

# Hitchhiking veligers of *Ctenoides scabra* (Born, 1778) (Mollusca: Bivalvia: Limidae) from the Bahamas in Dorset (UK)

Graham Saunders

Forge Cottage, Dewlish, DT2 7LR Dorchester, Dorset, UK

[smtaltd@tiscali.co.uk](mailto:smtaltd@tiscali.co.uk)

**Keywords:** Mollusca, Bivalvia, LIMIDAE, *Ctenoides scabra*, Dorset, UK.

**Abstract:** Specimens of *Ctenoides scabra* (Born, 1778) were introduced from the Bahamas in the waters off South Dorset, UK, picked up by local fishermen and kept in salt-water aquariums.

## Abbreviations:

AUTEC: Atlantic Undersea Test and Evaluation Center

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

CGS: Private collection of Graham Saunders (Dorset, UK)

H.: Height

L.: Length

**Diagnosis:** The normal range for *Ctenoides scabra* (Born, 1778) (Pl. I, Figs 1-4; Pl. II, Figs 5-8; Pl. III, Figs 9-12) is said to be from South Carolina to Brazil. In the mid 1980's a small number of large *Ctenoides* were being taken alive by local fishermen off South Dorset. Because they were so attractive, some of them ended their lives in salt-water aquariums in Charminster, the Bournemouth area, where being filter feeders, they eventually starved to death. I was able to obtain several specimens from a salt-water aquaria shop, which sometimes buys specimens from local fishermen.

It is almost certain that the appearance of this species in these waters resulted from a massive veliger transplant when 'HMS Challenger' returned from a trials visit to the AUTEC sonar ranges off South Andros in the Bahamas. In the centre of the ship is a structure called a moon-pool. This provides a sheltered area through which divers and manned submersibles can be dropped in all weathers. When the vessel is in motion the water in the moon pool is stable and does not mix with the open sea. Fish (diving crew observation), and plankton are trapped for the duration of the voyage. The barrier is dynamic rather than physical. When motion ceases, in this case just outside Portland Harbour, the "passengers" disperse.

Animals which belong to the genus *Ctenoides* are nocturnally mobile, normally spending daylight hours under dead coral slabs or in

crevices of limestone rock faces. In the old quarries behind Spanish Harbour Key, Florida (USA), I found juveniles up to about 35 mm at a depth of a metre.

Some authors (Abbott, 1974 among others) mention the existence of a form, e.g. *Ctenoides scabra* var. *tenera* (Born, 1778). In fact, it concerns:

*Ctenoides mitis* (Lamarck, 1807)

= *Ctenoides tenera* (G.B. Sowerby II, 1843)

= *Ctenoides floridana* (Olsson & Harbison, 1953) Pl. IV, Figs 13-15.

Range: North Carolina to Florida, Bermuda, Bahamas, West Indies, Gulf of Mexico, the Caribbean, Central America and South America (Colombia, Venezuela). This species lives in the same habitat as *Ctenoides scabra* (Born, 1778).

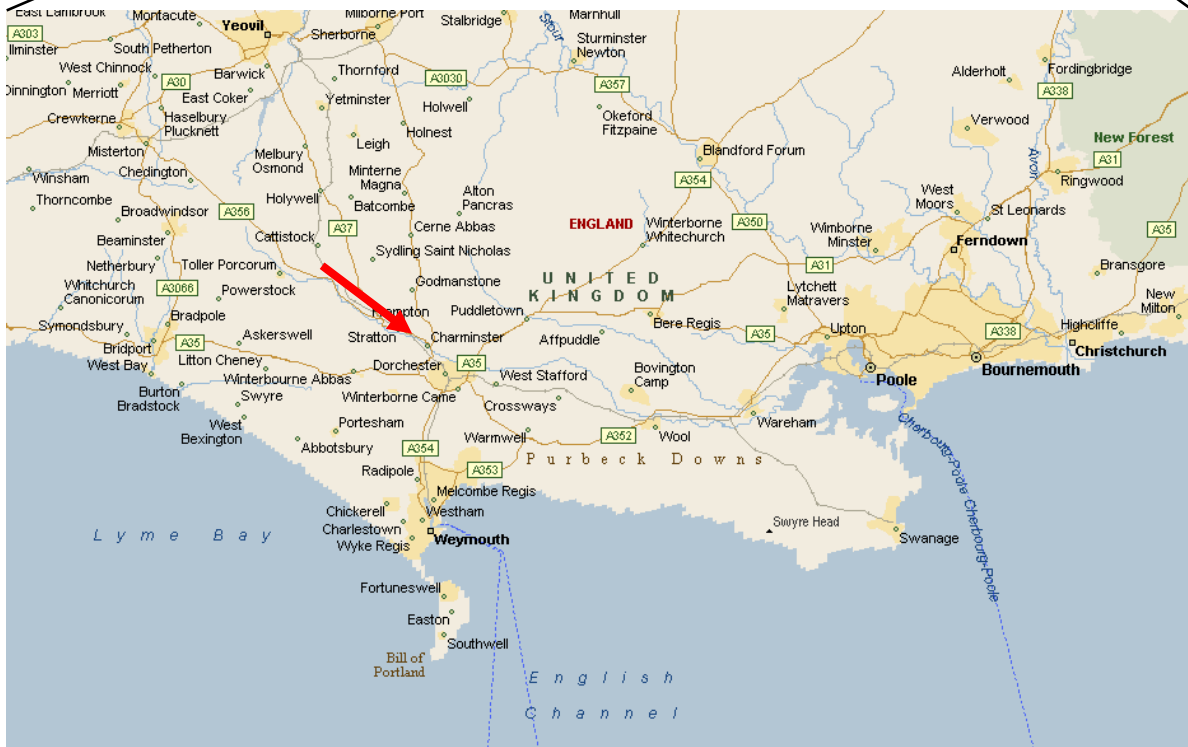
*C. scabra* is to 80-90 mm in height. The shell is heavier and slightly narrower than *C. mitis*, with only about 50 radial ribs instead of twice that amount in *C. mitis*. Weak concentric threads are present between the riblets. These white ribs are most noticeable near the centre of the valves under a yellow-brown periostracum. The shell is quite coarsely sculptured with wedge-shaped spines, giving it a much rougher surface than *C. mitis*. Concentric threads between the ribs are stronger and sometimes slanted, tending to give a pitted appearance especially to young shells. The hinge plate is often deeper than on similar sized specimens of *C. mitis*. The exterior is white to cream-yellow beneath a brown periostracum. The glossy interior has a yellow or purplish tint.

Both species often coexist on the same reef. They live under rocks in shallow water at low tide to a depth of 135 metres. *C. scabra* attracts more epifauna than *C. mitis*. Obviously, the epifauna on the emigrants is different to that of the West Atlantic population.

**Acknowledgements:** I thank Frank Nolf (Oostende, Belgium) for a revision of the manuscript and especially for providing additional information on the systematics of this species and for photographing shells from both our collections.

**References:**

- Abbott, R. T., 1974. *American Seashells: the Marine Mollusca of the Atlantic and Pacific Coasts of North America*. Second edition. Van Nostrand Reinhold, New York. 663 pp, 24 pls.
- Mikkelsen, P. M. & Bieler, R., 2008. *Seashells of Southern Florida: living marine mollusks of the Florida Keys and adjacent regions. Bivalves*. 503 pp + pls. and figs.
- Redfern, C., 2001. *Bahamian Seashells: A Thousand species from Abaco, Bahamas*. Bahamian seashells.com, Inc., Boca Raton, Florida, ix + 280 pp, 124 pls.

