Pusionella albocincta (Petit de la Saussaye, 1851): a form of *P. nifat* (Bruguière, 1792) (Mollusca: Gastropoda: Turridae)

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Keywords: MOLLUSCA, GASTROPODA, TURRIDAE, *Pusionella*, West Africa.

Abstract: Originally Petit de la Saussaye (1851) described a shell from West Africa as *Fusus albocinctus* comparing it with *Pusionella vulpina* (Born, 1780). Later on, Tryon (1884) regarded this shell as a variety of the latter, an opinion followed by Tucker (2004). However, this shell is not *P. vulpina* at all but merely a form of *Pusionella nifat* (Bruguière, 1792), differing from its usual appearance by the dark brown colour and median white band on the body whorl. Although this form is typical of specimens living on the Islands of São Tomé & Principe, it is probably not a subspecies as it has also been recorded from Senegal.

Abbreviations:
FN: Private collection of Frank Nolf
RBINS: Royal Belgian Institute for Natural Sciences (Brussels, Belgium)

Introduction: In recent years scuba divers have become active in searching for shells in the Republic of São Tomé & Principe. Many new species, especially in MURICIDAE, TURRIDAE and MARGINELLIDAE, have been described in the last twenty years. Among all these shells a larger turrid, which at first glance seemed unknown, turned up. Study of the family TURRIDAE in the Dautzenberg collection of the RBINS revealed that this shell was also known from Senegal. These specimens completely match the description and figure by Petit (1851). Unfortunately, Tryon regarded this shell as a variety of *Pusionella vulpina* (Born, 1780) and so induced a lot of errors in literature later on. The main problem arose from the fact that this form proved to be rather scarce on the shores of the West African mainland, except on the Islands of São Tomé & Principe, where the sublittoral molluscan fauna has only been actively studied in the last decades.

Material and methods: This study was based upon shells in the private collection of the author and shells in the Dautzenberg collection kept in the RBINS.

Measurements: From 13 (juvenile specimen) to 46 mm.

Geographic range: Senegal and the Republic of São Tomé & Principe.

Original description: '*Testa oblongo-turrita, laevigata, nitidissima, atro-rufa; anfractibus-11, depresso-convexis, supernè subangulatis, ultimo convexo, medio fascia albido-lutescente cincto, superioribus albis, costulatisque; spira conico-acuta; aperture ovato-oblonga; columella infernè alba, fusco fasciata; canali longiusculo; labor simplici, acuto*.'
'*Coquille turriculée, oblongue, lisse, très brillante, d'un noir brun; onze tours de spire, sub-anguleux à la partie supérieure, peu convexes, à l'exception du dernier qui l'est davantage: celui-ci est entouré au milieu d'une zône d'un blanc-jaunâtre; spire conique, aiguë; columelle ayant la partie inférieure blanche, tachée de brun; le canal assez long; le labre simple, tranchant. Longueur, 32 mill.; largeur, 12-13 mill*.'
Turriculated shell, oblong, smooth, dark brown coloured and very glossy; spire with 11 whorls, upper part subangulated, slightly convex except the body whorl which is more convex: the latter is surrounded by a whitish-yellow zone in the middle; conical spire, pointed; lower part of the columella white with brown blotches; the siphonal canal rather tall; outer lip simple and acute. Length, 32 mm; width: 12-13 mm.

Discussion: The appearance of this shell is completely of the same kind as in *Pusionella nifat*, except for the brown colour of the whole shell interrupted by a white band above the suture continuing downwards in the middle of the last whorl. Most of the specimens studied were rather small (13-46 mm) and provided with transversal plicae in the aperture, a typical feature of juvenile specimens of this species. Petit (1851) already remarked diffuse grooves at the base of the last whorl. Spiral whorls have traces of longitudinal folds and transversal striae, which disappear in adult specimens. Specimens of *P. albocincta* only differ from *P. nifat* by their colour and smaller size. Originally, only specimens from the Republic of São Tomé & Principe were obtained.

As regularly coloured and regularly sized specimens of *P. nifat* are not known from these islands in the Gulf of Guinea, and as the '*albocincta*' form has not been found on the shores of the West African mainland one could suppose that the dark brown coloured but white banded form is a subspecies of *P. nifat* (Bruguière, 1792). However, after careful study of the Turridae in the collection Dautzenberg in the RBINS, two more specimens from Senegal turned up. So we propose to merely regard it as a colour form of *Pusionella nifat* (Bruguière, 1792). Anyway, the median band is a common feature in many adult specimens of the latter. If it should ever turn out that the inscription 'Senegal' as locality on the label in the Dautzenberg collection is wrong, this form could be regarded as a subspecies of *P. nifat*, but not as a separate species. Tryon (1884) (p.235, Pl. 31, Fig. 5) put forward that this shell was a variety of *Pusionella vulpina* with a median white band. Strebel (1914) mentioned the opinion of Tryon, but was rather suspicious of the real identity of this shell. However, Snyder (2003) and Tucker (2004) followed the opinion of Tryon and both authors concluded from the earlier studies that *P. albocincta* should be regarded as a synonym of *Pusionella vulpina* (Born, 1780). The latter species has a different outline, being generally more elongated though more swollen specimens also exist. In most specimens the body whorl is much smaller compared to *P. nifat*, the upper part of the whorls is crossed by two or three engraved revolving lines and several more at the base of the body whorl. Otherwise specimens of *P. vulpina* are smooth and polished, or with microscopic revolving striae. The colour is chestnut to dark brown or sometimes completely creamish white.

Conclusion: Specimens of a turrid from West Africa with a dark brown colour and a white central band on the body whorl belong to *Pusionella nifat* and are not a form of *P. vulpina*.

Acknowledgements: Special words of thanks go to Thierry Backeljau (RBINS), who made the Dautzenberg collection available for study, Johan Verstraeten (Oostende, Belgium) for the critical reading of the text and also to David Monsecour (Aarschot, Belgium) for an attentive revision of the English version.

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Geographic distribution of *Pusionella nifat* forma *albocincta* (Petit, 1851)

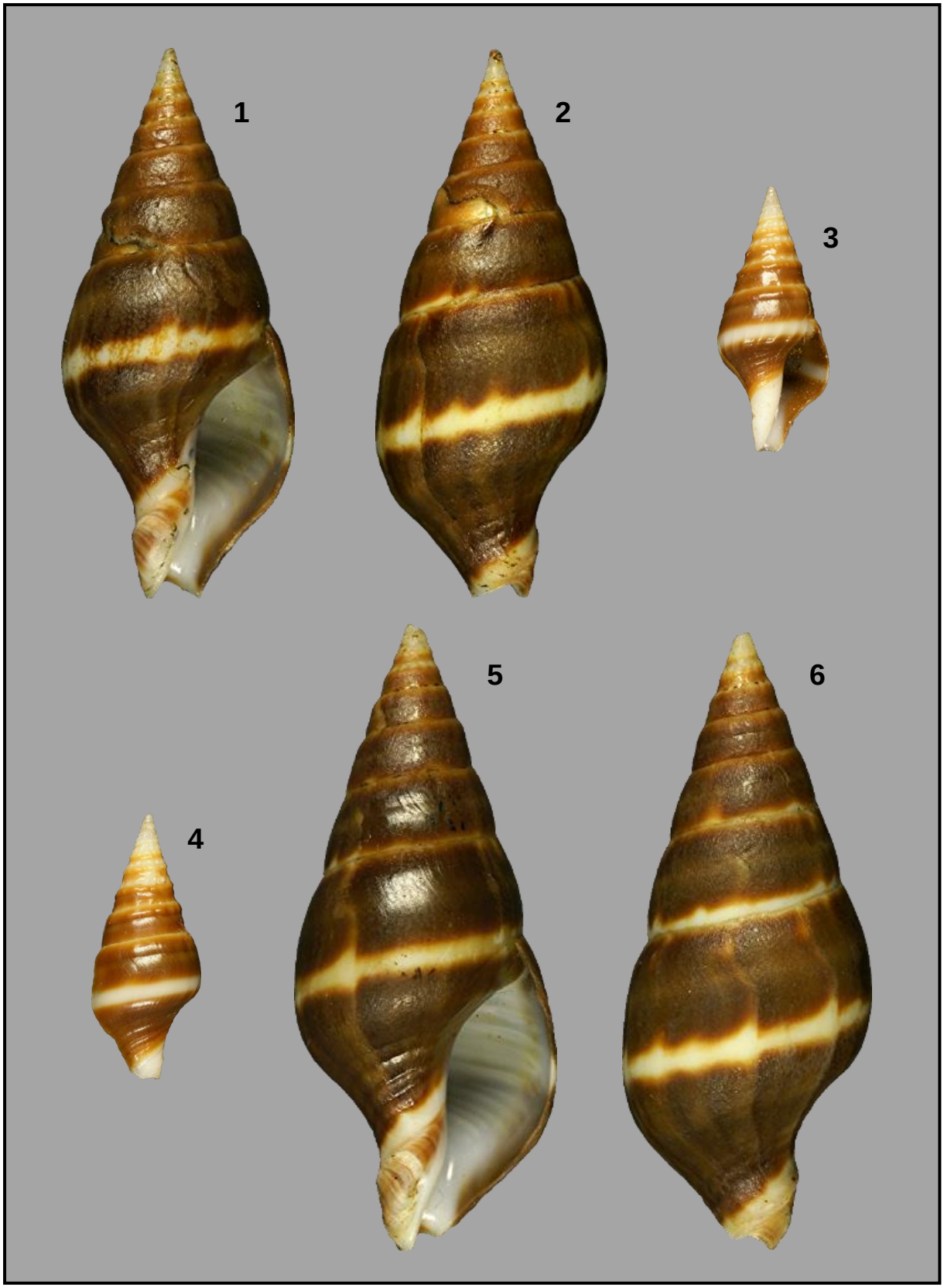

Plate I. Figs 1-6: *Pusionella nifat* forma *albocincta* (Petit de la Saussaye, 1851). São Tomé Island. Dived at a depth of 11 m. FN; 1-2: 30.44 mm; 5-6: 38.12 mm; 3-4: Principe Island, Gulf of Guinea. Dredged at a depth of 6 m. FN. 13.23 mm (juvenile specimen).

Plate II. Figs 7-10: *Pusionella nifat* forma *albocincta* (Petit de la Saussaye, 1851). Senegal. May 1927. RBINS; 7-8: 45.99 mm; 9-10: 33.23 mm.

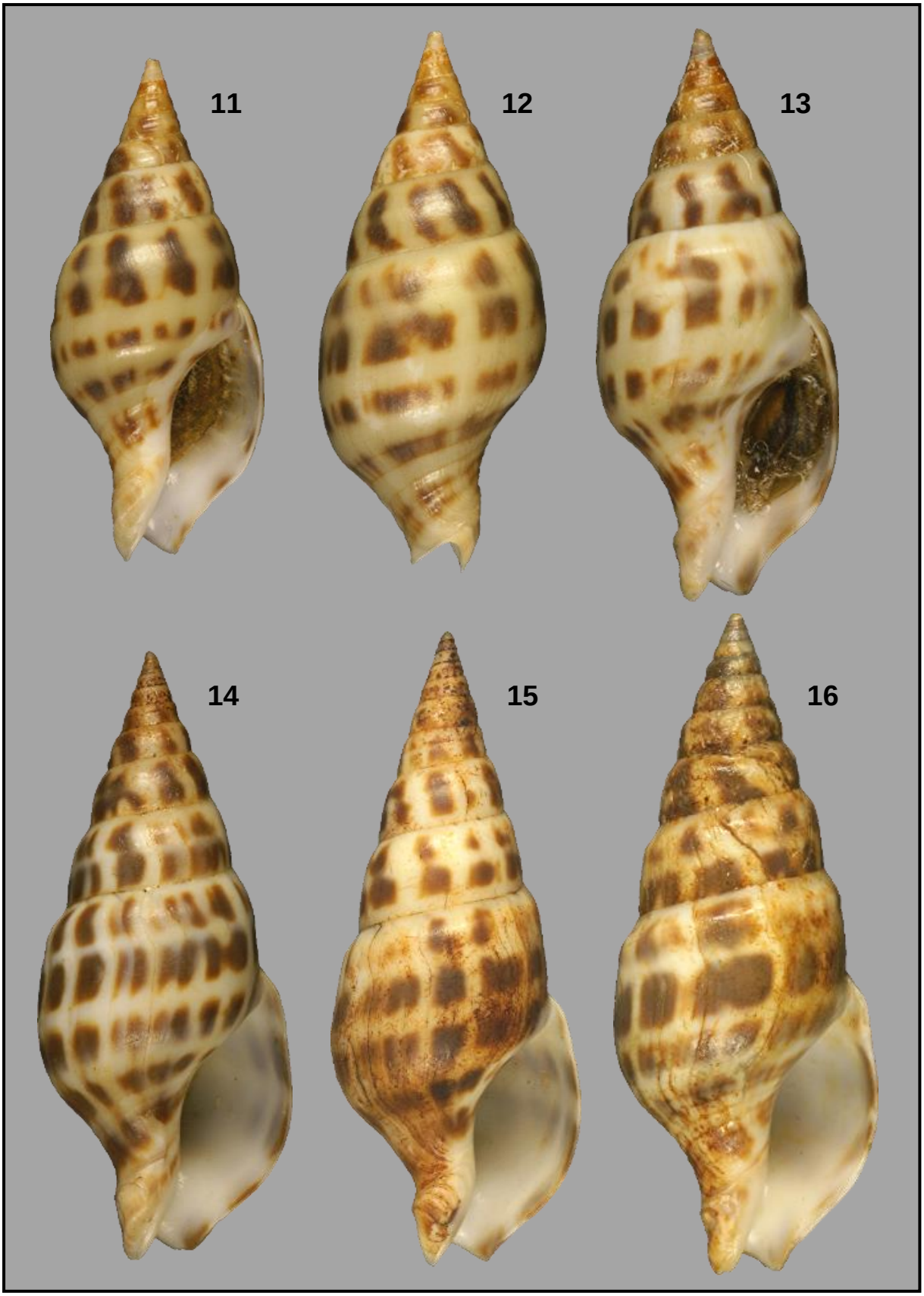

Plate III. Figs 11-16: *Pusionella nifat* (Bruguière, 1792). 13° 4' N. / 17° 6' W., North Casamance, Senegal. In sand. Trawled at a depth of 18 m. FN; 11-12: 36.92 mm; 13: 41.06 mm; 14: 48.57 mm; 15: 56.40 mm; 16: 64.27 mm.

