

# ***Pugilina dirki* (Mollusca: Gastropoda: Buccinoidea: Melongenidae): a new species from South India**

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**Key words:** Mollusca, Melongenidae, *Pugilina*, South India, new species.

Paratypes 1-5 from fishermen off Rameswaram, South India. 2002.

**Abstract:** During a search for rare and freak shells in South India, a Belgian-French team found about ten specimens of a new melongenid very different from all known representatives of this family. It is remarkable such a large shell with a length of about 80-150 mm was not discovered before 2002-2003.

**Type locality:** Rameswaram, South India. In shallow water. No other data.

**Measurements:** From 70 to 145 mm.

**Description:** We follow the classification by Bouchet & Rocroi (2006):

## **Abbreviations:**

FN: Private collection of Frank Nolf, Oostende, Belgium.

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

Superfamily Buccinoidea Rafinesque, 1815

Family Melongenidae Gill, 1871

Subfamily Melongeninae Gill, 1871  
[Cassidulidae Gray, 1854 (invalid); =  
Galeodidae Thiele, 1925 (invalid); =  
Volemidae Winckworth, 1845; =  
Heligmotomidae Adegoke, 1977]

Subfamily Echinofulgurinae Petuch, 1994

## **Introduction:**

In January 2002 a team of enthusiastic shell collectors, Patrick Anseeuw and Jean-Etienne Ghyoot both from Belgium, accompanied by Michel De Buck (France) travelled from Honavar to Cuddalore (South India). The search was particularly focused on rare shells, e.g. *Perotrochus indicus* Anseeuw, 1999 and strange forms such as left handed specimens of more common species. An important part of this catch is now in the FN-collection. Among smaller specimens of *Turbinella pyrum* (Linnaeus, 1767) and shells of *Pugilina cochlidium* (Linnaeus, 1758) an unusual shell was present, quite different from all other melongenids.

In 2003 J.-E. Ghyoot and M. De Buck obtained more specimens of this species. It is apparently new to science as the current literature fails in mentioning a description or a figure of this rather large shell. Even Subba Rao (2003) was unaware of its existence.

**Type material:** All specimens were live caught and with operculum.

**Holotype:** 70.6 mm (RBINS). Off Rameswaram, South India. From local fishermen. 2002.

**Paratypes:**

1. 78.9 mm (FN).
2. 88.8 mm (FN).
3. 98.0 mm (FN).
4. 132.6 mm (FN).
5. 144.9 mm (FN).
6. 76.5 mm (FN) – Rameswaram, South India, June 1999.

Many authors e.g. Wilson (1994) share the opinion there is no real basis for separating the Melongenidae-group from the buccinids and they consider Melongeninae as a subfamily of Buccinidae. This is probably due to the similarity in radular and anatomical characteristics.

Melongenids are highly variable in shape and sculpture. They have a wide aperture, open siphonal canal and usually lack the fasciole at the columellar lip. The periostracum consists of a thick velvet or felty layer and the operculum is elongate-ovate in shape with a terminal nucleus. Melongenids are generally predatory in habit though occasionally feeding on dead animal matter. Their meal mainly consists of gastropods, bivalves, polychaetes, ascidians and barnacles. According to Subba Rao (2003) three species of the genus *Pugilina*, which occur in bays and backwaters, are present in India. Feeding habits of each species may vary from place to place.

## **Genus *Pugilina* Schumacher, 1817**

Type-species: '*Fusus morio* L.' by subsequent designation by Hermannsen (1848), a species cited (as *Murex morio* Linnaeus) by Schumacher (*op. cit.*) in the synonymy of his *Pugilina fasciata* (= *Melongena melongena* Linnaeus, 1758).

Shell large, fusiform, tall spire, shoulders rounded and angulated, siphonal canal moderately long but wide; aperture wide, columella curved, smooth, reflected over a narrowly open umbilicus; sculpture lacking or consisting of fine spiral cords.

Indo-West Pacific and tropical Atlantic.

Synonym: *Volegalea* Iredale, 1938 (*wardiana* Iredale, 1938 = *cochlidium* Linnaeus, 1758).

***Pugilina dirki* sp. nov.**

**(Plate I, Figs 1 & 2; Plate II, Figs 3-6; Plate III, Figs 7 & 8; Plate IV, Figs 9 & 10; Plate V, Figs 11 & 12)**

Shell large, solid and heavy, fusiform with elongated spire. Protoconch of about 2-3 whorls; teleoconch of about 6-7 whorls, early ones rounded, later ones with angulated shoulders. Surface concave from suture to shoulder, this area provided with a ridge; particularly thickened just below the impressed suture in large specimens. There is a prominent shoulder in the middle of the lower part of each whorl, except in the body whorl where it is present in the posterior part, bearing 7-9 pointed or flattened nodules, particularly in adult shells. Especially in the lower part of each whorl there are numerous evenly spaced spiral ridges in addition to the knobs, 20-30 in number on the last whorl. The spiral cord in the middle of the body whorl is sometimes more prominent and better developed. Aperture narrow and elongate, wider in adult shells. Siphonal fasciole often strongly developed, pseudumbilicus narrow, siphonal canal wide. Periostracum consists of a dull olive-brown, resisting thin velvet layer, not thick enough to hide all colour of the shell itself. Colour of shell yellowish brown; aperture yellowish peach, brilliantly polished. Columellar lip ending in a bluish grey parietal callus.

**Derivation of name:** The name *Pugilina dirki* is derived from the name of my brother 'Dirk', who always participated for better or for worse in the search for new shells during all our shell collecting travels. After our father had passed away at an early age he partly sponsored my studies at university.

**Habitat:** Not known.

**Geographic range:** As far as we now this species only lives in South India. Further research is needed to obtain more data on its exact distribution and way of life.

**Discussion:**

This species is so unusual in different aspects a new genus should apparently be created. It can

only be compared with two other *Pugilina* species from the same area, namely *Pugilina carnarium* (Röding, 1798) and *Pugilina cochlidium* (Linnaeus, 1758).

***Pugilina carnarium* (Röding, 1798)**

**(Plate VI, Figs 13 & 14; Plate VII, Figs 15 & 16; Plate VIII, Figs 17 & 18; Plate IX, Figs 19 & 20)**

Synonym: *Melongena bucephala* Lamarck, 1822  
Shell large, up to 110 mm in height, solid and heavy, body whorl wide with a short and blunt spire. Aperture very wide, outer lip thick and smooth. Columella with callus from anterior to posterior end, smooth, umbilicus open. Sculptured with one row of small tubercles near the suture on spire whorls, two rows of strong tubercles on the body whorl, one at the shoulder being larger than the one below it, spiral cords on the spire whorls and on the body whorl below the lower row of tubercles. Colour from white to light yellowish-brown, with a thick periostracum, aperture white or yellowish-orange.  
Pakistan and West India (from Gujarat to Quilon).

***Pugilina cochlidium* (Linnaeus, 1758)**

**(Plate X, Figs 21-24; Plate XI, Figs 25-28; Plate XII, Figs 29-32; Plate XIII, Figs 33-36; Plate XIV, Figs 37-40; Plate XV, Figs 41-44)**

**Synonym:** *Volegalea wardiana* Iredale, 1938.

Shell large, up to 105 mm in height, fusiform, solid and heavy, shell less broad than in *P. carnarium*. Protoconch of about 2-3 smooth, rounded whorls; teleoconch of about 5-6 whorls, early whorls rounded, later whorls with angulated shoulders, concave from suture to shoulder, bearing low nodules (7-8 on the body whorl) becoming low axial folds on the posterior part of the whorls, sculptured with rough spiral cords. Aperture narrow and elongate, outer lip with obsolete ridges, columella without any fold, anterior canal short and broadly open, very narrow and shallow umbilicus, strong fasciole. Sculptured with axial ribs on the spire whorls, body whorl with close set spiral ridges on the lower half and more or less smooth on the remaining part, a row of about eight strong compressed tubercles at the angular shoulder of the last whorls. Colour reddish brown or yellowish-brown; interior creamy, polished brownish-orange or brownish-yellow.  
Central Indo-West Pacific. East and West Coasts of India. A common shell of the intertidal and shallow sublittoral zones in muddy areas and estuaries.

**Conclusion:** *Pugilina dirki* is in many respects different from both melongenids described above. The shell is more elongate and the shoulder of the body whorl bears less developed knobs. The single row of knobs is situated close to the suture, the latter being supported by a strong ridge, absent in the two other *Pugilina* species. *P. carnarium* has two rows of knobs on the last whorl.

**Acknowledgements:** Special thanks go to David Monsecour (Rillaar, Belgium) and Johan Verstraeten (Oostende, Belgium) for reading and

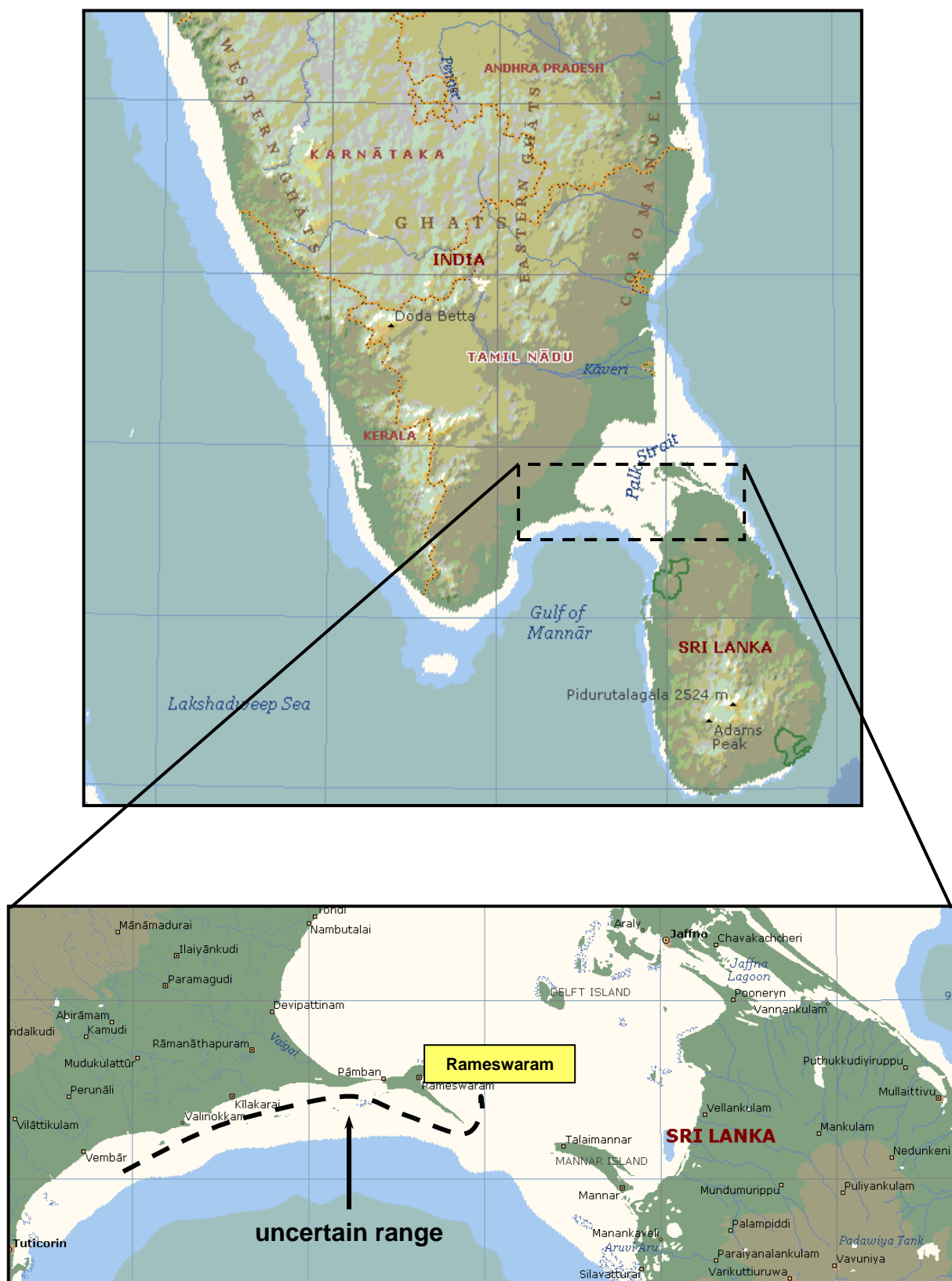
correcting the English text. I am also very grateful to Jean-Etienne Ghyoot (Destelbergen, Belgium) who provided me with so many interesting shells from South India. I would like to thank Jacky Van Goethem, Thierry Backeljau and Claudine Claes from the RBINS (Brussels, Belgium) for the favourable reception and the aid they gave me while consulting the Dautzenberg-collection.

