THE GENUS *CALLUMBONELLA* (GASTROPODA, TROCHACEA) WITH THE DESCRIPTION OF A NEW SPECIES FROM NAMIBIA

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Abstract *The Recent species of the genus* Callumbonella *from the Mediterranean and east Atlantic are studied and comparison is made with a similar species found in deep water off Namibia. The species* Callumbonella gorgonarum *from the Cape Verde Archipelago is considered valid. It is concluded that the Namibian species is different and it is described as such in the present work. Comparison is made of the morphological characters of the shell, soft parts, operculum and radula. The placement of this genus is discussed due to the differences of anatomical and radular characters when compared with the subfamilies in Trochidae.*

Key words *Gastropoda, Trochacea,* Callumbonella*, new species, Namibia.*

INTRODUCTION

Philippi (1836) described the species *Trochus suturalis* from fossil deposits in Sicilia. Monterosato (1884) included it in the genus *Zizyphinus*.

Thiele (1924) designated the genus *Callumbonella* as substitution of the genus name *Umbotrochus* Thiele, 1914 (non Perner, 1903) in which he included *Gibbula gorgonarum* P. Fischer, 1882 as the only species. This species is considered in the CLEMAM Internet page as a synonym of *Callumbonella suturalis*.

The position of this genus is not yet clear: Vaught (1989) placed the genus *Callumbonella* in the subfamily Umboniinae H. Adams & A. Adams, 1854; Currently, CLEMAM places it in Margaritinae Stoliczka, 1868; Hickmann & McLean (1990) did not mention this genus in their revision of Trochacean.

Information on the collecting history, as well as bibliographic information, and distribution area of *C. suturalis* can be found in Malaquias *et al*. (2003).

MATERIAL AND METHODS

The material for the new species from Namibia was collected during the "Namibia 0502" Expedition carried out by the Instituto Español de Oceanografía on board of the R/V "Vizconde de Eza". The collecting method was a net of Lofoten type.

Among the material from Namibia a species with a shape similar to that of the Mediterranean *Callumbonella suturalis* was collected.

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Other material of *Callumbonella* from Mediterranean, Cape Verde and West Africa studied belonged to several collections which will be indicated below.

The aim of the present paper is to study the species belonging to the genus *Callumbonella*; a new species is described and and compared with the two previously known species.

ABBREVIATIONS

AMNH	American Museum of Natural History, New York
BMNH	The Natural History Museum, London
IEO	Instituto Español de Oceangrafía, Centro Oceanográfico de Málaga
MHNS	Museo de Historia Natural "Luis Iglesias" Universidad, Santiago de Compostela
MNCN	Museo Nacional de Ciencias Naturales, Madrid
MNHN	Muséum national d'Histoire naturelle, Paris
USNM	United States National Museum, Washington
UVIGO	Universidad de Vigo, Área de Zoologia, Vigo
ZSM	Zoological Staatmuenchen Museum, Muenchen
CJH	collection of José María Hernández, Gran Canaria
CWM	collection of Werner Massier, Namibia
sp	specimen with soft parts
s	shell empty

TAXONOMY

Trochoidea
Trochidae
Margaritinae
Genus *Callumbonella* Thiele, 1924

Callumbonella suturalis (Philippi, 1836).
(Figs. 1-12, 27-34, 35, 52, 53, 56-64)

Trochus suturalis Philippi, 1836. *Enumeratio Molluscorum Siciliae*, 1, p. 185, pl. 10, fig. 23, 23a.
Zizyphinus folini P. Fischer, 1882. *Journ. Conchyl.*, 30: 50. [off Algeria, 900 m].
Trochus tetragonostoma Jordan, 1895. *Proc. Malac. Soc. London*: 268.
Calliostoma vincentae Kaicher, 1986 (no pagination) ex Ruttlant ms. [off Melilla].
Calliostoma vicentae auct. non Kaicher.

Material examined **Spain**: 1 sp, 2 s, Melilla, north Morocco (MHNS ex coll. Ruttlant) (Figs. 1-3); 1 sp. Estepona, Malaga, 150-200 m (CJH) (Fig. 4); 5 sp, Banc of Motril, Alboran Sea, 36º10.85'N 3º44.15'W, 290-300 m (FAUNA I, 14-07.89)(MNCN); 3 sp, Banc of Motril, Alboran Sea, 36º10.8'N 3º44.29'W, 290-300 m (FAUNA I, 14-07.89)(MNCN); 2 s, Gulf of Huelva, 36º33.94' 7º06.50'W, 500 m (FAUNA I, 24-07.89)(MNCN) (Figs 7-9). **Algeria**: 1 sp, Beni Saf, 35 m (CJH). **Morocco**: Some samples from Atlantic, deep water, images in Internet (Figs. 5, 6, from Guido Poppe).

Description See Philippi (1836), P. Fischer (1883), Jeffreys (1883), Jordan (1895), Locard (1898) and Wenz (1938).

The Mediterranean and Moroccan shells (Figs. 1-9) are light, not very solid, uniformly pink coloured dorsally and white from the periphery to the base. The lateral profile is straight, externally iridescent, which is also more evident in the aperture. The periphery of the last whorl is angulous. The spiral sculpture is delicate with fine nodulous cords, except for that subsutural and the peripheral areas, which have more prominent white nodules. The protoconch, although not perfect in the material from the Mediterranean, is very short (one whorl) and measures about 325 µm (Fig. 35).

The animal (Fig. 39) was described by Jeffreys (1883) as "...pale brownish-yellow; tentacles conical, edge on each side with a purplish-brown line; eyes black, conspicuous, placed as usual in the genus; foot thick, fringed with white conical papillae 4 on each side; no ocelli or eye-spots". We confirm this description with the study of 2 animals from Alboran Sea, where we found the purplish-brown line on the tentacles, but only found three conical tentacles at each side beside the cephalic. The border of the foot, the mouth, the cephalic lappets and the line which continues along the foot are finally denticulated.

Operculum (Figs. 52, 53) (from Melilla and Alboran specimens) rounded, yellowish, transparent, multispiral, with the spiral line near the border presenting wider spaces than in the central part.

Radula (Figs. 27-34) studied in one specimen from Melilla and 3 more from Alboran. It is bilaterally symmetrical, with 40 rows of teeth. Both the central and the marginal teeth fields are well developed. The cusps and the base rows are coincident. The rachidian tooth is wide, almost rounded, with an upper short sharp border, in which there are very small cusps at both sides (around 8), and a central part scarcely prominent, but with triangular form. The five lateral pairs of teeth are similar in size, increasing from the inner to outer ones; they are pointed with small cusps at both sides (about 6). The marginal teeth are elongate, sharply pointed, the innermost is largest, with very small cusps on its internal border; the size of the marginal teeth decreases outwards along the row. In the lower face of the marginals there is a prominent ridge hardly visible in the smaller ones.

Distribution The species was described from fossil material and it is known from Monte Mario, Pliocene of Roma and the Quaternary of Calabre and Sicily; also from Estepona (Landau, Marquet & Grigis, 2003).

There are many records of this species (Fig. 65): Jeffreys (1883) mentions the distribution from the Bay of Biscay and Marseilles Gulf ("Travailleur" Expedition) between 174 and 1025 m and from "Porcupine" in Vigo Bay; he also recorded it from Tunis gulf. After Locard (1898): South Ireland, 1026 m; Gascogne Gulf (Bay of Biscay), 160-510 m; Portugal coasts, between 549 to 986 m; south Spain 379 m; Mediterranean: West Corsica, 280 m; Oran, 980 m; Algeria (Fischer, 1882); West Morocco, between 440 and 1435 m; West Sahara, 2330 m. Dautzenberg (1927) mentioned Corsica,

Portugal, Morocco, Gibraltar, S. Portugal and Sahara between 150 to 2330 m. Rolán (1983) repeated Jeffreys's record from Vigo. Malaquias *et al*. (2003) recorded many places from the Mediterranean to the Cape Verde Islands (including in this archipelago *C. gorgonarum* as synonym).