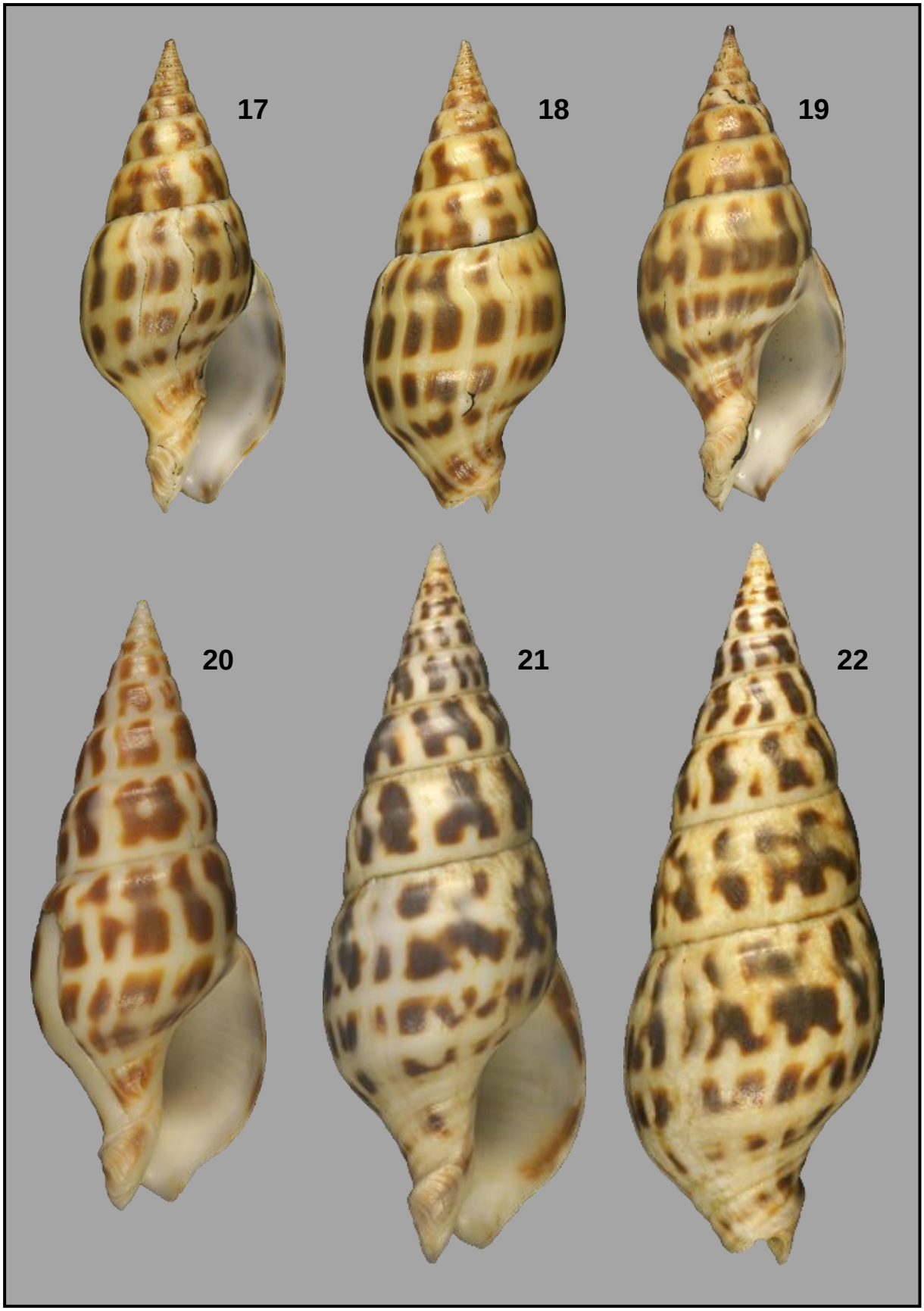

Plate IV. Figs 17-22: *Pusionella nifat* (Bruguière, 1792). FN; 17-19: Off Kribi, Cameroon. Trawled by shrimper at a depth of 35 m. 1974; 17-18: 51.30 mm; 19: 52.33 mm; 20-22: Pointe Idolo, Cap Esterias, Gabon. On rocks, in sand at low tide; 20: 64.77 mm; 21-22: 70.88 mm.

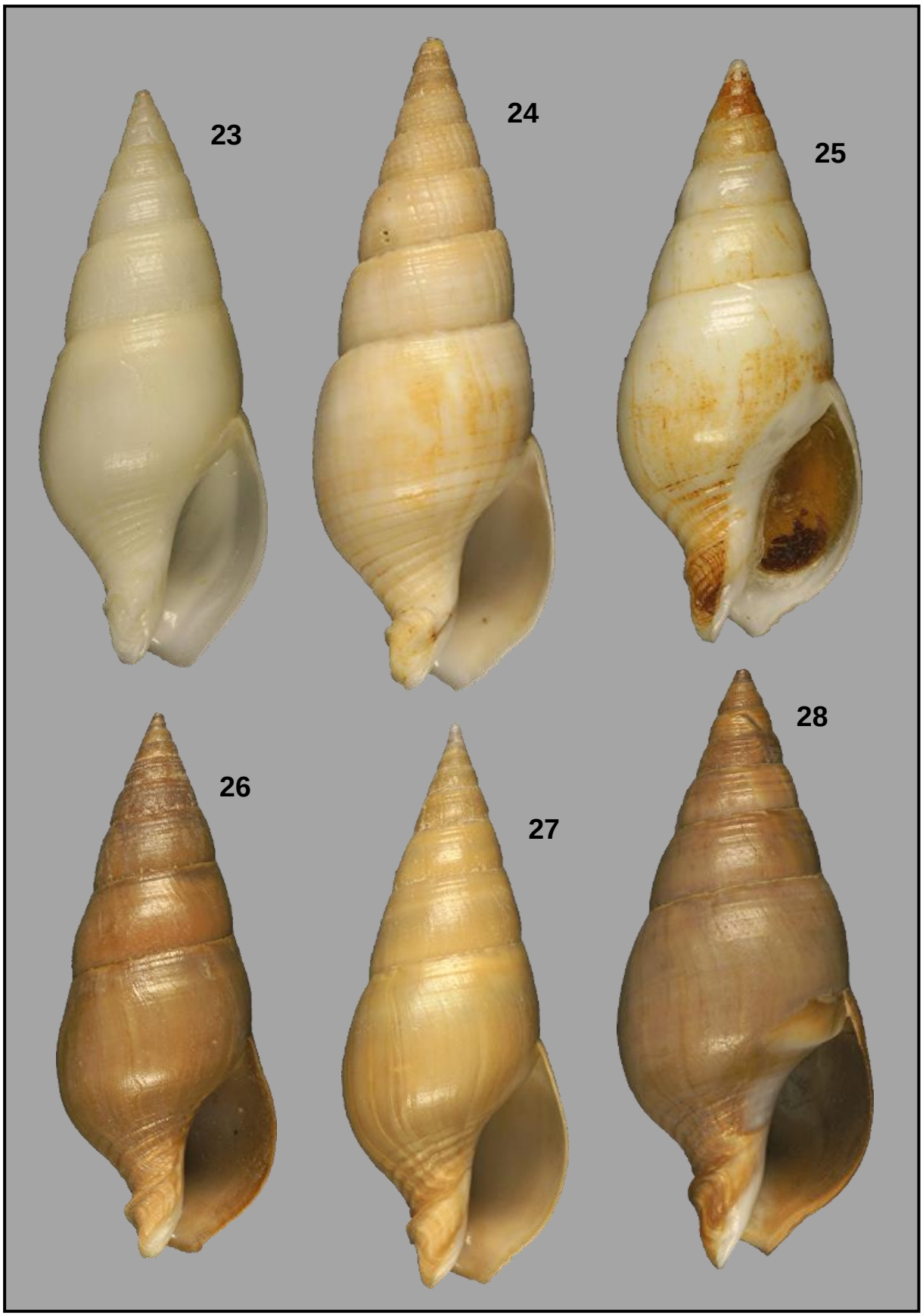

Plate V. Figs 23-28: *Pusionella vulpina* (Born, 1780). FN; 23-24: Cap Vert, Senegal; 23: 45.81 mm; 24: 50.89 mm; 25-28: Petite Côte, Joal, Senegal. Dredged at a depth of 15 m. 1985; 25: 43.23 mm; 26: 44.06 mm; 27: 43.94 mm; 28: 46.58 mm.

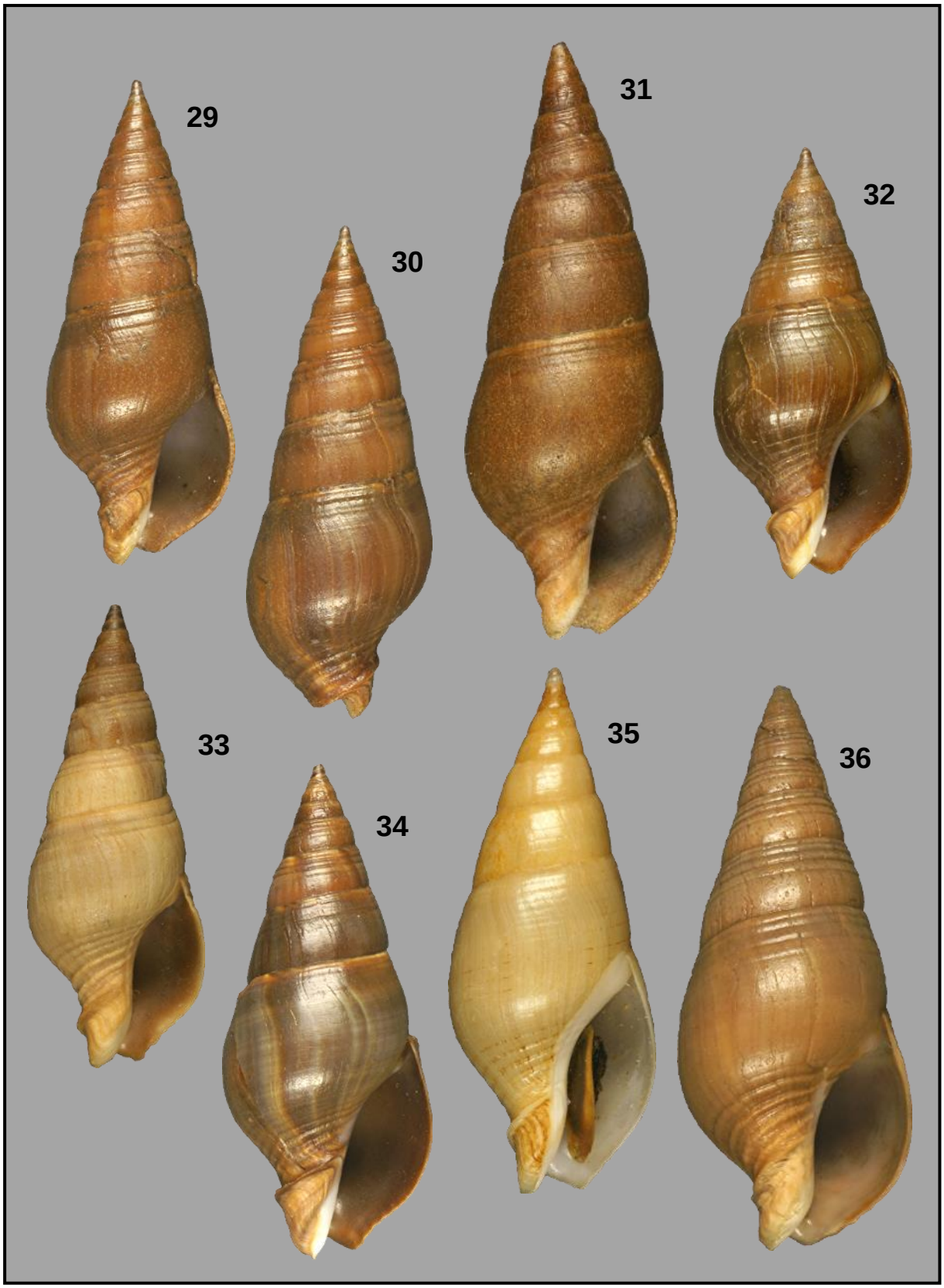

Plate VI. Figs 29-36: *Pusionella vulpina* (Born, 1780). FN; 29-31: Pointe Idolo, Cap Esterias, Gabon. In sand, among rocks at low tide; 29-30: 39.89 mm; 31: 50.46 mm; 32-34: Trois Rivières, Port Gentil, Gabon. On sandbar, at a depth of 5 m; 32: 31.92 mm; 33: 35.55 mm; 34: 42.42 mm; 35-36: Bay of Pointe Noire, Congo-Brazzaville. Dredged in muddy sand at a depth of 6 m; 35: 30.90 mm; 36: 47.43 mm.

