



Fifty-one new species of marine bivalves from tropical West Africa

Cincuenta y una especies nuevas de bivalvos marinos del África occidental tropical

Rudo von COSEL

ABSTRACT

Two new genera, fifty-one new species and two new subspecies of marine bivalves from the coast of tropical West Africa are described, and one preoccupied specific name is replaced. The new taxa result from a detailed systematic study of the extensive West African marine bivalve material in MNHN and some other institutions, and from several field trips by the author, in preparation of an exhaustive identification handbook of the tropical West African marine bivalves. Three genera (*Fulvia*, *Cryptomya*, *Paramya*) and one subgenus (*Diberus*) were not previously recorded from the eastern Atlantic, one family (Plicatulidae) and two genera (*Plicatula*, *Ctenoides*) were known as Cretaceous or Tertiary fossils from West Africa (Cameroon, Zaïre, Angola) but not living, and two other genera (*Parvicirce*, *Spheniopsis*) were hitherto represented only by European Tertiary fossils.

RESUMEN

Se describen dos géneros nuevos, cincuenta y una especies nuevas y dos subespecies nuevas de bivalvos de la costa occidental tropical de África y se propone también un nombre nuevo en sustitución de otro preocupado. El reconocimiento de los nuevos táxones es resultado del estudio sistemático del extenso material de bivalvos del oeste africano del MNHN y de otras instituciones, así como de los muestreos del autor, con el fin de elaborar una guía de identificación de los bivalvos de África occidental. Tres géneros (*Fulvia*, *Cryptomya* y *Paramya*) y un subgénero (*Diberus*) son nuevos para el Atlántico oriental; una familia (Plicatulidae) y dos géneros (*Plicatula* y *Ctenoides*) eran conocidos del Cretácico o Terciario del oeste de África (Camerún, Zaire y Angola), pero no actuales, y dos géneros (*Parvicirce* y *Spheniopsis*) eran conocidos sólo como fósiles del Terciario en Europa.

RÉSUMÉ

Deux nouveaux genres, cinquante un espèces nouvelles et deux sous-espèces nouvelles de bivalves marins de la côte d'Afrique occidentale tropicale sont décrites, et un nom nouveau est proposé en remplacement d'un nom préoccupé. Les taxa nouveaux ont été reconnus lors de la préparation d'un manuel d'identification de bivalves d'Afrique occidentale; ils sont fondés sur l'important matériel de bivalves ouest-africains du MNHN et d'autres institutions, et sur les récoltes de terrain de l'auteur. Trois genres (*Fulvia*, *Cryptomya*, *Paramya*) et un sous genre (*Diberus*) sont nouveaux pour l'Atlantique oriental, une famille (Plicatulidae) et deux genres (*Plicatula*, *Ctenoides*) étaient connus dans le Crétacé ou Tertiaire de l'Ouest Africain (Cameroun, Zaïre, Angola) mais non dans l'actuel, et deux autres genres (*Parvicirce*, *Spheniopsis*) étaient seulement connus dans le Tertiaire européen.

KEY WORDS: Bivalves, new species, new genera, tropical west Africa.

PALABRAS CLAVE: Bivalvos, nuevas especies, nuevos géneros, África occidental tropical.

MOTS-CLEFS: Bivalves, nouvelles espèces, nouveaux genres, Afrique occidentale tropicale.

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INTRODUCTION

This is the sixth part of a series of papers on taxonomy of tropical West African bivalves published in preparation of an identification handbook on the marine bivalves of the region. The first five parts appeared in *Bulletin du Muséum national d'Histoire naturelle, Paris*, (COSEL, 1989, 1990; SALAS AND COSEL, 1991; OLIVER AND COSEL, 1993a, 1993b).

When work on the book started in 1987, there were 350 bivalve species known from the West African coast between Rio de Oro (southern part of West Sahara) and Baia dos Tigres (southern Angola). Among the remaining taxa, 86 (that is 19.6% of the 440 species treated in the handbook), were undescribed, others were known from other regions but were new records for tropical West Africa. Subsequent taxonomic revisions of the West African species of the families Arcidae, Noetiidae, Galeommatidae, Condylcardiidae, Pharidae and Psammobiidae, have resulted in the description of 33 of the new taxa (COSEL, 1989, 1990, 1993; SALAS AND ROLÁN, 1990; SALAS AND COSEL, 1991; GOFAS, 1991; OLIVER AND COSEL, 1993a, 1993b).

This paper now provides the descriptions of 52 undescribed taxa revealed during the project; one other species will be described elsewhere. Surprisingly, not all of the 86 new taxa are small species, but some are fairly large, the largest new species, *Pharus chenui* Cosel, 1993, reaches a length of 130 mm. Also it was surprising to find that, within groups which are already represented by many nominal taxa in West African waters (e.g. Ungulinidae, Crassatellidae, Carditidae, Donacidae, Tellinidae), there were more species to be described.

One description (*Yoldiella orstomi*) was taken in part from an unpublished manuscript of the late M. Nicklès, and the name chosen by him was maintained; another chapter (Limopsidae) is in co-authorship with P.G. Oliver, NMW, Cardiff.

Moreover, a well-known species, *Corbula striata* E.A. Smith, 1871, had to receive a replacement name.

It is to note that three genera (*Cryptomya*, *Paramya*, *Periploma*) were not previously known either from the eastern Atlantic (*Paramya*, *Periploma*) or from the whole Atlantic (*Cryptomya*); four other genera were known from the eastern Atlantic only as Cretaceous (*Plicatula*, *Ctenoides*) or Tertiary fossils (*Plicatula*, *Parvicirce* n. g., *Spheniopsis*).

Apart from the introduction of two new genera in order to lodge two of the new species, this paper does not attempt to revise the supraspecific status of taxa, and as such a rather conservative approach has been adopted, especially where there has been no recent taxonomic revision (e. g. in Crassatellidae, Mactridae, Tellinidae and Donacidae). Comprehensive worldwide revisions of these families are needed to document decisions on the generic and subgeneric level.

MATERIALS AND METHODS

This study is mainly based on the extensive West African mollusc material in MNHN collected by the following expeditions or persons: Mission Gruvel (1909, 1911, whole coast), the cruises of the R/V "Calypso" (Gulf of Guinea, São Tomé, Príncipe, 1956, Cape Verde Islands, 1959), material collected by M. Nicklès (mostly Senegal and Guinea), I. Marche-Marchad (Senegal, Côte d'Ivoire, 1953-65), A. Crosnier and J. Marteau (Congo, Gulf of Guinea, 1962-69), P. Le Lœuff (Côte d'Ivoire, 1965-1972), B. Richer de Forges (Mauritania, 1981-1983), S. Gofas (Angola, 1981-1987), P. Bernard and C. Chevalier (Gabon, 1982-1989), M. Pin (Senegal, ca. 1980-1990) and myself (Senegal, Guinea-Bissau, Guinea, Cameroon, Gabon, Congo, Cape Verde Islands, 1969, 1978-1979, 1985, 1988). Much of the Guinea material originates from the two SEDIGUI cruises (May and October-November, 1988), carried out on board the ORSTOM research vessel "André Nizery" for a sedimentological survey of the continental shelf off the Guinean coast by F. Domain (sedimentology) and myself (benthos).

Other studied material is in IRSNB (Dautzenberg collection), ZMC (Mate-

rial of the "Atlantide" and "Galathea" cruises and littoral material, mostly from Gambia), ANSP (Congo, Zaïre (mouth of Congo River)) and MNCN (First Iberian Expedition to Cape Verde Islands). The material collected during the cruise M6-6 (1988) of the german R/V "Meteor" off Zaïre and northern Angola (now at Paleontological Institute of Würzburg University, Germany) was also studied.

A diagram of the shell inside, with explanations of characters and parameters used in the descriptions is given in Fig. 187.

An index containing all the mentioned taxa is given in pages 113-115.

Figures given in Measurements heading refer to milimetres.

Abbreviations used in the text:

ANSP: Academy of Natural Sciences of Philadelphia, Philadelphia.

ass. spm.: associated specimen (spm. from the type locality collected at the same time as the types but not included in the type lot).

BMNH: British Museum (Natural History) (now: The Natural History Museum), London.

colln.: collection.

ded.: *dedit*, given by.

ht: holotype.

IFAN: Institut Fondamental d'Afrique Noire, Dakar.

IRSNB: Institut royal des Sciences Naturelles de Belgique, Brussels.

leg.: legit, collected by.

MNCN: Museo Nacional de Ciencias Naturales, Madrid.

MNHN: Muséum national d'Histoire naturelle, Paris.

NMW(Z): National Museum of Wales (Zoology), Cardiff.

pt: paratype.

ORSTOM: Institut Français de Recherche Scientifique pour le Développement en Coopération.

RMNH: Rijksmuseum van natuurlijke Historie (now: Nationaal natuurhistorisch Museum), Leiden.

R/V: research vessel or trawler converted for research purpose (vessels mentioned without this prefix are marine ships or commercial fishing boats).

sh.: shell, shells.

SMNH: Naturhistoriska Riksmuseet (Swedish Museum of Natural History), Stockholm.

SMF: Natur-Museum und Forschungsinstitut Senckenberg, Frankfurt, M.

spm.: Specimen, specimens (live-collected).

sta.: sampling station of a research vessel.

v.: valve, valves.

ZMC: Universitets Zoologisk Museum, Copenhagen.

SYSTEMATICS

Family NUCULIDAE

Genus *Nucula* Lamarck, 1799

Nucula nicklesi n. sp. (Figs. 1-5)

Type material: Holotype MNHN, 1 complete spm., off Vridi, Côte d'Ivoire, 35 m, dredged R/V "Reine Pokou", leg. P. Le Lœuff, 22. XI. 1966. Paratypes: 8 live-collected specimens, same locality (1 coated for scanning): 3 MNHN, 1 SMNH, 1 IRSNB, 1 ZMC, 1 SMF, 1 Natal Museum.

Type locality: Vridi, Côte d'Ivoire.

Description: Shell very small, 2-3.6 mm long, oval, more or less thick and solid, rather inflated. Anterior margin rounded and gradually passing into the evenly convex antero-dorsal margin and the well rounded ventral margin. Posterior margin short-truncated and usually slightly sinuous, postero-dorsal margin very short and well rounded, postero-

ventral corner rounded and not well marked. Lunule not seen, escutcheon broad and ill-defined. Beaks within the posterior fourth of the valves.

Surface glossy, with slightly irregular, concentric ridges which are most pronounced on the marginal part of the valves and generally obsolete on the umbonal part. There are also fine

growth lines and a few coarse and well-defined growth stages, occasionally also extremely fine radial striae are visible. Posterior angle (that is the keel or ridge running from the beak to the postero-ventral corner and delimiting the posterior slope) rounded and hardly visible. Periostracum thin, very pale yellowish green.

Hinge plate with 11-14 anterior and 4-5 posterior teeth, both narrow, rather thick and slightly chevron-shaped; resilifer quite large. Ventral margin with extremely fine crenulations.

Valves translucent whitish, interior nacreous.

Measurements:

3.6 x 3.0	Dakar, 7 m
3.5 x 2.8 x 1.8	pt MNHN
3.1 x 2.5	ht
3.0 x 2.4	pt SMNH
2.8 x 2.3	pt MNHN
2.8 x 2.2	pt SMF
2.8 x 2.2	pt Natal Mus.
2.7 x 2.1	pt ZMC
2.6 x 2.1	pt IRSNB
2.4 x 2.0	pt MNHN

Distribution: Senegal (Dakar) to northern Angola (Luanda).

Material examined: The type material; Senegal: N of Cap Vert, 14° 53' N, 17° 33' W, 205-230 m, 1 v., 18. III. 1958; 14° 51.5' N, 17° 30' W, 180-165 m, 1 sh., 2 v., 18. II. 1958; SE of Madeleines, 48 m, 5 v., 15. IX. 1953; Baie de Gorée, 170-200 m, 2 v., 24. I. 1954; off Gorée, 16-25 m, 1 v., 9. III. 1954; 58 m, 2 v., 5. VII. 1955; 14° 19' N, 17° 23' W, 78 m, 2 v., 3. VI. 1955; SE of Gorée, 33-34 m, 12 v., 27. XI. 1953; S of Baie de Gorée, 32-34 m, 6 v., 13. XI. 1953; 38-42 m, 1 v., 27. X. 1953; 65 m, 1 v., 18. II. 1954; 110-112 m, 1 v., 18. II. 1954; 145-170 m, 1 sh., 5 v., 7. VI. 1955, all dredged R/V "Gérard Tréca", leg. Marche-Marchad; SE. of Gorée, 14° 41' N, 17° 16' W, 14 m, gravel and shell grit 2 spm., 5. I. 1982; 14° 41' N, 17° 21' W, 17 m, fine grey sand, 1 spm., 17. III. 1982; 13° 59' N, 17° 21' W, 70 m, fine grey sand, 1 sh., 17. III. 1982, all dredged R/V "Laurent Amaro", leg. Leung Tack; SE

of Gorée, 14° 41' N, 17° 23.2' W, 17 m, fine muddy sand, 2 v., 24. III. 1988; N-Casamance, 12° 44.5' N, 17° 27.3' W, 40 m, fine sand, 1 v., 28. III. 1988, both dredged R/V "Louis Sauger", leg. von Cosel, all MNHN. Guinea-Bissau: Bissagos, 3 v.; no precise locality, 7 sh., 6 v., both Mission L. Gain, 1913, MNHN. Guinea: W of Sierra Leone border, 9° 06' N, 13° 32' W, 16 m, 5 v. SEDIGUI sta. 72; 9° 05.9' N, 13° 35' W, 23 m, 5 v., SEDIGUI sta. 71; 9° 05.7' N, 13° 38' W, 24 m, 1 v., SEDIGUI sta. 70; W Tannah Is., 9° 12' N, 13° 34.5' W, 15 m, 1 sh., 6 v., SEDIGUI sta. 79, all in bottom grab samples, R/V "André Nizery", leg. von Cosel, 14. V. 1988, all MNHN. Côte d'Ivoire: off Jacqueville, 30 m, 3 spm., 25. XI. 1966; off Gonzagueville, 30 m, 1 spm., 1 sh., 20 III. 1966; Abidjan region (no precision), numerous sh. and v., all dredged R/V "Reine Pokou", leg. Le Lœuff, all MNHN. Equatorial Guinea: 1° 40' N, 9° 25' E, 150 m, boxcorer, 1 v.; Isla Bonga, Bahia de Corisco, 1 v., colln. IFAN, 17. VI. 1955, both MNHN. Congo: Pointe-Noire, Plage Mondaine, near lighthouse, on beach, 1 v., leg. von Cosel, XII. 1985, MNHN. Angola: Ambrizete, Zaire province, 45 m, 9 v., 1981; Ambrizete, on beach, 7° 17.49' S, 12° 53.05' E, 5 v., II. 1982; Barra do Dande, Bengo province, 0-2 m, 3 v.; Cabo Ledo, Bengo province, 40 m, 1 v., all leg. Gofas, 1981-86, all MNHN.

Biotope: In muddy sand and fine sand, from 1 m to about 80 m depth.

Derivatio nominis: The species is named in honour of Maurice Nicklès, the pioneer of modern West African malacology, who had worked on a revision of West African Nuculidae and Nuculanidae but could not finish the manuscript before his death.

Remarks: This rather common species has been overlooked in the past because it has most probably been mistaken for young *N. nitidosa* Winckworth, 1930, a temperate European species which goes southward to Senegal and also occurs in Angola. From this species,

N. nicklesi is easily distinguished by its much smaller size, a more inflated shell, the narrower hinge plate and the more

curved postero-dorsal margin. The marked growth stages typical for *N. nicklesi* are not present in *N. nitidosa*.

Family NUCULANIDAE
Genus *Yoldiella* Verrill and Bush, 1897
Yoldiella orstomi n. sp. (Figs. 6-9)

Type material: Holotype MNHN, off Grand Bassam, Côte d'Ivoire, 200 m, a fresh sh., dredged R/V "Reine Pokou", leg. Le Lœuff, 30. IX. 1966. Paratypes: Mauritania, 21° 15' N, 17° 38' W, 400 m, R/V "Meteor" sta. 60-56, 1 spm., 8. II. 1982, SMNH; 21° 15' N, 17° 48' W, 795 m, R/V "Meteor" sta. 60-52, 1 spm., 7. II. 1982, MNHN, both taken by box-corer, R/V "Meteor", cruise Subtropex '82, leg. Richer de Forges.

Type locality: Grand Bassam, Côte d'Ivoire.

Description: Shell 3.5-5.1 mm long, oval-rostrate, quite solid, inflated. Anterior margin rather narrowly rounded, posterior part rostrate, posterior margin pointed with the tip very narrowly rounded. Antero-dorsal and postero-dorsal margin straight, ventral margin strongly and evenly rounded. Beaks just in front of the vertical midline. Lunule narrow and ill-defined, escutcheon narrow and delimited by a rather faint ridge.

Surface smooth with fine irregular growth lines and a few slightly coarser growth stages. Posterior angle rather sharp but not keeled. Periostracum thin, glossy and nearly colourless, on the umbos eroded.

Hinge plate with 10-11 anterior and 13 posterior teeth, all close-set, rather strong and more or less chevron-shaped. Resilifer small, high-triangular and deeply sunken.

Valves entirely white.

Measurements:

5.1 x 3.2	pt SMNH
4.9 x 3.4	pt MNHN
4.0 x 2.7	ht

Distribution: Yet known only from Mauritania and Côte d'Ivoire

Material examined: The type material only.

Biotope: Most probably in muddy bottom, in about 200-800 m.

Derivatio nominis: The species is named after the French research organization ORSTOM.

Remarks: This species can be distinguished from *Y. philippiana* (Nyst, 1845) (Europe to Senegal) by its much more pointed posterior end, a well developed posterior angle and the visible escutcheon. The ventral margin is more evenly convex.

Family LIMOPSIDAE (by P. G. OLIVER and R. von COSEL)
Genus *Limopsis* Sassi, 1827

In the Atlantic Ocean, the Limopsidae are primarily a deep water group inhabiting regions at and beyond the continental margin zone. In tropical West Africa three species are recorded by OLIVER AND ALLEN (1980). Two are abyssal: *Limopsis tenella* Jeffreys, 1876 (West African records: Senegal - Angola; 2840-4595 m) and *L. ga-*

lathea Knudsen, 1970 (West African records: Senegal - Angola; 3730-4595 m); and the third is bathyal, *L. cristata lanceolata* Oliver and Allen, 1980 (Angola; 974-1559 m). The material considered here is from much shallower depths, mostly between 80-250 m, and the only determinations are those on museum labels which

identify some lots as *L. minuta* Philippi. This species is a Pliocene fossil but the name has been used for a continental margin zone-upper bathyal zone species which is widely distributed in the boreal and temperate regions of the north east

Atlantic. Therefore we must consider whether the West African forms represent southerly range extensions of temperate species or whether the bathyal forms have a wider depth range than indicated by OLIVER AND ALLEN (1980).

Limopsis pyrenoides Oliver and Cosel, n. sp. (Figs. 10-12)

Type material: Holotype MNHN, Senegal, Baie de Gorée, 170-200 m, 1 spm., dredged RV "Gérard Tréca", 24-1-1954. Paratypes: off Cap Vert Peninsula, 200-170 m, 7 spm., 6 v. MNHN, 1 spm., 1 v. SMF, 1 spm., 1 v. IRSNB, 1 spm., 1 v. NMWZ, 1 spm. 1 v. ZMC, dredged R/V "Gérard Tréca", 10. I. 1956; off Gorée, Dakar, 112-145 m, 1 sh., 8 v., all MNHN, dredged R/V "Gérard Tréca", 7. VI. 1955, all *leg.* Marche-Marchad.

Type locality: Baie de Gorée, Dakar, Senegal.

Description: Shell small, 2 to 5.5 mm in height, slightly compressed, equi-valve, slightly inequilateral. Outline ovate, somewhat oblique, higher than long or as high as long. Posterior margin slightly curved to almost straight, weakly disjunct at posterior ventral margin; ventral margin rounded curving continuously into rounded anterior margin. Dorsal margin very short. Dorsal area cleft, narrow, beaks not widely separated.

Sculpture in well preserved specimens of widely spaced but narrow concentric ridges, these finely interrupted by the insertion marks of the periostracal bristles. This detail is rapidly eroded in larger specimens and on dead valves. Periostracum with a primarily concentric arrangement of short, semi-erect, pointed bristles.

Ligament a simple elastic alivincular triangle (Type II, OLIVER, 1983). Hinge prominent; anterior teeth stronger than posterior; anterior set of up to 6 vertical teeth; posterior set of up to 5 more oblique teeth; edentulous gap narrow.

Inner margin finely crenulate, crenulations weaker on the posterior margin and absent at the posterior ventral junction. Adductor muscle scars unequal, the anterior 1, 3 the size of the posterior.

Shell white, periostracum a rust brown.

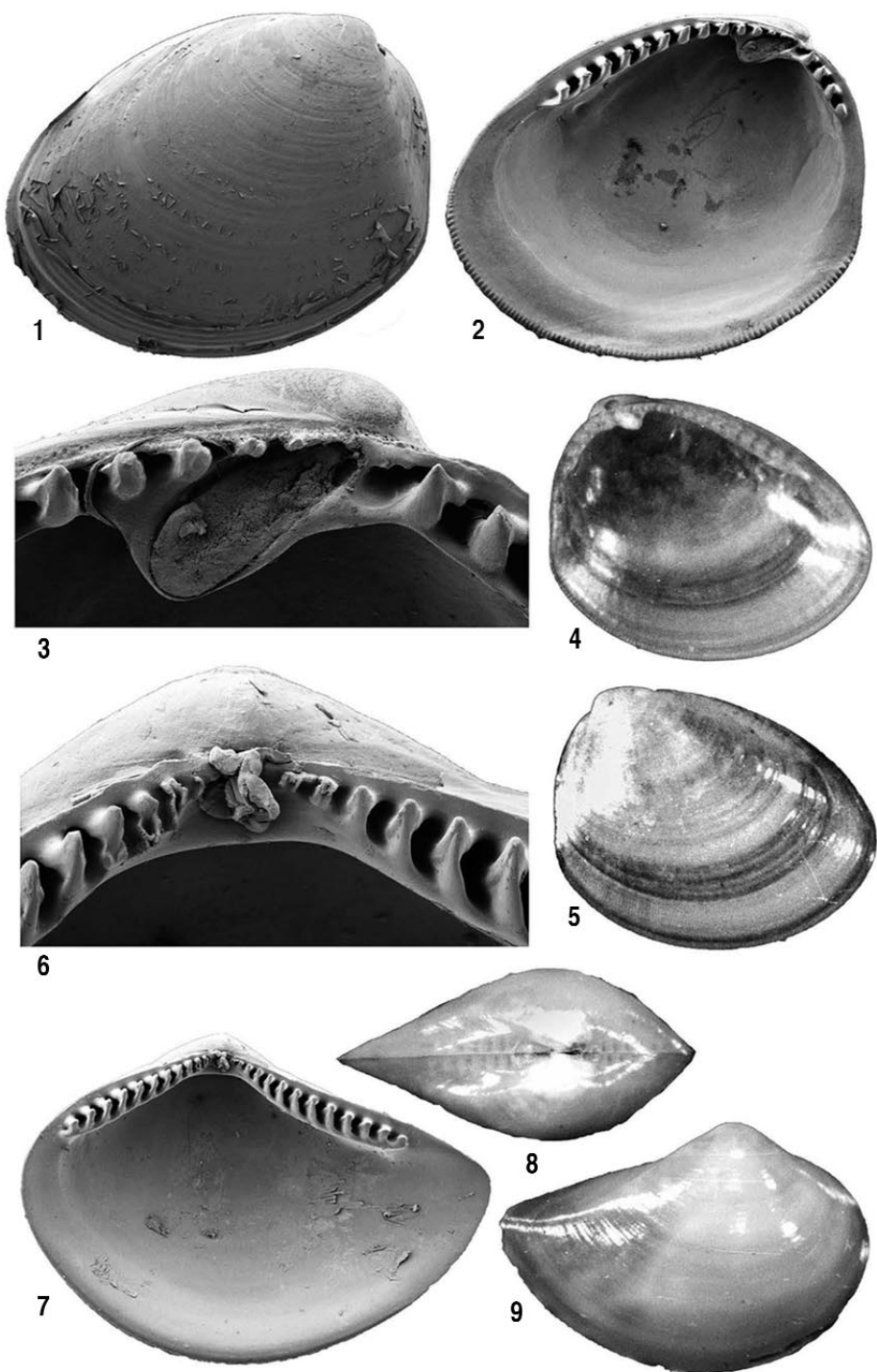
Measurements:

5.2 x 5.5	pt MNHN
4.2 x 4.5	pt MNHN
4.0 x 4.2	pt MNHN
3.8 x 3.9	pt MNHN
3.1 x 3.3	pt SMF
3.1 x 3.2 x 2.0	ht
3.0 x 3.1	pt ZMC
2.8 x 3.0	pt NMWZ
2.7 x 2.1	pt IRSNB
2.6 x 2.5	pt NMWZ
2.4 x 2.4	pt ZMC
2.1 x 2.1	pt IRSNB

Material examined: The type material. Senegal: Off Dakar, 14° 51.5' N, 17° 30' W, 180-165 m, many v., 18. II. 1958; 14° 53.5' N, 17° 30.5' W, 230-205 m, many v., 18. III. 1958; Baie de Gorée, 80-250 m, many

(Right page) Figures 1-5. *Nucula nicklesi* n. sp., Vridi, Côte d'Ivoire, 1-3: paratype, right valve; 4-5: holotype, 3.1 x 2.5 mm. Figures 6-9. *Yoldiella orstomi* n. sp., 6-7: holotype, Grand Bassam, Côte d'Ivoire, 200 m, interior of the right valve; 8-9: paratype 2, 5.1 x 3.2 mm, Mauritania, 21° 15' N, 17° 48' W, 795 m, dredged R/V "Meteor".

(Página derecha) Figuras 1-5. *Nucula nicklesi spec. nov.*, Vridi, Costa de Marfil, 1-3: paratipo, valva derecha; 4-5: holotipo, 3,1 x 2,5 mm. Figuras 6-9. *Yoldiella orstomi spec. nov.*, 6-7: holotipo, Grand Bassam, Costa de Marfil, 200 m, interior de la valva derecha; 8-9: paratipo 2, 5,1 x 3,2 mm, Mauritania, 21° 15' N, 17° 48' W, 795 m, dragado R/V "Meteor".



v., 20. II. 1956; off Cap Vert, 200-170 m, many v.; off Gorée, 112-145m, 9 v.; 230° off Cap Manuel, in stomach of holothurian, 120-215m, 4 spm., 17 v., 23. III. 1954, all dredged R/V "Gérard Tréca", leg. Marche-Marchad, all MNHN. Guinea: Off Conakry, 9° 29' N, 16° 03' W, 132 m, 15 v., in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 220, MNHN.

Distribution: Known only from off Senegal (Dakar region) and Guinea.

Biotope: Unknown but from data presented by OLIVER AND ALLEN (1980) one would expect a species of this shape to inhabit fine sand to muddy sand. It has been taken in depths between 80 to 230 m.

Derivatio nominis: *pyrenoides* - resembling a small hard seed, from "pyrenos" (Greek) = a pip or hard seed and "oides" suffix from Greek "eides" - to resemble.

Remarks: The form of the periostracum, crenulated inner margin and ligament type relate this species to the *L. cristata* agg. Jeffreys, 1876. *L. cristata* from off southern Angola differs in being less tumid, in having the periostracum in a primarily radial arrangement and in the bristles being much longer. The narrow con-

centric ridges are not apparent in any of the subspecies of *L. cristata* described by Oliver and Allen. *L. cristata* agg. is a bathyal species and would not be expected from the continental margin zone of tropical West Africa.

There appears to be a second species present in West Africa, *Limopsis* cf. *minuta* (Philippi, 1836) (Not *Limopsis minuta* (Philippi) in OLIVER AND ALLEN, 1980: 96-99). Several old and poorly preserved valves have been dredged in Baie de Gorée (80-250m), Dakar region. Despite the poor preservation of these valves it is possible to recognize that they belong to a complex with other tropical species such as *L. antillensis* Dall, 1881 (Caribbean) and *L. natalis* Barnard, 1964 (Indian Ocean). The subquadrate outline is distinctive as are the few marginal crenulations and fine decussate sculpture. In these respects all of these species resemble the pliocene *L. minuta* (Philippi, 1836) and because of the poor preservation of the West African material we are unwilling to consider separate nomenclatural status at this time, and it will not be included in the forthcoming identification guide. Oliver and Allen did not adequately consider the pliocene material but followed JEFFREYS (1876, 1883) in adopting nomenclature from the pliocene faunas of Italy.

Family MYTILIDAE
Genus *Lithophaga* Röding, 1798
Subgenus *Diberus* Dall, 1898

Lithophaga (Diberus) carmenae n. sp. (Figs. 13-15)

Type material: Holotype MNHN, off Port-Gentil, 0° 55' S, 8° 40.8' E, "Anguille" oilfield, in incrustation on the piles of an oil rig platform, 8-20 m, a dried spm., leg. Chevalier, 1980-89. Paratypes: same locality, 3 sh. MNHN, 1 sh. ZMC, 1 sh. SMF, 1 sh. Natal Museum.

Type locality: Port-Gentil, Gabon.

Description: Shell 20-42 mm long, elongate-dateshaped, with broadly rounded anterior margin and more or less narrowly rounded posterior margin, thin, very inflated. Ventral margin slightly and evenly convex, antero-dorsal (ligamental) margin straight, postero-dorsal margin somewhat convex,

between them a marked bend. Umbos subterminal.

Surface smooth, with growth lines only. Ligament rather long, extending slightly beyond the vertical midline. No hinge teeth. Periostracum strong, brown to dark brown, with strong, light grey calcareous incrustation which, when not ero-

ded, covers the whole shell. A narrow, sharp, more or less marked incision runs from the beaks to the postero-ventral extremity and cuts the incrustation into an antero-ventral part and a postero-dorsal part. Antero-ventral part with a rough, file-like surface. Postero-dorsal part of the valve with a thicker calcareous layer which slightly projects beyond the posterior margin and which, beginning on the posterior third or still more posterior, has typical, strong, irregular, divaricate wrinkles arranged like a plume.

Valves brownish, interior nacreous.

Measurements (including posterior incrustation):

42.5 x 14.6 x 12.7	pt MNHN
37.5 x 14.1 x 13.0	pt Natal Museum
36.3 x 11.7 x 10.0	ht
33.4 x 13.2 x 11.3	pt ZMC
28.8 x 11.3 x 10.0	pt MNHN
25.6 x 9.0 x 7.6	pt SMF
19.6 x 7.5 x 7.2	pt MNHN

Distribution: Senegal (Petite Côte) to southern Angola (Santa Maria, Benguela); Annobon, São Tomé and probably also Ilha do Principe.

Material examined: The type material. Senegal: Off M' Bour, Petite Côte, 25 m, 1 spm., dredged R/V "Gérard Tréca", leg. Delais, 19. V. 1949, MNHN. Guinea: off Sierra Leone border, 9° 03' N, 14° 11' W, 38 m, numerous spm., trawled R/V "André Nizery", SEDIGUI sta. 18 CH, leg. von Cosel, 12. V. 1988, MNHN. Côte d'Ivoire: Abidjan region, 4° 16.5' N, 7° 30' W, 40 m, 1 spm., dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 8. IV. 1964, MNHN. Ghana: Cape Coast, 26-31 m, 1 spm., leg. Le Lœuff, 10. II. 1968, MNHN. Bénin: (no precise locality) in coral, 55 m, 3 spm., X. 1953, leg. Crosnier, MNHN. Nigeria: off Niger delta,

4° 00' N, 6° 11' E, 34 m, in a *Chama*, 1 spm., dredged R/V "Calypso", sta. 28, leg. Marche-Marchad, 26. V. 1956, MNHN. Angola: Ilha de Luanda, Luanda province, 40-60 m, numerous spm., 90 m, 11 spm.; Baia de Corimba, Luanda province, 10-20 m, 1 juv. spm.; Cabo Ledo, Bengo province, 10-40 m, 5 spm., 1 v.; Baia de Santa Maria, Benguela province, 10 m, 6 spm., fragm., 30-40 m, 1 spm., all leg. Gofas, 1981-85, all MNHN. São Tomé: Punta Diogo Vaz, 0.6 m, 1 spm., R/V "Calypso" sta. 68, leg. Marche-Marchad, 1956, MNHN. Annobon: 1° 27' S, 5° 35' 48" E, 50-60 m, 1 spm., leg. Crosnier, 11. XII. 1965; 1° 28.5' S, 5° 37.5' E, 35-55 m, 3 spm., leg. Poincard, 16. VI. 1967, both MNHN.

Biotope: Boring in limestone, coral and shells, usually offshore from about 25 to 90 m. In southern Angola also found shallower, from 10 m downward.

Derivatio nominis: The species is named after my colleague Carmen Salas with whom I had many fruitful discussion on bivalves.

Remarks: This locally rather common species is very close to *L. (D.) mucronata* (Philippi, 1846) from East Africa to Indonesia and *L. (D.) plumula* (Hanley, 1844) from tropical West America, but the length of the "plumulate" sculpture on the West African species is shorter than on the Panamic species. The Caribbean *L. (D.) bisulcata* (d'Orbigny, 1842) completely lacks the plumulate sculpture, the oblique incision is broader. Other closely related Indo-Pacific species are *L. (D.) divaricalx* Iredale, 1939 and *L. (D.) pessulatus* (Reeve, 1857) (WILSON, 1979); this latter species, as well as *L. (D.) mucronata* are synonymized with *L. (D.) plumula* by KLEEMANN (1983). *L. carmenae* is the first record of the subgenus *Diberus* in the eastern Atlantic.

Genus *Modiolus* Lamarck, 1799

Modiolus verdensis n. sp. (Figs. 16-18)

Type material: Holotype MNHN, Boavista, Cape Verde Islands, between Sal Rei and Punta do Rife, on rocks, 2 m, divers, 1 dried spm., R/V "Calypso" sta. 69, leg. Marche-Marchad, 25. XI.

1959. Paratypes: same locality, 4 dried spm., 3 MNHN, 1 SMF; Boavista, Punta Manuel Lopez, 6-8 m, divers, 1 spm., "Calypso" sta. 69; São Tiago, 15° 16.6' N, 23° 47.7' W, 55-60 m, 3 spm., "Calypso" sta. 24, 18. XI. 1959, 1 MNHN, 1 ZMC, 1 IRSNB.

Type locality: Sal Rei, Boavista, Cape Verde Islands.

Description: Shell 10-15 mm long, variable in outline, broadly modioliform, with narrowly rounded anterior margin, solid, quite inflated. Ventral margin slightly concave to nearly straight, antero-dorsal (ligamental) margin straight. Postero-dorsal and posterior margin more or less evenly convex, with a rounded corner to the ventral margin. Bend between antero- and postero-dorsal margin rounded to rather sharp. Umbos broad, rather prominent, terminal.

Surface with quite coarse, irregular growth lines and growth stages and irregular folds along the ventral margin. Periostracum rather thin, yellow to brownish. Bristles moderately long to very long, thin and hair-shaped, not serrated, with more or less broad base, mostly rather scattered, occasionally denser near the posterior margin. Ligament rather broad and short, extending on about two thirds of the antero-dorsal margin.

Exterior pale to bright yellow, orange, red to purple or violet, near the ventral margin often whitish. Interior nacreous white, dorsally often purplish to violet.

Measurements:

15.7 x 9.8 x 8.5	pt MNHN, São Tiago, "Calypso" 24
14.3 x 8.3 x 9.3	pt SMF, Boavista, "Calypso" 69
11.7 x 7.1 x 7.4	pt ZMC, São Tiago, "Calypso" 24
10.7 x 5.6 x 6.2	pt IRSNB, São Tiago, "Calypso" 24

15.1 x 10.1 x 9.0	ht
8.1 x 5.3 x 4.7	pt MNHN, Boavista, "Calypso" 69

Distribution: Cape Verde Islands, endemic.

Material examined: The type material. Santo Antão: (no precision), numerous v.; São Vicente: (no precision), 2 v.; Ilha do Sal: (no precision), 6 v., fragm., all *leg.* Cadenat, 1950, all MNHN. São Tiago: Baía de Tarrafal, 0-8 m, hardbottom, 5 spm., R/V "Calypso", Cape Verde Islands cruise 1959, sta. 25. Brava: Punta de Ancião, low water, on rocks, 2 spm., R/V "Calypso" sta. 42; Ponta Tantão, 40 m, 1 spm., R/V "Calypso" sta. 51, all *leg.* Marche-Marchad, XI. 1959, all MNHN.

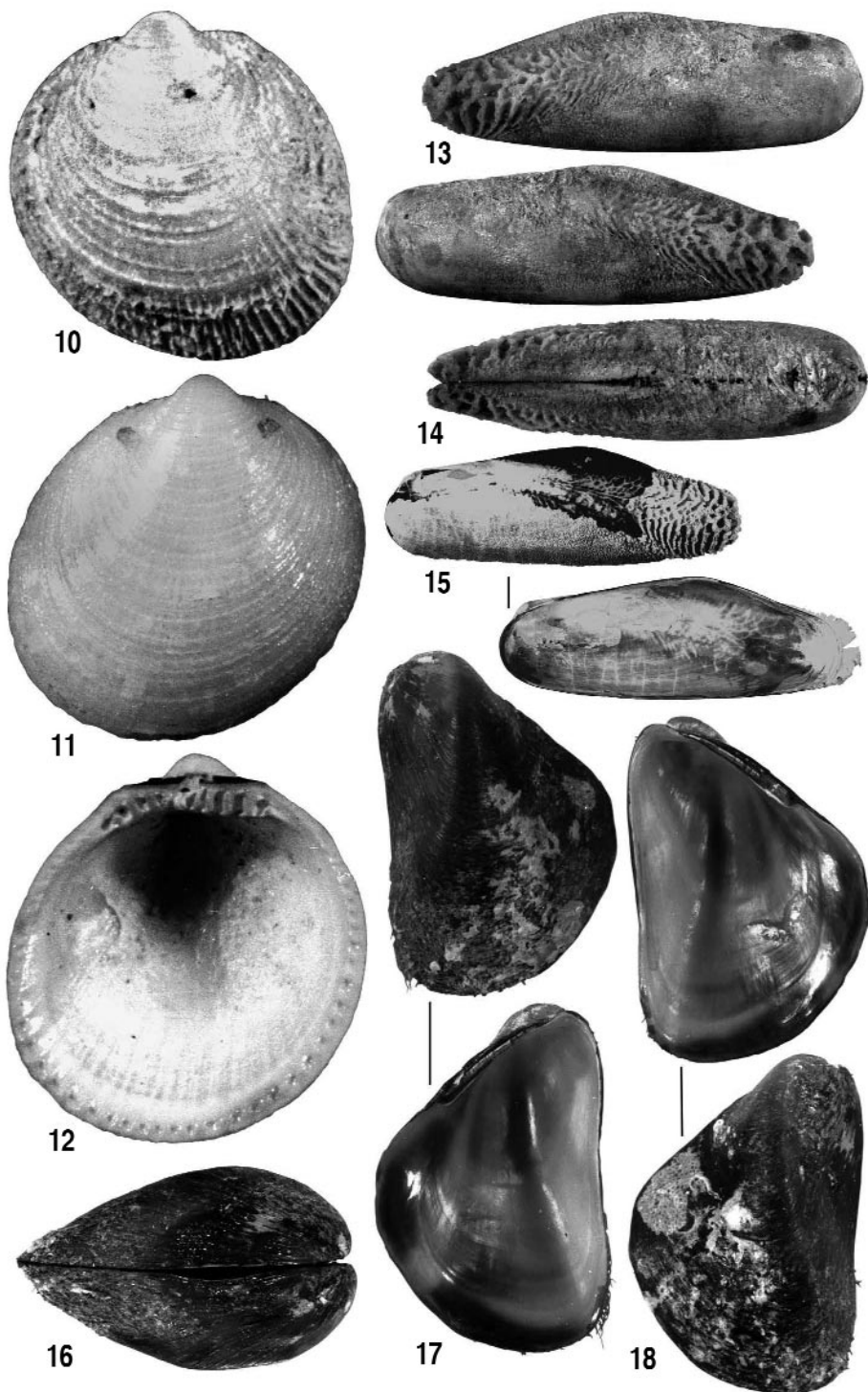
Biotope: On rocky shores on stones and rocks, also attached to hard objects on soft bottom such as sand with shell debris and calcareous algae, from low water mark to about 10-15 m, occasionally deeper, to 60 m.

Derivatio nominis: The species is named after the Cape Verde Republic.

Remarks: This species belongs to a group of small and superficially very look-alike modiolids of tropical West Africa which up to recently were unknown or mistaken for *M. lulat* Dautzenberg, 1891. Finally, OCKELMANN (1983) revealed three species from the continental coast: *Modiolus thorsoni* Oc-

(Right page) Figures 10-12. *Limopsis pyrenoides* n. sp., 10: holotype, 3.1 x 3.2 mm; 11: paratype, 5.2 x 5.5 mm, 14° 56.5' N, 17° 35' W; 12: paratype, 4.2 x 4.5 mm, same locality. Figures 13-15. *Lithophaga carmenae* n. sp., 13-14: holotype, 36.3 mm; 15: paratype, 42.5 mm. Figures 16-18. *Modiolus verdensis* n. sp. holotype, 15.1 mm, Boavista, Cape Verde Islands.

(Página derecha) Figuras 10-12. *Limopsis pyrenoides* spec. nov., 10: holotipo, 3,1 x 3,2 mm; 11: paratipo, 5,2 x 5,5 mm, 14° 56,5' N, 17° 35' W; 12: paratipo, 4,2 x 4,5 mm, misma localidad. Figuras 13-15. *Lithophaga carmenae* spec. nov., 13-14: holotipo, 36,3 mm; 15: paratipo, 42,5 mm. Figuras 16-18. *Modiolus verdensis* spec. nov. holotipo, 15,1 mm, Boavista, Archipiélago de Cabo Verde.



kelmann, 1983, *M. nicklesi* Ockelmann, 1983 and *M. pseudobarbatus* Ockelmann, 1983. Our new species is most close to the latter, it can be separated principally by the presence of very thin and nonseparated bristles, whereas in *M. pseudobarbatus* they are unilaterally serrated. The valves of *M. verdensis* are also broader and slightly less tumid, the posterior margin is not separated from the pos-

tero-dorsal margin. The anterior margin shows a lobelike flare under the umbos which is not observed in *pseudobarbatus*. *M. thorsoni* grows larger and has rather broad and leaf-like byssal bristles on the dorsal part of the shell. *M. nicklesi* is thinner, less tumid and has thin, serrated bristles. Records of other *Modiolus* species in previous Cape Verde Islands faunal lists may partly refer to *M. verdensis*.

Family PLICATULIDAE
Genus *Plicatula* Lamarck, 1801

Plicatula angolensis n. sp. (Figs. 19-22)

Type material: Holotype MNHN, Barra do Dande, N-Angola, rocky shore, on rocks at peak low tide, a live-taken spm., leg. Gofas, 1981-84. Paratypes: same locality, 7 spm (among them 4 juv. attached to stone), all MNHN; Cabo Ledo, Bengo province, N-Angola, 10-40 m, 1 spm., Universidade Augustinho Neto, Luanda.

Type locality: Barra do Dande, Bengo province, N-Angola.

Description: Shell 10-26 mm high, rounded to very irregular, higher than long to longer than high, rather thin but solid, somewhat inflated, with left valve flatter than right valve.

Surface irregular according to the substrate, with coarse growth stages and very irregular, rounded, occasionally scaly, radial ribs, which are not visible everywhere, giving way to an irregular surface, heavily incrustated by sessile or perforated by boring organisms. Umbos of the left valve small, rounded and very prominent. Ears very small and ill-defined.

Hinge in the right (lower) valve with a complex formed by two strong and hooked teeth and the long, very narrow resilium between them on a raised resilifer. The two teeth meet and merge close to the umbos and form a kind of tube. The upper part of the very long and narrow resilium, which is functional only at its lower part, is situated in that tube, and its upper end disappears from the sight of an observer at a normal interior view. Deep cavity for the opposite tooth at each side of the tooth complex. Left (upper) valve with two strong, hooked teeth and a deep cavity between them, containing the two sockets for the oppo-

site teeth and the narrow resilifer which is sunken and about on the same level as the sockets.

Exterior whitish, interior white, occasionally stained with brown.

Measurements (height, length):

26.5 x 25.7	ht
22.6 x 20.8	pt MNHN
19.8 x 18.7	pt MNHN
17.0 x 20.2	pt MNHN
14.4 x 14.6	Cabo Ledo, pt Univ. Luanda
11.8 x 14.2	Port-Gentil

Distribution: Cameroon to northern Angola (Luanda).

Material examined: The type material. Cameroon: off mouth of Sanaga river, 3° 27.4' N, 9° 22.6' E, 46 m, 4 v., dredged R/V "André Nizery", leg. Monteillet, III. 1991, MNHN. Gabon: Port-Gentil, on oil rig platform, 1 spm., leg. Bernard, 1986, MNHN. Angola: Ambrizete, Zaïre province, 07° 17.49' S, 12° 53.05' E, in beach drift, 2 v.; Ilha de Luanda, Luanda province, on hardbottom, 90 m, 2 spm. on rock pieces; Cabo Ledo, Bengo province, 10-40 m, several juvenile and adult spm. on rock pieces, all leg. Gofas, 1982-84, all MNHN.

Biotope: Cemented to rocks and other hard substrate (e.g. oil drilling platforms), from low water mark to off-shore (80-100 m). Just below low water, the species is mostly found under rocks which are deeply embedded in gravel, but where the water can still circulate.

Derivatio nominis: The species is named after the Republic of Angola, where the type locality is situated.

Remarks: Although this species has been found both near the tidal zone and in rather great depths, the populations are, according to the available material, not separable and are treated here as one species. The only somewhat similar-looking *Plicatula* are *P. penicillata* Carpenter, 1857 from the Panamic-Pacific faunal province and an apparently un-

named small *Plicatula* from the Colombian Caribbean coast near Santa Marta. In both species, however, the white shell has coloured radial lines, whereas in *P. angolensis*, these lines are absent.

This is the first record of a living species of the family Plicatulidae and the genus *Plicatula* for the eastern Atlantic. Several fossil species of *Plicatula* are known from the Miocene of Angola (Gofas, pers. comm.) and from the Cretaceous of Cameroon (DARTEVELLE AND FRENEIX, 1957), however, none of them is comparable with our Recent species.

P. angolensis seems to be most common in the southern zone of seasonal upwelling which reaches from Cap Lopez to southern Angola. It is absent from the greater part of the tropical zone and the northern zone of seasonal upwelling (Senegal, Mauritania).

Family LIMIDAE

Genus *Ctenoides* Mörch, 1853

Ctenoides catherinae n. sp. (Figs. 23-24)

Type material: Holotype MNHN, dredged at Doca, Baía de Lucira, S-Angola, on calcareous algal debris, 10-20 m, a right v., *leg.* Gofas, 1981-84. Paratypes: same locality, 8 v. (5 left, 3 right) MNHN, 1 left v. Natal Museum; 1 right v. Universidade Augustinho Neto, Luanda; off Cesar, Baía de Lucira, 10-20 m, 1 left v. MNHN, all *leg.* Gofas.

Type locality: Doca, Baía de Lucira, Moçâmedes province, S-Angola.

Description: Shell small, 12-18 mm high and up to 12 mm long, high-oval, somewhat variable in outline (juvenile specimens less high with tendency to more circular), nearly symmetrical to slightly oblique, adult specimens much higher than long, rather thin and fragile, quite inflated. Beaks about in the middle. Ears rather small, posterior ear indistinct and not set off from the disk. Valves posteriorly closed, anteriorly with short and narrow byssal opening just under the hinge line, margin on both sides slightly reflected.

Surface with numerous, fine, slightly irregular, very close-set, rounded, radial ribs with tiny, rather regularly spaced, transverse constrictions, visible under a lens (x 10-20) only. Ribs in the middle of the shell divaricating in a very acute angle. Ears also with narrow ribs.

Cardinal area very narrow in juveniles and narrow to rather broad in fully grown specimens.

Valves entirely white.

Measurements (height, length):

17.3 x 11.3	Santa Maria
15.0 x 11.1	pt MNHN
14.1 x 10.5	pt MNHN
13.4 x 9.2	pt Natal Museum
12.7 x 9.0	ht
9.3 x 7.1	pt Univ. Luanda
9.3 x 7.1	pt MNHN

Distribution: Known from southern Angola (Baía da Lucira, no other localities) but yet found as dead valves only. A single valve without locality data from the "Calypso" Expedition "Gulf of Guinea 1956" might perhaps have origi-

nated from São Tomé or Ilha do Príncipe.

Material examined: The type material. Angola: off Santa Marta, Baía de Lucira, Moçâmedes province, 40 m, 10 v., *leg.* Gofas, 1982-84, MNHN. Without locality: the above mentioned valve.

Biotope: Most probably mixed and coarse sand, from about 10 to 40 m.

Derivatio nominis: The species is named after the artist Catherine Vachet, who executed most of the drawings in my forthcoming book on West African bivalves.

Remarks: This is the first Eastern Atlantic record of a Recent species of the now Caribbean and Indo-Pacific genus *Ctenoides*. A fossil species, *Ctenoides aff. delectrei* (Coquand, 1962) from the Cretaceous of Kanzi (Zaire) has a similar size as *C. catherinae* but less numerous and much stronger ribs (cf. figure in DARTEVELLE AND FRENEIX, 1957). The most close living species is *Ctenoides lischkei* Lamy, 1930 from Japan and the adjacent Indo-Pacific. Other close and similarly small species have been found recently in deeper parts of the Lagoon of New Caledonia. The Caribbean *C. tenera* (Sowerby, 1843) with also very small ribs is much larger.

Family UNGULINIDAE
Genus *Diplodonta* Bronn, 1831

Diplodonta (Diplodonta) undata n. sp. (Figs. 25-27)

Type material: Holotype MNHN, a fresh half grown sh., Guinea, W of Kaporo, 9° 35.5' N, 14° 48' W, 32 m, in bottom grab sample, R/V "André Nizery" SEDIGUI sta. 290., *leg.* von Cosel, 21. X. 1988. Paratypes: Guinea, W of Ile Kouffin, 10° 33' N, 15° 43' W, 23 m, SEDIGUI sta. 765 1 v. MNHN; W of Rio Nuñez, 10° 36' N, 15° 30' W, 25 m, SEDIGUI sta. 801, 1 v. MNHN; 10° 27' N, 15° 43.5' W, 20 m, SEDIGUI sta. B3CH, 1 v. ZMC, 1 v. SMF; 9° 30' N, 14° 32' W, 30 m, SEDIGUI sta. B9gr.DW, 1 sh (1 v. broken) MNHN, all taken by bottom grab or dredge, R/V "André Nizery", *leg.* von Cosel, V. and X. 1988.

Type locality: Kaporo, Guinea.

