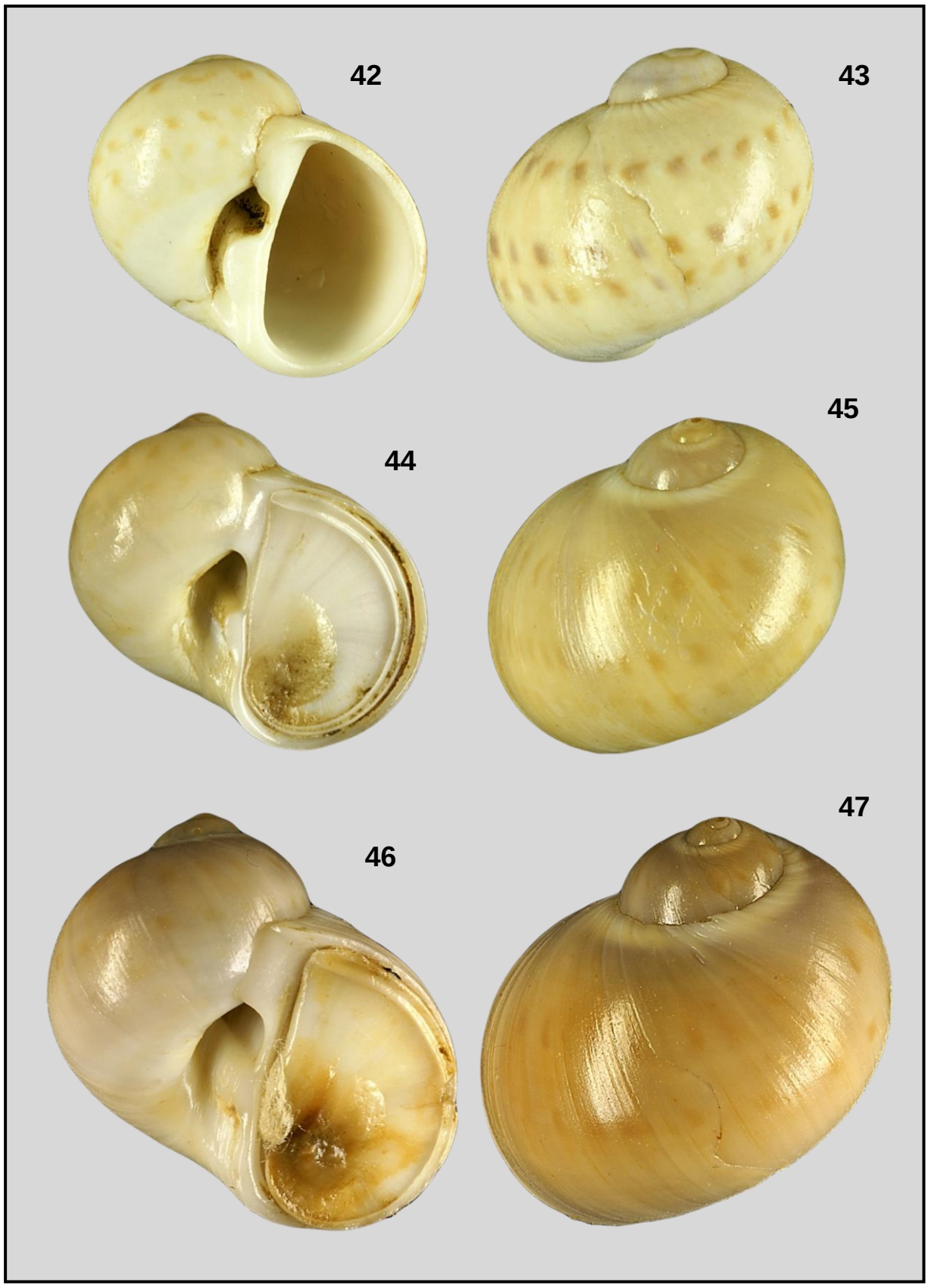
Pl. III. Figs 18-25: *Natica canariensis* Odhner, 1931. CFN; 18-19: off Abidjan, Ivory Coast. Trawled by fishermen; 18: H. 21.38 mm L. 22.05 mm; 19: H. 23.17 mm L. 25.06 mm; 20-25: Mayumba, Gabon. Dredged at a depth of 30 m; 20-21: H. 21.47 mm L. 22.79 mm; 22-23: 20.88 mm L. 23.21 mm; 24-25: H. 29.36 mm L. 28.20 mm.



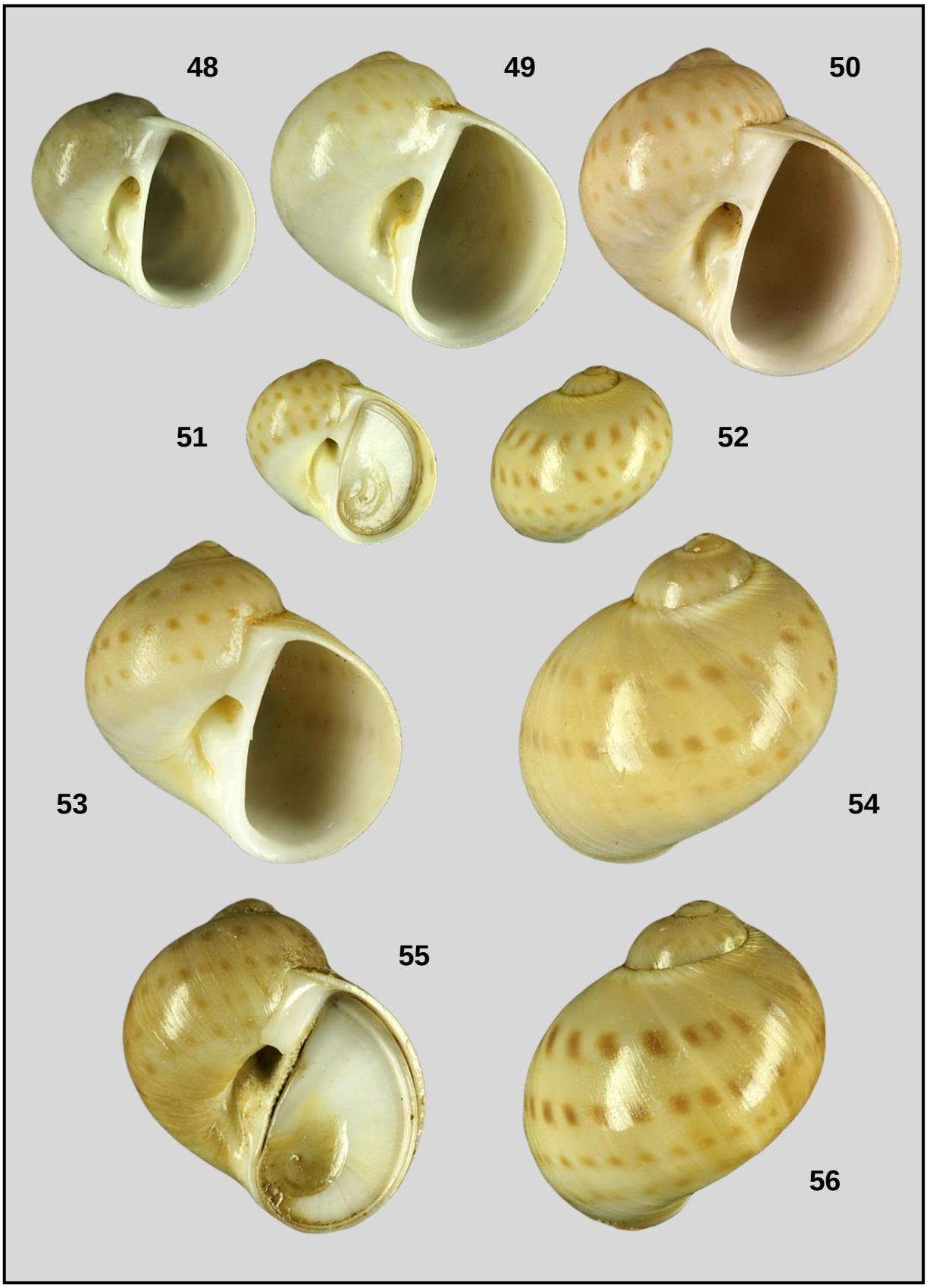
Pl. IV. Figs 26-33: *Natica canariensis* Odhner, 1931. CFN; 26-27: off Luanda, Angola. Dredged at a depth of 45 m. August 1982; 26: H. 12.60 mm L. 14.52 mm; 27: H. 18.83 mm L. 19.72 mm; 28-33: Point of Mussulo, Prov. Luanda, Angola. In shell deposits on the beach; 28-29: H. 15.54 mm L. 16.43 mm; 30-31: H. 23.41 mm L. 24.52 mm; 32-33: H. 30.93 mm L. 31.57 mm.



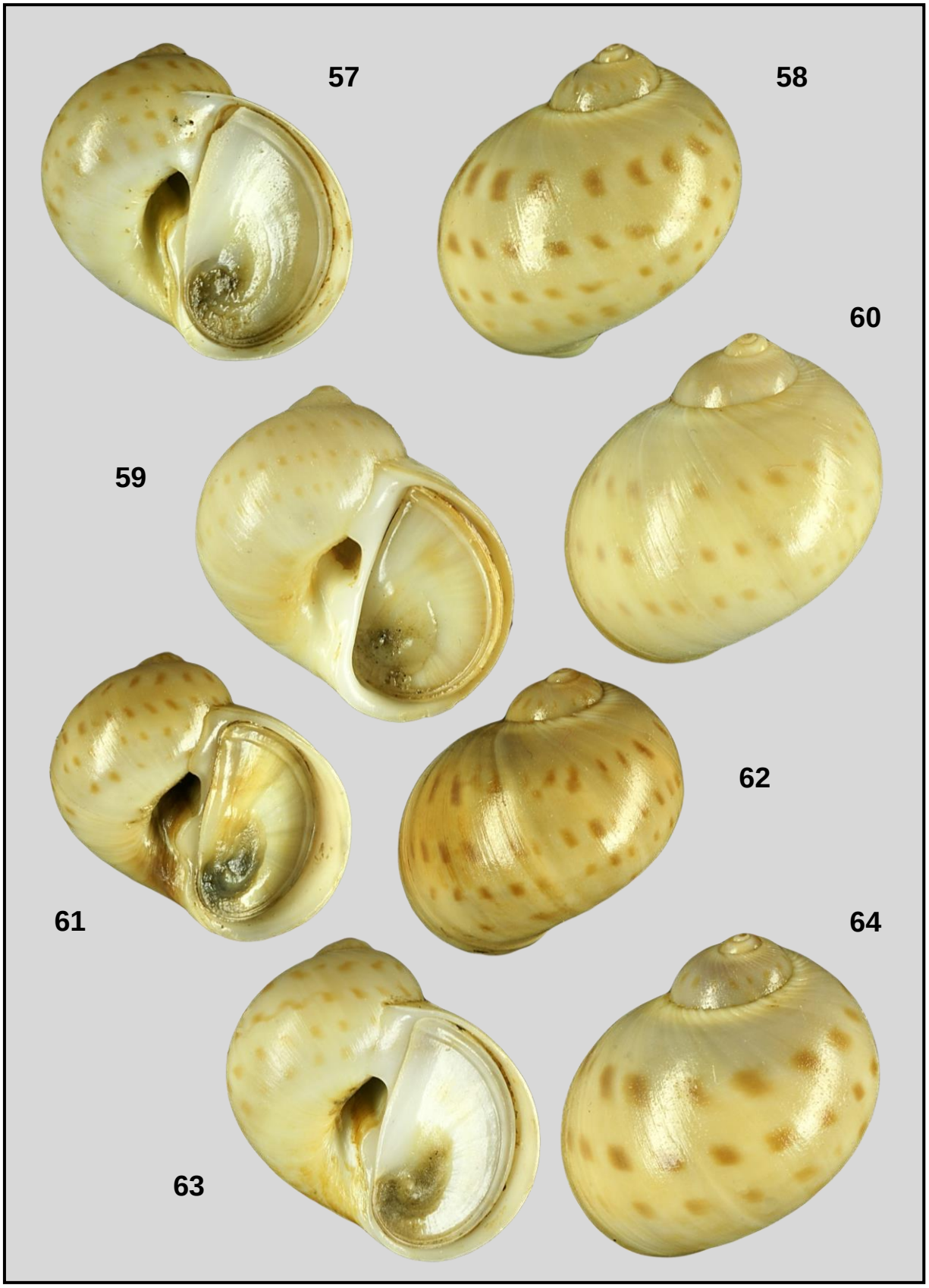
Pl. V. Figs 34-41: *Natica bouvieri* Jousseaume, 1883; 34-36: off Mauritania, NW Africa. 17°48' N/ 16°12' W. Dredged at a depth of 35 m. 1981. MNHN; 34-35: H. 9.64 mm L. 9.72 mm; 36: H. 12.52 mm L. 12.39 mm; 37-41: Cap de Naze, Senegal. Trawled at a depth of 40 m. 1987. CFN; 37-38: H. 16.67 mm L. 17.59 mm; 39: H.16.48 mm L. 16.88 mm; 40-41: H. 18.15 mm L. 19.54 mm.