Confirmation of the presence of *Fusinus rostratus* (Olivi, 1792) as a new invader in northern waters of Brittany (France)

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Keywords: GASTROPODA, FASCIOLARIIDAE, *Fusinus rostratus*, Brittany, France.

Abstract: Several specimens of *Fusinus rostratus* (Olivi, 1792) have been reported in northern Brittany as a non-indigenous invader in the past three years. Seven specimens of this predatory gastropod were found in the inner part of the Bay of Morlaix in October 2007. Three other specimens were already obtained by a Belgian marine biologist from the same area in August 2006. Most likely, this habitant of the Mediterranean Sea, also recorded from Morocco, Portugal and Galicia, was introduced via oyster translocation.

Abbreviations:
FK: Private collection of Francis Kerckhof.
FN: Private collection of Frank Nolf.
JV: Private collection of Johan Verstraeten.

Introduction: In many coastal waters of North Spain and West France records of non-indigenous species have increased in the last decades. This was especially due to the introduction of juvenile oysters from Canada, Spain and the Adriatic Sea in the oyster culture of Brittany and Normandy and in the Bay of Biscay. These samples often housed foreign molluscan species. Best known are the presence of *Crepidula fornicata* (Linnaeus, 1758) and the oyster *Crassostrea gigas* (Thunberg, 1793), but other alien species are now present on French shores such as the bivalves *Mya arenaria* Linnaeus, 1758), *Mercenaria mercenaria* (Linnaeus, 1758), *Tapes philippinarum* (Adams & Reeve, 1850), the latter being already locally cultivated, and the gastropods *Ocinebrellus inornatus* (Recluz, 1851), *Rapana venosa* (Valenciennes, 1846), *Cyclope neritea* (Linnaeus, 1758) and *Gibbula albida* (Gmelin, 1791). Most of the bivalves were introduced for aquaculture purpose, but gastropods were accidentally imported (Bachelet et al., 1990; Delemarre & Neuthiec, 1995; Blanchard, 1997; Goulletquer, 1999) and have become a real pest, especially *Crepidula fornicata* and *Ocinebrella inornatus*.
In October 2007, six specimens of the gastropod *Fusinus rostratus* (Olivi, 1792) were caught by a beam trawler during fish monitoring for the EC Water Framework Directive in the Bay of Morlaix. The area sampled was approximately 900 m² as the specimens were caught between 48°39.385' N., 3° 52.563' W. and 48° 38.988' N., 3° 52.103' W. The shells were collected at a depth of 9 m, on a heterogeneous-mud bottom mainly composed of dead *Crepidula fornicata* and dead maerl fragments mixed with mud. Another specimen was found by the Marine Biological Station of Roscoff (Brittany), 1 nautical mile north of the beam trawl tow (48° 40.555' N., 3°52.783' W.). The latter was dredged from a depth of 7 m, on a muddy maerl bottom in the spring of 2007.

Material examined: Three specimens (Plate I, Figs 1-6) of *Fusinus rostratus* (Olivi, 1792), were dredged by scientists working at the Station Biologique de Roscoff off Château du Taureau in the Bay of Morlaix, Brittany, France in August 2006, about half a year before the find of other specimens reported by Le Duff (2008). The molluscs were found alive and still possessed their operculum. They were obtained by the Belgian marine biologist Francis Kerckhof (Oostende) and their identification was confirmed by Rolan Hadorn (Röthenbach, Switzerland). This sample was compared with other similar specimens of the same species from the Mediterranean Sea and the East Atlantic.

Measurements: Plate I, Figs 1-6:
1. 29.37 mm
2. 34.72 mm
3. 34.08 mm

Description: Plate II, Figs 7-12; Plate III, Figs 13-17; Plate IV, Figs 18-23.
An extensive summary of the synonyms was established by Buzzurro & Russo (2007).
As the original description by Olivi (172) was not exhaustive the following is mainly based upon D'Ancona (1871). Shell highly fusiform, pointed at the tip, terminating at the base in a straight, narrow siphonal canal, somewhat smaller than the spire. The latter consist of about 9 convex whorls which are convex and carinate, except the early 3-4 whorls, separated by very deep sutures.

The whorls are crossed by 8-9 axial ribs rather large, rounded, raised, becoming broader downwards near the lower suture.
All the whorls are divided into two nearly equal parts (the upper one being often broader) by a raised keel, sometimes lamellose and fringed, producing some very blunt points in the intersection with the axial ribs, strongly compressed upwards. There are numerous spiral furrows and cords, being closely spaced, raised, wrinkled, slightly wavy, reaching the end of the siphonal canal, gradually decreasing in number and thickness. These cords are usually a little smaller in the upper part of the whorl, while in the lower part a thread can often be observed in the furrow separating two successive cords. The whole surface of the shell is roughened by very numerous, thin growth lines making the spiral cords nearly granular. The aperture is somewhat small and oval. The rather thick outer lip is sharp at its edge, and internally sulcate. The columellar callus, completely smooth in most specimens, rises on the penultimate whorl. The siphonal canal is moderately long, narrow, straight but sometimes bent and open.
The shell colour is variable, white (especially in deep-water specimens) to creamy white, pale yellow to deep chestnut, sometimes dark brown.
Size between 45 and 55 mm up to 95 mm.

Discussion: Aartsen & Giannuzzi-Savelli (1991, 1992), following a suggestion by Bouchet & Warén (1985), concluded that the correct name for this species should be *Murex sanctaeluciae* Salis-Marschlins, 1793 and not *Murex rostratus* Olivi, 1792. Buzzurro & Russo (2007) re-introduced the name *Murex rostratus* Olivi, 1792, basing their opinion on the following arguments. Application of the Principle of Priority (Art. 23.9 of the ICZN), involves that usage of a name prevails when the following conditions are both met: the senior synonym or homonym has not been used a as valid name after 1899 (Art. 23.9.1.1) and the junior synonym or homonym – in this case *Murex rostratus* Olivi – has been used for a particular taxon, as its presumed taxon, in at least 25 works, published by at least 10 authors in the preceding 50 years and encompassing a span of not less than 10 years (Art. 23.9.1.2). Following Art. 23.9.5 of the ICZN (1999) the junior synonym must not automatically be replaced and the case should be referred to the Commission as will do Buzzurro & Russo (2007) to maintain the use of the name *F. rostratus*.

Taxonomic confusion in literature concerning the real status of this species was especially due to its wide variability in different characteristics such as shell shape, morphology of the protoconch, siphonal canal, axial ribs and spiral cords, especially the supramedian cord sometimes forming a real keel, depending on habitat and locality. Like Buzzurro & Russo (2007) already stated the larval shell of this species does not seem to be a diagnostic characteristic of this species, being extremely variable depending on the population. However, the degree of variation for several characteristics seems to decrease within the same population and specimens tend to be homogeneous within the group, differentiating into well-defined forms lacking intergrades. The polymorphism in the shells of *F. rostratus* is represented in literature by many colour, morphological and even teratological forms. It is beyond the purpose of this paper to give a survey of all these varieties, but some of them are illustrated (Pl. II, Figs 7-12; Pl. III, Figs 13-17; Pl. IV, Figs 18-23). A few specimens of the typical Mediterranean *Fusinus syracusanus* (Linnaeus, 1758) are also figured for comparison's sake (Pl. IV, Figs 24-27).

Fusinus rostratus (Olivi, 1792) is an inhabitant of the Mediterranean Sea. It is more common in the northern and central Adriatic Sea and the Strait of Sicily. It was also recorded from Algarve, Portugal and the Canaries (Poppe & Goto, 1991) (though not quoted by Nordsieck & Talavera, 1979 for this archipelago) and also from the Moroccan coasts (Pasteur-Humbert, 1962; as *Fusinus* cfr. *rostratus* by Ardovini & Cossignani, 2004). Superficial references in literature refer to Atlantic coasts of France and Mauritania. It was recently recorded from Cambados, O Grove, Galicia, Spain (Horro & Rolán, 2007).

Until the report by Le Duff et al. (2008) no reports had been made of an occurrence in North Atlantic waters. The presence of small samples in the English Channel is rather surprising as the northern limit of distribution was supposed to be the coasts of Cantabria, northern Spain (Serrano et al., 2006). This species lives at a depth of about 20 m on heterogeneous mud in the northern Adriatic (Hall-Spencer et al., 1999) and can be found down to 100 m (Serrano et al., 2006) in Cantabria and to 500 m depth in the eastern Atlantic (Piepenburg & Müller, 2004). The southernmost limit seems to be North Angola (Pl. IV, Figs 22-23).

The present record confirms the presence of *F. rostratus* in Brittany. The specimens mentioned in this paper were found at nearly the same place (Château du Taureau) as another specimen recorded in the spring of 2007 (Le Duff, 2008).

The specimens were adult and fairly large compared to their relatives in the Mediterranean, certainly if we consider the lower temperature of these northern waters.
Most probably the specimens have been introduced via oyster cultures in Italy for instance, but till now the exact origin is unknown.
The Bay of Morlaix covers more than 700 ha for an annual production of 3,000 tons of oysters. Most of the oyster farms are situated subtidally. Although *F. rostratus* is known to live at a depth of at least 20 m, we suppose some individuals have found the same or more suitable conditions at about 10 m after introduction. Probably, the sheltering environment in the Bay of Morlaix, the relative soft climate of the region surrounding Roscoff and the favourable feeding conditions provided by the oyster farms had a positive influence on the growth and the development of the animals and their shells. Moreover, as the temperature in the English Channel is going to rise in the future, it can be expected *F. rostratus* could extend its northern limit of distribution even more. Since *Fusinus rostratus* is a carnivore mollusc it could impair the local fauna and its ecosystem. So, intensive monitoring should be recommended to follow the development of this species. Generally, species introduction is an on-going process, especially through mariculture, making continuous control of oyster-beds and removal of species other than oysters necessary.

Acknowledgements: I thank Francis Kerckhof (Oostende, Belgium) for the loan of specimens of *Fusinus rostratus* from the Bay of Morlaix. David Monsecour (Aarschot, Belgium) controlled the English text after a critical revision by Johan Verstraeten (Oostende, Belgium). Juan Horro (Vigo, Spain) sent me specimens of *F. rostratus* from Galicia and Roland Hadorn (Röthenbach, Switzerland) confirmed the identification.