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Fishermen on beach in South India

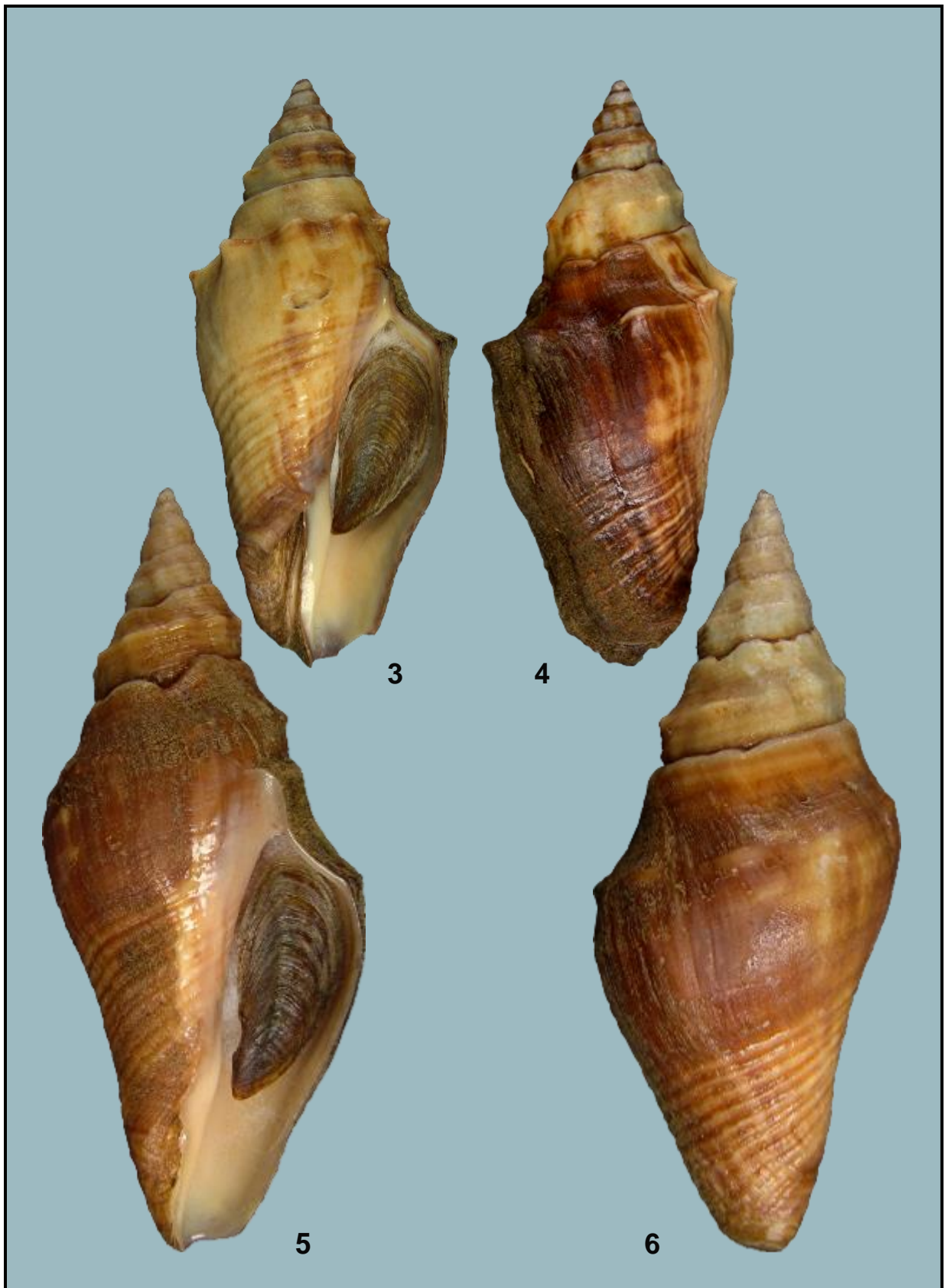


Distributional map of *Pugilina dirki* Nolf, 2007





Plate I. Figs 1 & 2. *Pugilina dirki* Nolf, 2007.  
Paratype 2 (FN; 88.8 mm).  
Off Rameswaram, South India. By local fishermen. 2002.

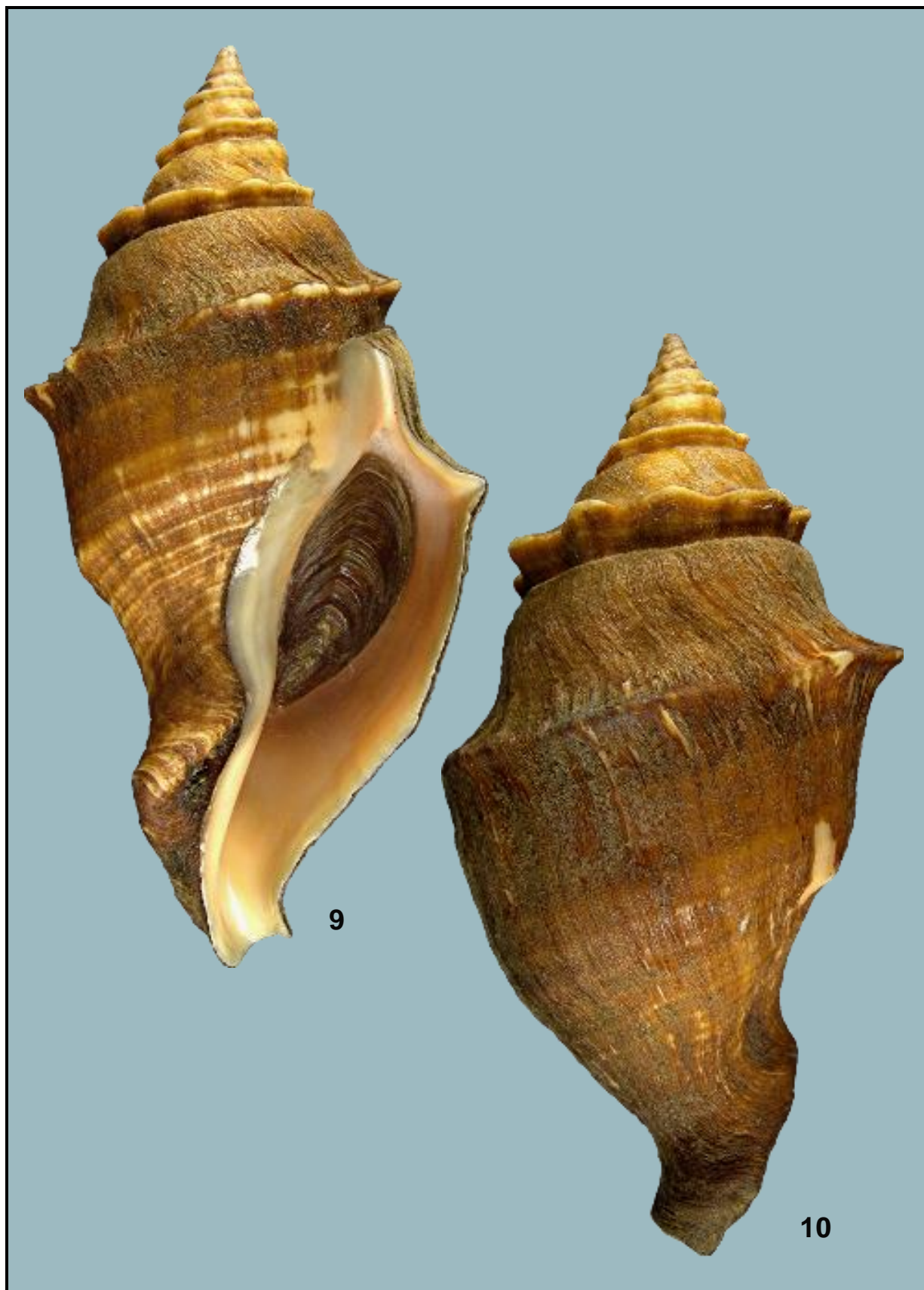


**Plate II. Figs 3-6. *Pugilina dirki* Nolf, 2007.**  
**Figs 3 & 4: Holotype (RBINS; 70.6 mm); Figs 5 & 6: Paratype 1 (FN; 78.9 mm).**  
**Off Rameswaram, South India. By local fishermen. 2002.**



Plate III. Figs 7 & 8. *Pugilina dirki* Nolf, 2007.  
Paratype 3 (FN; 98.0 mm).  
Off Rameswaram, South India. By local fishermen. 2002.





**Plate IV. Figs 9 & 10. *Pugilina dirki* Nolf, 2007.  
Paratype 4 (FN; 132.6 mm).  
Off Rameswaram, South India. By local fishermen. 2002.**





Plate V. Figs 11 & 12. *Pugilina dirki* Nolf, 2007.  
Paratype 5 (FN; 144.9 mm).  
Off Rameswaram, South India. By local fishermen. 2002.



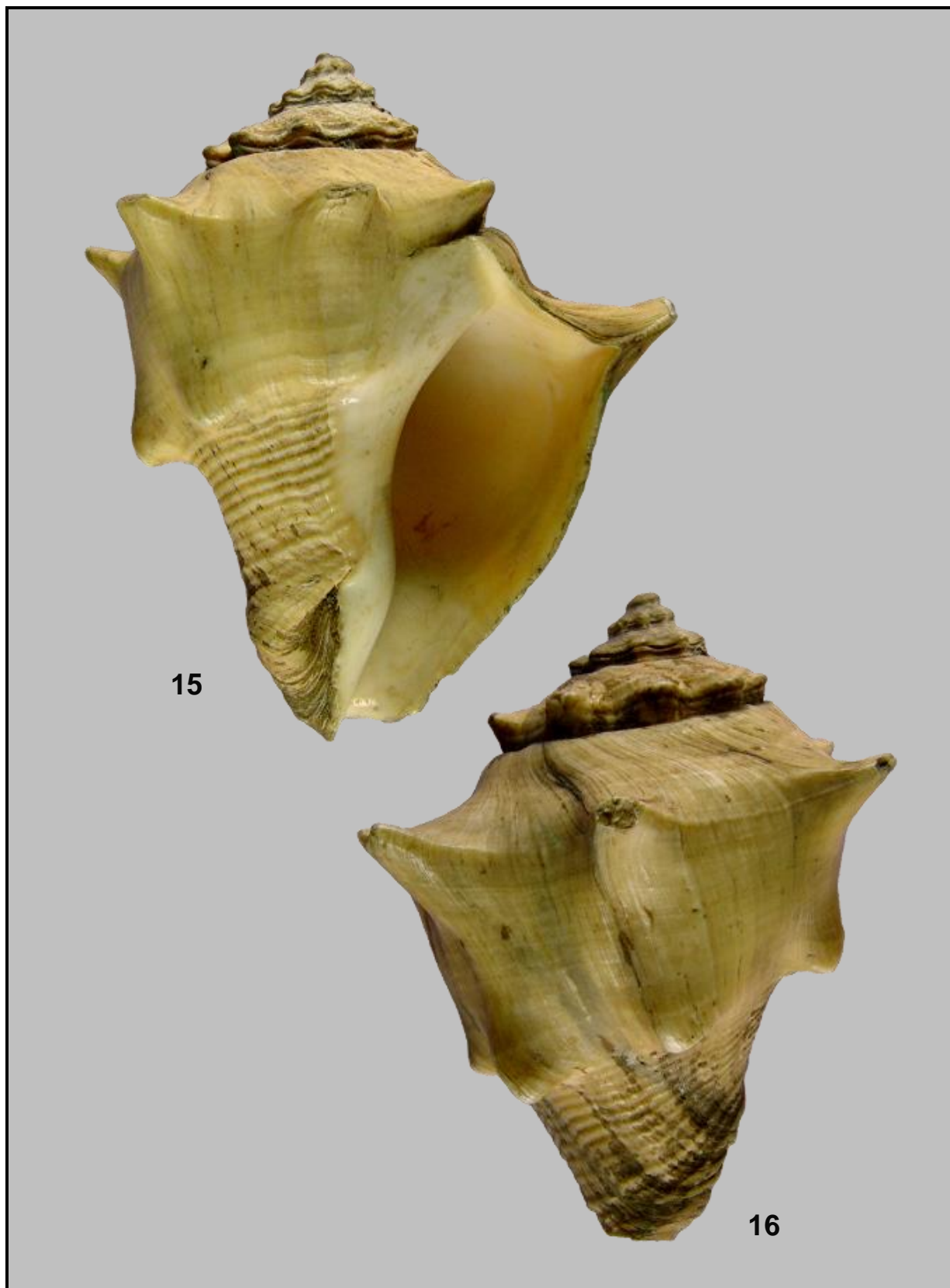


Plate VII. Figs 15 & 16. *Pugilina carnarium* (Röding, 1798).  
Sri Lanka.  
Ph. Dautzenberg-collection (RBINS; 74.5 mm): '*Melongena bucephala*'.