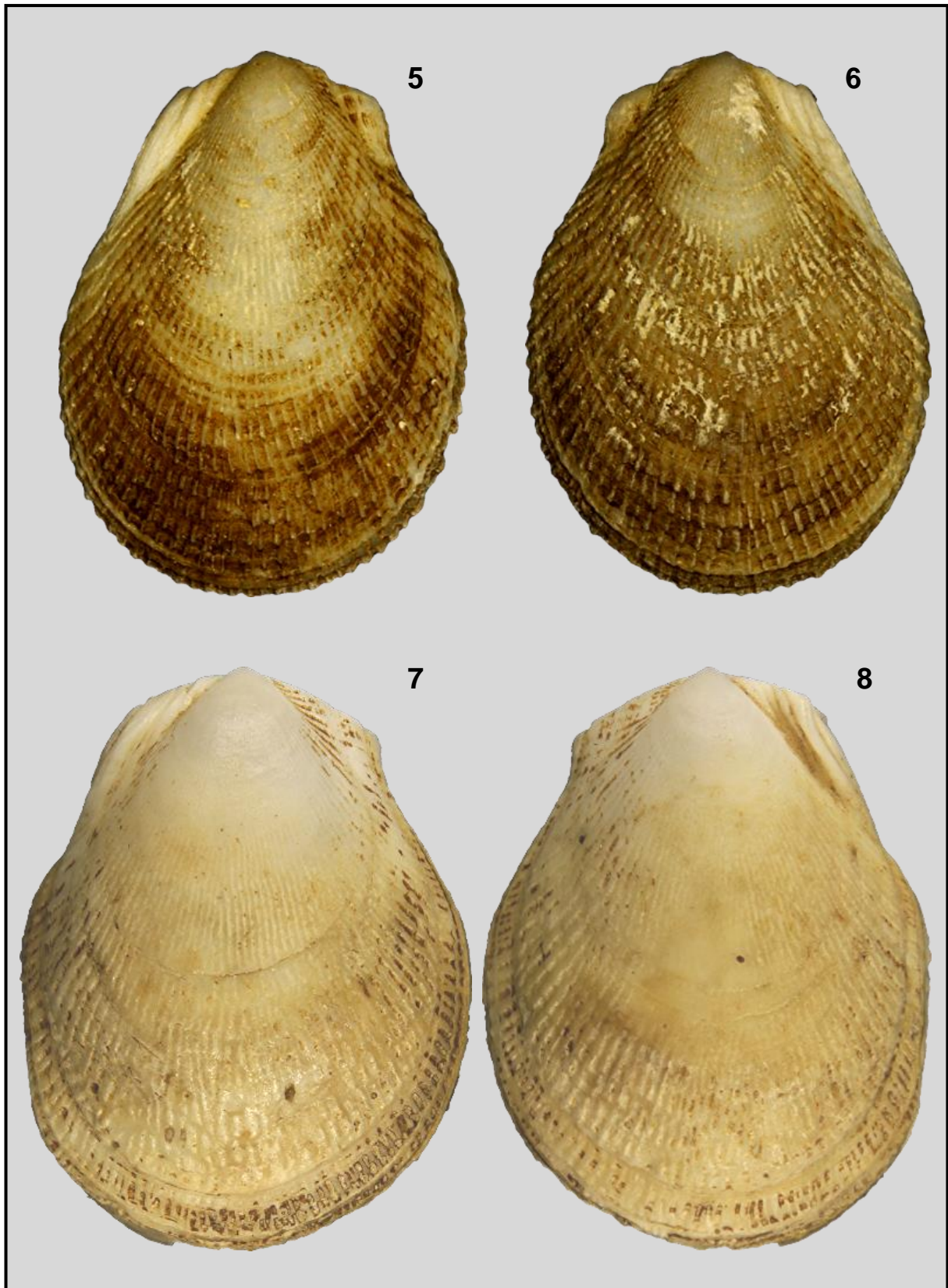


**Map of the Bournemouth area, Dorset, UK**

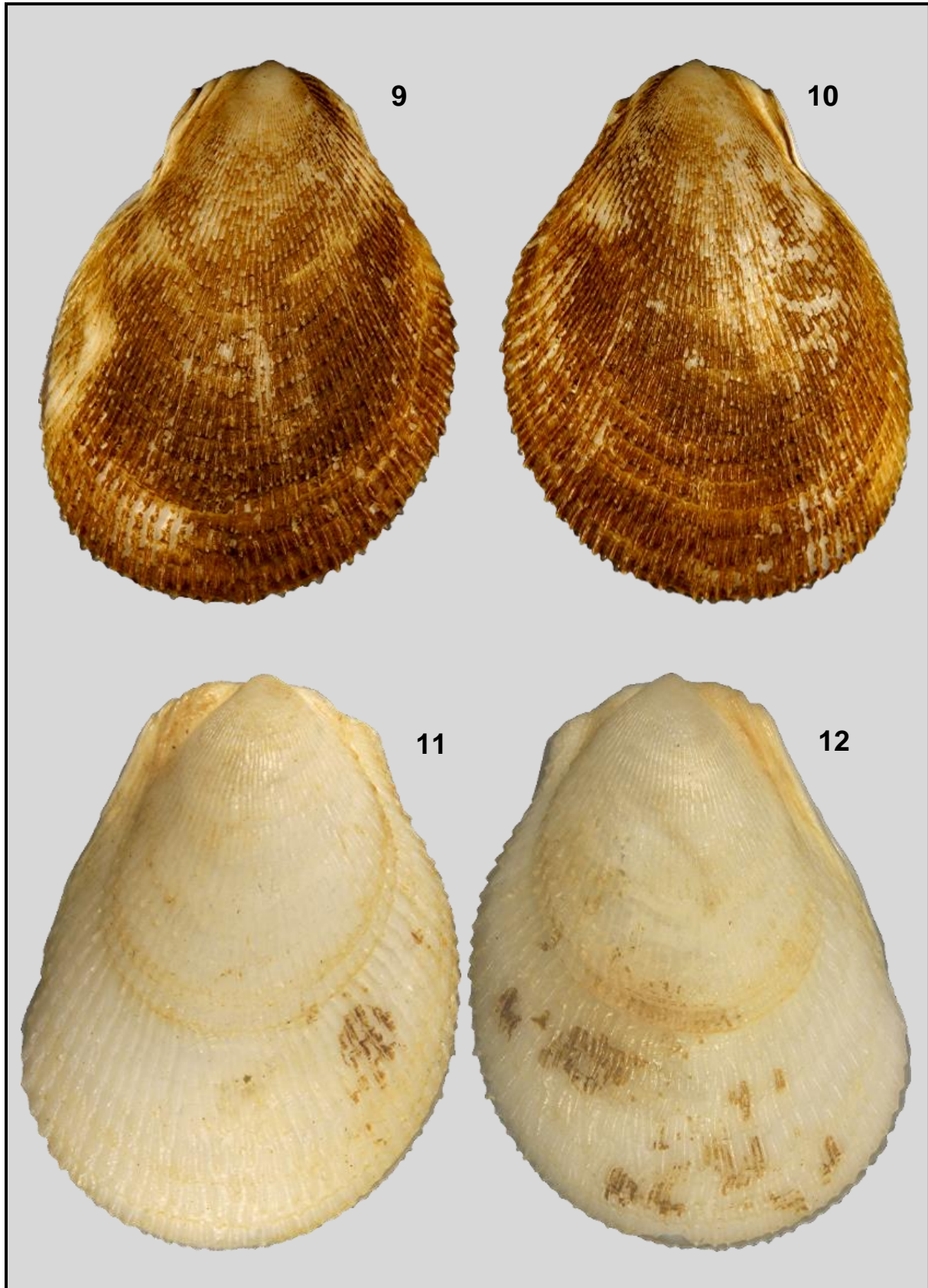


**Plate I.** Figs 1-4: *Ctenoides scabra* (Born, 1778). Trawled by local fishermen off South Dorset, UK and kept in salt-water aquarium (Charminster, Bournemouth area). CGS; 1-2: H. 81.53 mm L. 62.27 mm; 1: LV; 2: RV; 3-4: H. 69.99 mm L. 51.85 mm; 3: LV; 4: RV.



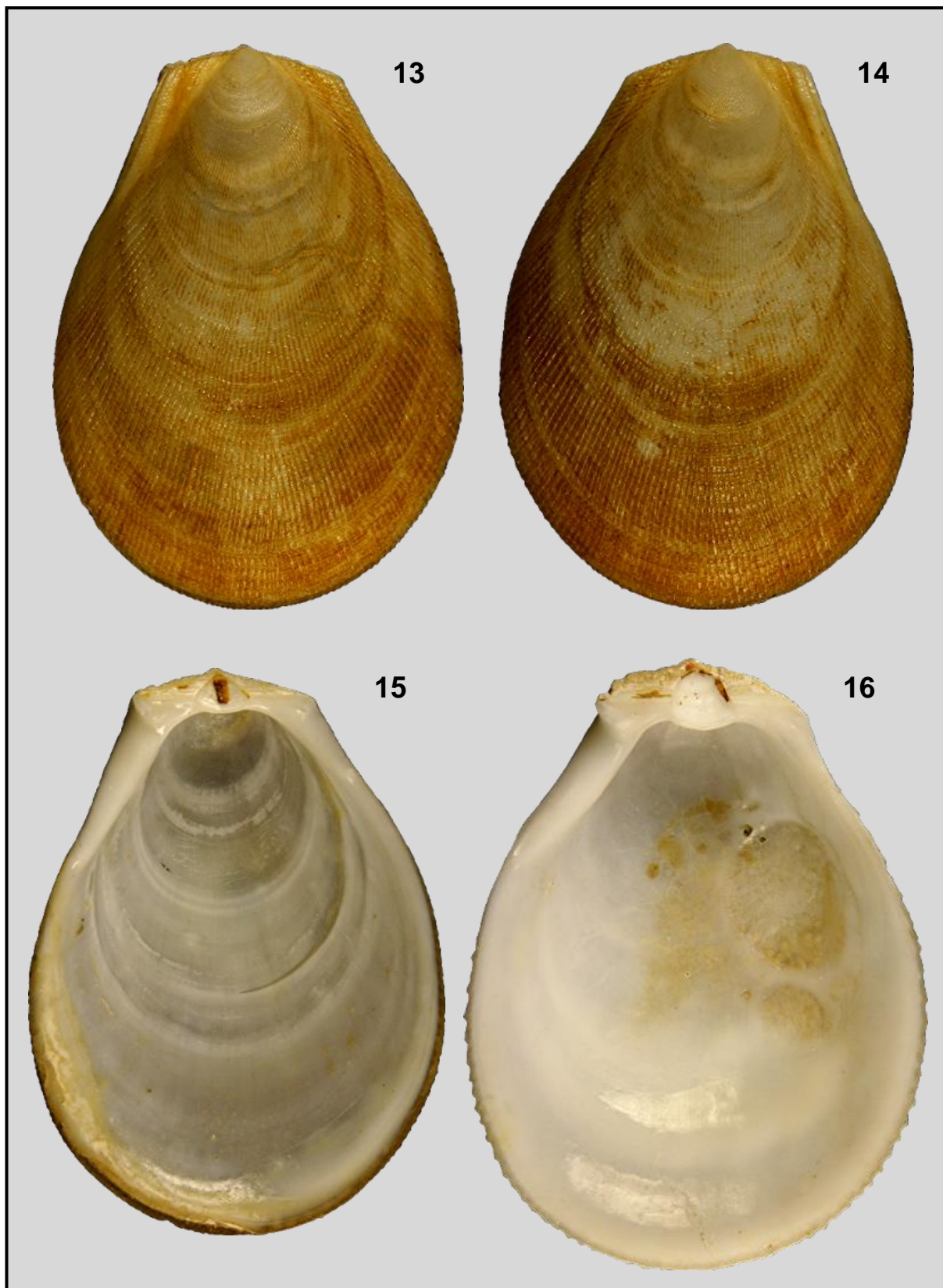


**Plate II.** Figs 5-8: *Ctenoides scabra* (Born, 1778). Trawled by local fishermen off South Dorset, UK and kept in salt-water aquarium (Charminster, Bournemouth area). CGS; 5-6: H. 56.52 mm L. 42.60 mm; 5: LV; 6: RV; 7-8: Collected by diver off Ilet à Fajou, Guadeloupe, Lesser Antilles. March 1972. H. 65.25 mm L. 50.88 mm. CFN; 7: LV; 8: RV.



**Plate III.** Figs 9-12: *Ctenoides scabra* (Born, 1778). Biscayne Bay, Miami, Florida, USA. Dived at a depth of 4 m. 27 July 1974. CFN; 9-10: H. 70.16 mm L. 52.51 mm, 9: LV; 10: RV; 11-12: H. 78.27 mm L. 59.80 mm; 11: LV; 12: RV.





**Plate IV.** Figs 13-15: *Ctenoides mitis* (Lamarck, 1807). Marathon, Key Vaca, Lower Florida Keys, USA. August 1971. H. 74.45 mm L. 54.19 mm. CFN; 13: LV; 14: RV; 15: interior of RV. Fig. 16: *Ctenoides scabra* (Born, 1778). Biscayne Bay, Miami, Florida, USA. Dived at a depth of 4 m. 27 July 1974. H. 78.27 mm L. 59.80 mm. Interior of RV. CFN.

# ***Anadara inaequalis* (Bruguère, 1789) (Mollusca: Bivalvia: Arcidae) a new invasive species in the eastern Atlantic waters of W France**

**Frank Nolf**

Pr. Stefanieplein, 43/8 – B-8400 Oostende  
[frank.nolf@pandora.be](mailto:frank.nolf@pandora.be)

**Keywords:** Mollusca, Bivalvia, ARCIDAE, invasive species, W France.

**Abstract:** Dozens of specimens of *Anadara inaequalis* were found in an oyster farm in the Morbihan, W France at the end of 2003. They were probably introduced with spat from the Mediterranean. This is a new invasive species in the East Atlantic waters of France.

## **Abbreviations:**

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

H.: Height

L.: Length

## **Diagnosis:**

### ***Anadara inaequalis* (Bruguère, 1789)**

= *Arca inaequalis* Bruguère, 1789

= *Arca cornea* Reeve, 1844

= *Arca rufescens* Reeve, 1844

The shell is solid, heavy, inflated and white coloured. There is a velvety, dark brown to black persistent periostracum present near the margins. It is strongly inequivalve in juveniles, less so in adults. The umbonal region is smooth and dark in juvenile specimens. The hinge is taxodont. There is a sculpture of 31 to 34 radial ribs. The internal ventral margin is strongly crenulated. It is highly variable in shape, shell thickness and convexity of the valves.