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Map with the sampling sites: August 2006 ● ; spring 2007 ● ; October 2007 ●

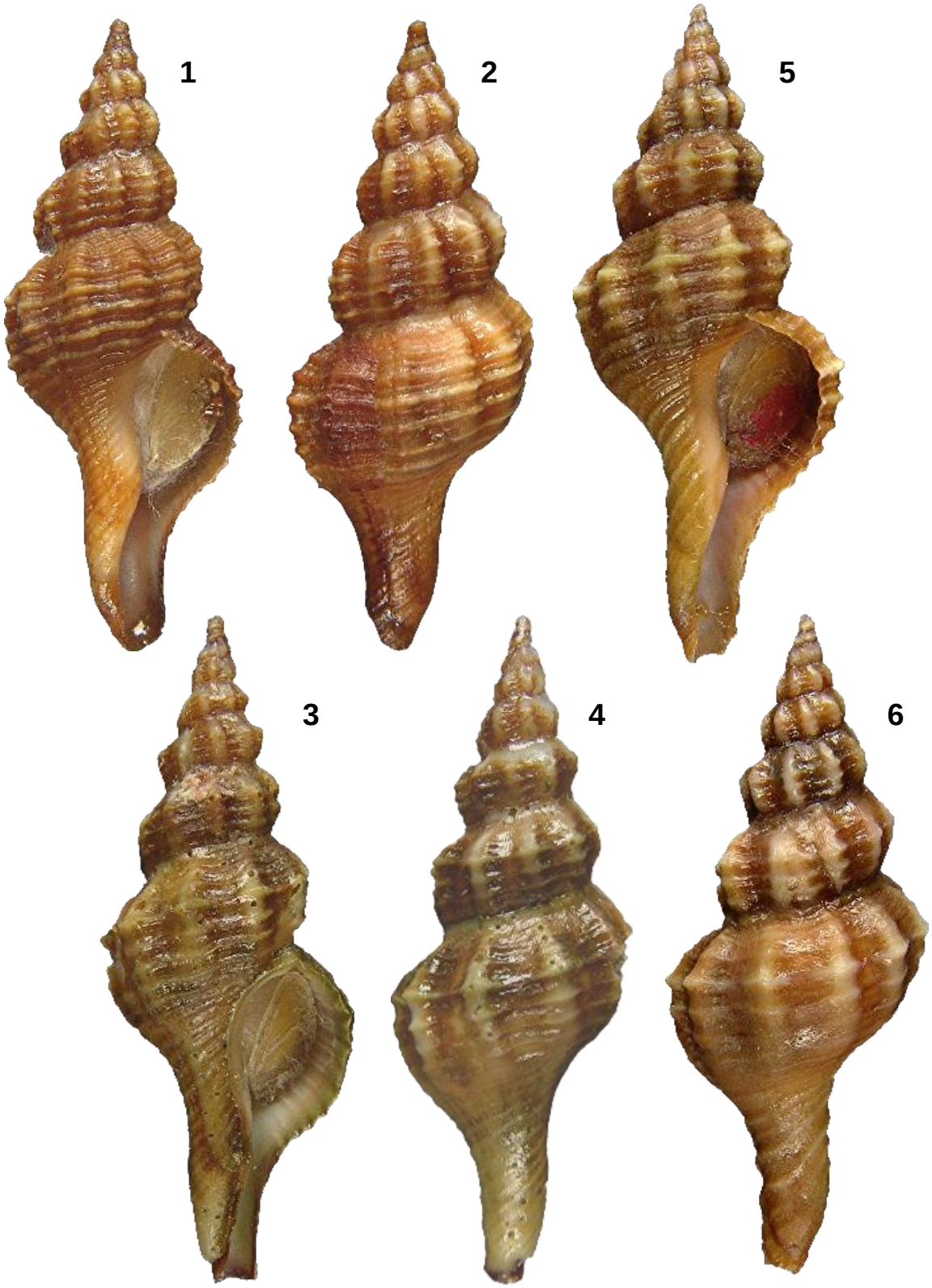

Plate I. Figs 1-6: *Fusinus rostratus* (Olivi, 1792). Dredged off Château du Taureau, Bay of Morlaix, Brittany, France. Collected by biologists of the Marine Biological Station of Roscoff (Brittany, France). August 2006. FK; 1-2: 29.37 mm; 3-4: 34.72 mm; 5-6: 34.08 mm.

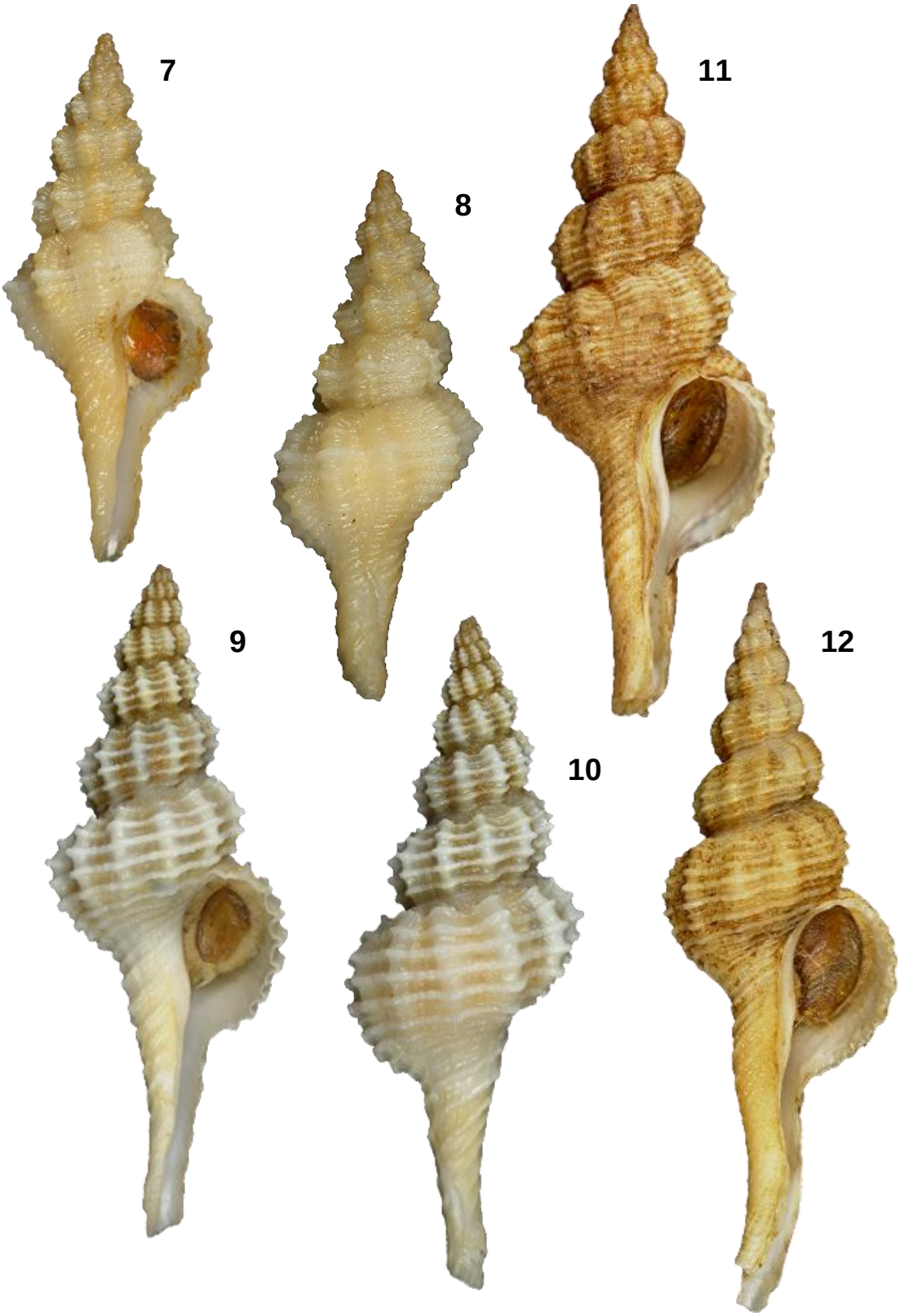

Plate II. Figs 7-12: *Fusinus rostratus* (Olivi, 1792). FN; 7-8: Gulf of Valencia, Spain. Dredged by fishermen. 29.80 mm; 9-10. Ibiza, Balearic Islands, Spain. Trawled by local fishermen. 1960. 53.75 mm; 11-12: La Spezia, Italy. Trawled at a depth of 200 m. April 1976; 11: 57.71 mm; 12: 59.01 mm.

Plate III. Figs 13-17: *Fusinus rostratus* (Olivi, 1792). FN; 13-14: Nettuno, Italy. Trawled by fishermen at a depth of 80 m. 1991; 13:43.59 mm; 14: 44.18 mm; 15-17: Gargano, Adriatic Sea, Italy. Dredged by fishermen at a depth of 40 m; 15: 63.07 mm; 16-17: 66.09 mm.

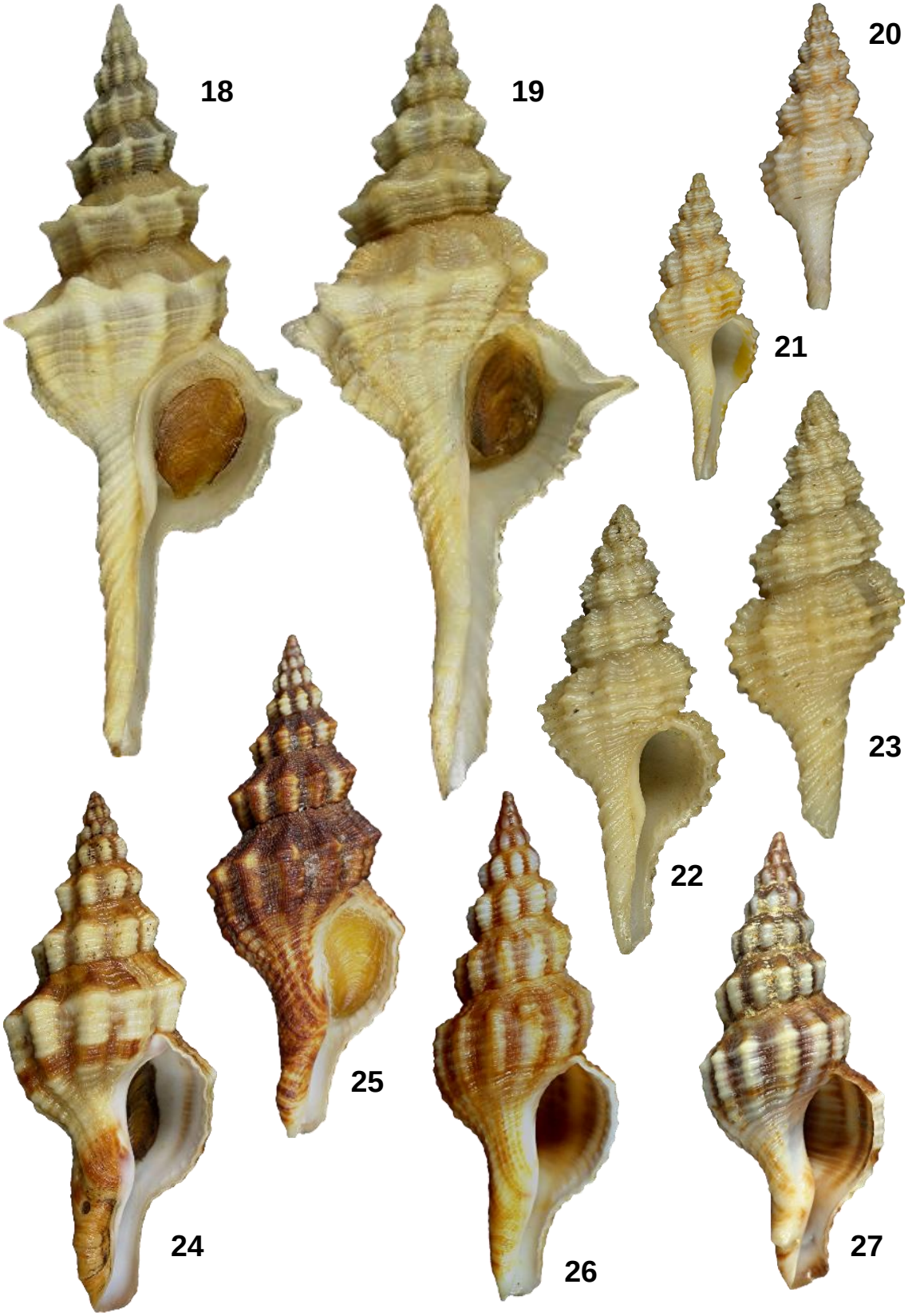

Plate IV. Figs 18-23: *Fusinus rostratus* (Olivi, 1792). FN; 18-19: Benicarlo, Spain. Trawled by fishermen at a depth of 175 m. July 1968; 18: 75.36 mm; 19: 78.71 mm; 20-21: Canary Islands., Spain. Trawled by fishermen. 1963. 23.51 mm; 22-23: Moita Seca, North Angola. Trawled by Belgian fishermen at a depth of 40-70 m. 1973. 33.64 mm; 24-28: *Fusinus syracusanus* (Linnaeus, 1758); 24: Pozzuoli, Naples, Italy. In *Caulerpa* sp. 15 April 2006. JV. 43.37 mm; 25: Ampolla, Tarragona, Delta del Ebro, Spain. In harbour. July 1974. FN. 44.70 mm; 26: Paleonora, Creta, Greece. Dived at a depth of 4 m. July 1996. FN. 41.09 mm; 27: Stentino, Sardinia, Italy. On rocks at a depth of 4 m. August 1984. FN. 37.02 mm.

On the presence of *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005 (Mollusca: Gastropoda: Muricidae) in the southeastern Atlantic Ocean

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Keywords: *Coralliophila trigoi*, *Coralliophila meyendorffi*, *Coralliophila occidentale*, MURICIDAE, range extension.

Abstract: A serious range extension is presented for *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005, recently described as a new species from the northeastern Atlantic Ocean, more exactly from Galicia, Spain. The species was soon found to range from Galicia to Algarve, Portugal and from Almeria and Malaga (Alboran Sea, Spain) into the Mediterranean Sea (Secche di Vada, Livorno and Sardinia, Italy). A number of specimens found in the Bellas Bay, Luanda, Angola completely match the samples from the northeastern Atlantic Ocean. Up to now, specimens from the Gulf of Guinea remain unknown.