Remarks Locard (1898) commented that the living species is a little different from the fossil described by Philippi. We also have some doubts about the fossil species being considered the same as the recent ones: Landau et al. (2003: 69, figs. 2, 3) described and figured shells from the Pliocene of Estepona, mentioning that the nucleus measures 65 µm and the protoconch diameter 266 µm. Both are rather different from the specimen we have photographed (Fig. 35) with a 150 µm nucleus and 325 µm protoconch diameter. Furthermore, the fossil shells in that work (Figs. 56-59) are more sculptured, peripherally more angulated and the first whorls of the teleoconch are very different (Figs. 35 and 60, 61). If the fossil and the recent species are conchologically different, the name to be employed would be *Callumbonella folini* (P. Fischer, 1883) whose lectotype (here designated, Figs. 62, 63) undoubtedly matches the species known from the Mediterranean and North Africa, the juveniles (Fig. 64) having the first whorls of the teleoconch almost smooth, very different from the fossil (Fig. 59). Anyway, it would be necessary to study more material to reach a final conclusion about these populations.

The differences with the following species will be related below.

Callumbonella gorgonarum (P. Fischer, 1884) (Figs 13-20, 36-38)

Gibbula gorgonarum P. Fischer, 1884 "1883". *Journ. Conchyl*., 31: 393 [Cape Verde Archipelago, 400-580 m].

Type material Lectotype (Figs. 13-15), here designated, and 149 paralectotypes (MNHN).

Description See Fischer (1884). All the type material studied consistently shows red axial lines, sometimes zigzagging or oblique, on a light pink background (Figs. 13-20). Protoconch (Fig. 36) with only a smooth whorl, a diameter of 280 µm, and a nucleus of about 100 µm.
The soft parts are unknown.
The radula (Figs. 37, 38) could be obtained from scarce rests from a dry animal, although the material is more than a century old. It was in bad conditions but the study showed a typical *Callumbonella* radula with a central tooth irregularly denticulated on the upper border, lateral 4, with only two external cusps; the innermost marginal with large internal cusps.

Dimensions The shells never grow to more than 14 mm in diameter.

Distribution *C. gorgonarum* in known only from the Cape Verde Archipelago (Fig. 65).

Remarks *C. gorgonarum* is considered by Malaquias et al. (2003) and in CLEMAM as synonym *C. suturalis.* We do not agree with this opinion after the examination of many samples of the type material, from which we can confirm the following differences:
- in *C. gorgonarum* the shell is smaller (diameter never larger than 14 mm, while *C. suturalis* can reach 19 mm).
- the shell is more depressed: the relation height/width was of 0.94 (n=15) in *C. suturalis* versus 0.74 (n=20) in *C. gorgonarum*.
- the axial red lines are constantly present in all the shells of *C. gorgonarum* whereas no shell of *C. suturalis* with this colour pattern was found.
- the protoconch in *C. gorgonarum* is scarcelly smaller than that of *C. suturalis*.
- the radula of *C. gorgonarum* has the central tooth with more numerous and smaller cusps on the upper border; the 5th lateral tooth has only two large external cusps, while in *C. suturalis* there are between 5 and 7; the first marginal in *G. gorgonarum* has large cusps in the internal border, while *C. suturalis* has only smaller ones.

Callumbonella namibiensis Rolán spec. nov. (Figs 21-26, 40-51, 54, 55)

Type material Holotype (Fig. 821) in MNCN (15.05/47000). Paratypes in the following collections: AMNH (3), BMNH (3), IEO (5), MHNS (3), MNCN (3), MNHN (3), USNM (3), UVIGO (38),