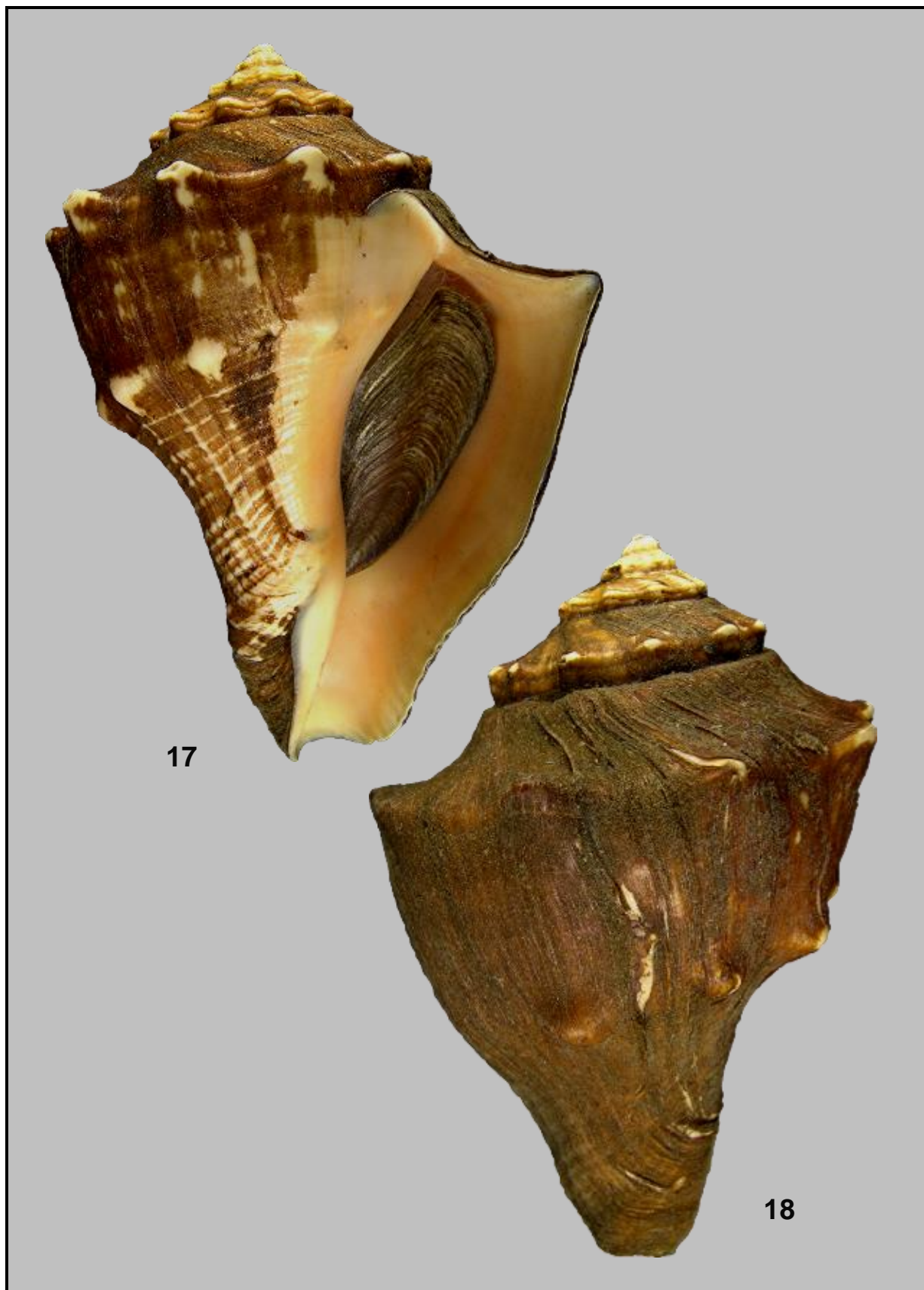
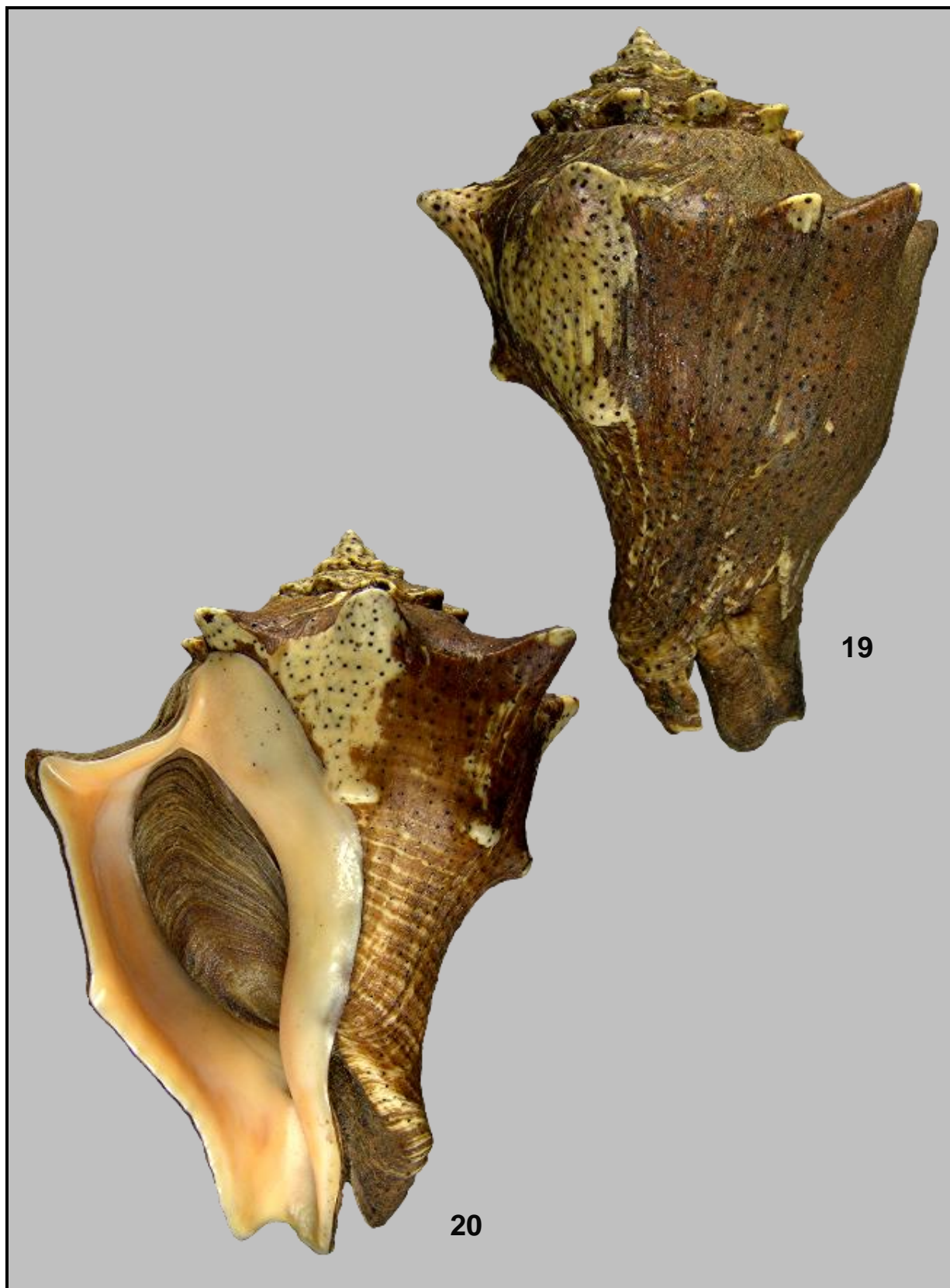
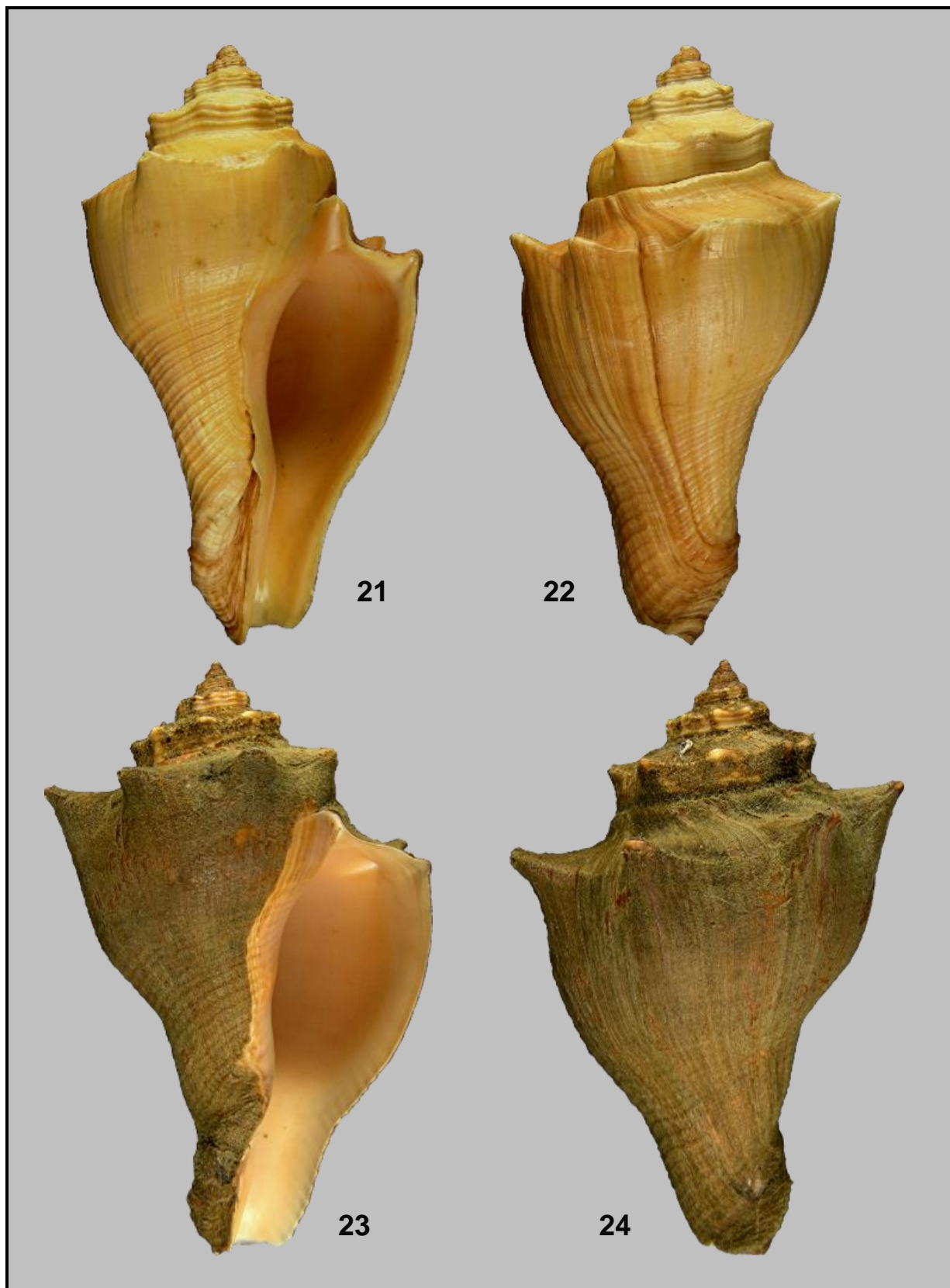


Plate VIII. Figs 17 & 18. *Pugilina carnarium* (Röding, 1798).  
Rameswaram, South India. 2002.  
Collection FN; 118.5 mm.