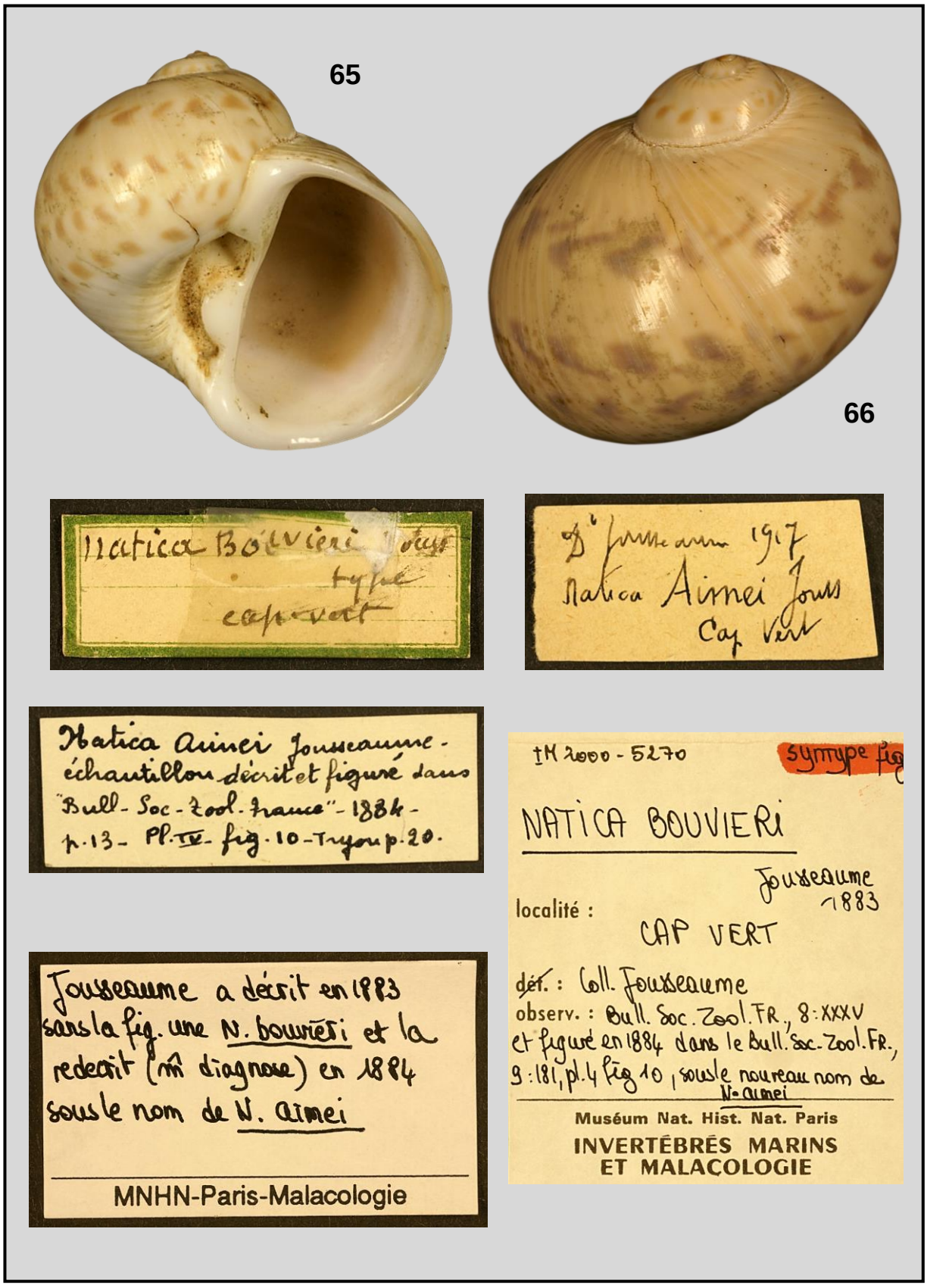
Pl. VI. Figs 42-47: *Natica bouvieri* Jousseaume, 1883. CFN; 42-43: Porto Grande, Cape Verde Islands. Dredged in sand and coralline rubble at a depth of 10-15 m. November 1976. H. 16.65 mm L. 17.79 mm; 44-47: off Abidjan, Ivory Coast. Dredged by shrimper at a depth of 50 m; 44-45: H. 11.93 mm L. 12.35 mm; 46-47: H. 19.50 mm L. 19.32 mm.



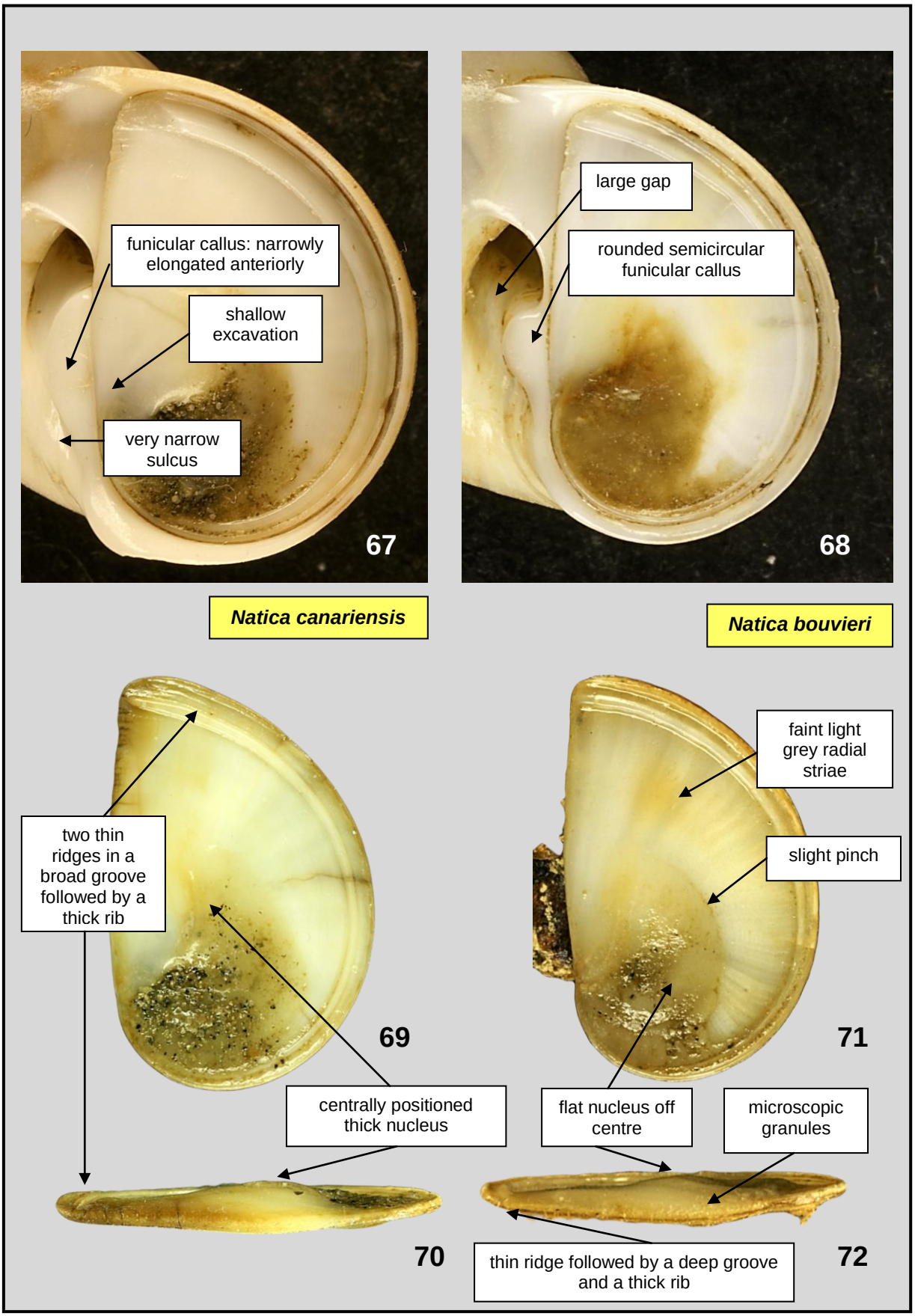
Pl. VII. Figs 48-56: *Natica bouvieri* Jousseaume, 1883; 48-50: Cape Morro, Angola. Trawled by Belgian fishermen (PEMARCO) at a depth of 92 m. 1972; 48: H. 11.30 mm L. 11.13 mm; 49: H. 14.42 mm L. 15.27 mm; 50: H. 18.22 mm L. 18.49 mm; 51-54: Namibe, Prov. Namibe, Angola. Trawled ex pisce, from stomach of *Lophia* sp. 1983. MNHN; 51-52: H. 10.32 mm L. 9.97 mm; 53-54: H. 15.24 mm L. 15.20 mm; 55-56: Radiale de Punta das Lagostas, Angola. Trawled in a muddy bottom at a depth of 30. CFN; 55-56: H. 15.28 mm L. 14.74 mm.



Pl. VIII. Figs 57-64: *Natica bouvieri* Jousseaume, 1883. Radiale de Punta das Lagostas, Angola. Trawled in a muddy bottom at a depth of 30 m. CFN; 57-58 : H. 15.04 mm L. 14.32 mm; 59-60: H. 15.69 mm L. 16.34 mm; 61-62: H. 15.69 mm L. 16.34 mm; 63-64: H. 16.38 mm L. 16.10 mm.



Pl. IX. Figs 65-66: *Natica bouvieri* Jousseaume, 1883. 'Cap Vert'. Syntype. MNHN 5270. H. 28 mm L. 28.8 mm.