Abbreviations:
FN: Private collection of Frank Nolf
H.: Height
JV: Private collection of Johan Verstraeten
PEMARCO: Pêche maritime du Congo
W.: Width

Introduction: During trades with the Portuguese shell collector Luis Coelho in the period 1970–1973 many interesting shells – and even unknown species - were offered to the senior author. Among them a sample of four specimens of a so called *Coralliophila meyendorffi* (Calcara, 1845) from Bellas Bay, Luanda, Angola. These shells had been labelled as *Coralliophila sp*. in our collections, awaiting further research. After the publication of the excellent paper on *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005, the shells were again studied and compared with that new species. One of the specimens proved to be *Coralliophila occidentale* Kosuge & Fernandes, 1988, the three other ones *C. trigoi*. Specimens from Portugal showed a complete similarity with those from Angola, two areas very remote from each other, yet there is no doubt that they belong to the same species.
The subfamily Coralliophilinae Chenu, 1859 in the family MURICIDAE forms a monophyletic group including more than 200 different species, distributed worldwide in temperate and tropical waters. The species are associated with cnidarians, which are used as food by these neogastropods. The classification and identification of the different species is made difficult by the current absence of radulae, a limited knowledge of the anatomy and especially the absence of a perfect protoconch and the scaly structure of the remaining shell, due to erosion in adult specimens. As a result the systematics at species level are far from stable.

Systematics:
Superfamily Muricoidae Rafinesque, 1815
Family MURICIDAE Rafinesque, 1815
Subfamily Coralliophilinae Chenu, 1859
Genus *Coralliophila* H. & A. Adams, 1853
Type species: *Fusus neritoideus* Lamarck, 1816. Recent, Indo-Pacific.

***Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005**
Coralliophila trigoi (Pl. I, Figs 1-4; Pl. II, Figs 5-8; Pl. III, Figs 9-12) is classified in the genus *Coralliophila* by using shell characteristics of the teleoconch (Mariottini, Smriglio & Rolán, 2005). It is a relatively large shell (up to 35 mm) usually eroded in adult specimens. The protoconch-teleoconch demarcation is often well-defined, marked by a varix. The shape of the shell is elongate ovoid-fusiform, solid and rather inflated. The spire contains 4-5 convex whorls and the shoulder is rounded. The suture is rather distinct, but partially covered by the structure, consisting of 15-20 spiral cords, only scarcely alternating with narrower spiral threads. The ribs are rounded and covered by imbricating, fine scales. A number of 7-10 large, but generally weak axial ribs, are crossing the spiral cords. The siphonal canal is short, narrow and rather curved creating a false umbilicus. The large and oval aperture represents more than half the length of the whole shell and is white to cream-white inside. The outer lip is thin and crenulated.
Colouration: pale orange to pale brown.

Type locality: Camariñas, Galicia, Spain, northeastern Atlantic Ocean, at 15-50 m.

Geographic distribution: From Galicia, Spain to Algarve, Portugal and from Almeria and Malaga (Alboran Sea, Spain) into the Mediterranean Sea. Range hereby extended to Luanda, Angola.

Habitat: Live specimens were found attached to the base of the sea anemone *Calliactis parasitica* (Couch, 1842).

Material examined: A sample of four specimens found on dead coral from Bellas Bay, Luanda, Angola contained the following shells:
Coralliophila occidentale Kosuge & Fernandes, 1988: 20.98 mm (FN) (Pl. IV, Figs 16-17)
C. trigoi Mariottini, Smriglio & Rolán, 2005: 30.15 mm (JV; Pl. I, Figs 1-2); 30.63 mm (FN; Pl. I, Figs 3-4); 33.58 mm (FN; Pl. II, Figs 5-6).

Discussion: *C. trigoi* is similar to ***C. meyendorffi*** (Calcara, 1845) (Pl. VI, Figs 27-31; Pl. VII, Figs 32-37; Pl. VIII, Figs 38-41) but it differs by the following characteristics: its more rounded shape, its smaller ratios length/width and length/aperture height (1.60 and 1.68 vs. 1.72 and 1.86), the pale orange-brown colour compared to the milky-white *C. meyendorffi* and the larger number of spiral cords (15-20 vs. 13-15), which are narrower and of a different sculpture (Mariottini, Smriglio & Rolán, 2005). In specimens of *C. meyendorffi* these scaly spiral ribs usually alternate with a narrower one, while in *C. trigoi* only occasional intercalating ribs are visible. *C. meyendorffi* is a littoral species living widespread in the Mediterranean Sea and along the Atlantic coasts, from Galicia at least to Senegal in the south, including the Canary Islands and the Cape Verde Islands. Till now *C. trigoi* only seemed to occur off the Atlantic coast of Spain and Portugal, being restricted to the Alboran Sea (Almeria, Malaga) within the western Mediterranean Sea. In this area specimens were found attached to the sea anemone *Calliactis parasitica* (Couch, 1842). Mariottini, Smriglio & Rolán (2005) already supposed *C. trigoi* could have a more extended geographic distribution due to its planktotrophic mode of development, as indicated by the protoconch. The specimens of *C. trigoi* found in Bellas Bay, Luanda, Angola (Plate I, Figs 1-4; Plate II, 5-6) show the same characteristics as the specimens from the northeastern part of the Atlantic Ocean: the same bulbous shape, similar ratios length/width and length/aperture height (an average of 1.63 and 1.70 respectively vs. 1.60 and 1.68), the same number of spiral cords and an identical pale orange shell colour. Most of the samples of *C. trigoi* described in the original paper came from deeper water (15-50 m), those from Angola were found at an unknown depth. As the sample contained one specimen of *C. occidentale* we can presume the animals were caught at a bathymetric range from 30 to 75 m. Another specimen of *C. occidentale* from Ambriz (Angola) was dredged by Belgian fishermen (PEMARCO) at a depth of 73 m. It is good to remember that both *C. trigoi* and *C. meyendorffi* are found on the same host, the cnidarian *Calliactis parasitica*, which prefers sublittoral areas, but occasionally also lives in shallower water. Perhaps for this reason *C. trigoi* was often confused with *C. meyendorffi* in the past, resulting in inaccurate records in literature. Certainly, a serious revision of specimens of *C. meyendorffi* in museums and private collections, originating from the West African coasts, should be made with the aim to obtain a better view on the real distribution of both species.

Coralliophila occidentale Kosuge & Fernandes, 1988 (Pl. IV, Figs 14-19; Pl. V, Figs 20-26) looks like juvenile specimens of *C. trigoi*. This was probably the reason why an adult specimen of *C. occidentale* was found in the sample from Bellas Bay (Luanda, Angola) and initially confused with *C. trigoi*. This shell (Plate IV, Figs 16-17) was completely similar to a specimen that was dredged by the Belgian fishermen of PEMARCO off Ambriz (North Angola) at a depth of 73 m (Pl. IV, Figs 14-15) and another specimen collected in Luanda Bay, Angola (Pl. IV, Figs 18-19). Besides, it is interesting to remark that the shells of *C. occidentale* from the type locality were taken from about the same depth (60 m deep, off Luanda, Angola). The Bellas Bay-specimen conveys the impression to be a real giant shell. Yet, this may be only one of the first full adult specimens ever recorded and figured in literature. Most likely all the specimens mentioned in the description by Kosuge & Fernandes (1988) were juvenile shells judging from their small size (from 6.2 mm to 9.4 mm). They possess the same characteristics: an inflated last whorl, about 9 axial ribs on the last whorl, 6 spiral cords on the penultimate whorl and about 16 spiral cords on the body whorl from the suture to the fasciole with additional intercordal spiral threads in the upper and lower part of the last whorl and finally the salmon–orange colour of the whole shell, except the pale straw-coloured protoconch. Moreover, the Bellas Bay-specimen has about the same H/W-ratio (1.48) as the specimen from Ambriz (1.54) and the Luanda Bay-specimen (1.57), while the shells from the type-locality show an average of 1.60.

The slight deviations can be explained by the degree of maturity: adult specimens tend to develop a larger and broader aperture, causing a smaller H/W-ratio.

C. panormitana (Monterosato, 1869) (Pl. V, Figs 20-26) has a more inflated body whorl and primarily inhabits the western Mediterranean Sea (Bouchet & Warén, 1985).
Coralliophila basilea (Dautzenberg & H. Fischer, 1896) is another similar East Atlantic species. There is much confusion about the real characteristics of this species: a more turreted shell and a coarser spiral sculpture than *C. trigoi* (Mariottini, Smriglio & Rolán, 2005) and also a broader siphonal canal compared to *C. squamosa* (Bivona, 1838) (Bouchet & Warén, 1985). Specimens of *C. trigoi* were even mistaken for *C. basilea* in the past (Rolán, López & Gutiérrez Garcia, 1995). *C. basilea* has a smaller shell and it mainly occurs around the Azores and the Canaries. As the true identity of this species is not settled we refrain from comparing it with any other *Coralliophila*-species from the Eastern Atlantic and the Mediterranean Sea till more material becomes available.
At present it is not known from the East Atlantic coasts, but a specimen trawled off Abidjan (Ivory Coast) (Pl. VIII, Figs 42-43) could be this species.

Conclusion: The three specimens that belong to the sample found in Luanda (Angola) are without doubt *C. trigoi*. After a careful comparison with other specimens of *C. trigoi* originating from Galicia, Algarve (Portugal) and the western Mediterranean bassin we are convinced of the identity of the southeastern representatives. The shells of *C. trigoi* show enough differences with specimens of *C. meyendorffi,* obtained from all kinds of localities, to conclude that they belong to a separate species.

Acknowledgements: We are grateful to David Monsecour for carefully reading the English manuscript.

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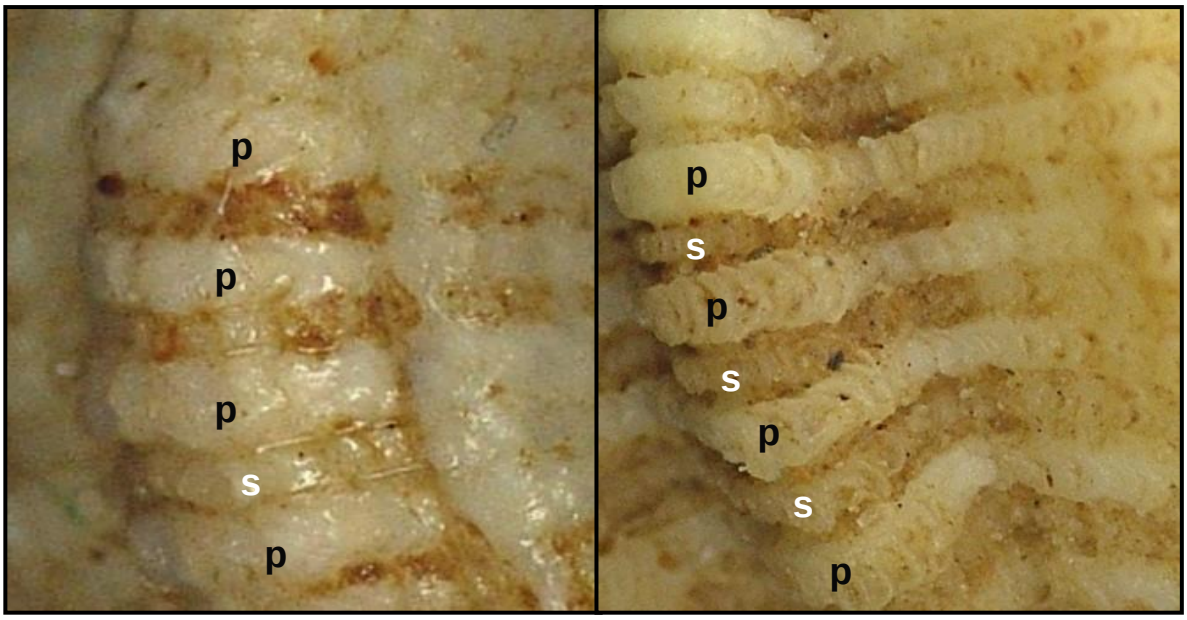

Primary (p) and secondary spiral cords (s) in *C. trigoi* (left) and *C. meyendorffi* (right)