The size ranges from 35 to 80 mm in length.

This species can easily be distinguished from other *Anadara* because of its valves being different in size. However, as in other *Anadara*, the shells become equivalve with increasing age. It can be differentiated from the similar *Anadara diluvii* (Lamarck, 1805) by the higher number of ribs (31-34) versus 26-28 in *A. diluvii*. The latter is a smaller shell.

**Habitat and distribution:** This Lessepsian species migrated into the Mediterranean Sea about half a century ago. It was first reported as *Scapharca* cfr *cornea* off Ravenna (Adriatic Sea, Italy) in 1969. Later on, it was reported from the Venice lagoon and Lake Faro (Sicily). It lives in the Indo-Pacific, except in the Red Sea, from

inshore brackish waters down to 30 m on sand and rocks. In the Adriatic Sea, it is found together with *Zostera nana* and *Cymodocea nodosa* in brackish lagoons. The introduction of *A. inaequalis* into the Adriatic in the past century was accidental, most likely by shipping. This invasive species can be found by the millions on the beaches of Ravenna (Italy), along with shells of *Rapana venosa* (Valenciennes, 1846). Several specimens were collected in the intertidal culture parks of *Ruditapes philippinarum* (Adams & Reeve, 1850) in the Eo Estuary, Atlantic North coast of Spain during 1993-1994. More recently, namely in December 2003, about 20-30 specimens were found in an oyster farm in St. Philibert (Morbihan, W France) (Pl. I, Figs 1-2; PL. II, Figs 3-4, Pl. III, Figs 5-6). They were probably introduced together with juvenile oyster shells or spat of *Ruditapes philippinarum* from the Mediterranean, especially from Italy. This is the first report of this invasive species in East Atlantic waters of W France. The specimens are similar to those from the Indo-Pacific (Pl. IV, Figs 7-8) and the Mediterranean (Pl. V, Figs 9-12; Pl. VI, Figs 13-14). *Anadara inaequalis* is resistant to a broad range of conditions, particularly extreme conditions of temperature and salinity and it has therefore the potential for fast expanding in the waters of W France. However, no more specimens have been found and reported in the past years.

**Acknowledgements:** Many thanks go to Johan Verstraeten for carefully checking the text.

## **References:**

- Cigarría, J. & Valdés, Á, 1996. *Anadara inaequalis* (Bruguère, 1789) in the North Atlantic. *Journal of Conchology*, communications, **35**(4): 378-379.
- Pope, G.T. & Goto, Y., 1993. *European Seashells* (vol. II). Verlag Christa Hemmen. Wiesbaden. 221 pp.
- Zenetos, A., Gofas, S., Russo, G. & Templado, J., 2003. *CIESM Atlas of Exotic Species in the Mediterranean. Vol. 3. Molluscs*. [F. Briand, Ed.]. CIESM Publishers, Monaco. 376 pp.



**Plate I.** Figs 1-2: *Anadara inaequalis* (Bruguère, 1789). St. Philibert, Morbihan, Brittany, W France. In oyster farm. 21 December 2003. H. 51.85 mm L. 59.35 mm. CFN; 1: RV; 2: LV.



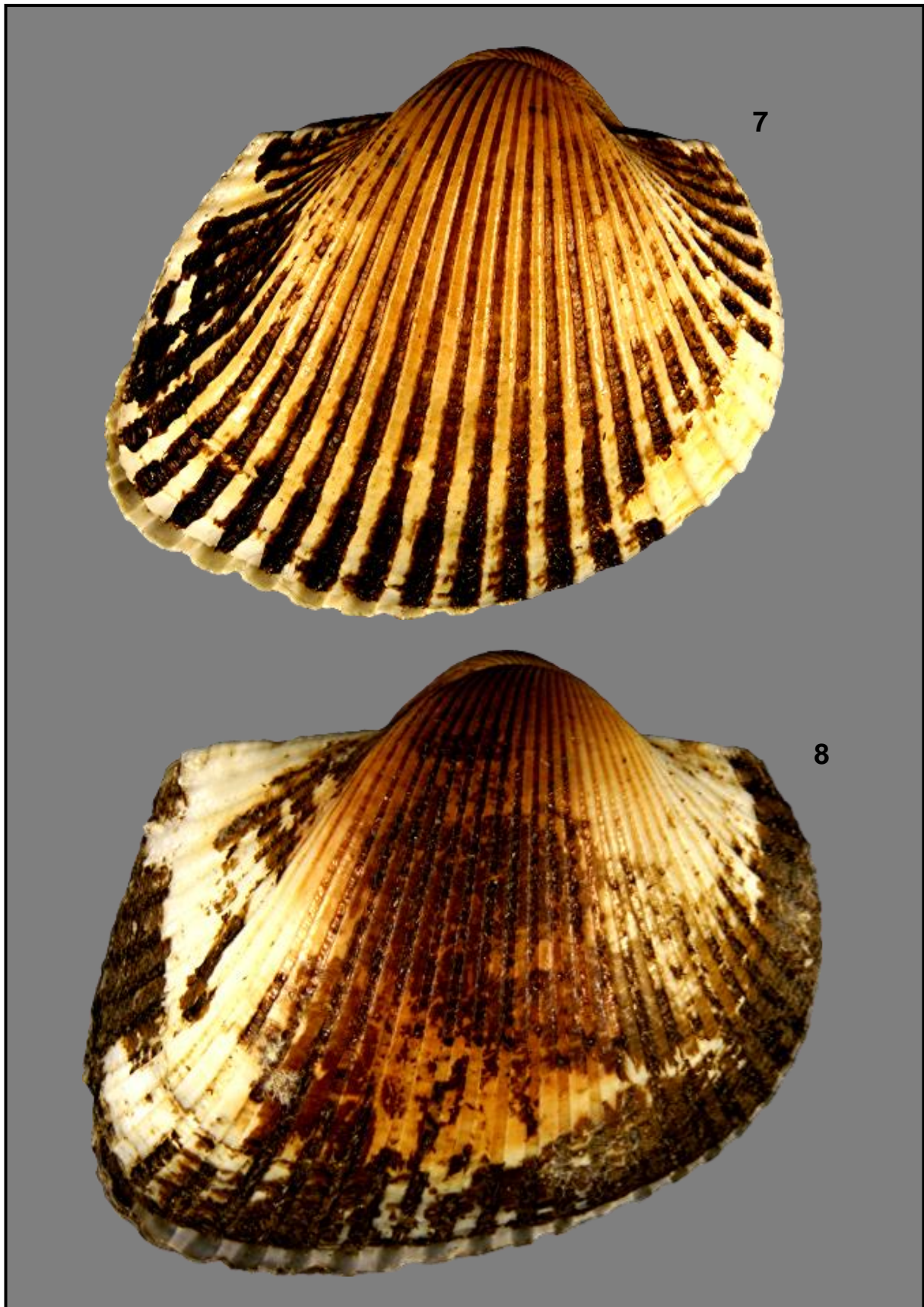


**Plate II.** Figs 3-4: *Anadara inaequalis* (Bruguère, 1789). St. Philibert, Morbihan, Brittany, W France. In oyster farm. 21 December 2003. H. 50.63 mm L. 62.23 mm. CFN; 3: RV; 4: LV.

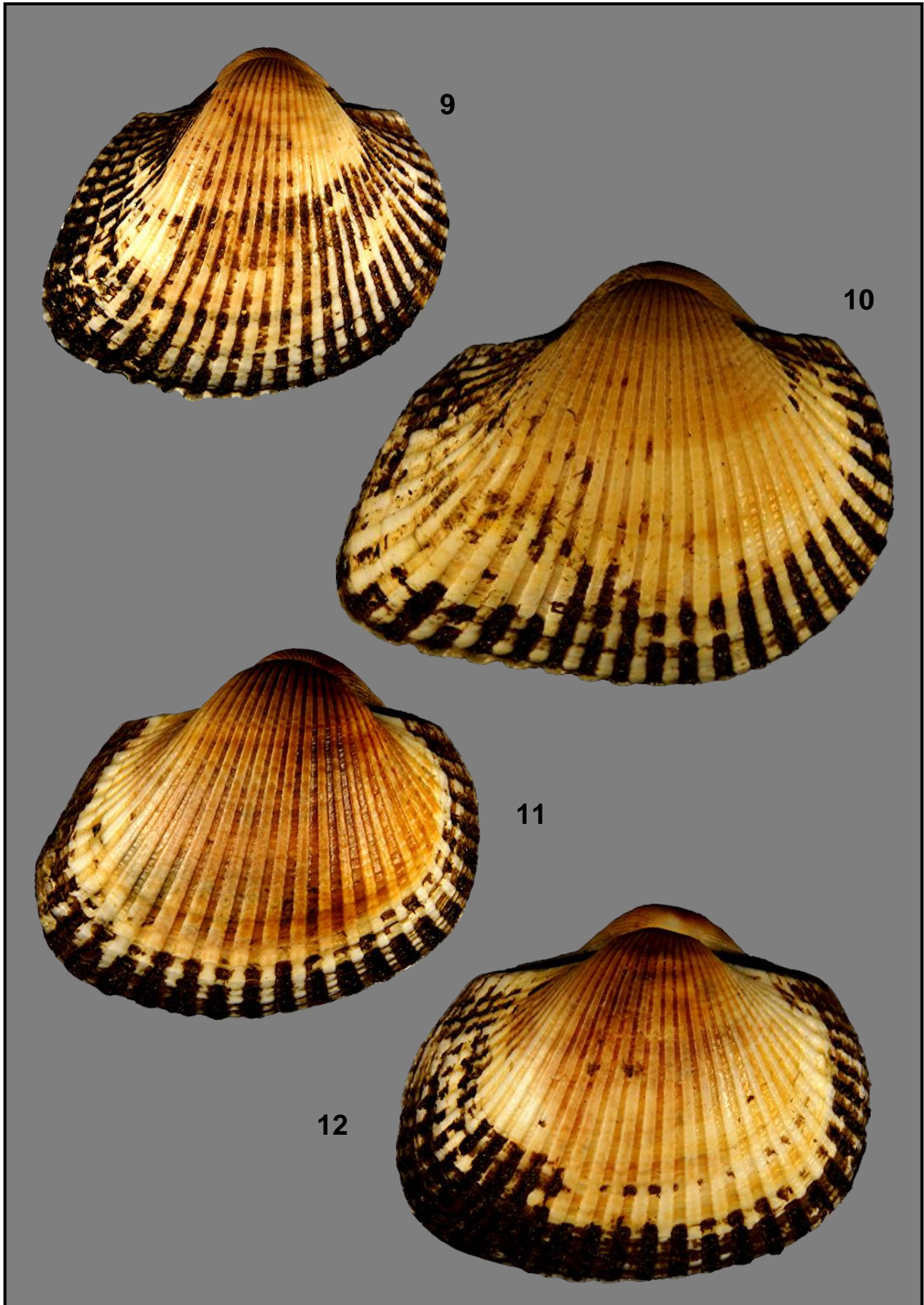


**Plate III.** Figs 5-6: *Anadara inaequivalvis* (Bruguière, 1789). St. Philibert, Morbihan, Brittany, W France. In oyster farm. 21 December 2003. H. 50.63 mm L. 62.23 mm. CFN; 5: RV; 6: LV.