Description: Shell 15-24 mm long, somewhat variable in shape, subcircular, slightly longer than high, with posterior part broader than anterior part, thin but rather solid when fully grown, inflated. Beaks in front of the vertical midline.

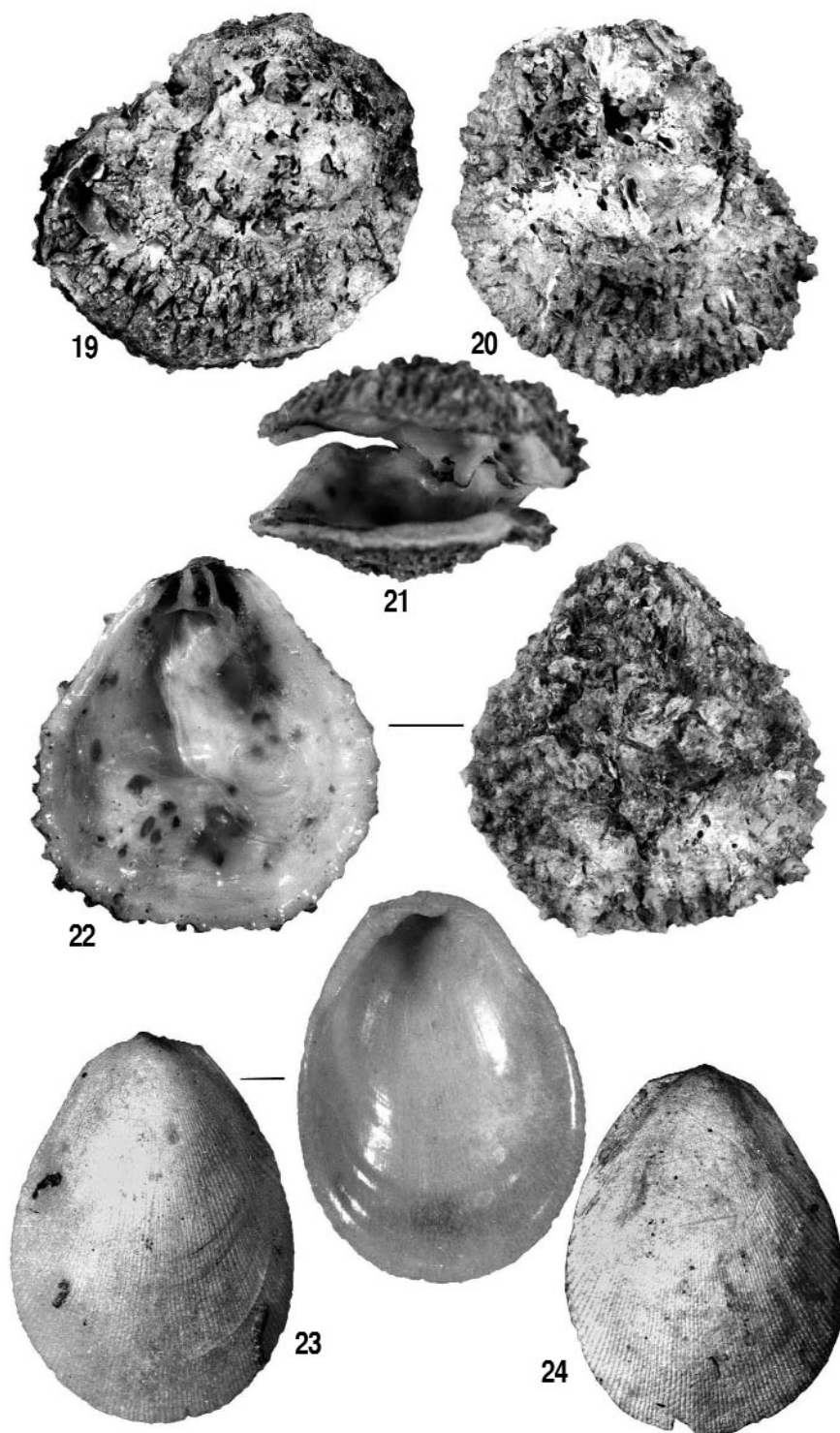
Surface without microsculpture but with very coarse and rather broad, irregular, concentric waves, in which the growth stages seem to be integrated. The waves are reflected on the interior,

especially in young specimens. Periostracum very pale yellowish, nearly colourless, eroded on the umbonal part of the valves.

Hinge typically diplodontoid, in the right valve with two cardinals, the posterior being distinctly bifid. Left valve with a bifid anterior and a narrow, inclined posterior cardinal, a long submarginal anterior ridge and a short submarginal posterior ridge behind the rather narrow resilifer on a well developed

(Right page) Figures 19-22. *Plicatula angolensis* n. sp., 19-21: holotype, height 26.5 mm, Barra do Dande, Angola; 22: paratype, height 22.6 mm, Barra do Dande. Figures 23-24. *Ctenoides catherinae* n. sp., 23: holotype, height 12.7 mm, Baía de Lucira, Angola; 24: paratype, height 14.1 mm, same locality.

(Página derecha) Figuras 19-22. *Plicatula angolensis spec. nov.*, 19-21: holotipo, altura 26,5 mm, Barra do Dande, Angola; 22: paratipo, altura 22,6 mm, Barra do Dande. Figuras 23-24. *Ctenoides catherinae spec. nov.*, 23: holotipo, altura 12,7 mm, Baía de Lucira, Angola; 24: paratipo, altura 14,1 mm, misma localidad.



nymph. Pallial line parallel to the margin and close to it.

Exterior and interior dirty whitish.

Measurements:

23.8 x 21.8	pt SMF, SEDIGUI sta. B3CH
23.1 x 21.6	pt MNHN, SEDIGUI sta. 765
22.4 x 20.4	pt MNHN, SEDIGUI sta. 801
22.3 x 20.4	pt ZMC, SEDIGUI sta. B3CH
18.9 x 17.4	pt MNHN, SEDIGUI sta. B9grDW
15.2 x 13.6 x 8.3	ht

Distribution: Only known from the continental shelf of Guinea (9° 12' N - 10° 36' N) where the species was discovered in 1988, but most probably also distributed southward and perhaps northward.

Material examined: The type material. Guinea: W of Sierra Leone border, 9° 06' N, 14° 4.5' W, 41-45 m, 1 v., SEDIGUI sta. B27CH; W of Tannah Is., 9° 12.4' N, 14° 28.5' W, 41 m, 1 broken sh., 1 v., SEDIGUI sta. 97; W of Conakry, 9° 30' N, 15° 30' W, 43 m, 1 v., SEDIGUI sta. 231;

W of Kaporo, 9° 36' N, 14° 30' W, 35 m, 3 juv. v., SEDIGUI sta. 284; 9° 36' N, 14° 45' W, 30 m, 1 juv. v., SEDIGUI sta. 289; W of Baie de Sangarea, 9° 42' N, 15° 15' W, 33 m, 2 v., SEDIGUI sta. 346, all taken by bottom grab, dredge or try-net R/V "André Nizery", leg. von Cosel, V. and X. 1988, all MNHN.

Biotope: In coarse sand, often with gravel, stones or shell concentrates, from 20 to about 50 m.

Derivatio nominis: The name recalls the undulated surface of the valves.

Remarks: This species is close to *D. rotundata* (Montagu, 1803), with which it co-occurs within its range. It differs principally by its sculpture with the conspicuous concentric waves and the thinner shell. The valves are slightly higher, and in contrast to the Guinean specimens of *D. rotundata*, the resilium is always on a well-developed nymph and the resilifer not visible on a view of the interior of the valve.

***Diplodonta (Diplodonta) enigmatica* n. sp. (Figs. 28-30)**

Type material: Holotype MNHN, a fresh sh., W of Cap Verga, 10° 12' N, 15° 45' W, 34 m, in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 611, leg. von Cosel, 21. X. 1988. Paratypes: W of Tannah Is., 9° 12' N, 15° 22.5' W, 103 m, SEDIGUI sta. 115, 1 sh. MNHN; W of Conakry, 9° 30' N, 14° 02' W, 25 m, SEDIGUI sta. 261, 1 sh. MNHN; W of Ouendi, 9° 54.3' N, 15° 25' W, 25 m, SEDIGUI sta. 455 CH, 3 v. MNHN, 1 v. ZMC, 1 v. IRSNB, 1 v. SMF; W of Yomboya Is., 10° 27' N, 15° 43.5' W, 20 m, SEDIGUI sta. B3CH, 1 v. MNHN, all taken by bottom grab, dredge or try net, R/V "André Nizery", leg. von Cosel, V. and X. 1988.

Type locality: Cap Verga, Guinea.

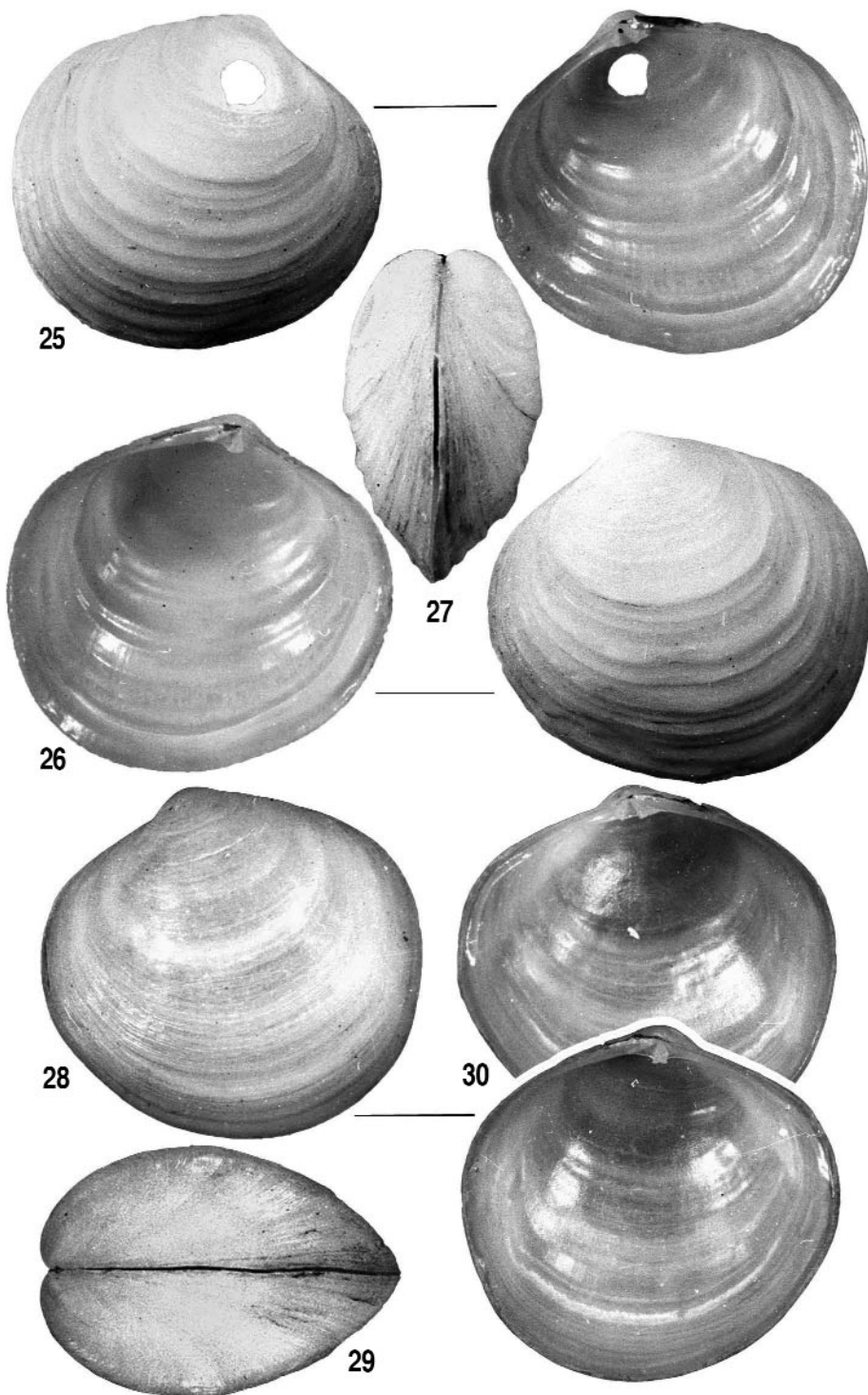
Description: Shell 13-18 mm long, quite variable, in outline and tumidity, circular to subcircular, as long as high or only slightly longer than high, with posterior part broader than anterior part,

thin but solid, inflated to very inflated. Beaks in front of the vertical midline.

Surface with concentric growth lines and very fine, dense, concentric striae, often obsolete. There are also very fine

(Right page) Figures 25-27. *Diplodonta undata* n. sp., holotype, 15.2 mm, SEDIGUI 290, 25: right valve; 26: left valve; 27: posterior view. Figures 28-30. *Diplodonta enigmatica* n. sp., holotype, 12.8 mm, SEDIGUI 611, 28: left valve; 29: anterior view; 30: interior of right valve.

(Página derecha) Figuras 25-27. *Diplodonta undata* spec. nov., holotipo, 15,2 mm, SEDIGUI 290, 25: valva derecha; 26: valva izquierda; 27: vista posterior. Figuras 28-30. *Diplodonta enigmatica* spec. nov., holotipo, 12,8 mm, SEDIGUI 611, 28: valva izquierda; 29: vista anterior; 30: interior de la valva derecha.



and close-set pits which become weaker or obsolete on the marginal area of adult valves. They are visible under a lens only ($\times 20-40$) and give the surface a punctate aspect. Periostracum thin and very pale yellowish, persistent only on the marginal part of the valves.

Hinge in the right valve with a small anterior and a rather broad and distinctly bifid posterior cardinal, left valve with a bifid anterior and a thin, strongly inclined posterior cardinal. Submarginal ridges ill-defined to nearly obsolete in the left valve but a short anterior submarginal ridge present in the right valve. Pallial line rather broad, close to the margin.

Exterior and interior dirty white.

Measurements:

17.3 x 16.1	pt MNHN, SEDIGUI sta. 261
16.8 x 16.1	pt MNHN, SEDIGUI sta. B3CH
16.8 x 16.1	Dakar region
16.6 x 16.1	pt MNHN, SEDIGUI sta. 455 CH
14.3 x 13.2	pt SMF, SEDIGUI sta. 261
14.2 x 14.0	pt IRSNB, SEDIGUI sta. 261
13.7 x 13.0	pt ZMC, SEDIGUI sta. 261
12.8 x 12.2 x 8.2	ht
12.1 x 11.4	Ambrizete, 45 m

Distribution: Senegal (Dakar) to northern Angola (Luanda).

Material examined: The type material. Senegal: off Cap Manuel, 18 m, 1 v., 1. III. 1957; SW of Cap Manuel, 50 m, 1 v., 20 II. 1956; off Gorée, 14° 32' N, 17° 25.5' W, 50 m, 1 v.; off Gorée, 50 m, 20 v., 5. VII. 1955; S of Gorée, 31-40 m, 4 v.; (without depth), 5 v., 18. II. 1954; Banc de Seminole, 43-45 m, 1 v., Dakar region (no precision), 1 v., all dredged R/V "Gérard Tréca", leg. Marche-Marchad,

all MNHN; N-Casamance, off Kafountine, 12° 55.5' N, 17° 17.2' W, 36 m, 1 v.; 12° 44.5' N, 17° 27.3' W, 40 m, 4 v., both dredged R/V "Louis Sauger", leg. von Cosel, 27-28. III. 1988, all MNHN. Guinea: 20 lots with numerous v. from the SEDIGUI cruises, between 9° 03' and 10° 12' N and 13° 41' and 16° 10' W, from 17 to 50 m, all taken by bottom grab or dredge, R/V "André Nizery", leg. von Cosel, V. and X. 1988, all MNHN. Nigeria: off the Niger delta, 4° 03' N, 6° 12' E, 32 m, 1 v., dredged R/V "Calypso", Golfe de Guinée cruise 1956 sta. 29, leg. Marche-Marchad, MNHN. Gabon: 0° 25' N, 9° 00' E, 73 m, 1 v., dredged R/V "Calypso", Golfe de Guinée cruise 1956 sta. 45, leg. Marche-Marchad, MNHN. Angola: Ilha de Luanda, Luanda province, 40-60 m, 7 v., fragm.; 120 m, 1 v., both leg. Gofas, 1982-85, both MNHN.

Biotope: In muddy sand and fine sand, offshore from 30 to 70 m and occasionally deeper.

Derivatio nominis: This species was always an enigma for me, and that is expressed in the name.

Remarks: The new species is distinguished from *D. (D.) rotundata* by its smaller and slightly higher shell and the fine, punctate sculpture. The nymph is always quite well developed, the resilifer is hardly visible on a view from the interior. *D. brocchii* (Deshayes, 1850) from the Mediterranean and West Africa is very close and has also a pitted surface, however, *D. enigmatica* differs by its higher and less inflated shell and the more close-set concentric striae. Juveniles of this species might also be confused with *D. undata* n. sp. but they are easily recognized by the punctate surface.

Family LASAEIDAE

Of this family, at least 35-40 species are estimated to occur in the West African faunal province, most of them being still undescribed. As they should

only be treated in the context of a thorough Eastern Atlantic, or better, world wide revision, only the three most distinctive species are described here.

Genus *Orobitella* Dall, 1900

Orobitella solida n. sp. (Figs. 31-32; 150)

Type material: Holotype MNHN, Cacucaco, N-Angola, between rocks at low peak tide, a live-taken spm., *leg.* Gofas 1982-84. Paratypes: same locality, 2 spm., 1 v.; Baia de Corimba, Luanda province, N-Angola, 10-20 m, 1 v., *leg.* Gofas, 1981-86, MNHN.

Type locality: Cacucaco, Bengo province, N-Angola.

Description: Shell 9-13 mm long, oblong, oblique-oval, superficially resembling a small *Donax*, solid, compressed, with rather broadly rounded anterior margin and truncated, somewhat curved posterior margin which is joined to the very short postero-dorsal margin. Antero-dorsal margin weakly concave in its upper part, ventral margin only slightly convex. Beaks between the third and the fourth fourth of the valves.

Surface with very strong and irregular growth lines and still coarser growth stages. Periostracum rather thin, dull, pale yellowish grey, folding broadly over the margin to the interior and bearing small, scattered, radially arranged tufts which are occasionally obsolete.

Hinge in the right valve with a strong, oblique anterior cardinal and a very small lateral parallel to it directly at the dorsal margin. Left valve with one strong cardinal only. Resilifer deep and not much inclined.

Valves entirely white.

Measurements:

13.1 x 9.8	pt Corimba
11.8 x 9.8	SEDIGUI 2
11.2 x 9.5 x 6.3	ht
11.0 x 8.5 x 5.6	pt Cacucaco

Distribution: Known from Senegal and Guinea (old valves only) and northern Angola (Ambrizete; Luanda).

Material examined: The type material. Senegal: Baie de Gorée (no precision), 1 v., *leg.* Marche-Marchad, MNHN; N-Casamance, Karabane Bôlon, off Karabane, 4 m, 2 v., *leg.* von Cosel, 17. III. 1988, MNHN. Guinea: W of Sierra Leone border, 9° 03' N, 13° 24.5' W, 8 m, in bottom grab sample, 1 v., R/V "André Nizery", SEDIGUI sta. 2, *leg.* von Cosel, 12. V. 1988, MNHN. Angola: Ambrizete, Zaire province, 7° 17.49' S, 12° 53.05' E, in beach drift, 1 juv. v.; Ponta das Lagostas, Luanda province, 0-2 m, 1 juv. v., both *leg.* Gofas, 1982, both MNHN.

Biotope: Between rocks in shallow water from low water mark to about 8 m deep.

Derivatio nominis: The name ("*solidus*", lat.= thick, solid) reminds the rather thick shell of the new species.

Remarks: This species superficially resembles *Orobitella nicklesi* (Rosso, 1975); however, it has a more truncated posterior margin, is thicker and has stronger cardinals, but no visible laterals. In Senegal, two valves of a very close species have been found, their hinge is slightly different with a more inclined resilifer. For a decision about its status, more material is necessary.

Genus *Lozouetia* n. g.

Type species: *Lozoueta distorta* n. sp. (described herein), monotypic.

Diagnosis: Shells small, higher than long, markedly oblique-quadrangular, more or less inequivalve and laterally more or less distorted. Sculpture consisting of fine commarginal lamellate

threads, regularly interrupted to form a radial pattern. Pallial line without sinus. Hinge in the left valve with a rather small cardinal and long and strong anterior and posterior laterals, these fit

between similar laterals and the enlargement of the dorsal margin in the right valve, which has also a small but strong cardinal. Internal ligament short, resilient deep, somewhat triangular.

Remarks: There is no really close-looking genus with which *Lozouetia* with its typically distorted shell could be compared. The genus *Litigiella* Monterosato, 1909 has a similar hinge configuration, however, in *Litigiella* (as figured in LAMY, 1908), the anterior and posterior laterals are much shorter, and the cardinals in right and left valve are still smaller and knob-like. The most distinctive character of both genera is the shell: in *Litigiella*, it is regular, equivalve and not distorted, markedly longer than high, with an oval outline and a smooth surface.

A specimen from Dakar of our new genus was labelled (probably by Marche-Marchad) as perhaps belonging to the genus *Potidoma* Dérout, 1961, a genus commensal with polychaete

worms (DÉROUX, 1961). However, the type species of that genus (*Lepton subtrigonum* Jeffreys, MS in P. Fischer, 1873) is trapezoid, longer than high, regular and equivalve, with well rounded anterior and posterior margin and ill-defined concentric striae only. The hinge has a similar configuration as in *Litigiella* and *Lozouetia* but has shorter, much thicker and somewhat irregular laterals (see figure in DÉROUX, 1961) and a single small but prominent cardinal in each valve. - The combination of characters in the West African species not yet seen in any other galeommatacean species such as high, irregular, somewhat distorted shell shape and characteristically sculptured surface lead to the distinction as a separate genus.

Derivatio nominis: The genus is named after my colleague Pierre Lozouet, an ardent paleontologist with whom I have spent many hours collecting and in fruitful discussions.

Lozouetia distorta n. sp. (Figs. 33-37; 151)

Type material: Holotype MNHN, Abidjan region (no precision), Côte d'Ivoire, 50 m, a live-taken spm. dredged R/V "Reine Pokou", leg. Le Lœuff, 24. XI. 1966. Paratypes: off Grand Bassam, Côte d'Ivoire, 35 m, 2 spm., dredged R/V "Reine Pokou", leg. Le Lœuff, 18. III. 1970; Wouri-Limbé region, Cameroon, 3° 27.4' N, 9° 22.6' E, 46 m, 1 v., dredged R/V "André Nizery", leg. Monteillet, III. 1991, all MNHN.

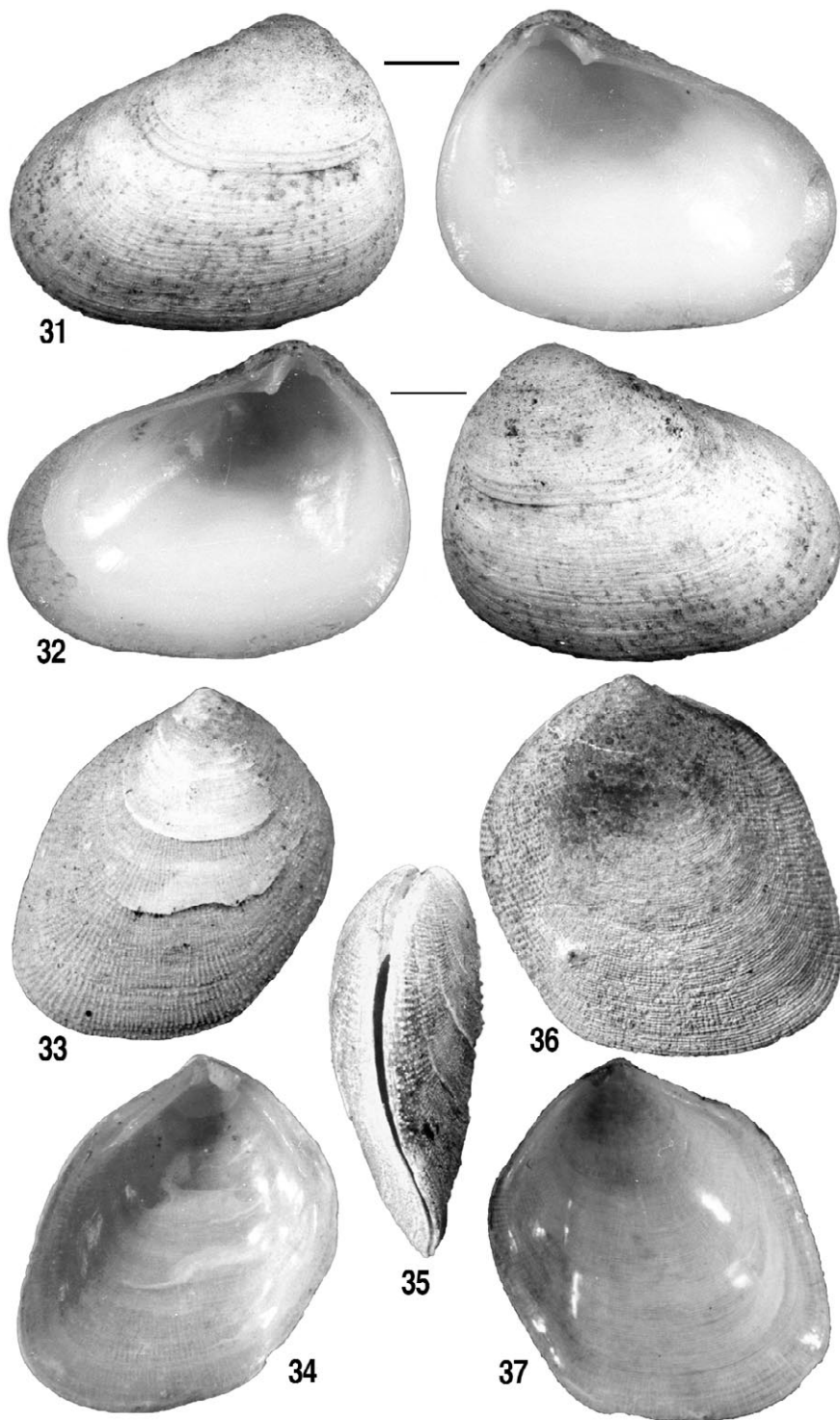
Type locality: Abidjan, Côte d'Ivoire.

Description: Shell 4-5 mm long and 5.5-6 mm high, slightly higher than long, quite variable in shape, irregularly oblique-quadrangular, rather solid, from nearly equivalve to more or less inequi-

valve: one (mostly the left) valve more or less inflated, the other one more compressed. Anterior margin slightly curved, in its lower part nearly straight, antero- and postero-ventral corners rounded to

(Right page) Figures 31-32. *Oorbitella solida* n. sp., holotype, 11.2 mm, Cacuaco, Angola, 31: left valve; 32: right valve. Figures 33-37. *Lozouetia distorta* n. sp., 33: paratype, 4.5 x 5.7 mm, Grand Bassam, exterior of left valve; 34: paratype, 4.5 x 5.7 mm, Grand Bassam, interior of right valve; 35: paratype, 4.5 x 5.7 mm, Grand Bassam, posterior view; 36: holotype, 5.1 x 6.1 mm, Abidjan, exterior of right valve; 37: holotype, interior of left valve.

(Página derecha) Figuras 31-32. *Oorbitella solida* spec. nov., holotipo, 11,2 mm, Cacuaco, Angola, 31: valva izquierda; 32: valva derecha. Figuras 33-37. *Lozouetia distorta* spec. nov., 33: paratipo, 4,5 x 5,7 mm, Grand Bassam, exterior de la valva izquierda; 34: paratipo, 4,5 x 5,7 mm, Grand Bassam, interior de la valva derecha; 35: paratipo, 4,5 x 5,7 mm, Grand Bassam, vista posterior; 36: holotipo, 5,1 x 6,1 mm, Abidjan, exterior de la valva derecha; 37: holotipo, interior de la valva izquierda.



rounded-angular, ventral margin short and slightly arched. Posterior margin in its lower part hardly convex, in the upper part only very slightly curved. Beaks somewhat behind the vertical midline.

Surface with extremely fine, concentric, very close-set and finely lamellate threads; these tiny lamellae (visible under a lens only) are arranged forming dense radial "riblets" which bifurcate on the rounded anterior and posterior angle and always terminate nearly perpendicular to the margin. There are also coarser, irregular growth lines. Periostracum thin, light straw coloured to brown, dull and often eroded in the older part of the valve.

Hinge in the left valve with a small knobby cardinal and a long and strong lateral on each side, these fit between similar laterals and the enlargement of the dorsal margin in the right valve, which has also a small but strong cardinal. Internal ligament strong but short, resilifer deep, somewhat triangular. Muscle impressions small and rather narrow.

Valves entirely whitish.

Measurements:

5.1 x 6.1	ht
4.7 x 5.6	Dakar port
4.6 x 6.1	SEDIGUI sta. 82
4.5 x 5.7	pt Grand Bassam
4.5 x 5.3	pt Cameroon
4.2 x 5.4	SEDIGUI sta. 82
4.0 x 5.1	pt Abidjan

Distribution: Senegal (Dakar) to northern Angola (Luanda).

Material examined: The type material. Senegal: Dakar region (no precision), 50 m, 5 v., 1 fragm., dredged R/V "Léon Coursin", leg. Marche-Marchad, 24. II. 1957; Harbour of Dakar, "in tube of *Panthalis bicolor*", 1 sh., leg. Marche-Marchad, 1955, both MNHN; Casamance, 12° 46.9' N, 17° 29.9' W, 45 m, 1 juv. v., dredged R/V "Louis Sauge", leg. von Cosel, 29. III. 1988, MNHN. Guinea: W of Tannah Is., 9° 12' N, 13° 40.5' W, 20 m, 1 v., SEDIGUI sta. 81; 9° 12' N, 13° 43.5' W, 24 m, 1 v., SEDIGUI sta. 82, both taken by bottom grab, R/V "André Nizery", leg. von Cosel, 14. V. 1988, both MNHN. Côte d'Ivoire: Abidjan region (no precision), 40 m, 1 sh., dredged R/V "Reine Pokou", leg. Le Lœuff, 8. III. 1966, MNHN. Angola: Ilha de Luanda, Luanda province, 120 m, 1 v., leg. Gofas, 1982-84, MNHN.

Biotope: Commensal, most probably with polychaete worms. One specimen was labelled by Marche-Marchad: "tube of *Panthalis bicolor*". The specimens studied were dredged from soft bottom in 35-120 m.

Derivatio nominis: The name reflects the irregular, distorted shell of the new species.

Remarks: as for the genus.

Genus *Bornia* Philippi, 1836

Bornia balalaika n. sp. (Figs. 38-39)

Type material: Holotype MNHN, Cabo Ledo, N-Angola, 10-40 m, dredged, a complete sh., leg. Gofas, 1981-84. Paratypes: Pointe-Noire, Congo, Plage Mondaine, on beach N of lighthouse, 3 v., leg. von Cosel, XII. 1985. MNHN.

Type locality: Cabo Ledo, Bengo province, N-Angola.

Description: Shell very small, 4-5.5 mm long, little variable in outline, triangular with sharp angled anterior and posterior margins and nearly straight ventral margin, thin but rather solid, very compressed. Antero- and postero-dorsal margins evenly but not

very convex. Umbos about in the middle.

Surface smooth and glossy, with very fine, irregular growth lines. Periostracum very thin, transparent and colourless. Interior with faint, irregular radial striae.

Hinge plate very narrow; hinge line of both valves with one inclined and one vertical cardinal, both in front of the resilifer, and a long posterior lateral. Muscle impressions small, pallial line often disintegrated into close-set isolate sections or points.

Valves entirely white, translucent.

Measurements:

5.5 x 4.2	ht
4.8 x 3.6	SEDIGUI sta. 74
4.7 x 3.8	pt
4.7 x 3.5	SEDIGUI sta. 74
4.6 x 3.3	Conakry

Distribution: Known from Senegal (Casamance), Guinea and northern Angola (Luanda).

Material examined: The type material. Senegal: S-Casamance, Cap Roxo, 12° 20.7' N, 16° 53.1' W, fine muddy sand, 15 m, 1 v., dredged R/V "Louis Sauer", leg. von Cosel, 27. III. 1988, MNHN. Guinea: Conakry, "Conakry sands" (no precision), 1 v., old colln.

MNHN. W of Sierra Leone border, 9° 06' N, 13° 25.7' W, 7 m, 2 v., taken in bottom grab, R/V "André Nizery", SEDIGUI sta. 74, leg. von Cosel, 14. V. 1988, MNHN.

Biotope: Most probably in fine, muddy sand, from a few to about 40 m.

Derivatio nominis: The pronounced triangular form of this new species strongly resembles a russian balalaika.

Remarks: This rare, exclusively tropical species can be distinguished by its shape from all other known Galeommatacea. The specimens from Guinea and Senegal have slightly more rounded corners and a continuous pallial line. They are included in *B. balalaika*, but further material is necessary to see if they are really that species. The only somewhat similar looking species is *Bornia chiclaya* Olsson, 1961 from NW Peru but this has anterior and posterior corners which are more pronouncedly rounded.

Family GALEOMMATIDAE

The Galeommatidae from tropical West Africa have recently been monographed by GOFAS (1992), however, af-

ter his paper appeared, processing of material from Guinea has revealed the following undescribed species.

Genus *Galeomma* Turton, 1825

Galeomma tripartita n. sp. (Figs. 40-41; 148-149)

Type material: Holotype MNHN, W of Tannah Island, Guinea, 9° 12' N, 13° 43.5' W, 24 m, 1 v., in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 82, leg. von Cosel, 14. V. 1988. Paratypes: W of Sierra Leone border, Guinea, 9° 06' N, 13° 32' W, 16 m, 1 v., bottom grab, R/V "André Nizery", SEDIGUI sta. 72, leg. von Cosel, 14. V. 1988; Roume, Iles de Los, Guinea, fine sand, 1.5-2 m, 1 v., leg. von Cosel, 29. V. 1988, both MNHN.

Type locality: Tannah Island, Guinea.

Description: Shell 7-8.7 mm long, elongate, rather thin and fragile, very widely gaping ventrally, weakly inequilateral with beaks just in front of the vertical midline. Valves looking like a rather inflated and about circular valve from which the lower two thirds have

been cut off. Dorsal margin straight just right and left of the beaks, then curving gently downwards. Antero- and postero-ventral corner sharp, ventral margin nearly straight.

Surface with very fine but rather prominent, dense, slightly irregular ra-

dial riblets which are much narrower than the interspaces and which are not really bifurcating, but occasionally new ribs commence in the interspaces. They are crossed by very fine concentric threads, resulting in a cancellate pattern. A deep and rather sharply marked depression on each side goes from the umbonal region straight to antero-and postero-ventral corner and divides the surface in three parts. In the depressions the radial riblets are strongly bifurcating; they are much finer on the antero-and postero-dorsal area, separated by the depressions from the rest of the shell. Periostracum not seen.

Hinge without visible teeth, resilifer small, triangular, just behind the beaks. Pallial line entire, rather broad and parallel to the ventral margin.

Valves entirely white.

Measurements:

8.7 x 4.1	ht
7.2 x 3.2	pt SEDIGUI sta. 72

Distribution: Only known from the southern part of the coast of Guinea.

Material examined: The type material only.

Biotope: Unknown but most probably, like *G. turtoni* Sowerby in Turton, 1825, on hard substrate under rocks. Nothing is known on the life history.

Derivatio nominis: The name recalls the external shape, divided in three parts.

Remarks: The new species cannot be confused with any other *Galeomma*. It is characterized by its broadly-triangular valves with the markedly sharp antero-and postero-ventral corners, the spectacular division of the surface in three parts (which, in lesser extent, is also present in *G. turtoni*) and the extremely wide ventral gape which gives the two joint valves the aspect of an inversed narrow oval bowl or, even more appropriately, a boat.

Family SPORTELLIDAE

Genus *Basterotia* Mayer in Hörnes, 1859

Basterotia clancula n. sp. (Figs. 42-43; 152)

Type material: Holotype MNHN, Ponta do Mussulo, N-Angola, on beach, a right v., *leg.* Gofas, 1983. Paratypes, same locality, 11 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Museum, 2 v. Universidade Augustinho Neto, Luanda.

Type locality: Ponta do Mussulo, Luanda province, N-Angola.

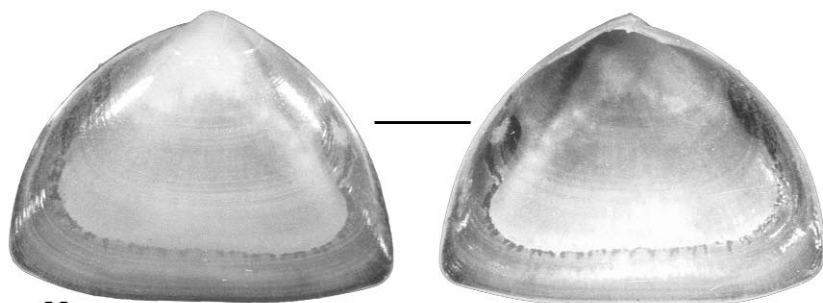
Description: Shell 9-13 mm long, quite variable in shape, transverse-oval to somewhat trapezoid-shaped, thin but rather solid, very inflated. Anterior margin rather narrowly to broadly rounded, posterior margin broadly rounded or obliquely rounded-trunca-

ted. Ventral margin slightly convex, occasionally straight. Maximal height of the valve often at the posterior part, behind the beaks. Umbos large and well in front of the vertical midline.

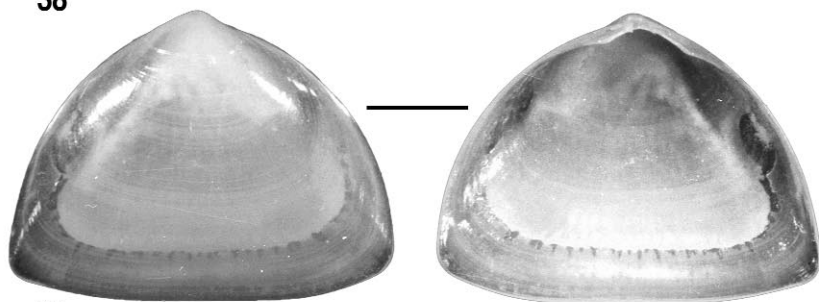
Surface with dense, strong irregular growth lines, coarser growth stages and

(Right page) Figures 38-39. *Bornia balalaika* n. sp., holotype, 5.5 mm, Cabo Ledo, Angola, 38: left valve; 39: right valve. Figures 40-41. *Galeomma tripartita* n. sp., 40: holotype, 8.7 mm, SEDIGUI 82, left valve, lateral view, dorsal view and interior; 41: paratype, 7.2 mm, SEDIGUI 72, right valve, same views.

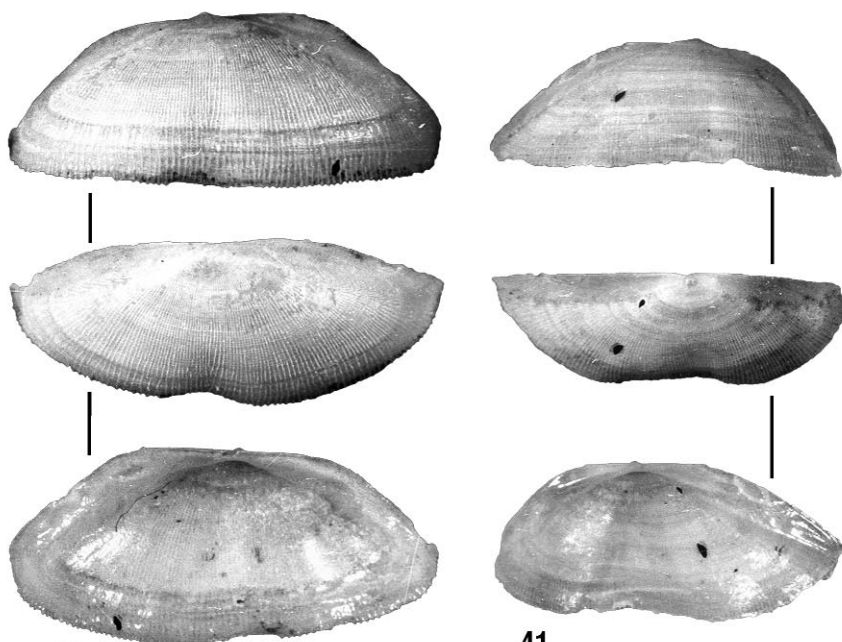
(Página derecha) Figuras 38-39. *Bornia balalaika* spec. nov., holotipo, 5,5 mm, Cabo Ledo, Angola, 38: valva izquierda; 39: valva derecha. Figuras 40-41. *Galeomma tripartita* spec. nov., 40: holotipo, 8,7 mm, SEDIGUI 82, valva izquierda, vista lateral, vista dorsal e interior; 41: paratipo, 7,2 mm, SEDIGUI 72, valva derecha, mismas vistas.



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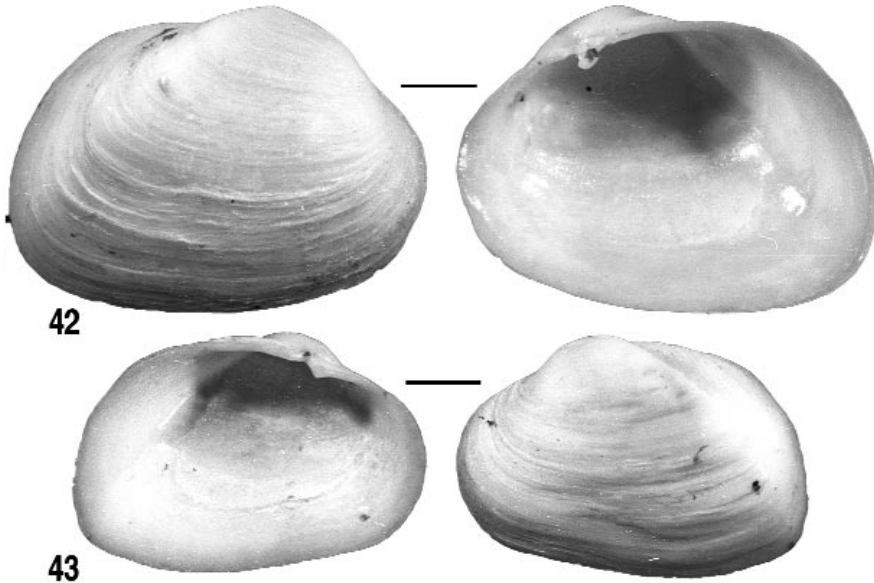


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Figures 42-43. *Basterotia clancula* n. sp., 42: holotype, 11.2 mm, right valve, Ponta do Mussulo, Angola; 43: paratype, 9.4 mm, left valve, same locality.

Figuras 42-43. Basterotia clancula spec. nov., 42: *holotipo*, 11,2 mm, *valva derecha*, Ponta do Mussulo, Angola; 43: *paratipo*, 9,4 mm, *valva izquierda*, misma localidad.

fine granules which are often obsolete. Posterior angle sharp on the early growth stage, later becoming rounded. Periostracum thin, dull, nearly colourless to pale brownish grey, frequently eroded on the earlier parts of the valve.

Hinge line with one strong, projecting anterior cardinal and a thickened posterior part, resilifer very small. Pallial line only with a very shallow posterior indentation or no sinus at all, but on its posterior part always with a considerable distance to the posterior margin.

Valves entirely white.

Measurements:

13.4 x 9.0	pt MNHN
12.3 x 8.5	pt MNHN
12.2 x 9.2	pt ZMC
12.0 x 8.9	pt IRSNB
11.7 x 8.9	pt Natal Museum
11.2 x 8.3	ht
9.4 x 6.3	pt MNHN

9.1 x 7.2 pt MNHN

8.5 x 6.3 pt MNHN

Distribution: Senegal (Dakar) to southern Angola (Lucira, Moçâmedes); Cape Verde Islands. As no record from south of Guinea (Iles de Los) to northern Angola (Luanda) exists, a distribution discontinuity might be probable.

Material examined: The type material. Senegal: Dakar region (no precision), 1 v., *leg.* Marche-Marchad, MNHN. Guinea: off Iles de Los, 18 m, 1 v., *leg.* Marche-Marchad, I. 1953, MNHN. Angola: Corimba, Luanda province, Praia Etambar, beach drift, 1 v.; Baía de Corimba, 10-20 m, 1 v.; Ponta do Mussulo, Luanda province, on beach, numerous v. (associated specimens); Baía do Mussulo, between seagrass, 0-1 m, 1 sh.; off Mussulo (Macoco), 50-70 m, 1 v.; Bissonga, Baía de Lucira, Moçâmedes province, 10-20 m, maërl, 1 v., all *leg.* Gofas, 1981-85, all

MNHN. Cape Verde Islands: Ilha do Sal, Palmeira, beach drift, 1 v.; Baía Mordeira, beach drift, 1 v.; Santa Maria, beach drift, 1 v., all *leg.* von Cosel, XII. 78 - I. 79; Boavista (no precision), *leg.* Burnay, all MNHN; São Vicente, Mindelo, Baía Mاتیota, 1 sh., *leg.* First Iberic Exped. to Cape Verde Islands, 15. VIII. 1985, MNCN.

Biotope: Insufficiently known, most probably on coarse sand and maërl, partly with vegetation, from 1 to about 20 m.

Derivatio nominis: The name ("*clanculus*", lat.= hidden) reminds the fact

that this species has hidden its identity up to now.

Remarks: This species is distinguished from the Caribbean *B. quadrata* (Hinds, 1843) by its more rounded posterior angle and the slightly less tumid valves; in *B. quadrata*, the posterior angle is keeled on its entire length. *B. oblonga* E. A. Smith, 1890 from St. Helena is very close but is still less tumid as the new species and has an entirely and evenly rounded posterior angle, whereas in *B. clancula*, the posterior angle is almost keeled on the early growth stages.

Family CARDITIDAE

The family Carditidae is particularly well represented in tropical West Africa with a total of 15 species, including those to be described here. Although the latest systematic order of the family, given by CHAVAN (1969) (followed by HAIN (1985)),

is still to be discussed (among others if at least some of the taxa to which Chavan and Hain gave full generic or subfamilial status will finally be ranked on subgeneric or generic level only), their systematic order is followed here.

Genus *Carditamera* Conrad, 1838

Subgenus *Carditamera*

Carditamera (Carditamera) rolani n. sp. (Figs. 44-46)

Type material: Holotype MNHN, Praia Maria Emilia, São Tomé, 5 m, a live-taken spm., *leg.* Rolán, 1989. Paratypes: same locality, 6 spm. MNHN, 1 juv. spm. ZMC, 1 juv. spm. SMF, 1 juv. spm. NMWZ, 2 v. (2 spm. coated for scanning) MNHN, *leg.* Rolán, 1989. Espirinha, São Tomé, rocks at low tide, 7 spm., 2 v. MNHN, *leg.* Gofas, XI. 1985.

Type locality: Praia Maria Emilia, N of the town of São Tomé, Ilha de São Tomé.

Description: Shell very small, to 4 mm long, variable in outline, subrectangular-trapezoid, rather thick and solid, moderately inflated. Beaks subterminal, situated near the anterior end.

Surface with 14-16 strong radial ribs which bear close-set transverse, generally not very prominent nodules and which gradually increase in thickness towards posterior, the two or three ribs ending at the postero-ventral corner being the largest and often bearing scales. Interspaces much narrower than ribs. Lunule short and narrow, escutcheon rather broad, both well-defined. Periostracum very thin, transparent and

nearly colourless. Inner margin dentate corresponding to the external sculpture. Protoconch small, about 150 µm long, prominent, with an irregular sculpture, separated from the teleoconch by a rim.

Hinge in the right valve with a strong and thick anterior lateral, the two cardinals merged into one broad triangular tooth. Left valve with a very small anterior lateral, two strong cardinals arranged in inverted V-shape, and a short, thick and strong lateral near the postero-dorsal corner. Pallial line without sinus.

Exterior uniform whitish to cream or uniform dark brown, occasionally white with a brown spot or zone near the pos-

terior margin, or light brownish. Interior with external coloration, occasionally with dark brown zones on the hinge line.

Measurements:

3.7 x 2.2	pt MNHN, Esprainha
3.6 x 2.1	ht
3.2 x 1.8	pt MNHN, Esprainha
3.1 x 1.7	pt MNHN, Praia Emilia
3.0 x 1.7	pt MNHN, Esprainha
2.7 x 1.6	pt MNHN, Esprainha
2.7 x 1.6	pt SMF, Praia Emilia
2.6 x 1.7	pt NMWZ, Praia Emilia

Distribution: Ilha de São Tomé, apparently endemic.

Material examined: The type material. São Tomé: Praia Mutamba, 5 m, 13 v.; Praia Maria Emilia, 5 m, several spm. and v.; 15 km S of the town of São Tomé, 3 spm, 2 v., all *leg.* Rolán, 1989, all MNHN.

Biotope: Rocky shores, on rocks in algal mat, in about 2-3 m. The species is

incubating: about 30 juveniles were found in the holotype specimen.

Derivatio nominis: The species is named after Emilio Rolán from Vigo, who has first collected it.

Remarks: This is the second West African species of the otherwise mainly American (both coasts) genus *Carditamera* s.s.; the other species being *Carditamera* (*Carditamera*) *contigua* (Dautzenberg, 1910). The new species is distinguished from this by its still smaller size and the shorter, more regular and more trapezoid valves with more subterminal beaks. It cannot be mistaken for young *Glans trapezia* (Linné, 1767) (with which it co-occurs), which is still much shorter and has more prominent and more regular ribs. The non-planktonic development explains the restricted range of the species. The other subgenus of *Carditamera*, *Lazariella* Sacco, 1899, is present in West Africa with one species, *C. (L.) regularis* (Sowerby, 1913).