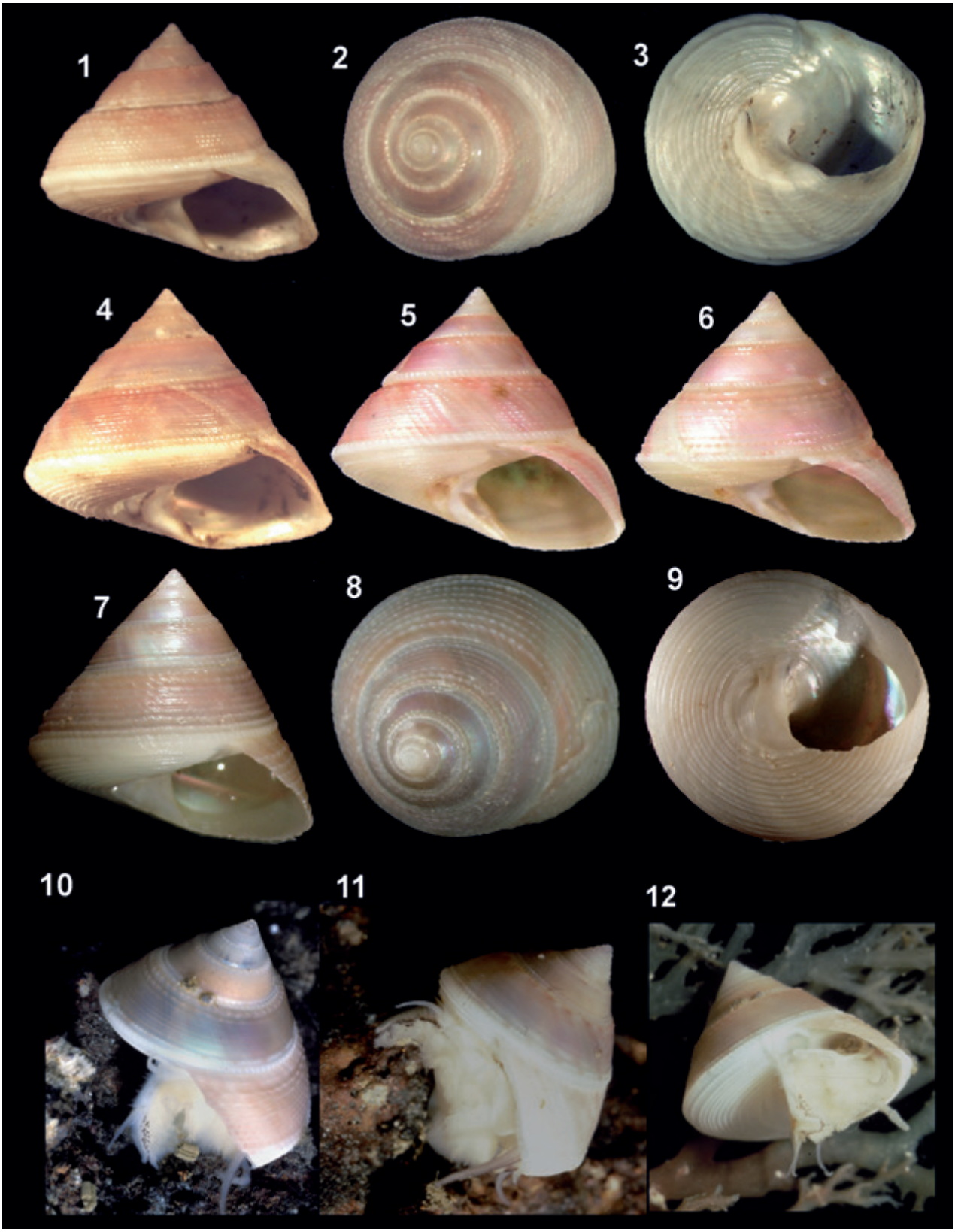
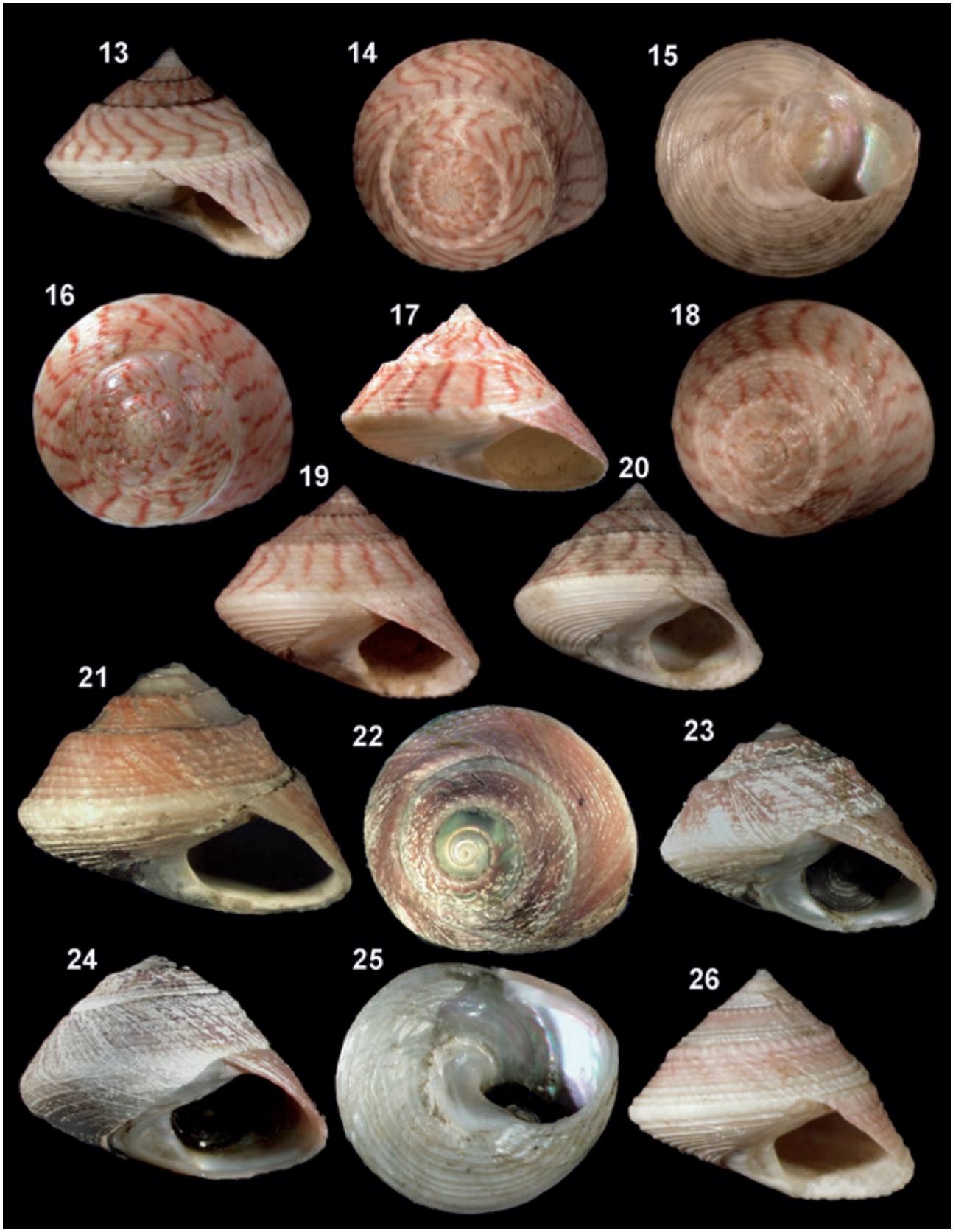
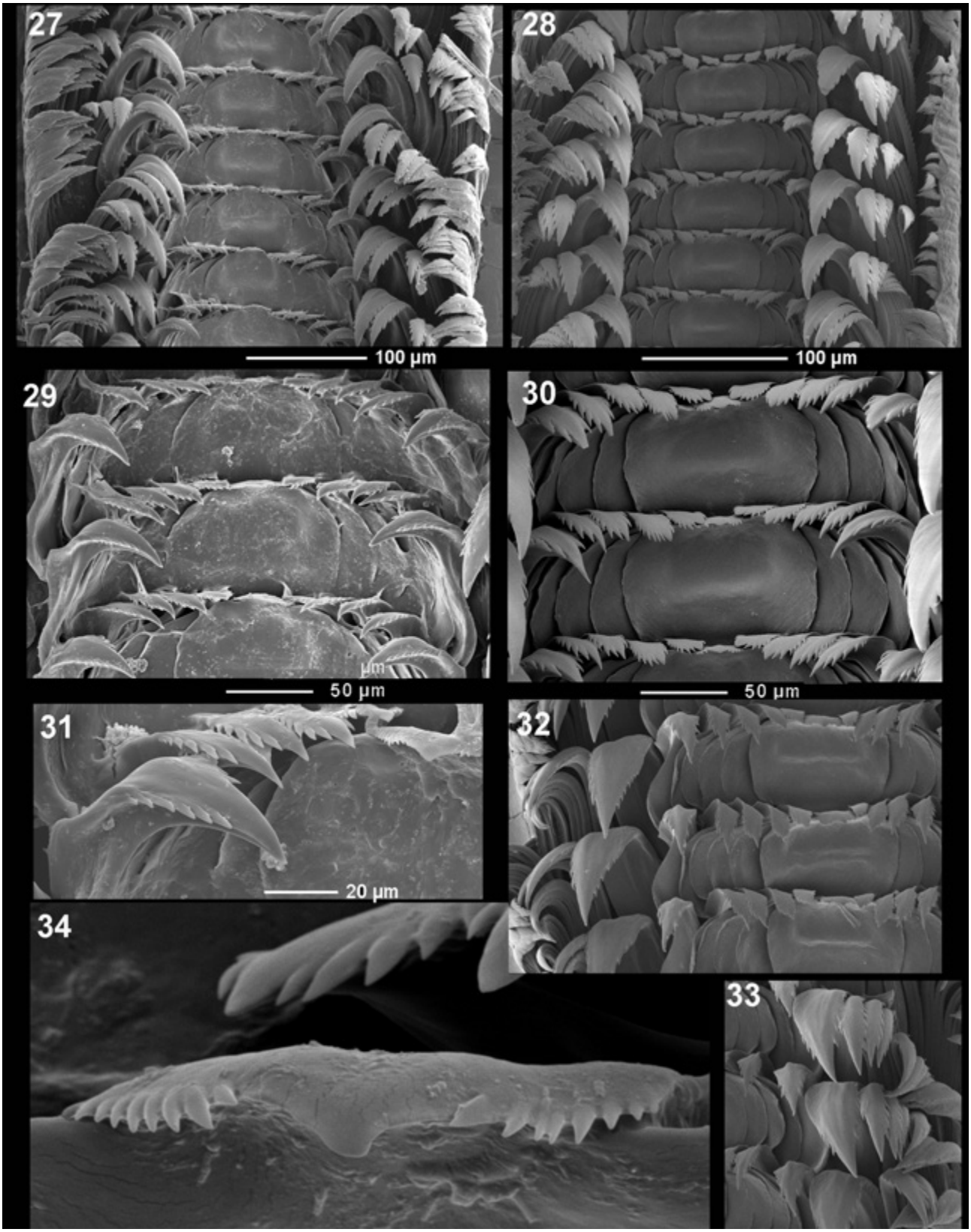