**Plate IX. Figs 19 & 20. *Pugilina carnarium* (Röding, 1798).  
Rameswaram, South India. 2002.  
Freak specimen: sinistral and provided with a double siphonal canal.  
Collection FN; 124.4 mm.**

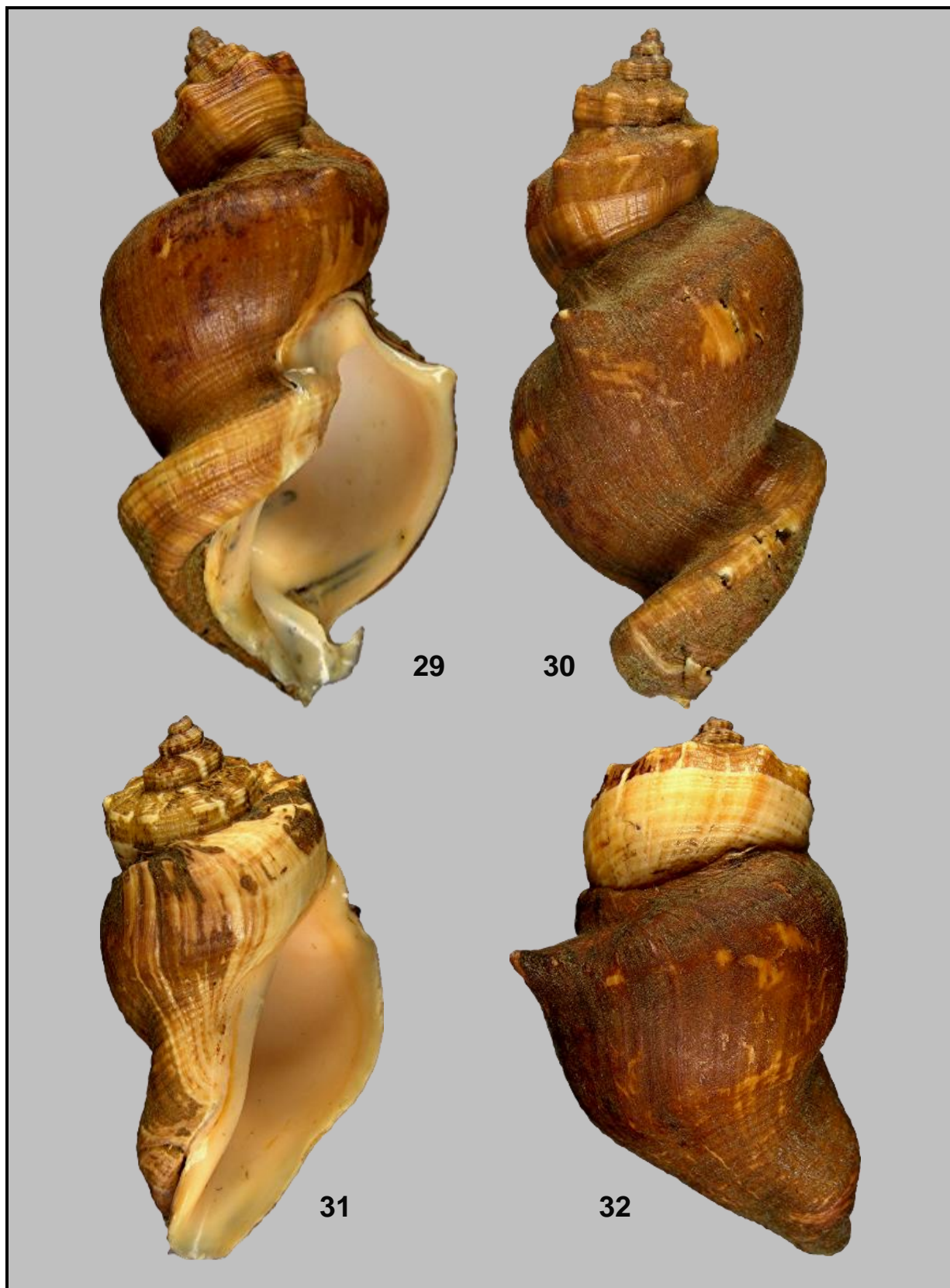


**Plate X. Figs 21-24. *Pugilina cochlidium* (Linnaeus, 1758).**  
**Off Cuddalore, SE India. Trawled by local fishermen at a depth of 20 m.**  
**January 1999. Collection FN.**  
**Figs 21 & 22: 109.9 mm.**  
**Figs 23 & 24: 107.6 mm.**



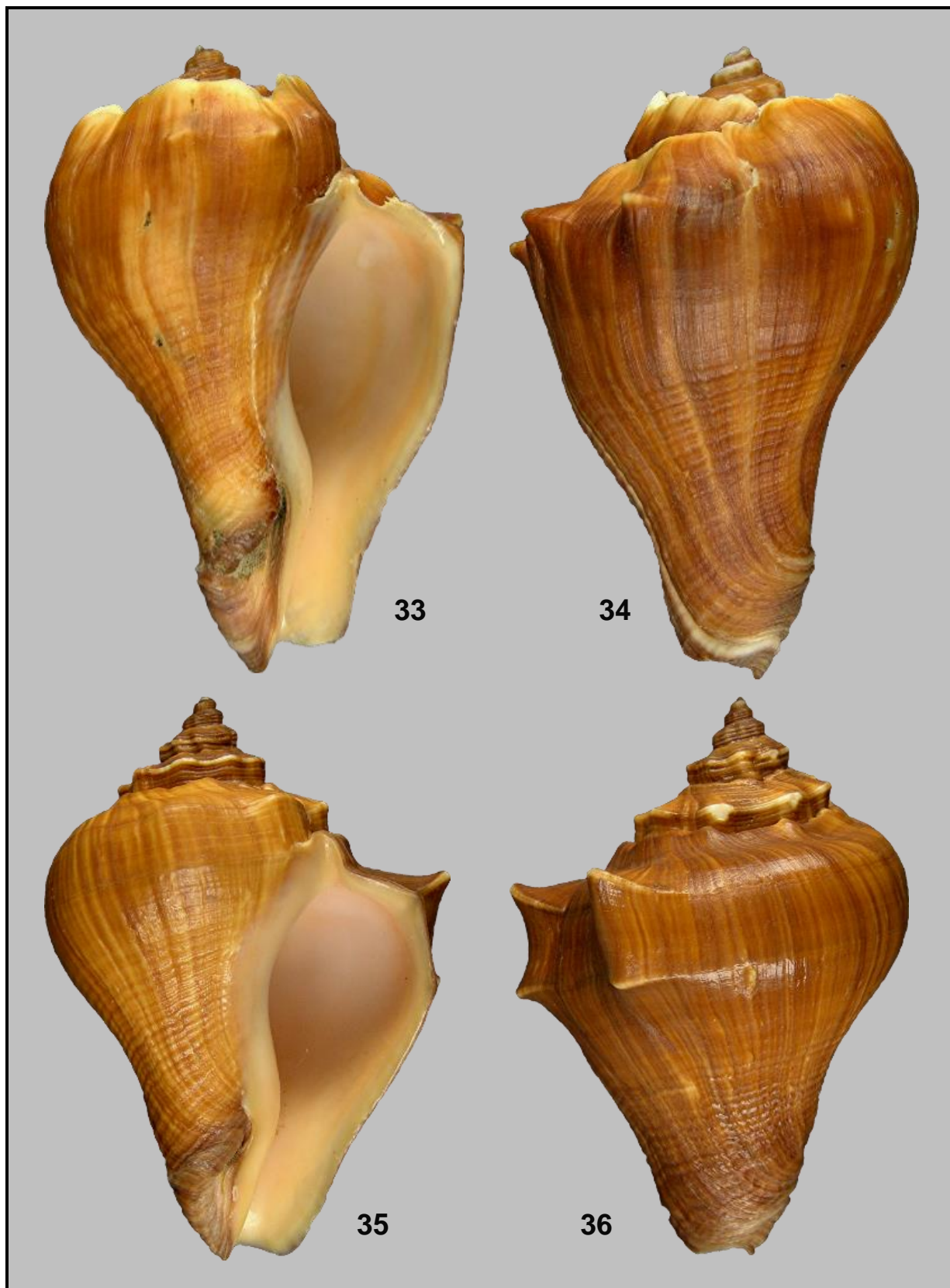
**Plate XI. Figs 25-28. *Pugilina cochlidium* (Linnaeus, 1758).**  
**Off Cuddalore, SE India. Trawled by local fishermen at a depth of 20 m.**  
**May 1999. Collection FN.**  
**Figs 25 & 26: 86.0 mm.**  
**Figs 27 & 28: 94.2 mm.**



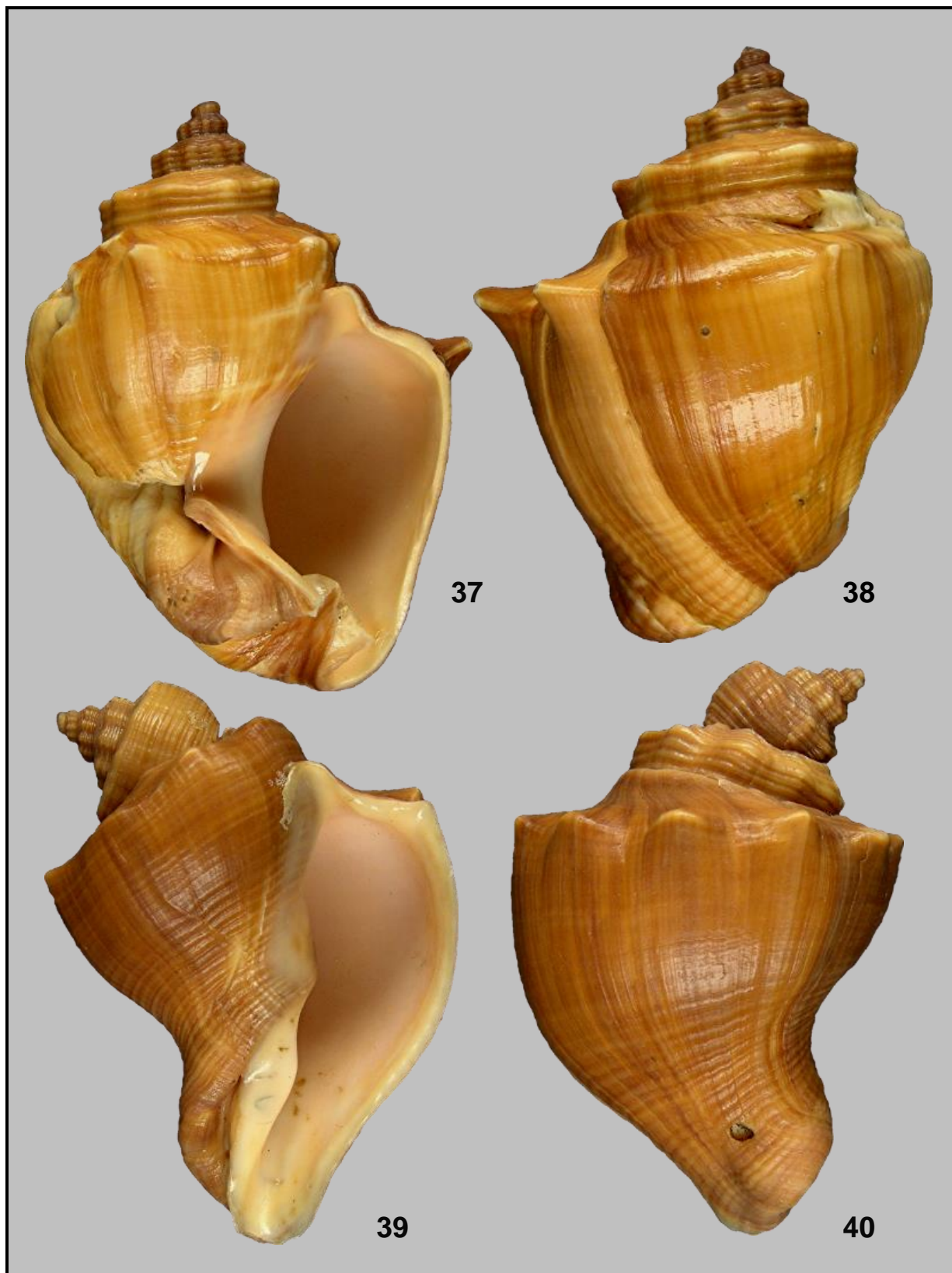


**Plate XII. Figs 29-32. *Pugilina cochlidium* (Linnaeus, 1758).**  
**Off Cuddalore, SE India. Trawled by local fishermen at a depth of 20 m.**  
**January 2002. Collection FN.**  
**Figs 29 & 30: 89.4 mm.**  
**Figs 31 & 32: 71.5 mm.**