Pl. X. Fig. 67: operculum and umbilicus/funicle of *Natica canariensis* Odhner, 1931; Fig. 68: operculum and umbilicus/funicle of *Natica bouvieri* Jousseaume, 1883. Figs 69-70: operculum of *Natica canariensis*; Figs 71-72: operculum of *N. bouvieri.*

The genus *Tomellana* (Mollusca: Gastropoda: Clavatulidae) in West Africa: a comprehensive survey and establishment of *Fusiturris kribiensis* Bozzetti, 2015 as a junior synonym

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Keywords: *Tomellana, Fusiturris kribiensis,* CLAVATULIDAE, Gastropoda, Mollusca, W Africa.

Abstract: The genus *Tomellana* Wenz, 1943 is certainly in need of a detailed revision since very limited information is available in recent literature. As a consequence of this lack of knowledge a species of *Tomellana* has recently been described as *Fusiturris kribiensis* Bozzetti, 2015. It is beyond doubt that the short description and the figures represent *Tomellana hupferi* var. *fusca* (Strebel, 1912). As a consequence the name *F. kribiensis* has to be considered a junior synonym of *Tomellana hupferi* (Strebel, 1912). On the other hand *Tomella pfefferi* Strebel, 1912 is tentatively regarded as '*Fusiturris*' *pfefferi* (Strebel, 1912). In the present paper the history of the genus *Tomellana* is presented, the four species are commented upon and with additional figures are added.

Abbreviations:
CFN: Private collection of Frank Nolf (Oostende, Belgium)
CJV: Private collection of Johan Verstraeten (Oostende, Belgium)
MNHN: Museum naturelle d'Histoire Naturelle (Paris, France)
RBINS: Royal Belgian Institute for Natural Science (Brussels, Belgium)
PEMARCO: Pêche maritime du Congo
ZMUC: Statens Naturhistoriske Museum (Copenhagen, Denmark)

Introduction: The systematic treatment of the CLAVATULIDAE has always been controversial in literature, certainly concerning the true position of the species now belonging to the genus *Tomellana*. First of all I refer to the description of *Tomella* W. Swainson, 1840):
"*Shell fusiform, smooth; the spire of very few whorls and not longer than the channel; inner lip with a thick callosity at the top; the slit short and wide*." Species: *lineata*, *clavicularis*, *filosa* and *lineolata*. Strebel (1912) notes that the last three species, all described by Lamarck, are fossil species and certainly do not belong to *Tomella*.
Weinkauff (1875-77) avoids a classification of the 'PLEUROTOMIDAE' and places all species which will be treated in the present paper in *Clavatula* while Tryon (1884) groups the genera *Clavatula* (with the subgenera *Perrona* and *Clionella*), *Pusionella* and *Surcula* in the subfamily Clavatulinae. G.W. Tryon (1884) does not distinguish *Tomella* from *Perrona* because on the one hand the spire of *Tomella* is not always smooth, in contrast with the keeled appearance in *Perrona*, and on the other hand because the posterior anal sinus is only so heavily directed downwards because of the position of the parietal callus (Strebel, 1912).
P. Fischer (1887) considers *Pusionella* and *Surcula* as separate and independent taxa and notes about the subgenus *Tomella*: "*Spire lisse, sinus large, placé presque au milieu du bord labial (*C. lineata *Lam.)*".
Cossmann (1896) questionably moves *Pusionella* to the family TEREBRIDAE. He supposes that *Surcula* should be separated from the other genera because of its aberrant embryonic whorls and Strebel (1912) uses the same argument to conclude that *Clavatula*, *Perrona* and *Tomella* are similar and belong to the same group. Strebel agrees with Fischer that *Perrona* and *Tomella* are very similar but have to be recognised as separate genera or subgenera. He avoids any discussion about the latter and prefers to use the term "*Gruppe*" (= group). He also refers to Cossmann (1896) who considers *Tomella* and *Perrona* as one and the same genus, but remarks that *Tomella lineata* occupies a special position by missing any fossil forms.
Strebel (1912) is convinced that the diagnosis by Swainson "*very few whorls*" is misleading and meaningless. He also states that the remark about fossil forms distorts the view on the real *Tomella*. He also critisises the short diagnosis by P. Fischer as the expression "*spire lisse*" is untrue. Further on he supposes that Tryon's motivation to combine *Perrona* and *Tomella* is only restricted to *T. lineata*. On the other hand, Tryon places *obesa* Reeve and *taxus* Chemnitz in the genus *Perrona*, creating a mix of shell characteristics in that genus.

Finally, Strebel (1912) decides to redefine the genera *Tomella* and *Perrona* with the purpose of making the classification more transparent and avoiding all further confusion. I hereby give an abbreviated free translation of the original German text.

Shell from fusiform to claviform, solid, rather glossy, spire slightly shorter than last whorl. The first of the 10-11 whorls are slightly sloping down but readily become broader downwards giving the shell a more or less globose outline. First whorls are rather curved, later whorls more evenly and poorly curved. Depending on the general appearance the last whorl is prominently present, the last whorls sometimes only slightly thickened or steeply roof-shaped from the suture forming an edge in the transition to the whorl, its projection only slightly visible. Whorls are separated by a clear suture always followed by a thickened ridge or cord in the first whorls. This ridge or cord disappears afterwards or turns into a parietal callus, depending on the species involved. On the body whorl there is an anal sinus, rounded dorsally and broadened ventrally. The siphonal canal is clearly delineated and is slightly curved at its base. The mouth is oval, clearly separated from the last whorl, and constricted at the top where the parietal thickening ends. The interior of the mouth is whitish, with the darker colour of the outside shining through. The peristome is sharp.
The first 1.5 whorls are smooth, glossy and translucent. Afterwards the spiral structure appears which is surely clearly visible in *T. lineata*, while in other species it is attenuated and only visible under a magnifying glass, yet sometimes prominently present. Curved folds cross all over the first whorls becoming obsolete later on and ending in short, oblique plicae above the suture which - depending on the species - only occur between the second and the seventh whorl and completely disappear later on. The siphonal canal is always provided with spiral grooves which are more or less developed.
The operculum is oval, with a central nucleusl.

Systematic treatment of the species belonging to the genus *Tomellana*:
In recent literature the genus *Tomella* W. Swainson, 1840 is considered as a junior homonym of *Tomella* Robineau-Desvoidy, 1830 [Diptera] and it is substituted by *Tomellana* Wenz, 1943.
Bouchet et al. (2011) regarded *Tomellana* as a subgenus of *Perrona* Schumacher, 1817 but now again consider it a separate genus (WoRMS: www.marinespecies.org – World Register of Marine Species)

Here follows the original diagnosis of the genus *Tomellana* by Powell (1966):
'*This apparently monotypic subgenus differs from* Perrona *in its short, concavely outlined spire, massive peripherical fold, lack of a basal angulation, very heavy parietal callus pad, and deep slit-like anal sinus. Protoconch small, papillate, of 1.5 smooth whorls, followed by a whorl of sigmoid brephic axials. Colouration most distinctive, consisting of numerous narrow dark-brown axial lines on a cream coloured ground. The lines are chevroned in the region of the sinus fasciole, which is in the form of a very shallow groove, situated well below the massive peripheral fold. The anal fasciole does not show on the spire whorls, being immersed by each succeeding whorl. Parietal callus pad white, very massive. Radula with a small narrow-based unicuspid central and a pair of large long simple pointed marginals, with one of the basal limbs detached and overlaid. Known only by the type species, which is Recent from West Africa.'*

Family: CLAVATULIDAE
Genus: *Tomellana* Wenz, 1943
Type taxon: *Clavatula lineata* Lamarck, 1816

Direct child taxa (in alphabetical order):
Tomellana hupferi (Strebel, 1912)
Tomellana hupferi var. *fusca* (Strebel, 1912)
Tomellana leschkei (Strebel, 1912)
Tomellana lineata (Lamarck, 1816)
Tomellana lineata var. gracilis (Strebel, 1912)

Not accepted: Tomellana pfefferi (Strebel, 1912)
= ? *Fusiturris pfefferi* (Strebel, 1912)

***Tomellana lineata* (Lamarck, 1816)**
= *Clavatula lineata* Lamarck, 1816
Pl. I, Figs 1-10; Pl. II, Figs 11-16; Pl. III, Figs 17-21; Pl. IV, Figs 22-27; Pl. V, Figs 28-30
Original description:
'Pleurotoma *testâ subfusiformi, caudata, ventrelaevi, albidâ; lineis longitudinabilus undulato-angulatis spadiceis; ultimo anfracti supernè angulato; spirâ minimâ, mucronatâ; caudâ longiusculâ, striatâ; columellâ supernè callosâ*.'
'var. testâ castaneâ, fusco-lineatâ'
'*Habite ….. Mon cabinet. Coquille assez jolie, renflée et subanguleuse au sommet de son dernier tour, et ayant la forme d'une massue mucronée. Longeur, un pouce. Sa variété, qui n'en diffère que par la coloration, à 11 lignes un quart*.'

I refer to the general characteristics mentioned earlier in this paper.
The colour ranges from dark yellow to light and dark brown, more vividly coloured in the upper

part of the shell, decorated with narrow brown lines, which run more or less parallel or are irregularly spread over the entire surface of the shell, and are sometimes branched. White and very dark brown shells are extremely rare. A prominent swollen white callus on the parietal wall of the inner lip reaches the suture between the last two whorls. Sometimes a very narrow paler band is visible in the subsutural area. The bottom of the columellar side is also whitish coloured. The protoconch consists of 1.5 whorls and is sometimes purplish adorned with a pattern which continues in the three following whorls. In larger specimens, the spiral grooves sometimes become very obsolete in the middle of the last whorl.

Most common are the claviform shells which have whorls with a very concavely curved outline and a body whorl which is very swollen in contrast to the spire. Subsequently there is a less or more distinct constriction above the anal area.

There is a form with convex whorls in the spire in contrast with the concave whorls in the type. It is less claviform in outline. The last whorl is smaller in height and less broad at its upper side in such a way that the labial callus and the anal sinus are situated at a lower position.

Another form is distinguished from the type by its slenderer outline and a prominent longer siphonal canal. It is much like the var. *gracilis*, which is treated separately. Both are very rare.

Measurements: 20-34.5 mm.

Habitat: in sand or muddy sand. Depth: 2-40 m

Geographic range: off Abidjan, Ivory Coast (CFN), Salt Point, Ghana (Strebel), Bugama, Nigeria (Strebel), Cameroon (Strebel), Black Point, Gabon (Strebel), Setta Kama, Gabon (Strebel), Loango, Gabon (Strebel), Banana, Congo (CFN), Cabinda, Angola (Strebel), Landana, Angola (Strebel), Cacuaco, N of Luanda, Angola (CFN, MNHN), Luanda Bay, Angola (CFN), Mussulo, Angola (Strebel), Quicombo, Angola (Strebel), Ambriz, Angola (Strebel), Cabo Ledo, Prov. Luanda, Angola (CFN, MNHN), Barra do Dande, Prov. Bengo, Angola (CFN, MNHN).

***Tomellana lineata* var. *gracilis* (Strebel, 1912)**

Pl. V, Figs 31-34; Pl. VI, Figs 35-41;
Pl. VII, Figs 42-48; Pl. VIII, Figs 49-53

Slender fusiform shell with less curved whorls, but the main characteristic is the subsutural cord, which gradually slopes down from the suture like a continuous roof tile, mostly rounded, but sometimes slightly pointed. Strebel believed that this form was more common in more northern localities, e.g. Senegal and Ghana, while the type form was predominantly present is southern areas (Cameroon, Gabon, Angola, …). After a careful study of hundreds of specimens in the MNHN I can confirm both forms occur in the same localities, but apart from a few exceptions, the type form indeed seems to be restricted to the south of the geographic range (from Congo to Angola).