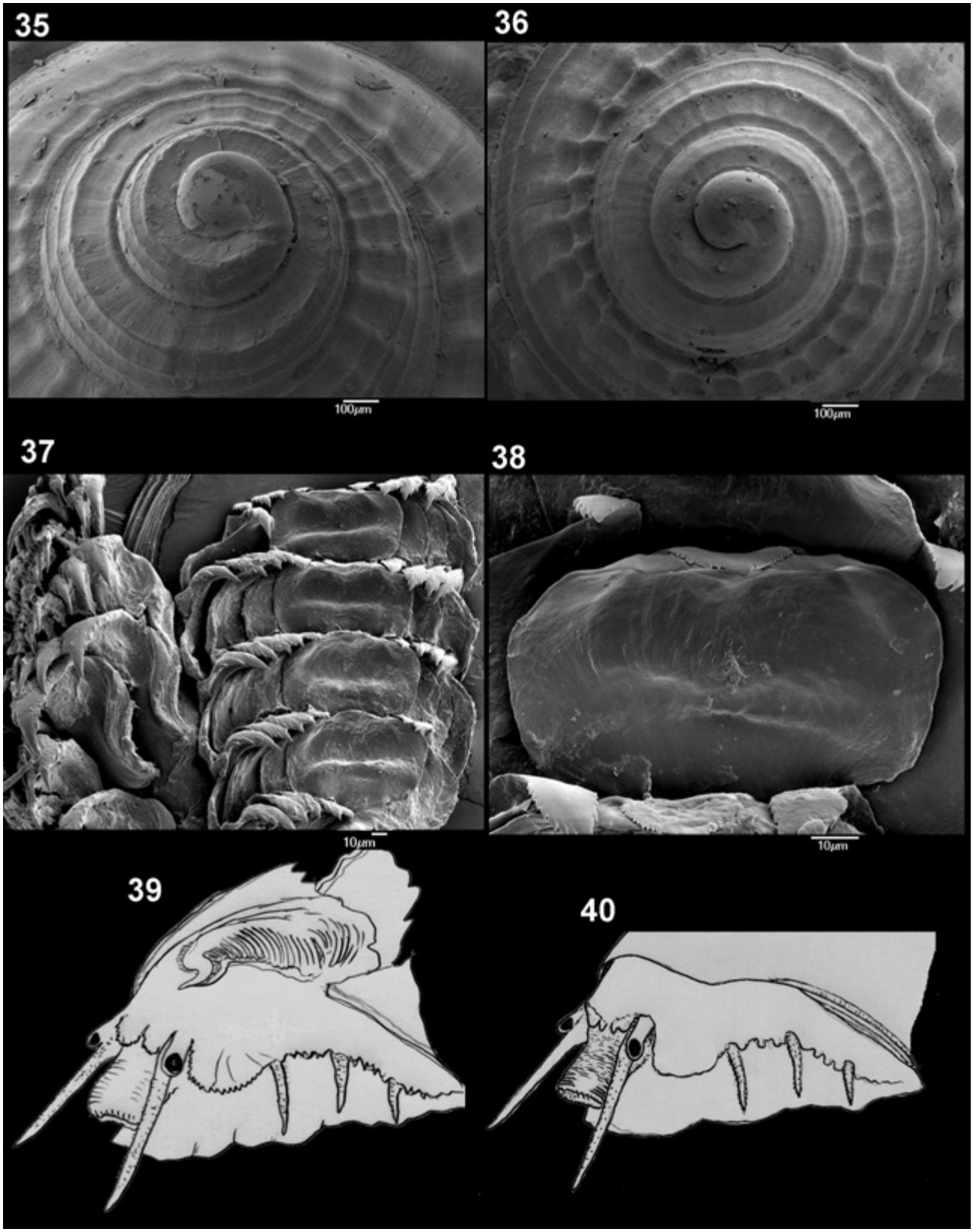
Figure 1-12 *Callumbonella suturalis* **1-3** shell, diameter 14.8 mm, Melilla (MHNS); **4** shell, diameter 18.5 mm, Estepona, Málaga (CJH); **5, 6** shells, 16.7 and 15.0 mm, Morocco (coll. Guido & Philippe Poppe); **7-9** shells, 14.9 mm, Huelva Gulf, 500 m (MNCN); **10-12** living specimens, Alboran Sea (FAUNA I/Diego Moreno).



Figures 13-20 *Callumbonella gorgonarum* **13-15** lectotype, 12.9 mm, Cape Verde Islands, 590 m (MNHN); **16-20** paralectotypes, diameter 13.0, 13.0, 12.5, 12.5, 12.8 mm, Cape Verde Islands, 590 m (MNHN). Figures **21-26** *Callumbonella namibiensis* spec. nov. 21: holotype, 19.2 mm, off Namibia (MNCN). **22, 23** paratype, 14.5 mm, off Namibia (CJH); **24** paratype, 17.0 mm (ZSM); **25, 26** *Callumbonella* cf. *namibiensis*, shell, 14.5 mm, Mauritania (MHNS).



Figures 27-34 Radula of *C. suturalis*. **27, 29, 31, 34** from Melilla specimen, 14.8 mm. **28, 30, 32, 33** from Alborán specimens, 12.0, 13,3 mm; **27, 28** entire vision; **29, 30** detail of the central field; **31, 32** detail of the rachidian tooth and lateral teeth; **33** detail of the marginal teeth; **34** upper part of the rachidian tooth.



Figures 35, 36 Protoconch and first whorls of teleoconch of *Callumbonella* **35** *Callumbonella suturalis*, Alboran Sea (MNCN); **36** *C. gorgonarum*, Cape Verde Islands (MNHN). **37, 38** Radula of *C. gorgonarum*, specimen of 12.5 mm, Cape Verde islands (MNHN). **Figures 39, 40** Soft parts, reconstructed from preserved animals; 39*: C. suturalis*; 40: *C. namibiensis*.

ZSM (3), CJH (3), CWM (1). All of them from the type locality; and UVIGO (22), between 18º03.76'S and 18º05.14'S, 11º23.13'E and 11º23.33E, between 612 and 623 m (Stn. 23, 10/03/05).

Type locality Off Namibia, between 18º11.12'S and 18º12.56'S, 11º24.80'E and 11º25.41E, between 500 and 541 m (Stn. 24, 10/03/05).

Other material study Supposed to belong to the same species: **Mauritania**: 2 s, dredgings at 80 m (MHNS); 1 sp, dredgings at 300 m (CJH); 2 s, dredgings at 120 m, fishermen (CER). **Guinea Conakry**: 1 sp, 10º06'N, 16º26'W, 300-600 m (CJH).

Etymology After the country where the type material was collected.

Description Shell (Figs. 21-26) very solid, with trochoid form, the profile is stepped due to the subsutural area of each whorl being more elevated than the suture. The protoconch could not be studied because it was always eroded in all the material examined. The teleoconch has about 4-5 whorls. The spiral sculpture is formed by 10-14 cords which have elongated nodules; the subsutural area is strong, more elevate and the nodules are larger. The periphery of the last whorl is rounded and with numerous spiral threads. From here to the base, there are about 10-12 spiral main non-nodulous cords with smaller ones between them. A umbilical callus closes the area. Aperture subcircular. Colour pink-violaceous dorsally, the periphery white and the base whitish. The aperture is iridescent. Dimensions: the holotype is 19.2 mm in diameter; most of the paratypes are of similar size or smaller, although one does reach 21 mm.

Animal (Fig. 40), examined in five preserved specimens, is whitish, cephalic tentacles narrow and elongate. Epipodium well developed with large neck lobes and simple margins anteriorly, and a little irregular in the middle and posteriorly. Cephalic lappets small but evident, sometimes with a large lobe and another small one, sometimes with only an irregular border. There are three well developed epipodial tentacles at each side, the first pair larger. The snout is large and papillated at the tip, dorsally with numerous transverse small folds. The foot is rounded anteriorly and tapering to a point posteriorly; in the opercular area there are small separate brown lines near the foot border. Eyes black, very large, on independent peduncles.

Operculum (Figs. 54, 55) rounded, dark brown, multispiral, slightly transparent and, near the external border, the spiral lines are close.

Radula (from Namibian specimens)(Figs. 46-51) bilaterally symmetrical. About 40 rows of teeth. Both the central and marginal tooth fields are well developed. The cusp and the base rows are coincident. The rachidian tooth is wide, almost rectangular, with a short upper sharp border, in which there are very small cusps on both sides and an irregular depressed central part. The five lateral pairs of teeth are similar in size, increasing from the inner to the outer ones; they are pointed with very small cusps (from 6 to 9) at both sides. The marginal teeth are elongated, sharply pointed, the innermost is largest and the size decreases outwards along the row, having small cusps on the inner border. In the lower face of the marginals there is a prominent ridge hardly visible in the smaller ones.