Genus *Cardiocardita* Anton, 1839

Cardiocardita obesa n. sp. (Figs. 48-51)

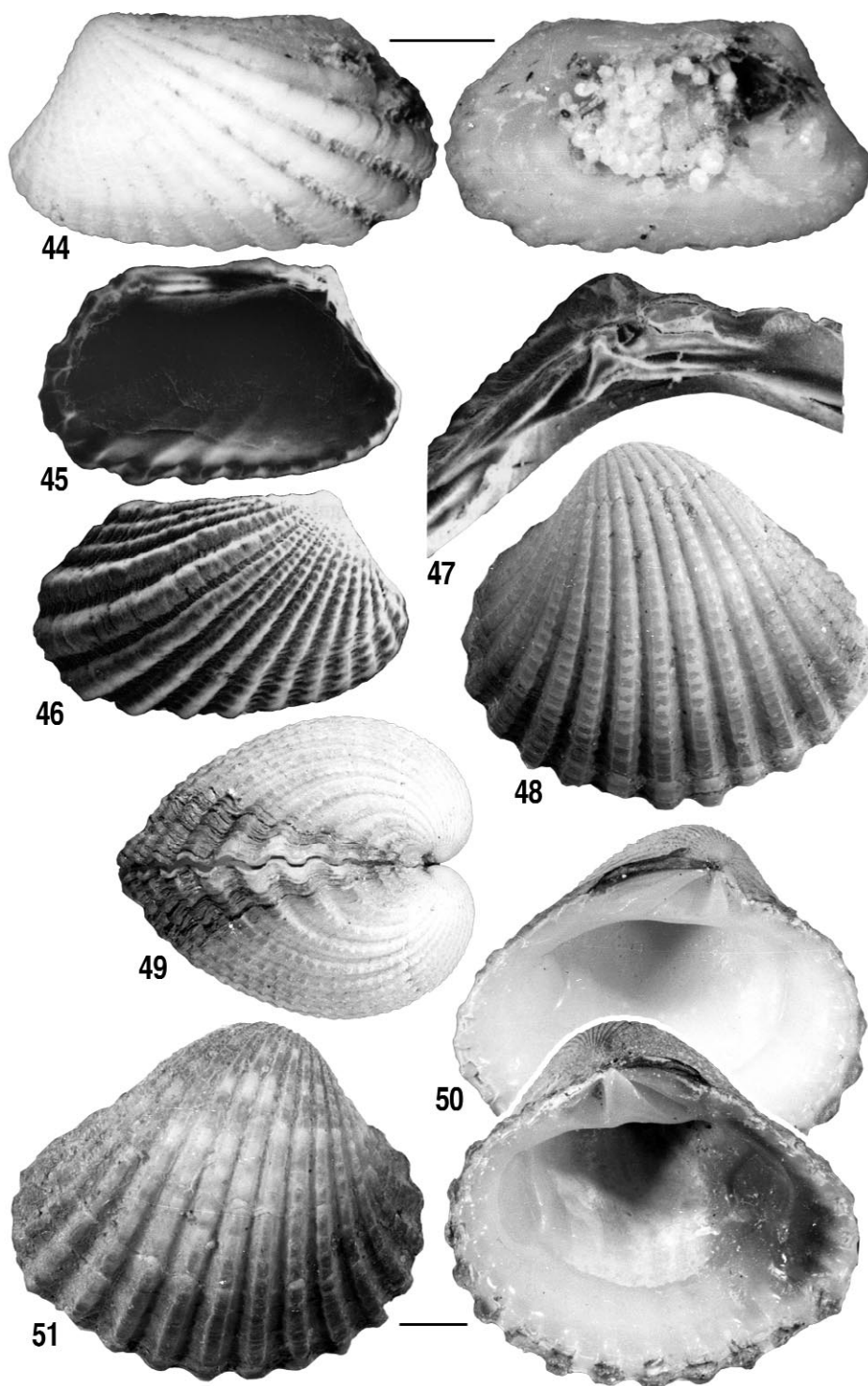
Type material: Holotype MNHN, a complete specimen off Presqu'île aux Oiseaux, Casamance, Senegal, 12° 46' N, 17° 12' W, fine clean sand, 22 m, dredged R/V "Louis Sauter", 28.3.1988, *leg.* von Cosel. Paratypes: same locality, 10 spms., MNHN; 1 spm., ZMC; 1 spm., IRSNB; 2 spms., SMF; 1 spm., Natal Museum.

Type locality: off Presqu'île aux Oiseaux, Casamance, Senegal.

Description: Shell small, 17 to 25 mm, occasionally to 25 mm long, strong and

thick-shelled, in certain limits variable, equivalve, suboval, very inflated, with

(Right page) Figures 44-46. *Carditamera rolani* n. sp., 44: holotype, 3.6 mm, left valve, Praia Emilia, Sao Tomé (note the incubated juveniles in the inside of the valve); 45: paratype, 2.7 mm, interior of left valve, Praia Emilia, Sao Tomé; 46: paratype, 2.6 mm, exterior of right valve, Praia Emilia; 47: same specimen, hinge of right valve. Figures 48-51. *Cardiocardita obesa* n. sp., 48: holotype, 23.7 mm, 12° 46' N, 17° 12' W, 22m, exterior of left valve; 49: holotype, anterior view; 50: holotype, interior of left valve; 51: paratype MNHN, 16.8 mm, same locality, right valve. (Página derecha) Figuras 44-46. *Carditamera rolani* spec. nov., 44: holotipo, 3,6 mm, valva izquierda, Praia Emilia, Sao Tomé (nótese los juveniles incubados en el interior de la valva); 45: paratipo, 2,7 mm, interior de la valva izquierda, Praia Emilia, Sao Tomé; 46: paratipo, 2,6 mm, exterior de la valva derecha, Praia Emilia; 47: mismo espécimen, charnela de la valva derecha. Figuras 48-51. *Cardiocardita obesa* spec. nov., 48: holotipo, 23,7 mm, 12° 46' N, 17° 12' W, 22m, exterior de la valva izquierda; 49: holotipo, vista anterior; 50: holotipo, interior de la valva izquierda; 51: paratipo MNHN, 16,8 mm, misma localidad, valva derecha.



globose beaks which are situated well in front of the vertical midline, but behind the middle of the anterior half of the valves. Anterior margin well rounded. Posterior part of the valve rounded-tapering. Postero-dorsal slope only very slightly convex, occasionally nearly straight.

Exterior with 20-22 strong broad radial ribs which have a square transverse profil in their top part and are broadening considerably towards their base, with interspaces of a concave, rounded appearance. Upper part and broadening lower part of each rib separated by a narrow groove on both sides of the rib. Top of the ribs with broad transverse bars, often only weakly marked, specially towards the ventral half of the valves, where the ribs get a more rounded appearance.

Hinge plate broad and strong, hinge with three cardinals in the right valve and two cardinals in the left valve and a very small anterior and posterior lateral knob in each valve. Pallial line without a real sinus but with a shallow broad depression just in front of the posterior adductor scar, and broadening in this part, a diagnostic feature of *Cardiocardita* and unique in Carditidae. Inner margin of valves strongly dentate according to the external ornamentation.

Colour of valves variable from uniform white to white with pale brown concentric zones and lines or irregular spots or streaks on the ribs, or more or less uniform pale brown with a few lighter concentric zones, or occasionally only on ribs irregularly brown with the interspaces lighter coloured. Periostracum thin, light grey and on the dorsal part of the valves obsolete. Interior entirely white or with salmon-reddish brown either in the umbonal cavity only, in the upper interior down to the pallial line, or nearly on the whole interior with only a narrow white rim along the margin. Some specimens have a brownish zone on the postero-dorsal part of the interior.

Measurements:

25.4 x 22.1 x 18.4	pt MNHN, 12° 46' N, 17° 12' W
23.7 x 21.3 x 17.7	ht, 12° 46' N, 17° 12' W

21.3 x 18.6 x 16.4	12° 30.4' N, 17° 16' W
19.3 x 15.9 x 14.7	12° 43' N, 17° 21.2' W
18.9 x 16.0 x 14.5	pt Natal Museum
18.5 x 16.5 x 13.6	pt SMF
18.2 x 15.5 x 13.7	pt MNHN
18.1 x 15.0 x 13.4	pt MNHN
17.8 x 15.6 x 13.2	pt MNHN
17.7 x 15.2 x 13.1	pt MNHN
17.6 x 15.0 x 13.4	pt IRSNB
17.5 x 15.3 x 13.4	pt MNHN
17.4 x 14.7 x 13.0	pt MNHN
17.3 x 15.9 x 13.2	12° 30.4' N, 17° 16' W
16.9 x 15.0 x 13.6	pt MNHN
16.9 x 14.9 x 12.5	pt ZMC
16.7 x 14.4 x 12.7	pt SMF
16.0 x 13.7 x 12.0	12° 30.4' N, 17° 16' W
11.4 x 9.2 x 7.5	pt MNHN

Distribution: apparently restricted to Senegal.

Material examined: The type material. Senegal: Casamance, Kafountine, 12° 56.94'N, 17° 06.8' W, fine sand, 22 m, 1 spm., 2 juv. sh., 3 juv. v.; Presqu'île aux Oiseaux, 12° 49' N, 17° 11.4' W, fine clean sand, 25 m, 1 spm.; 12° 47.2' N, 17° 12.4' W, fine sand, 24 m, 1 fresh sh.; Kalisseye, 12° 43' N, 17° 21.2' W, fine sand, 34 m, 1 spm.; Ile de la Goëlette, 12° 40.1' N, 17° 24' W, fine sand, 35 m, 1 spm.; Diembéring, 12° 30.4' N, 17° 16' W, fine sand, 21 m, 3 spms., all dredged R/V "Louis Sauter", leg. von Cosel, III. 1988, all MNHN.

Biotope: clean fine or medium sand, partly with shell debris, well offshore between 18 and 30 m.

Derivatio nominis: The name characterizes well this conspicuously inflated and "fat" carditid.

Remarks: This new species is very close to *C. ajar* (Bruguière, 1789), both species occur sympatrically and partly in the same biotope. It differs from the latter by its particularly globose umbos and the much smaller size; it is more inflated and elongate. The ribs of *C. obesa* are broader and have transverse bars over their whole surface, whereas in *C. ajar* they are more narrow and are often smooth in the central and ventral part of

the valves. In young specimens of both species the ribs are quite similar, but *C. ajar* is well distinguished by being less inflated and having a broader posterior end. The postero-dorsal slope of *C. ajar* is more convex than that of *C. obesa*. Both species live in sandy bottom, but the preferred depth of *C. ajar* is from low tide level to about 15 m and it is only occasionally found deeper than 25 m. *C. obesa* is an offshore species which has been found from 18 to 35 m. The geographical distributions of the two species overlap in Casamance, but *C. ajar* goes further north to Cap Blanc, Mauritania.

The other very close species is *C. gabonensis* n. sp. (see discussion below). *C. lacunosa* (Reeve, 1843) is less inflated, the ribs have a more triangular cross-section with very narrow top, ornamented with scales. It inhabits an entirely different, muddy-sandy biotope, mostly in shallower water from a few metres downward.

C. obesa forms part of a special assemblage on the vast clean sand grounds off Casamance, in which it is common and which it shares with the pharid bivalve *Pharus chenui* Cosel, 1993, another species with about the same limited distribution range.

Cardiocardita gabonensis n. sp. (Figs. 52-54)

Type material: Holotype MNHN, Port-Gentil, Gabon, 0° 38' S, 8° 43' E, a complete sh., leg. Chevalier, 1985. Paratypes, same locality, 8 sh. MNHN; Port-Gentil, on sand, 3-6 m, 7 sh. MNHN, 2 sh. ZMC, 2 sh. IRSNB, 3 sh. SMF, 2 sh. Natal Mus., leg. P. Bernard, 1985-87

Type locality: Port-Gentil, Gabon

Description: Shell rather small, 18-26 mm long, thick-shelled, equivalve, suboval to elongate-suboval, inflated. Beaks situated in the middle or just behind the middle of the anterior half of the valve. Anterior margin nearly semi-circular, posterior part of the valve tapering, with a rounded end. Postero-dorsal slope very slightly convex.

Exterior with 19-22 strong square radial ribs bearing prominent regularly close-set transverse bars. Lower part of the ribs only slightly broadening. Interspaces deep, with very fine irregular concentric threads in them.

Hinge plate broad, hinge in the right valve with a small narrow anterior cardinal, a very broad, prominent, triangular central cardinal and a long posterior cardinal, parallel to the posterior margin. Left valve with a strong anterior cardinal and a very strong, oblique posterior cardinal. Laterals with a very small anterior and posterior knob in each valve. Pallial line broadening towards posterior, with a very shallow depression directly in front of the posterior adductor scar. Inner margin of valves strongly dentate according to the external ornamentation.

Colour of valves very variable: dark brown with lighter transverse bars on the ribs and lighter interspaces, or white with all ribs completely or partly dark brown, white with brown spots or speckles on the ribs, entirely white or light brownish with whitish concentric bands on the ventral part. Periostracum thin, light yellowish grey. Interior reddish brown to dark brown with a narrow white band directly along the anterior and ventral margin. Hinge also white.

Measurements:

28.2 x 21.8 x 16.8	pt MNHN (Chevalier)
27.1 x 21.3 x 16.0	pt MNHN (Chevalier)
26.6 x 21.4 x 16.5	pt MNHN (Chevalier)
26.3 x 21.4 x 17.2	ht
25.3 x 19.1 x 15.7	ass. spm.
24.7 x 18.6 x 14.0	pt MNHN (Chevalier)
22.2 x 17.5 x 14.8	pt MNHN (Bernard)
22.1 x 17.0 x 13.8	pt SMF (Bernard)
20.6 x 16.6 x 14.4	pt SMF (Bernard)
20.6 x 16.2 x 14.2	pt ZMC (Bernard)
20.3 x 16.1 x 13.6	pt SMF (Bernard)
19.8 x 15.2 x 12.3	pt Natal Mus. (Bernard)
18.7 x 15.7 x 13.1	pt MNHN (Bernard)

Distribution: Senegal to northern Angola, Ilha do Principe.

Material examined: The type material. Senegal: Joal (no precision), 2 spm., 1 v., leg. Marche-Marchad, 1952, MNHN. Guinea-Bissau: border to Senegal (Casamance), Essoukoudiak Bôlon, 5-6 m, 1 v., leg. von Cosel, 7. III. 1988, MNHN; 12° 16' N, 16° 51.5' W, 11 m, 6 spm.; 12° 10.8' N, 16° 57.1' W, 10 m, 6 spm.; 12° 10.5' N, 16° 53' W, 12 m, 2 spm.; 12° 10' N, 16° 46.5' W, 8 m, 9 (4 juv.) spm.; 12° 05' N, 16° 44' W, 8 m, 11 (4 juv.) spm., all dredged R/V "André Nizery", leg. von Cosel, 23. IV. 1988, all MNHN. Guinea: W of I. Quito, 10° 00' N, 15° 36.5' W, 26 m, 5 v., in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 513, leg. von Cosel, 26. V. 1988, MNHN. Côte d'Ivoire: Abidjan region: 5° 07' N, 3° 22' W, 20 m, 5 v., dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 21. III. 1964; Abidjan region (no precision), 20 m, 2 sh., 1 v.; 30 m, 1 spm.; (no depth), 1 sh., 1 v., all dredged R/V "Reine Pokou", leg. Le Lœuff, 1966-72; Abidjan region (no precision), 1 v., leg. Marche-Marchad, all MNHN. Gabon: Port-Gentil (no precision), 1 sh., 10 v., ex colln. ORSTOM Pte.-Noire; Port-Gentil, sand, 3-6 m, several sh., leg. P. Bernard; off Port-Gentil, 0° 38' 25"S, 8° 46' E, 5 m, 1 v., dredged R/V "Calypso", Gulf of Guinea cruise 1956 sta. 56, leg. Marche-Marchad, 16. VI. 1956; "Anguille" oilfield, 0° 47.4' S, 8° 43.6' E, 25 m, 2 v., leg. Chevalier, 1980-89; Ile Banié, off Cap Esterias, 1 sh., 8 v., leg. P. Bernard, 1985-86, all MNHN. Angola: Palmeirinhas, Luanda province, 20-30 m, 2 spm., leg. Gofas, II. 1987, MNHN. Ilha do Principe: (no precision), 3 sh., colln. Fé-russac; Praia S. Antonio, 3 v., R/V "Calypso" Gulf of Guinea cruise 1956, sta. P22; between Pta. da Mina and Ilha Santa Ana, 10-12 m, 1 spm., 1 v., sta. P1; Baía de S. Antonio, 15 m, numerous v., sta. P14, all dredged R/V "Calypso", leg. Marche-Marchad, VI. 1956, all MNHN.

Biotope: in clean sand, from about 2-3 m to 30 m.

Derivatio nominis: The species is named after the Republic of Gabon, where the type locality is situated.

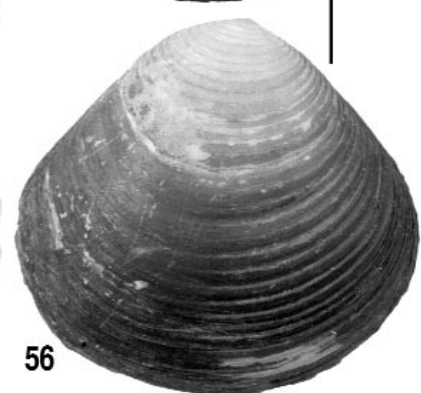
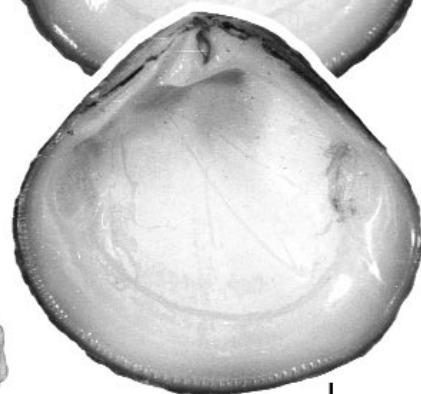
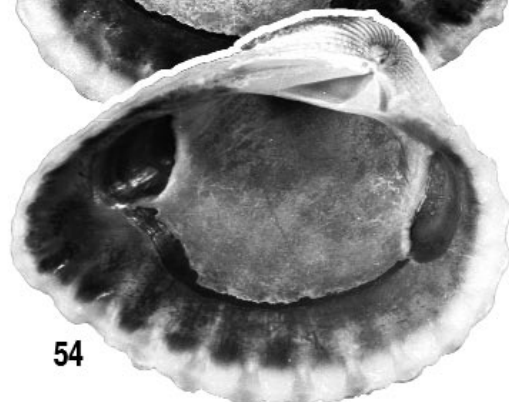
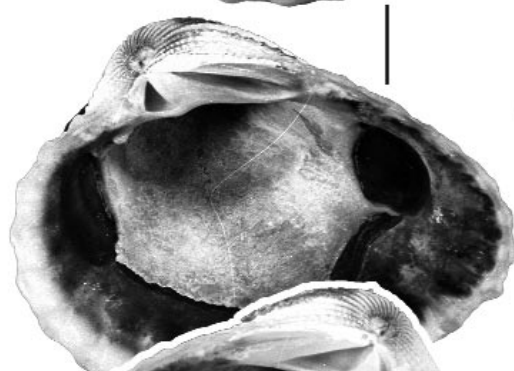
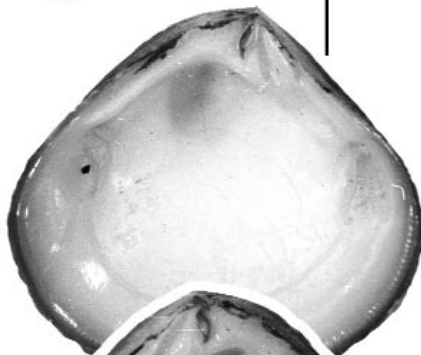
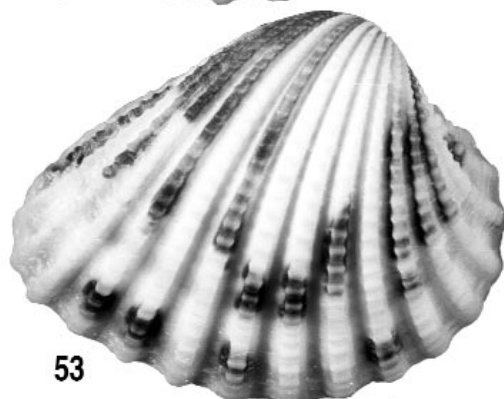
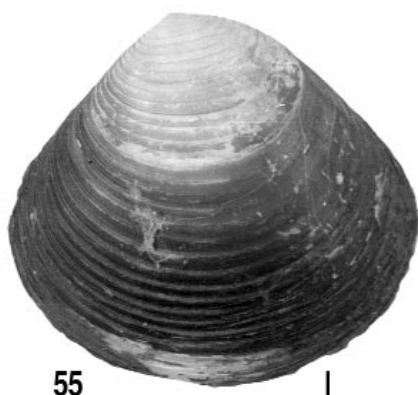
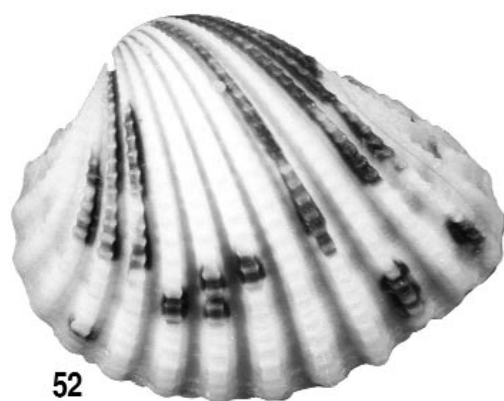
Remarks: This variable species is most close to *C. ajar* and to the preceding species, *C. obesa* n. sp. All three species form a species complex which is not always easy to understand and which must have derived from a common ancestor (the fourth species of *Cardiocardita*, *C. lacunosa*, is easily distinguished by its scaly ribs). Besides the well separable *C. obesa* population off Casamance, there are largely two morphs of *C. gabonensis*: the typical, rather elongate form from Gabon from shallow water with an often vivid brown, white colour pattern, and one mostly smaller and somewhat shorter form from Joal, Senegal, to Angola, which is predominantly whitish and which goes deeper, to 20-30 m.

From *C. obesa*, the new species differs mostly by the ribs: those of *C. gabonensis* n. sp. are sharper with a narrower base than the ribs of *C. obesa*. The smaller form of *C. gabonensis* has the same length/height ratio as *C. obesa* but the shells are usually less inflated with less bulbous beaks. A form from Côte d'Ivoire, whitish or with light brown speckles on the ribs, has about the same size, shell outline and nearly the same tumidity as *C. obesa*, but the ribs are typical of *gabonensis*.

C. ajar is larger and shorter, juvenile specimens are less tumid and have a higher posterior part with a much less pointed and more rounded posterior margin than *C. gabonensis* of equal size; the ribs, however, are more or less similar. *C. ajar* is confined to Mauritania

(Right page) Figures 52-54. *Cardiocardita gabonensis* n. sp., holotype, 26.3 mm, Port-Gentil, 52, 54: left valve; 53: right valve. Figures 55-56. *Crassatina alba* n. sp., holotype, 14.7 mm, S of Gorée, 95-98 m, 55: left valve; 56: right valve.

(Página derecha) Figuras 52-54. *Cardiocardita gabonensis* spec. nov., holotipo, 26,3 mm, Port-Gentil, 52, 54: valva izquierda; 53: valva derecha. Figuras 55-56. *Crassatina alba* spec. nov., holotipo, 14,7 mm, S de la Gorée, 95-98 m, 55: valva izquierda; 56: valva derecha.



and Senegal, but judging from a few available beach-worn samples, there seems to be a distribution pocket of that species in the zone of intermediate upwelling from Côte d'Ivoire to Togo. *C. gabonensis* has about the same outline as *C.*

lacunosa, but differs by its thicker shelled valves and the square ribs with broader tops. Moreover, the ribs of *C. lacunosa* bear scales. Both species overlap in their depth range, *C. gabonensis*, however, is confined to sandy bottom.

Family CRASSATELLIDAE

Genus *Crassatina* Kobelt, 1881

Crassatina alba n. sp. (Figs. 55-56)

Type material: Holotype MNHN, S of Gorée, Dakar, Senegal, 95-98 m, 1 live-collected spm., dredged R/V "Gérard Tréca", leg. Marche-Marchad, 18. II. 1954. Paratypes: same locality, 10 spm. MNHN, 1 spm. ZMC, 1 spm. IRSNB, 1 spm. SMF, 1 spm. IRSNB.

Type locality: Gorée, Dakar, Senegal.

Description: Shell small, 10-15 mm long, slightly variable in outline, rounded-trigonal, somewhat longer than high, with rounded anterior and posterior margin and markedly convex ventral margin, thick and solid, rather compressed. Beaks flat and slightly in front of the vertical midline.

Surface with numerous, close-set, regular, concentric ridges which become obsolete on the posterior part of the valves a bit behind the vertical midline. Lunule long and rather broad, escutcheon longer and narrower, not sharply delimited. Periostacum light greenish brown to darker brown, on the umbonal region often eroded.

Hinge in the right valve with a strong and long anterior cardinal which is nearly parallel to the anterior dorsal margin and continues as the lower anterior lateral; the upper (dorsal) anterior lateral nearly coincides with the antero-dorsal margin; posterior cardinal almost vertical, rather narrow, long and strong. Posterior lateral long and well developed, both laterals with very fine, dense, irregular transverse wrinkles or striae. Left valve with a long anterior cardinal and a long and very thin posterior cardinal; anterior and posterior laterals also well developed, with extremely faint transverse wrinkles, visible under a lens (x 20-30) only. Upper (dorsal) posterior lateral almost coinciding with the postero-dorsal margin, on its distal part

slightly separating from it. Resilifer behind the cardinals, narrow, not reaching the lower margin of the hinge plate. Pallial line without sinus. Inner margin of valves finely crenulate.

Exterior and interior entirely white.

Measurements:

14.7 x 13.5 x 8.0	ht
14.4 x 13.1 x 7.4	pt MNHN
13.7 x 12.3 x 6.1	pt ZMC
13.3 x 12.3 x 6.6	pt MNHN
12.8 x 12.0 x 7.0	pt MNHN
12.3 x 11.2 x 5.7	pt SMF
12.4 x 11.2 x 6.3	pt MNHN
11.6 x 10.5 x	pt MNHN
11.2 x 10.3 x 5.4	pt IRSNB
9.4 x 8.1 x 4.2	pt SMF

Distribution: Known from Mauritania (20° 34' N) to Senegal (Dakar region), with most material from around the Cap Vert Peninsula. A record from Ouidah, Bénin might be a mislabelling or mixture of samples, it remains doubtful and needs confirmation.

Material examined: The type material. Mauritania: off Cap Blanc, 20° 34' N, 17° 47' W, 90 m, 3 v., dredged R/V "Président Théodore Tissier", 1936; 18° 00' N, 16° 17' W, 50 m, 1 juv. sh., dredged R/V "N' Diago", sta. 259, leg. Richer de Forges, 1981, both MNHN. Senegal: Kayar, N of Dakar, 110-120 m, several old v.; Dakar region, 14° 50' 1"N, 17° 29' 3"W, 150 m, 3

old v., both dredged "Tenace", *leg.* Marche-Marchad, 6. IV. and 15. III. 1967; Dakar region, 14° 53' 5"N, 17° 30' 5"W, 230-205 m, 4 juv. spm., 5 juv. v.; 18. II. 1958; 14° 23' 5"N, 17° 24' 5"W, 65-70 m, 1 v.; 14° 22' N, 17° 32' W, 130-260 m, 1 spm., 24. I. 1958; Baie de Gorée, 170-200 m, several juv. v., 24. I. 1954; 80-250 m, 2 juv. spm., 14 juv. v., 20 II. 1956; off Gorée, 145-170 m, 1 spm., 1 v., 7. VI. 1955; S of Gorée, 65 m, 1 spm., 18. II. 1954; Dakar region, 129-150 m, 1 spm., 11 v., 24. I. 1958; 125-160 m, 2 spm., 14. II. 1958, all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad; S of Dakar (no precision), 150-200 m, 1 v.; Dakar region (no precision), 190-220 m, 1 juv. v., both *leg.* Marche-Marchad; S of Dakar, 14° 00' N, 17° 29' W, 200 m, grey medium sand, 1 spm., dredged R/V "Laurent Amaro", *leg.* Leung Tack, 17.-19. II. 1982, all MNHN. ?Bénin: Ouidah, 6° 10' N, 2° 05' W, 200 m, 6 spm., 2 v., dredged R/V "Léon Cour-sin", *leg.* Marche-Marchad, MNHN.

Biotope: In muddy sand and fine sand, well offshore, from 65 to 250 m.

Derivatio nominis: The name reminds the entirely white colour of this species.

Remarks: This species, which is restricted to the deeper shelf and beginning slope, is most close to *C. triquetra* (Reeve, 1842), the type species of the genus *Crassatina*, however, *C. alba* is much smaller, slightly more inflated and has a markedly convex ventral margin. It is also easily distinguished by its entirely white shell. MARCHE-MARCHAD (1958: 48) might have meant this species in listing "*Crassatella fusca* Kobelt, 1886"; however, the latter species is more elongate with more tapering posterior part and is coloured ("livid") on the inside (see KOBELT, 1886: 30-31, pl. 8, fig. 8).

Crassatina (s.l.) dakarensis n. sp. (Figs. 57-59)

Type material: Holotype MNHN, Dakar region (no precision), Senegal, 129-150 m, a live-collected spm., dredged R/V "Gérard Tréca", *leg.* Marche-Marchad, 24. I. 1958. Paratypes: same locality, 6 spm., 6 v. MNHN, 1 spm. ZMC, 1 spm., 1 v. IRSNB, 1 spm. SMF.

Type locality: Dakar, Senegal.

Description: Shell small, 6-8 mm long, subtrigonal, rather solid, inflated, slightly longer than high, with anterior margin narrowly rounded, posterior margin weakly angulate and ventral margin well convex. Beaks small, slightly in front of the vertical midline.

Surface with numerous, regular, close-set, concentric ridges which abruptly become obsolete on the posterior part, leaving only the growth lines and growth stages, the limit being a short distance behind the vertical midline. The ridges may reappear on the rounded posterior angle. Lunule long, rather broad, somewhat heart-shaped, escutcheon long and narrow, both not well delimited. Periostracum rather thin, light greyish brown.

Hinge in the right valve with a rather short anterior cardinal, almost parallel to the anterior dorsal margin

and continuing as the very long and narrow lower (ventral) anterior lateral which reaches nearly the anterior adductor scar; the upper (dorsal) anterior lateral nearly coincides with the antero-dorsal margin; posterior cardinal rather narrow, strong and curved with the lower part directed towards anterior. Posterior lateral narrow and long, reaching the posterior adductor scar. Left valve with a small but rather broad, slightly curved anterior cardinal and a thin, curved posterior cardinal; anterior and posterior laterals thin but well developed. Upper (dorsal) posterior lateral almost coinciding with the postero-dorsal margin. Resilifer behind the cardinals, small, not reaching the lower margin of the hinge plate. Pallial line without sinus. Inner ventral margin finely crenulate on about two thirds of its length, on the last third smooth.

Exterior white, greyish white or pale pink, interior with the same colouration. Occasionally a few ill-defined and only slightly darker spots on the escutcheon, sometimes visible also on the interior.

Measurements:

8.2 x 7.5	ht
8.0 x 7.3	pt MNHN
7.7 x 7.1	pt IRSNB
7.6 x 7.0	pt MNHN
7.6 x 6.7 x 4.2	pt MNHN
7.4 x 6.5	pt SMF
7.2 x 6.6	pt ZMC
6.2 x 5.8 x 3.2	pt IRSNB

Distribution: Known only from Senegal, both sides of the Cape Verde Peninsula

Material examined: The type material. Senegal: NW of Lompoul, 15° 38' N, 17° 00' W, 130 m, 2 spm., 2 v., *leg.* Marche-Marchad; off Lompoul, 150 m, 2 spm., dredged R/V "Louis Sauger", *leg.* Pin, IV. 1991; off Kayar, 110-120 m, 1 v., dredged "Tenace", *leg.* Marche-Marchad, 6. IV. 1967; off Kayar, 14° 53' 5" N, 17° 39' 5" W, 205-230 m, 5 v., 18. III. 1956; off Cap Vert Peninsula, 170-220 m, 1 juv. v..10. I. 1956; Dakar region (no precision), 129-250 m, 3 v., 24. I. 1858; Baie de Gorée, 80-250 m, several v., 20. II. 1956; 170-200 m, numerous v., 24. I. 1954; off Gorée, 14° 19' N, 17° 23' W, 78 m, several juv. v., 3. VI. 1955; off Gorée (no precision), 145-170 m, 7 juv. et adult spm., 1 sh., numerous v., 7. VI. 1955; S of Gorée, 65 m, numerous v.; 95-98 m, 1 spm., both 18. II. 1954; SW of Gorée,

150-250 m, 1 spm., 4 v., 10. I. 1956, all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad; S of Dakar (no precision), 150-200 m, 1 v.; Dakar region (no precision), 190-220 m, 4 v., both *leg.* Marche-Marchad, all MNHN.

Biotope: Most probably fine sand with mud, well offshore from 80-250 m, rarely shallower.

Derivatio nominis: The species is named after the type locality Dakar.

Remarks: The new species is smaller than *C. alba*, more triangular, thinner and more inflated, with smaller beaks, a comparatively narrow hinge plate and smaller hinge dentition. The cardinals are characteristically curved whereas those of *C. alba* are straight, the laterals of *C. dakarensis* are longer.

An isolated record of a live specimen from Mauritania (19° 24' N, 16° 46' W, 17 m) might refer to a close, undescribed species but more material is necessary for a proper taxonomic decision.

Another species very close to *C. dakarensis* is *Crassatina* (s.l.) *congoensis* (Jaekel and Thiele, 1932) (described as "*Astarte congoensis*") which is known only from the short coast strip from the mouth of the Congo River (44 m, dredged R/V "Valdivia") to Ambrizete, northern Angola (40-45 m) and of which very few specimens are known. *C. congoensis* is smaller than *C. dakarensis*, slightly higher in outline, has a more pronounced sculpture and is entirely white.

***Crassatina* (s.l.) *marchadi* n. sp. (Figs. 60-63)**

Astarte congoensis Jaekel et Thiele, 1932: - Marche-Marchad, 1958, *Catal. IFAN*, 14: 47.

Type material: Holotype MNHN, off Popenguine, Petite Côte, Senegal, 14° 36' N, 17° 27' W, 36 m, medium sand, dredged R/V "Laurent Amaro", *leg.* Leung Tack, 1981. Paratypes: same locality, 1 sh. SMF, 1 sh. ZMC, 1 spm. IRSNB, 6 v. MNHN (1 coated for scanning).

Type locality: Popenguine, Petite Côte, Senegal.

Description: Shell very small, 3.5-5 mm long, somewhat variable, high-trigonal, as long as high, rather solid, inflated

with anterior margin narrowly rounded, posterior margin weakly angulate and ventral margin well convex, in its middle

part slightly less convex. Beaks small, hardly in front of the vertical midline, markedly "hooked" towards anterior.

Surface with numerous, regular, pronounced, close-set, concentric ridges. Lunule rather broad, somewhat heart-shaped, escutcheon long and narrow, both not sharply delimited. Periostracum very thin, light straw coloured to nearly colourless, often eroded on the earlier part of the valves.

Hinge in the right valve with a rather short anterior cardinal, which may be slightly curved and which continues as the long and narrow lower anterior lateral; the upper (dorsal) anterior lateral nearly coincides with the antero-dorsal margin; posterior cardinal narrow but strong, markedly curved with the lower part directed towards anterior. Posterior lateral narrow and long, reaching the posterior adductor scar. Left valve with a strong and prominent, well curved anterior cardinal and a thin, equally curved posterior cardinal; anterior and posterior laterals thin but well developed. Upper (dorsal) posterior lateral almost coinciding with the postero-dorsal margin, however, on its distal part slightly separating from it. Resilifer behind the cardinals, small, not reaching the lower margin of the hinge plate. Pallial line without sinus. Inner ventral margin finely crenulate, on the posterior third crenulations gradually disappearing.

Exterior greyish white, pale pink or light brownish, rarely white, interior with the same colouration; valves occasionally somewhat translucent.

Measurements:

5.1 x 4.9	off Gorée
4.2 x 4.2	ht
3.9 x 3.8	Petite Côte
3.8 x 3.9	off Gorée
3.6 x 3.8	Petite Côte
3.5 x 3.5	pt MNHN
3.2 x 3.2	pt MNHN
3.1 x 3.2	pt SMF
2.8 x 2.9	pt ZMC
2.7 x 2.7	pt IRSNB

Distribution: Known only from Senegal, both sides of the Cape Verde

Peninsula, and one sample from Guinea.

Material examined: The type material. Senegal: off Kayar, 110-120 m, 1 v., dredged "Tenace", leg. Marche-Marchad, 6. IV. 1967; Dakar region, SW of Madeleines, 45-46 m, 1 v., 9. I. 1954; 47 m, 1 v., 9. X. 1954; 49-51 m, 2 v., 21. I. 1954; Seminole, 38 m, 3 v., 8. XII. 1953; S of Pointe Bel-Air, 9 m, 1 v., 18. I. 1954; Baie de Gorée (no precision), 10 v.; off Gorée, 50 m, 1 spm., 28 v., 5. VII. 1955; 145-170 m, 1 v., 7. IV. 1955; 170 m, 1 v., 7. VI. 1955; SW of Gorée, 150-250 m, 3 v., 10. I. 1956; S of Gorée, 38-42 m, 6 v., 27. X. 1953; 65 m, 2 v., 18. II. 1954, all dredged R/V "Gérard Tréca", leg. Marche-Marchad; Dakar region, 14° 09.2' N, 16° 57.3' W, 7 m, 1 spm.; 14° 11.9' N, 17° 09.5' W, 26 m, 1 spm., both dredged R/V "Laurent Amaro", leg. Leung Tack, 1983-84, all MNHN. Guinea: (no precision) in holothurian stomach, from 200-300 m, 2 v., leg. Delais, Marche-Marchad, III. 1953, MNHN.

Biotope: In fine sand from 7 to about 50 m, old valves found also deeper, to 200 m.

Derivatio nominis: This species is named after Igor Marche-Marchad, who already had recognized it. He worked contemporarily with M. Nicklès on West African marine molluscs and took many of the samples on which this paper is based.

Remarks: *C. marchadi* n. sp. is most close to *C. congoensis* with which it forms an allopatric species pair. *C. congoensis* has a slightly more convex ventral margin, the sculpture is less pronounced, and the valves are entirely white (see THIELE AND JAECKEL, 1931: 211, pl. 3, fig. 76).

From *C. dakarensis*, the new species is distinguished by its smaller size, the higher and still more trigonal outline, the stronger and continuous concentric striae, the small, forward-bent beaks, the still more curved cardinals and the

slightly shorter anterior laterals. In contrast to *C. dakarensis*, the valves are mostly coloured.

C. dakarensis, *C. marchadi* and *C. congoensis* are superficially resembling American small crassatellids of the genus *Crassinella* Guppy, 1874, however these

are different in being slightly inequivalve and having their beaks directed towards posterior (see ALLEN, 1969); the West African species are more inflated and have a denser sculpture. They are here placed in the genus *Crassatina* pending a more thorough examination.

Superfamily CARDIACEA

Genus *Fulvia* Gray, 1853

Fulvia fragilis congoensis n. ssp. (Figs. 64-66)

Type material: Holotype MNHN, Pointe-Noire, Congo, Plage Mondaine, on beach in beachdrift, a fresh empty shell, *leg.* von Cosel, XII. 1985. Paratypes: same locality, 4 sh., 3 v. MNHN; 1 sh., 2 v. ZMC; 1 sh., 2 v. IRSNB; 1 sh., 2 v. SMF; 1 sh., 2 v. Natal Museum.

Type locality: Pointe-Noire, Congo.

Description: Shell 35-50 mm long, variable in outline, rounded to short-oval, often somewhat oblique, slightly longer than high to as high as long, thin, very inflated. Beaks more or less before the vertical midline.

Surface with 32-38 smooth and not prominent, radial ribs which have the summit at their posterior side. No ribs on the part of the antero-dorsal area close to the beaks. Interspaces smooth and narrower than ribs. Periostracum greyish brown, forming fringes on the summits of the ribs, otherwise thin and translucent. Inner margin finely dentate corresponding to the ribs.

Hinge in the right valve with a very small anterior upper cardinal and a more prominent posterior lower cardinal. Left valve with a strong anterior lower cardinal and a very small poste-

rior upper cardinal. Laterals rather strong and thick, the dorsal laterals of the right valve are merely a broadening of the dorsal margin of the valve.

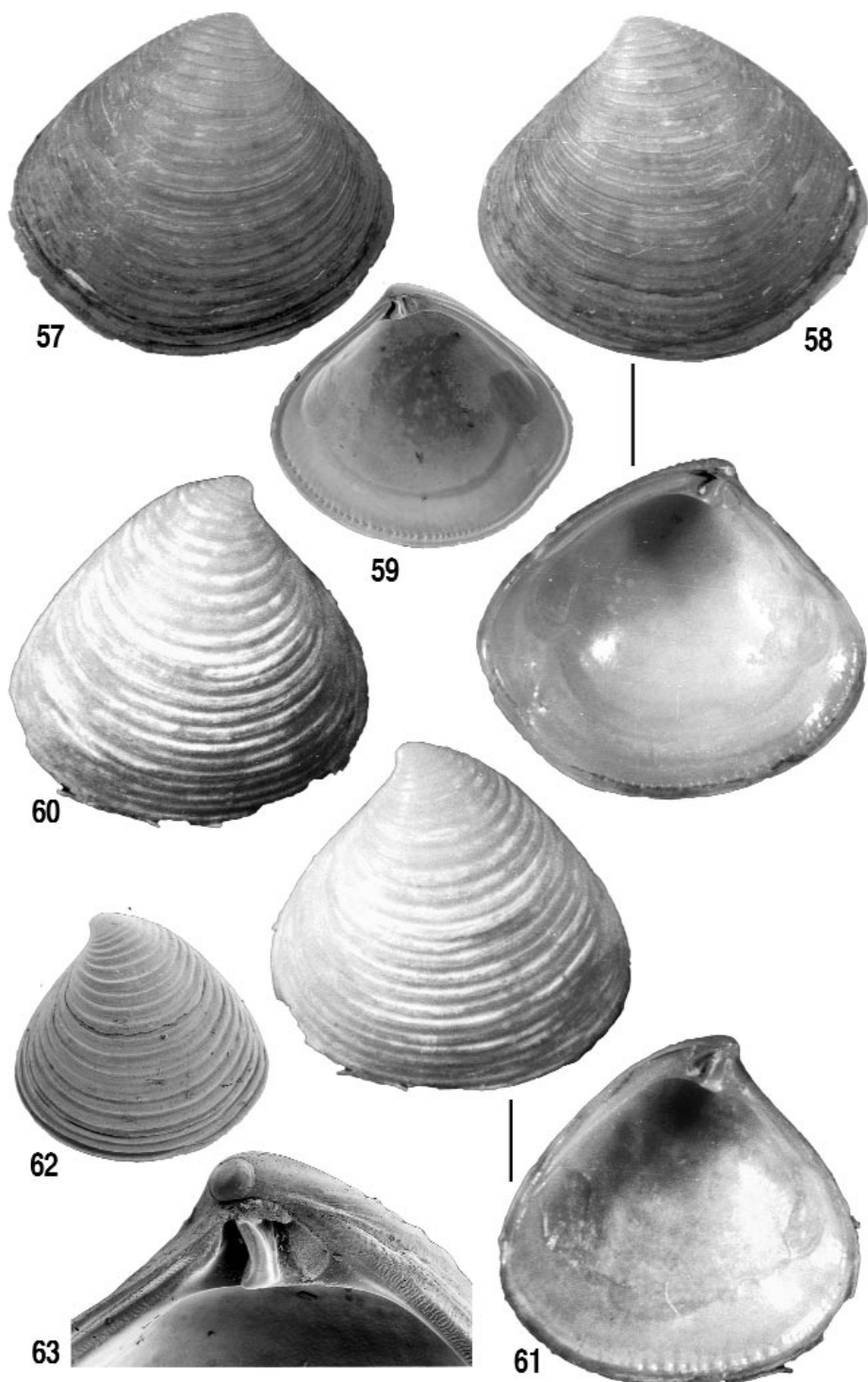
Exterior cream to pale yellowish, on the umbonal part often with pale fawn, horizontally arranged zigzag markings, umbos more or less tinged with purple. Interior white, often with yellow or reddish near the umbos. Dark, purplish red zones under the beaks, on the postero-dorsal margin below the ligament and along the posterior and postero-ventral margin, often extending to the middle and sometimes to the anterior half.

Measurements:

50.0 x 46.6 x 34.5	Bortianor Lagoon, Ghana
49.2 x 46.5 x 34.7	ht
45.2 x 45.2	Côte d'Ivoire

(Right page) Figures 57-59. *Crassatina* (s.l.) *dakarensis* n. sp., 57: holotype, 8.2 mm, Dakar region, 129-150 m, exterior of right valve; 58: holotype, left valve; 59: associated specimen, 7.4 mm, off Gorée, 145-170 m, dredged R/V "Gérard Tréca", 7. VI. 1955, MNHN, interior of right valve. Figures 60-63. *Crassatina* (s.l.) *marchadi* n. sp., 60: holotype, 4.2 mm, 14° 36' N, 17° 27' W, 36 m, exterior of right valve; 61: holotype, left valve; 62: paratype, 3.2 mm, same locality, exterior of left valve; 63: same specimen, hinge of right valve.

(Página derecha) Figuras 57-59. *Crassatina* (s.l.) *dakarensis* spec. nov., 57: holotipo, 8,2 mm, Dakar region, 129-150 m, exterior de la valva derecha; 58: holotipo, valva izquierda; 59: espécimen asociado, 7,4 mm, frente a Gorée, 145-170 m, dragado R/V "Gérard Tréca", 7. VI. 1955, MNHN, interior de la valva derecha. Figuras 60-63. *Crassatina* (s.l.) *marchadi* spec. nov., 60: holotipo, 4,2 mm, 14° 36' N, 17° 27' W, 36 m, exterior de la valva derecha; 61: holotipo, valva izquierda; 62: paratipo, 3,2 mm, misma localidad, exterior de la valva izquierda; 63: mismo espécimen, charnela de la valva derecha.



42.9 x 42.4	pt SMF
41.0 x 40.8	pt MNHN
38.5 x 36.3	pt Natal Museum
38.3 x 36.1 x 26.2	Bortianor Lagoon, Ghana
34.8 x 31.6 x 25.5	pt MNHN
32.8 x 30.5	pt MNHN
31.8 x 31.3 x 22.8	pt Natal Museum
31.5 x 30.2	pt MNHN
31.2 x 29.3 x 21.3	pt MNHN
21.8 x 20.1 x 14.2	Baia do Mussulo, Angola
18.8 x 17.6 x 12.6	Baia de Corimba, Angola

Distribution: Known from Côte d'Ivoire to northern Angola, but yet found only in a few isolated populations in Côte d'Ivoire, Ghana, the Congo and Northern Angola.

Material examined: The type material. Côte d'Ivoire: (no precision) 1 v., ex ORSTOM colln., MNHN. Ghana: Bortianor Lagoon, about 18 km W of Accra, 1 sh., Natal Museum. Congo: Pointe-Noire, Plage Mondaine, 1-3 m, muddy sand, 7 sh., 7 v.; 3-6 m, 7 juv. spm., 2 sh., 1 v.; 3-5 m, in the nets of fishermen, 8 sh.; in beach drift, numerous sh and v. (associated specimens), all MNHN. Angola: Ilha de Luanda, Luanda province, 40-60 m, 1 juv spm.; Baia de Corimba, Luanda province, 10-20 m, 3 juv., 1 half-grown spm.; Ponta do Mussulo, Luanda province, low water, 1 half-grown sh.; Palmeirinhas, Luanda province, 20-30 m, 1 juv. sh., all leg. Gofas, 1981-87, all MNHN.

Biotope: In muddy sand and fine sand, from just below low tide mark to about 10 m, mostly in calm bays and lagoons where it seems to tolerate somewhat reduced salinities.

Derivatio nominis: The subspecies is named after the Congo Republic where the type locality is situated.

Remarks: The West African populations of the Indian Ocean species *F. fragilis* (Forsskål, 1774) (Moçambique and Madagascar northward to the Red Sea and the Suez Canal) are separated from the Indian Ocean and Red Sea population as a geographic subspecies. The Indian Ocean population is commonly known as *Fulvia papyracea* (Bruguière, 1789), which, however, is a distinct species from the Philippine area. The taxonomy of the genus *Fulvia* is treated in detail by VIDAL (1994). The east African nominal subspecies *F. f. fragilis* grows larger (up to 75 mm) than *F. fragilis congoensis*, furthermore it differs by the still thinner valves, the slightly more numerous ribs (35-43), the more towards brownish-red tending colouration of often less intensity on the interior and the frequently somewhat less tapering posterior margin.

The species has most probably invaded the West African coast from the Indian Ocean around the Cape of Good Hope during the Eem interglacial or perhaps earlier; afterwards the populations became separate and continued developing independently. The present distribution pattern shows that the *Fulvia* survived on the West African coast only in isolated pockets with an adequate biotope. The records from Angola seem to represent only pseudo-populations: all recorded specimens were juveniles or half-grown and not capable of reproduction, and obviously larvae originating from the next stable "reservoir" (Pointe-Noire) arrive regularly at these localities during spring and summer, settle and start growing but before reaching maturity they die out because of the falling water temperatures in autumn and winter.

Family MACTRIDAE Genus *Mactra* Linné, 1767

Mactra micronitida n. sp. (Figs. 67-68; 154)

Mactra nitida (Spengler): - Dautzenberg, 1813, *Ann. Inst. Océanogr.*, 5 (3): 97 [partim].

Mactra nitida Spengler: - Nicklès, 1950, *Man. Ouest-Afric.*, 2: 209 [partim].

Mactra nitida (Spengler) Schroeter: - Nicklès, 1955, *Atlantide Rep.*, 3: 191 [partim].

Type material: Holotype MNHN, off Cap Skirring, Senegal, 12° 20.7' N, 16° 53.1' W, 15 m, fine muddy sand, a dried spm., dredged R/V "Louis Sauger", *leg.* von Cosel, 27. III. 1988. Paratypes: same locality, 19 mostly juv. spm., 1 v. MNHN, 1 spm. IRSNB, 2 juv. spm., 1 v. Natal Mus.; off Cap Skirring, 12° 22.5' N, 17° 03' W, 20 m, very fine muddy sand, 1 spm., 1 v. SMF, 1 spm. ZMC, all dredged R/V "Louis Sauger", *leg.* von Cosel, 27. III. 1988.

Type locality: Cap Skirring, Casamance, Senegal

Description: Shell 18-31 mm long, quite variable in outline, elongate-triangular, quite thin but solid, rather inflated. Anterior margin narrowly rounded to slightly pointed, posterior margin more or less pointed and slightly angulate, beaks slightly in front of the vertical midline.

Surface smooth, with numerous, very fine, regular, concentric ridges on the marginal half or one third of the valves, sometimes nearly completely missing. Lunular area and postero-dorsal slope with broader concentric ribs. A keel separates the postero-dorsal slope from the rest of the shell. Periostracum very light brownish grey to nearly colourless, thin and translucent, slightly bristly on the postero-dorsal keel.

Hinge in the right valve with two separate lamellar cardinals arranged in inverted V-shape. Left valve with two cardinals in inverted broad V-shape and fused dorsally; laterals short and strong. Rather small and deep triangular resilifer posterior to the cardinals. Pallial sinus almost horizontal, pointing to the lower part of the anterior adductor scar, rather narrow, terminating well behind beak level.

Interior and exterior uniform dirty white, interior dull.