Measurements: 20 -29.5 mm.

Habitat: in muddy or sandy bottom, depth: 7-50 m.

Geographic range: Gorée, Senegal (Strebel), Grand Bassam, Ivory Coast (Strebel), off Abidjan, Ivory Coast (CFN, MNHN), Accra, Ghana (Strebel), Mudrachmi Bay, Ghana (CFN), Grand Popo, Benin (Strebel), Setta Kama, Gabon (Strebel), Pointe-Noire, Congo-Brazzaville (CFN, MNHN), Banana, Congo (CFN), Landana, Angola (Strebel), Barra do Dande and Barra do Bengo, Prov. Bengo, Angola (CFN, MNHN)

***Tomellana hupferi* (Strebel, 1912)**

Pl. IX, Figs 54-61

The general appearance and arrangement of whorls in this species are similar to *T. lineata* var. *gracilis*, but it can easily be differentiated by its glossy appearance and slenderer outline.

In this species the subsutural cord is present as a very narrow sharp ridge. There is no trace of a second ridge at the base of the anal sinus like in *T. lineata* var. *gracilis* The first four whorls possess clear axial carinate folds, while in *T. lineata* var. *gracilis* these folds are nearly invisible or sometimes completely absent. The surface is provided with tiny parallel lines becoming deeper incised at the base of the shell. The parietal callus is never as impressive as in most specimens of *T. lineata*, but can be compared with that in *T. lineata* var. *gracilis*.

The background colour varies from creamish white or yellow to flesh-coloured covered with broad brown axial flammules which are bifurcated from the subsutural ridge downwards. The subsutural cord is whitish and in the middle of the body whorl there is a hardly visible broken off-white band.

Measurements: 20-26 mm.

Habitat: in soft mud, depth: 17-20 m; 10-14.5 m (Strebel). Typically covered with *Bryozoa*.

Geographic range: Gorée, Senegal (Strebel), Petit Popo, Togo (Strebel), Grand Popo, Benin, (Strebel), Ouidah (Whydah), off Lagos, Nigeria, 05°59' N/ 04°36' E and 05°34' N/ 04°50' E (ZMUC), Victoria, Bota (Limbé), Cameroon (Strebel)

***Tomellana hupferi* var. *fusca* (Strebel, 1912)**

Pl. X, Figs 62-67; Pl. XI, Figs 68-72

This form is only differentiated from the type by the dark chestnutbrown colour of the flammules all over the whorls clearly showing through in the

aperture. This characteristic is accentuated by the contrasting white colour of the background, making the central band on the body whorl more visible. The edge of the mouth is also provided with a cream-white band. On the other hand the parietal callus is not white, but light brown.
Measurements: 21-27.5 mm.
Habitat: in muddy sand, depth: 6 m (CFN); 10-13 m (Strebel); 18-20 m (Bozzetti).
Geographic range: Lomé, Togo (Strebel), Ouidah (Whydah), Benin (Strebel), Victoria, Bota (= Limbé), Cameroon (CFN).
Remarks: This form has recently been described as a new species by L. Bozzetti (2015): ***Fusiturris kribiensis.***
After comparison with the figures we can immediately conclude there was no reason to recognise this form as a new species and certainly not to classify it into the genus *Fusiturris* which has an uncertain status in the family CLAVATULIDAE. Moreover, this is merely a form, not only restricted to Cameroon but also occurring in neighbouring waters (Togo, Benin) together with the nominal type. Therefore there is no reason to regard it as a subspecies.

***Tomellana leschkei* (Strebel, 1912)**

Pl. XII, Figs 73-78

Fusiform shell with 9-9.5 convex whorls, rather glossy. This species can easily be differentiated from *T. hupferi* by the swollen body whorl. The 2nd to the 5th whorl are separated by a distinctive suture supported by a subsutural keeled cord which becomes rounded in later whorls and completely disappears in the body whorl. However, some specimens may occasionally again show a sharp-ridged subsutural cord in the last whorl (Strebel, 1912). The 1.5 embryonic whorls are smooth but in the 2nd to 4th whorl axial folds, which occupy the complete surface of a whorl and are most distinctive in the suprasutural area, may appear. These plicae completely disappear in the 5th whorl. A spiral sculpture of parallelly incised lines is hardly visible over the entire surface. The siphonal canal is provided with a series of narrow grooves. The parietal callus is relatively obvious.
The colour is translucent white to very light bluish-grey, contrasting with the subsutural zone and the parietal callus which are pure white. Rarely yellow coloured.
Remark: The apical angle of the postnuclear whorls is larger than in *T. lineata*. The last whorl is more prominent and more bulbous.
Measurements: 10-24 mm.
Habitat: in sand of tidal zone.
Geographic range: Accra, Ghana (Strebel), Cap Esterias, Gabon (CFN, MNHN), Praia Santiago, Prov. Bengo, Angola (CFN).

'*Tomella pfefferi* (Strebel, 1912)' = ?*Fusiturris pfefferi* (Strebel, 1912)

Pl. XIII, Figs 79-86

The following characteristics are paraphrased from Strebel (1912):
Protoconch with 1.5 smooth whorls, and a total of 11-12 whorls. Fusiform shell, rather glossy but to a lesser extent than *T. hupferi*. The outline of the last whorl is slightly different and sometimes constricted from the middle to the base, a characteristic particularly visible in more juvenile or semi-adult specimens. From the first whorls to the body whorl a subsutural cord continuously runs as a rather sharp ridge extending beyond the whorls outline. The whorls are provided with clearly visible tiny spiral striae in the subsutural zone becoming obsolete later on and finally ending in deeper grooves at the base of the body whorl. Moreover, axial folds are prominently present in the suprasutural zone of each whorl, starting as small nodules in the first whorls, becoming elongated later on and becoming prominent at shoulder height of the last whorl of juvenile and semi-adult shells. In adult shells the plicae disappear when reaching the last whorl. The parietal callus, nearly absent in juvenile specimens, is smaller and not as striking as in *Tomellana* species.
The shells are intensely brown flesh-coloured with a lighter subsutural ridge and siphonal canal.
Measurements: 26 mm.
Habitat: in soft mud, depth: 27-29 m; 11-15 m (Strebel).
Geographic range: Grand Popo, Benin (Strebel), off Lagos, Nigeria, 05°34' N/ 04°50' E and 06°06' N/ 04°29' E (ZMUC)
Remarks: This is a controversial species, especially due to the obscure and confusing figure rendered by Strebel (1912). This is a species which is very hard to obtain because it is probably restricted to a very small area. The only known material is the six specimens from Grand Popo (Benin) (Strebel, 1912) and 17 other specimens collected by the "*Atlantide*" Expedition in Nigeria and Benin.
I have studied the latter material, kindly provided on loan by the ZMUC, and I am convinced this is not a *Tomellana* snce the shell has most characteristics of '*Fusiturris'*, showing a close affinity with *F. amianta* (Dautzenberg, 1912) and other related species: a very slender shell with a clear constriction from the middle of the body whorl to the base, distinct axial folds running all over the whorls and especially the lack of a parietal callus. See also the underlined fragments in the translation from Strebel's description. The remarks on this species will be elaborated on in a next paper, treating already

known and new species of the controversial genus '*Fusiturris*' in West Africa.

Conclusion: The three species belonging to the genus *Tomellana* can easily be separated from each other, despite a certain grade of variability. I refer to the comparative table for a survey of all the main characteristics of *T. lineata*, *T. lineata* var. *gracilis*, *T. hupferi*, *T. hupferi* var. *fusca* and *T. leschkei*. I reject the classification of *Tomellana pfefferi* (Strebel, 1912) and I propose to provisionally assign it to *Fusiturris*. On the other hand the newly described *Fusiturris kribiensis* Bozzetti, 2015 is obviously only a form of *Tomellana hupferi*, known as *T. hupferi* var. *fusca* (Strebel, 1912) and should therefore be considered a mere synonym of the latter.

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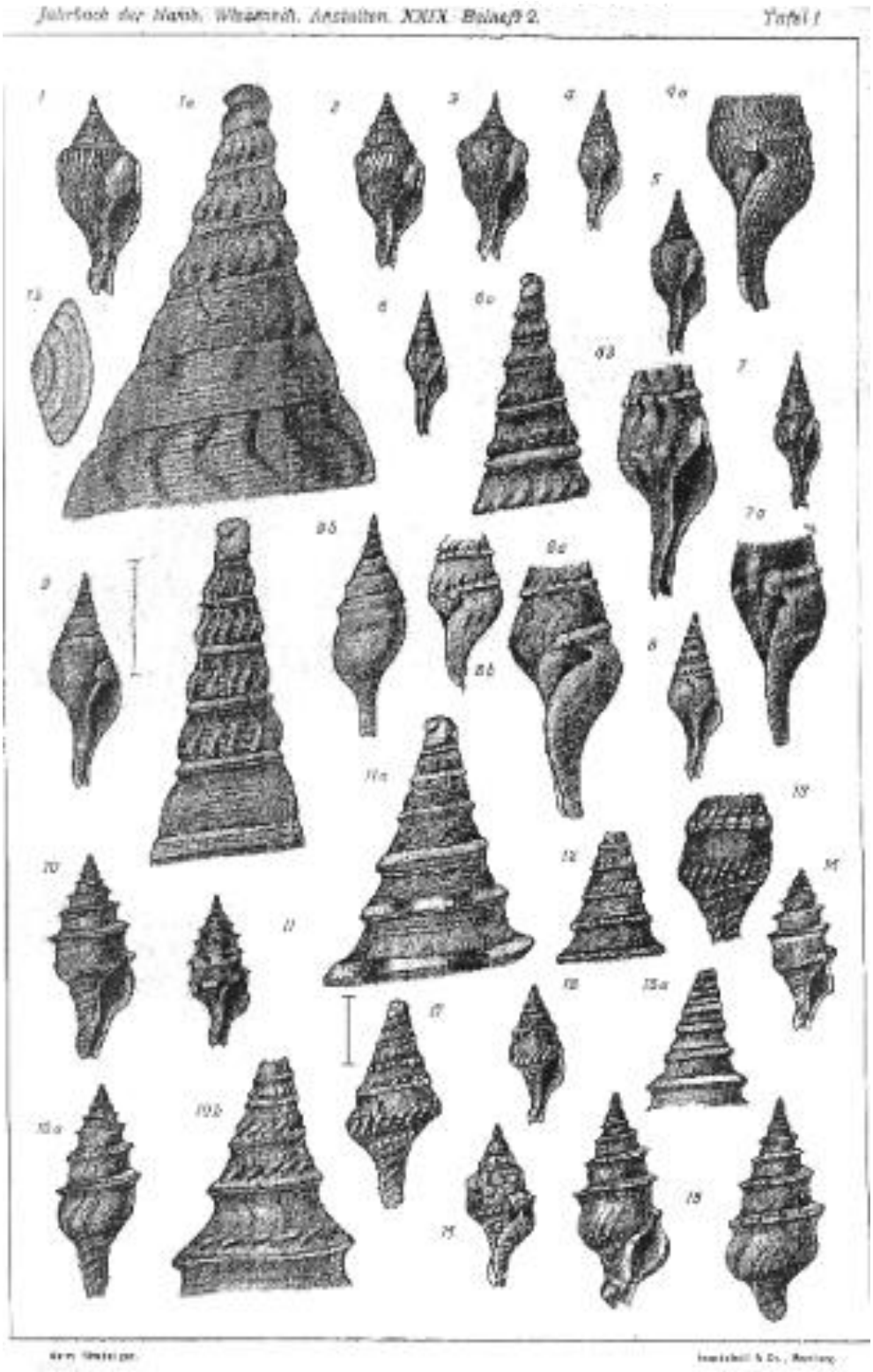
Geographic distribution of *T. lineata* (△), *T. lineata* var. *gracilis* (▲), *T. hupferi* (□), *T. hupferi* var. *fusca* (■) and *T. leschkei* (○)