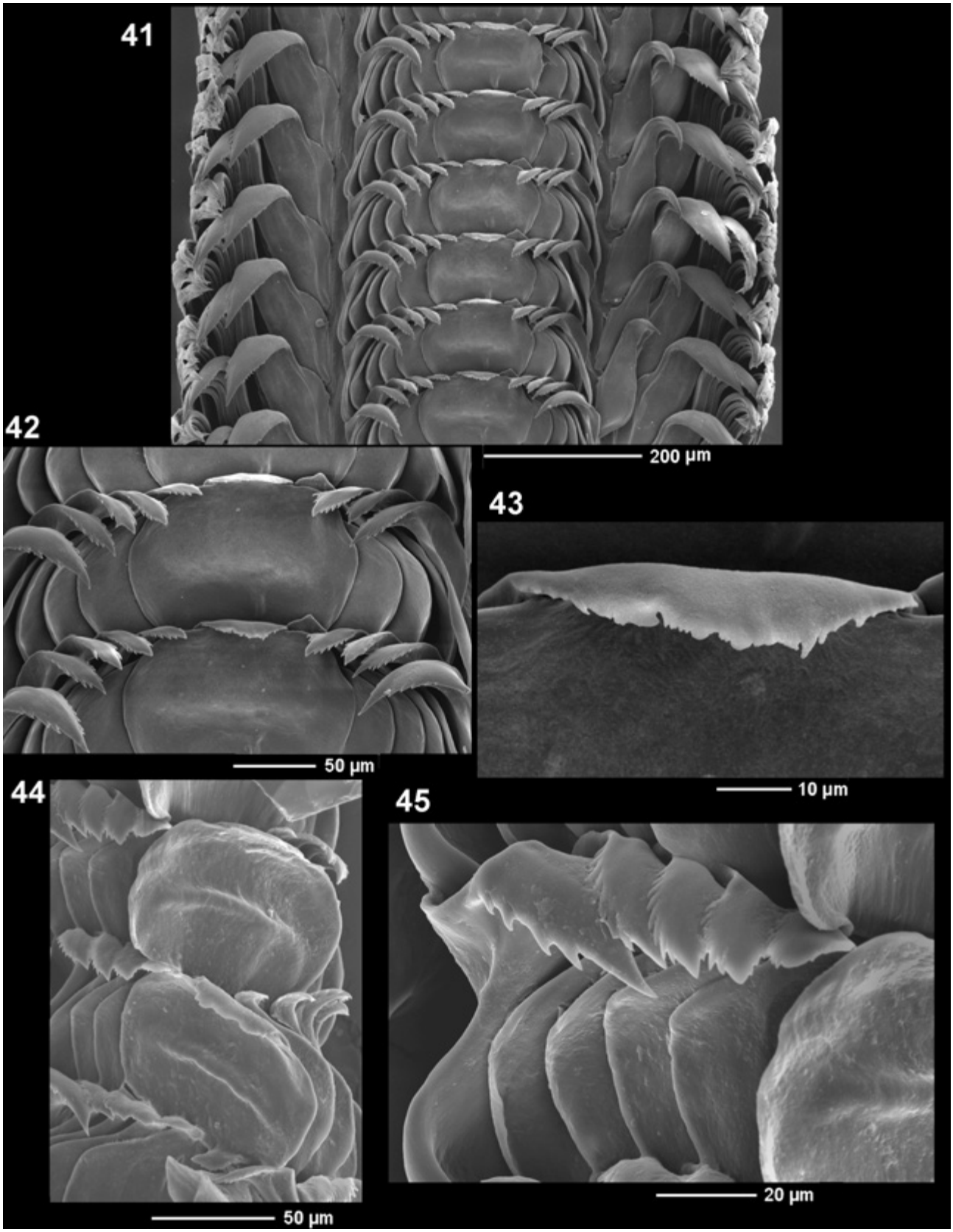
The radula of the populations from Mauritania (Figs. 41-43) and Guinea-Conakry (Figs. 44, 45), supposed conspecific, are rather similar, with the border of the rachidian tooth very irregular.

Distribution The species is described from Namibian (Fig. 65) populations. The West African populations in Guinea Conakry and Mauritania are morphologically very similar and they could be the same species and not the Mediterranean *C. suturalis*.

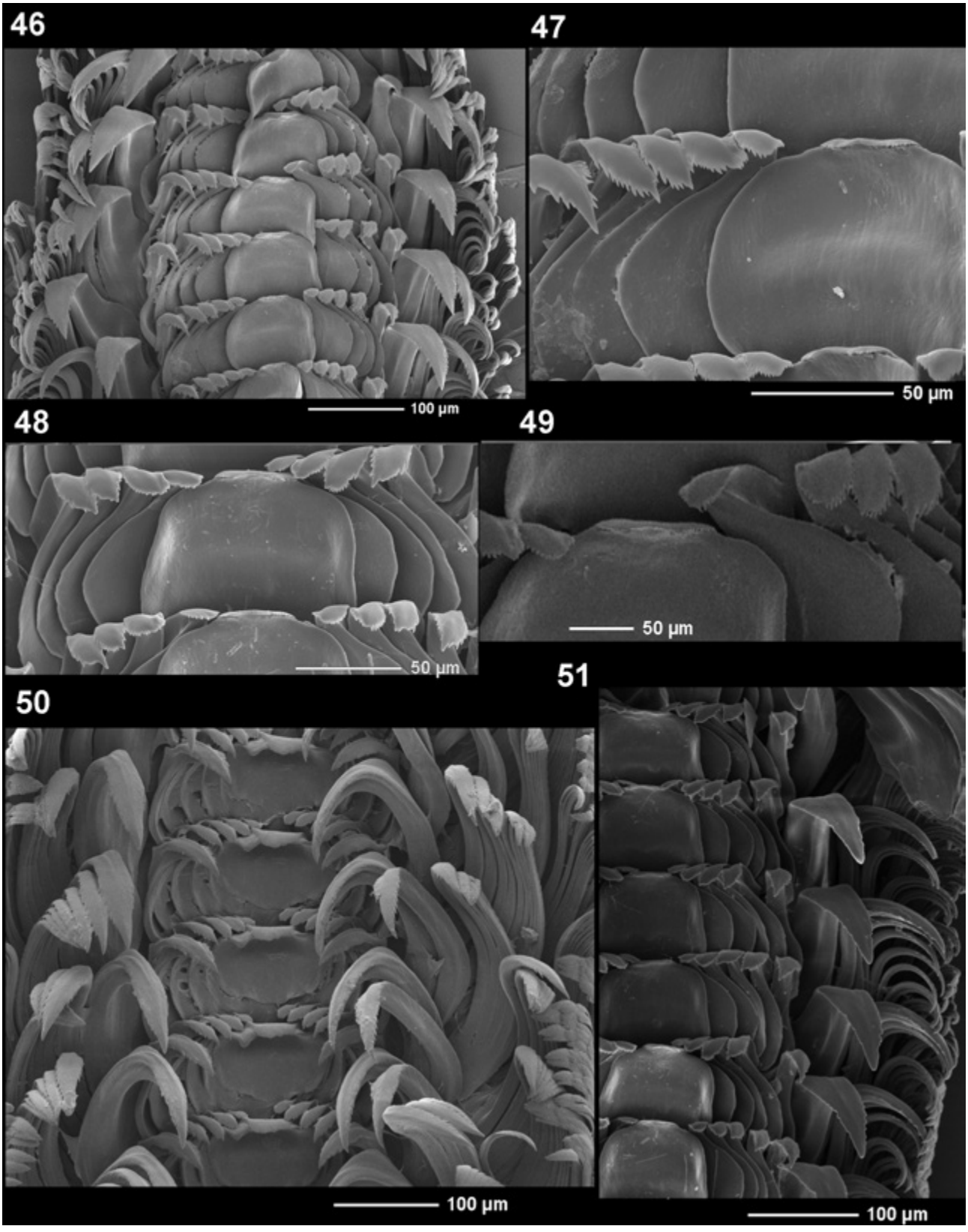
Habitat Collected in very homogeneous muddy and sandy sedimentary soft bottom.