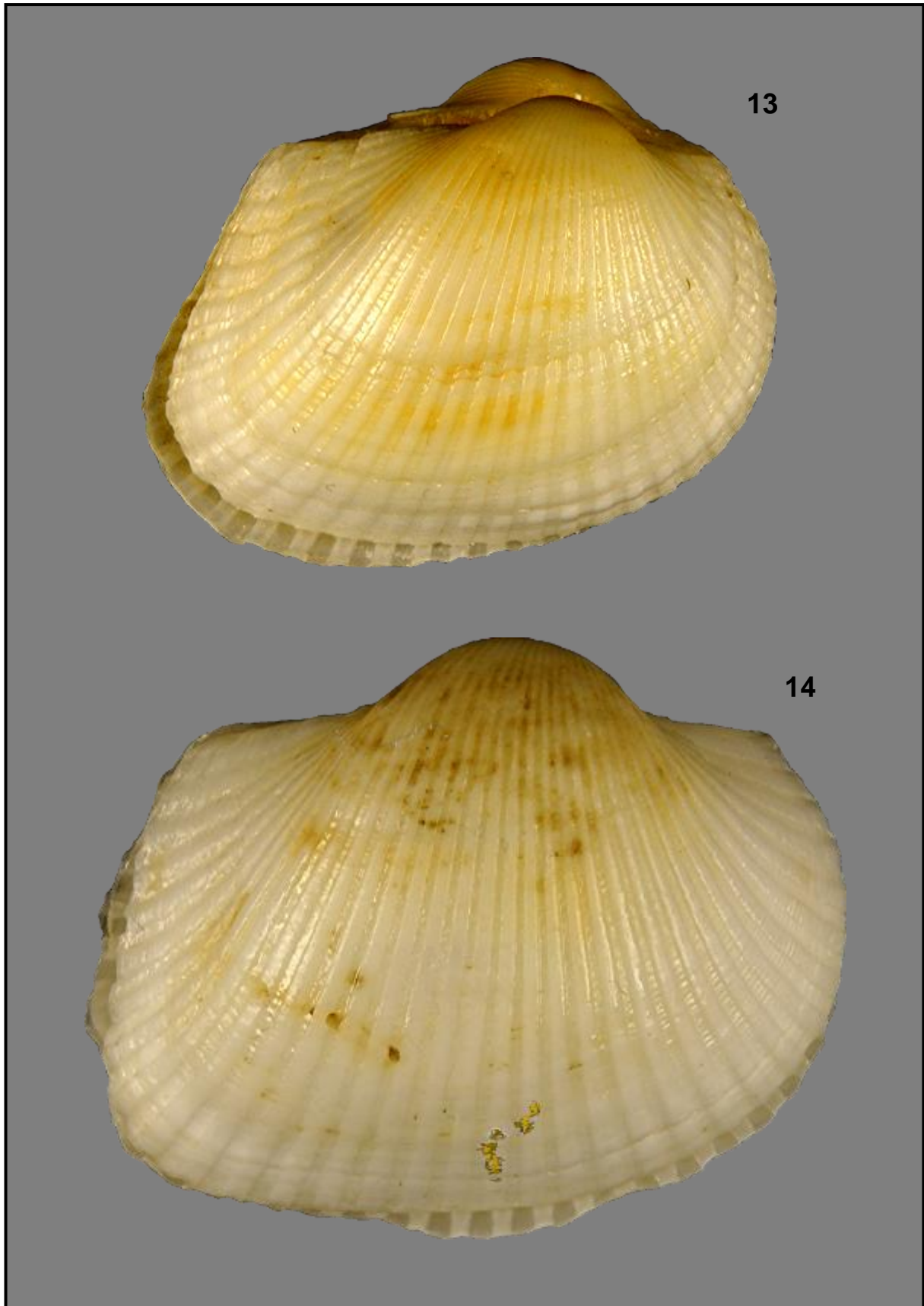


**Plate IV.** Figs 7-8: *Anadara inaequivalvis* (Bruguière, 1789); 7: Amami Islands, Japan. H. 49.64 mm L. 60.08 mm. RV. CFN; 8: Rameswaram, SE India. Trawled by local fishermen. January 2002. H. 49.14 mm L. 65.20 mm. RV. CFN.



**Plate V.** Figs 9-12: *Anadara inaequivalvis* (Bruguière, 1789). San Benedetto del Tronto, Italy. Alive on beach. November 1994. RV. CFN; 9: H. 41.15 mm L. 47.64 mm; 10: 45.67 mm L. 59.88 mm; 11: 40.15 mm L. 48.58 mm; 12: 40.33 mm L. 51.80 mm.





**Plate VI.** Figs 13-14: *Anadara inaequalis* (Bruguière, 1789). Djerba Island, Tunisia. RV. CFN; 13: H. 32.89 mm L. 45.49 mm; 14: H. 38.82 mm L. 51.06 mm.

# Some critical notes about the introduction of the subspecies *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009 (Mollusca: Gastropoda: Cypraeidae)

Frank Nolf

Pr. Stefanieplein, 43/8 – B-8400 Oostende  
[frank.nolf@pandora.be](mailto:frank.nolf@pandora.be)

**Keywords:** Mollusca, Gastropoda, CYPRAEIDAE, *Zonaria pyrum nigromarginata*, subspecies, form.

**Abstract:** The new subspecies *Zonaria pyrum nigromarginata* from the south Atlantic coasts of the Iberian Peninsula introduced by Deprez & Govaert (2009) should merely be regarded as a form of this very variable species.

#### Abbreviations:

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

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

**Discussion:** Deprez & Govaert (2009) described *Zonaria pyrum nigromarginata* (Pl. VI, Figs 22-27; Pl. VII, Figs 28-30; Pl. VIII, Figs 31-33; Pl. IX, Figs 34-36; Pl. X, Figs 37-39; Pl. XI, Figs 40-42) as a subspecies from the Gulf of Cadiz (Spain) and South Portugal after studying several specimens dived in shallow water. The sample is differentiated from specimens collected elsewhere by the dark brown colour of the margins and the indistinct marginal spotting on both columellar and labral sides. The authors argue that the dark coloured margins and the lateral spotting allow to distinguish these shells from classic *Zonaria pyrum* (Gmelin, 1791) (Pl. I, Figs 1-4; Pl. IV, Figs 16-18; Pl. V, Figs 19-21). However, study of the shells of *Z. pyrum* reveals the immense variability within this species. Specimens dived off Bodrum (Turkey) (Pl. V, Figs 19-21) have the same dark coloured margins but the dorsum is dark orange instead of pale and banded as in *Z. pyrum nigromarginata*. Spotting occurs in all populations through the Mediterranean and West Africa. It is not a constant feature. Specimens from Tunis (Tunisia) (Pl. I, Figs 1-4) for instance show similar characteristics as the new subspecies, namely the brown-orange colour of the base and the margins provided with spots. Specimens with the same appearance are also found in the waters surrounding southern France. Moreover, the margins of the new subspecies are never as black as could be supposed by the name '*nigromarginata*' (plate 1, figs 1-2). We can only

conclude there was no proper justification to create a new subspecies for a species that lives in a continuing range from the Eastern Mediterranean Sea to Angola.

Members of one subspecies have to differ morphologically or by different coding sequences of the DNA from members of another subspecies of the species. It is evident that specimens which belong to a subspecies live in an isolated area (for instance in the waters of an archipelago) or are separated by geographic barriers from other specimens of the same species. We can assume that two groups of different subspecies can interbreed freely if some external barrier is removed. Finally, the distinction between a species and a subspecies depends only on the likelihood that in the absence of external barriers the two populations would merge back into a single, genetically unified population. It has nothing to do with 'how different' the two groups appear to be to the human observer. The differences described by Deprez and Govaert (2009) are not constantly observed in all the specimens (Goutal, 2008; Muñoz Sanchez, pers. com.) from the same habitat and no correlation has been made with the feeding and environmental conditions. More information was obtained from divers in Cadiz (SW Spain). They state that 'real *nigromarginata* specimens' inhabit the same habitat as paler shells. All the described differences between known subspecies and forms can be observed in a same population in the south of the Iberian Peninsula. Shells with different colour (orange, creamy white and even almost whitish) are living together in this area, though only in Cadiz and southern Portugal the dark marginated shells are predominating. The darker margins are in fact so striking because they are very contrasting with the paler creamish dorsum transversed by 3-4 bluish-brown bands. The mantle of the animal is also very variable in colour, from creamy yellow to mauve over a nice brown-orange. Shells from Algarve seem to be larger than those collected off Cadiz. *Zonaria pyrum* is as variable in the south of the Iberian Peninsula as in other localities of the Mediterranean Sea.



Moreover, as the differences described by Deprez and Govaert (2009) are also present in specimens from other localities (Tunisia, S France, Morocco, Sicily, Turkey, ...) it is evident that *Zonaria pyrum nigromarginata* does not belong to an isolated group.

*Zonaria pyrum* is an inhabitant of most shores of the Mediterranean and the East Atlantic coasts of W Africa, where it lives as a polytypic species with several local forms or subspecies such as *Z. pyrum angelicae* (Clover, 1974), *Z. pyrum angolensis* (Odhner, 1923) (Pl. II, Figs 5-7) and *Z. pyrum petitiana* (Crosse & Fischer, 1872) (Pl. III, Figs 10-15), which are more related to a specific habitat than *Z. pyrum nigromarginata* Deprez & Govaert, 2009.

According to F. Goutal (2008), *Z. pyrum* lives in the south of the Iberian Peninsula in a very variable habitat: on detritus bottoms, under large rocks or hiding under seaweed. Specimens are often found in turbid waters. Maybe suspended particles are absorbed by the mantle of the animal and cause the dark colour of the margins of some shells (the '*nigromarginata*' form).

**Conclusion:** There are two main reasons to reject the new subspecies *Z. pyrum nigromarginata*. First of all, many specimens from other areas in NW Africa and the Mediterranean Sea nearly show the same

features. Second, not all specimens in the same habitat at Cadiz (Spain) and in Algarve (Portugal) show the characteristics described by Deprez & Govaert (2009). Third, as the southern coasts of the Iberian Peninsula form a passage between the Mediterranean and E Atlantic waters they offer enough possibilities to members of this group to interbreed. The populations are not enough isolated from those living in the nearby waters. So far, we prefer to regard the new subspecies '*nigromarginata*' only as a local dark form of *Zonaria pyrum*. This can also be supposed of the taxons *senegalensis* Schilder, 1928 (Pl. II, Figs 8-9) and *petitiana* (Crosse, 1872) (Pl. III, Figs 10-15), which only differ in minor characteristics.

**Acknowledgements:** Willy Van Damme (Deurne-Antwerpen, Belgium) kindly submitted a pair of specimens from Cadiz (Spain) and Frank Swinnen (Lommel, Belgium) loaned his specimens from the south of the Iberian Peninsula for study and photography, Johan Verstraeten punctually read and corrected the text, while Benito & José Muñoz Sanchez provided detailed information about the habitat of the living animals. They also offered an interesting opinion about the variability of *Zonaria pyrum* in the south of the Iberian Peninsula to W. Van Damme.