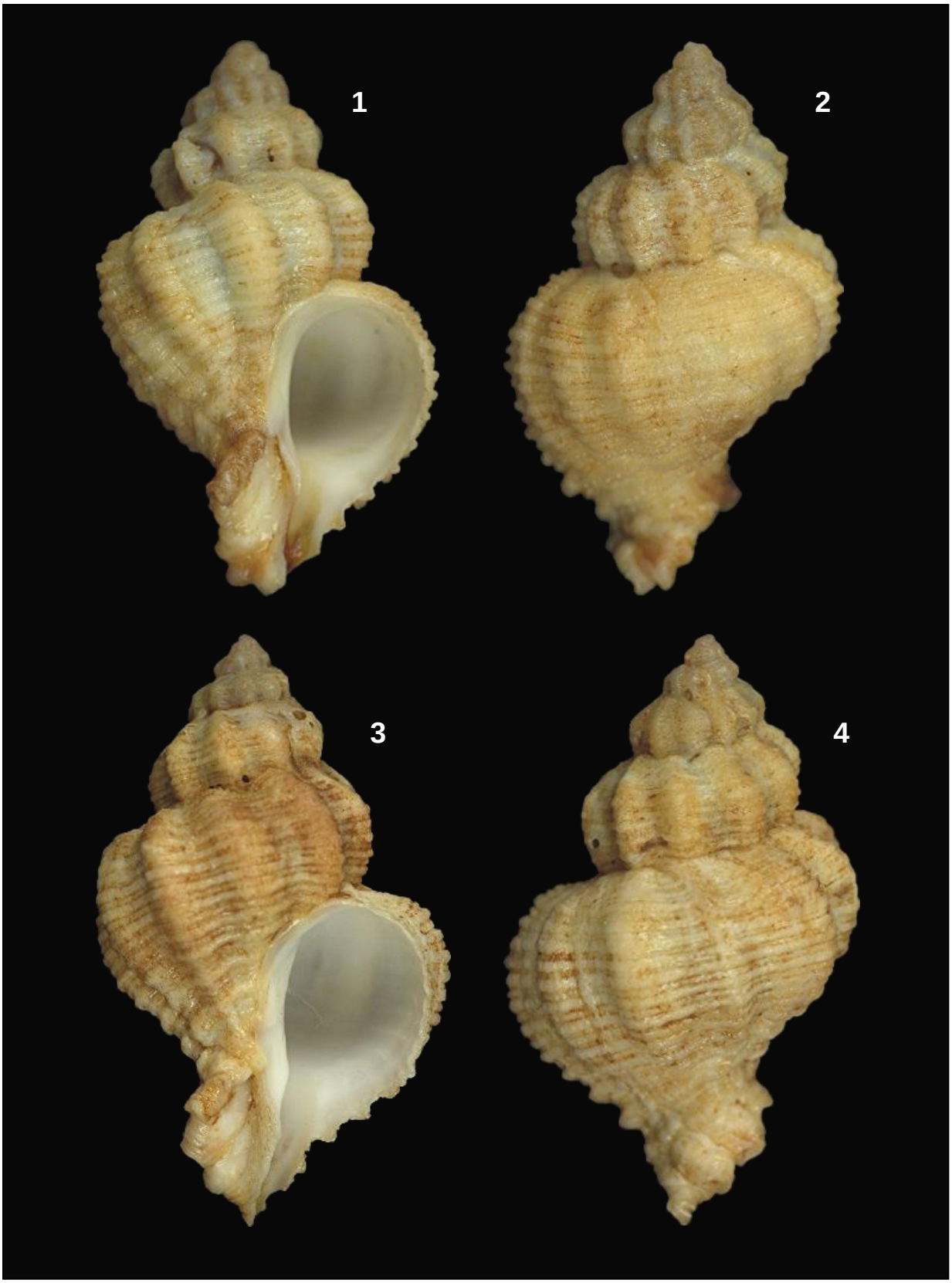

Plate I. Figs 1-4: *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005. Bellas Bay, Luanda, Angola. On dead coral. 1972; 1-2: 30.15 mm. JV; 3-4: 30.63 mm. FN.

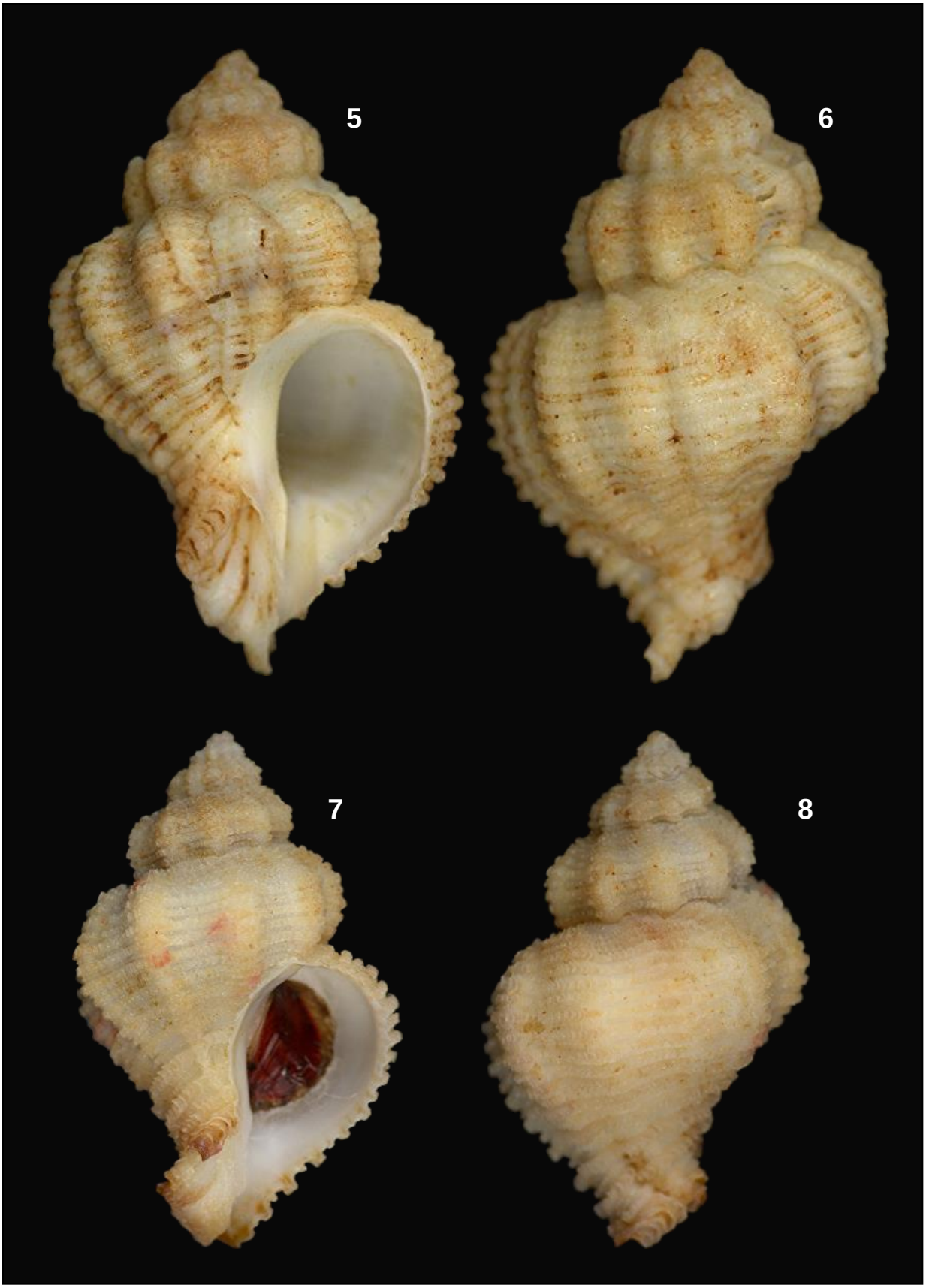

Plate II. Figs 5-8: *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005; 5-6: Bellas Bay, Luanda, Angola. On dead coral. 1972. 33.58 mm. FN; 7-8: Torrevieja, South Spain. On sea anemone. July 1973. 26.45 mm. FN.

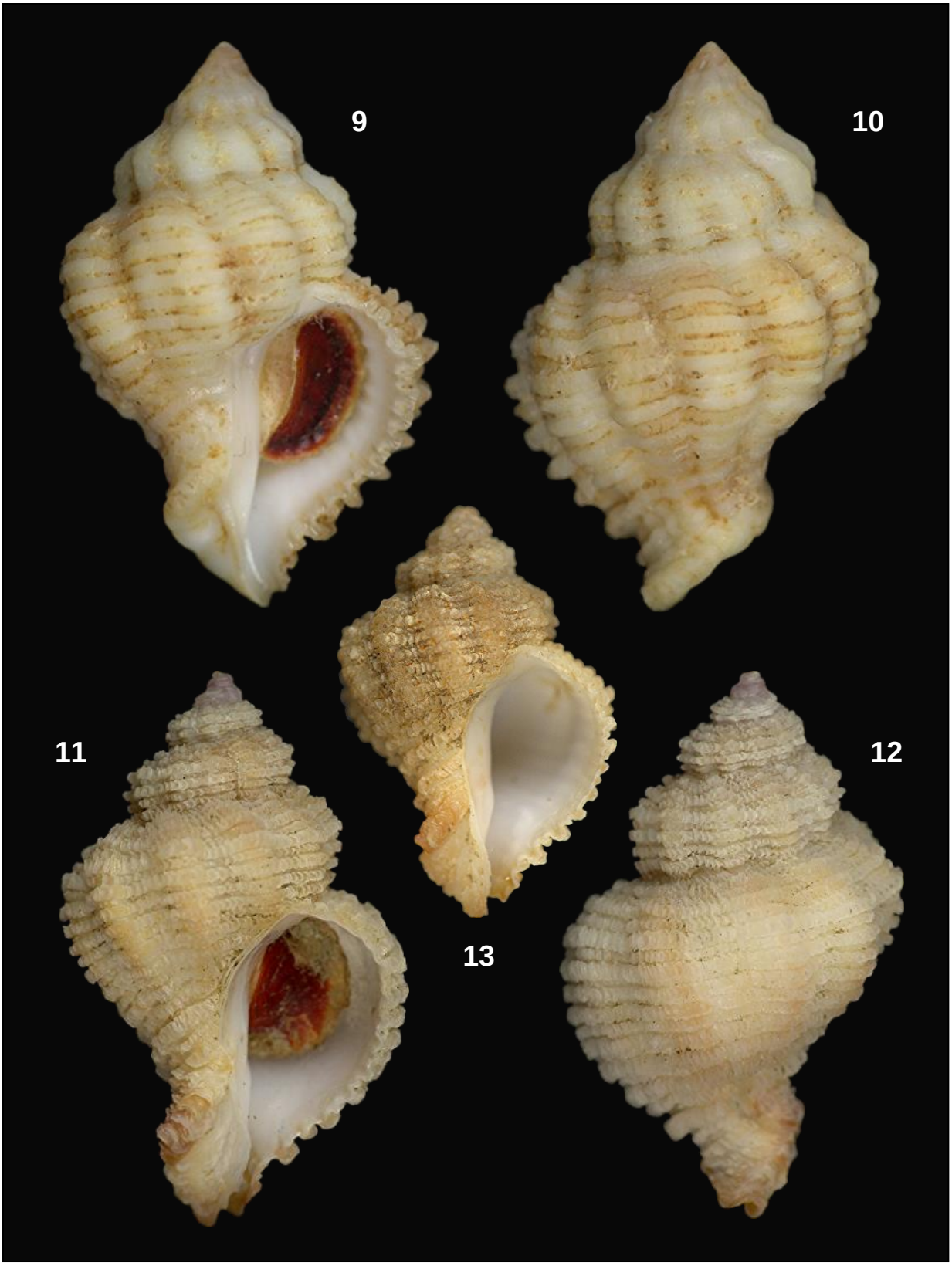

Plate III. Figs 9-12: *Coralliophila trigoi* Mariottini, Smriglio & Rolán, 2005; 9-10: Malaga, South Spain. Trawled by fishermen. 1995. 27.04 mm. JV; 11-12: Off Ponta da Piedade, Lagos, Algarve, Portugal. Collected from fish and octopus traps set between 55-60 m deep, on rocky/muddy bottom. 23.22 mm. JV; 13: Malaga, South Spain. Collected by fishermen. 1991. 16.46 mm. JV.