Measurements:

28.1 x 20.2	ht
25.0 x 18.7	pt MNHN
24.0 x 17.4	pt SMF, 12° 22' N
23.3 x 16.9 x 10.5	pt MNHN
23.0 x 18.1 x 10.9	pt ZMC, 12° 22' N
22.4 x 16.2	Cotonou (IRSNB)
22.1 x 17.5 x 10.9	pt SMF, 12° 22' N
21.1 x 15.4	pt Natal Museum
21.0 x 17.6	Guinea-Bissau, dredged "André Nizery"
20.6 x 14.7 x 9.2	pt MNHN
18.9 x 14.0 x 8.9	pt IRSNB

16.3 x 12.1 x 7.7	pt Natal Museum
14.2 x 9.7 x 6.3	pt Natal Museum
7.6 x 5.6	Cotonou (IRSNB)

Distribution: Gambia to northern Angola (Cabo Ledo, S of Luanda); São Tomé, Ilha do Príncipe.

Material examined: The type material. Gambia: Fajara Beach, several v., *leg.* Knudsen, III. 1979, ZMC; Senegal: Casamance, Kafountine, on beach, 1 v.; Abéné-Kafountine, on beach, 1 v.; Karabane Bôlon, off Karabane, 6 m, 10 v; SE of Karabane, 3-4 m, 1 v; in creek off Elinkine, 3 m, several v.; S of Cap Skirring, 3-5 m, fine sand, 4 spm., several v.; Diembéring - Cap Skirring - Cap Roxo, in beachdrift, many v., all *leg.* von Cosel, 3.-17. III. 1988; off Cap Skirring, 12° 23' N, 16° 52.8' W, 13 m, several sh., 5 v.; 12° 20.7' N, 15° 53.1' W, 15 m, 1 juv. spm., several juv. v.; off Cap Roxo, 12° 20.7' N, 16° 53.1' W, 15 m, many spm. and v., all dredged R/V "Louis Sauger", *leg.* von Cosel, 27. III. 1988, all MNHN. Guinea-Bissau: border to Senegal (Casamance), Essoukoudiak Bôlon, low tide - 5 m, 2 v., *leg.* von Cosel, 7. III. 1988; shallow shelf between Rio Cacheu and Rio Geba, on 27 sta. between 12° 17' N and 11° 40.5' N and 16° 26' W and 17° 02.5' W, 8-20 m, numerous spm., sh. and v., all dredged R/V "André Nizery", *leg.* von Cosel, IV. and X. 1988; W of Ilha Caravela, Bissagos, 11° 35' N, 16° 34' W, 15 m, 6 v., dredged R/V. "André Nizery", *leg.* von Cosel, X. 1988, all MNHN. Guinea: SW of Iles Tristão, 10° 45' N, 15° 12' W, 13 m, 3 spm., 1 v., SEDIGUI sta. 788; W of Baie de Sangarea, 9° 42' N, 13° 50.2' W, 2 m, several v., SEDIGUI sta. 374 DW; W of Kabak Is., 9° 18, 13° 32.5' W, 10 m, 4 spm., SEDIGUI sta. 164 DW; W of Tannah Is., 9° 12' N, 13° 31.5' W, 10 m, 3 spm., SEDIGUI sta. 78 D; W of Sierra Leone

border, 9° 06' N, 13° 25.7' W, 7 m, 1 sh., SEDIGUI sta. 74 D; (more samples in the still unsorted SEDIGUI material), all dredged R/V "André Nizery", *leg.* von Cosel, V. and X. 1988; Conakry (no precision), 10 v., *leg.* Nicklès, 1947; "Sables de Conakry", many v., old colln.; Kaporo, NE of Conakry, muddy sand, low tide, 8 v.; Banc Crawford, Iles de Los, 4 v.; Roume Is., Iles de Los, on beach, 6 v.; off the beach, 1.5-2 m, very fine muddy sand, numerous sh. and v., all *leg.* von Cosel, V.-VI. 1988, all MNHN; W of Banc Crawford, Roume, Iles de Los, numerous v., 8. XII. 1909; Roume, Iles de Los, 10-20 m, several juv spm., 20. XII. 1909; Tamara, Iles de Los, near the wharf, 2 juv. spm., several v., 8. XII. 1909, all Mission Gruvel; Conakry (no precision), many v., *leg.* Lechatelier, 1892, Dautzenberg ex Lamothe colln.; Conakry, Anse de Boulbinet, 10 v., 6. XII. 1909; between Conakry wharf and Boulbinet lighthouse, numerous v., 7. XII. 1909; 4 miles SW of Conakry, soft mud (no depth), numerous v., 10. XII. 1909, all Mission Gruvel, all IRSNB. Liberia: Marshall, 12 m and beach, 2 v., R/V "Atlantide" sta. 53, ZMC; Little Bouton, 3 v.; Nana Kra, 4 juv. v.; Garrauee (Garroway), 1 v., all *leg.* Jullien, 1887, all IRSNB. Côte d'Ivoire: 1 mile off Victoria near Tabou, 19 m, 1 sh., 8 v., 3. III. 1887; Tabou, several mostly juv. v., both *leg.* Jullien, Dautzenberg colln., IRSNB; 4° 45' N, 6° 35' W, 30 m, 1 v.; 4° 56' N, 5° 58' W, 12 m, 1 sh., 2 juv. v.; 5° 09' N, 4° 39' W, 20 m, 7 spm., 7 v.; 5° 05' N, 3° 33' W, 30 m, 1 v.; 5° 07' N, 3° 22' W, 20 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, *leg.* Cherbonnier, III. 1964; 5° 09' N, 3° 48' W, 30 m, 2 juv. spm., 28. IX. 1966; 5° 07.7' N, 3° 48' W, 35 m, 1 juv spm., 29. IX. 1966; 5° 06.4' N, 3° 46.7' W, 36 m, 1 juv. spm.; off Bassam, 25 m, 1 juv. spm., 17. VIII. 1966; Abidjan region (no precision), three lots: 1, 1 and 2 sh., all dredged R/V "Reine Pokou", *leg.* Le Lœuff; Abidjan region (no precision), 2 spm., 1 v., *leg.* Marche-Marchad; 5° 03' N, 5° 25' W, 20-25 m, 1 v., dredged R/V "Calypso", Golfe de Guinée sta. 18, *leg.* Marche-Marchad, VI. 1956, all MNHN;

Grand Bassam, 12 m, several v., *leg.* Jullien, Dautzenberg colln.; off Grand Bassam 15 m, 1 v.; (no precision), several v., 23. I. 1910; Lagune Ebrié, 1 juv. v., 20. I. 1910, both Mission Gruvel, all IRSNB. Ghana: Addah, 1 v., Mission Gruvel, I. 1910, IRSNB; Cape St. Paul, 5° 45' N, 0° 57' E, 17 m, 2 v., fragments, dredged R/V "Atlantide", sta. 86, 31. I. 1946, ZMC. Bénin: Cotonou, on beach, 3 v., II. 1910; off Cotonou, 20-25 m, shell sand, many v., 1909-1910; Bouche-du-Roi, Grand Popo, on beach, 14 v., III. 1910, all Mission Gruvel, all IRSNB. Nigeria: 6° 06' N, 4° 29' E, 29 m, 2 v.; 5° 59' N, 4° 36' E, 17 m, 2 spm., 2 v.; 5° 34' N, 4° 50' E, 27-29 m, 2 spm., all dredged R/V "Atlantide", sta. 100, 101 and 102, 15-16. II. 1946, all ZMC. Cameroon: off Victoria, 4° 04' N, 9° 12' E, 11 m, several v., dredged R/V "Galathea", sta. 53; Victoria-Bota, 8-9 m, several spm. and v., dredged R/V "Galathea", sta. 61, both 1. XII. 1950, ZMC; Victoria/Limbe, beach Morton Bay, numerous v.; in front of beach, 1-2 m, 1 juv. spm., 1 sh.; Victoria/Limbe - Bota, 5-10 m, 13 spm., numerous v.; Wouri estuary - Cape Nachtigal, 3° 44' N, 9° 22' E, 13 m, 7 v., trawled "Campo Star", all *leg.* von Cosel, XI.-XII. 1985; Kribi, beach drift, 5 v., *leg.* von Cosel, IV. 1969; 3° 15' N, 9° 49' 54" E, 12 m, 1 sh., *leg.* Crosnier, XII, 1962, all MNHN. Gabon: Port-Gentil, "Anguille" oilfield, 0° 47.4' S, 8° 43.6' E, 25 m, 8 v., *leg.* Chevalier, 1981-89; "Village St. Denis", 1 sh., Jousseume colln., both MNHN; Iquela, 2° 03' S, 9° 05' E, 50 m, 4 v., dredged R/V "Atlantide", sta. 123, 5. III. 1946, ZMC. Congo: off Conkouati, 4° S, 10° 59' E, 19 m, several juv. v.; 4° 10' S, 11° 15' E, 19 m, 5 v., both trawled "Kounda"; Pointe-Noire, Plage Mondaine, beach drift, several v.; 1-5 m, 3 v.; Plage ORSTOM, beach drift, 1 v.; 5-6 m, 2 spm.; Plage Sauvage, beach drift, 1 v., all *leg.* von Cosel, XII. 1985, all MNHN. Zaïre: between Pointe Padrone and Shart Point, 25 m., 8 juv spm., 4 v., 4. V. 1910, Mission Gruvel, IRSNB; off Kipundji, 5° 56' S, 12° 07' E, 22-25 m, 3 juv. spm., 2 sh., 5 v., fragm., *leg.* Crosnier, 25.-26. VIII. 1965, MNHN. Angola: Cacucaco,

Bengo province, 0-5 m, 1 spm.; Cabo Ledo, Bengo province, 10-40 m, 4 spm., both *leg.* Gofas, 1982-84, MNHN; Baía de Lobito, Benguela province, on beach, 2 v., Mission Gruvel, 20. V. 1910, IRSNB. São Tomé: between Punta Oquedelrey and São Sebastião, 5 m, 3 v.; off Punta Oquedelrey, 6 m, 11 juv. spm., 3 juv. v., both dredged R/V "Calypso", Gulf of Guinea cruise, *leg.* Marche-Marchad, VI. 1956, MNHN.

Biotope: In slightly sandy mud to fine muddy sand, on open coasts and in sheltered bays, from shallow water (3-4 m) to about 15 m, rare in northern Casamance and Angola, more common to abundant under more tropical conditions, e.g. in southern Casamance, in the vast muddy areas off Guinea-Bissau and Guinea, and in Cameroon. The species seems to tolerate salinity changes in a certain amount. It is usually found together with *Nuculana montagui* (Gray, 1825), *Cardium costatum* Linné, 1758, *Macoma cumana* O. G. Costa, 1829, *Pitar tellinoidea* (Sowerby, 1851), *Corbula dautzenbergi* Lamy, 1941, *Nassarius obliquus* (Kiener, 1835).

Derivatio nominis: The name reminds the fact that this species had

always been identified as a small *M. nitida*.

Remarks: This species in the past has been mistaken for young *M. nitida* Spengler, 1786 as seen in the literature and on museum labels. Although NICKLÈS (1955: 192) remarked that his study material was nearly exclusively composed of juveniles "for reasons which escape me", he did not realize that a distinct species could be involved. However, in spite of its variability, *M. micronitida* is always distinguished by its smaller size, the longer pallial sinus, the more pointed anterior and posterior end, the dull interior and the external sculpture. Young *M. nitida* are much thinner and translucent, already glossy at the interior and have the smaller pallial sinus. Also the biotopes of the two species are entirely different: *M. nitida* inhabits coarser sand than the new species and requires normal salinity. *M. angolensis* is distinguished in being larger, more elongate, smooth and having the still longer pallial sinus. *M. micronitida* is the most common *Macra* in tropical West Africa, on certain beaches, valves are abundant and form a major part of the beachdrift. The species is an important indicator of the shallow water sandy mud bottom communities.

Macra angolensis n. sp. (Figs. 69-71; 153)

Macra nitida Spengler *var.*: - Dunker, 1853, *Index Moll. Guinean Inf. coll. Georgius Tams Med.*: 61, pl. 10, fig. 18-20.

Macra nitida (Spengler): - Dautzenberg, 1813, *Ann. Inst. Océanogr.*, 5 (3): 97 [partim].

Macra nitida Spengler: - Nicklès, 1950, *Man. Ouest-Afric.*, 2: 209 [partim].

Macra nitida (Spengler) Schroeter: - Nicklès, 1955, *Atlantide Rep.*, 3: 191 [partim].

Macra nitida Spengler: - Gofas, Pinto Alfonso and Brandão, 1985, *Conch. mol. Angola*: 138.

Type material: Holotype MNHN, Barra do Cuanza, N-Angola, in sand at low water, *leg.* Gofas, 1983, a fresh sh. Paratypes: same locality, 2 sh., 6 v., MNHN; Praia de Buraco, Palmeirinhas, Luanda province, 1 spm. ZMC, 1 spm. IRSNB, 1 spm. Natal Museum, 1 spm. Universidade Augustinho Neto, Luanda 1 spm. SMF, 4 spm. MNHN.

Type locality: Barra do Cuanza, Luanda province, N-Angola.

Description: Shell 45-70 mm long, slightly variable in outline, elongate, triangular-oval, thick to very thick and solid, moderately inflated. Anterior margin narrowly rounded, posterior

margin pointed and somewhat angulate, beaks in or very slightly in front of the vertical midline.

Surface with fine irregular growth lines, otherwise smooth, also on lunular

and escutcheon area with the exception of a few striae on the very early part of the valves. Postero-dorsal slope separated from the rest of the valve by a weak keel. Periostracum pale to dark greyish olive, in fully grown specimens mostly present only on the marginal and dorsal part of the valves.

Hinge in the right valve with two separate lamellar cardinals arranged in inverted V-shape and two anterior and two posterior laterals, both short and rather thick. Left valve with two cardinals in inverted V-shape and fused dorsally, one anterior and one posterior lateral, both short and rather thick. Deep triangular resilifer posterior to the cardinals. Pallial sinus very long for a *Macra*, narrow and horizontal, terminating just behind beak level.

Exterior white, occasionally with pale yellowish hue towards the umbos, interior dull, white.

Measurements:

56.1 x 37.0 x 23.6	ht
54.1 x 36.7 x 22.2	pt MNHN
52.2 x 35.2	pt MNHN
51.7 x 35.2	pt MNHN
47.4 x 33.0	pt MNHN
47.1 x 32.6 x 19.0	pt MNHN, Palmeirinhas
47.0 x 31.6 x 18.2	pt ZMC
46.4 x 32.1 x 19.3	pt SMF
45.5 x 32.0 x 18.4	pt Natal Museum
45.0 x 31.1 x 18.0	pt Univ. Luanda
43.7 x 30.7 x 18.7	pt IRSNB

Distribution: Congo (Pointe-Noire, valves only) to southern Angola (Moçâmedes).

Material examined: The type material. Congo: Pointe-Noire, Plage Mondaine, in beach drift, 5 old v., 2 broken v.; Plage ORSTOM, 5 m, 1 v., both *leg.* von Cosel, XII. 1985; Pointe-Noire region (no precision), 4 old v., colln. ORSTOM Pointe-Noire, all MNHN. Angola: Cabinda, 2 v., *leg.* C. R. Boettger, 1909; Cacuaco, Bengo province, 5-10 m, 1 v.; Barra do Dande, Bengo province, 0-2 m, numerous juv. spm.; Foz de Bengo, 0-2 m, fine sand, 1 juv. spm., all *leg.* Gofas, 1981-85, all MNHN; Baía de Lobito, Benguela province, 1 v., Mission Gruvel, VI. 1910; Baía de Benguela, on beach, 2 v., fragm., Mission Gruvel, 21. V. 1910, both IRSNB; Santo Antonio, Benguela province, 5-10 m, 1 juv. v.; Baía de Moçâmedes, 5-10 m, 1 juv. v., both *leg.* Gofas, both MNHN; Moçâmedes, on beach, 1 v.; Baía de Moçâmedes, 15-20 m, 1 juv. spm., 31. V. 1910, both Mission Gruvel, both IRSNB.

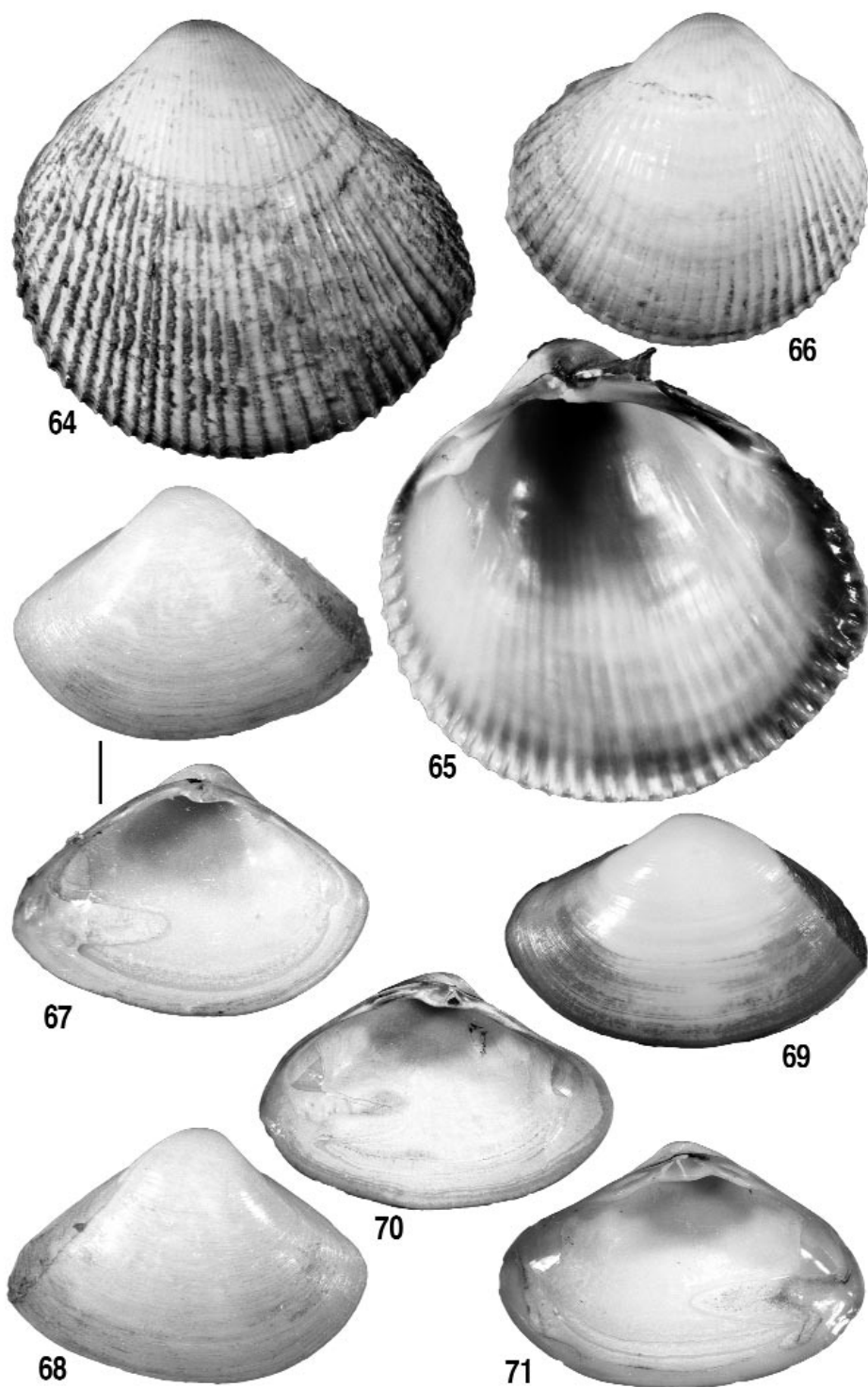
Derivatio nominis: The species is named after the Republic of Angola, the main distribution area.

Biotope: In clean fine and mixed sand, in shallow water (1-10 m).

Remarks: This species, which is locally quite common, has frequently been

(Right page) Figures 64-66. *Fulvia fragilis congoensis* n. ssp., 64: holotype, 49.2 mm, Pointe-Noire, Congo, exterior of left valve; 65: holotype, interior of right valve; 66: paratype, 34.8 mm, same locality, exterior of right valve. Figures 67-68. *Macra micronitida* n. sp., holotype, 28.1 mm, Casamance, 67: left valve; 68: exterior of right valve. Figures 69-71. *Macra angolensis* n. sp., 69: holotype, 56.1 mm, Barra de Cuanza, Angola, exterior of left valve; 70: paratype MNHN, 51.7 mm, same locality, interior of left valve; 71: paratype MNHN, 54.1 mm, same locality, interior of right valve.

(Página derecha) Figuras 64-66. *Fulvia fragilis congoensis* subsp. nov., 64: holotipo, 49,2 mm, Pointe-Noire, Congo, exterior de la valva izquierda; 65: holotipo, interior de la valva derecha; 66: paratipo, 34,8 mm, misma localidad, exterior de la valva derecha. Figuras 67-68. *Macra micronitida* spec. nov., holotipo, 28,1 mm, Casamance, 67: valva izquierda; 68: exterior de la valva derecha. Figuras 69-71. *Macra angolensis* spec. nov., 69: holotipo, 56,1 mm, Barra de Cuanza, Angola, exterior de la valva izquierda; 70: paratipo MNHN, 51,7 mm, misma localidad, interior de la valva izquierda; 71: paratipo MNHN, 54,1 mm, misma localidad, interior de la valva derecha.



mistaken for adult *M. nitida* (Spengler, 1786) and all Angolan records for *M. nitida* in fact refer to *M. angolensis*. Its different habitus has already been recognized by DUNKER (1853) without naming

it. *M. angolensis* is markedly more slender than *M. nitida*, it has a narrower and much deeper horizontal pallial sinus and lacks the concentric ridges on the antero- and postero-dorsal area.

***Mactra acutissima* n. sp. (Figs. 72-75; 155)**

Mactra nitida (Spengler): - Dautzenberg, 1813, *Ann. Inst. Océanogr.*, 5 (3): 97 [partim].

Mactra nitida Spengler: - Nicklès, 1950, *Man. Ouest-Afric.*, 2: 209 [partim].

Mactra nitida (Spengler) Schroeter: - Nicklès, 1955, *Atlantide Rep.*, 3: 191 [partim].

Type material: Holotype MNHN, Roume Is., Guinea, north side, fine sand, 1.5-2 m, leg. von Cosel, 29. V. 1988, a dried spm. Paratypes: same locality, 8 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Museum.

Type locality: Roume Is., Iles de Los, Guinea.

Description: Shell 15-27 mm long, slightly variable in outline, elongate-triangular, moderately thick and solid, rather inflated. Anterior margin pointed and angulate or very narrowly rounded, posterior margin pointed, with a rounded corner. Ventral margin with a weak sinuosity just in front of the posterior end. Beaks slightly anterior to the vertical midline.

Surface smooth, with numerous regular concentric ribs on the marginal half, occasionally also on earlier parts but sometimes restricted to the immediate marginal zone. Lunular area and postero-dorsal slope with broad concentric ribs which terminate on the keels delimiting the antero-dorsal area and the rounded postero-dorsal angle respectively. Shallow radial depression just in front of the posterior angle, not or hardly visible in juveniles. Periostracum light olive grey, thin and translucent, slightly bristly on the postero-dorsal angle.

Hinge in the right valve with two separate lamellar cardinals arranged in inverted V-shape. Left valve with two cardinals in inverted V-shape and fused dorsally; laterals short and strong. Rather small and narrow, deep triangular resilifer posterior to the cardinals. Pallial sinus long and narrow, markedly oblique and pointing upwards towards a point just posterior to the umbos.

Interior and exterior dirty white, interior more or less dull.

Measurements:

21.4 x 13.7	Grand Bassam (IRSNB)
19.5 x 13.1	Cotonou (IRSNB)
18.8 x 12.7	pt SMF
18.7 x 12.6	pt MNHN
18.5 x 11.9	pt MNHN
18.4 x 12.1	Grand Bassam (IRSNB)
16.7 x 11.0	pt IRSNB
16.6 x 11.1 x 7.3	ht
15.9 x 10.5	pt Natal Museum
15.8 x 10.4	pt MNHN
15.7 x 10.7	pt ZMC
15.5 x 10.5	pt MNHN
15.2 x 9.7	pt Natal Museum
14.8 x 9.7	pt IRSNB
14.6 x 9.7	pt SMF
14.5 x 9.5	pt ZMC
7.9 x 5.3	Cotonou (IRSNB)

Distribution: Gambia and Senegal (Casamance, Diembéring) to southern Angola (Lobito). Records on old museum labels from St. Louis (northern Senegal; MNHN) and Pt. Etienne (Nouadhibou, Mauritania; IRSNB) are doubtful and need confirmation.

Material examined: The type material. Gambia: Fajara Beach, 4 v., leg. Knudsen, III. 1979, ZMC; Guinea-Bissau: W of Ilha Caravela, Bissagos, 11° 35' N, 16° 34' W, 15 m, 2 v., dredged R/V. "André Nizery", leg. von Cosel, 10. X. 1988, MNHN. Guinea: Roume, Iles de Los, on beach, 5 v.; 1.5-2 m, numerous v.; Banc Crawford, 2 m, 1 v., both leg. von Cosel,

29. V. 1988, both MNHN; W of Banc Crawford, Roume, Iles de Los, 8 v., 8. XII. 1909; Roume, Iles de Los, 10-20 m, 2 juv. spm., 1 v., 20. XII. 1909; Tamara, Iles de Los, near the wharf, several v., 8. XII. 1909, all Mission Gruvel; Conakry (no precision), 3 v., *leg.* Lechatelier, 1892, Dautzenberg ex Lamothe colln.; Conakry, Anse de Boulbinet, 3 v., Mission Gruvel, 6. XII. 1909; 4 miles SW of Conakry, soft mud (no depth), numerous v., Mission Gruvel, 10. XII. 1909, all IRSNB. Liberia: off Monrovia, 11 m, 1 spm., 1 sh., 4 v.; off Marshall, 12 m, 1 spm.; 6° 05' N, 10° 25' W, 2-25 m, 1 v.; all dredged R/V "Atlantide" sta. 52, 53 and 54, 2-8. I. 1946, all ZMC; Watabo, 1 v.; Nana Kru, 1 v., both *leg.* Jullien, 1887, colln. Dautzenberg, both IRSNB. Côte d'Ivoire: Tabou, several mostly juv. v., *leg.* Jullien, 1887, IRSNB; Sassandra, 10 m, 1 juv. spm., 10. III. 1966; Abidjan region (no precision), 1 sh., both dredged R/V "Reine Pokou", *leg.* Le Lœuff; 4° 46' N, 5° 58' W, 12 m, 1 juv. v.; 5° 09' N, 4° 39' W, 20 m, 11 spm.; 5° 07' N:3° 22' W, 20 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, *leg.* Cherbonnier, III-IV. 1964, all MNHN; Grand Bassam, 12 m, 1 sh., numerous v., both *leg.* Jullien, colln. Dautzenberg; off Grand Bassam (no precision), several v., Mission Gruvel, 23. I. 1910, all IRSNB; Abidjan region (no precision), 2 sh., 5 v., colln. Marche-Marchad, MNHN. Ghana: Adadah, 1 v., Mission Gruvel, I. 1910, IRSNB; Cape St. Paul, 5° 45' N, 0° 57' E, 17 m, 3 spm., 2 v., dredged R/V "Atlantide", sta. 86, 31. I. 1946, ZMC. Bénin: Cotonou, on beach, 5 v., II. 1910; off Cotonou, 20-25 m, shell sand, many v., 1909-1910; off Cotonou (no precision), 1 spm., several v., II. 1910; Bouche-du-Roi, Grand Popo, on beach, 14 v., III. 1910, all Mission Gruvel, all IRSNB. Nigeria: Lagos, in the lagoon, 1 chipped v., *leg.* Madsen, 22. XII. 1927; 5° 59' N, 4° 36' E, 17 m, 1 v., dredged R/V "Atlantide", sta. 101, 15. II. 1946, both ZMC. Cameroon: Victoria/Limbe, Morton Bay, beach drift, 8 v., *leg.* von Cosel, 1-4. XII. 1985; Kribi, beach drift, 1 v., *leg.* von Cosel, IV. 1969, both MNHN. Gabon: Village St. Denis, 1 sh., colln. Jousseume, MNHN. Congo:

Pointe-Noire (no precision), 7 v., colln. Marche-Marchad; Pointe-Noire, Plage Sauvage, beach drift, 4 v.; Plage Mondaine, beach drift, numerous v.; 5 m, 1 v.; off plage ORSTOM, 3-6 m, several v.; Baie de Pointe-Noire, Songolo, 3-6 m, 1 juv. spm., 5 v., all *leg.* von Cosel, XI-XII. 1985, all MNHN. Zaïre: Congo estuary near Banana, 1 spm., 2 v., Mission Gruvel, IV. 1910, IRSNB. Angola: Palmeirinhas, Luanda province, 20-30m, 2 juv. v., *leg.* Gofas, II. 1987, MNHN; Baia de Lobito, Benguela province, on beach, 1 v., Mission Gruvel, 20. V. 1910, IRSNB.

Biotope: In fine slightly muddy sand on open coasts and in sheltered areas, from shallow water (1.5 m in calm water) to about 15 m, not overall common.

Derivatio nominis: The name reflects the sharp anterior and posterior ends of the valves, in comparison to other Mactridae.

Remarks: Like the preceding species, *M. acutissima* was previously placed with young *M. nitida* and nearly all studied samples were mixed samples of *M. acutissima* and *M. micronitida*. The new species is distinguished from *M. micronitida* by the more elongate shell with the sharply pointed anterior corner and the long pallial sinus which is not horizontal but which characteristically points markedly upward to just behind the beaks (see Fig. 155). Also in certain specimens of *M. micronitida*, the pallial sinus can be quite long and point slightly upwards, but here, the dorsal limb of the sinus is always horizontal, its prolongation points to the anterior end of the valve, whereas in *M. acutissima*, it points towards the upper half of the antero-dorsal margin.

Globally, *M. acutissima* is slightly less common than the preceding species, however, in certain areas it can be likewise abundant, and it is the second common *Mactra* in tropical West Africa. The species inhabits more clean sandy sediment than *M. micronitida*, but occasionally the two species co-occur in

the same habitat as their sediment preferences overlap; their valves are frequently found together in the beach

drift. *M. acutissima* seems to have less tolerance for salinity changes than *M. micronitida*.

***Mactra (?Mactrinula) inconstans* n. sp. (Figs. 76-78; 156)**

Mactra nitida (Spengler): - Dautzenberg, 1813, *Ann. Inst. Océanogr.*, 5 (3): 97 [partim].

Mactra nitida Spengler: - Nicklès, 1950, *Man. Ouest-Afric.*, 2: 209 [partim].

Mactra nitida (Spengler) Schroeter: - Nicklès, 1955, *Atlantide Rep.*, 3: 191 [partim].

Type material: Holotype MNHN, Praia de Buraco, Palmeirinhas, N-Angola, in sand at peak tide low water, *leg.* Gofas, 1984, a dried spm. Paratypes: same locality, 5 spm., MNHN, 1 spm. ZMC, 1 spm. IRSNB, 1 spm. SMF, 1 spm. Natal Museum.

Type locality: Praia de Buraco, Palmeirinhas, N-Angola.

Description: Shell 15-22 mm long, extremely variable in outline, shape and situation of the umbos, suboval to subtriangular, exceptionally thin and fragile, inflated to very inflated. Anterior margin broadly rounded, posterior margin pointed and more or less angulate, ventral margin often with a very weak sinuosity just in front of the posterior end. Beaks slightly to well behind the vertical midline, occasionally in the middle.

Surface smooth, with fine irregular growth lines, no particular sculpture. Antero-dorsal area with a faintly delimited lunule, posterior angle forming a more or less sharp keel. Periostracum pale yellowish to nearly colourless, thin and translucent, bristly on the posterior keel.

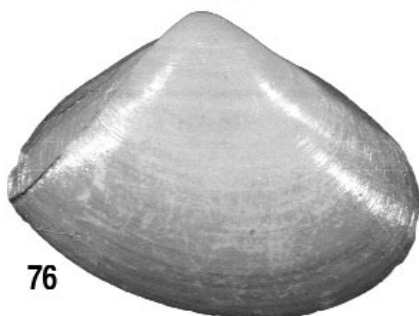
Hinge dentition extremely complicated: hinge plate consisting of a conspicuous submarginal lamina reaching from

the anterior to the posterior lateral, broadest under the beaks, above which the hinge teeth are situated. Right valve with two lamellar separated cardinals; left valve with two fused cardinals in inverted V-shape. Resilifer triangular, only partly fused with the submarginal lamina.

Laterals laminar, blade-shaped; the single laterals in the left valve and the ventral laterals in the right valve very long (in prolongation of the submarginal lamina), reaching the anterior and posterior adductor scars, with the summit about in their middle. Dorsal laterals of the right valve with only half the length, rather narrow and protruding from the shell wall, distally ending abruptly at their summit. Anterior lateral of the left valve and ventral anterior lateral of the right valve with their proximal part fused to an accessory

(Right page) Figures 72-75. *Mactra acutissima* n. sp., 72: holotype, 16.6 mm, Rroume Island, Guinea, exterior of right valve; 73: paratype MNHN, 18.7 mm, same locality, exterior of left valve; 74: paratype MNHN, 18.5 mm, same locality; 75: paratype MNHN, 15.5 mm, same locality. Figures 76-78. *Mactra inconstans* n. sp., 76: holotype, 22.3 mm, Palmeirinhas, Angola, exterior of right valve; 77: holotype, interior of left valve; 78: specimen from SEDIGUI 367, 16.5 mm, right valve (note entirely different form; there exist all kinds of intermediates) figure 79. *Raeta senegalica* n. sp., holotype ANSP, 22.2 mm, Banana, Zaïre, right valve.

(Página derecha) Figuras 72-75. *Mactra acutissima* spec. nov., 72: holotipo, 16,6 mm, Rroume Island, Guinea, exterior de la valva derecha; 73: paratipo MNHN, 18,7 mm, misma localidad, exterior de la valva izquierda; 74: paratipo MNHN, 18,5 mm, misma localidad; 75: paratipo MNHN, 15,5 mm, misma localidad. Figuras 76-78. *Mactra inconstans* spec. nov., 76: holotipo, 22,3 mm, Palmeirinhas, Angola, exterior de la valva derecha; 77: holotipo, interior de la valva izquierda; 78: especimen de SEDIGUI 367, 16,5 mm, valva derecha (nótese la forma completamente diferente; existen todo tipo de formas intermedias). Figura 79. *Raeta senegalica* spec. nov., holotipo ANSP, 22,2 mm, Banana, Zaire, valva derecha.



lamella which itself is fused with its proximal end to the dorsal side of the anterior cardinal. Posterior laterals proximally disappearing under the support of the resilifer.

Pallial sinus short, small and about semicircular, terminating well behind beak level.

Valves entirely white.

Measurements:

22.3 x 15.8	ht
22.2 x 14.5	pt MNHN
19.2 x 13.7	pt MNHN
19.2 x 12.4	Casamance
18.2 x 13, 1	pt Natal Museum
18.3 x 13.2	pt MNHN
16.5 x 11.5	SEDIGUI sta. 367
16.3 x 11.3 x 7.2	pt ZMC
16.2 x 13.6	Abidjan ("Rafale")
16.1 x 11.5 x 7.1	pt SMF
15.1 x 10.6 x 6.6	pt IRSNB
13.8 x 10.1 x 6.2	pt Natal Museum

Distribution: Mauritania (Cap Blanc) to Guinea; Côte d'Ivoire; Zaïre to southern Angola (Moçâmedes). There are no records known from Sierra Leone and Liberia, as well as from Nigeria to Gabon.

Material examined: The type material. Mauritania: Port Etienne (now Nouadhibou), 20° 20' N, 16° 22' W, 10 m, Mission Pt. Etienne 1965, *leg.* Marche-Marchad, 8. V. 1965; SW of Nouakchott, 17° 54' N, 16° 04' W, 10 m, 1 v., "N' Diago" sta. 253; 17° 36' N, 16° 11' W, 24 m, 1 spm., "N' Diago" sta. 213; NW of Tiguent, 17° 24' N, 16° 05' W, 14 m, 1 spm., "N' Diago" sta. 189, all dredged R/V "N' Diago", *leg.* Richer de Forges, 1981, all MNHN. Senegal: N of Kayar, 15° 12' N, 15° 54' 8" W, 25 m, 1 spm., 6 v., dredged "Tenace", 6. IV. 1967, *leg.* Marche-Marchad; off Casamance, many spm and v. from 20 sta. between 13° 03' N and 12° 23' N and 16° 58.8' W and 17° 29.9' W, 13-45 m, all dredged R/V "Louis Sauger", *leg.* von Cosel, III. 1988, all MNHN. Guinea-Bissau: S of Bissagos, 10° 22' N, 16° 22' W, 41-45 m, 1 v., dredged R/V "Atlantide", sta. 44, 17. 12. 1945, ZMC. Guinea: W of Foulaya, 10° 18' N,

15° 42.5' W, 26 m, 1 spm., 1 v., SEDIGUI sta. 630; 10° 18' N, 15° 57.5' W, 26 m, 1 v., SEDIGUI sta. 625; Cap Verga, 10° 13' N, 14° 45.5' W, 17 m, several v.; W of Ouendi, 9° 54' N, 14° 36.5' W, 24 m, 1 v., SEDIGUI sta. 471; W of Konebomby Is., 9° 48' N, 14° 02' W, 13 m, 3 v., SEDIGUI sta. 379; 9° 45' N, 14° 01' W, 14 m, 3 v.; W of Baie de Sangarea, 9° 42' N, 14° 02' W, 13 m, 3 v., SEDIGUI sta. 370; 9° 42' N, 14° 08' W, 17 m, 1 v. SEDIGUI sta. 368; 9° 41.5' N, 14° 11' W, 17 m, 1 v., SEDIGUI sta. 368, all dredged or taken by bottom grab R/V "André Nizery", *leg.* von Cosel, V. and X. 1988; Roume, Iles de Los, 1.5-2 m, several juv. and adult sh., *leg.* von Cosel, 29. V. 1988, all MNHN; W of Rio Morébaya, 9° 23' N, 15° 07' W, 30-34 m, 1 v., fragments, dredged R/V "Atlantide", sta. 45, 18. XII. 1945, ZMC. Côte d'Ivoire: 1 mile off Victoria near Tabou, 19 m, 5 v., 3. III. 1887; Tabou, several mostly juv. v.; Grand Bassam, 12 m, 1 v., all *leg.* Jullien, colln. Dautzenberg, all IRSNB; Sassandra, 4° 38' N, 6° 18' W, 80-90 m, 1 spm., dredged R/V "Atlantide", sta. 68, 12. I. 1946, ZMC; Jacquenville-Vridi, 20 m, 1 juv. v.; Bassam, 25 m, 1 spm.; Abidjan region (no precision), 3 spm., all dredged R/V "Reine Pokou", *leg.* Le Lœuff, 1966-67; 5° 09' N, 4° 39' W, 20 m, 1 spm., 4 v., fragm.; 5° 07' N, 3° 22' W, 20 m, several spm. and v.; 5° 06' N, 4° 38.5' W, 50 m, 2 v.; 5° 04' N, 5° 18' W, 30 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, *leg.* Cherbonnier, IV. 1964; 5° 03' N, 5° 25' W, 20-25 m, 1 v., dredged R/V "Calypso", Gulf of Guinea cruise, sta. 18, *leg.* Marche-Marchad, VI. 1956, all MNHN; Ghana: off Tema, 30 m, 10 v., *leg.* J. Edmunds, 1969; Addah, 5° 32' N, 0° 38' E, 50 m, 1 v., dredged R/V "Atlantide", sta. 85, 30. I. 1946, both ZMC. Congo: Pointe-Noire, Plage ORSTOM, 3-4 m, fine sand and gravel, 1 v., *leg.* von Cosel, XII. 1985, MNHN. Zaïre: between Pointe Padrone and Shart Point, 25 m, 1 v., 4. V. 1910, Mission Gruvel, IRSNB; off mouth of Congo river, 6° 02' S, 12° 20' E, 12 m, 3 v., dredged R/V "Atlantide", sta. 129, ZMC; 6° 06.0' S, 12° 07.6' E, 30 m, 4 v., "Meteor" M6-6, Sta. 1004-2, *leg.* Fürsich, Paleo. Inst. Univ. Würzburg (Germany), to be deposited in SMF. Angola: Ambri-

zete, 7° 19' S, 12° 40' E, 47 m, 1 v., dredged R/V "Atlantide", sta. 133, 16. III. 1946, ZMC; Moçâmedes, Moçâmedes province, 0-6 m, 1 juv. spm., leg. Gofas, 1981-82, MNHN.

Biotope: In fine, slightly muddy sand or clean fine sand, also with shells and shell debris, from shallow water (1.5-5 m, sheltered areas) to 50 m.

Derivatio nominis: The name reflects the different shell forms within the species.

Remarks: Valves of this new species were also occasionally encountered in mixed samples with *M. acutissima* and *M. micronitida*. However, *Maetra inconstans* is easily distinguished by its much thinner and fragile shell, the different shape of the lateral hinge teeth and the short and rounded pallial sinus. The species is characterized by its extreme variability. Within populations from clean sandy bottom in 20-40 m it seems

to be quite stable, however, in shallower water (1.5-20 m) the different forms seem to occur together with intergrades in the same population. Generally, a higher form with posterior-situated beaks, broad posterior part, convex postero-dorsal margin and sharp posterior keel from the deeper water and a somewhat smaller, slightly more elongate form with more median beaks, more pointed posterior part, more or less straight postero-dorsal margin, and a less developed posterior keel can be distinguished. However, the presence of all kinds of intermediate forms do not allow the separation into two species.

The peculiar hinge dentition suggests a placement of this species in a different subgenus or genus. A comparable hinge teeth arrangement is found in *Maetrinula* Gray, 1853, however, the shell form is different, and the type species has a pronounced concentric sculpture. In lack of a comprehensive worldwide revision, I leave this species in *Maetra s.l.* for the moment.

Genus *Raeta* Gray, 1853

Raeta senegalica n. sp. (Figs. 79; 157)

Maetra senegalensis Philippi, 1849: - Reeve, 1854, *Conch. Icon.*, 8: pl. 21, sp. 120.

Standella senegalensis (Philippi, 1849): - Dautzenberg, 1913, *Ann. Inst. Océanogr.*, 5 (3): 97.

Standella senegalensis Philippi: - Nicklès, 1947, *Catal. IFAN*, 1: 20; Nicklès, 1950, *Man. Ouest-Afric.*, 2: 210.

Standella senegalensis Philippi, 1849: - Marche-Marchad, 1958, *Catal. IFAN*, 14: 53.

Type material: Holotype in ANSP, Banana, Zaïre, 1 sh., leg. American Museum Nat. Hist. Congo Expedition, 1915. Paratypes: same locality, 16 v, ANSP, MNHN (2 v.).

Type locality: Banana, Zaïre.

Description: Shell 15-25 mm long, elongate-oval, extremely thin and fragile, moderately inflated, posterior end compressed. Anterior margin well rounded, posterior end somewhat pointed, with a weak corner. Beaks slightly in front of the vertical midline.

Surface with strong, broad subconcentric waves which are reproduced on the interior and which are slightly diverging from the very fine, regular, concentric growth lines. Periostracum very thin and nearly colourless to light brown.

Muscle impressions and pallial line often hardly visible.

Hinge plate with a short submarginal lamina reaching from the anterior to the posterior lateral. Right valve with two lamellar separated cardinals; left valve with two rather strong fused cardinals in inversed V-shape. resilifer rather large, triangular, entirely fused with the submarginal lamina.

Laterals laminar, the single laterals in the left valve and the ventral laterals in the right valve very long (in prolongation

of the submarginal lamina), reaching above the anterior and posterior adductor scars, with the summit very close to the beaks. Dorsal laterals of the right valve very short, especially the anterior one, rather narrow and protruding from the shell wall, distally ending abruptly at their summit. Anterior lateral of the left valve separate from the anterior cardinal but nearly parallel to it with high summit close to it. Ventral anterior lateral of the right valve with its proximal part fused via a hardly discernible accessory lamella with the small anterior cardinal.

Pallial sinus rounded, terminating at the vertical midline but not reaching beak level.

Shell white and somewhat translucent.

Measurements:

25.1 x 16.5	pt ANSP, Banana
23.8 x 15.2	pt ANSP, Banana
23.1 x 15.5	pt ANSP, Banana
22.2 x 14.6	ht, Banana
18.2 x 11.7	pt ANSP, Banana
17.7 x 12.2	pt ANSP, Banana
16.8 x 10.8	pt ANSP, Banana
13.3 x 8.8 x 5.3	pt ANSP, Banana

Distribution: Senegal (Casamance) to northern Angola (Cabinda).

Material examined: The type material. Senegal: Casamance, Fleuve Casamance, Ziguinchor, 3-5 m, 1 fragm., leg. von Cosel, 19. III. 1988, MNHN. Angola, Cabinda: Nemlão, in brackish water, 1 sh., 1 v., leg. C.R. Boettger, 1909, MNHN. Zaire: Banana (no precision), several sh.

and v., leg. American Museum Congo Expedition 1915, ANSP 277094.

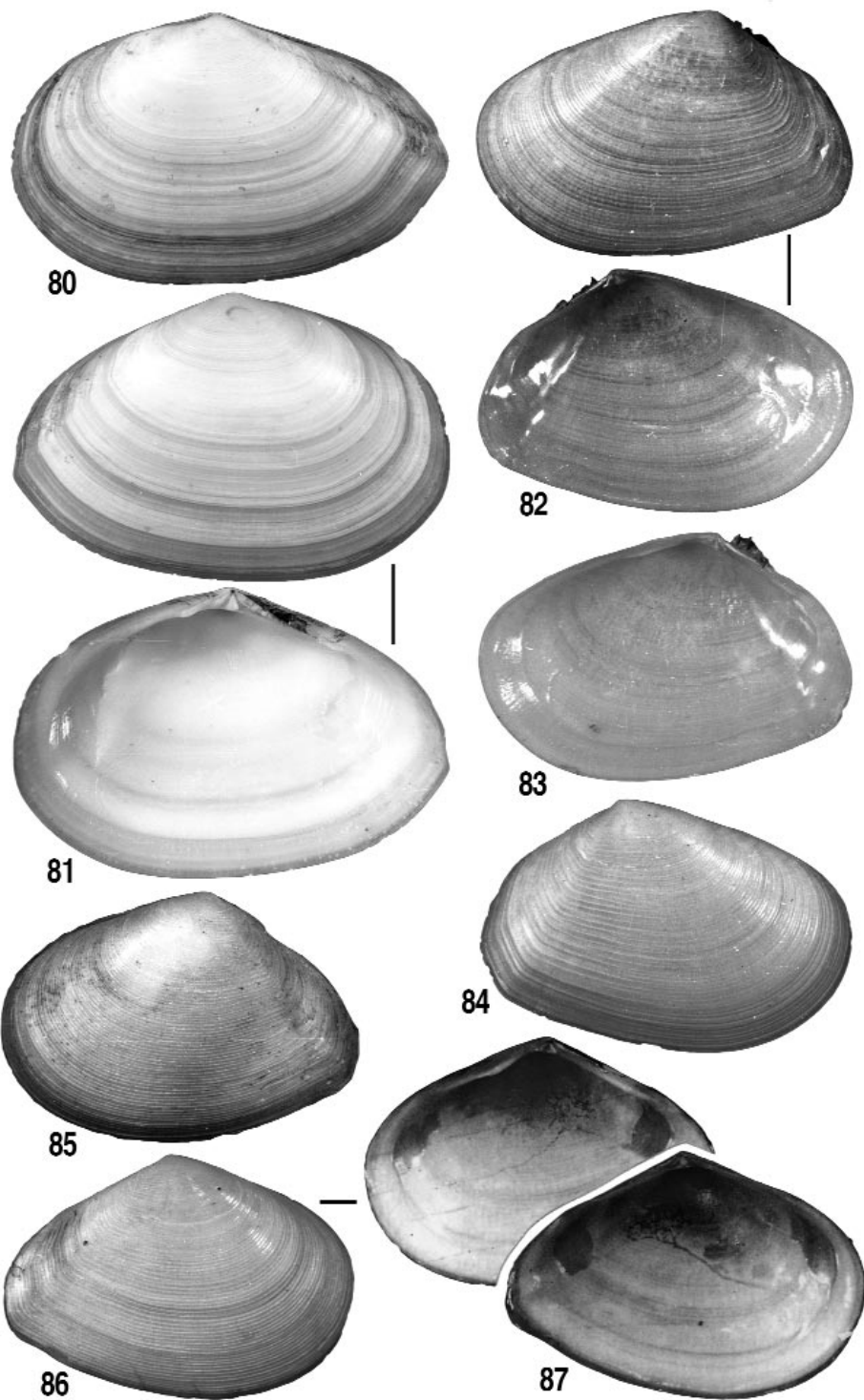
Biotope: Unknown but most probably mud or slightly sandy mud, in shallow water, mostly in mangrove areas. The species is rare, and due to its habitat and the fragility of the shell, complete specimens are extremely difficult to obtain. It seems to tolerate reduced salinity.

Derivatio nominis: Although Senegal is not type locality, the name reflects the fact that this species was long known as "*Standella senegalensis* (Philippi, 1849)" among biologists dealing with West African material and that the southern part of Senegal lies still within the distribution area.

Remarks: Philippi's original description of *Macra senegalensis* without figure (PHILIPPI, 1849: 27) does not coincide with this species but more with a juvenile *Macra glabrata* Linné, 1767. REEVE (1854, sp. 120) cites Philippi's name with reference but his description and figure refer to the species here described; subsequent authors refer to Reeve in citing this species under Philippi's name. The placement of the species in *Raeta* is not definitive but might still change in a worldwide revision of the family. *Standella* Gray, 1853 into which this species had been frequently placed, is entirely different, the type species being the West African *Spisula* (*Standella*) *nivea* (Gmelin, 1791) (= *Macra* (*Standella*) *striatella* Lamarck, 1818).

(Right page) Figures 80-81. *Tellina* (*Peronaea*) *planata afroccidentalis* n. ssp., holotype, 63.2 mm, Casamance, 80: exterior of left valve; 81: right valve. Figures 82-84. *Tellina* (*Moerella*) *boucheti* n. sp., 82: holotype, 11.2 mm, SEDIGUI 513, left valve; 83: holotype, interior of right valve; 84: paratype, 10.1 mm, SEDIGUI 730, exterior of right valve. Figures 85-87. *Tellina* (*Moerella*) *bertrandi* n. sp., 85: holotype, 12.7 mm, Pointe-Noire, exterior of left valve; 86: paratype, 12.8 mm, Pointe-Noire, right valve; 87: same specimen, interior of left valve.

(Página derecha) Figuras 80-81. *Tellina* (*Peronaea*) *planata afroccidentalis* subspec. nov., holotipo, 63,2 mm, Casamance, 80: exterior de la valva izquierda; 81: valva derecha. Figuras 82-84. *Tellina* (*Moerella*) *boucheti* spec. nov., 82: holotipo, 11,2 mm, SEDIGUI 513, valva izquierda; 83: holotipo, interior de la valva derecha; 84: paratipo, 10,1 mm, SEDIGUI 730, exterior de la valva derecha. Figuras 85-87. *Tellina* (*Moerella*) *bertrandi* spec. nov., 85: holotipo, 12,7 mm, Pointe-Noire, exterior de la valva izquierda; 86: paratipo, 12,8 mm, Pointe-Noire, valva derecha; 87: mismo espécimen, interior de la valva izquierda.