	T. lineata	***T. lineata*** **var. *gracilis***	***T. hupferi***	***T. hupferi*** **var. *fusca***	***T. leschkei***
general outline	**claviform**	fusiform	**slender**, fusiform; glossy	**slender**, fusiform	fusiform, glossy; apical angle of postnuclear whorls larger than in *T. lineata*
body whorl	**very swollen, broad shoulder**	**less globose**	not swollen	not swollen	**bulbous**
parietal callus	**prominent and white**	small, less striking	rather obscure	obscure; **brown**	small
subsutural cord	nearly completely **absent**	**mostly rounded and thickened, especially apparent in body whorl**	cord is replaced by a **very narrow, sharp, whitish ridge**	cf *T. hupferi*	**keeled in spire whorls, rounded in last whorls**; not always distinctive
axial folds	**absent**	rarely visible, **mostly absent**	**clearly visible** in first four whorls	cf *T. hupferi*	only present in first five whorls in the suprasutural area; not always visible
colour	from dark yellow to light and dark brown; **narrow parallel brown lines over the entire surface of shell, often branched**	cf *T. lineata*	from yellow to flesh-coloured with brown axial flammules; indistinct white band in middle of body whorl	**dark chest-nut flammules** all over the whorls, contrasting with the cream colour of the background	**white**, exceptionally yellow

Comparative table for the identification of West African species of *Tomellana*



Figs 1-3,5: *Tomella lineata* (Lamarck, 1816)
Figs 4, 4a*: Tomella lineata* var. *gracilis* Strebel, 1912
Figs 6, 6a & 6b: *Tomella hupferi* Strebel, 1912
Figs 7 & 7a: *Tomella hupferi* var. *fusca* Strebel, 1912
Figs 8, 8a & 8b: *Tomella pfefferi* Strebel, 1912
Figs 9, 9a & 9b: *Tomella leschkei* Strebel, 1912

From: Strebel, H., 1912. Bemerkungen zu den Clavatula-Gruppen Perrona und Tomella. *Jahrbuch der Hamb. Wissensch. Anstalten,* 29(2): 1-24. Tafel I.

Plate I. Figs 1-10: *Tomellana lineata* (Lamarck, 1816). Cacuaco, north of Luanda, Angola. Dredged in muddy sand at a depth of 18 m. 1992. CFN; 1-2: 19.19 m; 3-4: 19.23 mm; 5-6: 21.42 mm; 7-8: 19.82 mm; 9-10: 24.32 mm.

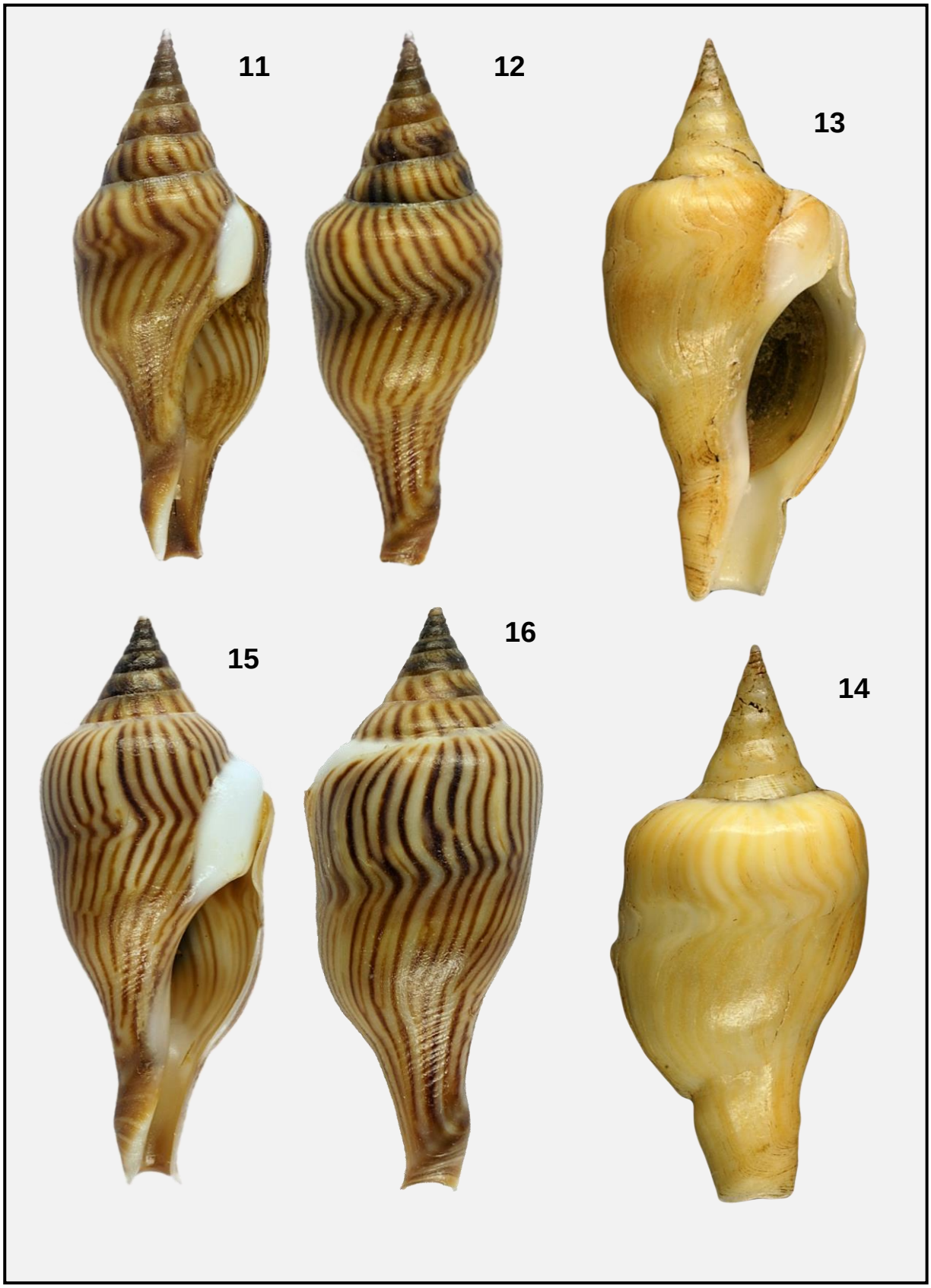


Plate II. Fig 11-16: *Tomellana lineata* (Lamarck, 1816). Cacuaco, north of Luanda, Angola. Dredged in muddy sand at a depth of 18 m. 1992. CFN; 11-12: 25.66 mm; 13-14: 27.40 mm; 15-16: 27.26 mm.

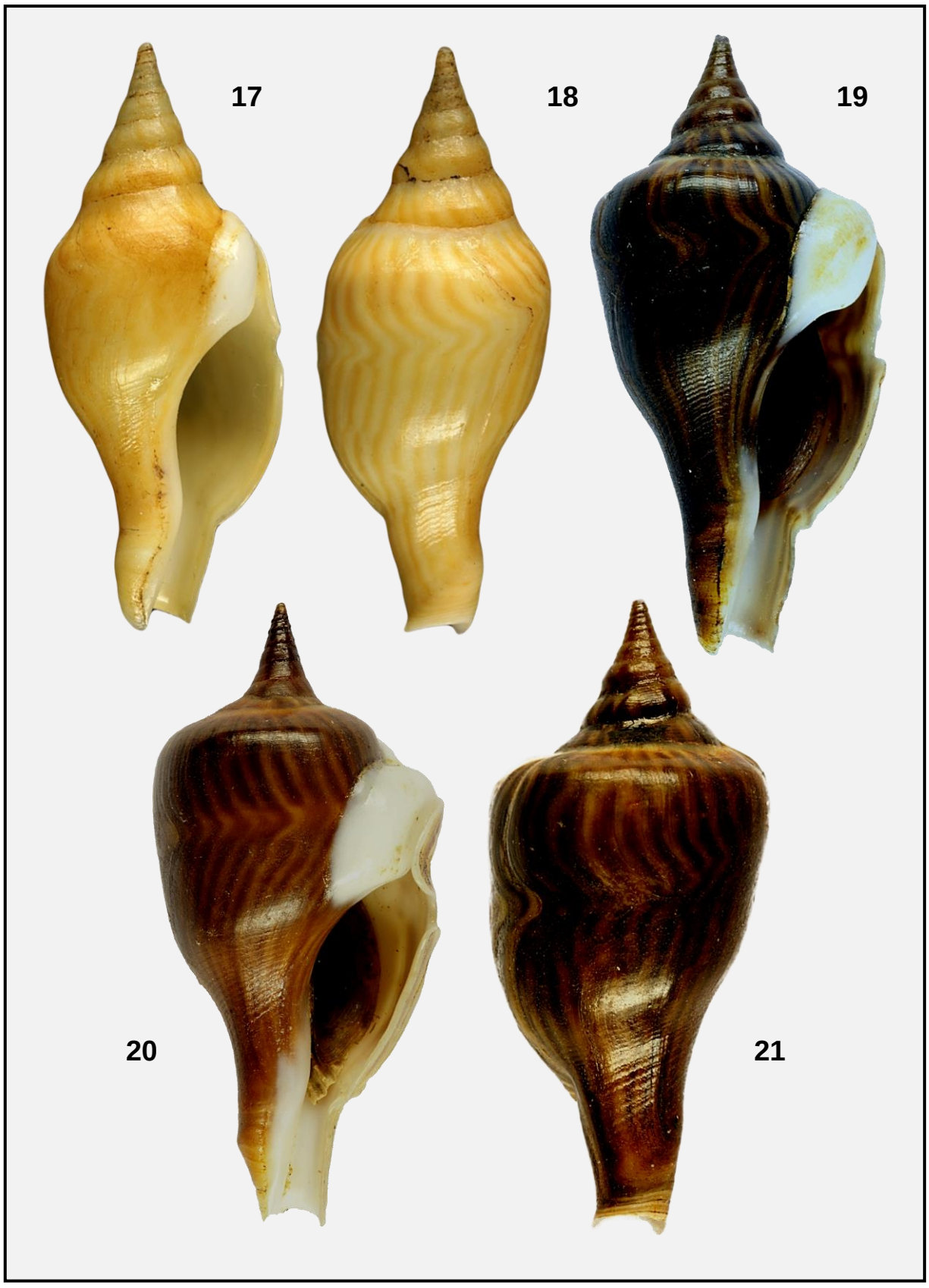


Plate III. Fig 17-21: *Tomellana lineata* (Lamarck, 1816). Cacuaco, north of Luanda, Angola. Dredged in muddy sand at a depth of 18 m. 1992. CFN; 17-18: 29.91 mm; 19: 32.88mm; 20-21: 29.25 mm.