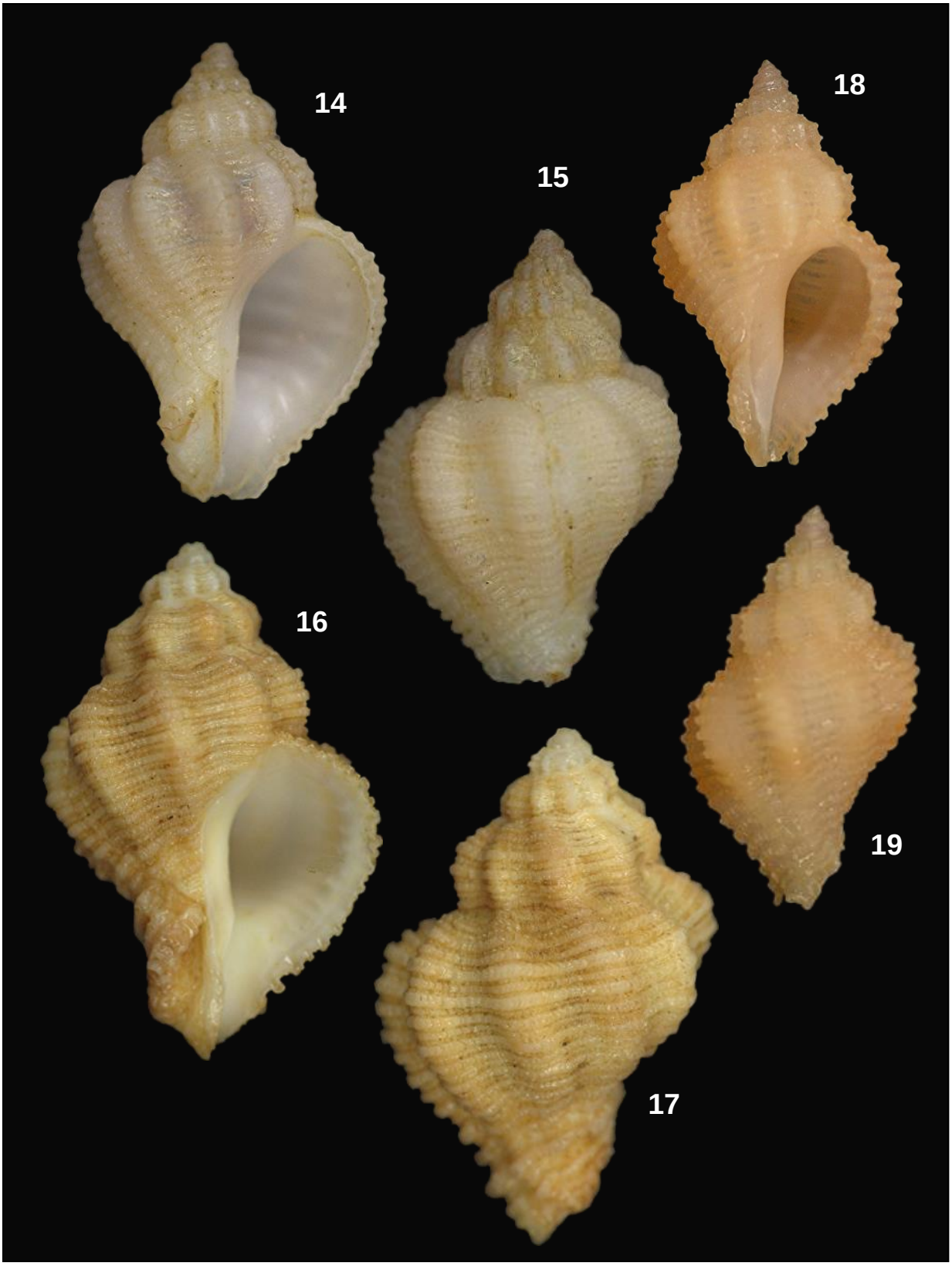

Plate IV. Figs 14-19: *Coralliophila occidentale* Kosuge & Fernandes, 1988. FN; 14-15: Ambriz, North Angola. Trawled by Belgian fishermen (PEMARCO) at a depth of 73 m. 1972. 1.76 mm; 16-17: Bellas Bay, Luanda, Angola. Collected on dead coral. 1972. 20.98 mm; 18-19: Off Luanda Bay, Angola. Trawled at a depth of 60 m. January 1982. 8.97 mm.

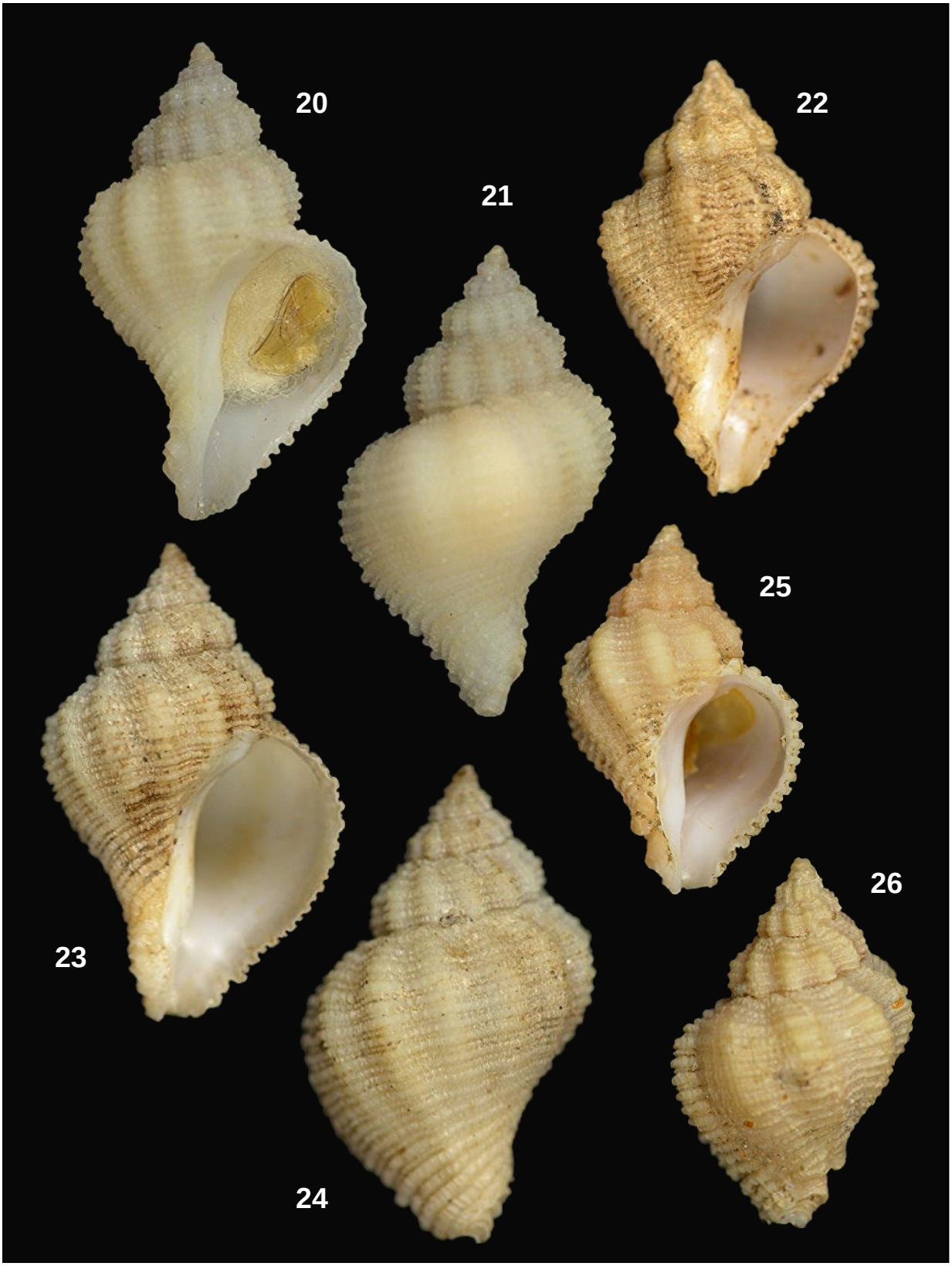

Plate V. Figs 20-26: *Coralliophila panormitana* (Monterosato, 1869); 20-21: Malaga, South Spain. Trawled by fishermen. 1998. 15.18 mm. FN; 22-24: Malaga, South Spain. Collected by fishermen. 1991; 22: 14.31 mm. JV; 23-24: 15.16 mm. JV; 25-26: Palermo, Sicily, Italy. Dredged at a depth of 100-110 m. On rock. 11 August 1984. 10.72 mm. JV.

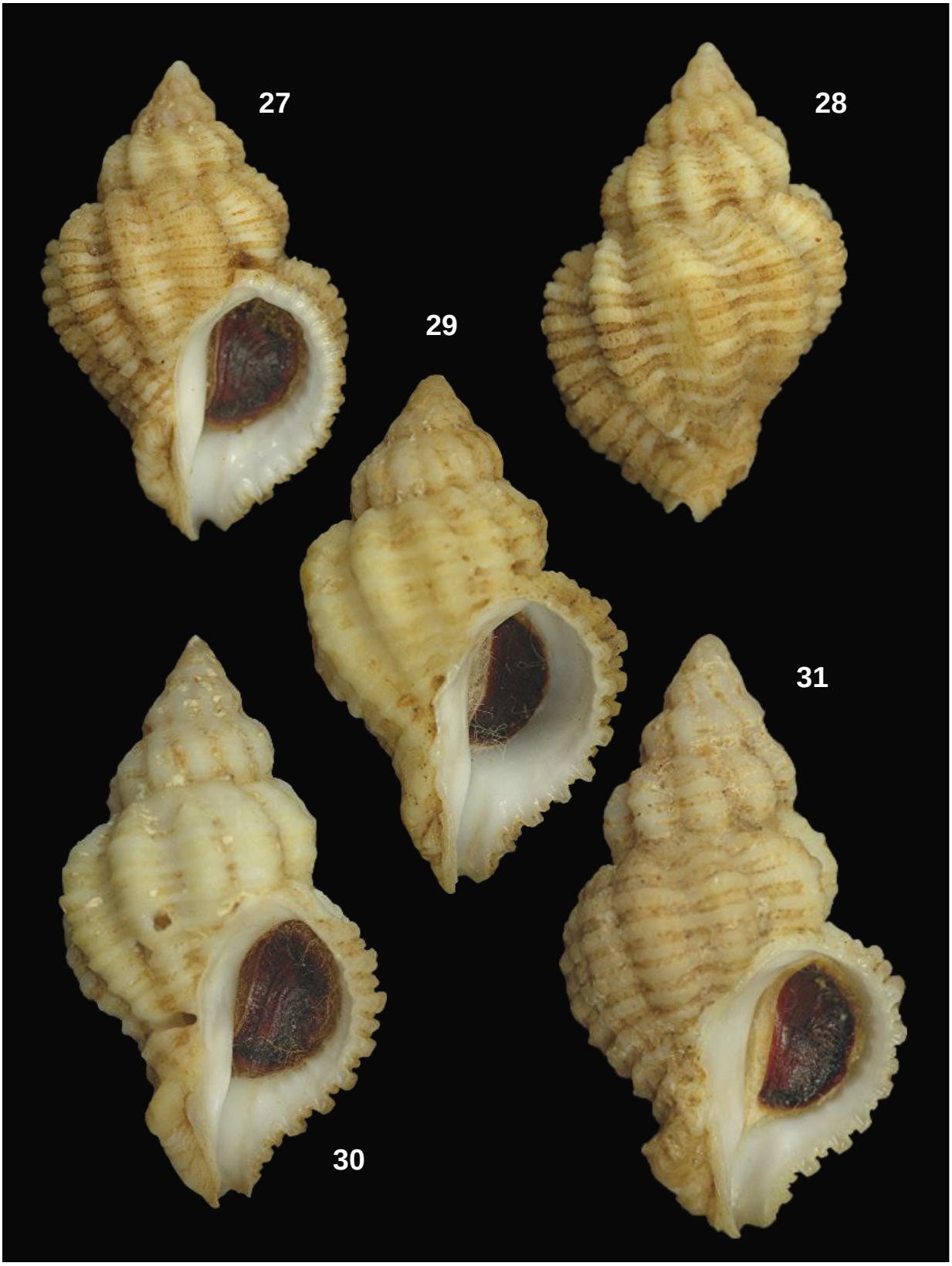

Plate VI. Figs 27-31: *Coralliophila meyendorffi* (Calcara, 1845). Torrevieja, South Spain. Dived at a depth of 8 m. On sea anemones. July 1975. FN; 27-28: 26.59 mm; 29: 29.69 mm; 30: 33.03 mm; 31: 34.81 mm.