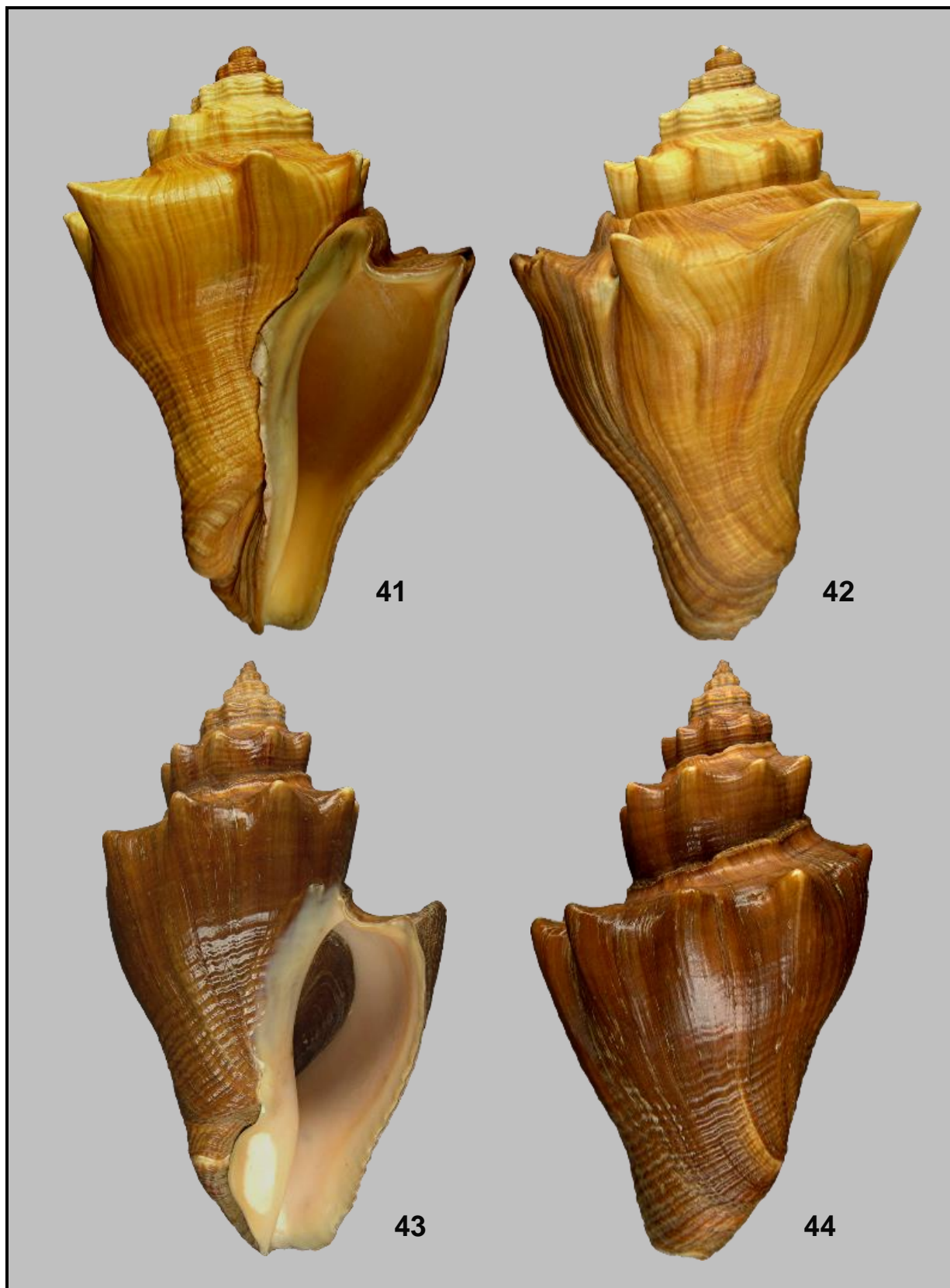
**Plate XIII. Figs 33-36. *Pugilina cochlidium* (Linnaeus, 1758).**  
**Off Cuddalore, SE India. Trawled by local fishermen at a depth of 20 m.**  
**January 2002. Collection FN.**  
**Figs 33 & 34: 77.8 mm.**  
**Figs 35 & 36: 68.3 mm.**



**Plate XIV. Figs 37-40. *Pugilina cochlidium* (Linnaeus, 1758).  
Off Cuddalore, SE India. Trawled by local fishermen at a depth of 20 m.  
January 2002. Collection FN.**

**Figs 37 & 38: 58.2 mm.**

**Figs 39 & 40: 54.7 mm.**



**Plate XV. Figs 41-44. *Pugilina cochlidium* (Linnaeus, 1758).**

**Figs 41 & 42: Cavite, Manila Bay, Philippines. On reef. July 1993. 101.5 mm.  
Figs 43 & 44: Darwin, Western Australia. On mud banks. August 1973. 98.9 mm.  
Collection FN.**



# Another population variant of *Conus furvus* Reeve, 1843 (Mollusca: Gastropoda: Conoidea: Conidae) from the Cuyo Islands (Palawan, Philippines)

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**Key words:** MOLLUSCA, CONIDAE, *Conus furvus*, Cuyo Islands, Palawan, Philippines, population variant.

**Abstract:** A new population variant of *Conus furvus* Reeve, 1843 from the Cuyo Islands is described and illustrated. The shells are moderately different from the nominal species with regard to size, weight and colour pattern.

## Abbreviations:

ABS-AJ: Private collection of Aïcha Ben-Saâd & Adriaan Janssens, Antwerpen, Belgium.

FN: Private collection of Frank Nolf, Oostende, Belgium.

L: length

MD: maximum diameter of body whorl.

**Introduction:** The island of Palawan and its surrounding islands and islets have so far been exploited for seashells, but the SW Philippines are now offering further and new malacological mysteries due to recent activities by compressor-diving fishermen from Olango who gather the much praised sea-cucumbers for the Japanese market. These fishermen are operating in the Cuyo Islands situated between northern Palawan and western Panay and are also working in the Balabac Island region of southern Palawan in front of northern Sabah. These extensive sea-cucumber hunts in the north and south have yielded a lot of new shelled molluscan species and new forms such as *Conus guidopopei* Raybaudi, 2005 and the newly described *Conus petergabrielii* (in fact merely a form of *Conus spectrum* Linnaeus, 1758 and not at all a new species as claimed) and *Conus leobottonii* both by Lorenz, 2006. In this paper a new population variant of *Conus furvus* Reeve, 1843 is described and figured.

**Material studied:** ABS-AJ-collection.

1. L: 55.85 mm MD: 27.50 mm MD/L: 0.49
2. L: 56.30 mm MD: 28.35 mm MD/L: 0.50
3. L: 58.65 mm MD: 28.75 mm MD/L: 0.49
4. L: 61.35 mm MD: 30.50 mm MD/L: 0.50
5. L: 61.40 mm MD: 30.15 mm MD/L: 0.49

6. L: 61.45 mm MD: 30.10 mm MD/L: 0.49
7. L: 61.85 mm MD: 31.15 mm MD/L: 0.50
8. L: 62.45 mm MD: 31.65 mm MD/L: 0.51
9. L: 62.85 mm MD: 31.75 mm MD/L: 0.51
10. L: 63.30 mm MD: 32.50 mm MD/L: 0.51
11. L: 63.65 mm MD: 31.50 mm MD/L: 0.49
12. L: 64.15 mm MD: 32.05 mm MD/L: 0.50
13. L: 64.40 mm MD: 31.05 mm MD/L: 0.48
14. L: 64.40 mm MD: 32.05 mm MD/L: 0.50
15. L: 64.70 mm MD: 32.65 mm MD/L: 0.50
16. L: 65.30 mm MD: 33.85 mm MD/L: 0.52
17. L: 65.35 mm MD: 32.35 mm MD/L: 0.50
18. L: 65.40 mm MD: 33.25 mm MD/L: 0.51
19. L: 68.65 mm MD: 35.10 mm MD/L: 0.51
20. L: 68.95 mm MD: 34.85 mm MD/L: 0.51
21. L: 69.05 mm MD: 33.80 mm MD/L: 0.49
22. L: 71.55 mm MD: 36.10 mm MD/L: 0.50
23. L: 71.60 mm MD: 36.35 mm MD/L: 0.51
24. L: 73.40 mm MD: 37.85 mm MD/L: 0.52

Average value of MD/L = 0.50.

All the shells are from the Cuyo Islands, NE off Palawan, Philippines. Dived at 10-30 m. May-June 2006.

**Description:** Shell moderately large and very solid with a low gloss. Last whorl broadly conical and not conical or ventricosely conical as in other population variations. Outline almost straight. Shoulder angular, smooth to tuberculate. Spire moderately high, rather stepped. Protoconch consisting of 2-2.5 whorls. First 4-9 postnuclear whorls slightly tuberculate. Teleoconch sutural ramps flat to slightly concave, with 1-2 to 4-7 spiral grooves, sometimes fine and weak on all ramps. Sculpture of last whorl uniform in all studied specimens.

Ground colour white to creamy white. Pattern of last whorl generally consists of three broad spiral bands, one in the apical third, another nearly at the centre and the last on the basal third. These bands are always dark yellow to orange or even red colour. Spiral rows of evenly spaced regular reddish-brown dots, extend from base to shoulder. Base and siphonal fasciole with a purple patch.



Larval shell white to pink. Adjacent postnuclear sutural ramps usually of the same colour. Late sutural ramps white to very light brown, immaculate or with delicate reddish-brown streaks.

Aperture white with a violet tinge at the anterior end. Colour and structure of periostracum are unknown as all studied specimens were thoroughly cleaned.

**Habitat:** No information on bottom conditions and depth at which these shells were taken was obtained. However, as these specimens were found in a sea-cucumber's habitat it has to be a sand bottom in 5 m or more. Because the shells at hand are fairly heavy-weighted and robust in outline we presume they are from rather shallow water and probably not from 10-30 m as was indicated on the labels.

**Geographic range:** This form only seems to live only off the Cuyo Islands (Palawan, Philippines). Neither the exact locality nor region/area on an island/islet was given.

**Discussion:** This local variant is in many respects different from the nominal species and other described forms. Most shells are at least 60 mm and the maximum height of some of them is reaching more than 70 mm, nearly world record size. Another general difference is the solid character of the shells. Specimens are never conoid-cylindrical and the outline is never moderately convex as in the nominal species. The structure of the whorls is smooth and always lacks the granulated spiral ridges often present in other forms. All specimens have three orange to red broad spiral zones on the last whorl, passed through by spotted lines. These dots are really very regular, tiny and never run into one another like in some other forms.

**Conclusion:** A sample consisting of 24 specimens from the Cuyo Islands has been

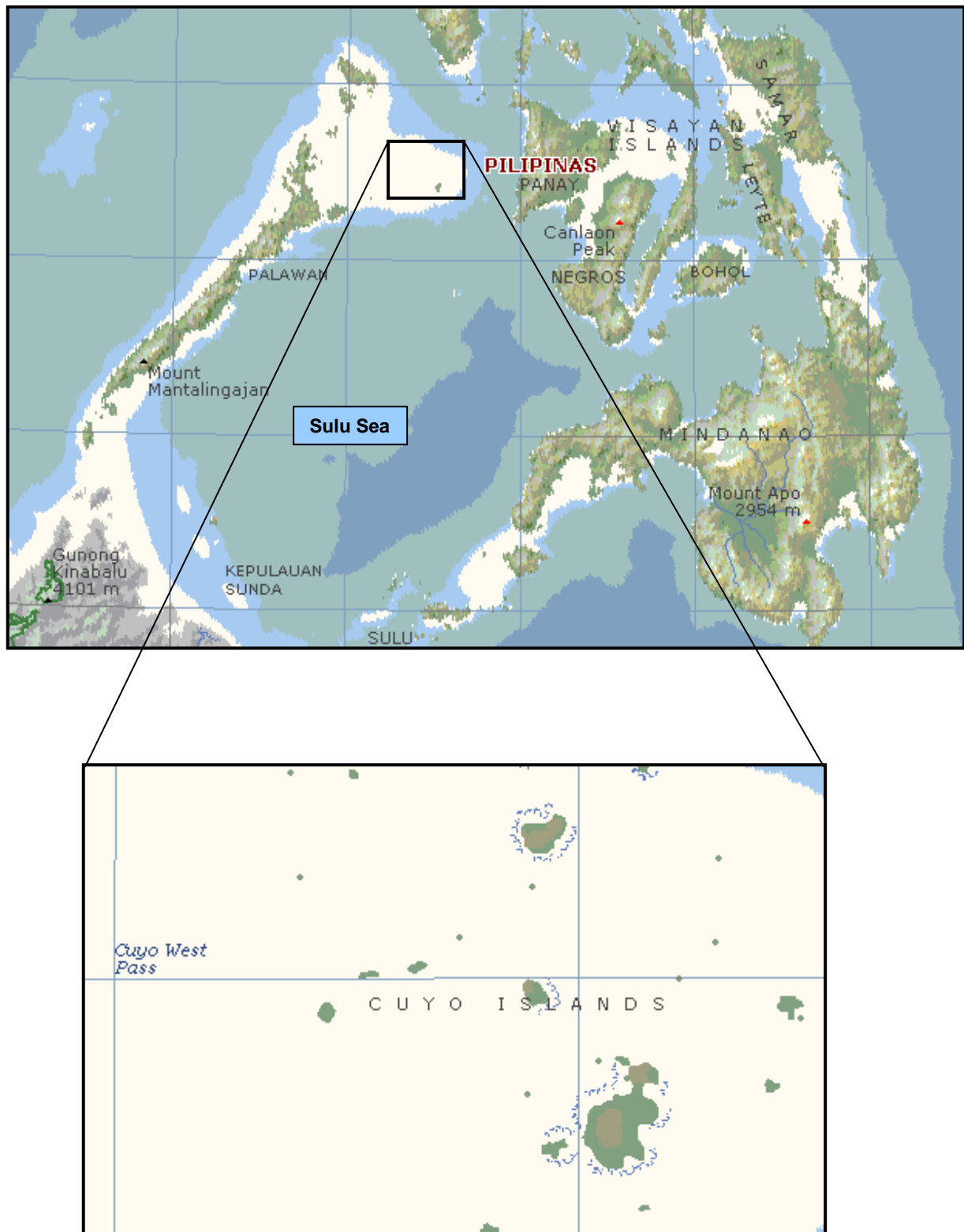
studied. There is a major similarity with regard to weight, height, the ratio max. diameter of last whorl to the total length (0.50) and colour pattern within all these shells. This ratio is high compared to the value in usual forms from other localities. This ratio usually varies between 0.40 and 0.49, with an average of 0.47. In the Cuyo Island-population variation the ratio max. diameter/total length should even be higher if it was not for that high spire.