#### References:

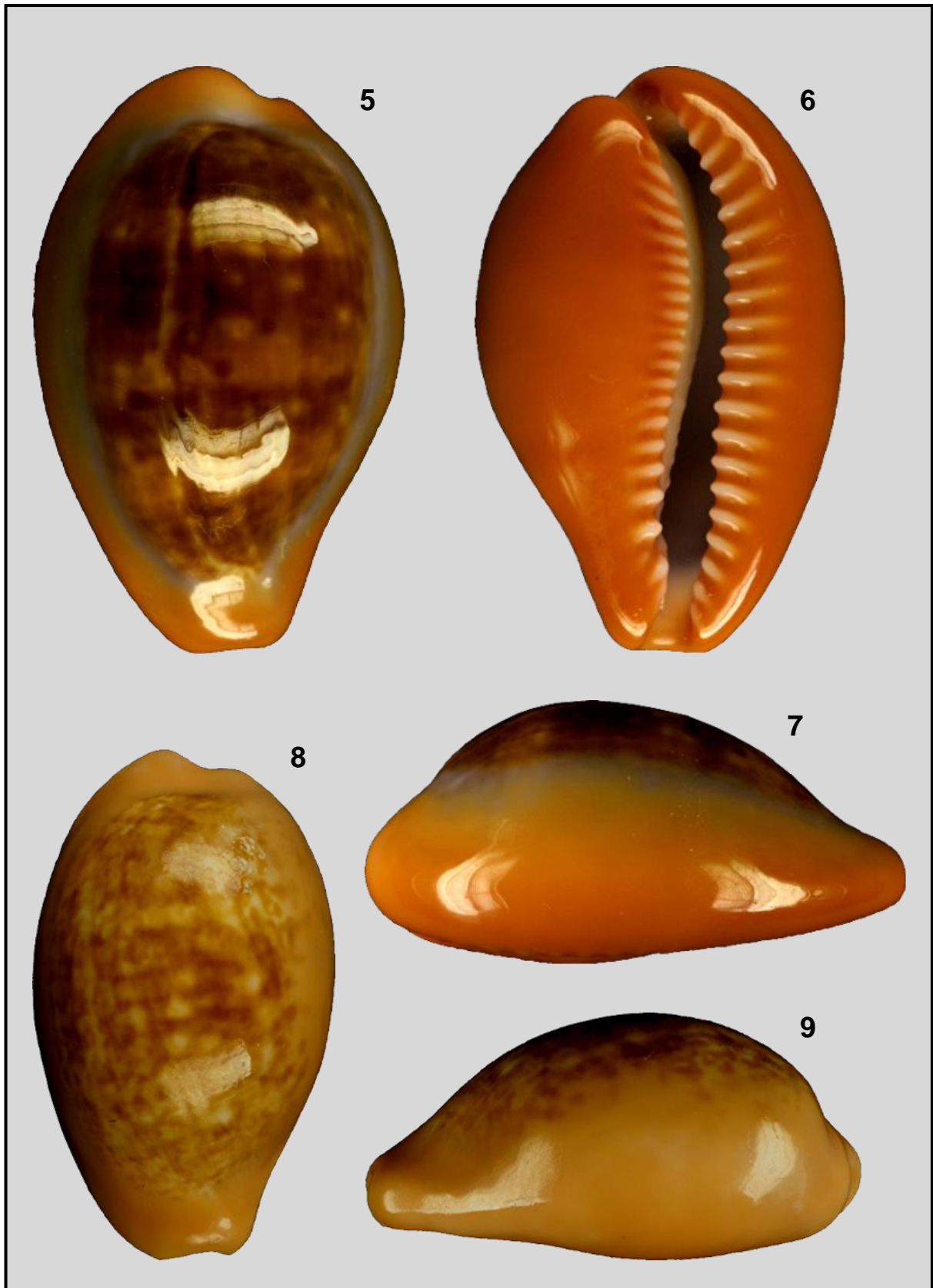
- Deprez, J. & Govaert, P., 2009. *Zonaria pyrum nigromarginata*: A new subspecies of *Zonaria pyrum* (Gastropoda: Cypraeidae) from the Atlantic coast of the Iberian Peninsula. *Gloria Maris*, **48**(4-5): 91-98.
- Goutal, F., 2008. *Zonaria pyrum* des côtes Atlantiques de l'Europe. *Xenophora*, **121**: 12-13.
- Lorenz, F., 2002. *New Worldwide Cowries*. Conchbooks, Hackenheim. 292 pp.
- Lorenz, F. & Hubert, A., 2000. *A Guide to Worldwide Cowries*. Second edition. Conchbooks. Hackenheim. 584 pp.
- Schilder, F.A. & Schilder, M., 1952. *Ph. Dautzenberg's collection of CYPRAEIDAE*. Mémoires Institut Royal des Sciences Naturelles de Belgique (2ième série), fasc. 45. 243 pp, 4 pls.



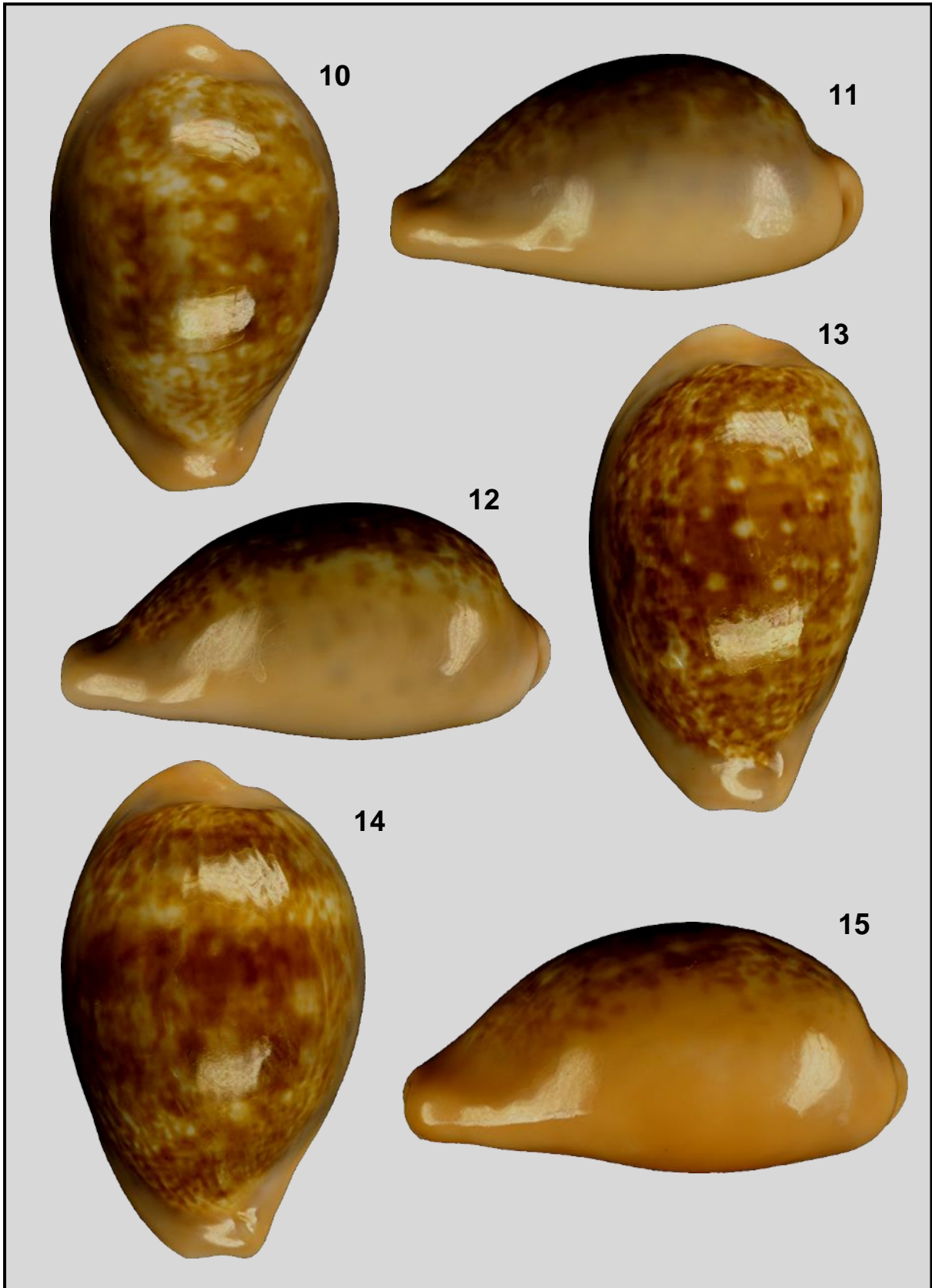


**Plate I.** Figs 1-4: *Zonaria pyrum* (Gmelin, 1791). Tunis, Tunisia. 30.78 mm. CFN.





**Plate II.** Figs 5-7: *Zonaria pyrum angolensis* (Odhner, 1923). North Luanda Province, Angola. 32.57 mm. CFN; Figs 8-9: *Zonaria pyrum* var. *senegalensis* Schilder, 1928. Senegal, W Africa. Dredged at a depth of 90 m. 1978.