Family TELLINIDAE

Within this family, numerous genera and subgenera have been proposed, but, apart from the arrangement by AFSHAR (1969), which is not followed here, a modern and comprehen-

sive supraspecific revision of the family does not exist. Herein, the systematics of KEEN (1969) is followed, grouping most taxa as subgenera of *Tellina*.

Genus *Tellina* Linné, 1758
Subgenus *Peronaea* Poli, 1791

Tellina (Peronaea) planata afroccidentalis n. ssp. (Figs. 80-81)

Type material: Holotype MNHN, Casamance (no precision), 10-20 m, taken by shrimpboat, a complete sh., *ded.* M. Pin. Paratypes: same locality, 3 sh., MNHN.

Type locality: Diembéring, Casamance, Senegal (here selected).

Description: Shell 50-82 mm long, oval, rather thick and solid, compressed. Anterior margin broadly rounded, posterior margin rounded and slightly angulate at the end which is slightly twisted to the right. Ventral margin with very slight or without posterior sinuosity. Beaks slightly in front of the vertical midline. Escutcheon restricted to the length of the deep sunken ligament.

Surface smooth, with irregular growth lines and very faint irregular radial striae, fully visible under a lens (x 10) only. There are also faint, regular, not too close-set, concentric threads on the first 12-15 millimetres of the umbonal area. Postero-dorsal area delimited by a very weak angle. Periostracum light yellowish brown, thin and translucent, present only on the marginal area.

Hinge in the right valve with a small and very short anterior lateral, close to the beaks and set off in a more or less marked angle from the antero-dorsal margin. Anterior cardinal small, posterior cardinal broader and bifid, posterior lateral very short, situated immediately behind the deep-sunken nymph. Left valve with a narrow, bifid anterior cardinal and a thin posterior cardinal; there are very slight knobs opposite to the laterals of the right valve. Pallial sinus very long but not reaching the anterior adductor scar, with the broad-

est part under the beaks, confluent with the ventral pallial line over nearly its whole length.

Exterior cream or dirty white, often with light greyish growth zones. Interior white, with exterior colouration showing through.

Measurements:

78.0 x 49.3	Port-Gentil
67.0 x 42.1 x 16.4	pt MNHN
65.4 x 43.6	Port-Gentil
64.3 x 41.9 x 16.1	pt MNHN
63.2 x 42.1 x 16.3	ht
36.6 x 22.7	SEDIGUI sta. B1 CH

Distribution: Senegal (Dakar) to Gabon (Port-Gentil); Cape Verde Islands.

Material examined: The type material. Senegal: Cap Vert Peninsula (no precision), 1 v., *leg.* Mauny; (no precision), 2 sh., colln. Denis, old colln., both MNHN. Guinea-Bissau: Cap Varela, 1 v., *leg.* Mauny, 1964, MNHN. Guinea: W of Ile Kouffin, 10° 33' N, 15° 44' W, 26 m, 1 v., SEDIGUI sta. B1 CH, trawled R/V "André Nizery", *leg.* von Cosel, 27. X. 1988, MNHN. Côte d'Ivoire, Abidjan region (no precision), 1 sh., *leg.* Marche-Marchad, MNHN. Ghana: off Beyin, 4° 58' 05"N, 2° 41' 05"W, 20 m, 1 v., dredged R/V "La Rafale", *leg.* Cherbonnier, 19. III. 1964, MNHN. Equatorial Guinea: Bata, 2 sh., *leg.* Pobeguín, 1900, MNHN. Gabon: Cap

Lopez, 1 sh., colln. Dybowski; Port-Gentil (no precision), 5 v., *leg.* P. Bernard, 1986; Port-Gentil, Ile aux Pigeons, 1 sh., 2 v., *leg.* Chevalier 1981-89, all MNHN.

Biotope: In sandy bottom, from about 10 to 20 m, not common.

Derivatio nominis: The name reflects the west African occurrence of the new subspecies.

Remarks: The West African specimens are very close to *T. (P.) planata planata* Linné, 1758 from the Mediterranean; there are, however, a few minor

but constant differences which justify the separation as a geographic subspecies. *T. planata planata* is smaller (up to 67 mm), somewhat shorter, thinner and stained with light orange on the umbonal area or the central part of the valves, whereas the West African form is heavy and never coloured. In the mediterranean subspecies, the fine concentric threads on the umbonal area are still finer, much closer set and occasionally absent. *T. (P.) strigosa* Gmelin, 1791 (Mauritania-Senegal), for which this species could be mistaken, is more slender with a more tapering posterior part, the concentric threads on the umbonal area are absent.

Subgenus *Moerella* Fischer, 1887

The subgenus *Moerella* is used here in a rather broad sense; only a worldwide revision of the Tellinidae would help to place some of the species in perhaps more

appropriate subgenera. All *Tellina* (*Moerella*) examined for this work are characterized by at least the vestige of a small internal ligament posterior to the cardinals.

Tellina (Moerella) boucheti n. sp. (Figs. 82-84; 158)

Type material: (all from Guinea) Holotype MNHN, W of Ile Quito, 10° 00' N, 15° 36.5' W, 26 m, a complete sh., in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 513, *leg.* von Cosel, 26. V. 1988. Paratypes: W of Ile Quito, 10° 00' N, 14° 39' W, 22 m, 2 sh., SEDIGUI sta. 494 26. V. 1988; W of Point Goro, 10° 06' N, 15° 35' W, 25 m, 1 sh., 2 v., SEDIGUI sta. 549; 10° 06' N, 15° 07' W, 22 m, 1 sh., SEDIGUI sta. 558, both 20 X. 1988; W of Rio Yomponi, 10° 24' N, 15° 39' W, 24 m, 2 sh., 4 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Mus., SEDIGUI sta. 730, 25. X. 1988, all in bottom grab samples, R/V "André Nizery", *leg.* von Cosel.

Type locality: Ile Quito, Guinea, West Africa.

Description: Shell 8-13 mm long, slightly variable in outline, oval, thin, moderately compressed. Anterior margin rounded, posterior margin narrowly rounded, end very slightly twisted to the right. Ventral margin slightly convex. Beaks slightly behind the vertical midline.

Surface with fine regular close-set concentric ridges on the anterior half. In the middle, each second or third ridge disappears, the remaining transform into wider spaced, somewhat irregular, fine, concentric lamellae on the posterior half. Postero-dorsal angle rounded. Escutcheon narrow and short, ligament short and slightly sunken. Periostracum

thin, transparent and nearly colorless, present only on the extreme marginal part of the valves.

Hinge in the right valve with a short but rather strong anterior lateral, the summit of it being at about two thirds its length from the beaks. Anterior cardinal knob-like, posterior cardinal rather narrow and slightly bifid, posterior lateral short but strong. Left valve with a strong bifid anterior cardinal and a short, very thin posterior cardinal. Behind the cardinals, there is a narrow but distinct resilial pit with a narrow internal ligament, slightly longer than the posterior cardinal of the left valve but and parallel to it. Pallial sinus long but

not reaching the anterior adductor scar, with the broadest part situated under the beaks, confluent with the ventral pallial line over nearly its whole length.

Exterior pale yellowish, rarely cream, often with pale pink-lilac hue on the postero-dorsal slope and, in a lesser extent, occasionally parallel to the ventral margin. Interior with same colour as exterior.

Measurements:

11.2 x 7.3	ht
10.5 x 6.7	pt ZMC, SEDIGUI sta. 730
10.1 x 7.0	pt Natal Mus. SEDIGUI sta. 730
10.1 x 6.8	pt MNHN, SEDIGUI sta. 730
10.0 x 6.2	SEDIGUI sta. 542
9.7 x 6.0	pt MNHN, SEDIGUI sta. 730
9.6 x 6.4	pt SMF, SEDIGUI sta. 730
8.7 x 5.9	pt MNHN, SEDIGUI sta. 730
8.6 x 5.6	pt SMF, SEDIGUI sta. 730
8.5 x 5.8	pt ZMC, SEDIGUI sta. 730
8.1 x 5.0	"N' Diago" sta. 281
7.4 x 5.1	SEDIGUI sta. 353
5.5 x 3.6	Baie de l'Etoile

Distribution: Mauritania (21° N) to Guinea (Conakry, 9° 36' N); northern Angola (Barra do Dande, Bengo province)

Material examined: The type material. Mauritania: Baie de l' Etoile (21° N), muddy sand with seaweed, low tide, 1 spm.; Pointe ds Maures (20° 55' N), low tide, 1 v., both *leg.* Bouchet, V. 1983; SW of Cap Timiris, 19° 05' N, 16° 26' W, 22 m, 1 v., dredged R/V "Leon Coursin", *leg.* Marche-Marchad, 22. II. 1957; SW of Nouakchott, 17° 42' N, 16° 07' W, 17 m, 1 spm., dredged R/V "N' Diago", *leg.* Richer de Forges, 1981, all MNHN. Senegal: Dakar, Anse Bernard, 6-8 m, several v., 4. X. 1956; Baie de Gorée, "Tacoma", 16-18 m, several v., 13. I. 1954; off Gorée, 16-25 m, 10 juv. v., 9. III. 1954; S of M' Bao, 30 m, 1 v., 10. IX. 1953, all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad; NE of Gorée, 14° 41' N, 17° 23.2' W, fine muddy sand, 17 m, 5 v., dredged R/V "Louis Sauger", *leg.* von Cosel, 24. III. 1988; Popenguine-Cap Rouge, 14° 35.8' N, 17° 13.5' W, 19 m, 3 spm.; 14° 34.5' N, 17° 14.9' W, 26 m, 1 spm.; off M' Bour, 14° 21.3' N,

17° 09.5' W, 21 m, 1 spm.; off Saloum. 14° 02.6' N, 16° 55.9' W, 10 m, 1 spm.; 13° 54.7' N, 16° 57.3' W, 2 spm.; Dakar-Saloum (no precision), 4 spm., all dredged R/V "Laurent Amaro", *leg.* Leung Tack 1983-84; off Cap de Naze, 20 m, numerous sh. ex pisce, trawled R/V "Gérard Tréca", *leg.* Marche-Marchad, 4. II. 1954; Casamance, Abéné, 13° 02.3' N, 17° 08.5' W, 27 m, 1 v.; Kafountine, 12° 55.5' N, 17° 17.2' W, 36 m, 1 v., both dredged R/V. "Louis Sauger", *leg.* von Cosel, 25. and 27. III. 1988; all MNHN. Guinea-Bissau: W of Ilha de Orango, Bissagos, 11° 11' N, 16° 51' W, 26 m, 1 v., 22. IV. 1988; SW of Iles Tristão, 10° 41' N, 15° 44.5' W, 25 m, numerous v., 6. X. 1988, both dredged R/V "André Nizery", *leg.* von Cosel, both MNHN. Guinea: 106 lots, mostly sh. and v. from the SEDIGUI cruises, between 9° 36' N and 10° 39' N, 14° 17' W, and 16° 06' W, from about 15 to 42 m, all taken by bottom grab, R/V "André Nizery", *leg.* von Cosel, V.-X. 1988, all MNHN.

Biotope: In mixed and coarse sand, also with gravel, from low tide (rare) to offshore (15-35 m).

Derivatio nominis: The species is named after my colleague Philippe Bouchet who collected the specimens from Mauritania.

Remarks: The new species is superficially close to *T. hanleyi* Dunker, 1853, with which it co-occurs over part of its range. *T. hanleyi* is distinguished from *T. (M.) boucheti* by its shorter shell with more oval outline, the smooth surface and the very short and thick, occasionally almost knob-like anterior lateral; the broadest part of the pallial sinus is situated closer to the posterior end.

The range of the new species coincides with the northern seasonal upwelling zone. In the northern extremity of that zone with long annual duration of the upwelling (Cape Blanc region), *T. (M.) boucheti* occurs also at low tide; in the more southern region where the upwelling is limited to one to a few months (Casamance to Guinea), the species has been found only offshore.

Tellina (Moerella) bertrandi n. sp. (Figs. 85-87; 159)

Type material: Holotype MNHN, Pointe-Noire, Congo, Plage ORSTOM, 3-5 m, fine sand, a live-collected spm., *leg.* von Cosel, XII. 1985. Paratypes: same locality, 3 sh., 3 v., partly broken, MNHN, 1 v. ZMC, 2 v. IRSNB, 1 v. SMF, 2 v. Natal Museum.

Type locality: Pointe-Noire, Congo.

Description: Shell 10-17 mm long, somewhat variable in outline, suboval, rather solid, not very compressed. Anterior margin well rounded, posterior part tapering, posterior end rounded-rostrate and twisted to the right. Postero-ventral margin more or less convex, occasionally with a small, very weak sinuosity just in front of the posterior end. Beaks just behind or on the vertical midline.

Surface with fine, regular, close-set concentric ridges which transform into fine lamellae on the posterior third of the valves, with disappearing of each second to sixth ridge. Postero-dorsal angle well rounded. Lunule small, not well defined, escutcheon short and narrow, ligament not sunken. Periostracum thin and nearly colourless, more brownish on the extreme marginal area.

Hinge in the right valve with a rather strong anterior lateral, the summit of it being at its middle. Anterior cardinal small, the posterior cardinal rather narrow but distinctly bifid; posterior lateral short but strong. Left valve with a strong bifid anterior cardinal and a small, thin posterior cardinal. Behind the cardinals, there is a narrow resilial pit with a very small internal ligament. Pallial sinus long but not reaching the anterior adductor scar, with the broadest part behind beak level, confluent with the ventral pallial line over nearly its whole length.

Exterior and interior white.

Measurements:

15.4 x 10.0	Palmeirinhas
15.3 x 10.2	SEDIGUI sta. 478
12.8 x 9.0	pt MNHN
12.8 x 8.6	pt SMF
12.7 x 8.9 x 4.2	ht
12.3 x 8.1	pt ZMC
12.0 x 8.5	pt Natal Museum
11.9 x 8.1	pt MNHN
11.4 x 8.0	SEDIGUI sta. 478

8.5 x 6.0	pt Natal Museum
8.4 x 5.6	pt IRSNB

Distribution: Senegal (Baie de Gorée) to southern Angola (Baia dos Tigres).

Material examined: The type material. Senegal: N of Cayar, 15° 12.5' N, 15° 54.8' W, 25 m, 1 sh., 6.IV. 1967 (no more precision); SE of Gorée, 14° 41' N, 17° 13.2' W, fine muddy sand, 17 m, 1 sh., 9 v.; Casamance, Abéné, 13° 00.4' N, 17° 00.6' W, fine sand, 18 m, 1 v.; 12° 46.9' N, 17° 29.9' W, very fine sand, 45 m, 2 v.; 12° 46.5' N, 17° 19.2' W, fine sand with carbonate, 32 m, 1 v., all dredged R/V "Louis Sauer", *leg.* von Cosel, 25.-29. III. 1988; N-Casamance, Karabane Bôlon, off Karabane, 4 m, 2 v.; S-Casamance, creek off Elinkine, 3 m, 5 v., both *leg.* von Cosel, 17. III. 1988, all MNHN. Guinea-Bissau: W of Ilha Caravela, Bissagos, 11° 35' N, 16° 34' W, 15 m, 7 v., dredged R/V. "André Nizery", *leg.* von Cosel, 10. X. 1988, MNHN. Guinea: 23 lots, mostly sh and v. from the SEDIGUI cruises, between 9° 03' N and 10° 36' N, 13° 41.5' W, and 15° 16' W, from about 12 to 45 m, all taken by bottom grab, R/V "André Nizery", *leg.* von Cosel, V.-X. 1988; Conakry, "Sables de Conakry", 3 v., old colln.; Roume, I. de Los, N-side, fine muddy sand, 1.5-2 m, several v.; Banc Crawford, 2-3 m, several v., both *leg.* von Cosel, 29. V. 1988; Banc Crawford, 2 v., Mission Gruvel, 8. XII. 1909, all MNHN. Côte d'Ivoire: 4° 56' N, 5° 58' W, 12 m, 2 v.; 5° 09' N, 4° 39' W, 20 m, 2 v.; 5° 06' N, 4° 38.5' W, 50 m, 1 v.; 5° 05' N, 3° 22' W, 30 m, 2 v., all dredged R/V "La Rafale", *leg.* Cherbonier, 21. III. - 3. IV. 1964; Sassandra, 30 m, 1 spm., 10. III. 1966; Bassam, 35 m, 3 spm., 17. VIII. 1966; Abidjan region (no precision), 1 sh., 2 v., all dredged R/V "Reine Pokou", *leg.* Le Loeuff, all MNHN. Congo: Pointe-Noire, Plage Mondaine, N of Lighthouse, on beach, 5

v.; Plage ORSTOM, 4-6 m, 4 v.; Songolo, 5-6 m, 1 v., all *leg.* von Cosel, XII. 1985, all MNHN. Angola: Cacuaco, Bengo province, 5-10 m, 2 v.; Baia de Corimba, Luanda province, 10-20 m, several juv. sh. and v.; Santo Antonio, Benguela province, 5-10 m, 1 sh.; Bissonga, Baia de Lucira, Moçâmedes province, maerl, 10-20 m, 1 sh.; Praia do Cesar, Baia de Lucira, maerl, 10 m, 1 juv sh.; Baia de Moçâmedes, Moçâmedes province, vase, 5-10 m, 2 sh., 1 v.; Baia dos Tigres, Moçâmedes province, 10-15 m, 2 spm., 3 sh., 1 v., all *leg.* Gofas, 1982-1985, all MNHN.

Biotope: In fine muddy sand and fine sand, from 2-3 m to about 20 m, occasionally deeper, to 45 m, often in sheltered bays, but also more offshore.

Derivatio nominis: The species is named after my colleague Bertrand Richer de Forges, biologist at ORSTOM, who collected a lot of mollusc material during his dredging and trawling operations on the shelf of Mauritania.

Remarks: This locally rather common species is quite close to *T. (M.) boucheti*, but grows larger, has a longer and more pointed posterior part and lacks any colour. The concentric ridges cover the surface entirely backwards to the posterior angle; in *T. boucheti*, however, up to a half of them becomes obsolete already below the beaks or even more forward. The anterior cardinal in the new species has its summit in the middle, whereas in *T. boucheti*, the summit is at two thirds its length from the beaks.

***Tellina (Moerella) pseudopusilla* n. sp. (Figs. 88-89; 161)**

Tellina pusilla Philippi: - Nicklès, 1955, *Atlantide Rep.*, 3: 215.

Tellina pusilla Philippi, 1836: - Marche-Marchad, 1958, *Catal. IFAN*, 14: 55.

Tellina pusilla Philippi, 1836: - Cosel, 1982, *Cour. Forsch. Senckenb.*, 52: 44.

Type material: Holotype MNHN, W of Baie de Sangarea, Guinea, 9° 42' N, 15° 33' W, 36 m, a complete sh., SEDIGUI sta. 340, in bottom grab sample, R/V "André Nizery", *leg.* von Cosel, 1988. Paratypes: same locality, 1 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Mus.; 9° 42' N, 15° 18' W, 31 m, 8 v. (4 right, 4 left), SEDIGUI sta. 345; 9° 42' N, 15° 44.5' W, 29 m, 1 sh., 4 right, 2 left v., SEDIGUI sta. 356, all dredged R/V "André Nizery", *leg.* von Cosel, all MNHN.

Type locality: W of Baie de Sangarea, Guinea, 9° 42' N, 15° 33' W.

Description: Shell very small, 4-7 mm long, somewhat variable in shape, elongate-oval, solid, inflated. Anterior and posterior margin rounded, ventral margin in its anterior half well convex, posterior half only weakly convex. Beaks behind the vertical midline, generally at the end of the third fourth of the valves.

Surface with fine, close-set, concentric ridges which are flat-topped on the anterior half of the valves. Every second to fourth ridge disappears on the third fourth of the valves, the remaining becoming somewhat lamellate with broad interspaces. Postero-dorsal slope not delimited by angle or keel. Escutcheon and ligament very short, escutcheon ill-defined. Periostracum not seen.

Hinge in the right valve with a long and narrow but rather strong anterior

lateral, the summit of it being at about two thirds its length from the beaks. There are two cardinals, the anterior one narrow and almost laminar, the posterior one strong and slightly bifid and a short, strong posterior lateral. Left valve with two cardinals: one strong bifid anterior and one thin, lamellar posterior. Behind the cardinals, there is a resiliar pit with a small, narrow internal ligament, in an angle of about 100° to the dorsal margin of the anterior part. Pallial sinus long, with the broadest part under the beaks, confluent with the ventral pallial line over about five sixth its length.

Exterior mostly white, cream, pale yellowish or very pale pink, occasionally pink with slightly darker radial rays. Interior with same colour as exterior.

Measurements:

7.0 x 3.9	pt MNHN, SEDIGUI sta. 356
6.2 x 3.6	pt MNHN, SEDIGUI sta. 356
6.1 x 3.7	pt SMF, SEDIGUI sta. 340
6.1 x 3.6	pt Natal Mus., SEDIGUI sta. 340
6.1 x 3.6	Ambrizete
6.0 x 3.5	ht
6.0 x 3.4	pt SMF, SEDIGUI sta. 340
5.7 x 3.4	pt Natal Mus., SEDIGUI sta. 340
5.5 x 3.2	pt IRSNB, SEDIGUI sta. 340
5.2 x 3.1	pt IRSNB, SEDIGUI sta. 340
4.7 x 2.8	Ambrizete
4.7 x 2.8	Baia Matiota, S. Vicente, Cape Verde Is.
4.2 x 2.7	Santa Maria, Sal, Cape Verde Is

Distribution: Mauritania (Cap Blanc) and Senegal (Dakar) to Cote d'Ivoire (Abidjan region); northern Angola (Ambrizete) to southern Angola (Baia dos Tigres); Cape Verde Islands.

Material examined: The type material. Mauritania: off Cap Blanc, 20° 30' N, 17° 03' W, 18 m, 1 spm., dredged R/V "N' Diago", *leg.* Richer de Forges, 21. X. 1981, MNHN. Senegal: off Gorée, 50 m, 1 v.; off Gorée (no precision) 1 v., both 5. VII. 1955; S of Gorée, 95-98 m, 4 v., 18. II. 1954, all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad, all MNHN. Guinea: Guinean shelf, 76 lots, mostly sh and v. from the SEDIGUI cruises, between 9° 03' N and 10° 33' N, 14° 01.5' W, and 15° 59' W, from about 14 to 53 m, all taken by bottom grab, R/V "André Nizery", *leg.* von Cosel, V. and X. 1988, all MNHN; Côte d'Ivoire: Abidjan region

(no precision), 25 m, 5 juv. sh., 25. V. 1973; 50 m, 1 sh., 23. IV. 1966, both dredged R/V "Reine Pokou", *leg.* Le Lœuff, MNHN. Angola: off Ambrizete, 7° 07' S 12° 21' E, 80 m, 2 sh., 3 v., taken by box corer; Ambrizete, Zaire province, 45 m, 3 v.; off Ilha de Luanda, Luanda province, 120 m, 5 v.; Baia dos Tigres, Moçâmedes province, 40 m, 8 v., all *leg.* Gofas, 1982-85, all MNHN. Cape Verde Islands: Baia Matiota, Mindelo, São Vicente, sand, 3 m, 2 v., 16. XII. 1978; Santa Maria, Ilha do Sal, on beach, 10 v., 28. 12. 1978, both *leg.* von Cosel; Ilha do Sal (no precision), 10 v., *leg.* Cadenat, 1952, all MNHN; Ilheu Branco, 25 m, 1 spm., several v., *leg.* First Iberic Exp. to the Cape Verde Islands, 23. VII. 1985, MNCN.

Biotope: In mixed and coarse sand, also with gravel and shell debris, from 15-60 m, occasionally deeper, most common between 25 and 45 m.

Derivatio nominis: The name reminds the resemblance of this species to *T. (M.) pusilla*.

Remarks: The new species is close to the European and Mediterranean *T. (M.) pusilla* Philippi, 1836 and has been mistaken as that species. *T. (M.) pusilla*, however, has a somewhat more blunt posterior end and an even sculpture over the whole surface: the concentric ridges do not change their appearance and not any is disappearing towards the posterior end. It is more vividly coloured.

***Tellina (Moerella) oryza* n. sp. (Figs. 146-147; 162)**

Type material: Holotype MNHN, Côte d'Ivoire, off Grand Bassam, Abidjan region, 20 m, a live-collected spm., dredged R/V "Reine Pokou", *leg.* Le Lœuff, 2. II. 1967. Paratypes: 6 spm., same locality, MNHN; same locality, XI. 1966, 1 spm ZMC, 1 spm. IRSNB, 1 spm. SMF, 1 spm. Natal Museum; same locality, 23. XII. 1966, 3 spm., MNHN, all dredged R/V "Reine Pokou", *leg.* Le Lœuff.

Type locality: Grand Bassam, Abidjan region, Côte d'Ivoire.

Description: Shell very small, 3-4 mm long, quite variable in shape and also somewhat in length-width ratio, oval, solid, inflated. Anterior margin well rounded, ventral margin in its ante-

rior half well convex, posterior half less convex. Posterior margin rounded in juvenile and small specimens, in larger adult specimens nearly straight in the upper, dorsal part and more narrowly

rounded in the lower part. Beaks well behind the vertical midline, within the fourth fourth of the valves.

Surface with fine, dense concentric ridges of which every second to fourth disappears on the third fourth of the valves, the remaining becoming distinctly lamellate. Postero-dorsal slope not delimited by angle or keel. Escutcheon rather short, sunken and well delimited, lunule long and narrow; ligament very short. Periostracum not seen.

Hinge in the right valve with a long and strong anterior lateral, the summit of it being very close to its anterior end. There are two cardinals, the anterior one small, often reduced to a knob or becoming obsolete, the posterior one strong and occasionally somewhat bifid and a short, strong posterior lateral. Left valve with two cardinals: a strong bifid anterior one and a thin, lamellar posterior one. Behind the cardinals, there is a deep resilial pit with a narrow but strong internal ligament, in an angle of about 90-95° to the dorsal margin of the anterior part (mean). Pallial sinus long, with the broadest part under the beaks, extending nearly to the anterior adductor scar but not reaching it, confluent with the ventral pallial line over more than 5, 6 its length.

Valves entirely white.

Measurements:

4.3 x 2.9	Abidjan (Bassam)
4.3 x 2.85 x 1.8	Abidjan (Bassam)
4.2 x 2.85	ht
4.2 x 2.7	pt MNHN, 2. II. 1967
4.0 x 2.7	pt MNHN, 23. XII. 1966
4.0 x 2.6	Abidjan (Bassam)
3.9 x 2.6 x 1.6	pt SMF, XI. 1966
3.6 x 2.3	pt, Natal Museum, XI. 1966

3.5 x 2.2 x 1.3	pt ZMC, XI. 1966
3.5 x 2.2 x 1.3	pt IRSNB, XI. 1966

Distribution: Guinea (Iles Tristão) to Côte d'Ivoire (Abidjan region) and Cameroon.

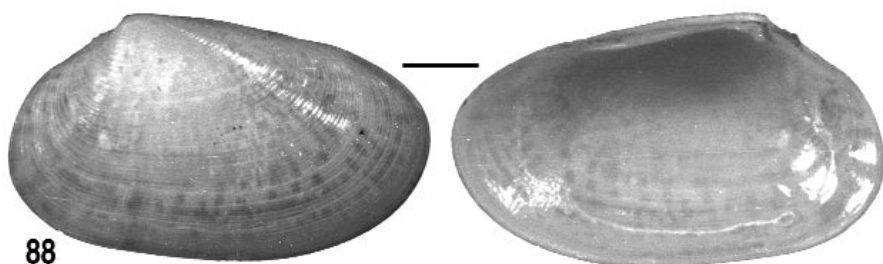
Material examined: The type material. Guinea: Ile Tristão (no precision), 2 v., leg. Marche-Marchad; Guinean shelf, W Rio Yomponi, 10° 24' N, 15° 18' W, 15 m, 1 spm., 2 v., SEDIGUI sta. 723, 25. X. 1988; 18 further lots from the SEDIGUI cruises, between 9° 03' N and 10° 36' N, 14° 14' W, and 15° 37.5' W, from 21 to 49 m, sh. and v. only, all taken by bottom grab, R/V "André Nizery", leg. von Cosel, V. 1988; Banc Crawford, Iles de Los, 2 m, 1 v., leg. von Cosel, 29. V. 1988, all MNHN; Côte d'Ivoire: off Grand Bassam, 15 m, 4 spm., 1. II. 1966; 5° 14.34' N, 4° 02' W, 20 m, several spm. in 10 lots taken on different dates between 9. IX. 1966 and 2. VI. 1967; Grand Bassam (no precision), 7 v.; Abidjan region (no precision), 25 m, several juv. v., all dredged R/V "Reine Pokou", leg. Le Lœuff, all MNHN. Cameroon: off Idenau, 4° 05' N, 8° 28' E, 53 m, 1 v., dredged R/V "André Nizery", leg. Montillet, III. 1991, MNHN.

Biotope: In mixed and coarse sand, also with gravel and shell debris, from 15-60 m, occasionally deeper, most common between 25 and 45 m.

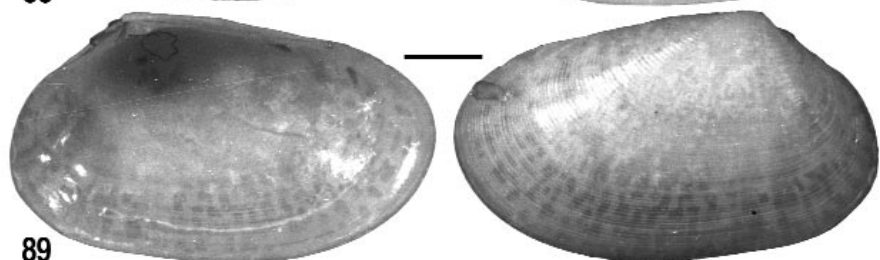
Derivatio nominis: *oryza* (lat.)= rice. This extremely small and entirely white species reminds perfectly a rice grain.

Remarks: *T. (M.) oryza* is very close to *T. (M.) pseudopusilla* n. sp., with which it occurs sympatrically. The main differen-

(Right page) Figures 88-89. *Tellina (Moerella) pseudopusilla* n. sp., holotype, 6.0 mm, SEDIGUI 340, 88: right valve; 89: left valve. Figures 90-91. *Tellina (Moerella) modica* n. sp., holotype, 6.7 mm, SEDIGUI 45, 90: right valve; 91: left valve. Figures 92-93. *Tellina (Oudardia) densestriata* n. sp., holotype, 18.4 mm, Abéné, Casamance, 92: right valve; 93: left valve. (Página derecha) Figuras 88-89. *Tellina (Moerella) pseudopusilla spec. nov.*, holotipo, 6,0 mm, SEDIGUI 340, 88: valva derecha; 89: valva izquierda. Figuras 90-91. *Tellina (Moerella) modica spec. nov.*, holotipo, 6,7 mm, SEDIGUI 45, 90: valva derecha; 91: valva izquierda. Figuras 92-93. *Tellina (Oudardia) densestriata spec. nov.*, holotipo, 18,4 mm, Abéné, Casamance, 92: valva derecha; 93: valva izquierda.



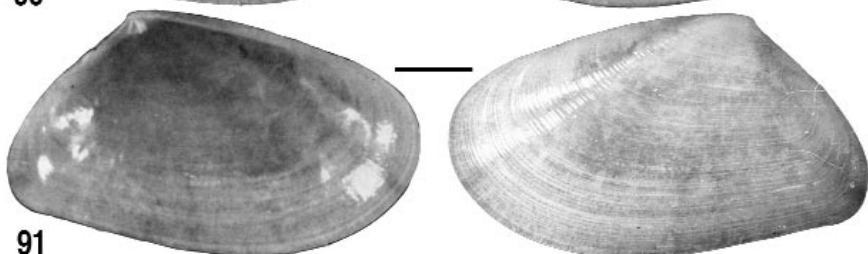
88



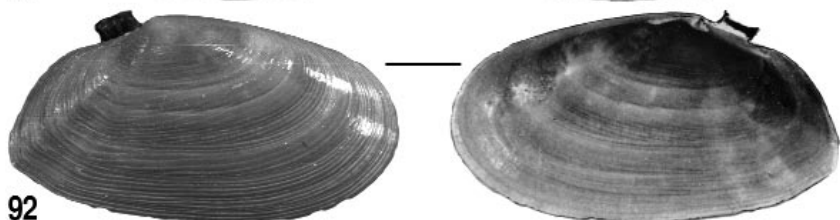
89



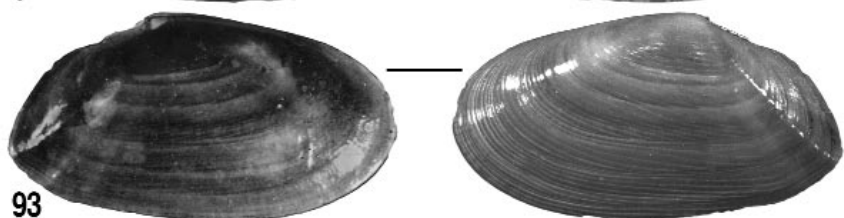
90



91



92



93

ces from *T. (M.) pseudopusilla* are the still smaller size, a generally shorter and stouter shell, still further backwards placed beaks resulting in a shorter posterior part and the lack of any colouration. The pallial sinus terminates closer to the anterior adductor scar than in *T. (M.) pseudopusilla*. The hinge line in fully grown specimens of *T. (M.) oryza* is somewhat stronger, the summit of the anterior lateral in the right valve is placed further forward, near its end; the internal portion of the ligament is stronger.

This group of very small Tellinidae species, at the moment placed in the subgenus *Moerella*, and consisting in the eastern Atlantic of *T. (M.) oryza*, *T. (M.) pseudopusilla* and *T. (M.) pusilla*, (and also *T. (M.) modica*, with its slightly different, more "tellinid" outline) has a small internal ligament portion (resilium) also in adult stage, which in most other tellinid species disappears during ontogeny.

There is a similar group known from American waters under the generic name *Semelina* Dall, 1900. It has been placed in the Family Semelidae, characterized by its well-developed internal portion of the ligament. The resilium in *Semelina* is, however, much smaller and shorter than in "true" *Semele* and steeper (see also BOSS, 1972, fig. 8). Moreover, the type species of *Semelina*, *S. nuculoides* (Conrad, 1841) (Cape Hatteras to Brazil), is very close in size, shape, hinge dentition and sculpture to *Tellina (Moerella) oryza*, only the pallial sinus is slightly different in being confluent with the ventral pallial line for less than half its length. The genus *Semelina* would therefore better be placed in the Tellinidae, however, this and the relations to *Moerella* would be the subject of another, more detailed article, and for the moment, the two new west African species are left in *Tellina (Moerella)*.

Tellina (Moerella) modica n. sp (Figs. 90-91; 160)

Tellina sp.: - Cosel, 1982, *Cour. Forsch. Senckenb.*, 52: 44.

Type material: Holotype MNHN, Guinea, W of Sierra Leone border, 9° 06.2' N, 14° 52.5' W, 70 m, a complete specimen, SEDIGUI sta. 45, in bottom grab sample, R/V "André Nizery", leg. von Cosel, 13. V. 1988. Paratypes: W of Ile Kabak, Guinea, 9° 18' N, 14° 27' W, 47 m, 10 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Museum, SEDIGUI sta. 145, in bottom grab sample, R/V "André Nizery", leg. von Cosel, 16. V. 1988.

Type locality: Pointe Sallatouk, W of Sierra Leone border, Guinea.

Description: Shell small, 5-8 mm long, slightly variable in outline, oblong-oval, rather thick and solid, somewhat inflated. Anterior margin rounded, posterior part tapering, posterior end narrowly rounded, slightly twisted to the right. Ventral margin in its anterior half convex, posterior half very slightly convex, straight or even with a weak sinuosity. Beaks well behind the vertical midline, between the second and the third third or at the beginning of the third third of the valves.

Surface with fine, dense concentric ridges, becoming lamellate towards the posterior part, with every second to fifth ridge disappearing. Postero-dorsal angle broadly rounded. Lunule narrow and

rather long, escutcheon and ligament very short. Periostracum not seen.

Hinge in the right valve with a long and narrow anterior lateral, the summit of it being at its middle or slightly closer to the beaks. There are two cardinals, the anterior one small, the posterior larger and slightly bifid, and a rather strong posterior lateral. Left valve with two cardinals: one bifid anterior and one very thin, lamellar posterior. Behind the cardinals, there is a small and narrow but deep resilial pit with a small internal ligament, in an angle of about 100° to the dorsal margin of the anterior part. Pallial sinus long, with the broadest part under the beaks, confluent with the ventral pallial line over nearly its whole length.

Exterior whitish, cream or pale yellowish, often with light orange hue on the umbonal part or with light pink on the upper part of the postero-dorsal slope, occasionally a few pale reddish to reddish brown radial rays. Interior whitish to yellowish, with exterior colour showing through.

Measurements:

6.7 x 3.9 x 2.2	ht
6.6 x 3.7	pt SEDIGUI sta. 145
6.5 x 3.8	pt SEDIGUI sta. 145
6.1 x 3.6	pt SEDIGUI sta. 145
6.0 x 3.6	pt SEDIGUI sta. 145
5.7 x 3.4	pt SMF, SEDIGUI
5.7 x 3.3	pt Natal Museum, SEDIGUI
5.6 x 3.4	pt SEDIGUI sta. 145
5.5 x 3.3	pt Natal Museum, SEDIGUI
5.2 x 3.2	pt IRSNB, SEDIGUI
4.9 x 2.9	pt IRSNB

Distribution: Senegal (Dakar) to Sierra Leone and perhaps more SE-wards; Cape Verde Islands; Ilha do Principe.

Material examined: The type material. Senegal: S of Gorée, 38-42 m, 2 v., 27. X. 1953; 110-112 m, 2 v. 18. II. 1854; off Gorée (no precision), 1 v., 5. VII. 1955; Dakar region (no precision), 129-150 m, 3 v., 24. I. 1958, all dredged R/V "Gérard Tréca", leg. Marche-Marchad; Casamance, off Kafountine, 12° 55.5' N, 17° 17.2' W, 36 m, 2 v.; 12° 46.9' N, 17° 29.9' W, 45 m, 4 v.; 12° 44.5' N, 17° 27.3' W, 40 m, 3 v., all dredged R/V "Louis Sauger", leg. von Cosel, 27.-29. III. 1988, all MNHN. Guinea: Guinean shelf, 19 lots, mostly sh. and v. from the SEDI-

GUI cruises, between 9° 03' N and 9° 48' N, 13° 56' W, and 16° 24.5' W, from about 26 to 60 m, all taken by bottom grab, R/V "André Nizery", leg. von Cosel, V. 1988, all MNHN; Sierra Leone, 7° 15.5' N, 12° 51' W, 64 m, 1 v., dredged R/V "Calypso", leg. Marche-Marchad, 11. V. 1956, MNHN. Cape Verde Islands: Baía Matiota, Mindelo, São Vicente, sand, 3 m, 3 v., leg. von Cosel, 16. XII. 1978, MNHN. Ilha do Principe, 1° 37' N, 7° 22' E, 30 m, 6 v., dredged R/V "Calypso", Gulf of Guinea cruise 1956, leg. Marche-Marchad, 26. VI. 1956, MNHN.

Biotope: In fine sand, also with calcareous algae and shell debris, from about 25 m to 150 m, mostly between 40 and 60 m, in the Cape Verde Islands most probably also in shallower water.

Derivatio nominis: "modicus" (lat.)= small, moderate, indifferent; the name expresses the extreme featurelessness of this species.

Remarks: This rather uncommon species is distinguished from *T. (M.) pseudopusilla* and the European *T. (M.) pusilla* Philippi, 1836 by its pointed and more twisted posterior end; it resembles somewhat the European and West African *T. (M.) distorta* Poli, 1795 in outline but is much smaller and slightly shorter and thicker-shelled. Juvenile *T. (M.) distorta* of the same size are distinguished from the new species by the thinner and slightly more elongate shell and the more blunt posterior margin.

Subgenus *Oudardia* Monterosato, 1884

Tellina (Oudardia) densestriata n. sp. (Figs. 92-93; 165)

Tellina (Oudardia) compressa Brocchi: - Dautzenberg, 1910, *Act. Soc. Linn. Bordeaux*, 64: 154.

Type material: Holotype MNHN, Abéné, N-Casamance, 13° 01.8' N, 17° 25.5' W, fine sand, 53 m, 1 sh., dredged R/V "Louis Sauger", leg. von Cosel, 29. III. 1988. Paratypes: Abéné, N-Casamance, 13° 02.3' N, 17° 08.5' W, 27 m, 1 sh., 3 v. MNHN, 25. III. 1988; Presqu'île aux Oiseaux, Casamance, 12° 46.9' N, 17° 29.9' W, fine sand, 45 m, 5 sh., 3 v. MNHN, 1 sh., 1 v. ZMC, 1 sh., 1 v. IRSNB, 1 sh., 1 v. SMF, 1 sh., 1 v. Natal Museum, 29. III. 1988, both dredged R/V "Louis Sauger", leg. von Cosel.

Type locality: Abéné, Casamance, 13° 01.8' N, 17° 25.5' W.

Description: Shell small, 12-20 mm long, slightly variable in outline and sculpture, elongate-oval, thin and fragile, compressed. Anterior margin rounded, posterior part slightly tapering, posterior margin obliquely truncated, weakly convex, with rounded corners. Ventral margin very slightly convex, a bit rising posteriorly. Beaks well behind the vertical midline.

Surface with dense grooves which on the anterior third are concentric, then gradually diverge and become more or less oblique towards ventrally. On a line from the beaks to the postero-ventral margin these grooves widen to become interspaces of ridges, these abruptly change the direction to become again concentric, continuing on the rounded posterior angle and the postero-dorsal slope and becoming slightly lamellate. On the left valve this posterior sculpture is less pronounced, the part between the umbonal-ventral line and the posterior angle being nearly or completely smooth; occasionally, there is a similar, but narrower almost smooth zone on the left valve between the grooves and the lamellae. Periostracum not seen, even in live-taken specimens.

Hinge in the right valve with a short but strong anterior lateral, the summit of it near its anterior end. Anterior cardinal well developed, simple, posterior cardinal strong and markedly bifid. Posterior lateral short and strong, situated beyond the ligament. Left valve with a strong, bifid anterior cardinal and a thin but well developed lamellar posterior cardinal. Ligament on a well developed protruding nymph. Pallial sinus with its broadest part under the beaks, extending to near the anterior adductor scar but not reaching it. Weak reinforcement on the interior behind the anterior adductor scar.

Exterior creamish, salmon or (less commonly) pale pinkish, often with yellowish umbonal area. Interior with same colour. Specimens from Cape Verde Islands translucent white with very pale yellowish hue.

Measurements:

18.4 x 9.8	ht
17.1 x 9.2	pt MNHN, Abéné

15.6 x 8.2	pt IRSNB, Presqu'île aux Oiseaux
15.5 x 8.5	pt ZMC, Presqu'île aux Oiseaux
15.3 x 8.0	pt Natal Mus., Presqu'île aux Oiseaux
15.1 x 8.1	pt MNHN, Abéné
15.0 x 7.9	pt SMF, Presqu'île aux Oiseaux
14.7 x 8.5	Gorée
14.5 x 7.6	pt MNHN, Abéné
14.2 x 8.5	Gorée
13.4 x 7.3	Gorée
11.8 x 6.7 x 3.0	"N' Diago" sta. 229
11.6 x 6.9	Gorée
10.2 x 5.5	pt SMF, Presqu'île aux Oiseaux
9.7 x 5.3	pt IRSNB, Presqu'île aux Oiseaux

Distribution: Mauritania (20° N) to Guinea (off Ile Kabak, 9° 18'); Cape Verde Islands.

Material examined: The type material. Mauritania: upper continental shelf, on 20 sta., between 20° 50' N (Cap Blanc) and 17° 18' N (SW Tiguent), and 16° 11' W and 17° 26' W, mostly spm. and sh., from 19 to 53 m, all dredged R/V "N' Diago", *leg.* Richer de Forges, 1981; Nouadhibou, Baie de Cansado, few v., *leg.* Mission Gruvel, 1908; 5 miles east of Pte. de Repos, 9-10 m, few v., *leg.* Mission Gruvel, 1909; off Mhairrett, 19° 05' N, 16° 26' W, 22 m, 1 v., dredged R/V "Léon Coursin", *leg.* Marche-Marchad, 22. II. 1957, all MNHN. Senegal: Baie de Rufisque, 18-20 m, few v., *leg.* Mission Gruvel, 1909 [sample later mixed with the two lots from Mauritania]; S of Gorée, 38-42 m, 5 v., 27. X. 1953; 65 m, 1 sh., 4 v.; 95-98 m, 1 v., both 18. II. 1954; SE of Gorée, 27-28 m, several sh. and v.; 33-34 m, several v., both 27. XI. 1953; off Gorée, 16-25 m, 1 v., 9. III. 1954; 132 m, 2 v., 5. VII. 1955; off Cap Manuel, Dakar, 18 m, 2 v., 1. III. 1957; off M' Bao, 20 m, 4 v., 2. IX. 1958; 30 m, 1 sh., 10. IX. 1953; Dakar region (no precision), 7 v.; off M' Bour, 14° 23.5' N, 17° 24.5' W, 65-70 m, 1 v., all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad; SE of Gorée, 14° 41' N, 17° 23.2' W, 17

m, numerous spm., 24. III. 1988; 14° 41' N, 17° 23.1' W, 19 m, 1 spm., 3 v., 30. III. 1988, both dredged R/V "Louis Sauter", leg. von Cosel; off Cap des Biches (no precision), several spm and sh.; between Dakar ad Saloum (no precision), numerous spm.; between Pte. Sarène and Sangomar, Saloum, 10-15 m, numerous spm., all dredged R/V "Laurent Amaro", leg. Leung Tack, 1983-84, all MNHN; Casamance, upper shelf, on 11 sta. between 12° 29' N and 13° 01.8' N, 17° 12.4' W, and 17° 29.9' W, from 22 to 53 m, mostly sh and v., all dredged R/V "Louis Sauter", leg. von Cosel, 25.-29. III. 1988, all MNHN. Guinea-Bissau: W Ilha Une, Bissagos, 11° 11' N, 16° 59' W, 26 m, 2 v., dredged R/V "André Nizery", leg. von Cosel, 22. IV. 1988, MNHN. Guinea: W of Ile Konebomby, 9° 48' N, 16° 30.5' W, 123 m, 2 v., SEDIGUI sta. 428; W Ile Kabak, 9° 18' N, 14° 12' W, 33 m, 2 v., SEDIGUI sta. 150; 9° 18' N, 14° 03' W, 26 m, 15 v., SEDIGUI sta. 153, all taken by bottom grab, R/V "André Nizery", leg. von Cosel, V. 1988, all MNHN. Cape Verde Islands: Boavista, W of Sal Rei, 80 m, numerous v., dredged 1. Iberic Expedition to the Cape Verde Islands, 23.-26. VIII. 1985, MNCN; Boavista, 16° 01' N, 23° 00' W, 45 m, 1 v., R/V "Calypso" Cape Verde Islands cruise 1959, sta. 75a, leg. Forest, MNHN.

Biotope: In clean or occasionally very slightly muddy, fine sand or mixed sand, also with calcareous algae and shell debris, from about 17 m to 50 m.

Derivatio nominis: The name reflects the stronger and denser oblique striae on the surface in comparison to the Mediterranean and West African *T. (O.) compressa* Brocchi, 1814.

Remarks: The new species was mistaken for *T. (O.) compressa* (Western Mediterranean to Nigeria; northern Angola), however, it is distinguished from that species by its slightly more elongate shell with less truncated posterior end and the denser oblique incisions with the peculiar transformation into a sculpture with ridges or even faint lamellae on the posterior part of the right valve, which is not seen in other *Tellina (Oudardia)*. Within the tropical West African province, *T. (O.) densestriata* is restricted to the northern transition zone which is characterized by seasonal upwelling. Within the continental part of the range of *T. (O.) densestriata*, both species are sympatric, but live in different depths and habitats: *T. (O.) densestriata* mostly in shallower water with sand, *T. (O.) compressa* deeper (down to 200 m) in more muddy bottom.

Tellina (Oudardia) crosnieri n. sp. (Figs. 94-95; 164)

Tellina (Oudardia) compressa (Brocchi): - Dautzenberg, 1913, *Ann. Inst. Océanograph.*, 5 (3): 102.

Type material: Holotype MNHN, Pointe-Noire, Congo, in front of Plage ORSTOM, fine muddy sand, 3-6 m, a live-collected spm., leg. von Cosel, XII. 1985. Paratypes: same locality, 1 spm., 16 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Museum.

Type locality: Pointe-Noire, Congo.

Description: Shell small, 12-19 mm long, slightly variable in outline, elongate-oval, thin and fragile, compressed. Anterior margin rounded, posterior margin obliquely truncated, slightly convex, with quite angulate postero-ventral corner. Ventral margin slightly convex to straight. Beaks somewhat behind the vertical midline.

Surface glossy, with more or less densely spaced grooves, on the anterior part somewhat but not entirely following the growth lines, about in the middle bending down and becoming oblique. They end just in front of the rather sharp posterior angle and leave a narrow smooth space between them and the concentric ridges on the postero-

dorsal slope. Periostracum very thin, colourless to brownish, persistent only on the marginal posterior part.

Hinge in the right valve with a short but strong anterior lateral, the summit of it just behind its middle. Anterior cardinal small but well developed, simple, posterior cardinal distinctly bifid. Posterior lateral very short, situated beyond the ligament. Left valve with a rather narrow, bifid anterior cardinal and a thin but well developed lamellar posterior cardinal. Ligament on a slightly protruding nymph. Pallial sinus large, with its broadest part just behind the beaks, extending to under the anterior adductor scar but not reaching it. Interior with moderately prominent reinforcement just posterior to the antero-ventral adductor scar.

Exterior pale to bright pink, occasionally translucent white on the umbonal area. Interior with same colour.

Measurements:

18.4 x 9.5	pt MNHN
17.0 x 9.7	pt MNHN
15.7 x 8.8	ht
15.6 x 8.1	pt MNHN
14.8 x 8.1	pt ZMC
14.7 x 7.9	Palmeirinhas
14.6 x 8.3	pt SMF
14.2 x 8.1	pt Natal Museum
14.0 x 8.2	pt ZMC
12.8 x 7.1	pt Natal Museum
12.5 x 7.0 x 2.6	pt MNHN
12.3 x 6.8	pt SMF
12.2 x 6.7	pt IRSNB

Distribution: Guinea (Iles de Los, rare) to northern Angola (Luanda); Ilha do Principe.