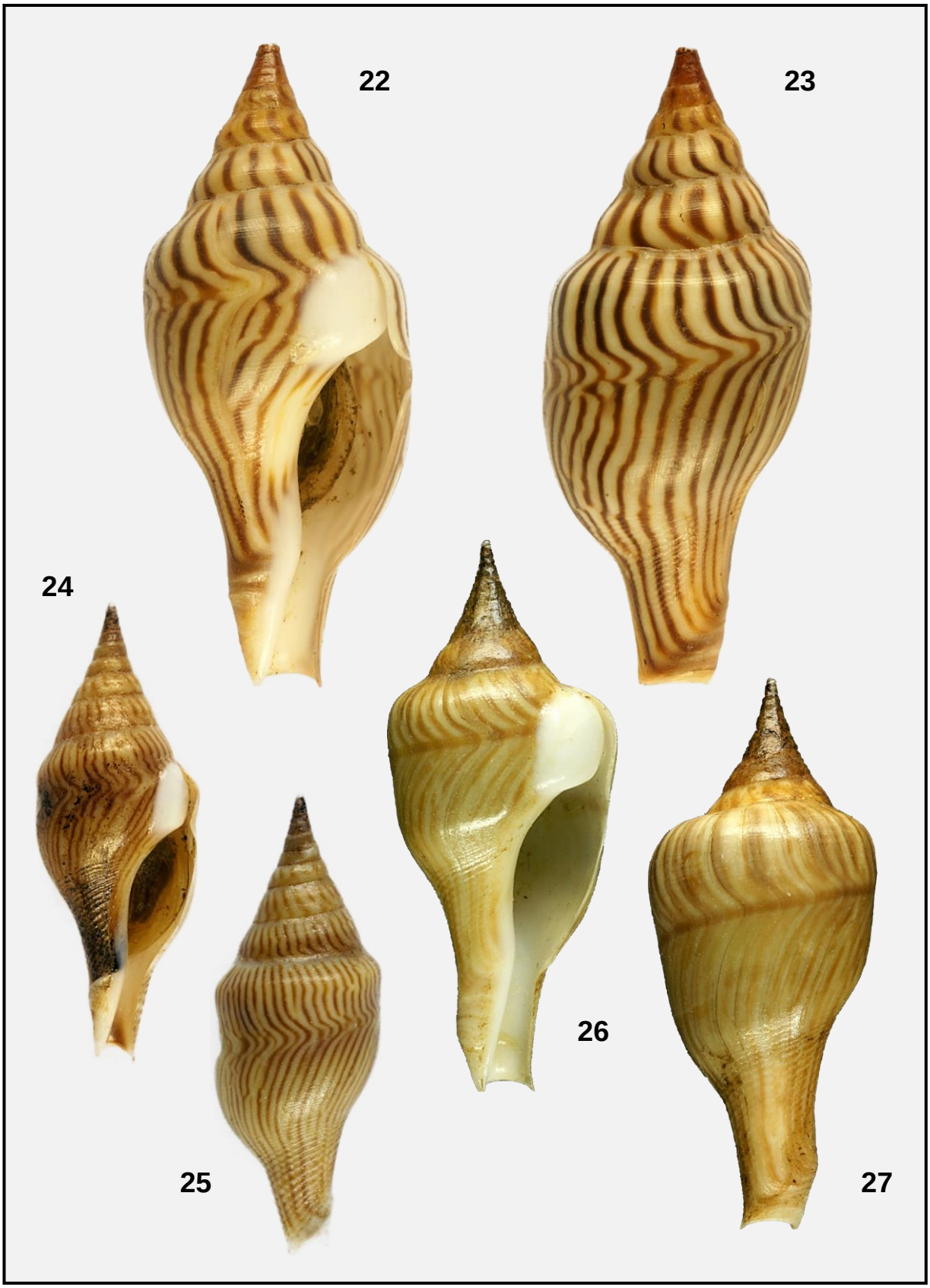


Plate IV. Fig 22-27: *Tomellana lineata* (Lamarck, 1816). CFN; 22-23: Cacuaco, north of Luanda, Angola. Dredged in muddy sand at a depth of 18 m. 1992. 34.26 mm; 24-27: Banana, Congo. Trawled by Belgian fishermen (PEMARCO) at a depth of 22 m; 24-25: 25.18 mm; 26-27: 31.37mm.

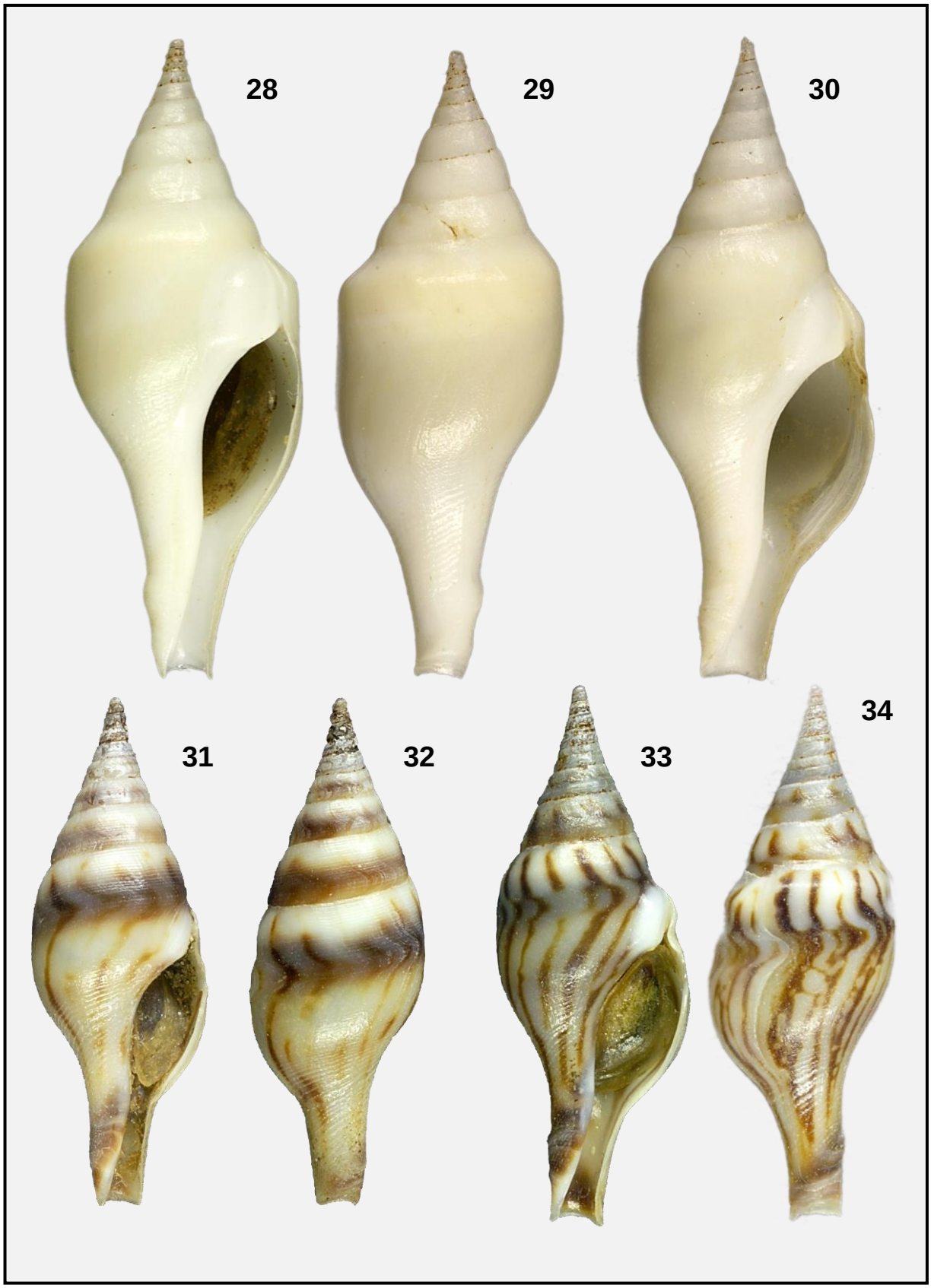


Plate V. Figs 28-30: *Tomellana lineata* (Lamarck, 1816). Off Abidjan, Ivory Coast. Dredged at a depth of 40 m. CFN; 28-29: 26.87 mm; 30: 28.34 mm;
Figs 31-34: *Tomellana lineata* var. *gracilis* (Strebel, 1912). Barra do Bengo, Angola. Trawled at a depth of 50 m. 1982. MNHN; 31-32: 20.53 mm; 33-34: 21.08 mm.

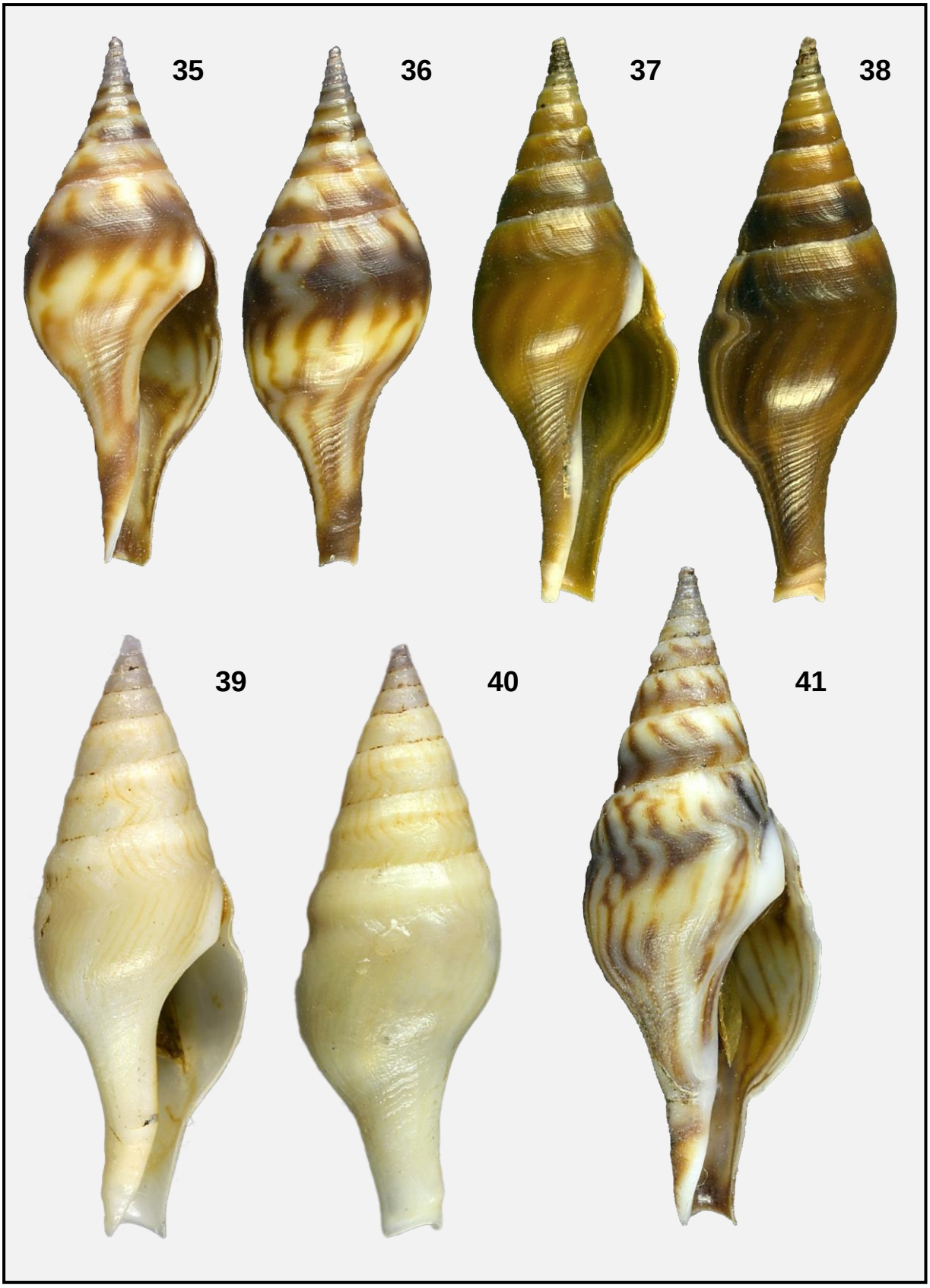


Plate VI. Figs 35-41: *Tomellana lineata* var. *gracilis* (Strebel, 1912). Barra do Bengo, Angola. Trawled at a depth of 50 m. 1982. MNHN; 35-36: 21.18 mm; 37-38: 23.84 mm; 39-40: 26.83 mm; 41: 28.26 mm.