The accompanying fauna was composed of hormatids (Anthozoa, Actiniaria), decapods (Crustacea, Decapoda) and polychaetes (Annelida, Polychaeta). Besides, in the Stn. 24 there were demosponges (Porifera, Demospongia). Curiously, the two stations (23 and 24) in which the *Callumbonella* specimens were collected were the only ones in which no individuals of Echinodermata were present, this group being abundant in other Stn. of the Expedition.

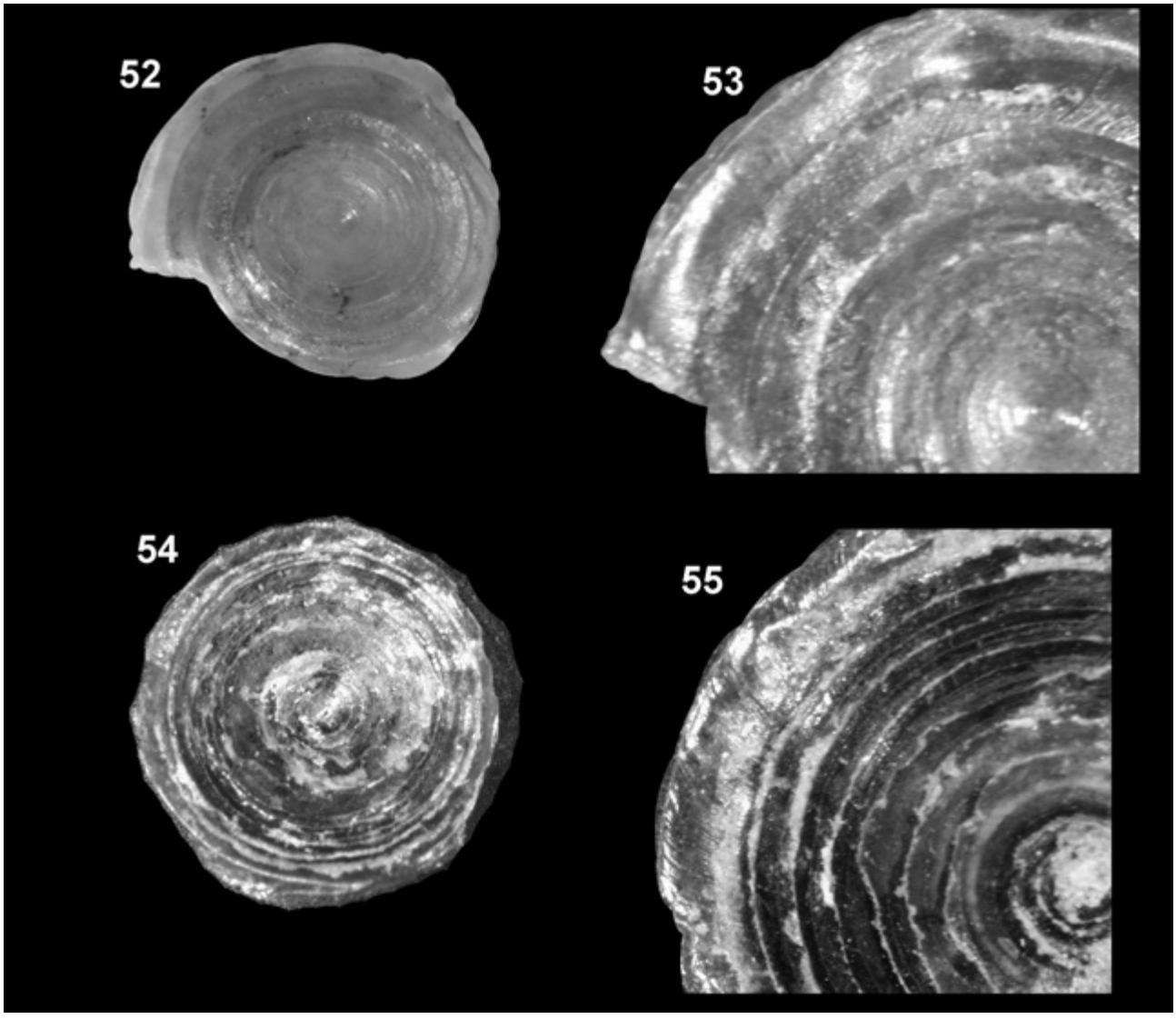
Remarks The populations from Mauritania and Guinea Conackry, are geographically closer to those from Europe. Nevertheless, the morphology



Figures 41-45 Radula of *C.* cf. *namibiensis.* **41-43** specimen from Mauritania, 14.5 mm (CER). **41** entire vision; **42** detail of the rachidian tooth and lateral teeth; **43** detail of the upper part of the rachidian tooth. **44, 45** specimen from Guinea Conakry (CJH); **44** detail of the lateral teeth; **45** detail of the rachidian tooth.



Figures 46-51 Radula of C. *namibiensis* spec. nov., from off Namibia. **46, 50** entire vision, specimens of 14.7, 14.0 mm; **47** detail of the central field; **48** detail of the rachidian tooth and lateral teeth; **49** detail of middle radula; **51** radula of specimen 14.3 mm.