Shells are large, more solid and show a particularly nice red pattern of broad spiral zones, passed through by evenly spaced reddish-brown dotted lines. At first glance it should be obvious to conclude these shells belong to a new taxon. However, *Conus furvus* Reeve, 1843 is distributed over nearly all the Philippines Islands by the isolation of local populations, and often intergrading among these clines has been detected. Moreover *Conus furvus* proves to be a very variable species and it can be assumed that more forms will be found in the future showing characteristics of both this 'Cuyo Islands-variety' and other typical forms. We can conclude it is unlikely this population variant at present deserves recognition as a new geographic subspecies or even as a new species. Further research needs to be done to confirm this. If we had used the same arguments as Röckel *et al* (1995) for distinguishing *Conus fischoederi* Röckel & da Motta, 1983 from similar species such as *C. achatinus*, *C. monachus*, *C. catus*, *C. striolatus*, *C. magus*, *C. spectrum* and *C. conspersus* this shell could have been described as a new species. It is so different from the classic *Conus furvus* in shape, weight and colour pattern this looks very attractive for any author.

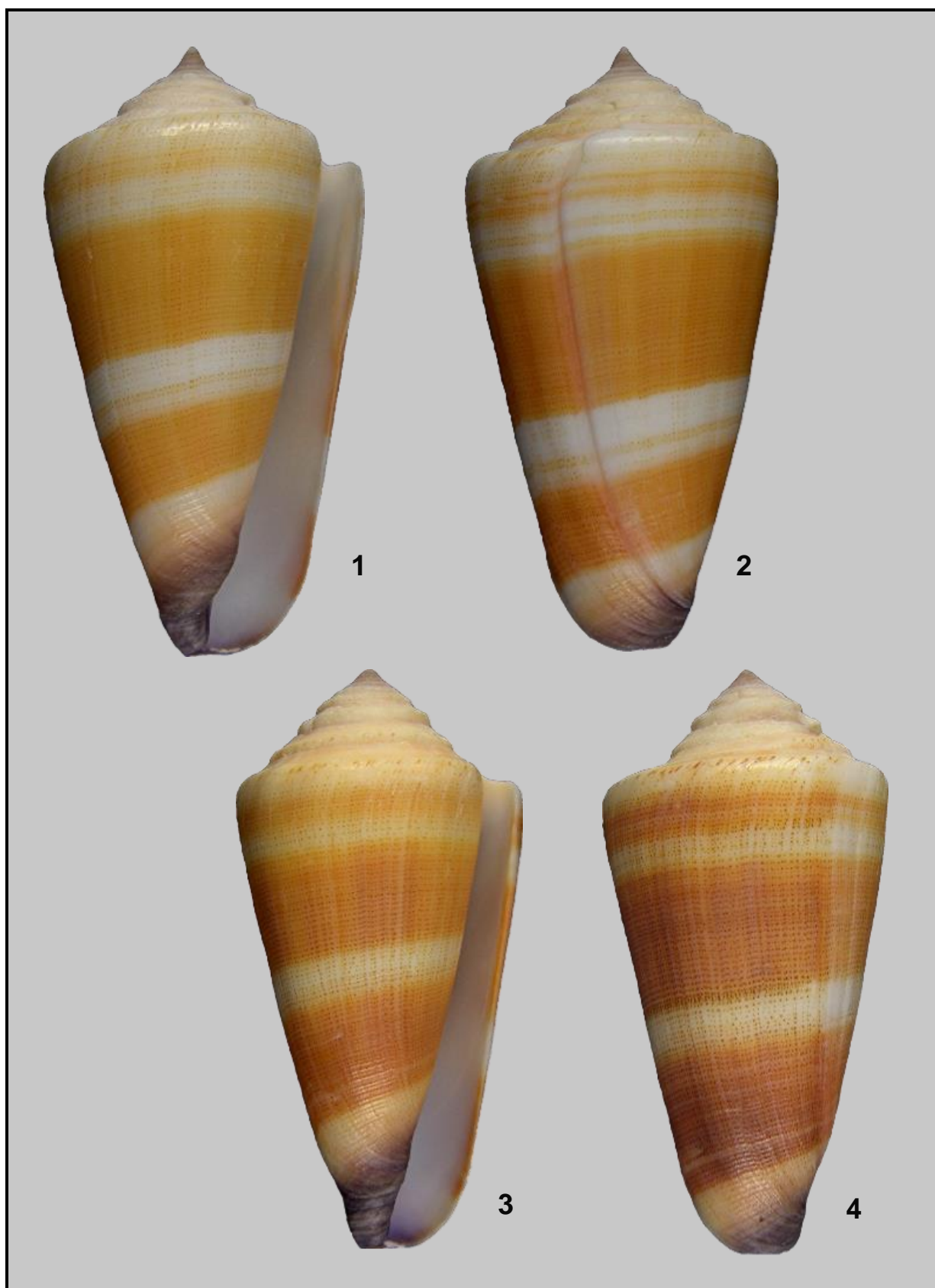
**Acknowledgements:** We are especially grateful to Johan Verstraeten (Oostende, Belgium) and David Monsecour (Rillaar, Belgium) for reading and correcting the English text.

## References:

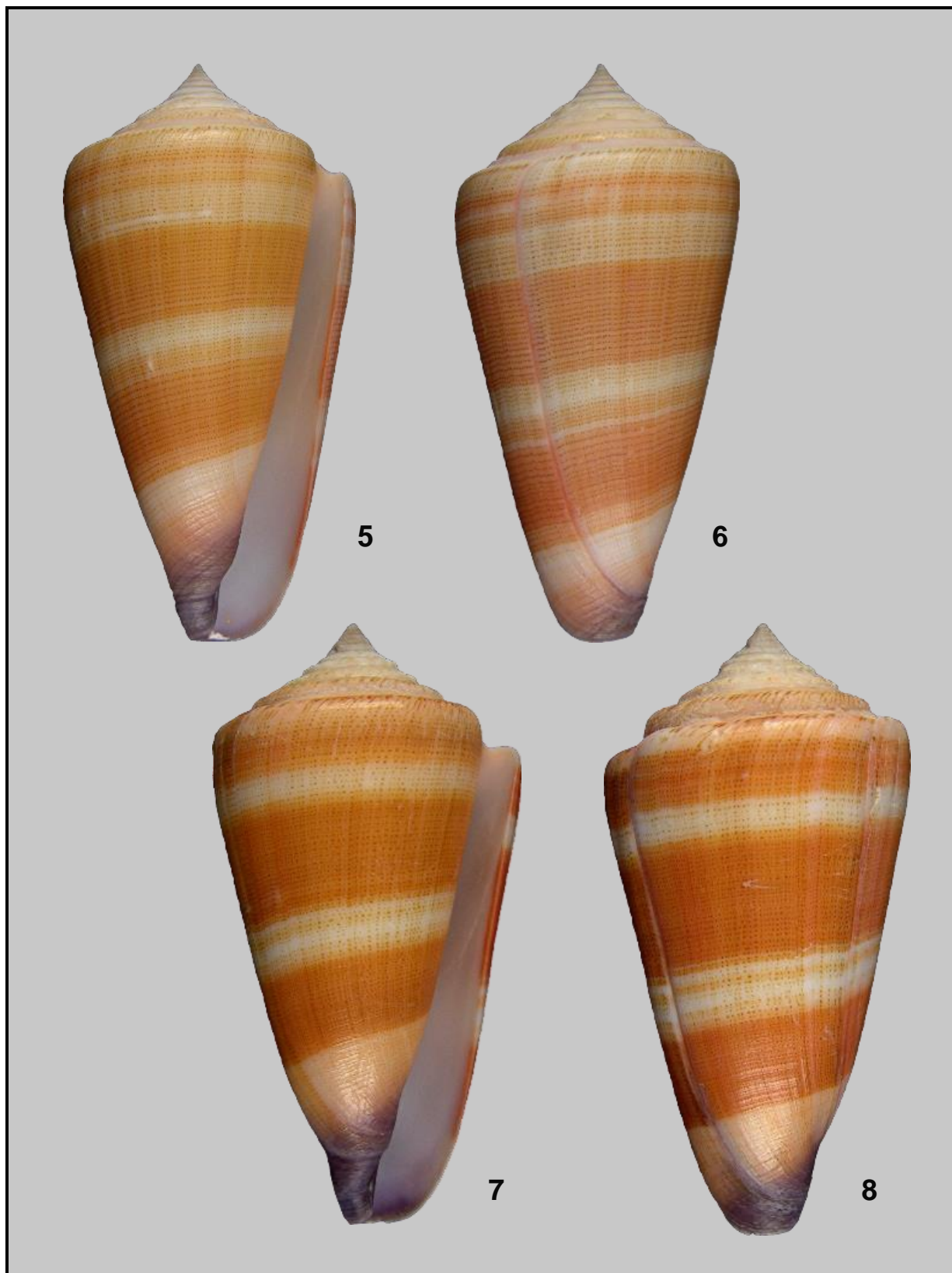
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**Distributional map of the heavy, strongly red-coloured population in *Conus fuvvus***

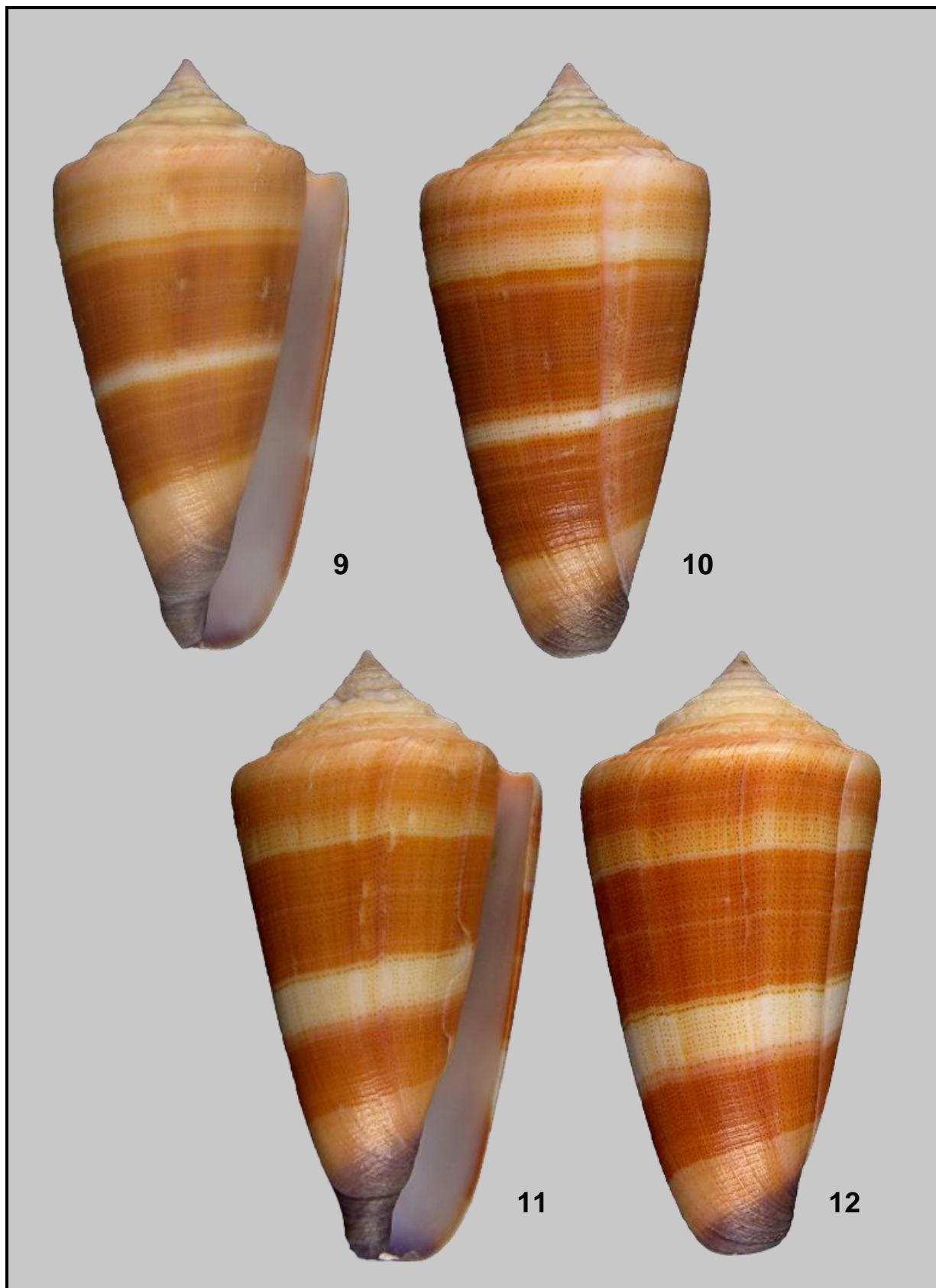


**Plate I. *Conus furvus* Reeve, 1843.**  
**Cuyo Islands, East of Palawan, Philippines. Dived at 10-30 m. June 2006.**  
**Figs 1 & 2: 63.30 mm; Figs 3 & 4: 61.45 mm. (ABS-AJ).**