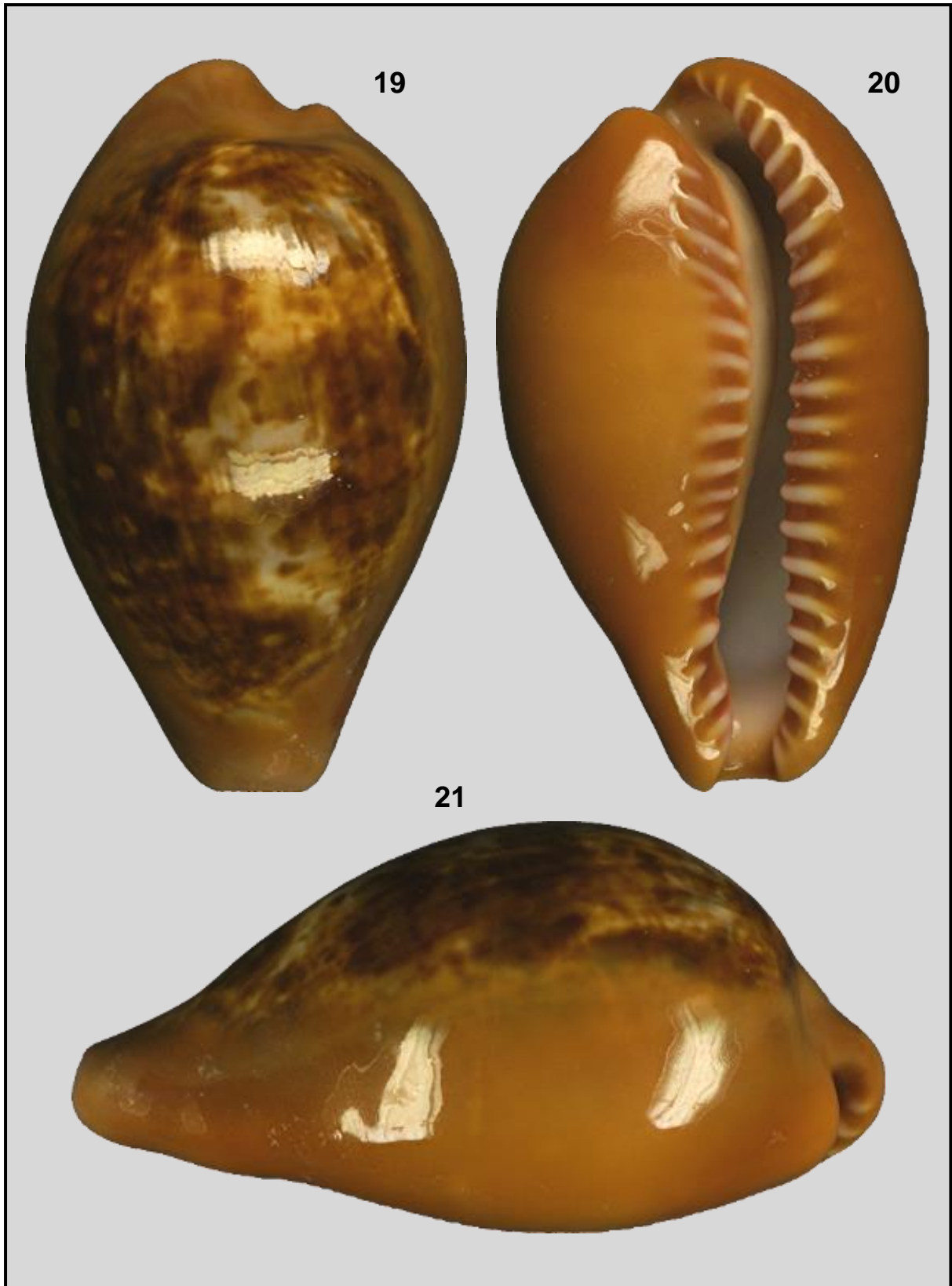


**Plate III.** Figs 10-15: *Zonaria pyrum petitiana* (Crosse, 1872). Casamance, Senegal, W Africa. On rock. Dived at a depth of 7 m. 1990. CFN; 10-11: 24.41 mm; 12-13: 33.37 mm; 14-15: 34.60 mm.

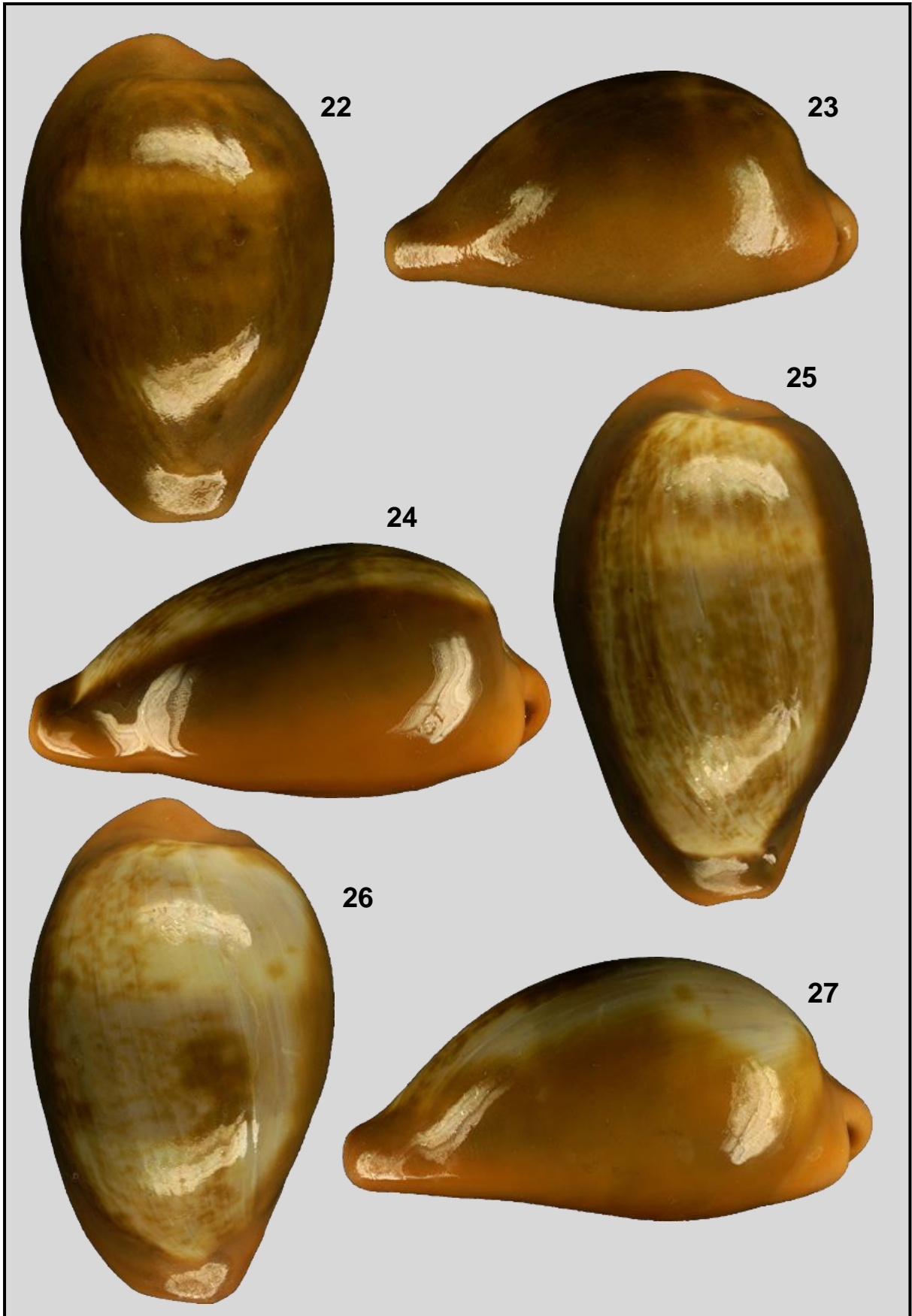


PI. IV. Figs 16-18: *Zonaria pyrum* (Gmelin, 1791). Bodrum, Turkey. Dived. 2010. 44.06 mm. CFN.

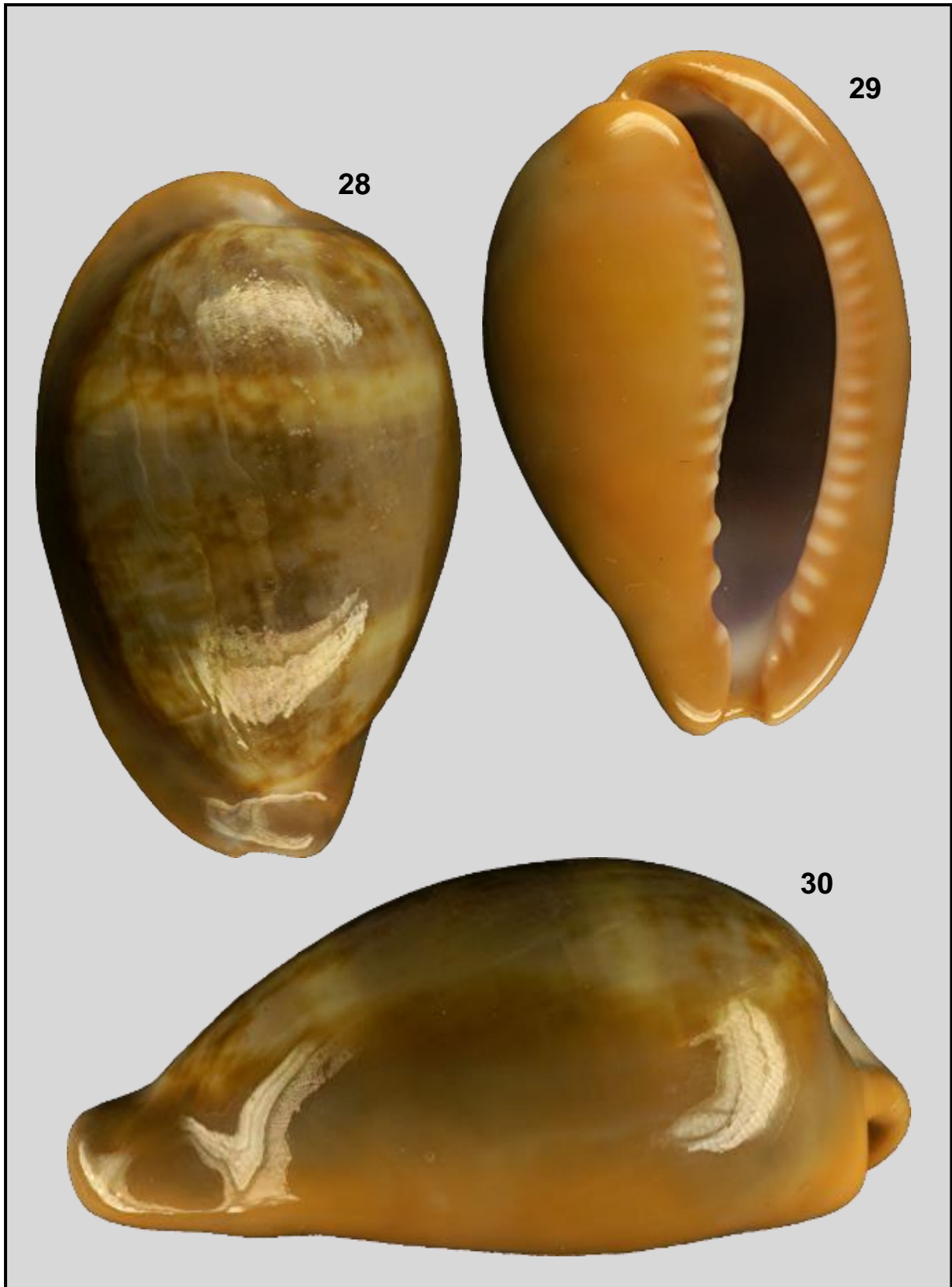




PI. V. Figs 19-21: *Zonaria pyrum* (Gmelin, 1791). Bodrum, Turkey. Dived. 2010. 45.22 mm. CFN.



**Plate VI.** Figs 22-27: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Olhão, Portugal. Dived under large rocks at a depth of 15 m. CFS; 22-23: 35.87 mm; 24-25: 42.23 mm; 26-27: 42.92 mm.



**Plate VII.** Figs 28-30: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Faro, Algarve, Portugal. Collected with snorkel while attached to rocks at a depth of 6-8 m. 2007. 43.18 mm. CFS.





**Plate VIII.** Figs 31-33: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Off Cadiz, Spain. Under rock with sponge in moderately turbid water. By SCUBA diving at a depth of 5 m. 31 May 2010. 30.60 mm. CFN.