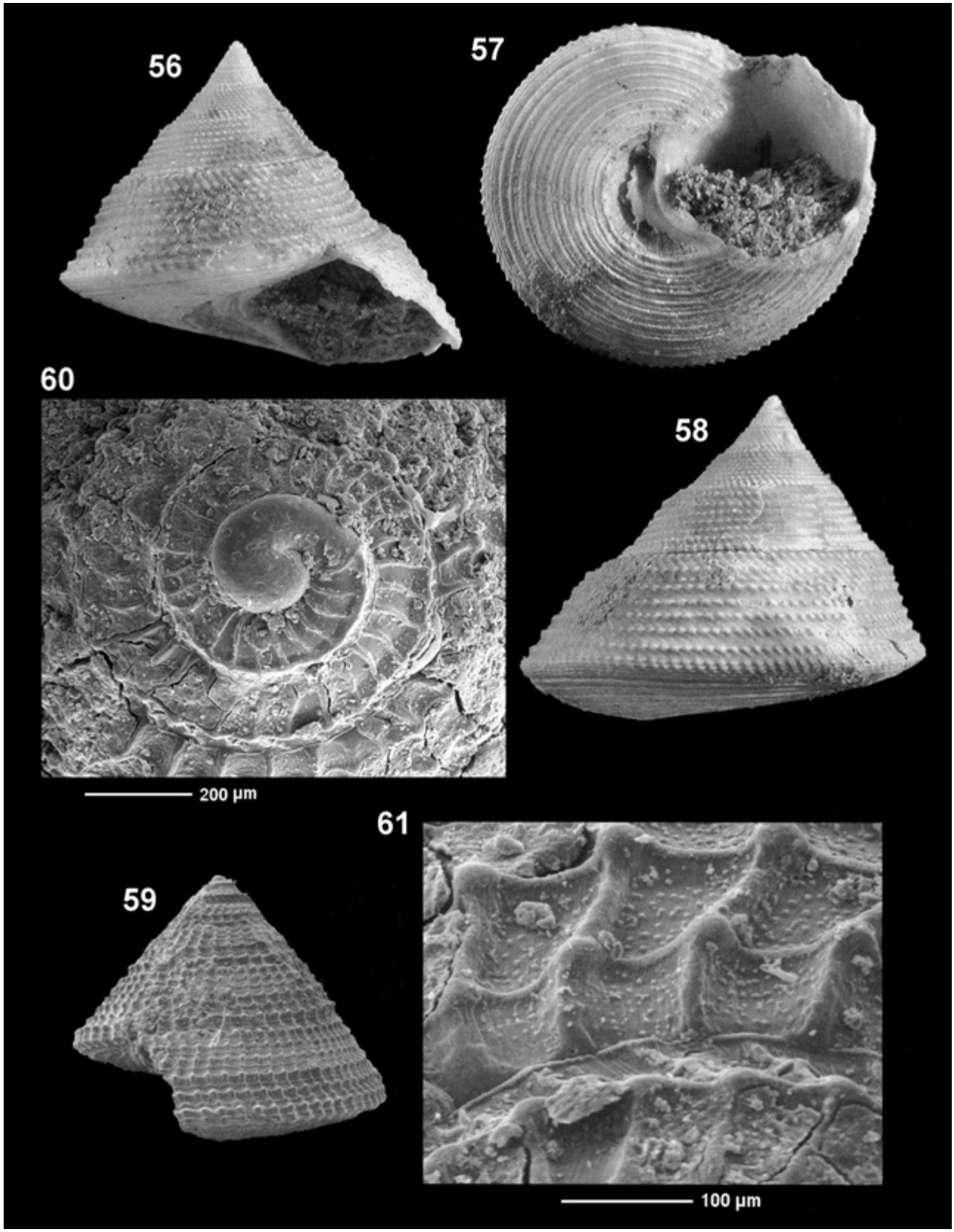


Figures 52-55 Operculum of *Callumbonella.* **52, 53** *C. suturalis* from Melilla. **54, 55** *C. namibiensis* spec. nov. from off Namibia.

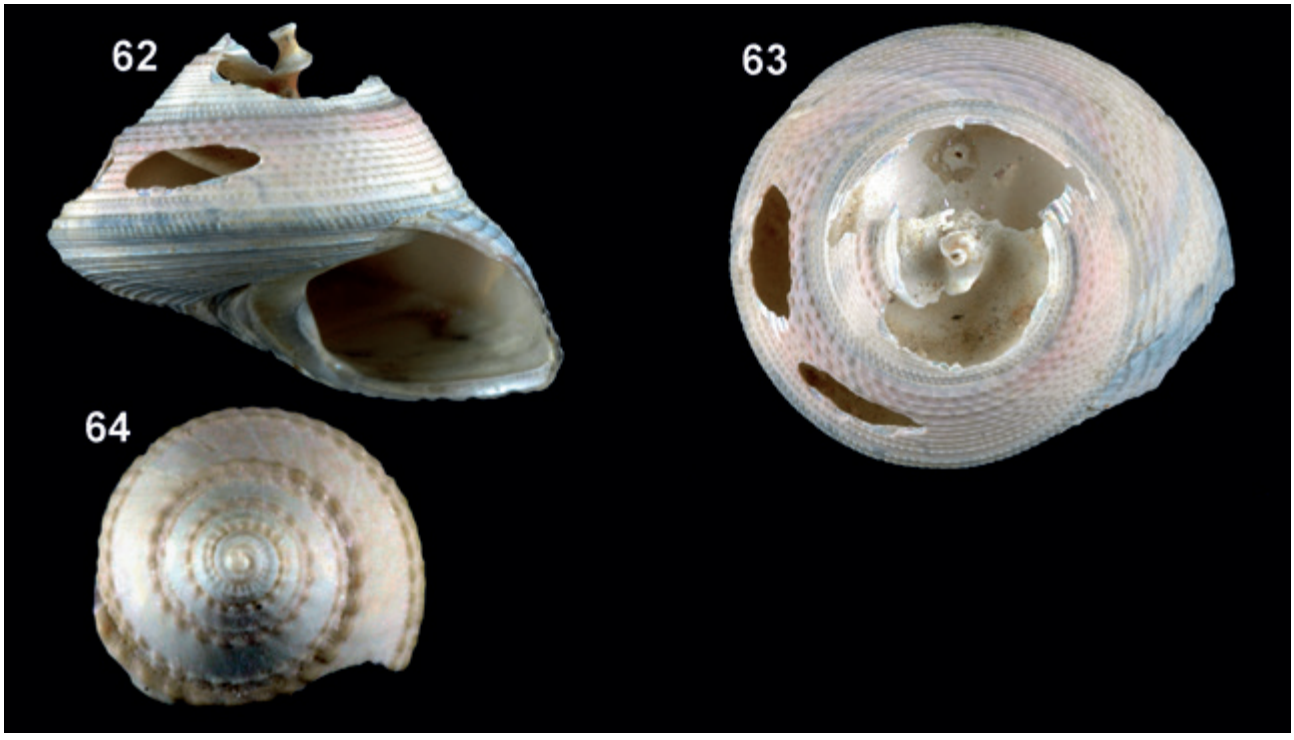
of the shell (Fig. 25, 26) and the radula (Figs. 41-45) are closer to those from Namibian specimens. The shells are less high and the suture slightly depressed in comparison with the northern *C. suturalis*. Having not examined enough material and having no soft parts available, we prefer to keep it as dubious, but morphologically closer to that from Namibia. In this case, the species *C. suturalis* could have a distribution area from the Mediterranean and the Atlantic above 30º N, while *C. namibiensis* would be found in Namibia and probably northwards up to Mauritania.

The differences between *C. suturalis* and *C. namibiensis* are the following:

- *C. suturalis* is smaller, never reaching 20 mm; it is more fragile, lesser eroded, the external colour is pink instead of near violaceous, the lateral profile is straight instead of slightly stepped, the first whorls of the teleoconch are almost smooth, the periphery is angled with several small threads instead of a wide cord. In the soft parts, the cephalic tentacles have a dark violet line, not observable in *C. namibiensis*. The cephalic lappets have the border more denticulated. The operculum is of a lighter shade instead of yellowish, and the spiral whorls are less numerous, the outermost being more separated. Finally, the radula of *C. suturalis* has a rachidian tooth with a border with a central prominence and cusps at both sides, while *C. namibiensis* has an irregular



Figures 56-61 *Calumbonella suturale*. **56-58** shells, 12.6 mm, fossil of the Pliocene of Estepona, South Spain; **59** juvenile, 5.9 mm; **60** protoconch; **61** detail of the sculpture.



Figures 62-64 *Callumbonella folini*. **62, 63** lectotype, diameter 16.0 mm (MNHN); **64** paralectotype (MNHN); both from TRAVAILLEUR 1881, Dr 26 25/07/1881, 900 m, 35°45'N, 01°01'W'', North of Oran, Algery.

border; the lateral teeth are more sharply pointed with smaller cusps; the innermost marginal has prominent cusps at internal border while *C. namibiensis* has very diminute and numerous cusps in this area.

C. gorgonarum can be differentiated because the shell is smaller (not reaching 14 mm, while *C. namibiensis* can reach 21 mm); the shell has constant axial red lines; it is more depressed; the radula in *C. gorgonarum* has more numerous cusps on the border of the rachidian tooth and a large central one; the lateral teeth are more sharply pointed and have small but more numerous cusps.

CONCLUSIONS

The present study shows that three species exist within the genus *Callumbonella*. They are present in Eastern Atlantic, their distribution areas being shown in Fig. 65. Due to the scarcity of the available material we still have some doubts about the identification of some populations found from Moroccan waters southwards to Namibia, which are provisionally classified as *C. namibiensis*.

The genus *Callumbonella* has a difficult placement within the subfamilies of Trochidae. After our study, we think that this genus must not be placed in the subfamilies in which it had traditionally been included. The comparison of the following characters is based on the work of Hickman & McLean (1990):

-The shells of Tegulinae Kuroda, Habe & Oyama, 1971 may be similar but usually have tubercles on the base of the columella; the soft parts have some differences: small cephalic lappets, 4 lateral tentacles, a corneous operculum with a long growing edge, and a rachidian tooth as a turbinid in which the lateral teeth are larger than the innermost marginal. More recently, this subfamily has been considered as a turbinid by Bouchet & Rocroi (2005: 245) on the basis of molecular evidence.