Material examined: The type material. Guinea: Roume, Iles de Los, north side, very fine muddy sand, 1.5-2 m, 3 v., leg. von Cosel, 29. V. 1988, MNHN. Côte d'Ivoire: SE of Sassandra, 4° 46' N, 5° 58' W, 12 m, 2 spm., 2 v.; SW of Jacqueville, 5° 09' N, 4° 39' W, 20 m, 6 v.; 5° 06' N, 4° 38.5' W, 50 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 31. III. - 3. IV. 1964; Grand Lahou, 5° 07.4' N, 5° 04.5' W, 15 m, 4 v.,

8. III. 1966; Jacqueville, 20 m, 2 v., 25. 11. 1966; Grand Bassam, 5° 09' N, 3° 48' W, 30 m, 1 spm., 20. IX. 1966; Abidjan region (no precision), 4 spm., 1 v., all dredged R/V "Reine Pokou", leg. Le Lœuff; Abidjan region (no precision), 1 sh., 1 v., leg. Marche-Marchad, all MNHN. Gabon: off Port-Gentil, 0° 55' S, 8° 44.6' E, 30 m, 3 v., leg. Chevalier, 1986-89, MNHN. Congo: Pointe-Noire, Plage Mondaine near lighthouse, on beach, 5 v.; 5 m, 1 v.; Plage ORSTOM, 3-6 m, 1 spm., 2 sh.; Songolo, 5 m, 1 v., all leg. von Cosel, XII. 1985, all MNHN. Zaïre: Kipundji, 5° 56' S, 12° 07' E, 22-25 m, dredged R/V "Ombango", leg. Crosnier, 25.-26. VIII. 1965, MNHN. Angola: Cacuaco, Bengo province, 5-10 m, 1 sh.; Praia de Buraco, Palmeirinhas, Luanda province, 5-10 m, 2 v., 1 fragm.; off Palmeirinhas, 20-30 m, 2 sh., 4 v., all leg. Gofas, 1981-86, all MNHN. Ilha do Principe: Baía Santo Antonio, 15 m, several v.; Santo Antonio, on beach, 3 v.; off Cais de Sta. Ana, 11 m, 1 v.; Baía das Agulhas, 30 m, 1 v., all taken by expedition R/V "Calypso" Golfe de Guinée, 26.-29. VI. 1956, leg. Marche-Marchad, all MNHN.

Biotope: In fine muddy sand and fine sand, from shallow water (2-6 m) to about 25 m, rarely deeper, in sheltered bays as well as offshore.

Derivatio nominis: The species is named after my colleague A. Crosnier, biologist at ORSTOM, who worked for a long period at the Pointe-Noire ORSTOM biological station and who is one of the persons being at the origin of the forthcoming book on West African bivalves.

Remarks: The new species is distinguished from *T. (O.) compressa* (for which it also was mistaken) by its rich pink colour, the sharper postero-ventral corner, the less convex ventral margin and the much denser oblique grooves. The pink colour distinguishes it also from most specimens of the other close species, *T. (O.) densestriata*; this latter has a more rounded and risen postero-ventral corner and a somewhat stronger hinge dentition. Moreover, the lamellate

sculpture on the posterior part of the right valve is much less developed to obsolete in *T. (O.) crosnieri*. The populations around the oceanic islands (Cape Verde Islands for *T. (O.) densestriata* and Ilha do Principe for *T. (O.) crosnieri*) of

both species are, in contrast to the continental shelf, very light-coloured to nearly colourless; this phenomenon is also known for other bivalves, e.g. the Capeverdean populations of *Solecurtus afroccidentalis* Cosel, 1969.

Genus *Macoma* Leach, 1819
Subgenus *Psammacoma* Dall, 1900

***Macoma (Psammacoma) pseudofallax* n. sp. (Figs. 96-97; 167)**

Macoma candida (Lamarck, 1818): - Nicklès, 1955, *Atlantide Rep.*, 3: 211 [partim].

Tellina galathea Hanley in Sowerby, 1846: - Nicklès, 1955, *Atlantide Rep.*, 3: 211 [partim].

M. (P.) fallax auct. (*non* Bertin, 1878) [partim].

Type material: Holotype MNHN, W of Gonzagueville, Côte d'Ivoire, 200 m, a complete sh. (r.v. broken and repaired), dredged R/V "Reine Pokou", leg. Lelœuff, 23. VI. 1970. Paratypes: Abidjan region (no precision), 1 right v., leg. Marche-Marchad, MNHN; S of Marshall, Liberia, 5° 50' N, 10° 30' W, 95 m, 1 left v., dredged R/V "Atlantide" (sta. 58), 8. I. 1946, MNHN.

Type locality: Gonzagueville, Côte d'Ivoire.

Description: Shell 25-53 mm long, somewhat variable in outline, elongate-rectangular-oval, rather thin and brittle, compressed. Anterior margin well rounded, posterior part only slightly tapering, posterior margin rounded-truncated, postero-dorsal margin straight, ventral margin straight in the central part. Posterior end weakly bent to the left. Beaks well behind the vertical margin.

Surface with irregular growth lines and coarser growth stages. Posterior angle broad and indistinct. Very shallow and broad radial depression on the postero-dorsal area of the right valve. Escutcheon small and narrow, ligament short. Periostracum rather thick, pale brownish to brownish, persistent only on the marginal part of the valves, if at all.

Hinge with a small but strong anterior cardinal and a strongly bifid posterior cardinal in the right valve and a bifid anterior and a thin, lamellar posterior cardinal in the left valve, no laterals. Pallial sinus broad and rather short, passing beyond the level of the beaks but ending at about the middle of the valves, confluent with the ventral pallial line in its posterior half.

Exterior dull and dirty whitish, occasionally with a pale yellowish to pale

orange hue just on the umbonal area. Interior white, often with pale yellowish to orange under the beaks.

Measurements:

53.8 x 34.6	pt MNHN
37.0 x 22.2	St. Louis
36.6 x 21.4	Ouidah
35.5 x 21.4	St. Louis
34.7 x 21.6	Ouidah
32.2 x 19.8	ht
24.7 x 14.7	Marshall, pt, Atlantide sta. 58

Distribution: Senegal (Kayar) to Bénin (Ouidah) and perhaps further east and southward. There are no records from Guinea-Bissau, Guinea and Sierra Leone.

Material examined: The type material. Senegal: off St. Louis, 580 m, 2 v., dredged R/V "Louis Sauer", leg. Pin, 1987; off Kayar, 110-120 m, 6. IV. 1967; off Cambérène, 14° 50' N, 17° 29' W, 150 m, 2 v., fragm., 15. III. 1967, both dredged "Tenace", leg. Marche-Marchad; S of Dakar, 150-200 m (no precision, 1 v., all MNHN. Côte d'Ivoire: SW of Sassandra, 4° 33' N, 6° 36' W, 100-109 m, 2 v., dredged R/V "Calypso" Gulf of Guinea cruise 1956, leg. Marche-Marchad, 21. V.

1956, MNHN. Bénin: off Ouidah, 6° 10' N, 2° 05' E, 200 m, 6 v., dredged R/V "Léon Coursin", leg. Marche-Marchad, MNHN.

Biotope: In mud and muddy sand, from about 95 to more than 200 m.

Derivatio nominis: The name reflects the confusion of this species with *M. fallax* Bertin, 1878.

Remarks: This rare species, as well as the following one, has been cited in publications on West African mollusks as *M. (P.) candida* (Lamarck, 1818) or *M. (P.) fallax* Bertin, 1878. However, the types of both species are different and at least *M. fallax*, described without locality, is an Indopacific species: recently a few specimens were dredged off New Caledonia and could be compared with the type and the West African material.

***Macoma (Psammocoma) inexpectata* n. sp. (Figs. 98-100; 166)**

Macoma candida (Lamarck, 1818): - Nicklès, 1955, *Atlantide Rep.*, 3: 211 [partim].

M. (P.) fallax auct. (non Bertin, 1878) [partim].

Tellina galathea Hanley in Sowerby, 1846: - Nicklès, 1955, *Atlantide Rep.*, 3: 211 [partim].

Type material: Holotype MNHN, Abidjan region, Côte d'Ivoire (no precision), a complete sh., dredged R/V "Reine Pokou", leg. Le Lœuff. Paratypes: same locality, 8 v. MNHN, 1 sh. ZMC, 1 sh. IRSNB, 2 v. SMF, 1 sh. Natal Museum.

Type locality: Abidjan, Côte d'Ivoire.

Description: Shell 30-43 mm long, variable in length/height ratio, elongate-rectangular-oval, thin and more or less fragile, compressed. Anterior margin well rounded, posterior part only slightly tapering, posterior margin rounded-truncated, postero-dorsal margin straight, ventral margin in its central part straight or even slightly concave. Posterior end bent to the right. Beaks well behind the vertical midline.

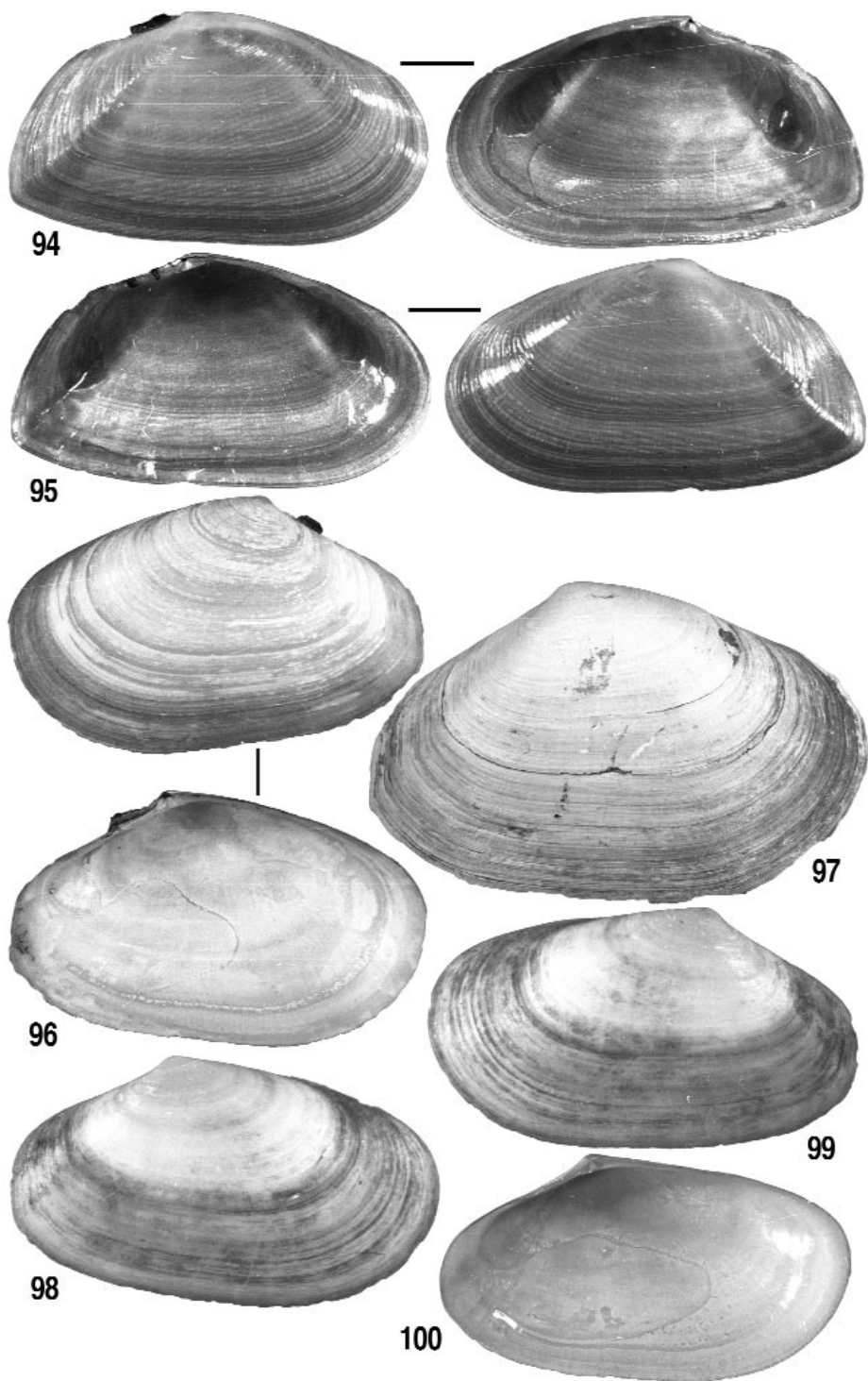
Surface with irregular growth lines and coarser growth stages. Posterior angle broad and indistinct. Very broad and shallow radial depression on the postero-

dorsal area of the left valve. Escutcheon small, narrow, rather deep, ligament short. Periostracum finely wrinkled, on the umbonal part of the valves thin, colourless and translucent, on the marginal part becoming thicker, with greenish brown colour, mostly along coarser growth stages, on fresh specimens persistent on nearly the whole valve.

Hinge with a small but strong anterior cardinal and a broad and strongly bifid posterior cardinal in the right valve and a rather narrow, bifid anterior and a thin, lamellar posterior cardinal in the left valve, no laterals. Pallial sinus

(Right page) Figures 94-95. *Tellina (Oudardia) crosnieri* n. sp., holotype, 15.7 mm, Pointe-Noire, 94: right valve; 95: left valve. Figures 96-97. *Macoma (Psammocoma) pseudofallax* n. sp., 96: holotype, 32.2 mm, Gonzagueville, Côte d'Ivoire, left valve; 97: paratype, 53.8 mm, Abidjan, right valve. Figures 98-100. *Macoma (Psammocoma) inexpectata* n. sp., 98: holotype, 28.2 mm, Abidjan, exterior of right valve; 99: holotype, exterior of left valve; 100: specimen from Ilha de Luanda, Angola, 33.2 mm, interior of left valve.

(Página derecha) Figuras 94-95. *Tellina (Oudardia) crosnieri spec. nov.*, holotipo, 15,7 mm, Pointe-Noire, 94: valva derecha; 95: valva izquierda. Figuras 96-97. *Macoma (Psammocoma) pseudofallax spec. nov.*, 96: holotipo, 32,2 mm, Gonzagueville, Costa de Marfil, valva izquierda; 97: paratipo, 53,8 mm, Abidjan, valva derecha. Figuras 98-100. *Macoma (Psammocoma) inexpectata spec. nov.*, 98: holotipo, 28,2 mm, Abidjan, exterior de la valva derecha; 99: holotipo, exterior de la valva izquierda; 100: especimen de Ilha de Luanda, Angola, 33,2 mm, interior de la valva izquierda.



broad and moderately long, ending beyond the middle of the valves, confluent with the ventral pallial line in its posterior half.

Exterior dirty whitish, interior white with a few light greyish growth zones.

Measurements:

40.2 x 21.8	pt MNHN
37.6 x 21.1	pt MNHN
35.9 x 19.7	pt MNHN
35.4 x 18.6	Ilha de Luanda
34.8 x 19.5	Bota - Batoke
33.2 x 18.2	Ilha de Luanda
32.8 x 17.1	pt MNHN
31.3 x 16.3	pt SMF
28.2 x 15.7 x 8.4	ht
27.4 x 14.7	pt Natal Museum
26.2 x 13.5	pt ZMC
26.1 x 14.0	pt SMF
20.8 x 11.0	pt IRSNB
19.8 x 10.6 x 5.6	Dakar

Distribution: Senegal (Lompoul) to northern Angola (Luanda), perhaps further northward.

Material examined: The type material. Senegal: off Lompoul, 15° 32' N, 16° 46' W, 65 m, 1 spm., dredged R/V "Léon Coursin", leg. Marche-Marchad, 1. II. 1957; off M' Boro, 246 m, 1 spm.; Dakar region (no precision), 1 v., both dredged R/V "Louis Sauter", leg. Pin, 1987, both MNHN. Sierra Leone: most probably Freetown region (no precision), 1 v., dredged R/V "Cape St. Mary", leg. Longhurst, 2. VII. 1952, MNHN. Côte d'Ivoire: SW Sassandra, 4° 36' N, 6° 33' W, 100 m, 1 spm.; S. Dibou, 5° 01' N, 5° 17' W, 40 m,

1 spm.; SW Jacqueville, 5° 06' N, 4° 38.5' W, 50 m, 3 v., all dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 31. III. - 3. IV. 1964; Abidjan region (no precision), several sh. and v., leg. Marche-Marchad, all MNHN. Cameroon: Bota - Batoke, 3° 59' N, 8° 58.5' E, 45-50 m, 1 v.; 4° 01' N, 8° 59' E, 48-49 m, 6 v., both trawled "Campo Star", leg. von Cosel, 22.-29. XII. 1985, both MNHN. Angola: off Ponta das Lagostas, Luanda province, 30-50 m, several v., trawled "Victoria"; Ilha de Luanda, Luanda province, 75-80 m, several v.; Cabo Ledo, Bengo province, 10-40 m, 1 juv. v., all leg. Gofas, 1981-85, all MNHN.

Biotope: In mud and fine, muddy sand, from 30 to 250 m.

Derivatio nominis: This species showed up unexpectedly during examination of lots of the preceding species, hence its name.

Remarks: This new species has also been mistaken for *M. (P.) fallax* and *M. (P.) candida*, it is distinguished from *M. (P.) pseudofallax* principally by the inverted flexure of the posterior end: not to the left like other *Macoma* but to the right. Other differences of *M. (P.) inexpectata* are the entirely white colour, the often more elongate outline, the somewhat more inflated shell, the slightly longer pallial sinus and the smaller size. The species is uncommon but less rare than the preceding one, it goes up to more shallower water and is occasionally taken in shrimp trawls.

Genus *Gastrana* Schumacher, 1817

Gastrana orstomi n. sp. (Figs. 101-104; 168)

Type material: Holotype MNHN, Abidjan, Côte d'Ivoire, "Trou sans Fond" submarine canyon, 175-270 m, a live-collected spm., dredged R/V "Reine Pokou", leg. Le Lœuff, 13. XI. 1969. Paratypes: same locality, 5 spm. in alcohol, 2 sh. MNHN, 1 sh. ZMC, 1 sh. IRSNB, 1 sh. SMF, 1 sh. Natal Museum. **Type locality:** Abidjan, Côte d'Ivoire.

Description: Shell small, 15-22 mm long, variable in shape and often more or less distorted, oval, thin but solid,

inflated. Anterior margin broadly rounded, posterior part somewhat tapering but with rather convex postero-dorsal

and postero-ventral margin. Posterior margin narrowly rounded, posterior end not bent. Beaks on or just in front of the vertical midline.

Surface with fine, dense, irregular concentric lamellae and very faint, irregular, radial striae, visible under the lens only ($\times 5-10$). Posterior angle rounded and ill-defined. No depression in front of the posterior angle. Small, well-defined lunule, escutcheon short and very narrow, sharply delimited, ligament short. Periostracum greyish brown, dull and slightly wrinkled, persistent mostly on the marginal part of the valves.

Hinge in the right valve with a thick, strong anterior and a strong, slightly bifid posterior cardinal, with a rather wide space between them. Left valve with a very broad, more or less bifid, centrally situated anterior cardinal and a narrow, rather indistinct posterior cardinal which is nearly parallel and adjacent to the nymph. Pallial sinus short and rather broad, rounded at the end, passing slightly beyond beak level or ending almost under the beaks.

Exterior and interior dull white.

Measurements:

22.2 x 16.9	pt Natal Museum
20.8 x 16.0 x 10.3	ht
20.3 x 15.4	pt SMF
20.0 x 15.4	pt ZMC
19.5 x 15.6 x 9.9	pt MNHN
17.7 x 13.6	pt IRSNB
16.7 x 12.1	Mauritania, "N' Diago" sta. 21
16.6 x 12.0	Mauritania, "N' Diago" sta. 21

Distribution: Tropical West Africa, to date only known from Côte d'Ivoire and Mauritania (19° N).

Material examined: The type material. Mauritania: off Mhairrett, 19° 04' N, 16° 50' W, 425 m, 11 v. (some juv.), dredged R/V "N' Diago", leg. Richer de Forges, 1983, MNHN. Côte d'Ivoire: SW Jacquelineville, 5° 09' N, 4° 39' W, 15 m, mud, 1 spm., 31. III. 1964; off Abidjan,

100-250 m, mud with stones, 6 spm., 4 sh., 1 v., 22. III. 1964, both dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier; off Abidjan, "Trou sans Fond" submarine canyon (no more precision), 150 m, 2 sh., 3 v., 13. XI. 1969; northern slope, 100-200 m, 3 spm., 17. XI. 1967; eastern slope, 80-90 m, 3 sh., 2 v. (no date), all dredged R/V "Reine Pokou", leg. Le Lœuff, all MNHN.

Biotope: In mud, apparently with rocks and stones, perhaps also in sandy mud, mainly between 80 and 425 m, but occasionally also shallower as shows the specimen from 15 m.

Derivatio nominis: The species is named after the French overseas research organization ORSTOM.

Remarks: The new species is distinguished from the also West African *G. matadoa* (Gmelin, 1791) by its smaller, shorter and more oval and pure white shell with a broader anterior part, finer and denser concentric lamellae, a well defined lunule and escutcheon and the lack of the shallow posterior radial depression which is typical for *G. matadoa*. The shell of *G. orstomi* is more equilateral with almost centrally situated beaks; the pallial sinus, which in both species reaches to or just beyond beak level, is in the new species shorter, tapering but more rounded at the end. The European-Mediterranean *G. fragilis* (Linné, 1758) is larger than *G. orstomi*, more inequilateral with a longer and generally markedly tapering posterior part and finer, much more spaced concentric lamellae which tend to be obsolete in fully grown specimens.

In contrast to *G. matadoa* and *G. fragilis*, the new species inhabits muddy bottom, mostly in considerable depths, often with hard objects imbedded in the sediment, whereas *G. matadoa* is littoral and avoids mud. *G. orstomi* is known only from scattered populations, it is common in the famous "Trou sans Fond", a submarine canyon in the shelf of Côte d'Ivoire off Abidjan with a depth of over 300 m immediately at the coast.

Family Donacidae
Genus *Donax* Linné, 1758

Donax (s.l.) verdensis n. sp. (Figs. 105-106; 172)

Donax trunculus Linné, 1767: - Nicklès, 1955, *Atlantide Rep.*, 3: 196-197.

Type material: Holotype MNHN, Baia Mordeira, Ilha do Sal, Cape Verde Islands, short beach on the SE-side, beach drift, a left v., *leg.* Kegelmann and von Cosel, XII. 1978. Paratypes: same locality, 8 v. MNHN, 2 v. ZMC, 2 v. IRSNB, 2 v. SMF, 2 v. Natal Museum.

Type locality: Baia Mordeira, Ilha do Sal, Cape Verde Islands.

Description: Shell 12-19 mm long, very variable in shape and size, wedge-shaped, thick and solid (juvenile specimens rather thin), rather inflated. Anterior margin more or less narrowly rounded, posterior margin narrowly rounded, postero-dorsal margin convex in its upper part, ventral margin weakly convex, posteriorly slightly raised. Beaks at the beginning or within the last third of the valves.

Surface with fine, regular radial striae and faint growth lines; no difference between the posterior area and the rest of the shell. Posterior angle rounded. Lunule long, narrow and ill-defined, no escutcheon. Periostracum not seen in the studied specimens.

Hinge in the right valve with a very faint, thin anterior cardinal, often ill-defined and a broad, bifid posterior cardinal; there are two short and rather thick posterior laterals, anterior lateral tending to be obsolete, when present, situated directly in front of and adherent dorsally to the anterior cardinal. Left valve with a strong anterior cardinal, a strong to more thin posterior cardinal and a short but strong and broad, knob-like posterior lateral. Directly adjacent to the anterior

cardinal a very short and rather thick anterior lateral. Pallial sinus broad, reaching beyond the vertical midline, confluent with the ventral pallial line for two thirds its length. Interior of ventral and posterior margin with fine, regular denticulations.

Exterior colour variable, mostly whitish, pale yellow or pale bluish violet, frequently with three brownish radial rays, beaks occasionally dark bluish violet. Interior white, light yellow, pink or violet, with white on the very marginal part.

Measurements:

14.2 x 8.6	pt MNHN
13.4 x 7.8	pt ZMC
11.5 x 6.5	pt MNHN
11.4 x 6.7	pt IRSNB
11.0 x 6.1	pt SMF
10.3 x 5.8	pt MNHN
10.2 x 6.0	ht
9.3 x 5.7	pt SMF
9.0 x 5.5	pt IRSNB
8.9 x 4.8	pt ZMC
7.3 x 4.4 x 2.9	pt MNHN

Distribution: Cape Verde Islands, endemic.

(Right page) Figures 101-104. *Gastrana orstomi* n. sp., 101: holotype, 20.8 mm, Abidjan, right valve; 102: holotype, exterior of left valve; 103: paratype MNHN, 19.5 mm, Abidjan, exterior of right valve; 104: paratype MNHN, 20.0 mm, Abidjan, interior of left valve. Figures 105-106. *Donax verdensis* n. sp., 105: holotype, 10.2 mm, Baia Mordeira, Ilha do Sal, left valve; 106: paratype MNHN, 10.8 mm. Baia Mordeira, right valve.

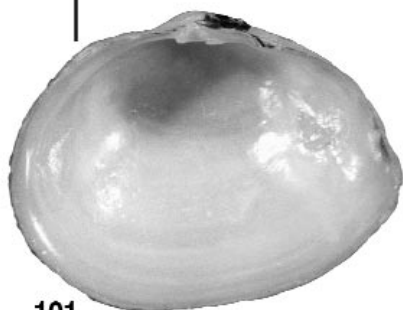
(Página derecha) Figuras 101-104. *Gastrana orstomi spec. nov.*, 101: holotipo, 20,8 mm, Abidjan, valva derecha; 102: holotipo, exterior de la valva izquierda; 103: paratipo MNHN, 19,5 mm, Abidjan, exterior de la valva derecha; 104: paratipo MNHN, 20,0 mm, Abidjan, interior de la valva izquierda. Figuras 105-106. *Donax verdensis spec. nov.*, 105: holotipo, 10,2 mm, Baia Mordeira, Ilha do Sal, valva izquierda; 106: paratipo MNHN, 10,8 mm. Baia Mordeira, valva derecha.



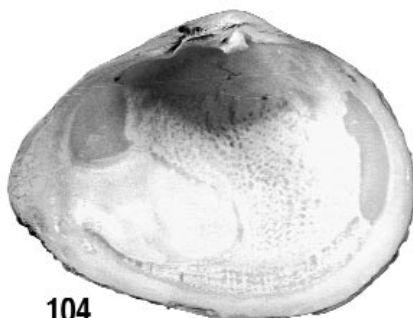
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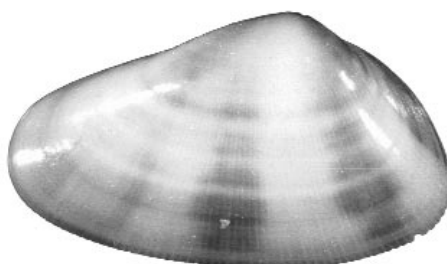
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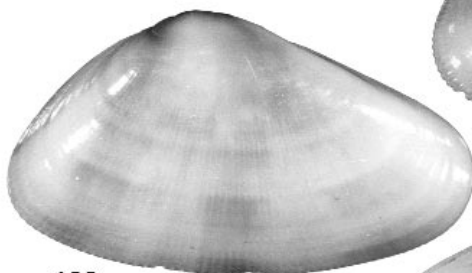
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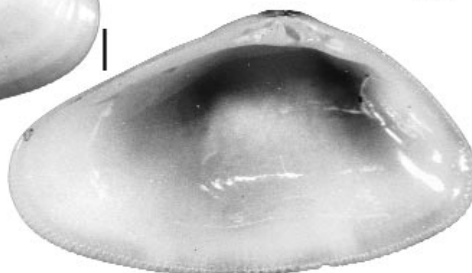
104



105



106



Material examined: The type material. São Vicente: Mindelo, Baía Matiota, sand, 3 m, 6 v., *leg.* von Cosel, 16. XII. 1978; near Mindelo, several v., *leg.* Cadenat, VI. 1950; Ilha do Sal, Baía Mordeira, beach at SE-side, numerous v., *leg.* Kegelmann and von Cosel, 4. I. 1979; Ilha do Sal: (no precision), *leg.* Cadenat, VI. 1950, numerous v., all MNHN; Palmeira, 10 m, 1 sh., numerous mostly juv. v., *leg.* First Iberic Exp. to Cape Verde Islands, 10. VIII. 1985, MNCN.

Biotope: Most probably in coarse sand, in shallow water well below low tide mark.

Derivatio nominis: The species is named after the Cape Verde Republic.

Remarks: The new species is superficially looking quite close to *D. pulchellus* Hanley, 1843 from the west African continental shore, and both have in common the external sculpture, the tapering anterior part, the two short and strong posterior laterals in the right valve and the single posterior lateral in the left valve. However, *D. verdensis* is thicker, shorter, higher, somewhat more compressed and has a longer posterior part, the umbos are placed less backwards than in *D. pulchellus*. The most conspicuous difference is that in *D. pulchellus*, the nymph is not about parallel to the postero-dorsal margin and at about 35-40° to the antero-dorsal margin as in *D. verdensis*, but is deeply sunken

and inclined at 90° to the antero-dorsal margin, so the whole rather thick ligament is situated in a pit and does not rise above the postero-dorsal surface as in most other Donacidae and also in *D. verdensis*.

From the European *D. vittatus* (da Costa, 1778), *D. verdensis* is distinguished by its shorter and smaller but thicker shell, the more tapering anterior part and the more convex postero-dorsal margin. The posterior laterals are similar in both species, the anterior lateral of the left valve of *D. vittatus*, however, is close but not adjacent to the anterior cardinal. There are commarginal striae on the posterior slope which are absent in *D. verdensis*. The other European species, *D. trunculus* Linné, 1758 has a similar simple external sculpture as the new species, but otherwise differs entirely: it is considerably larger, more compressed, much broader anteriorly, and, in contrast to *D. verdensis* and *D. vittatus*, it is slightly inequivalve. The hinge of *D. trunculus* is also different: the anterior lateral in the left valve is not adjacent to the anterior cardinal but parallel to the dorsal margin and separated from the anterior cardinal by a wide depression; the posterior lateral is much smaller and often ill-defined. The right valve has no anterior lateral as in *D. verdensis*, and the posterior lateral is a small knob only or obsolete.

D. verdensis is the only capeverdian *Donax* and is locally rather common in shell deposits on sandy beaches.

Subgenus *Machaerodonax* Römer, 1870

Donax (Machaerodonax) phariformis n. sp. (Figs. 107-109; 174)

Type material: Holotype in ANSP, Banana, Zaïre, 1 sh., *leg.* American Mus. Nat. Hist. Congo Expedition, 1915. Paratypes: same locality, 7 sh. ANSP, MNHN (1).

Type locality: Banana, Zaïre.

Description: Shell quite small, 13-18 mm long, little variable in shape, elongate, thin and brittle, compressed. Anterior margin well rounded, ventral margin gently convex, posteriorly less convex. Dorsal margin straight to very slightly concave, giving the valve a somewhat knife-shaped appearance. Posterior mar-

gin sharply cut, slightly arched in its middle part. Beaks at the beginning or within the last fourth of the valves.

Surface smooth, with fine irregular growth lines and very faint radial striae, visible under a lens (x 20-30) only. Posterior angle sharp, posterior area with very fine, dense radial ridges, crossed

by fine, regular, close-set, prominent concentric lamellae, resulting in a cancellate pattern. Long, narrow and ill-defined lunule, no escutcheon. Periostracum glossy and nearly transparent, only very pale greyish straw-coloured.

Hinge in the right valve with a short and thin anterior lateral and a thickened and slightly raised dorsal margin above it, representing a kind of second lateral. Anterior cardinal thin, posterior cardinal broad and strongly bifid; there are two very short and well-developed posterior laterals. Left valve with a very thin and faint anterior lateral, a rather thin anterior cardinal, a thin but strong posterior cardinal and a very short and rather thick posterior lateral. Pallial sinus broad, rounded, reaching to the vertical midline or remaining just posterior to it, confluent with the ventral pallial line for about four fifth its length. Ligament on a short but widely protruding nymphal plate which is as high or higher than the beaks. Interior of anterior and posterior margin very finely denticulate, visible only under a lens (x 10-20).

Valves entirely white and slightly translucent.

Measurements:

17.8 x 7.4	pt
16.6 x 6.5	ht
16.2 x 6.6	pt
16.1 x 6.8	pt
16.0 x 6.2	pt
13.0 x 5.2	SEDIGUI sta. 76
12.7 x 5.1	pt

Distribution: Known only from Guinea and Zaïre (mouth of the Congo).

Material examined: The type material. Guinea: border to Sierra Leone, 9° 12' N, 13° 27' W, 3 m, 1 v., in bottom grab sam-

ple, R/V "André Nizery", SEDIGUI sta. 76, leg. von Cosel, 14. V. 1988, MNHN.

Biotope: Not known but apparently in shallow water under calm conditions, most probably with slightly estuarine influence.

Derivatio nominis: The shell form reminds somewhat a short Pharidae.

Remarks: The new species is close to *Donax (Machaerodonax) acutangulus* Deshayes, 1855, also from West Africa (see Fig. 175). It differs in the lighter, thinner, non-coloured and more compressed shell with more backwards placed umbos, sharper cut posterior margin and the more parallel dorsal and ventral margins. There exists a smaller form of *D. (M.) acutangulus* with a generally slightly shorter posterior part, most specimens of this form are known from the southern part of the species' range. This form of *D. (M.) acutangulus* was found together with the type material of *D. (M.) phariformis* in the same lot without any intermediates. It is distinguished from the new species by the more inflated, thicker and often coloured shell and a much smaller nymph which never reaches the height of the umbos. The hinge configuration is the same in both species, however, the hinge plate in *D. (M.) phariformis* is somewhat broader on its posterior part, and the laterals are longer and more slender.

The type lot is the only record of *D. (M.) phariformis* which I am aware of, except the valve collected by me in Guinea. The other two known species of *Donax (Machaerodonax)*, *D. (M.) scalpellum* Gray, 1825 (Red Sea) and *D. (M.) transversus* Sowerby, 1825 (Panamic-Pacific Province), are much larger and have a longer posterior part.

Subgenus *Capsella* Gray, 1851

Donax (Capsella) domaini n. sp. (Figs. 110-111; 173)

Type material: Holotype MNHN, N-Casamance, off Ile de la Goëlette, 12° 40.5' N, 17° 10.5' W, fine sand, 18 m, a live-collected spm., dredged R/V "Louis Sauer", leg. von Cosel, 26. III. 1988. Paratypes: N-Casamance, 13° 03' N, 17° 03' W, fine sand with shells, 20 m, 1 sh. IRSNB; 12° 49'

N, 17° 11.4' W, fine sand, 25 m, 1 spm., 1 sh., 2 v. MNHN; 12° 46' N, 17° 12' W, 22 m, 1 spm. ZMC, 1 v. MNHN, all dredged R/V "Louis Sauter", leg. von Cosel, 25.-26. III. 1988. Guinea, 10° 22' N, 16° 03' W, 27 m, SEDIGUI sta. 617 D, 1 sh. SMF, taken by bottom grab, R/V "André Nizery", leg. von Cosel, 21. X. 1988.

Type locality: Ile de la Goëlette, N-Casamance, Senegal.

Description: Shell 9-14 mm long, elongate-trigonal, thin but solid, not very compressed. Anterior margin narrowly rounded, posterior part tapering, posterior margin narrowly rounded; ventral margin convex in the middle, nearly straight in the anterior and posterior part. Beaks just before the end of the second third of the valves.

Surface smooth and glossy, with very fine growth lines and few coarser growth stages. Posterior area with strong, slightly irregular, dense, concentric ridges. Posterior angle rounded. Lunule long and ill-defined. Periostracum thin, light greyish brown, light straw-coloured or nearly colourless, thin and glossy, persistent on the greater part of the valves.

Hinge in the right valve with a low but rather thick and long anterior lateral far from the beaks in the middle of the anterior dorsal margin; anterior cardinal thin, posterior cardinal broad and bifid; there are two posterior laterals, one indistinct knob-like one on the postero-dorsal margin and one short and well-developed one underneath. Left valve with three cardinals: two anterior and a posterior cardinal and a short, strong posterior lateral, no anterior lateral. Pallial sinus broad, rounded, ending just posterior to the vertical midline, confluent with the ventral pallial line for about four fifth its length. Ligament very short, on a small, not protruding nymph. Interior of margin smooth.

Exterior white, mostly with an irregular brownish radial ray on the posterior part and occasionally with more brownish rays or zones on the anterior part; few specimens entirely white. Interior whitish with exterior colouration slightly showing through, occasionally a reddish brown spot on the postero-dorsal area.

Measurements:

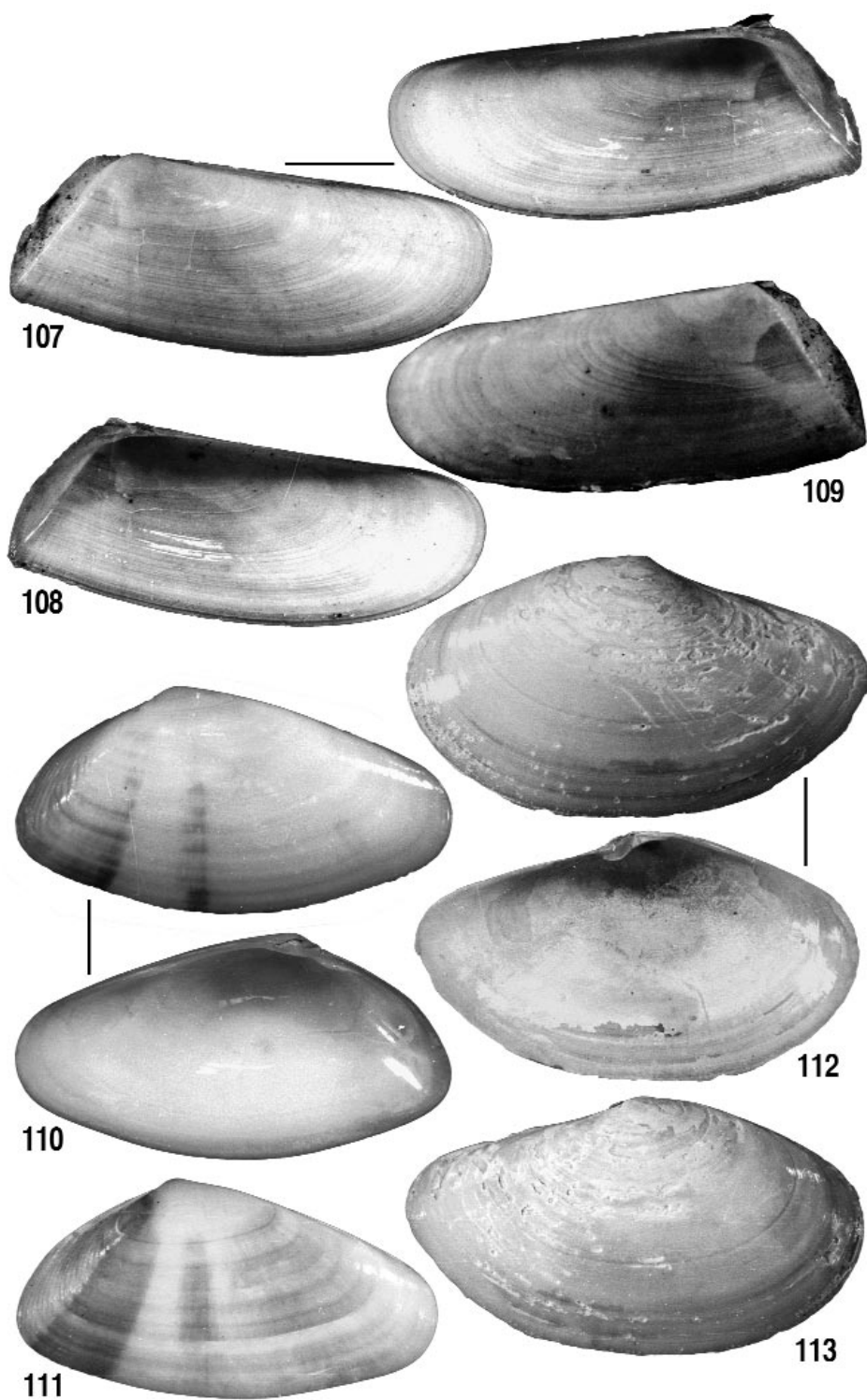
14.0 x 7.8	pt MNHN, 12° 43' N
13.1 x 6.9	ht
12.3 x 6.5	pt ZMC, 12° 46' N
12.2 x 6.6	pt IRSNB, 13° 03' N
11.6 x 6.1	pt MNHN, 12° 43' N
11.2 x 5.7	pt MNHN, 12° 49' N
10.7 x 5.5	SEDIGUI sta. 405
10.2 x 5.5	pt SMF, SEDIGUI 617D
9.9 x 5.6	Pt. Gentil
9.4 x 4.8 x 2.8	pt MNHN, 12° 49' N
9.0 x 4.5	Abidjan

Distribution: Senegal (Casamance: Abéné) to Gabon (Port-Gentil).

Material examined: The type material. Senegal: Casamance, Abéné, 13° 00.4' N, 17° 00.6' W, 18 m, fine sand, 1 v., dredged R/V "Louis Sauter", leg. von Cosel, 25. III. 1988, MNHN. Guinea-Bissau: W of Ilha Caravela, Bissagos, 11° 35' N, 16° 34' W, 15 m, 1 v., dredged R/V. "André Nizery", leg. von Cosel, 10. X. 1988, MNHN. Guinea: W of Ouendi, 9°

(Right page) Figures 107-109. *Donax (Machaerodonax) phariformis* n. sp., 107: holotype ANSP, 16.6 mm, Banana, Zaïre, right valve; 108: holotype, interior of left valve; 109: paratype ANSP, 16.1 mm, same locality. Figures 110-111. *Donax (Capsella) domaini* n. sp., 110: holotype, 13.1 mm, Casamance, right valve; 111: specimen from SEDIGUI 405, 10.7 mm, exterior of right valve. Figures 112-113. *Abra pini* n. sp., holotype, 18.0 mm, Longa, Senegal, 112: left valve; 113: exterior of right valve.

(Página derecha) Figuras 107-109. *Donax (Machaerodonax) phariformis spec. nov.*, 107: holotipo ANSP, 16,6 mm, Banana, Zaire, valva derecha; 108: holotipo, interior de la valva izquierda; 109: paratipo ANSP, 16,1 mm, misma localidad. Figuras 110-111. *Donax (Capsella) domaini spec. nov.*, 110: holotipo, 13,1 mm, Casamance, valva derecha; 111: espécimen de SEDIGUI 405, 10,7 mm, exterior de la valva derecha. Figuras 112-113. *Abra pini spec. nov.*, holotipo, 18,0 mm, Longa, Senegal, 112: valva izquierda; 113: exterior de la valva derecha.



54' N, 15° 19' W, 23 m, 1 sh., 1v., SEDIGUI sta. 457; W of Ile Konebomby, 9° 48' N, 15° 21' W, 26 m, 1 v., SEDIGUI 405, 23. V. 1988; W of Sierra Leone border, 9° 02' N, 14° 06' W, 32 m, 5 v., SEDIGUI sta. 16; 9° 03' N, 13° 53' W, 23 m, 1 v. SEDIGUI sta. 12, both 12. V. 1988; all taken by bottom grab, R/V "André Nizery", leg. von Cosel, all MNHN. Côte d'Ivoire: SW of Jacqueville, 5° 09' N, 4° 39' W, 20 m, 1 v.; off Assinie, 5° 07' N, 3° 22' W, 20 m, 8 v.; both dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 21.-31. III. 1964; Grand Bassam, 20 m, several spm., dredged R/V "Reine Pokou", leg. Le Lœuff, 12. V. 1967, all MNHN. Ghana: SE Beyin (Côte d'Ivoire border), 4° 58' N, 2° 41' W, 20 m, 1 v., dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 19. III. 1964, MNHN. Gabon: Port-Gentil (no precision), 1 spm., leg. Bernard, 1987; 0° 55' S, 8° 44.6' E, 30 m, 1 v., leg. Chevalier, 1989, both MNHN.

Biotope: In fine, mixed or rather coarse sand, offshore from about 15 to 30 m.

Derivatio nominis: The species is dedicated to my colleague François Domain, biologist at ORSTOM, the chief scientist on most of the cruises of R/V "André Nizery" in which I participated.

Remarks: The new species is characterized by its rather small shell with the convex middle part of the ventral margin. It is much shorter than the sympatric *D. (Capsella) owenii* Hanley, 1843, which also differs in its more posterior umbos. Moreover, that species prefers shallower water and finer sediment. *D. (C.) domaini* has a mainly tropical distribution. Off Guinea, Recent specimens of the new species have been found in sediment with shell concentrates consisting of subfossil *D. (C.) burnupi* Sowerby, 1894, a species with disjunct distribution and originally described from South Africa, which in the northern part of its range is now strictly confined to the zone with predominant upwelling and colder water (Mauritania, North of Senegal).

Family SEMELIDAE
Genus *Abra* Lamarck, 1818

Abra pini n. sp. (Figs. 112-113; 169)

Type material: Holotype MNHN, off Longa, Senegal, 600 m, 1 sh. dredged R/V "Louis Sauger", leg. Pin, I. 1987. Paratypes same locality, 1 sh., MNHN.

Type locality: Longa, Senegal.

Description: Shell 18 mm long, elongate-oval, thin and fragile, nearly equi-valve, rather compressed. Anterior margin well rounded, posterior margin attenuated, narrowly rounded. Ventral margin anteriorly and posteriorly more convex than in the middle. Beaks in the middle or very slightly behind the vertical midline.

Surface smooth and glossy, with fine, irregular growth lines and very faint radial waves on the marginal part, visible under the lens only (x 10-20). Periostracum very thin, transparent, at the margins with a pale yellowish hue.

Hinge in the right valve with anteriorly and posteriorly a rather short, lamellar lateral and two small cardinals. Left valve with

one small cardinal, no laterals. External ligament very short, on a small nymph. Pallial sinus broadest in its posterior part, tapering, reaching beyond the vertical midline and confluent with the ventral pallial line over nearly its whole length.

Exterior and interior entirely white.

Measurements:

18.1 x 10.4 pt
18.0 x 10.3 ht

Distribution: At present only known from Senegal.

Material examined: The type material only.

Biotope: In muddy bottom on the continental slope between 600 and 1000 m.

Derivatio nominis: The species is named after Marcel Pin, a keen amateur collector from Dakar, who provided me with the type lot.

Remarks: The new species is close to *A. jarli* Nicklès, 1955, also from West

Africa (see Fig. 171), but has a less pointed posterior part and a more horizontal middle part of the ventral margin. The European *A. longicallis* (Scacchi, 1836) is broader, with the beaks well behind the vertical midline. *A. profundorum* (E. A. Smith, 1885) is much larger (up to 30 mm) with an even more tapering posterior part; this species is also recorded from West Africa but from much deeper water.

Abra intesi n. sp. (Figs. 114-115; 170)

Type material: Holotype MNHN, off Abidjan, Côte d'Ivoire, mud and gravel, 100-250 m, 1 sh., dredged R/V "La Rafale", Guinean Trawling Survey, leg. Cherbonnier, 22. III. 1964. Paratypes: same locality, 1 spm., 1 sh., 1 v., MNHN.

Type locality: Abidjan, Côte d'Ivoire.

Description: Shell 20-24 mm long, elongate-oval, thin and fragile, equivalent, somewhat inflated. Anterior margin well rounded, posterior margin attenuated and narrowly rounded. Ventral margin straight, raising posteriorly, occasionally with a very weak postero-ventral sinuosity. Beaks slightly in front of the vertical midline.

Surface smooth and glossy, with faint, irregular, concentric growth lines, a few coarser growth stages and extremely fine, irregular radial striae, mostly visible under a lens (x 10-20) only. Periostracum very thin, transparent, colourless to very pale yellowish, visible mostly at the margins and the coarser growth stages.

Hinge in the right valve with a thin, lamellar anterior lateral and a slightly shorter posterior lateral, two very small cardinals. Left valve with one very small cardinal, no laterals. Resilifer rather small, sunken. External ligament on a very small nymph. Pallial sinus broad, reaching well beyond beak level, confluent with the ventral pallial line for about half its length or slightly less.

Exterior and interior white, often with more translucent concentric bands along growth stages.

Measurements:

22.2 x 11.8 ht
19.0 x 10.3 pt

17.4 x 9.2 pt
16.1 x 8.4 pt

Distribution: Known from Côte d'Ivoire (Abidjan region) and northern Angola (Luanda).

Material examined: The type material. Côte d'Ivoire: off Abidjan, "Trou sans Fond" submarine canyon, 150 m, 1 spm.; 100-200 m, 1 spm.; 100-170 m, 1 spm., all dredged R/V "Reine Pokou", leg. Le Lœuff, 13. XI. 1969, all MNHN. Angola: Ilha de Luanda, Luanda province, 75-80 m, 1 juv. sh., leg. Gofas, 1985, MNHN.

Biotope: In muddy bottom, from about 100 to 250 m and perhaps deeper.

Derivatio nominis: The species is named after my colleague A. Intès, biologist at ORSTOM, who worked mostly at Abidjan (Côte d'Ivoire) and, together with P. Le Lœuff, took many of the samples examined for this paper.

Remarks: When compared to *A. pini* and *A. jarli*, the new species has a smaller and finer hinge plate with smaller hinge teeth, the shell is more elongate, with more anteriorly situated beaks. The resilifer is smaller and more sunken than in *A. pini*. *A. jarli* has a more attenuated posterior half.

Family VENERIDAE
Genus *Parvircirce* n. g.

Type species: *Parvircirce donacina* n. sp., described herein.

One Fossil species, Upper Eocene, Paris Basin (*Parvircirce goodallioides* (Cossmann, 1886)) and one Recent species, tropical West Africa.

Diagnosis: Shells minute, suboval to oval-trigonal, compressed, with beaks markedly behind the vertical midline. Lunule long and ill-defined, escutcheon missing. Surface smooth, with irregular growth lines only. Hinge plate more or less broad on the anterior part, behind the beaks very narrow; hinge in the right valve with three cardinals and two anterior laterals, in the left valve with three cardinals and one anterior lateral, no posterior laterals. Anterior and middle cardinal in the left valve fused directly under the beaks, however, degree of fusion somewhat variable. Ligament short, only very slightly sunken. Pallial sinus either marked only by a few irregularities in the nearly integral pallial line or a very broad and shallow sinuosity.

Remarks: This unusual venerid genus is characterized by its exceptionally small size (probably among the smallest venerids existing), the typical posteriorly-situated beaks, resembling more a minute, short *Donax* than a venus shell, and the poorly defined pallial sinus. Concerning shell size and shape of pallial sinus, the new genus is most close to *Gouldia*, however, it is clearly distinguished by the longer anterior part, the still much smaller size, the hardly sunken ligament and the longer and ill-defined

lunula. A very shallow, ill-defined or obsolete pallial sinus is common to all Circinae and the reason why this new genus is placed in that subfamily.