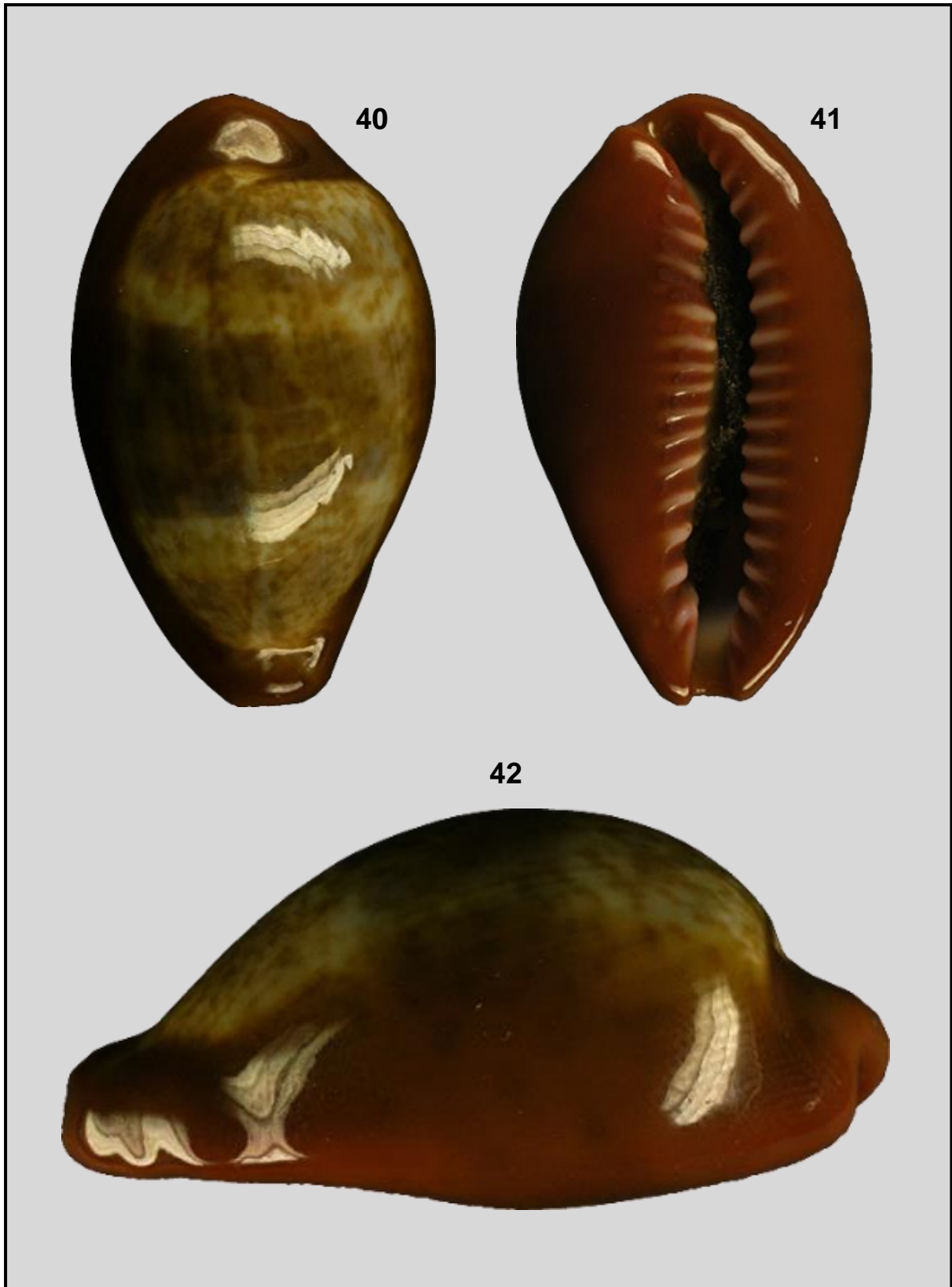


**Plate IX.** Figs 34-36: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Off Cadiz, Spain. Under rock with sponges in moderately turbid water. By SCUBA diving at a depth of 5 m. 31 May 2010. 36.62 mm. CFN.

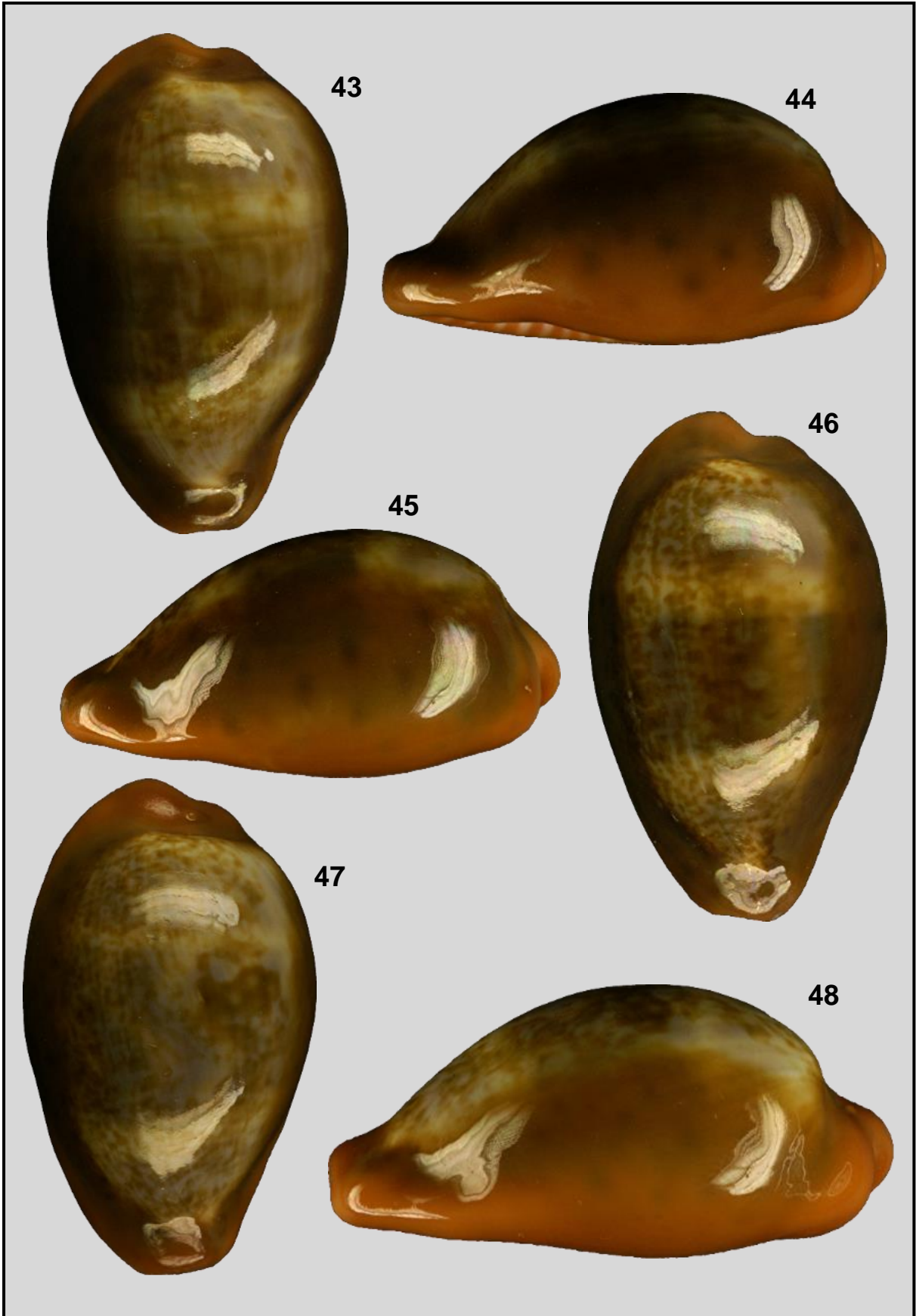


**Plate X.** Figs 37-39: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Off beach of Cadiz, Spain. Dived at a depth of 3-6 m. July 2008. 29.51 mm. CFS.





**Plate XI.** Figs 40-42: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Bay of Cadiz, Spain. On sponges under stones. Dived at a depth of 5-6 m. August 2008. 28.79 mm. CFS.



**Plate XII.** Figs 43-48: *Zonaria pyrum nigromarginata* Deprez & Govaert, 2009. Bay of Cadiz, Spain. By SCUBA diving; 43-44: 30.12 mm; 45-46: 34.74 mm; 47-48: 32.98 m. CFS.

# *Turritella nzimaorum* Ryall & Vos, 2010 a junior synonym of *Turritella caelata* Mörch in Dunker, 1858

Frank Nolf & Johan Verstraeten

Frank Nolf  
Pr. Stefanieplein, 43/8 – B-8400 Oostende, Belgium  
[frank.nolf@pandora.be](mailto:frank.nolf@pandora.be)

Johan Verstraeten  
Warschaustraat, 48  
B-8400 Oostende, Belgium

**Keywords:** Mollusca, Gastropoda, TURRITELLIDAE, *Turritella caelata*, *Turritella nzimaorum*, junior synonym.

**Abstract:** Recently, P. Ryall & C. Vos (2010) described a new species of *Turritella* from western Africa. This species was compared with other similar representatives of the genus *Turritella* but the authors failed to notice the existence of *Turritella caelata* Mörch in Dunker, 1858 a species from the Gulf of Guinea with the same characteristics as those of *T. nzimaorum* Ryall & Vos, 2010. Because of the unmistakable likeness with the type and the original figures of *T. caelata*, the name *T. nzimaorum* is rejected as taxon.

## Abbreviations:

**CFN:** Private collection of Frank Nolf (Oostende, Belgium)  
**CHD:** Private collection Henrikas Danila (Klaipeda, Lithuania)  
**CJV:** Private collection of Johan Verstraeten (Oostende, Belgium)  
**RBINS:** Royal Belgian Institute for Natural Sciences, Brussels, Belgium.  
**ZMUC:** Zoologisk Museum, København, Danmark

**Diagnosis:** The family TURRITELLIDAE is a relatively small family with about a hundred species living all over the world and some twenty species along West African coasts. Marche-Marchad (1960) treated 16 species and 2 subspecies of them and mentioned 9 doubtful species. His paper does not mention any *Turritella* species with solid and heavy shells that are broadly conical and measure more than 100 mm.

While going through literature we encountered the description of a species called *Turritella caelata* by Mörch in Dunker (1858) (Plate I, Figs 4-5).

The following is the original description in Latin: 'Testa valde crassa, conico-turrita, colore badio, apicem versus pallidior tincta, apex ipse paene

*albus, anfractus circa 15 planiusculi sutura distincta sejuncti, inferne angulati, subimbricati transversimque rugoso-costati, costae validiores duae rugoso-nodosae, costae angustiores ad suturam papilliferae; aufractus ultimus obtuse angulatus, inferne planus liris obsoletis 4 bi-vel tripartitis exaratus; striae incrementi retroflexae confertae; interstitia impresso-punctata; apertura obliqua subquadrata. – Long. Circa 90 mill., diam. 30 mill., apertura 14 mill. Habitat in sinu Guineensi?*

The type of this species is deposited in the ZMUC (code: ZMUC-GAS-372) (Plate II, Figs 6-7; Plate III, Figs 8-10). The taxon is easily recognizable after the well-figured and described specimen in the *Novitates Conchologicae* (PI II, Figs 4-5). It is certainly not a *nomen dubium* as the type completely matches the description and the drawings, except of the type locality, which is unknown.