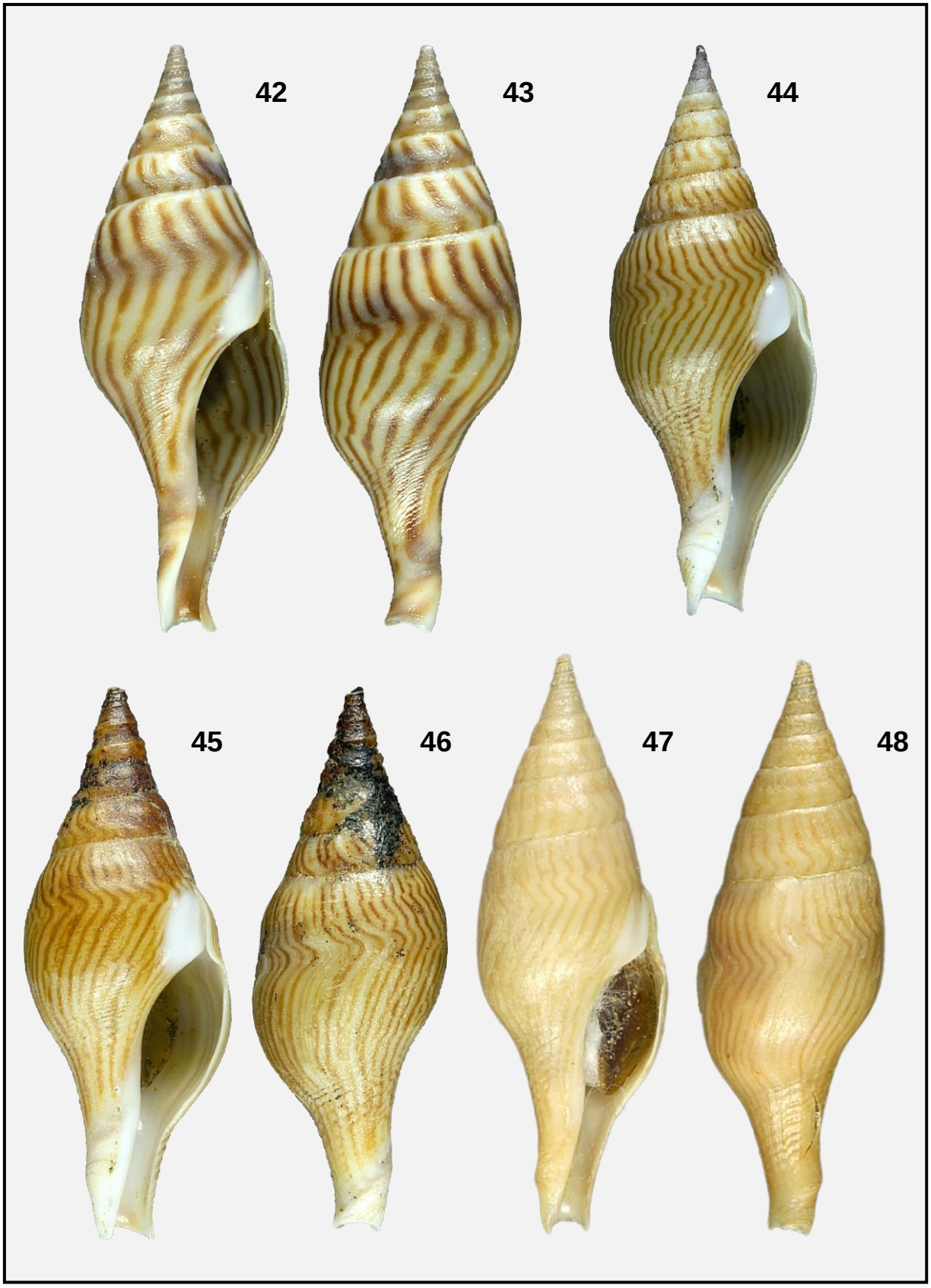


Plate VII. Figs 42-48: *Tomellana lineata* var. *gracilis* (Strebel, 1912). MNHN; 42-44: Pointe Noire, Congo-Brazzaville. Dredged at a depth of 6 m. December 1980; 42-43: 28.42 mm; 44: 28.13 mm; 45-48: Dredged off Abidjan, Ivory Coast; 45-46: 26.59 mm; 47-48: 28.56 mm.

Plate VIII. Figs 49-53: *Tomellana lineata* var. *gracilis* (Strebel, 1912). Dredged off Abidjan, Ivory Coast. CFN; 49-50: 27.57 mm; 51: 28.45 mm; 52-53: 29.67 mm.

Plate IX. Figs 54-61: *Tomellana hupferi* (Strebel, 1912). ZMUC; 54-55: '*Atlantide*' Expedition, Station 101, 05°59' N/ 04°36' E Nigeria. Dredged in soft mud at a depth of 17 m. 16 February 1946. 23.1 mm; 56-61: '*Atlantide*' Expedition, Station 102, 05°34' N/ 04°50' E Nigeria. Dredged in mud at a depth of 17 m. 15 February 1946; 56-57: 20.2 mm; 58-59: 24.1 mm; 60-61: 26.7 mm.

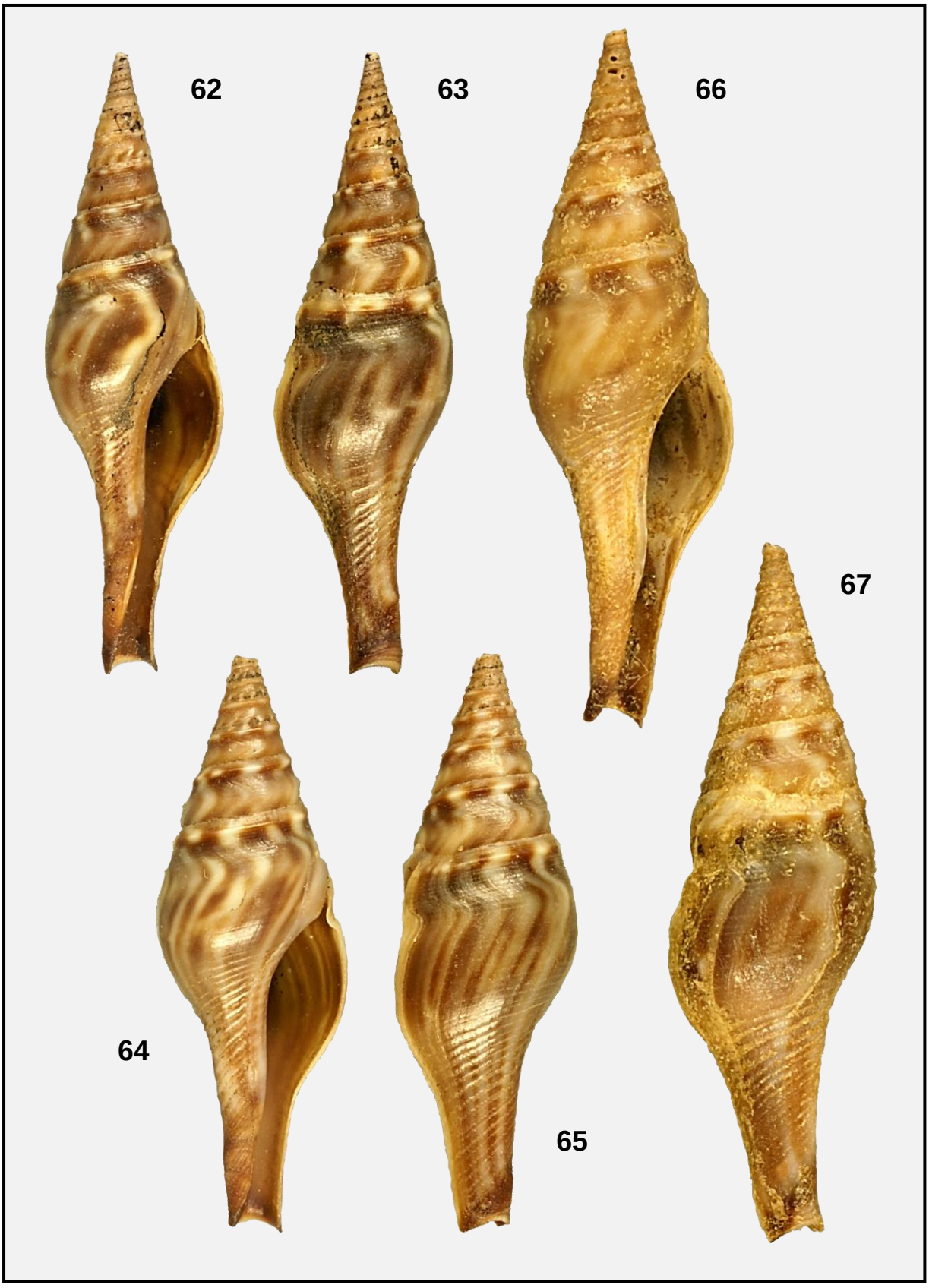


Plate X. Figs 62-67: *Tomellana hupferi* var. *fusca* (Strebel, 1912). Bota, Victoria, Cameroon. Dredged in muddy sand at a depth of 6 m. 2014. CFN; 62-63: 25.63 mm; 64-65: 24.79 mm; 66-67: 27.27 mm.