-Umboniinae Adams & Adams, 1854 (in which subfamily it was placed by Brookes-Knight et al. in Moore, 1960: I260) has a different shell, depressed and with a large columellar callus; the animal has 4 pairs of epipodial tentacles and the foot is bifid anteriorly; the radula is highly modified with a simplification or loss in the rachidian and lateral fields.

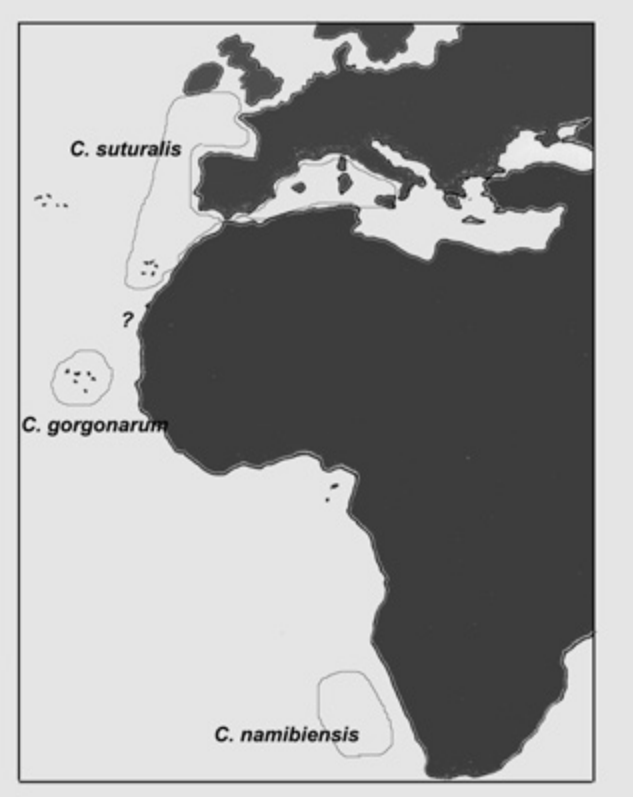


Figure 65 Distribution map of the species of *Callumbonella*

-The shell of *Callumbonella* is similar to those of the genus *Calliostoma* Swaison, 1840, in the subfamily Calliostomatinae Thiele, 1924, which can also have three or four epipodial tentacles in each side. But there are several differences: the cephalic lappets in *Calliostoma* are small or absent; the radula is very different in the rachidian and lateral teeth field, which are very elongate and narrow, with numerous fine cusps.

-In CLEMAM, the genus *Callumbonella* presently appears included in the subfamily Margaritinae Stoliczka, 1868 because of presenting a broad rachidian that overlaps the adjacent marginals. It seems that the overhanging shaft of the rachidian is reduced, but the cusp and the side denticles are still there in rudimentary form. In Callumbonella there is a huge inner marginal, and no "lateromarginal" plate, and 3 lateral tentacles as opposed to more numerous ones in the tribe Margaritini Stoliczka, 1868 and in Gazini Hickman & McLean, 1990. Morphology alone, does not seem to provide enough good characters to resolve the relationships of *Callumbonella*. A molecular phylogenetic framework including representatives of all subfamilies of Trochidae may help resolving this taxonomic tangle.

ACKNOWLEDGEMENTS

The authors wish to express their sincere gratitude to Dr. Eduardo Balgueiras, chief of the Namibe 0502 Expeditions, and to the authorities of the Instituto Español de Oceanografía for the opportunity to study this material. We thank J. M. Hernández and José Templado of MNCN for the loan of material studied from their collections. To Jesús Méndez and Inés Pazos of the Centro de Apoyo Científico y Tecnológico a la Investigación (CACTI) of the University of Vigo for the SEM photographs. To Jesús S. Troncoso for allowing us to use the Photographing set of the Department of Ecology and Animal Biology of the University of Vigo. To António Monteiro who revised the English. To Guido & Philippe Poppe for authorization to employ the images from his page: http://www.conchology.be. To Bernard Landau for allowing the use of the fossil images of *C. suturalis*. To Anders Warén and Jame McLean for their very usefull comments on some questions related with the manuscript.

REFERENCES

BOUCHET P & ROCROI J.-P (eds.). 2005 Classification and Nomenclator of Gastropod Families. *Malacologia* **47** (1-2): 239-283.

BROOKES KNIGHT J, COX LR, KEEN AM, BATTEN RL, YOCHELSON EL. & ROBERTSON R 1960 In Moore R C (ed.) *Treatise on Invertebrate Palaeontology*. Part 1. I260.

CLEMAM www.somali-asso-fr/clemam/index-clemam.html.

DAUTZENBERG P 1927 *Mollusques provenant des campagnes scientifiques du Prince Albert I de Monaco dans l'Ocean Atlantique et dans le Golfe de Gascogne.* Fasc. 72. Monaco. 400 pp, 9 pls.

FISCHER P 1882 Diagnoses d'especes nouvelles de Mollusques récueillis dans le cours de l'Expédition scientifique du Travailleur. *Journal de Conchyliologie* 30: 49-55, 273-277.

FISCHER P 1884 "1883" Diagnoses d'especes nouvelles de Mollusques récueillis dans le cours de l'Expédition scientifique du Talisman (1883). *Journal de Conchyliologie* 31: 391-394.

HICKMAN CS & MCLEAN JH 1990 *Systematic revision and suprageneric classification of Trochacean Gastropods*. Natural History Museum of Los Angeles County, Sciences series nº 35, 169 pp.

JEFFREYS JG 1883 On the Mollusca procured during the "Lightning" and "Porcupine" Expeditions 1868-70. Part 6.: 88-114, pls. 19-20.

JORDAN HK 1895 On some new species of British

Mollusca, from the "Triton" Expedition, with a list of other species new to the Faroe Channel *Proceedings of the Malacological Society of London* 1: 264-269.

LANDAU BM, MARQUET R & GRIGIS M 2008 The early Pliocene Gastropoda (Mollusca) of Estepona, Southern Spain. Part 1 Vestigastropoda. *Palaeontos* **3**: 1-87.

LOCARD A 1898 *Expeditions Scientifiques du "Travailler" et du "Talisman". Mollusques testacés*. Vol. 2. Masson & Cia., Paris. 515 pp, 18 pls.

MALAQUIAS MAE, BORGES JP & BORGES TC 2003 On the occurrence of *Callumbonella suturalis* (Philippi, 1836) (Mollusca: Gastropoda: Prosobranchia) on the south Atlantic coasts of Europe *Journal of Conchology* 38(1): 1-5.

MONTEROSATO TMM di 1884 Nomenclatura generica e specifica di alcune conchiglie mediterranee. Palermo, Stab. Tipografico Virzi, pp. 152.

PHILIPPI RA 1836 *Enumeratio Molluscorum Siciliae cum viventium tum in tellure tertiaria fossilium, quae in itinere suo observavit.* vol 1. Berolini, pp 14 + 267, pls. 1-12.

ROLÁN E 1983 Moluscos de la Ría de Vigo 1. Gasterópodos *Thalassia* 1 suppl. 1: 1-383 pp.

ROLÁN E 2005 *Malacological fauna from the Cape Verde Archipelago*. Conchbooks, Hackenhein. 455 pp.

ROSENBERG G & PETIT RE 2003 Kaicher's *Card Catalogue of World-Wide Shells*: a collation, with discussion of the species named therein *The Nautilus* 117(4): 99-120.

THIELE J 1924 Revision des Systems der Trochacea *Mitteilungen aus dem Zoologischen Museum in Berlin* 11(1): 47-74.

VAUGHT KC 1989 *A Classification of the living Mollusca*. American Malacologist, Melbourne. 189 pp.

WENZ W 1938 *Handbuch der Palaozoologie*. 6. Gastropoda, I. Allgemeiner Teil und Prosobranchia. Gebrüder Borntraeger, Berlin. 948 pp.