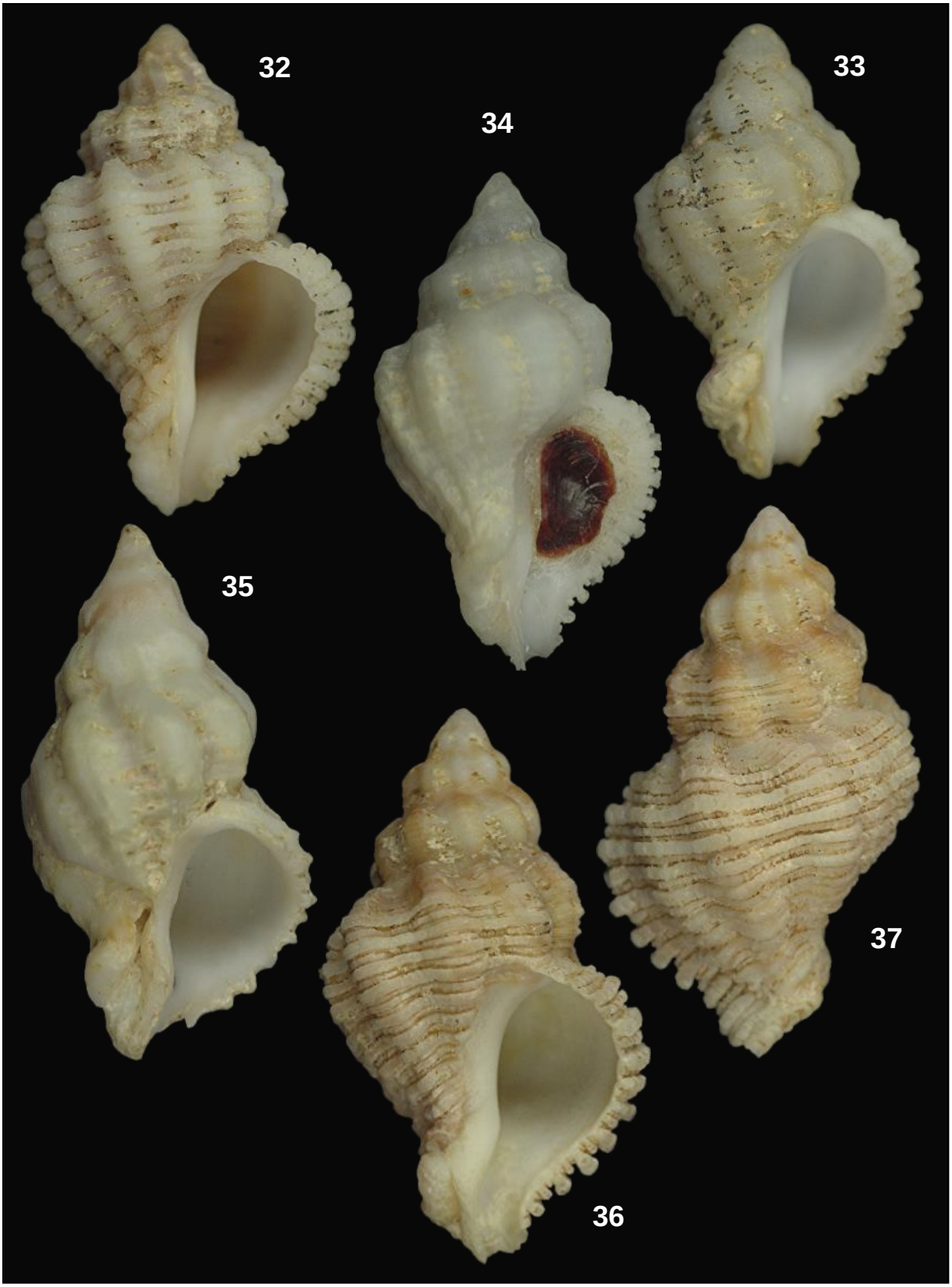

Plate VII. Figs 32-37: *Coralliophila meyendorffi* (Calcara, 1845). FN; 32: Vathia, Greece. Dived at a depth of 2 m. On volcanic sand. July 1986. 19.04 mm; 33: San Agustin, South Gran Canaria, Canary Islands. On rocks at low tide. Crabbed specimens. May 1971. 19.74 mm; 34: Cefalu, Palermo, Sicily, Italy. Dived at a depth of 9 m. July 1996. 19.17 mm; 35-37: Arrecife, Lanzarote, Canary Islands. On rocks at low tide. Crabbed specimens. May 1971; 35: 34.43 mm; 36-37: 31.57 mm.

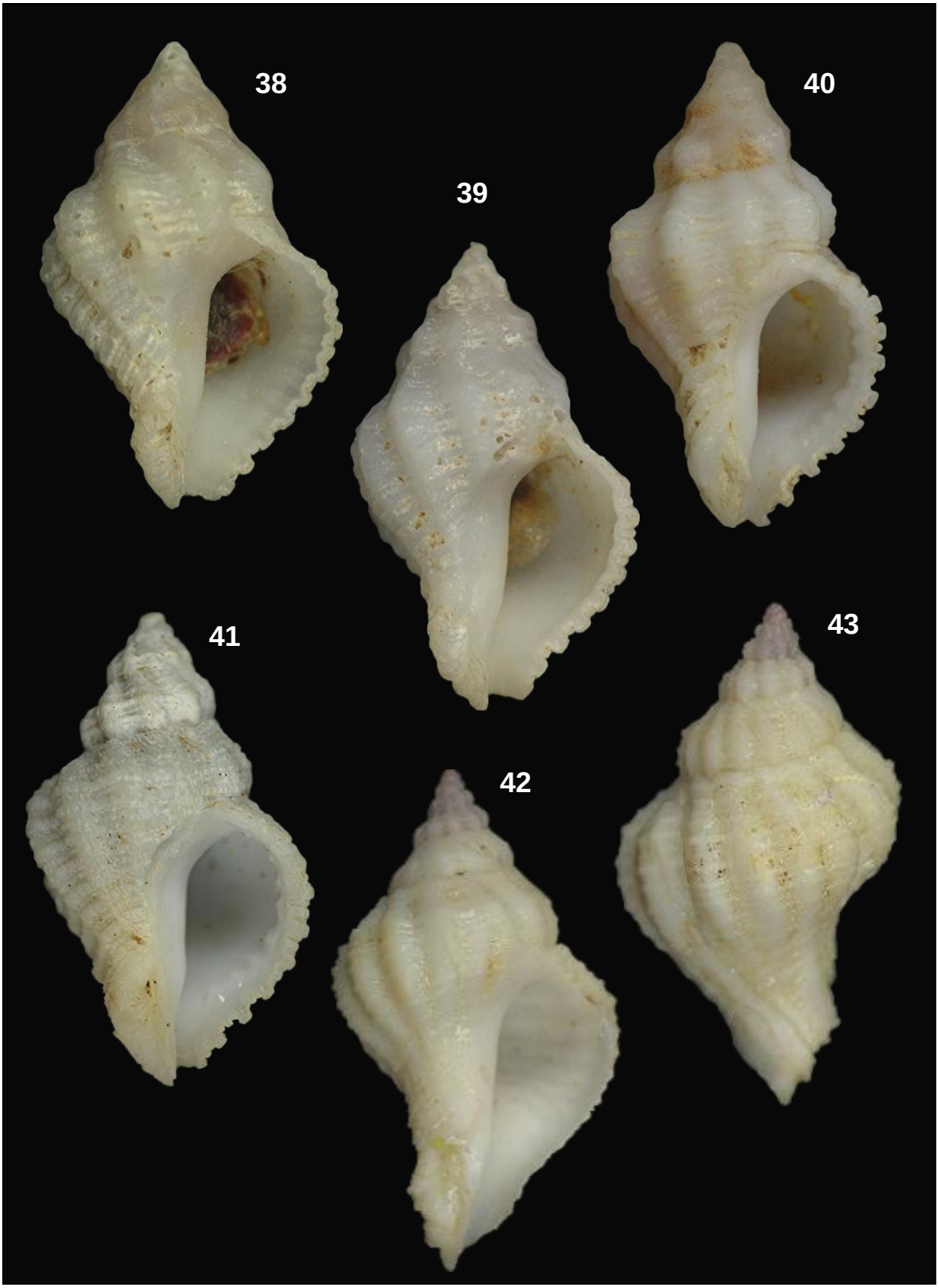

Plate VIII. Figs 38-41: *Coralliophila meyendorffi* (Calcara, 1845). Dakar, Senegal. On rocks at low tide. April 1977. FN; 38: 13.14 mm; 39: 13.18 mm; 40: 14.65 mm; Fig. 41: Pointe Noire, Congo-Brazzaville. By snorkelling. Under rock. 1992. 13.49 mm. JV. Figs 42-43: *Coralliophila* cf. *basilea* (Dautzenberg & H. Fischer, 1896). Off Abidjan, Ivory Coast. Trawled by fishermen. 21.87 mm. FN.

Further notes on *Conus trencarti* Nolf & Verstraeten, 2008

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Keywords: MOLLUSCA, GASTROPODA, CONIDAE, Senegal, West Africa, *Conus trencarti*, habitat, size.

Abstract: Further information on the habitat of *Conus trencarti* Nolf & Verstraeten, 2008 is presented as well as the record of a specimen exceptional in size and colour.

Abbreviations:
AT: Private collection of Alex Trencart (Paris, France)
JV: Private collection of Johan Verstraeten (Oostende, Belgium)

Habitat: *Conus trencarti* Nolf & Verstraeten, 2008 is an uncommon species locally occurring off Dakar, Senegal. It is known from a restricted range, living on rocky bottoms with strong underwater currents, from 12 to 25 m deep, between the Island of N'Gor and the lighthouse of the Almadies. Its habitat is in small sand pockets overgrown with red algae within rock crevices or on the face of sloping rocks, which it shares with specimens of *Conus cloveri* Walls, 1978, *Hexaplex angularis* (Lamarck, 1822) and *Babelomurex bernardi* Nicolay, 1984. However one specimen of exceptional size and colour was recovered between the lighthouse of the Almadies and the lighthouse of the Mamelles, about two kilometres away from its usual habitat. This area is characterised by its calm waters. The specimen was found in a sand pocket occupying a fracture in a large basalt rock at a depth of 22 metres. The other malacological fauna in this habitat consists of *Cypraea spurca verdensium* Melvill, 1888, *Harpa doris* Röding, 1798, *Purpurellus gambiensis* (Reeve, 1845), *Muricanthus angularis* (Lamarck, 1822), *Hexaplex megacerus* (Sowerby, 1834) and *Jaton flavidus (*Jousseaume, 1874). The size is exceptional, 41.61 mm, as the largest specimens from its usual habitat reach a maximum of 27 to 30 mm. Its dark brown colour is unusual as specimens from the type locality have a much lighter colour. The species appears to be quite uncommon in this area as only this specimen was recovered after some fifty scuba dives.

Acknowledgements: We are grateful to David Monsecour (Aarschot, Belgium) and Frank Nolf (Oostende, Belgium) for a critical control of the text.

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Plate I. Fig. 1: *Conus trencarti* Nolf & Verstraeten, 2008: between the lighthouses of Almadies and Mamelles, off Dakar, Senegal. In a sand pocket on a large basalt rock. Dived at a depth of 22 m. AT. 41.61 mm.

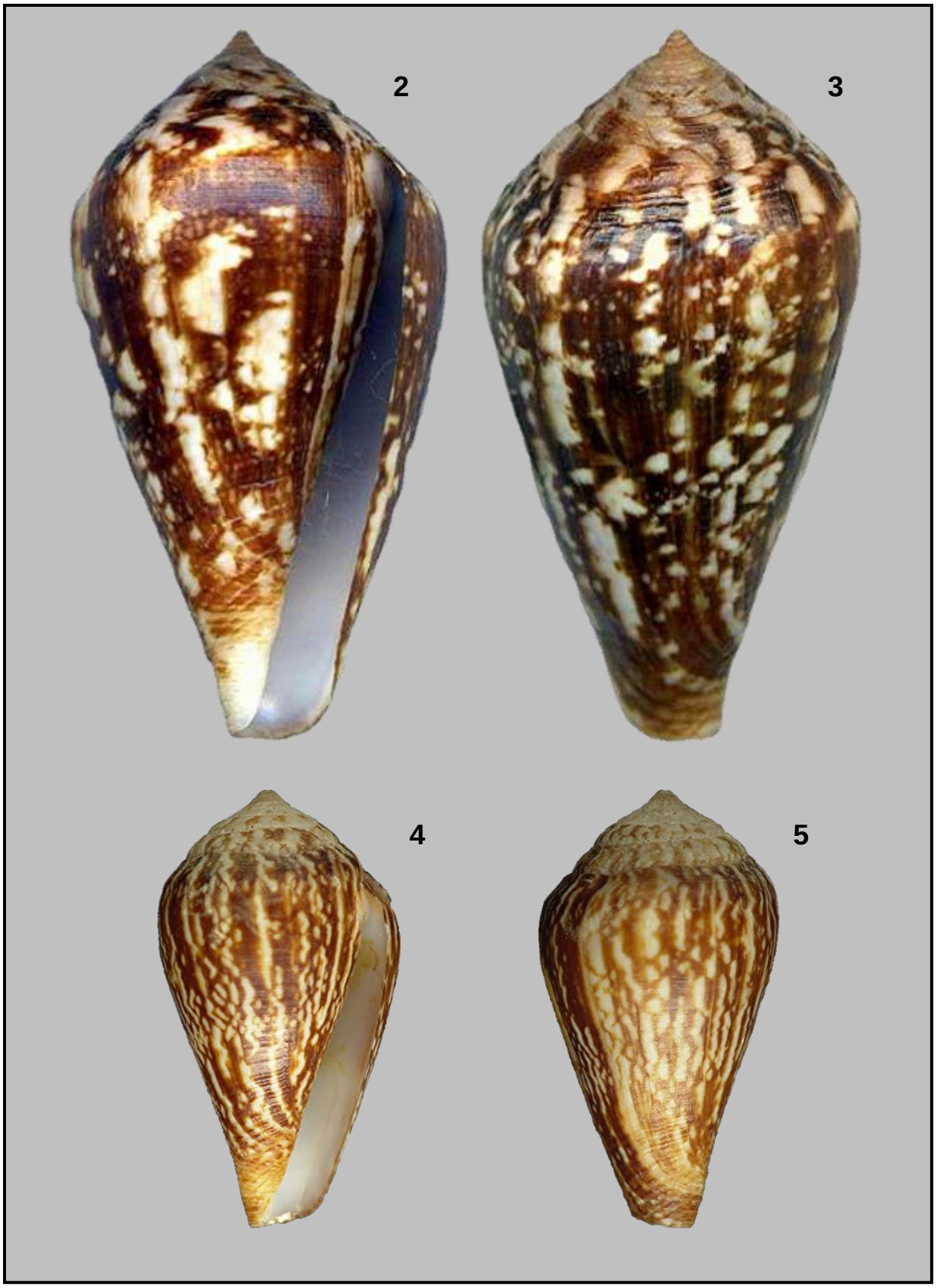

Plate II. Figs 2-5: *Conus trencarti* Nolf & Verstraeten, 2008; 2-3: between the lighthouses of Almadies and Mamelles, off Dakar, Senegal. In a sand pocket on a large basalt rock. Dived at a depth of 22 m. AT. 41.61 mm; 4-5: off Almadies, Dakar, Senegal. On rocks. Dived at a depth of 30-40 m. Paratype 4 (JV). 24.18 mm.