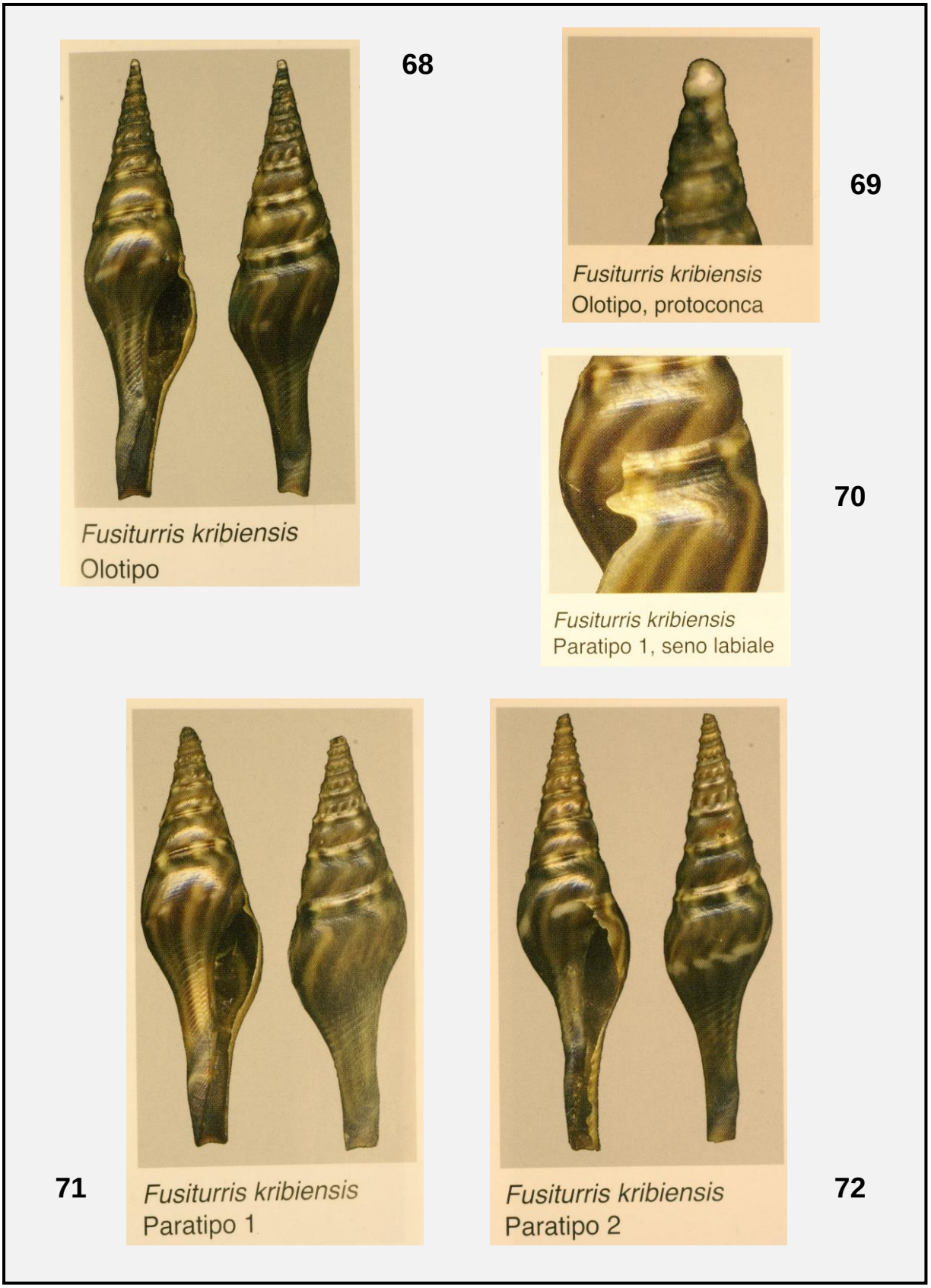


Plate XI. Figs 68-72: '*Fusiturris kribiensis* Bozzetti, 2015' = junior synonym *of Tomellana hupferi* var. *fusca* (Strebel, 1912); all from *Malacologia*, **86**: 8-10: Due nuove *Fusiturris* (Gastropoda: Neogastropoda: Clavatulidae) dall'Africa Occidentale by L. Bozzetti (2015); 68: holotype; 69: protoconch of holotype; 70: paratype 1: labial sinus; 71: paratype 1; 72: paratype 2.

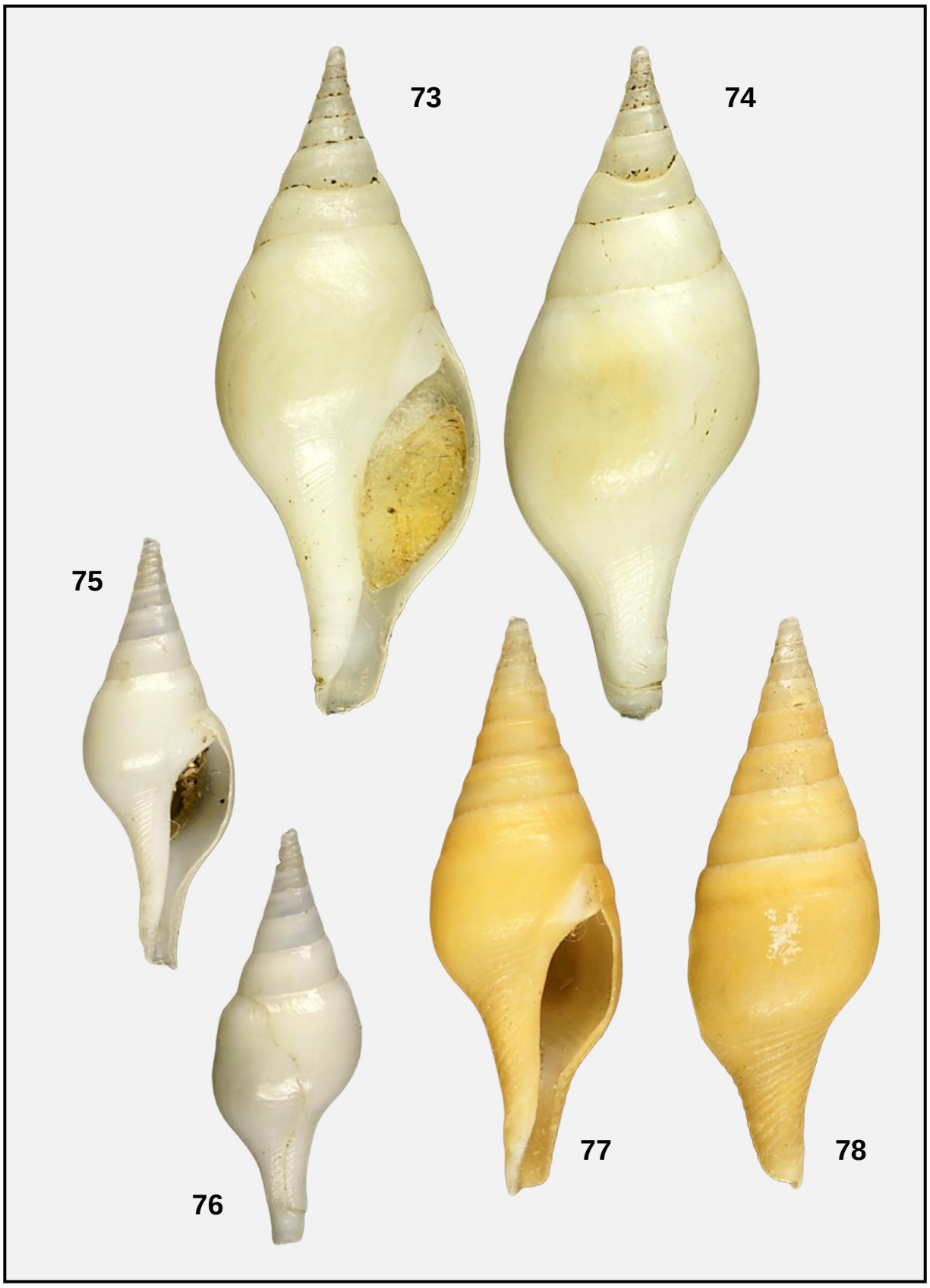


Plate XII. Figs 73-78: *Tomellana leschkei* (Strebel, 1912). CFN; 73-74: Pointe Idolo, Cap Esterias, Gabon. On rocks at low tide. March 2008. 21.20 mm; 75-78: Praia Santiago, Prov. Bengo, Angola. Snorkelled in sand at a depth of 2 m. July 1995; 75-76: 14.08 mm; 77-78: 20.16 mm.

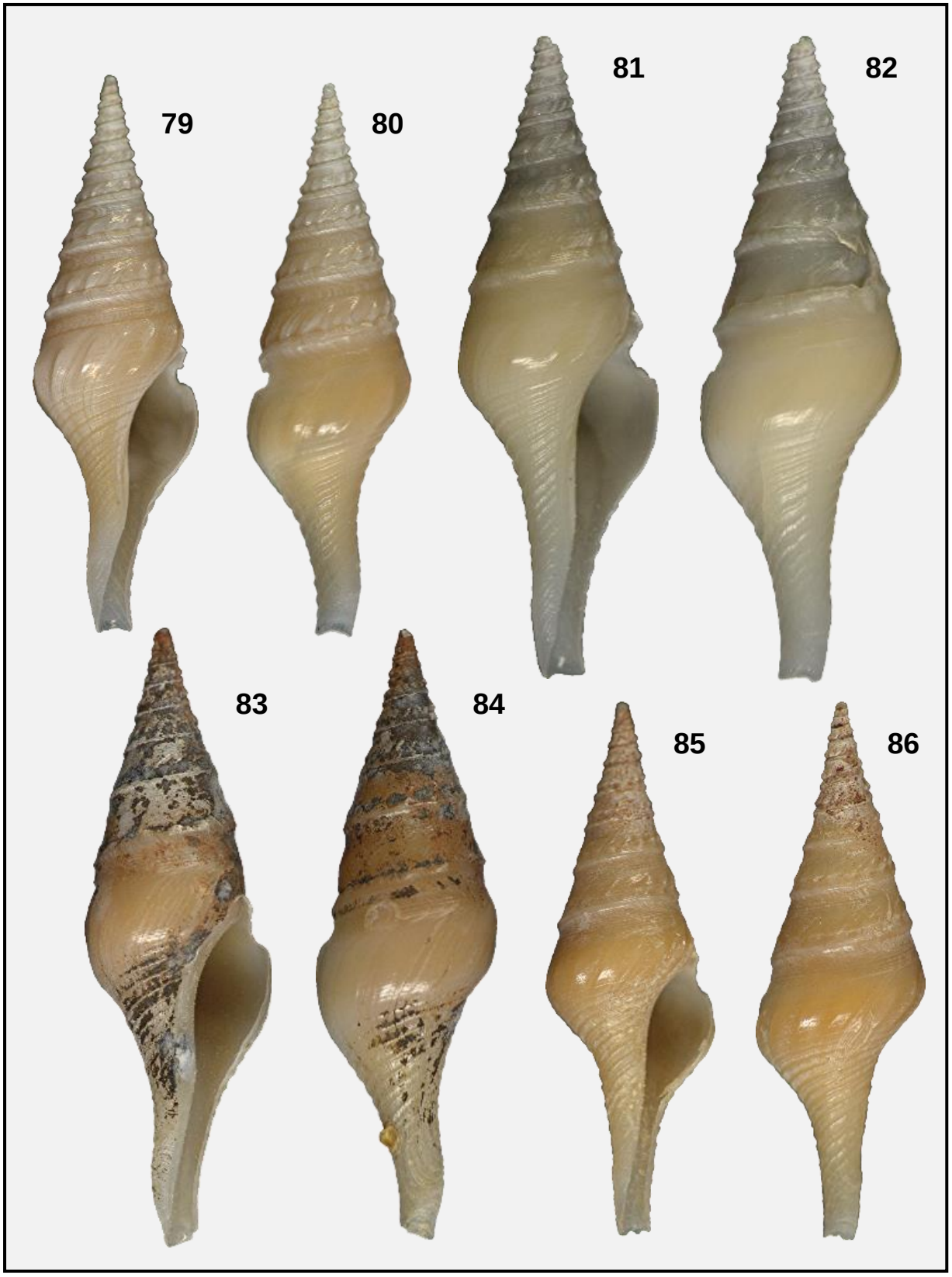


Plate XIII. Figs 79-86: '*Fusiturris*' *pfefferi* (Strebel, 1912). ZMUC; 79-82: '*Atlantide*' Expedition, Station 100, 06°06' N/ 04°29' E, Nigeria. Dredged in soft mud at a depth of 29 m. 15 February 1946; 79-80: 20.4 mm; 81-82: 25.9 mm; 83-86: '*Atlantide*' Expedition, Station 102, 05°34' N/ 04°50' E, Nigeria. Dredged in soft mud at a depth of 27-29 m. 16 February 1946; 83-84: 30.3 mm; 85-86: 20.9 mm.