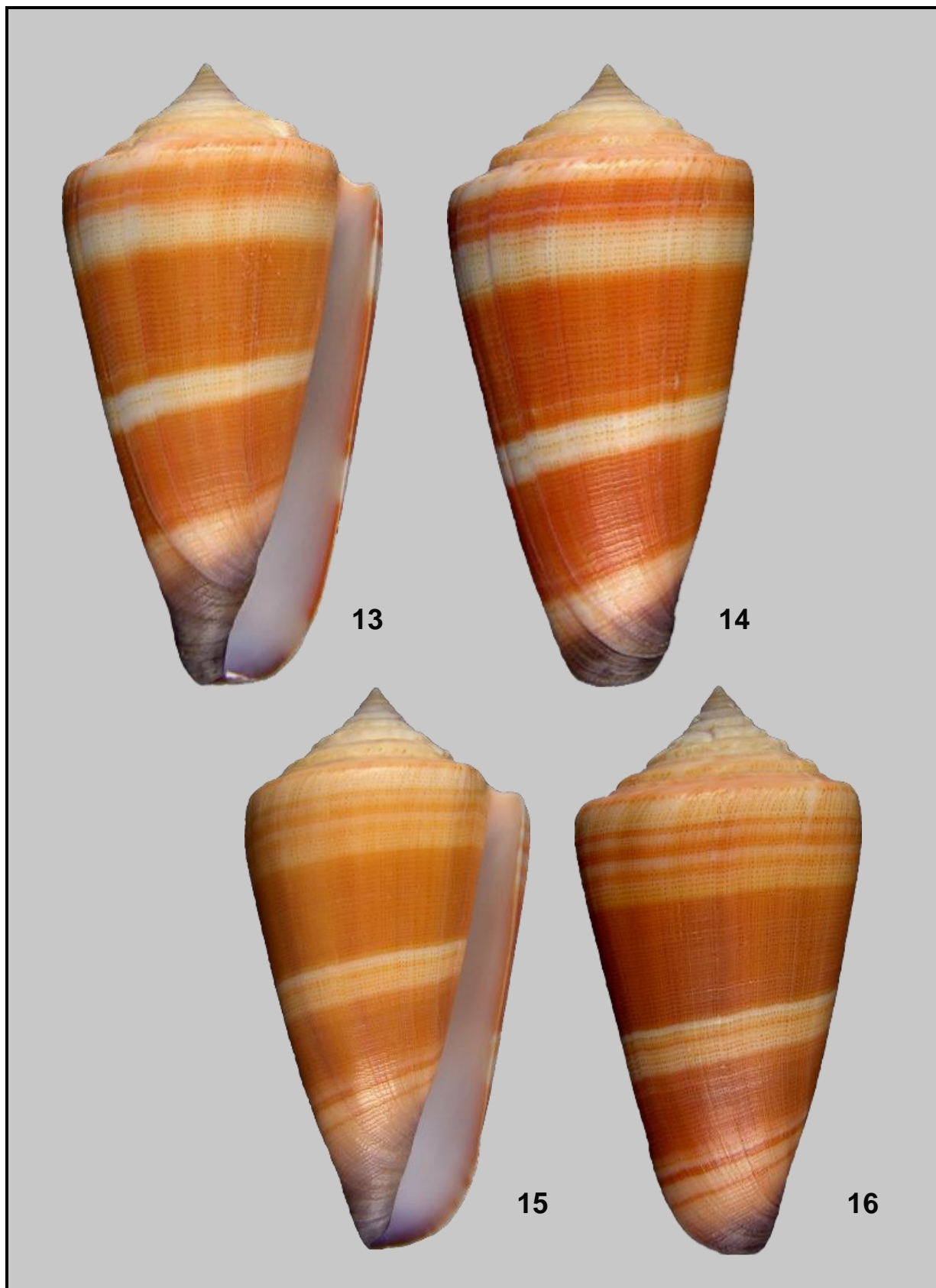


**Plate II. *Conus furvus* Reeve, 1843.**  
**Cuyo Islands, East of Palawan, Philippines. Dived at 10-30 m. June 2006.**  
**Figs 5 & 6: 64.40 mm; Figs 7 & 8: 68.95 mm. (ABS-AJ).**

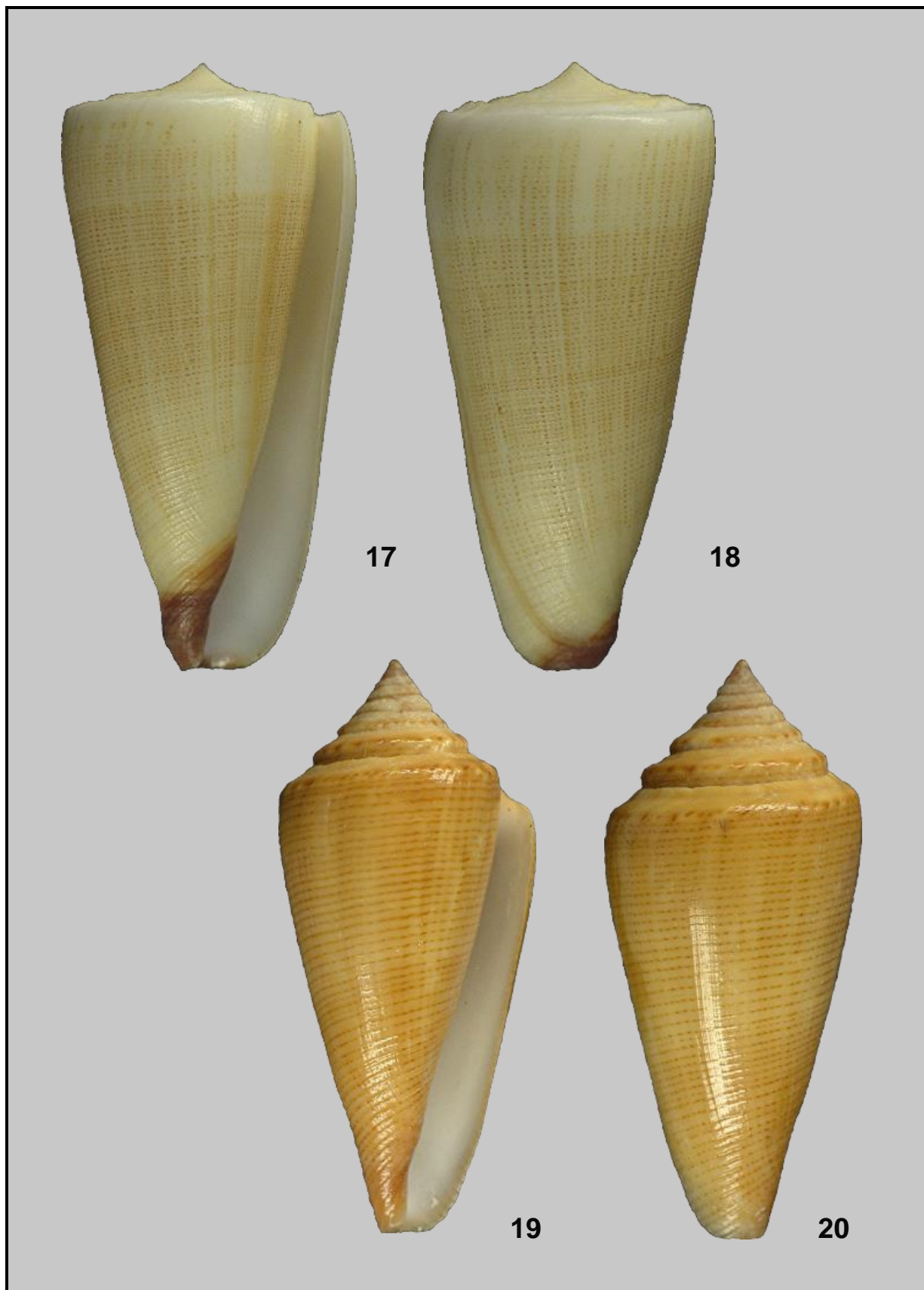




**Plate III. *Conus furvus* Reeve, 1843.**  
**Cuyo Islands, East of Palawan, Philippines. Dived at 10-30 m. June 2006.**  
**Figs 9 & 10: 58.65 mm; Figs 11 & 12: 61.35 mm. (ABS-AJ).**

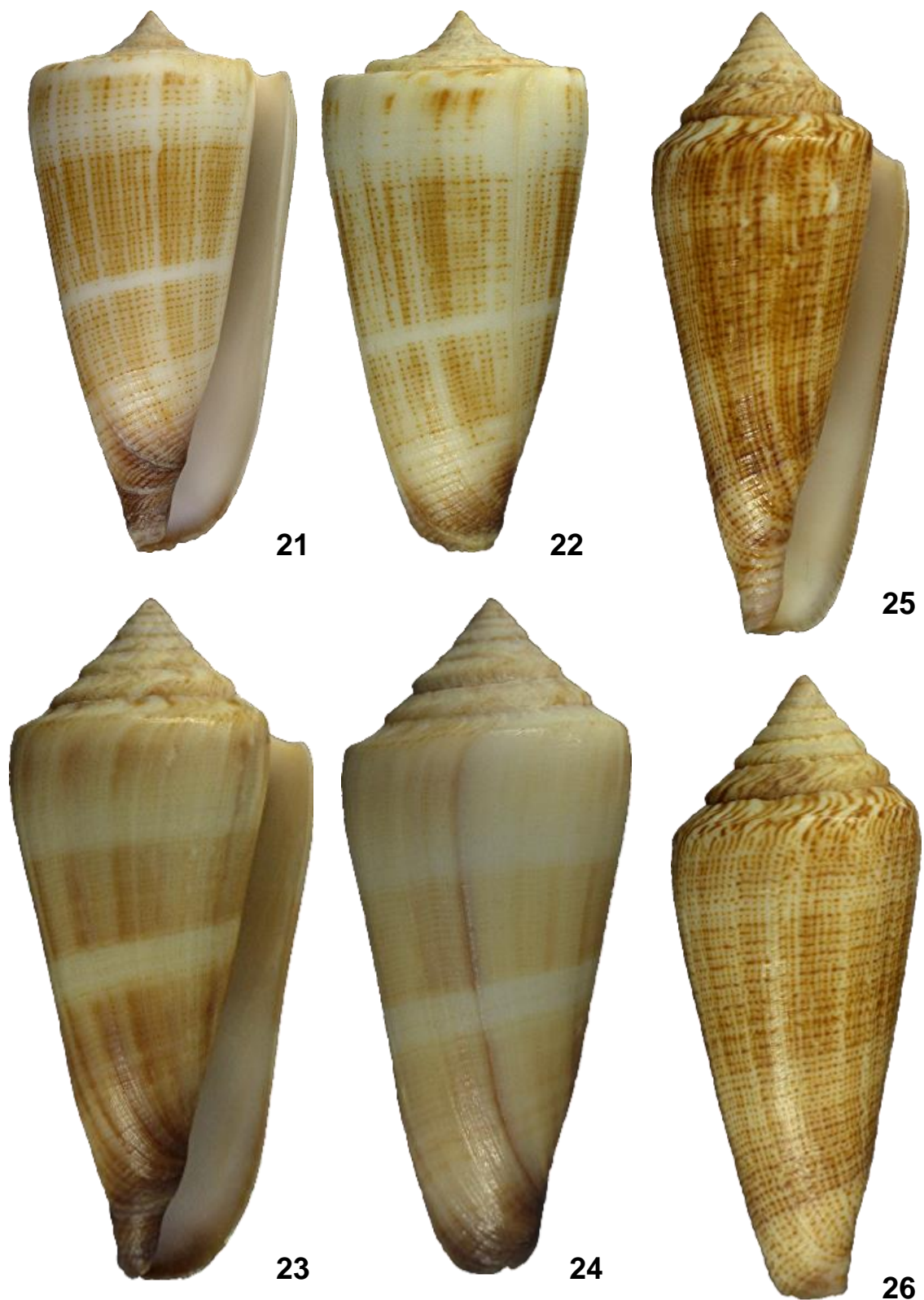


**Plate IV. *Conus furvus* Reeve, 1843.**  
**Cuyo Islands, East of Palawan, Philippines. Dived at 10-30 m. June 2006.**  
**Figs 13 & 14: 61.85 mm; Figs 15 & 16: 55.85 mm. (ABS-AJ).**