The hinge configuration of *Parvircirce* is the same as in *Gouldia*, however, the hinge plate is narrower in relation to shell size, the anterior laterals are narrower, and the hinge plate terminates gradually towards the anterior end, whereas in *Gouldia*, it ends abruptly. In *Parvircirce*, the middle cardinal in the right valve is short and does not reach the upper shell margin; the anterior and middle cardinals in the left valve are fused to a hook under the beaks, with the fused part more or less narrow.

In the Fossil *Parvircirce goodallioides*, the hinge plate is rather broad; it is more narrow in the Recent *Parvircirce donacina*, which latter would mean a loss of neoteny towards the Recent species. However, a fusion of the anterior and middle cardinal in the left valve to a hook under the beaks is still present in both species, which indicates that neoteny in this character is retained. In Veneridae, this fusion is normally lost during ontogeny (Salas and Gofas, unpublished manuscript).

Derivatio nominis: "*parvus*" (lat.)= small, the name means small *Circe*, to express the close relationship to that genus.

Parvircirce donacina n. sp. (Figs. 116-118; 176)

Type material: Holotype MNHN, Ponta do Mussulo, N-Angola, on beach at low tide, a complete shell, leg. Gofas, 1982-85. Paratype: same locality, 1 worn v., MNHN.

Type locality: Ponta do Mussulo, Luanda province, N-Angola.

Description: Shell minute, 2-3.4 mm long, somewhat variable in outline and hinge plate, oval-subtrigonal, more or less thick and solid, rather inflated. Beaks behind the vertical midline. Anterior part of the valves tapering, anterior

margin rather narrowly rounded, posterior part shorter, with broadly rounded posterior margin.

Surface smooth with fine, irregular growth lines and occasionally some indistinct concentric waves on the anterior

part near the margin. Inner margin of the valves smooth. Lunule very small and ill-defined, no escutcheon. Periostracum very thin, somewhat dull, nearly colourless to very pale straw-coloured near the margins. Protoconch very small, glossy (observed only in a few specimens from Guinea), in most specimens hardly visible.

Hinge in the right valve with two strong anterior laterals and three cardinals, in the left valve with one strong anterior lateral and three cardinals. In the left valve, anterior and middle cardinal fused to a hook under the beaks. Ligament very short and hardly sunken. Muscle impressions equally sized, pallial sinus marked only by a slight irregularity of the pallial line.

Exterior and interior white to cream, occasionally with light brownish hue on the posterior slope, or white with brownish zigzag markings, visible also on the interior. Beaks in several specimens from Côte d'Ivoire and Guinea light to dark purple.

Measurements:

3.4 x 2.9	ht
3.1 x 2.8	SEDIGUI sta. 1
2.9 x 2.55	Abidjan
2.7 x 2.3	SEDIGUI sta. 1
2.5 x 2.3	SEDIGUI sta. 1
2.3 x 2.1	SEDIGUI sta. 1

Distribution: Known from the parts of the tropical zone were light intermittent upwelling is present: Guinea (10° 36' -9° 06' N), Côte d'Ivoire and Northern Angola.

Material examined: The type material. Guinea: Iles Tristão (no precision), 1 adult, 3 juv. v., *leg.* Marche-Marchad; W of Rio Nuñez, 10° 36' N, 15° 17' W, 8 m, 5 v., SEDIGUI sta. 778; W Ile Kouffin, 10° 30.5' N, 15° 13' W, 12 m, 2 sh., 4 v., SEDIGUI sta. 751, both 26. X. 1988; W Rio Yomponi, 10° 24' N, 15° 18' W, 15 m, 1 v., SEDIGUI sta. 723; 10° 23.9' N, 15° 06' W, 9 m, 7 v., SEDIGUI sta. 719, both 25. X. 1988; Roume, I. de Los, 1.5-2 m, very fine sand, 1 v.; Banc Crawford, 2-3 m, 1 v., both *leg.* von Cosel, 29. V. 1988; W of Sierra

Leone border, 9° 03' N, 13° 22.4' W, 4 m, 6 v., SEDIGUI sta. 1; 9° 06' N, 13° 25.7' W, 7 m, 2 v., SEDIGUI sta. 74, both taken by bottom grab R/V "André Nizery", *leg.* von Cosel, 12. V. and 14. V. 1988, all MNHN. Côte d'Ivoire: Abidjan region (no precision), 1 v.; Bassam, 15 m, 2 v., 1. III. 1966; 20 m, 1 sh., 1 spm., 30. IX. 1966; 25 m, 1 v., 5. V. 1973, all dredged R/V "Reine Pokou", *leg.* Le Lœuff, all MNHN.

Biotope: Most probably fine, somewhat muddy or pure fine sand, 1-30 m.

Derivatio nominis: The name points out the shape of the new species which reminds a small and very short *Donax*.

Remarks: *P. donacina* is for the moment the only known living species of this genus. The single other species to be lodged in the new genus is *Parvicirce goodallioides* (Cossmann, 1886), which had been described from the Upper Eocene of the Paris Basin as a *Circe* (COSSMANN, 1886: 114-115, pl. 6, fig. 29-31). JUKES-BROWNE (1908) proposes to place *C. goodallioides* in the "section" *Circenita* Jousseaume, 1888, because of the "convex valves (not compressed) and no defined escutcheon nor sunken ligament" (JUKES-BROWNE, 1908), however, the type species of *Circenita* (not "*Circentia*" as erroneously printed in KEEN, 1969 and subsequently in OLIVER, 1992) is *Venus arabica* Dillwyn, 1817 (= *Circenita callipyga* (Born, 1778)), in spite of its non-sunken ligament an entirely different and much larger *Circinae* with "normal" anteriorly situated beaks, thick anterior laterals and sculptured surface. COSSMANN (1913) cites Jukes-Browne but leaves his species "provisionally" in *Circe* because of the lack of a sinus, pending a more thorough examination. In lack of an appropriate genus, a new genus had to be erected for these two minute species differing considerably from the other *Circinae*.

Parvicirce goodallioides (see Figs. 177-180) is quite close to *P. donacina* but the shells have only less than half the size of those of the new species, they are more compressed and have a more oval outline with a less tapering anterior part

and a continuously convex postero-dorsal margin, whereas the middle part of the postero-dorsal margin in *P. donacina* is often nearly straight; the ventral margin of *P. goodallioides* is more evenly rounded. The hinge plate of *P. goodallioides* is broader in relation to shell size; the fusion between the anterior and middle cardinal in the left valve is well visible. Both species have an almost smooth looking surface, but in *P. goodallioides*, indistinct concentric striae may be present.

COSSMANN (1886) in his description of *P. goodallioides* indicates the complete absence of a pallial sinus, most probably because he had only few specimens at hand and because internal characters of small, especially fossil, bivalves are often extremely difficult to observe. However, within the 12 lots of *P. goodallioides* in the J. Le Renard collection, I could observe in at least 12 valves a very broad and shallow pallial sinus or indentation. This sinus is slightly variable in depth, it coincides with some other species within the Circinae and reminds somewhat the "sinus" in *Gouldia minima* (Montagu, 1803).

Juvenile *Tivela tripla* (Linné, 1771) of the same size are frequently found with *P. donacina* in the same samples and might look rather similar to the new species at a first glance. However, they are easy to separate because they have a longer posterior part, are much more compressed, the ventral margin is less convex, the anterior laterals are slightly thicker, the posterior cardinals more inclined towards ventrally, and a well-defined pallial sinus is present.

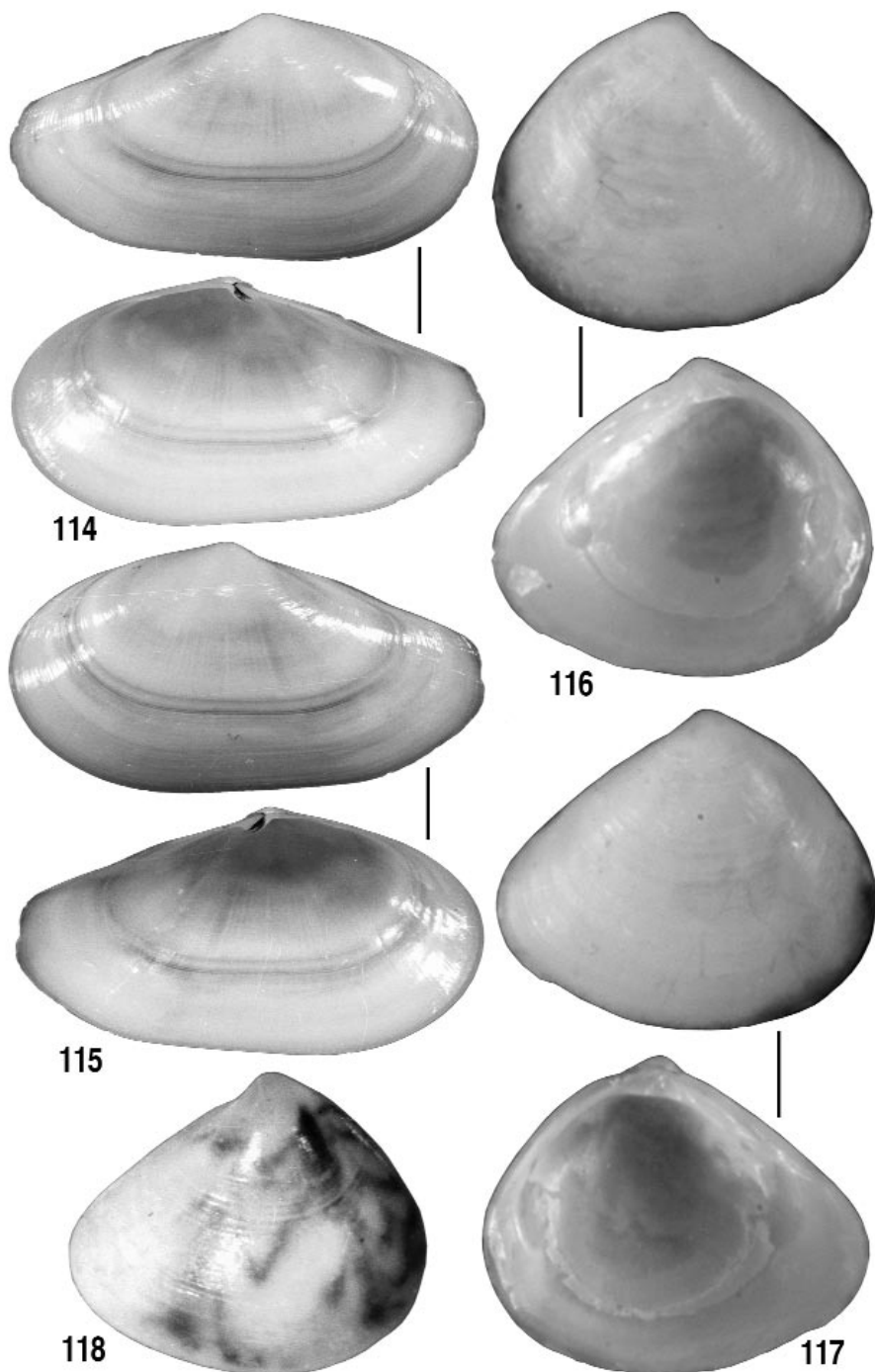
The material of *P. donacina* at hand looks quite variable, and two different forms have been found: the population from Angola (with the type lot) and two apparently isolated populations from

Guinea and Côte d'Ivoire. Specimens from these two localities differ from the Angolan form in having a still slightly shorter posterior part; they seem somewhat thinner-shelled, the hinge line is narrower with slightly more delicate teeth, especially the anterior laterals are thinner and appear longer than those in specimens from Angola. The degree of fusion of the anterior and middle cardinal in their upper part in the left valve is also different: in the Angolan specimens, the teeth are only fused at their uppermost extremity. In specimens from Côte d'Ivoire and Guinea, the cardinals are thinner but the fusion is more pronounced and has nearly the same thickness as both cardinals; the middle cardinal in the right valve terminates consequently in a greater distance from the dorsal margin. Zigzag markings and a dark purple protoconch have yet only been noticed on specimens from Guinea and one valve from Côte d'Ivoire; all other specimens from Côte d'Ivoire and those from Angola are whitish. The very small and not clearly set-off protoconch suggests for this species more a planktotrophic development rather than incubation as it is known from some other very small bivalves.

There is no record yet known from the zone with entirely tropical conditions in the inner Gulf of Guinea and from Sierra Leone and Liberia. Although this might perhaps be due to insufficient sampling, a distribution discontinuity between Ghana and the Congo is not excluded and could explain the differences in the populations north and south of this zone. These differences may point to the possibility of the presence of two close allopatric species but only more material will reveal if in fact two species are involved.

(Right page) Figures 114-115. *Abra intesi* n. sp., holotype, 22.2 mm, Abidjan, 114: right valve; 115: left valve. Figures 116-118. *Parvicirce donacina* n. sp., 116: holotype, 3.4 mm, Baía do Mussulo, Angola, right valve; 117: holotype, left valve; 118: specimen from SEDIGUI 1, 2.7 mm, exterior of left valve (note zigzag markings).

(Página derecha) Figuras 114-115. *Abra intesi* spec. nov., holotipo, 22,2 mm, Abidjan, 114: valva derecha; 115: valva izquierda. Figuras 116-118. *Parvicirce donacina* spec. nov., 116: holotipo, 3,4 mm, Baía do Mussulo, Angola, valva derecha; 117: holotipo, valva izquierda; 118: espécimen de SEDIGUI 1, 2,7 mm, exterior de la valva izquierda (nótese las marcas en zigzag).



Genus *Pitar* Römer, 1857

Pitar peliferus n. sp. (Figs. 119-120)

Type material: Holotype MNHN, off Grand Lahou, Côte d'Ivoire, 26 m, a complete spm. with animal in alcohol, trawled R/V "Reine Pokou", leg. Le Lœuff, 18. VIII. 1968. Paratypes: same locality, 1 spm. MNHN, 1 spm. SMF, 1 spm. ZMC, 1 spm. IRSNB; same locality, 20 m, 1 spm. MNHN, dredged R/V "Reine Pokou", leg. Le Lœuff, 25. IV. 1967.

Type locality: Grand Lahou, Côte d'Ivoire.

Description: Shell 15-35 mm long, quite variable in outline, longer than high, rounded-triangular, quite thin but solid, moderately inflated. Anterior margin narrowly rounded, posterior margin generally pointed, occasionally rounded, postero-dorsal margin typically convex, ventral margin gently convex, beaks well in front of the vertical midline.

Surface with fine to pronounced irregular concentric growth lines, occasionally an additional sculpture of very fine irregular concentric ridges is visible. Periostracum thin, dull and translucent. A thick layer of sediment is adhering to the marginal parts of fully grown specimens and to the whole shell of juvenile specimens.

Hinge with three cardinals in each valve, left valve with one large and thick anterior lateral, right valve with two small anterior laterals and a deep depression between them. Pallial sinus rather large, almost horizontal, generally reaching the vertical midline or passing slightly beyond it.

Valves entirely dirty white.

Measurements:

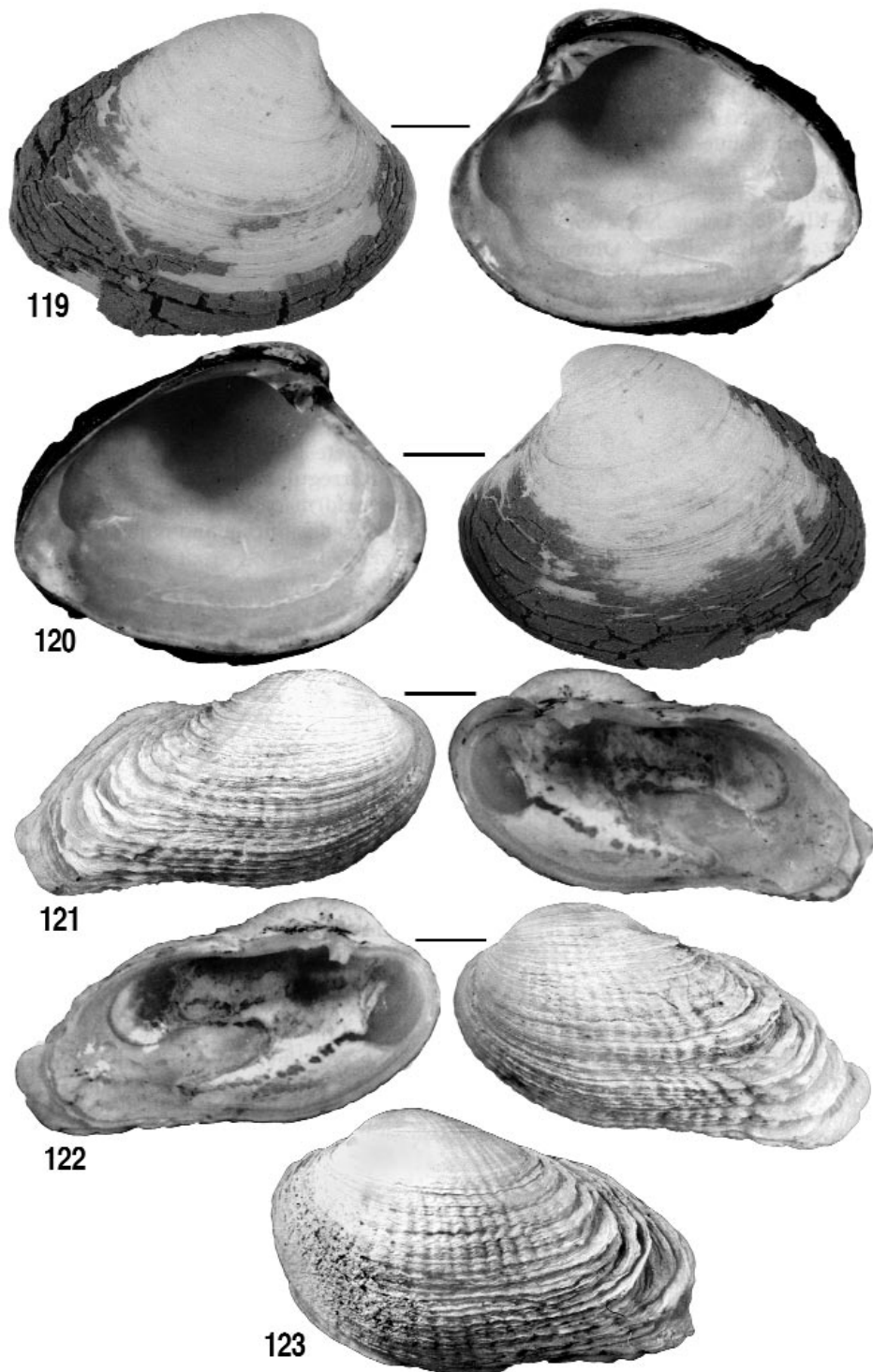
34.5 x 27.5 x 17.7	pt MNHN
31.4 x 24.8	ht
28.7 x 23.1	Congo
25.5 x 20.2	Casamance
24.7 x 19.1	Cameroon, 13 m
23.2 x 19.3	pt ZMC
22.8 x 18.4	pt SMF

19.9 x 16.2	Victoria - Bota
15.5 x 12.8	Conkouati
12.5 x 10.5	Pointe-Noire
12.1 x 9.8	Pointe-Noire
11.8 x 9.2	Kayar

Distribution: Senegal (Kayar) to northern Angola (Luanda).

Material examined: The type material. Senegal: N of Cayar, 15° 12.1' N, 15° 54.15' W, 25 m, 1 spm., 6. IV. 1967 (no precision; Casamance, Abéné-Kafountine, on beach, 4 v.; Diembéring-Cap Skirring-Cap Roxo, on beach, several v.; in creek off Elinkine, 3 m, 1 v.; Katakalous Bôlon, 3-4 m, 1 v., all leg. von Cosel, 3.-17. III. 1988; off Cap Skirring, 12° 20.7' N, 16° 53.1' W, 15 m, 1 spm., dredged R/V "Louis Sauger", leg. von Cosel, 27. III. 1988, all MNHN. Guinea-Bissau: W of Ilha Caravela, Bissagos, 11° 35' N, 16° 34' W, 15 m, 1 v., dredged R/V. "André Nizery", leg. von Cosel, 10. X. 1988, MNHN. Guinea: Conakry, "Sables de Conakry" (no precision), 1 v.; Banc Crawford, I. de Los, 2-3 m, 1 v.; Roume, I. de Los, very fine sand with mud, 1.5-2 m, 5 juv. spm., 1 sh., 5 v., both leg. von Cosel, 29. V. 1988, both MNHN. Côte d'Ivoire: SE Fresco, 5° 05' N, 5° 18' W, 20 m, 1 spm. (no date); Grand Bassam, 23-25 m, 2 spm., 25. IV. 1957, both trawled R/V "Reine Pokou", both MNHN. Cameroon: Victoria, Limbé - Bota, 8-10 m, 1 v., leg. von Cosel, 4. XII. 1985; Wouri Estuary -

(Right page) Figures 119-120. *Pitar peliferus* n. sp., holotype, 31.4 mm, Grand Lahou, 119: right valve; 120: left valve. Figures 121-123. *Petricola angolensis* n. sp., 121: holotype, 11.9 mm, Cabo Ledo, Angola, right valve; 122: holotype, left valve; 123 paratype MNHN, 12.7 mm, Cabo Ledo. (Página derecha) Figuras 119-120. *Pitar peliferus* spec. nov., holotipo, 31,4 mm, Grand Lahou, 119: valva derecha; 120: valva izquierda. Figuras 121-123. *Petricola angolensis* spec. nov., 121: holotipo, 11,9 mm, Cabo Ledo, Angola, valva derecha; 122: holotipo, valva izquierda; 123 paratipo MNHN, 12,7 mm, Cabo Ledo.



Cap Nachtigal, 3° 44' N, 9° 22' E, 13 m, 1 v., trawled "Campo Star", leg. von Cosel, 22.-29. XI. 1985, both MNHN. Congo: Konkouati, 4° 10' S, 11° 15' E, 19 m, 1 spm., trawled "Kounda", leg. von Cosel, XII. 1985; Pointe-Noire, Plage Mondaine, on beach, 7 v.; Plage ORSTOM, 3-6 m, 5 juv. spm., 1 sh., 3 v., both leg. von Cosel, XI.-XII. 1985; Pointe-Noire (no precision), 1 v., dredged R/V "Ombango", all MNHN. Angola: Cacuaco, Bengo province, 5-10 m, 1 spm., 5 sh.; Cabo Ledo, Bengo province, 10-40 m, 1 sh., 1 v., both leg. Gofas, 1981-84, both MNHN.

Biotope: In sandy mud and fine muddy sand, from about 3 to 25-30 m. Smaller specimens appear in the dredge samples as small mud balls during sieving, only breaking of these shows if it is just an agglomeration of sticky mud

or if it is a *Pitar* with its also quite firm mud layer around it.

Derivatio nominis: The name means "mudbearing" (from "*pelos*", greek=mud) and reflects the mode of life of the species.

Remarks: This species is not to be mistaken for any other West African *Pitar*. It is distinguished from *P. tumens* (Gmelin, 1791), *P. virgo* (Gray, 1838), *P. elata* (Sowerby, 1908) and *P. belcheri* (Sowerby, 1851) by its comparatively thinner shell and the deeper horizontal pallial sinus, from *P. virgo*, *P. belcheri* and *P. tellinoidea* (Sowerby, 1851) by the complete lack of any sculpture other than irregular growth stages. The southern form of *P. elata* is superficially close, but is thicker and much larger.

Family PETRICOLIDAE
Genus *Petricola* Lamarck, 1801

Petricola angolensis n. sp. (Figs. 121-123)

Type material: Holotype MNHN, Cabo Ledo, N-Angola, in grey sandstone, 10-40 m, a complete spm., leg. Gofas, 1982-86. Paratypes: same locality, 10 spm., 3 sh., MNHN, 1 sh. ZMC, 1 spm. IRSNB, 1 sh. SMF, 1 spm. Natal Museum, 1 sh. Universidade Augustinho Neto, Luanda.

Type locality: Cabo Ledo, Bengo province, N-Angola.

Description: Shell small, 10-16 mm long, irregular, very inflated, extremely variable in shape (according to the substrate), more or less elongate, short-oval to somewhat cuneiform, with broadly rounded anterior end and more or less pointed posterior end. Beaks at the end of the first third of the valves.

Surface with irregular, coarse, rounded radial ribs which are most prominent in the middle and on the posterior part and flattened and partly absent on the anterior part. Occasionally they are present only near the margins or totally absent. There are also irregular concentric growth ridges, on the anterior part very dense and slightly lamellate, on the postero-dorsal slope coarse and somewhat foliate. Lamellae occasionally overpassing the posterior margin, reminding somewhat a siphonoplax of a pholadid.

Hinge with a narrow to very thin anterior cardinal and a broad bifid posterior cardinal in the right valve; left valve with a rather narrow, hooked, bifid anterior and a small and oblique, almost horizontal posterior cardinal. No laterals visible. Pallial sinus large, broad, passing beyond the vertical midline but not reaching beak level, pointing towards the anterior adductor scar. Pallial line often broken up into a row of points.

Exterior dirty white, occasionally light brownish, interior white.

Measurements:

13.5 x 8.2	pt Univ. Luanda
13.2 x 7.3	pt MNHN
12.7 x 7.8	pt MNHN
12.5 x 6.6 x 5.7	pt MNHN
12.0 x 8.0	pt SMF
11.9 x 7.3	pt MNHN

11.9 x 6.2	ht
11.2 x 5.6	pt MNHN
10.7 x 6.1	pt ZMC
10.1 x 5.4	pt MNHN
9.7 x 5.4	pt Natal Museum
9.3 x 4.9	pt IRSNB

Distribution: Gabon (Cap Esterias) and Congo (Pointe-Noire) to southern Angola (Porto Alexandre).

Material examined: The type material. Gabon: Cap Esterias (no precision), 2 sh., *leg.* P. Bernard, 1985, MNHN. Congo: Pointe-Noire (no precision), 2 sh., colln. Office Pte.-Noire (ORSTOM); Pointe-Noire, Plage Mondaine, N of lighthouse, on beach at low tide, 1 v.; Plage Sauvage, on beach, 1 sh., 1 v., both *leg.* von Cosel, XII. 1985, all MNHN. Angola: 10 km S of Ambrizete, Zaire province, shell sand on beach, 2 juv. sh.; Barra do Dande, Bengo province, 0-2 m, 2 v.; Cacucaco, Bengo province, 0-2 m, rocks, 1 juv. sh.; Praia de Buraco, Palmeirinhas, Luanda province, rocks, 2-3 m, 1 juv. sh., 1 v.; Cabo Ledo, Bengo province, 10-40 m, several sh. and v., some still in live position in rock pieces

(associated spm.); Porto Alexandre, Moçâmedes province, 2 m, 6 v., all *leg.* Gofas, 1981-1986, all MNHN.

Biotope: Boring in limestone and sandstone, from shallow water to about 40 m. At the type locality, it was found together with *Ungulina alba* which inhabits the empty boreholes.

Derivatio nominis: The species is named after the Republic of Angola, the main distribution area.

Remarks: This species is yet very imperfectly known, there is no close resemblance to any other *Petricola* from Atlantic or American Pacific; only *P. denticulata* Sowerby, 1834 from the Panamic faunal Province is comparable but has a more elongate shell with much finer sculpture. *P. angolensis* has a restricted range in the southern zone of seasonal upwelling within the tropical West African faunal province. The specimens from Gabon are finer sculptured than the more southern ones but are indiscernible otherwise.

Genus *Mysia* Lamarck, 1818

Mysia marchali n. sp. (Figs. 124-125; 181)

Type material: Holotype MNHN, Port-Gentil, Gabon, Plage de la Sogara, 0° 38' S, 8° 43' E, shallow water, a complete sh., *leg.* Chevalier, 1980-89. Paratypes: same locality, 1 sh. MNHN, 1 sh. SMF. Pointe-Noire, Congo, Plage Mondaine, N of lighthouse, on beach at low tide, 4 v. MNHN; same locality, 1-3 m, fine sand, 1 v. ZMC; Pointe-Noire, Plage ORSTOM, 3-4 m, 1 v.; 5-6 m, 2 juv. spm., MNHN, all *leg.* von Cosel, XI.-XII. 1985.

Type locality: Port-Gentil, Gabon.

Description: Shell 10-21 mm long, somewhat variable in shape, subcircular-quadrangular, quite thin and brittle, rather inflated. Beaks just in front of the vertical midline.

Surface with irregular concentric growth lines and growth waves and extremely fine and dense radial striae, visible under a lens only (x 20-40), often slightly bifurcating just in front of the postero-dorsal angle and mostly absent on the earlier (umbonal) part of the valves. Periostracum very thin and colourless.

Hinge in the right valve with a thin anterior and a thin posterior cardinal and a broad interspace between them. Left valve with a rather thin but strong anterior cardinal, a broad, triangular, strongly bifid middle cardinal and a long and thin, oblique posterior cardinal; no distinct laterals. Pallial sinus very long and broad, broadly rounded at the end, passing far beyond beak level, pointing upwards towards the upper part of the anterior adductor scar and ending close to it.

Exterior and interior white to cream, rarely with a light purple hue on the postero-dorsal slope.

Measurements:

21.3 x 20.1	Port-Etienne (Nouadhibou)
20.2 x 18.5 x 10.1	pt MNHN, Pt.-Gentil
19.3 x 18.4	ht
18.5 x 17.0	pt MNHN, Pte.-Noire
17.9 x 17.3	pt SMF, Pt.-Gentil
15.1 x 13.8	pt MNHN, Pte.-Noire
14.1 x 13.1	Guinea
13.8 x 12.7	pt ZMC, Pte.-Noire
11.4 x 10.8	pt ZMC, Pte.-Noire
9.5 x 8.8	pt MNHN, Pte.-Noire
9.3 x 8.5	Casamance
7.4 x 6.5	pt MNHN, Pte.-Noire

Distribution: Mauritania (Nouadhibou) and Senegal (Casamance) to northern Angola (Luanda).

Material examined: The type material. Mauritania: Port Etienne (now: Nouadhibou) (no precision), 1 sh., Mission Gruvel, coll Dautzenberg, MNHN. Senegal: Casamance, Kafountine, 12° 53.4' N, 17° 01.5' W, 17 m, 1 v., dredged R/V "Louis Sauter", leg. von Cosel, 25. III. 1988, MNHN. Guinea: off Rio Koumba, 10° 21' N, 15° 01' W, 12 m, 1

sh., in bottom grab sample, R/V "André Nizery", SEDIGUI sta. 676, 23. X. 1988; off Ile Quito, 10° 01' N, 14° 36' W, 15 m, 1 v., dredged R/V "André Nizery", 1. X. 1988; Banc Crawford, I. de Los, 2-3 m, 1 v., 29. V. 1988, all leg. von Cosel, all MNHN. Côte d'Ivoire: Grand Bassam, 20 m, 1 juv. sh., dredged R/V "Reine Pokou", leg. Le Lœuff, 25. IV. 1973, MNHN. Angola: Corimba, Luanda province, 10-20 m, 1 v., leg. Gofas, 1981-82, MNHN.

Biotope: Most probably in mixed and coarse sand, also with gravel and shells, from shallow water to about 20 m.

Derivatio nominis: The species is dedicated to my colleague Emile Marchal, biologist at ORSTOM, one of the first having the idea of an identification book on West African bivalves.

Remarks: *Mysia marchali* is distinguished from the European and mediterranean *M. undata* (Pennant, 1777) by its smaller size, the more quadrangular outline and the presence of a faint radial microsculpture. This microsculpture is slightly stronger in the only valve from Casamance than in the material from Gabon to Angola.

Family MYIDAE

Genus *Cryptomya* Conrad, 1848

Cryptomya africana n. sp. (Figs. 126-128; 182)

Type material: Holotype MNHN, Grand Lahou, Côte d'Ivoire, 22 m, a complete dried specimen, dredged R/V "Reine Pokou", leg. Le Lœuff, 8. III. 1966. Paratypes: same locality, 6 spm. MNHN, 1 spm. ZMC, 1 spm. SMF, 1 spm. IRSNB, 1 spm. Natal Museum.

Type locality: Grand Lahou, Côte d'Ivoire.

Description: Shell 10-16 mm long, variable in outline, oval, somewhat trapezoid-shaped, compressed, juveniles fragile, adults rather thin, not gaping. Anterior margin obliquely rounded, posterior margin obliquely truncated, slightly convex. Postero-ventral corner angulate or rounded-angulate. Beaks in front of the vertical midline.

Surface with well marked concentric growth lines and growth stages and

with close-set, irregular, tiny granules arranged along the growth lines and occasionally merging to short, concentric folds, best visible under a lens (x 5-10) and becoming weaker or obsolete on the central part of the valves. Posterior angle marked by a more or less visible keel. Periostracum thin, light yellowish brown to nearly colourless, somewhat stronger on the posterior area.

Hinge line with a large, projecting chondrophore on the left valve and the corresponding resilifer in the umbonal cavity of the right valve. Pallial sinus well developed but very short and broad; ventral pallial line often disintegrated into several scars. Inner shell margin smooth.

Exterior and interior dirty white.

Measurements:

14.2 x 10.1	Port Etienne
13.7 x 9.3	Elinkine
13.5 x 9.2	Karabane Bôlon
12.1 x 8.0	Ziguinchor
11.2 x 8.1	Popenguine
11.0 x 7.2	Abéné
7.8 x 5.7 x 3.4	ht
7.8 x 5.1 x 3.2	pt SMF
7.2 x 5.1	pt MNHN
7.0 x 4.7	pt Natal Museum
6.5 x 4.6	pt ZMC
6.5 x 4.6	pt IRSNB

Distribution: Mauritania (20° N) to northern Angola (Luanda).

Material examined: The type material. Mauritania: Port Etienne (now: Nouadhibou), 20° 20' N, 16° 22' W, 10 m, 4 v.; 3 miles W of Kiaoné, 20° 02' N, 16° 22' W, 6 m, 2 v., both Mission Port Etienne 1965, *leg.* Marche-Marchad, 8. V. 1965, both MNHN. Senegal: Popenguine (no precision), 1 v., *leg.* Marche-Marchad, I. 1961; Casamance, Karabane Bôlon, off Karabane, 4 m, 1 v.; Casamance River, Ziguinchor, 3-5 m, several v.; creek off Elinkine, 3 m, 2 v.; Abéné-Kafountine, on beach, 1 v., all *leg.* von Cosel, 15-19. III. 1988, all MNHN. Guinea: W of Ile Kouffin, 10° 33' N, 15° 16' W, 11 m, 1 v., SEDIGUI sta. 774, 26. X. 1988; 10° 30' N, 14° 43' W, 1 v., SEDIGUI sta. 702, 24. X. 1988; W of Rio Morébaya, 9° 24' N, 13° 48' W, 13 m, 1 v., SEDIGUI sta. 171; W of Sierra Leone border, 9° 06' N, 13° 25.7' W, 7 m, 9 v., SEDIGUI sta. 74, both 17. 5. 1988, all taken by bottom grab, R/V "André Nizery", *leg.* von Cosel; Roume, I. de Los, N-side, 1.5-2 m, very fine muddy sand, 7 v.; Banc Crawford, I. de Los, 2-3 m, 3 v., both *leg.* von Cosel, 29. V. 1988, all MNHN. Côte d'Ivoire: SE

Sassandra, 4° 56' N, 5° 58' W, 12 m, 1 v.; Assinie, 5° 09' N, 4° 39' W, 20 m, 2 v.; 5° 06' N, 4° 38.5' W, 50 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, *leg.* Cherbonnier, 31. III. - 3. IV. 1964; Grand Bassam, 5° 09' N, 3° 48' W, 30 m, 1 spm., 28. IX. 1966; Abidjan region, 22 m, 2 spm.; Abidjan region (no precision), 3 spm., 2 sh., all dredged R/V "Reine Pokou", *leg.* Le Lœuff, all MNHN. Angola: Baia de Corimba, Luanda province, 10-20 m, 5 juv. v., *leg.* Gofas, 1983-85, MNHN.

Biotope: In sandy mud, muddy sand, and fine sand, in shallow water (ca. 3-5 m), obviously in lagoons, creeks, inlets with changing salinities, but also found offshore (20-30 m). The species lives deeply buried and is most probably commensal, adjacent to the boreholes of some crustaceans and echiuroid worms, in the same way as *C. californica* (Conrad, 1837).

Derivatio nominis: The name reflects the range extension of this genus, hitherto known from the eastern Pacific and Japan, to Africa.

Remarks: This species is most close to *C. californica*, the type species of the genus *Cryptomya*, from California and tropical Western America. *C. africana* is distinguished by its peculiar punctate surface and the short but well marked pallial sinus. *C. busoensis* (Yokoyama, 1922), from Japan, has no pallial sinus, the pallial line is going straight upwards from its postero-ventral corner to the posterior adductor scar.

C. africana has not yet been collected live except by dredgings with a "Charcot" dredge off Côte d'Ivoire, but from the localities of the empty valves (e.g. Casamance estuary), and from localities of the other species (e.g. *C. busoensis*, Posyet Bay near Vladivostok, salinity 33 ‰, SCARLATO, 1981) a preference for a marine-estuarine habitat is the most probable. All Côte d'Ivoire specimens, taken more offshore, have a much smaller size than those from more shallow localities with estuarine influence.

Genus *Paramya* Conrad, 1861

Paramya africana n. sp. (Figs. 129-130; 183; 184)

Type material: Holotype MNHN, Kayar, N of Dakar, Senegal, 110-112 m, a right valve, *leg.* Marche-Marchad, 6. IV. 1967. Paratype, off the mouth of the Congo River, 5° 41.9' S, 11° 42.6' E, 105 m, a right valve, Taken by box corer, R/V "Meteor", cruise M6-6, sta. 1000-2 C, *leg.* Fürsich, 20. II. 1988, SMF.

Type locality: Kayar, Grande Côte, Senegal.

Description: Shell very small, 3-6 mm long, rather variable in outline and length/width ratio, oblong-trapezoid, somewhat inflated, thin, hardly gaping posteriorly. Posterior part much higher than anterior part. Anterior part rather narrow, anterior margin evenly rounded, posterior margin slightly obliquely truncated. Postero-ventral corner well rounded. Beaks somewhat in front of the vertical midline.

Surface with strong, irregular growth lines and coarser growth stages, visible also on the interior of the valves. Posterior angle rounded, broad. Protoconch I and II smooth, well set off and distinguishable. Periostracum very thin and transparent, in adult specimens may be slightly straw-coloured near the margins, persistent only on fresh valves.

Hinge line rather broad, with a small, triangular, only slightly protruding resilifer, which is equal in both valves and strongly inclined towards posterior, its middle axis being only at about 15° to the horizontal midline of the valve. Right valve with a small to rather conspicuous and prominent knobshaped tooth in front of the resilifer. No indented pallial sinus but posterior pallial line straight vertical and not parallel to the posterior margin as in real integripalliate bivalves. Pallial line slightly irregular and tending to be

interrupted at the anterior and posterior adductor scar. Weak reinforcement (but-tress) stretching from under the beak to the anterior adductor scar and delimiting it towards postero-ventral.

Valves entirely white.

Measurements:

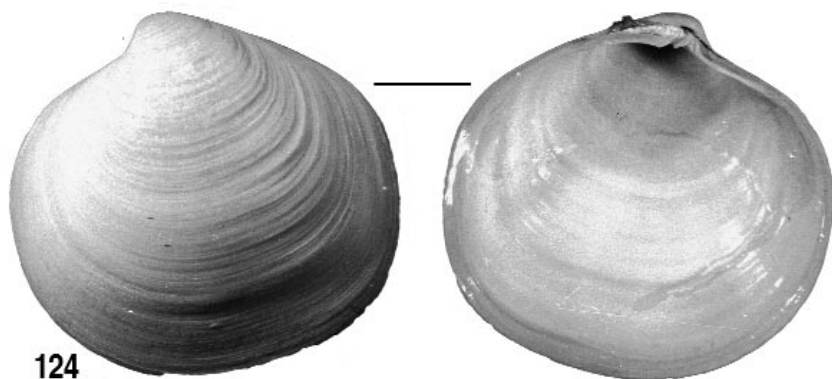
6.1 x 3.4	pt SMF, Zaïre, 105 m
6.1 x 3.3	ht
4.4 x 2.6	associated spm., Zaïre, "Meteor" sta. 1005-2C
4.0 x 2.6	Ambrizete (6° 57' S, 12° 23' E)
3.6 x 2.1	associated spm., Zaïre "Meteor" sta. 1005-2B

Distribution: Senegal; off the mouth of the Congo River. In this rare species, the lack of records between these localities must not necessarily mean a distribution discontinuity (which nevertheless cannot be excluded) but could also be due to insufficient sampling

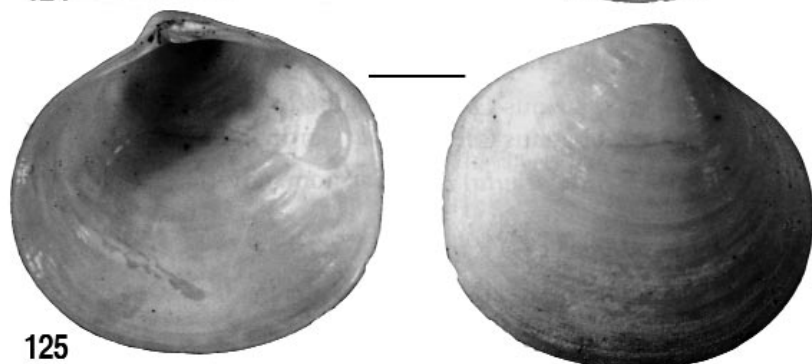
Material examined: The type material. Zaïre: off the mouth of the Congo River, 5° 41.9' S, 11° 42.6' E, 105 m, a broken left v., "Meteor" sta. 1000-1 B; 6° 14.1' S, 11° 30.1' E, 237 m, 2 right v., "Meteor" sta 1005-2 B and C, all taken by box corer, R/V "Meteor", cruise M6-6, *leg.* Fürsich, 20. II. 1988, at the moment all in Paleontological Institute of Würzburg

(Right page) Figures 124-125. *Mysia marchali* n. sp., 124: holotype, 19.3 mm, Port-Gentil, left valve; 125: specimen from Guinea (10° 01' N, 14° 36' W, 15 m), 14.1 mm, right valve. Figures 126-128. *Cryptomya africana* n. sp., 126: holotype, 7.8 mm, Grand Lahou, Côte d'Ivoire, exterior of right valve; 127: specimen from Elinkine, Casamance, 13.7 mm, left valve; 128: specimen from Abéné, Casamance, 11.0 mm, left valve.

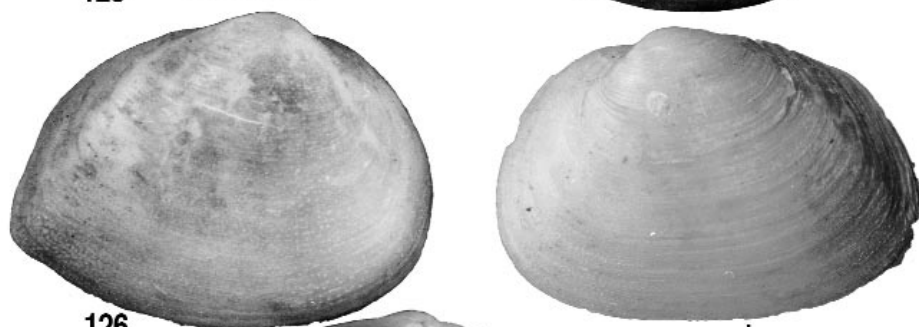
(Página derecha) Figuras 124-125. *Mysia marchali* spec. nov., 124: holotipo, 19,3 mm, Port-Gentil, valva izquierda; 125: especimen de Guinea (10° 01' N, 14° 36' W, 15 m), 14,1 mm, valva derecha. Figuras 126-128. *Cryptomya africana* spec. nov., 126: holotipo, 7,8 mm, Grand Lahou, Costa de Marfil, exterior de la valva derecha; 127: especimen de Elinkine, Casamance, 13,7 mm, valva izquierda; 128: especimen de Abéné, Casamance, 11,0 mm, valva izquierda.



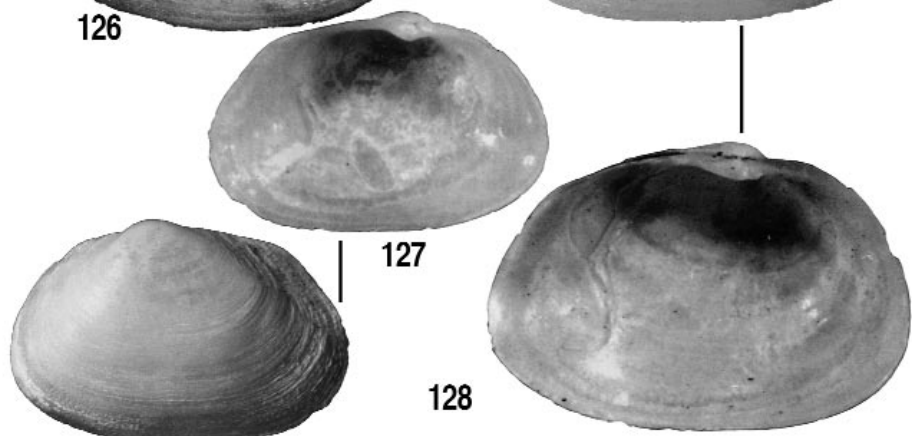
124



125



126



127

128

University, Germany. Angola: off Ambrizete, 6° 57' S, 12° 23' E, 45 m, 1 right v., leg. Gofas, 1983, MNHN.

Biotope: Well offshore in soft sediments, probably commensalic with echiurid worms like the Western Atlantic *P. subovata* (Conrad, 1845). Known depth range 45-240 m.

Derivatio nominis: As this is the first African record of another myid genus yet known only from the Western Atlantic, this is expressed in the name likewise.

Remarks: This is the second known species of this hitherto monotypic and little known genus. It differs from *P. subovata* (Conrad, 1845) from the North American east coast and the Gulf of Mexico (Delaware to Texas, for figures, see ABBOTT, 1974: 537) by its smaller size and the more elongate shape. In the examined specimens and in contrast to the American species, the pallial line is not broken up except just under the adductor scars. From all other Myidae, *Paramya* is distinguished by its equal resilifers in symmetric position.

Family CORBULIDAE

Genus *Corbula* Bruguière, 1797

Subgenus *Caryocorbula* Gardner, 1926

Corbula (*Caryocorbula*) *virginiae* nom. nov. (Figs. 131-132)

Corbula striata E.A. Smith, 1871, *Proc. Malac. Soc. London*: 728 (non Lamarck, 1801).

Type material: Figured syntype and one other syntype of *C. striata* in BMNH (1871.1.24.28, 1-2), Wydah, Dahomey (now: Bénin), leg. Capt. Kocker; possible syntype, 1 sh., BMNH 1871.1.24.14, same locality.

Type locality: Ouidah (Wydah), Bénin.

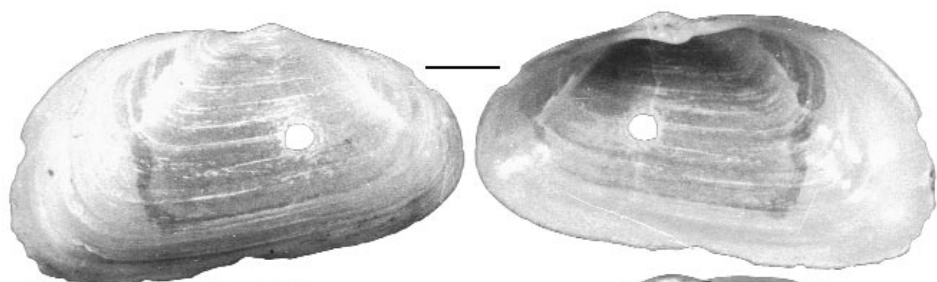
Description: Shell small, 4-6 mm long, slightly variable in shape, oblong, rather thick (juveniles thin), inflated to very inflated, with rounded anterior margin, tapering posterior part and slightly rounded-truncated, oblique posterior margin. Postero-ventral corner rather sharp, in fully-grown specimens posterior end with an irregular posterior rostration. Right valve larger and a bit more inflated than left valve and

slightly overlapping it. Beaks in front of the vertical midline.

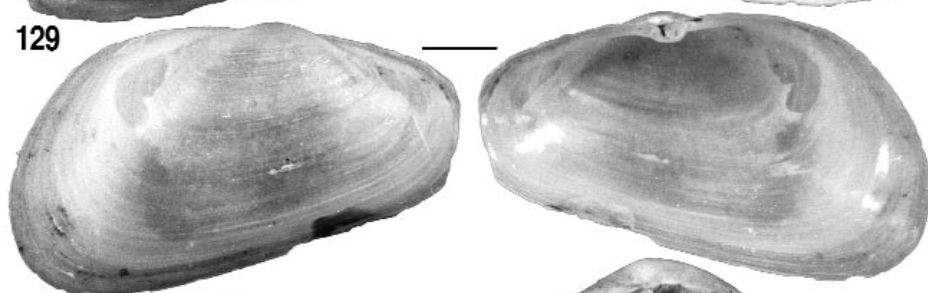
Surface of both valves with rather few broad, shallow concentric waves, becoming denser and more irregular near the ventral margin, rather ill-defined on the umbonal half. Sculpture on the posterior area less marked. There are also extremely fine radial threads which persist only on rather fresh specimens and which are visible under a lens

(Right page) Figures 129-130. *Paramya africana* n. sp., 129: holotype, 6.1 mm, Kayar, Senegal, right valve; 130: paratype SMF, 6.1 mm, mouth of Congo, 5° 41.9' S, 11° 42.6' E. Figures 131-132. *Corbula* (*Caricorbula*) *virginiae* n. nov., figured syntype of *Corbula striata* E.A. Smith, BMNH 1871.1.24.28, 1-2, 6.1 mm, 131: exterior of left valve; 132: interior of right valve. Figures 133-134. *Corbula* (*Varicorbula*) *granum* n. sp., holotype, 7.1 mm, 133: left valve; 134: right valve.

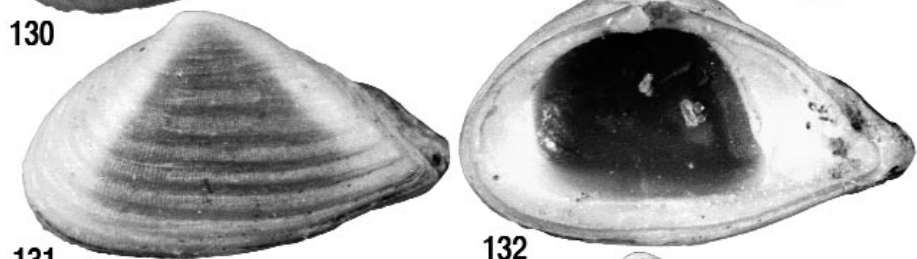
(Página derecha) Figuras 129-130. *Paramya africana* spec. nov., 129: holotipo, 6,1 mm, Kayar, Senegal, valva derecha; 130: paratipo SMF, 6,1 mm, mouth de la Congo, 5° 41,9' S, 11° 42,6' E. Figuras 131-132. *Corbula* (*Caricorbula*) *virginiae* n. nov., sintipo de *Corbula striata* E.A. Smith, BMNH 1871.1.24.28, 1-2, 6,1 mm, 131: exterior de la valva izquierda; 132: interior de la valva derecha. Figuras 133-134. *Corbula* (*Varicorbula*) *granum* spec. nov., holotipo, 7,1 mm, 133: valva izquierda; 134: valva derecha.