This species was classified among the genus *Torcula* (Gray). Dunker (1858) remarked that it was very special according to the structure of the surface. He localised it 'in the Gulf of Guinea' with a certain doubt (question mark) and he was unable to compare it with other similar species except the fossil *Turritella varicosa* Brocchi. The most important characteristics are the heavy shell with a rough finely striolated surface. The specimen described by Dunker has two strong tuberculated ribs in the lower part of the whorls and four narrow very close ribs in the upper part below the suture. This area is also crossed by parallel nodulous folds. The last whorl is angular and rounded, the base being rough and finely striolated. The inside of the mouth is white and the columellar part is brown.

P. Ryall & C. Vos (2010) described this shell as *Turritella nzimaorum*. The description of this species largely matches that of *T. caelata*. However, photographs of specimens studied by both authors prove this is really a very variable species. Figs 5, 6 and 7 of their specimens are very close to the type of *T. caelata* and show rather strong folds at the upper side of the



whorls, a feature nearly absent in our brown coloured specimen from the Republic of Congo (Plate III, Fig. 12; this paper) as well as in the white specimen from Ghana in fig. 4 by P. Ryall & C. Vos (2010).

The most important characteristics of this species are the heavy shell, the large size (from 90 to 150 mm), the typical sharp median keel in the middle of the last whorls and the parallel folds in the upper part of the whorls. However, the number of concentric ribs on the last whorls is often variable. These features are visible in all the studied specimens as well as in the type of *Turritella caelata*. Further study will probably result in the creation of a new genus for this species. P. Ryall & C. Vos (2010) compared it with other similar representatives of the genus *Turritella* like *T. conspersa* Adams & Reeve, 1850, *T. torulosa* Kiener, 1844, *T. gemmata* Reeve, 1849, *T. meta* Reeve, 1849 and the fossil *Turritella desmarestina* Basterot, 1825 from the Aquitanian deposits around Bordeaux. No similarities between *T. nzimaorum* and the species above have been found.

**Conclusion:** After comparing the description of *Turritella caelata* Mörch in Dunker (1858) and the type itself with the text and the illustrations of *Turritella nzimaorum* Ryall & Vos, 2010 from Ghana and Angola we can only conclude that it concerns the same species. Therefore, the latter name has to be regarded as a junior synonym. This paper confirms the presence of this large *Turritella* in West African waters from Ghana to Angola (Plate I, Fig. 1). The catch of a specimen

off Cape Frio (Namibia) (Plate I, Figs 2 & 3) means a range extension in the south of its distribution area, where specimens of *Turritella caelata* seem to grow larger.

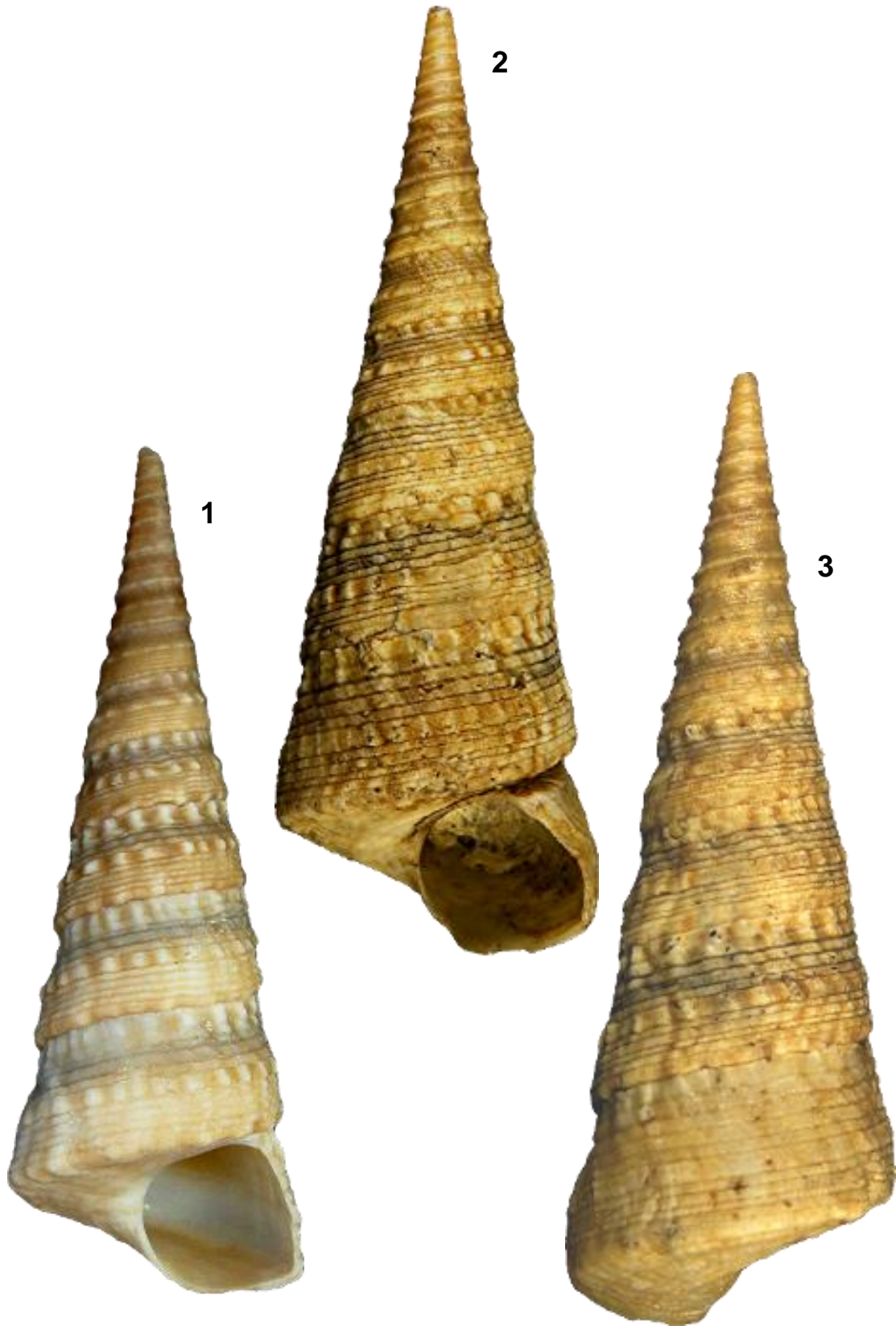
**Acknowledgements:** First, we wish to thank Dr. Ole Tendall and Miss Antonia Vedelsby, both of the ZMUC, who made the type of *Turritella caelata* available for study and photography. Henrikas Danila was so generous to lend a specimen from Angola. We are grateful to Thierry Backeljau and Rose Marie Sablon (RBINS, Belgium) for kindly helping us through the old literature and searching for specimens in the extensive collections of the museum in Brussels.

**References:**

Dunker, W., 1858-70. *Novitates Conchologicae. Mollusca Marina. Beschreibung und Abbildung neuer oder wenig Gekannter Meeres-Conchylien.* Theodor Fischer, Cassel, iv + 144 pp., 45 pls.  
 Marche-Marchad, I., 1958. Nouveau catalogue de la collection des mollusques testacés marins de l'I.F.A.N. *Bulletin de l'Institut Français d'Afrique Noire Sér. A*, **20**(14): 1-64.  
 Marche-Marchad, I., 1960. Les Turritellidae de l'Afrique Occidentale (Gastropodes Prosobranches marins). *Bulletin de l'Institut Français d'Afrique Noire T. XXII, sér. A, n°3* **22**: 853-885, pls.I-III.  
 Ryall, P. & Vos, C., 2010. Two new species of *Turritella* (Gastropoda: Turritellidae) from western Africa. *Novapex*, **11**(1): 13-20.



**Geographic distribution of *Turritella caelata* Mörch in Dunker, 1858**



**Plate I.** Figs 1-3: *Turritella caelata* Mörch in Dunker, 1858; 1: Angola. 103.2 mm. CHD; 2-3: Trawled by Belgian fishermen off Cape Frio, Namibia, SW Africa. 1968. 114.49 mm. CFN.



4



6



2.

5

7

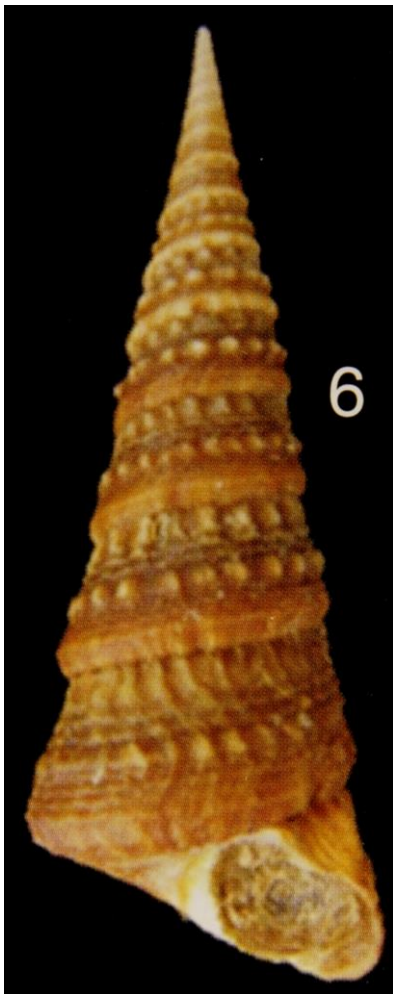


**Plate II.** Figs 4-7: *Turritella caelata* Mörch in Dunker, 1858; 4-5: original figures from: *Novitates Conchologicae. Mollusca Marina. Beschreibung und Abbildung neuer oder wenig gekannter Meeres-Conchylien*, by Dr. W. Dunker. Cassel. 1858-1870. Pl. XXXIV, figs 1-2; 6-7: type of *Turritella caelata* from the Mörch-collection (ZMUC-GAS-372). 87.79 mm.



ZOOLOGISK MUSEUM, KØBENHAVN. 8  
*Turritella caelata* Mörch  
 Loc. Sine loc.  
 (Dunker Novitates - spm. orig.)  
 Datum: before 1821  
 Legit: Kongelige Museum  
 Det. Jrn. ZMUC-GAS-372

*Turritella*  
*caelata* Mörch.  
 Dunker Novitates.  
 spm. orig.  
 Muzginet.



11



10



12

Plate III. Fig. 8: Label of the type of *T. caelata* (ZMUC-GAS-372); Fig. 9: Original label of the type of *T. caelata*. ZMUC; Fig 10: mouth of the type of *T. caelata* with the initials K. M. of Kongelige Museum; Fig. 11: Trawled off Mudrachmi Bay, western Ghana. March 1989. 80.3 mm. (fig. 6 from Ryall & Vos, 2009); Fig. 12: *Turritella caelata*. Trawled by local fishermen off Pointe-Noire. Republic of Congo. 81.30 mm. CJV.