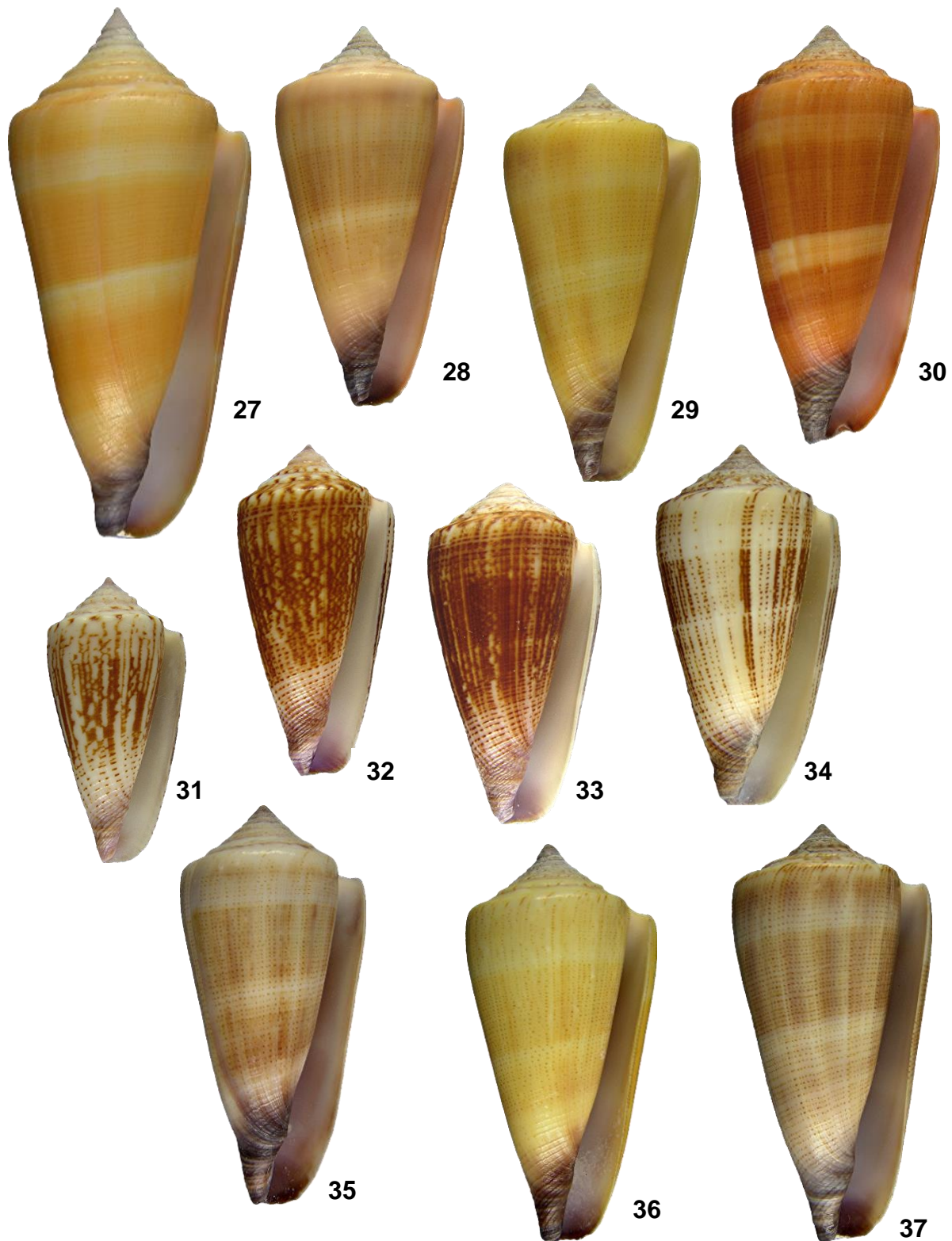


**Plate V. *Conus furvus* Reeve, 1843.**  
**Figs 17 & 18: Bohol, Philippines. 1994. 51.21 mm. (FN).**  
**Figs 19 & 20: Cebu, Philippines. 41.94 mm. (FN).**





**Plate VI. *Conus furvus* Reeve, 1843.**  
**Balabac, Palawan Island, Philippines. In mud.**  
**Figs 21 & 22: 45.27 mm; Figs 23 & 24: 60.38 mm; Figs 25 & 26: 48.91 mm. (FN).**



**Plate VII. *Conus furvus* Reeve, 1843. (ABS-AJ)**

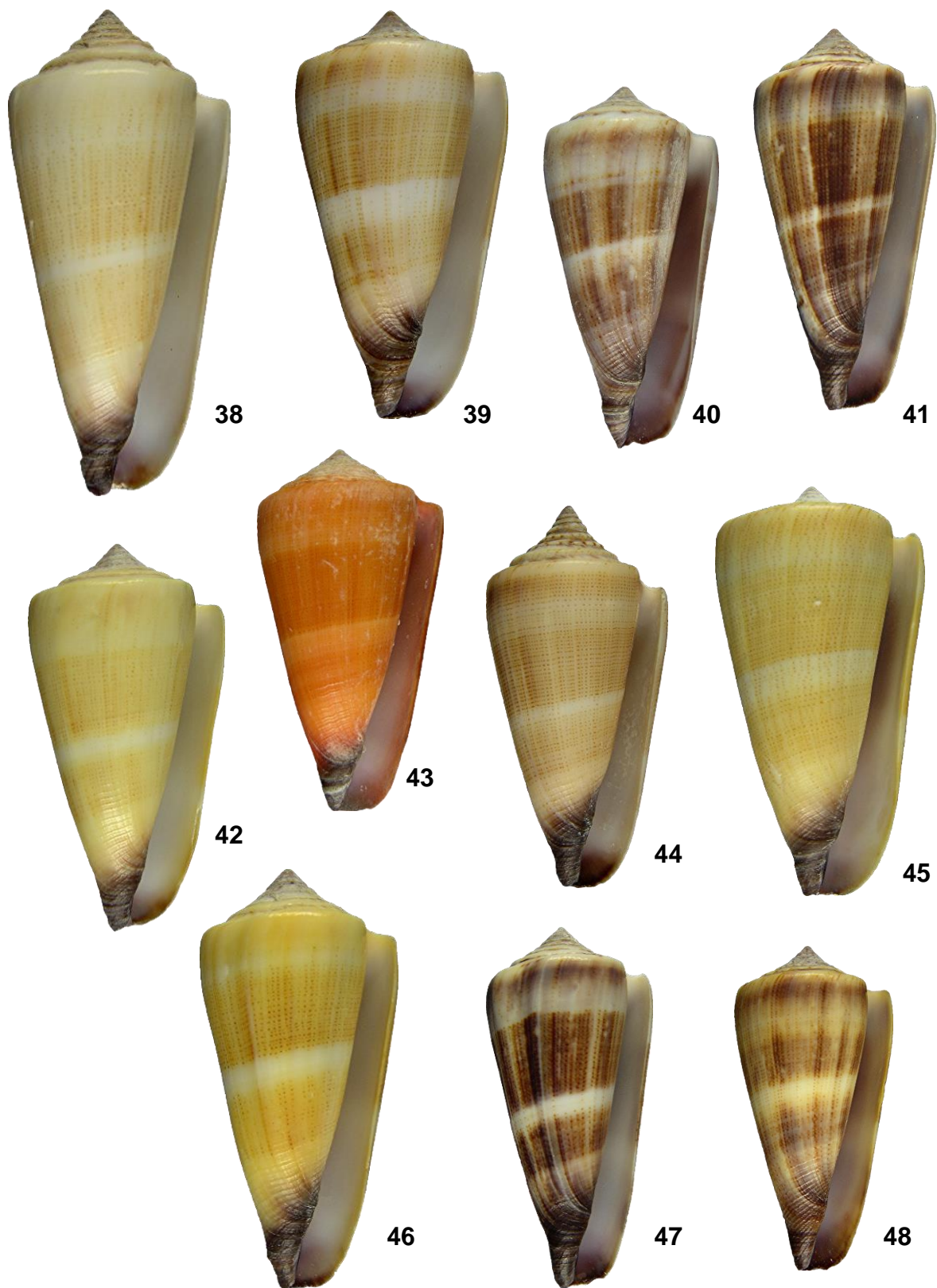
**Fig 27:** Cuyo Islands, NE Palawan, Philippines. May 2006. 73.26 mm.

**Figs 28-30:** Puerto Princessa area, Palawan, Philippines. Dived at 10 m.  
44.90 mm; 45.25; 47.81 mm.

**Figs 31-34:** Patongong, Balabac Island, South Palawan, Philippines. Dived at 10 m.  
32.37 mm; 40.04 mm; 43.11 mm; 46.96 mm.

**Figs 35-37:** Coron, Philippines. Dived at 10 m. 50.89 mm; 49.58 mm; 52.31 mm.





**Plate VIII. *Conus furvus* Reeve, 1843.**  
**Coron , Palawan, Philippines. Dived at 10 m. (ABS-AJ).**  
**Figs 38-48: 61.33 mm; 49.66 mm; 47.38 mm; 45.96 mm; 51.82 mm; 48.85 mm;**  
**50.07 mm; 54.36 mm; 55.70 mm; 50.48 mm; 43.09 mm.**



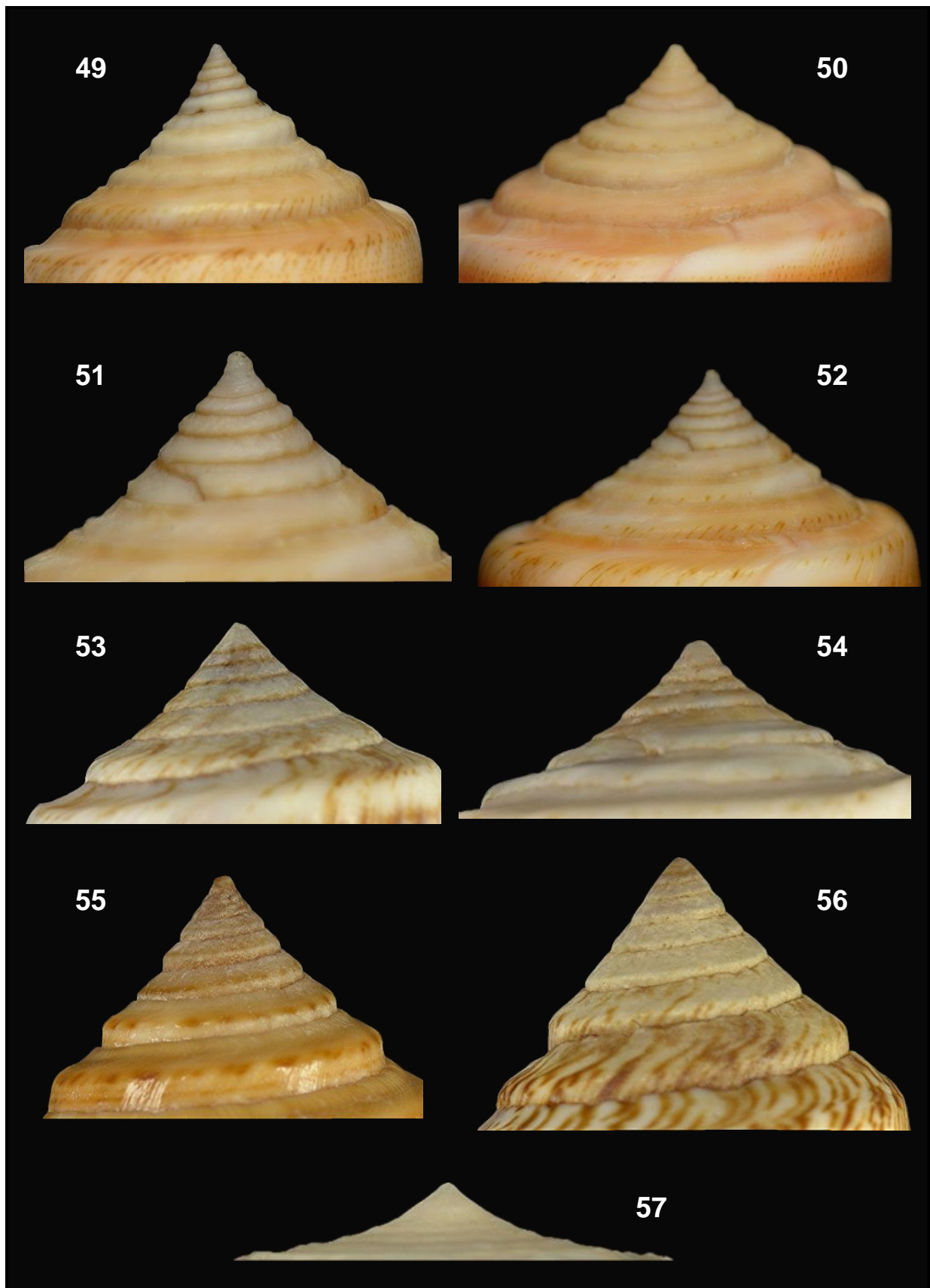


Plate IX. *Conus furvus* Reeve, 1843: comparison of the spire in different forms.  
 Figs 49-52: 'Cuyo Island-variation', Philippines.  
 Figs 53-57: Palawan Island, Philippines.