129

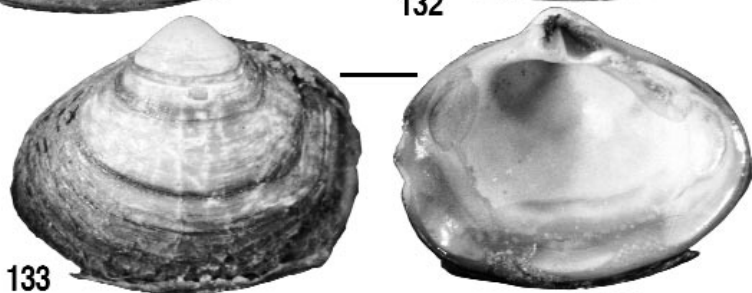


130

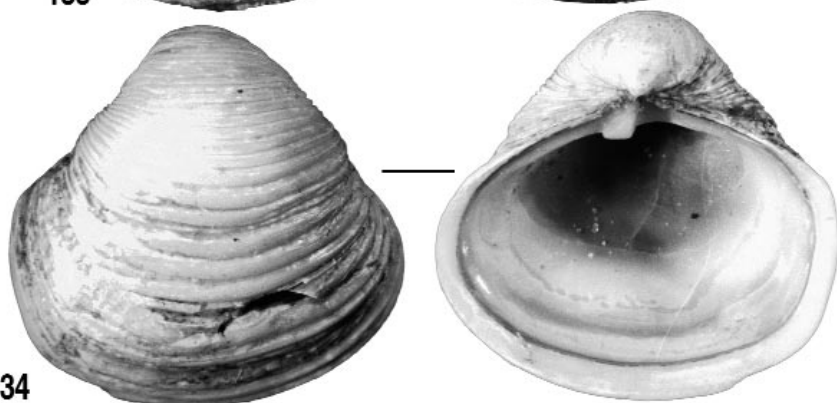


131

132



133



134

(x 5-10) only. Posterior angle rounded. Periostracum thin, light brownish, generally persistent only on the immediate marginal area.

Exterior white to pinkish or light brownish, reddish with paler irregular spots and zones or with a triangular dark pinkish field in the middle part of the valve below the beaks, vanishing near the ventral margin. Interior white, light brownish or pink.

Measurements:

6.1 x 3.7	figured syntype of <i>C. striata</i>
5.2 x 3.2 x 2.8	syntype
5.1 x 3.3 x 3.0	possible syntype

Distribution: Guinea-Bissau to Bahia de Corisco, N-Gabon.

Material examined: The type material. Guinea-Bissau: W Rio Cacheu, 12° 05.5' N, 16° 50.5' W, 11 m, 1 spm., 2 v., 23. IV. 1988; SW Iles Tristão, 10° 41' N, 15° 44.5' W, 25 m, 2 sm., 1 sh., 1 v., 6. X. 1988, both dredged R/V "André Nizery", leg. von Cosel, both MNHN. Guinea: Conakry, "Sables de Conakry" (no precision), 2 v.; near Roume, I. de Los, 10-20 m, 1 v., Mission Gruvel, 20. XII. 1909; Roume, I. de Los, 1.5-2 m, 1 sh., 1 v.; Banc Crawford, I. de Los, 2-3 m, 5 spm., 7 v., both leg. von Cosel, 29. V.

1988; Guinean shelf, 21 lots, mostly sh and v. from the SEDIGUI cruises, between 9° 03' N and 9° 12.3' N, 13° 22.4' W, and 13° 56' W, between 4 to 33 m, all taken by bottom grab, R/V "André Nizery", leg. von Cosel, V. 1988 [material from northern part of SEDIGUI not yet examined], all MNHN; Bénin: Off Cotonou, 20-25 m, 10 v., Mission Gruvel, 1909-10, MNHN. Gabon: Ile Conga, Baia de Corisco (no precision), 2 v., ex colln. IFAN, 17. VI. 1955, MNHN.

Biotope: In fine and mixed sand, often with shell debris, from 2 to about 30 m.

Derivatio nominis: The name gives tribute to Virginie Heros, MNHN, in recognition of the many hours she has spent sorting incoming material, among it also many lots from West Africa.

Remarks: This little known *Corbula* was first recognized by E. A. SMITH (1871) but as his name is preoccupied, a replacement name had to be given. The species is restricted to the tropical zone proper; the lack of any records from Côte d'Ivoire (and Ghana) might indicate a possible distribution gap in the zone of intermittent upwelling in the Gulf of Guinea.

Subgenus *Varicorbula* Grant and Gale, 1931

Corbula (Varicorbula) granum n. sp. (Figs. 133-135)

Type material: Holotype MNHN, off Gorée, Dakar region, Senegal, 132 m, a complete spm., dredged R/V "Gérard Tréca", leg. Marche-Marched, 5. VII. 1955. Paratypes: same locality, 5 spm. MNHN, 1 sm. ZMC, 1 spm. SMF, 1 spm. IRSNB, 1 spm. Natal Museum.

Type locality: Gorée, Dakar, Senegal.

Description: Shell small, variable in shape, high-trigonal, rather thick and solid, very inflated, with rounded anterior and posterior margins. Right valve larger and much more inflated as left valve and considerably overlapping it. Beaks about at the vertical midline, occasionally slightly in front of or behind it.

Surface of the right valve with numerous, close-set, low, concentric rid-

ges. Left valve with growth lines only and only few very faint radial lines. Posterior angle rounded and ill-defined. Periostracum pale yellowish brown to dark brown, on the right valve thin and mostly eroded, on the left valve thicker, somewhat wrinkly and persistent.

Hinge in the right valve with a strong anterior cardinal and a deeply sunken resilifer posterior to it; left valve

with a small cardinal and a rather broad, projecting chondrophore anterior to it. Pallial line may be interrupted in its ventral part, pallial sinus only marked as an indentation of the posterior pallial line.

Exterior whitish, cream, light yellowish to light brown, occasionally with a few lighter, irregular rays. Interior whitish, often tinged with light brown, pinkish or light purple.

Measurements:

7.1 x 7.0	ht
6.2 x 6.0	S. Gorée
6.0 x 5.6 x 4.2	pt Natal Museum
5.8 x 6.1	N' Diago sta. 287
5.8 x 5.9	pt MNHN
5.5 x 5.7 x 3.9	pt IRSNB
5.4 x 5.4 x 4.0	pt SMF
5.1 x 5.2	Calypso sta. 29
5.1 x 5.1 x 3.7	pt ZMC
5.0 x 5.1	pt MNHN

Distribution: Mauritania (Cap Blanc) to southern Angola (Moçâmedes); São Tomé.

Material examined: The type material. Mauritania: off Mhairrett, 19° 06' N, 16° 37' W, 64 m, 1 sh., 1 v.; off Tiouilît, 18° 54' N, 16° 38' W, 92 m, 2 v.; off Lemsid, 18° 42' N, 16° 28' W, 70 m, 1 v.; 18° 36' N, 16° 31' W, 96 m, 1 v.; 18° 30' N, 16° 27' W, 69 m, 1 sh.; off Nouakchott, 18° 12' N, 16° 23' W, 70 m, 2 v.; off Tiguent, 17° 17' N, 16° 28' W, 95 m, several juv. sh. and v., all dredged R/V "N' Diago", *leg.* Richer de Forges, 1981; off Tiguent, 17° 17' N, 16° 25' W, 88 m, 5 v., dredged R/V "Meteor", Subtropex '82, sta. 60, 77, *leg.* Richer de Forges, 13. II. 1982, all MNHN. Senegal: off St. Louis, 40 m, several spm., dredged R/V "Louis Sauger", *leg.* Pin, 1987; off Kayar, 110-120 m, 1 v., *leg.* Marche-Marchad, 6. IV. 1967; off Lompoul, 15° 32' N, 16° 46' W, 1 sh., 2 v., dredged R/V "Léon Coursin", *leg.* Marche-Marchad, 1. II. 1957; N of Cap Vert Peninsula, 14° 51' N, 17° 30' W, 165-180 m, 1 sh., 5 v., 18. II. 1958; Baie de Gorée, 80-250 m, 7 v., 20. II. 1956; 170-200 m, 3 v., 24. I. 1954; off Gorée (180°), 82 m, 2 v., 25. III. 1954; S of Gorée, 32-34 m, several sh. and v., 13. XI. 1953;

38-42 m, 1 v., 27. X. 1953; 65 m, numerous sh. and v.; 95-98 m, 4 v.; 110-112 m, several spm. and v., all 18. II. 1954; off Gorée, 50 m, 2 spm.; 132 m, 7 v., both 5. VII. 1955; 112-145 m, 2 v.; 170 m, 1 sh., 12 v.; Dakar region (no precision), 129-150 m, 6 v., 24. I. 1958; SW Popenguine, 14° 27' N, 17° 33' W, 170-200 m, 2 spm., 1 sh., 24. I. 1958; SW M' Bour, 78 m, 3 v., all dredged R/V "Gérard Tréca", *leg.* Marche-Marchad; Casamance, off Presqu'île aux Oiseaux, 12° 46.9' N, 17° 29.9' W, 45 m, 1 spm., 6 v., dredged R/V "Louis Sauger", *leg.* von Cosel, 24. I. 1988, all MNHN. Guinea: (no precision), 250-300 m, in holothurian stomach, 2 v., *leg.* Delais, III. 1953, MNHN. Liberia: off Cestos, 5° 21.5' N, 9° 54.5' W, 73-80 m, 1 v.; W of Sesters, 4° 34.5' N, 8° 31' W, 64 m, 1 v., both dredged R/V "Calypso", *leg.* Marche-Marchad, 20. V. 1956, both MNHN. Côte d'Ivoire: SW of Tabou, 4° 16.5' N, 7° 30' W, 40 m, 1 juv. v.; off Béréby, 4° 27.5' N, 7° 09' W, 50 m, 2 v.; SE of Addah, 5° 06' N, 4° 38.5' W, 50 m, 6 v.; Assinie, 5° 01.5' N, 3° 23.5' W, 70 m, 1 v., all dredged R/V "La Rafale", Guinean Trawling Survey, *leg.* Cherbonnier, 22. III. - 8. IV. 1964; Abidjan region (no precision), 3 v., *leg.* Marche-Marchad, all MNHN. Ghana: off Sekondi, 4° 36.5' N, 1° 31' W, 50 m, 1 spm., 2 v., dredged R/V "Calypso", Gulf of Guinea cruise 1956, *leg.* Marche-Marchad, 24. V. 1956, MNHN. Bénin: Ouidah, 6° 10' N, 2° 05' E, 200 m, 1 v., dredged R/V "Léon Coursin", *leg.* Marche-Marchad, MNHN. Equatorial Guinea: 1° 40' N, 9° 25' E, 150 m, 1 v., box corer, 1987, MNHN. Gabon: off Setté Cama, 2° 34.1' S, 9° 00' E, 120 m, 2 v., *leg.* Chevalier, 1980-89, MNHN. Angola: off Ambrizete, Zaire province, 6° 57' S, 12° 23' E, 45 m, 6 v.; Ilha de Luanda, Luanda province, 40-60 m, 1 v.; 75-80 m, numerous v.; 90 m, several sh. and v.; 120 m, numerous v.; Baía de Corimba, Luanda province, 10-20 m, 1 juv. sh., 1 juv. v.; off Mussulo (Macoco), Luanda province, 50-70 m, several spm., sh. and v.; 90-100 m, numerous sh. and v.; Praia Amelia, Moçâmedes province, 40-60 m, 9 v., all *leg.* Gofas, 1982-86, all MNHN. São Tomé, 0° 25.6' N, 6° 40.2' E, 50 m, 1 spm., dredged R/V "Calypso", *leg.* Marche-Marchad, 21. VI. 1956, MNHN.

Biotope: In fine and muddy sand, well offshore, mostly between 60 and 250 m, occasionally shallower, from 10 m downwards.

Derivatio nominis: "*granum*" (lat.)= grain. The name reminds the shape and the small size of the species.

Remarks: This new species is very close to *Corbula* (V.) *gibba* Olivi "*forma curta* Locard, 1886" from the Mediterranean; however, *C. granum* is smaller, still higher and more sculptured. The normal form of *C. gibba* is larger, less tumid and much more oblong. The fact

that *C. granum* occurs together with *C. gibba* without intergrades on the Mauritanian coast proves that both are separate species. The Caribbean *C. (V.) operculata* Philippi, 1848 is close and has a similar sculpture, but the shell is less high and the beaks are more curved forward.

The available records of *C. granum* show a distribution pattern, in which the parts of the West African coast with entirely tropical conditions throughout the year seem to be in part excluded; this might indicate that *C. granum* prefers at least during a short period of the year some influence of upwelling.

Family SPHENIOPSISIDAE

Genus *Spheniopsis* Sandberger, 1861

Spheniopsis senegalensis n. sp. (Figs. 136-137; 185-186)

Type material: Holotype MNHN, off Cap Vert Peninsula, 170-200 m, a fresh empty sh., dredged R/V "Gérard Tréca", leg. Marche-Marchad, 10. I. 1956. paratypes, same locality: 1 sh., 3 v., MNHN; 2 v. SMF, 2 v. IRSNB.

Type locality: Dakar, Cap Vert Peninsula, Senegal.

Description: Shell very small, 2.0-3.4 mm long, slightly variable in outline, oval-triangular, not very much inflated, almost equivalve, right valve only slightly overlapping the left valve along the postero-dorsal margin. Anterior margin well rounded, posterior part tapering with rostrum marked by a weak postero-ventral sinuosity in the otherwise evenly convex ventral margin. Rostrum with truncated posterior margin, very compressed and almost not gaping. Beaks just in front of the vertical midline.

Surface with very faint and rather narrow concentric waves on the anterior part which become obsolete towards posterior; posterior half smooth. There are also more irregular growth lines all over the valve. Weak keel on the posterior angle running from the beaks to the postero-ventral corner; another weak ridge running directly parallel to the postero-dorsal margin to the postero-dorsal corner, delimiting a long and very narrow escutcheon. Lunule smooth

and not well separated. Protoconch comparatively small, smooth and well separated from the teleoconch, giving the beaks a pointed aspect. Periostracum very thin and colourless.

Resilifer minute, situated under the beaks and directed posteriorly, no nymph for an external ligament. Hinge line in the right valve with a very small anterior cardinal and a narrow but strong posterior tooth (more a lateral than a cardinal) in form of a long laminar ridge parallel to the postero-dorsal margin; no hinge teeth in the left valve. Pallial sinus short, broad and rounded.

Valves entirely white, somewhat translucent.

Measurements:

2.9 x 1.8	ht
2.8 x 1.8	pt MNHN
2.8 x 1.8	pt SMF
2.6 x 1.7	pt IRSNB
2.6 x 1.65	pt MNHN
2.5 x 1.6	paratype SMF
2.4 x 1.6	pt IRSNB

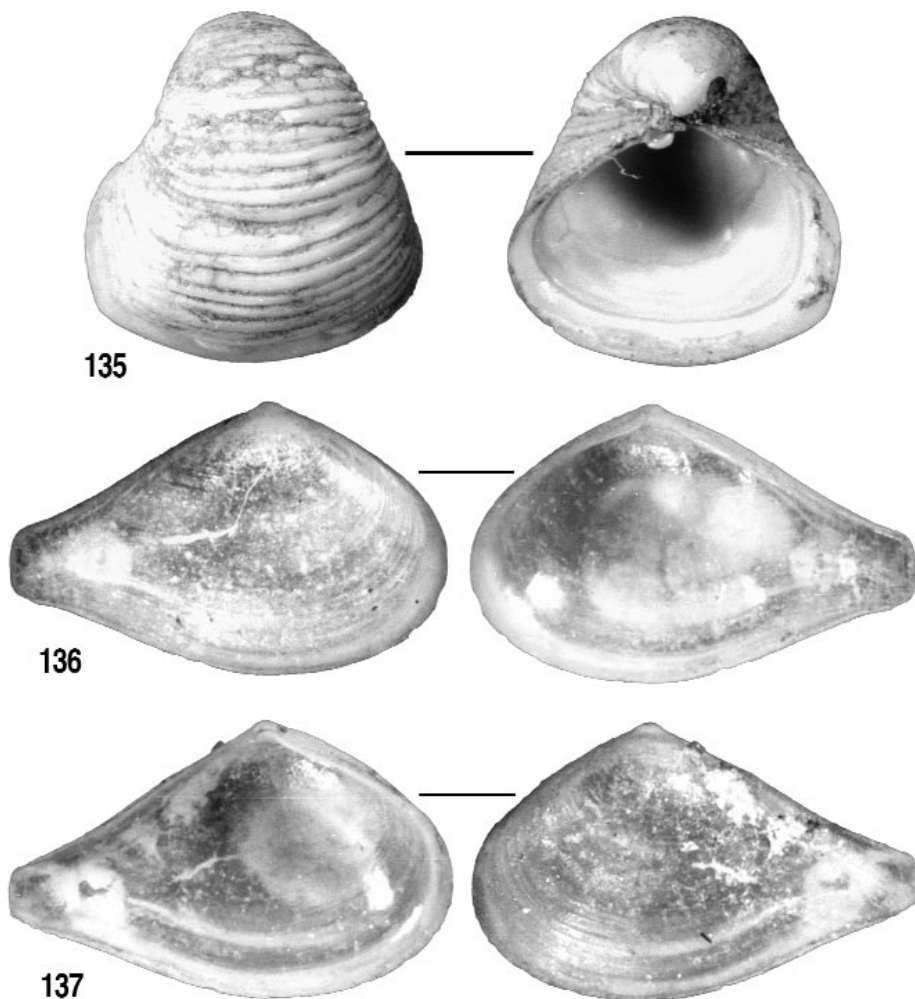


Figure 135. *Corbula* (*Varicorbula*) *granum* n. sp., length 6.0 mm, height 6.2 mm, S of Gorée, 110-112 m, right valve. Figures 136-137. *Spheniopsis senegalensis* n. sp., holotype, 2.9 mm, 136: right valve; 137: left valve.

Figura 135. *Corbula* (*Varicorbula*) *granum* spec. nov., longitud 6,0 mm, altura 6,2 mm, S de Gorée, 110-112 m, valva derecha. Figuras 136-137. *Spheniopsis senegalensis* spec. nov., holotipo, 2,9 mm, 136: valva derecha; 137: valva izquierda.

Distribution: Known from Senegal (Dakar region) only.

Material examined: The type material. Senegal: Dakar region, 14° 51.5' N, 17° 30' W, 180-165 m, 1 v., 18. II. 1958; Baie de Gorée, 170-200 m, 1 v., 24. I. 1954; 80-

250 m, 3 v., 20. II. 1956; S of Gorée, 110-112 m, 9 v., 18. II. 1954; SW of Gorée, 150-250 m, 1 sh., 6 v., 10. I. 1956; 230° of Cap Manuel, 120-215 m, in stomach of holothurian, 13 v.; Dakar region (no precision), 150-200 m, 4 v., all dredged R/V "Gérard Tréca", leg. Marche-Marchad, all MNHN.

Biotope: Apparently in fine muddy sand or mud, from 150 to 250 m.

Derivatio nominis: The species is named after the Senegal Republic, to which it is endemic.

Remarks: The few known living species of the family Spheniopsidae (with the genera *Spheniopsis* and *Grippina* Dall, 1912) were described or cited from America (Californian and Panamic faunal provinces as well as the US East Coast) and New Zealand (COAN, 1990), fossil records in America exist from the Lower Miocene of the Chipola River, Florida (DALL, 1903; COAN, 1990) and the Lower Oligocene Vicksburg Group, Mississippi (DOCKERY, 1982). In Europe, fossil Spheniopsidae are recorded from the limit between Middle and Upper Eocene (Wemmel Sands, Belgium, GLIBERT, 1936), the lower Oligocene (northern Germany, KOENEN, 1894), the Middle Oligocene (Mainz Basin, Germany, NEUFFER, 1973) and the Upper Oligocene (Northern half of Germany (North Sea Basin), JANSSEN, 1979). *S. senegalensis* is now the first record of a Recent species in the eastern Atlantic.

S. senegalensis is characterized by its narrow hinge line, the very small anterior cardinal and the rather long and narrow posterior tooth in the right valve, as well as the almost smooth surface.

The hinge dentition of *S. senegalensis* is best to be compared with that of the European Tertiary species *S. daimeriesi* E. Vincent, 1923, as figured by GLIBERT (1936),

S. scalaris (Braun, 1851) (see COAN, 1990, fig. 1) and *S. curvata* Koenen, 1894, which have also a comparatively small anterior cardinal and a rather narrow, more or less prolonged posterior tooth parallel to the postero-dorsal margin. In contrast to *S. senegalensis*, these three species have strong, rounded, concentric ribs, widely spaced in *S. daimeriesi* and *S. scalaris*, similar but more numerous in *S. curvata*.

The anterior cardinal in the American *Spheniopsis* is generally stronger and the posterior tooth thicker and shorter, also the shells are thicker and more solid. Most close to *S. senegalensis* looks *S. americana* Dall, 1903 from the Chipola Formation, which has a rather faint concentric sculpture, however, in this species, apart from the different hinge teeth, the two posterior keels are missing, the posterior end is sharper, and the shell is higher.

COAN (1990) found out that *Grippina californica* Dall, 1912 is incubating, he assumes that all Spheniopsidae are brooding, underlining that, like the Spheniopsidae, many brooding bivalve species are small (e.g. Condylorcardiidae, Cyamiacea, certain Carditidae [see *Carditamera rolani*, this paper], etc.). Although no specimens with animal of *S. senegalensis* were available, the well separated protoconch supports me in assuming that this species makes no exception; a nonplanktotrophic development would also be one explanation of the restricted distribution of this uncommon deep-shelf species, limited to the Dakar region on the Senegalian coast.

Family PHOLADIDAE

Genus *Jouannetia* Desmoulins, 1828

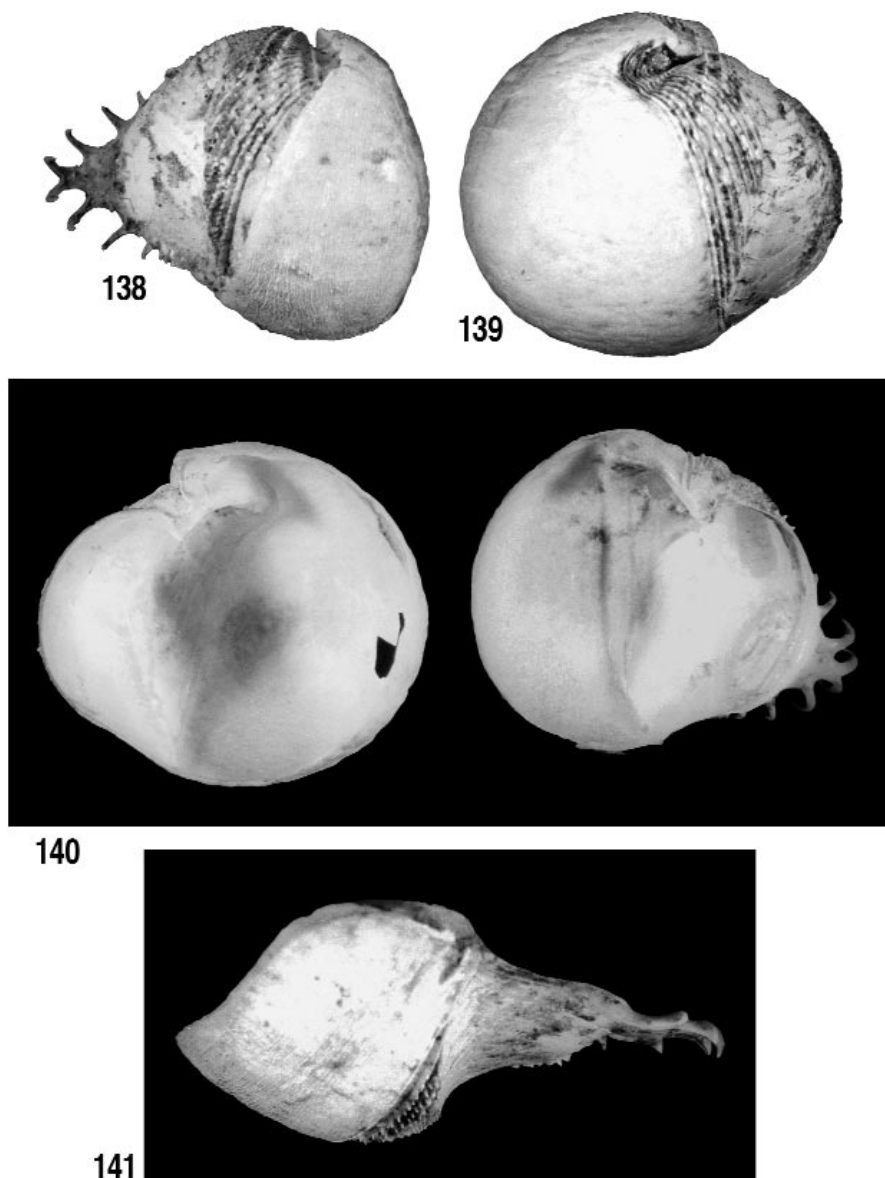
Subgenus *Pholadopsis* Conrad, 1849

Jouannetia (Pholadopsis) uncinata n. sp. (Figs. 138-141)

Type material: Holotype MNHN, Abidjan region (no precision), Côte d'Ivoire, a complete shell, *leg.* Marche-Marchad. Paratypes: same locality, 2 sh. MNHN, 1 sh. ZMC, 1 sh. SMF, 1 sh. Natal Museum.
Type locality: Abidjan, Côte d'Ivoire.

Description: Shell 10-12 mm long (including callum and siphonoplax), globose, already in the juvenile stage slightly inequivalve, with the posterior

part of the valves bent to the right. Juveniles anteriorly widely gaping, posteriorly closed; right valve of adults with very large, globular callum which co-



Figures 138-141. *Jouannetia uncinata* n. sp., 138: holotype, 8.0 mm (without siphonoplax), Abidjan region, exterior of right valve; 139: holotype, exterior of left valve; 140: holotype: interior of both valves; 141: paratype, 10.3 mm, ventral view of right valve.

Figuras 138-141. Jouannetia uncinata spec. nov., 138: holotipo, 8,0 mm (without siphonoplax), región de Abidjan, exterior de la valva derecha; 139: holotipo, exterior de la valva izquierda; 140: holotipo: interior de ambas valvas; 141: paratipo, 10,3 mm, vista ventral de la valva derecha.

vers about two thirds of the anterior gape and which is connected with the

short and broad mesoplax. Left valve with much smaller callum which covers

only one third of the gape, ends considerably on the right to the closing plane of the valves and is only slightly or not overlapped by the callum of the left valve. Umbonal reflections rather high and free, dorsal part of the callum attached to them.

Surface with dense, concentric lamellae bearing short imbrications, on the anterior part arranged radially, partly on shallow ribs, on the posterior part sparse and arranged irregularly. Umbonal-ventral sulcus on the left valve marking the change of intensity and direction of the concentric lamellae, on the right valve just a rather indistinct line in a broad, deep and nearly smooth, radial depression. Left valve callum smooth, with faint dents, right valve callum with very fine wrinkles, visible under a lens (x 5-10) only. Siphonoplax rather narrow, somewhat triangular, with 6-9 long, claw-shaped spines, hooked to the right.

Exterior and interior cream to whitish.

Measurements (without siphonoplax):

10.7 x 9.3 pt MNHN
10.3 x 8.5 pt Natal Museum

8.6 x 7.2 pt MNHN
8.0 x 7.1 ht
7.9 x 6.6 pt ZMC
7.2 x 6.5 pt SMF

Distribution: Known only from Côte d'Ivoire.

Material examined: The type material. Côte d'Ivoire: Abidjan region (no precision), 6 sh., partly broken, *leg.* Le Lœuff, 1965-72, MNHN.

Biotope: Not known, possibly boring in soft bottom and not in rock as the other species of the genus; offshore; very rare.

Derivatio nominis: "*uncinatus*" (lat.)= hooked; the name reminds the claw-like siphonoplax.

Remarks: This new species is well distinguished from all other *Jouannetia* by its peculiar claw-shaed siphonoplax; it has been taken only at two occasions from the continental shelf of Côte d'Ivoire, but the nearer circumstances are unknown.

Family THRACIIDAE

Genus *Thracia* Blainville, 1824

Subgenus *Odoncineta* O. G. Costa, 1829

Thracia (Odoncineta) roumei n. sp. (Figs. 142-143)

Type material: Holotype MNHN, Roume, I. de Los, Guinea, N-side, 1.5-2 m, very fine muddy sand, a complete dried specimen, *leg.* von Cosel, 29. V. 1988.

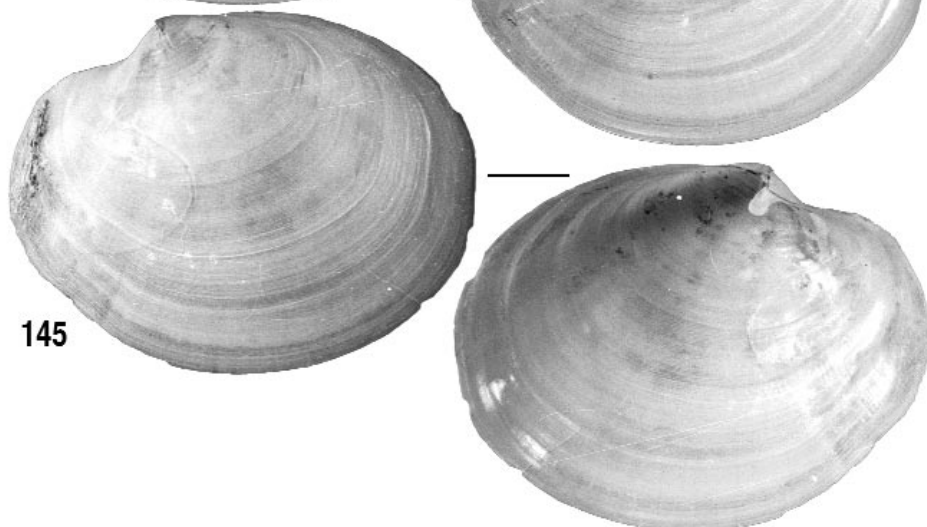
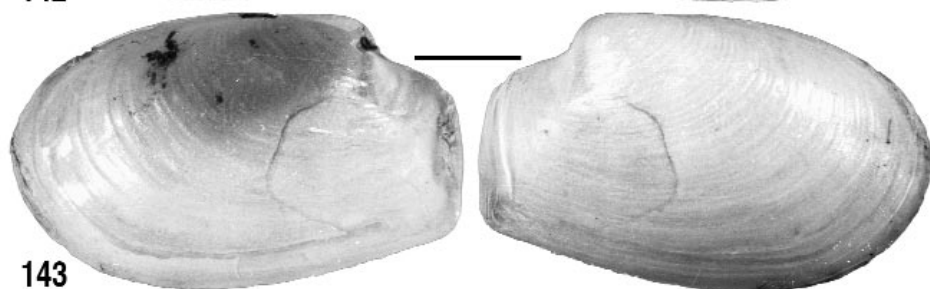
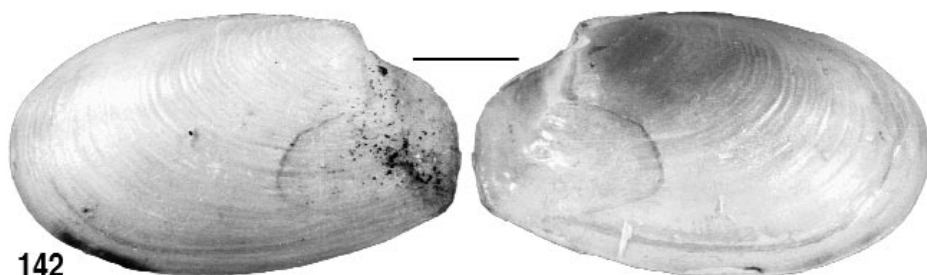
Type locality: Roume, I. de Los, Guinea.

Description: Shell small, 6-12 mm long, somewhat variable in shape, elongate-oval, slightly inequivalve, very thin and extremely fragile, rather inflated, right valve slightly overlapping the left

valve but of nearly equal convexity. Beaks well behind the vertical midline, at the beginning of the fourth fourth of the valve. Antero-dorsal margin gently convex, anterior margin well rounded,

(Right page) Figures 142-143. *Thracia roumei* n. sp., holotype, 10.0 mm, I. de Roume, Guinea, 142: left valve; 143: right valve. Figures 144-145. *Periploma camerunensis* n. sp., holotype, 19.2 mm, Cameroon, 3° 31' N, 9° 24.4' E, 30 m, 144: left valve; 145: right valve.

(Página derecha) Figuras 142-143. *Thracia roumei* spec. nov., holotipo, 10,0 mm, I. de Roume, Guinea, 142: valva izquierda; 143: valva derecha. Figuras 144-145. *Periploma camerunensis* spec. nov., holotipo, 19,2 mm, Camerún, 3° 31' N, 9° 24,4' E, 30 m, 144: valva izquierda; 145: valva derecha.



ventral margin in its anterior part well convex, towards posterior only slightly convex. Posterior margin vertically rounded-truncated, postero-dorsal margin short and nearly straight.

Surface with extremely fine granules, visible under a lens ($\times 30-50$) only, irregular growth lines and faint irregular concentric waves. Posterior angle often sharp near the umbos, towards the margins becoming rounded and rather ill-defined. Periostracum thin, light yellowish brown, persistent mostly near the margins and on the posterior part.

Hinge line without teeth. Small external ligament and internal resilium in a small triangular chondrophore. Lithodesma well developed. Pallial sinus rather short, broad and about squarish.

Valves entirely white, with a slightly nacreous aspect.

Measurements:

10.0 \times 5.8 ht

Distribution: Senegal (Saloum) southward to the Congo (Pointe-Noire).

Material examined: The type material. Senegal: Sine-Saloum region (no

precision), mangroves, 2 juv. spm., partly broken, leg. Bouchet, 1973, MNHN. Sierra Leone: Banana Grounds, 10 m, 1 slightly broken spm, taken by bottom grab, R/V "Cape St. Mary", leg. Longhurst, XII. 1955, MNHN. Congo: Pointe-Noire, Plage ORSTOM, 4-6 m, fine muddy sand, 1 spm, leg. von Cosel, XII. 1985, MNHN.

Biotope: In fine muddy sand in calm bays, inlets and other sheltered areas, also near mangroves, in shallow water from 1 to about 10 m.

Derivatio nominis: The species is named after Roume Island, the type locality, which itself bears its name from Mr. Roume, a former Governor of French West Africa (Guinea) at colonial times. The species name in this form had been chosen to preserve a typical Dautzenberg name: DAUTZENBERG (1913) had given that name to a *Corbula*, but that is now a synonym.

Remarks: The new species is distinguished from the European *T. phaseolina* (Lamarck, 1818) by its smaller size and more fragile shell, the more oval shape and the more backward situated beaks.

Family PERIPLOMATIDAE

Genus *Periploma* Schumacher, 1817

Periploma camerunensis n. sp. (Figs. 144-145)

Periploma discus Stearns, 1890: - Nicklès, 1955: 225

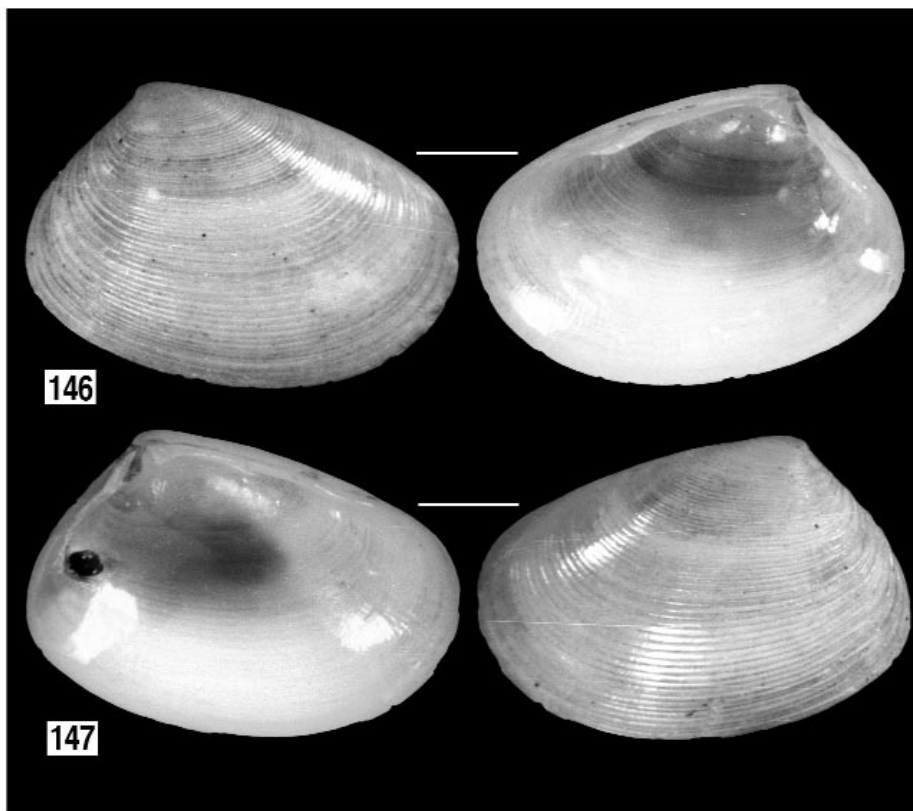
Type material: Holotype MNHN, W of mouth of Sanaga river, Cameroon, 3° 31' N, 9° 24.4' E, 30 m, muddy sand, a complete sh., dredged R/V "André Nizery", leg. Monteillet, III. 1991. Paratypes: 3° 34.3' N, 9° 22.3' E, 29 m, 1 slightly damaged sh., dredged R/V "André Nizery", leg. Monteillet, III. 1991, MNHN; off Victoria/Limbe, 3° 58' N, 9° 05' E, 38 m, 1 v., trawled "Campo Star", leg. R. von Cosel, 22.-29. XI. 1985, MNHN.

Type locality: Sanaga river mouth, Cameroon.

Description: Shell 16-27 mm long, short-oval, very thin and fragile, rather compressed, with right valve slightly more inflated than left valve. Umbos well behind the vertical midline, with typical, transverse crack. Anterior margin well rounded, passing into the con-

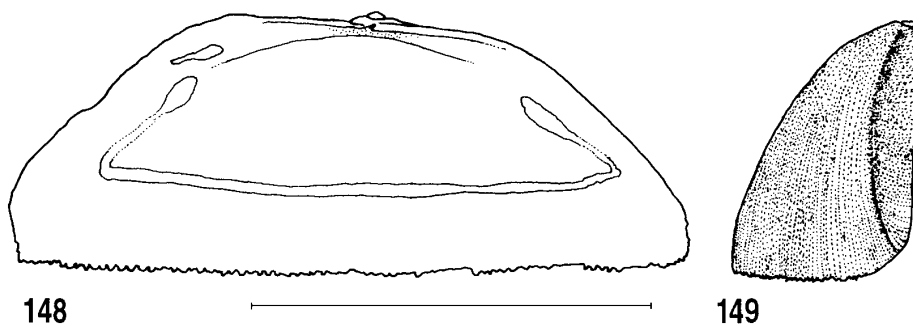
vex ventral margin. Posterior margin narrowly rounded.

Surface with irregular growth lines and growth waves and with extremely fine, irregular, dense striae which are not entirely parallel to the growth lines and which transform to somewhat coar-



Figures 146-147. *Tellina (Moerella) oryza* n. sp., holotype, 4.2 mm, Grand Bassam, Côte d'Ivoire, 146: right valve; 147: left valve.

Figuras 146-147. Tellina (Moerella) oryza spec. nov., holotipo, 4,2 mm, Grand Bassam, Costa de Marfil, 146: valva derecha; 147: valva izquierda.

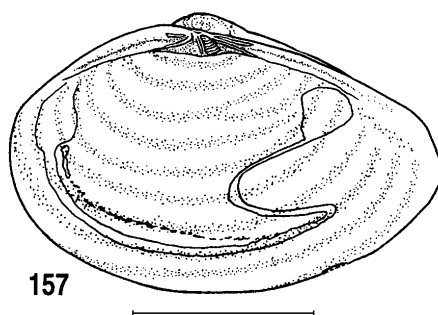
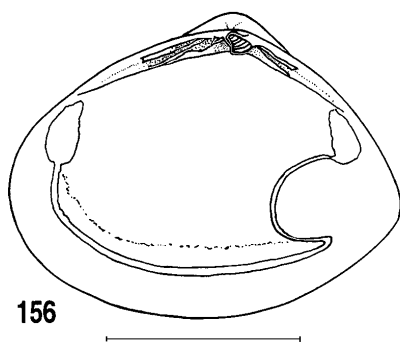
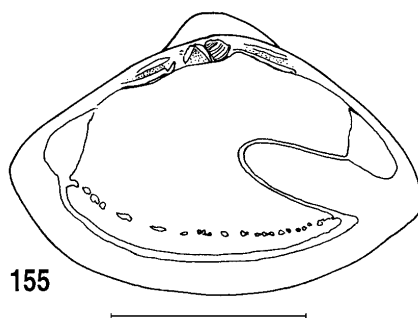
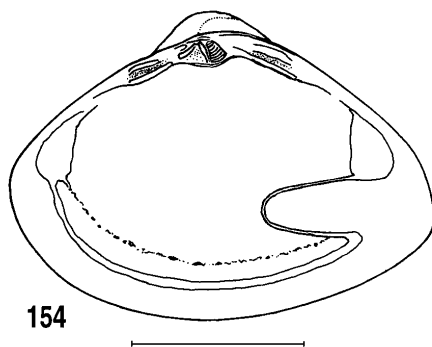
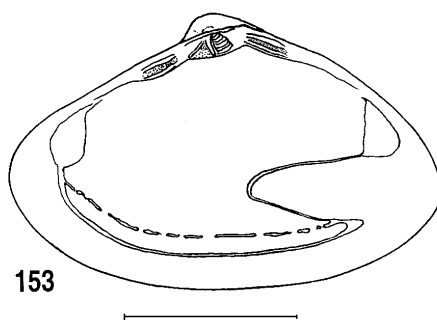
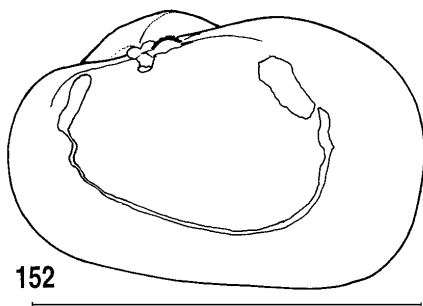
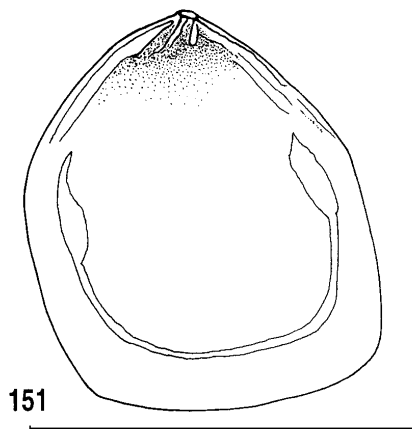
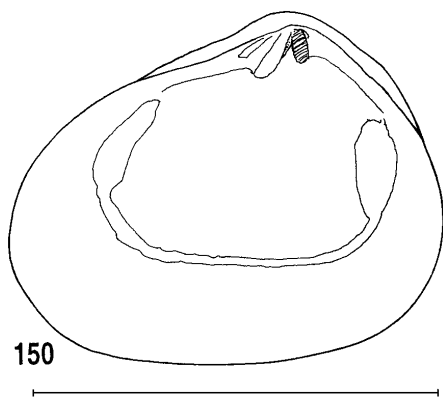


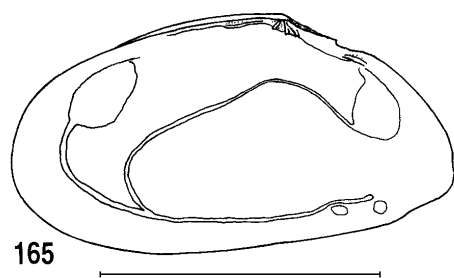
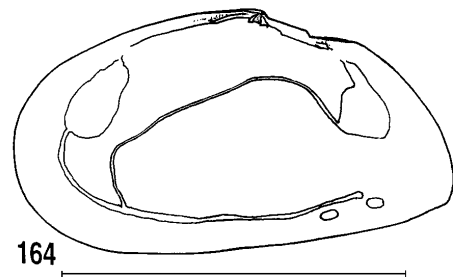
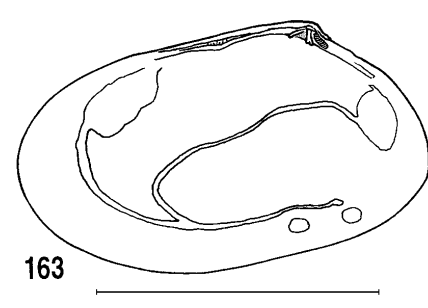
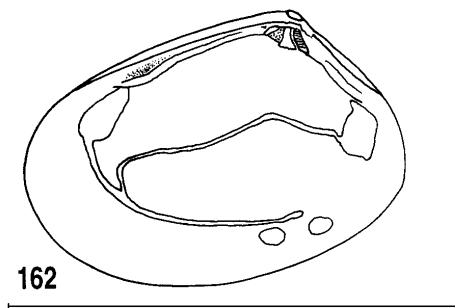
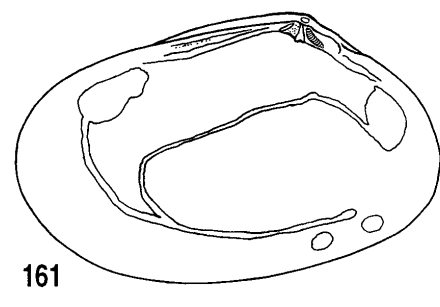
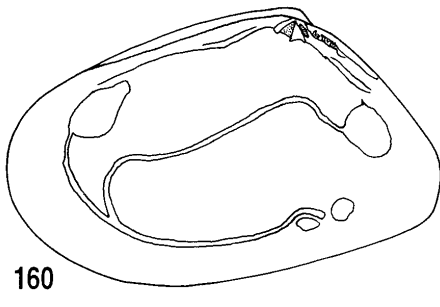
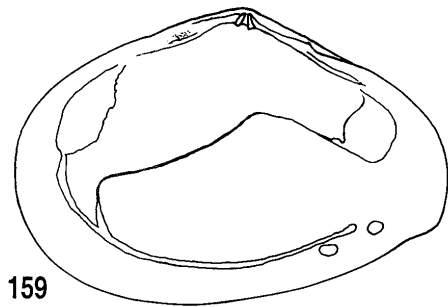
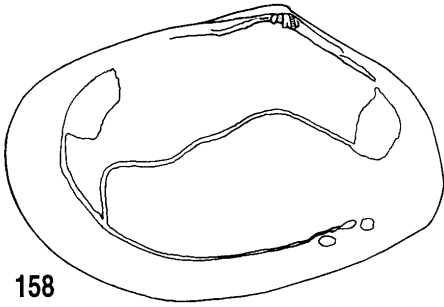
Figures 148-149: *Galeomma tripartita* n. sp., holotype, 148: internal features of left valve; 149: posterior view of left valve.

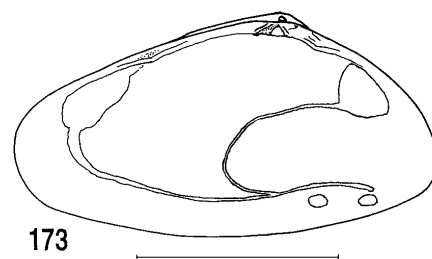
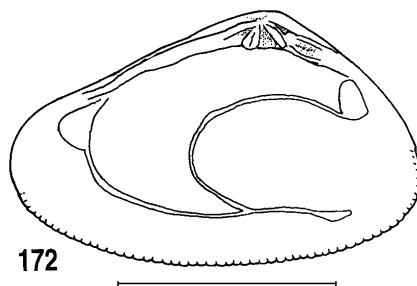
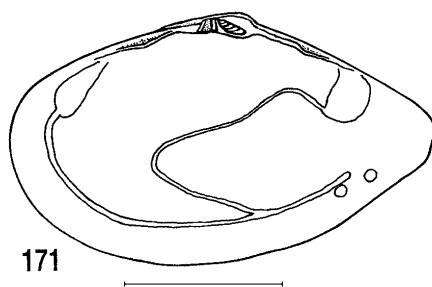
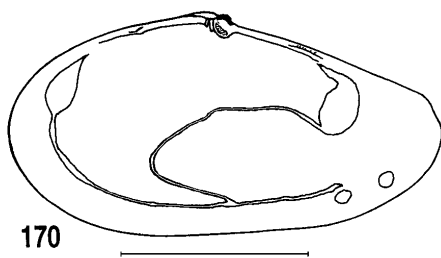
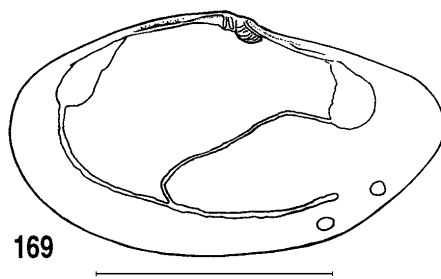
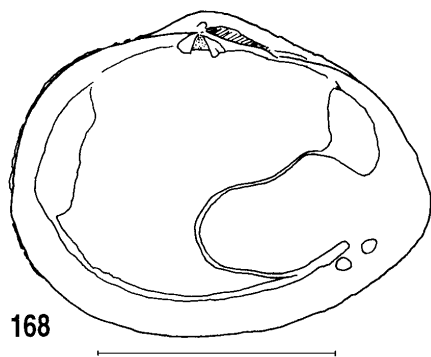
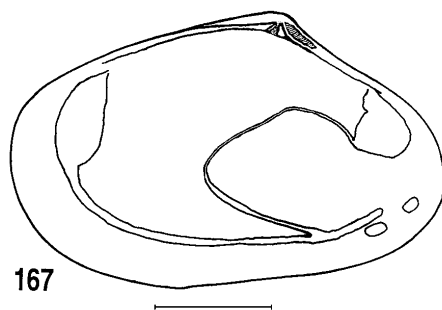
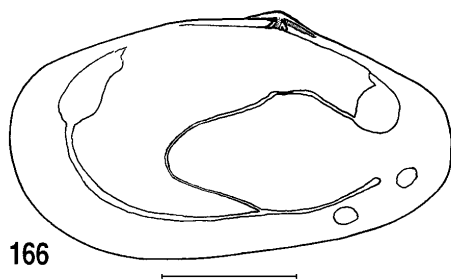
Figuras 148-149: Galeomma tripartita spec. nov., holotipo, 148: internal features de la valva izquierda; 149: vista posterior de la valva izquierda.

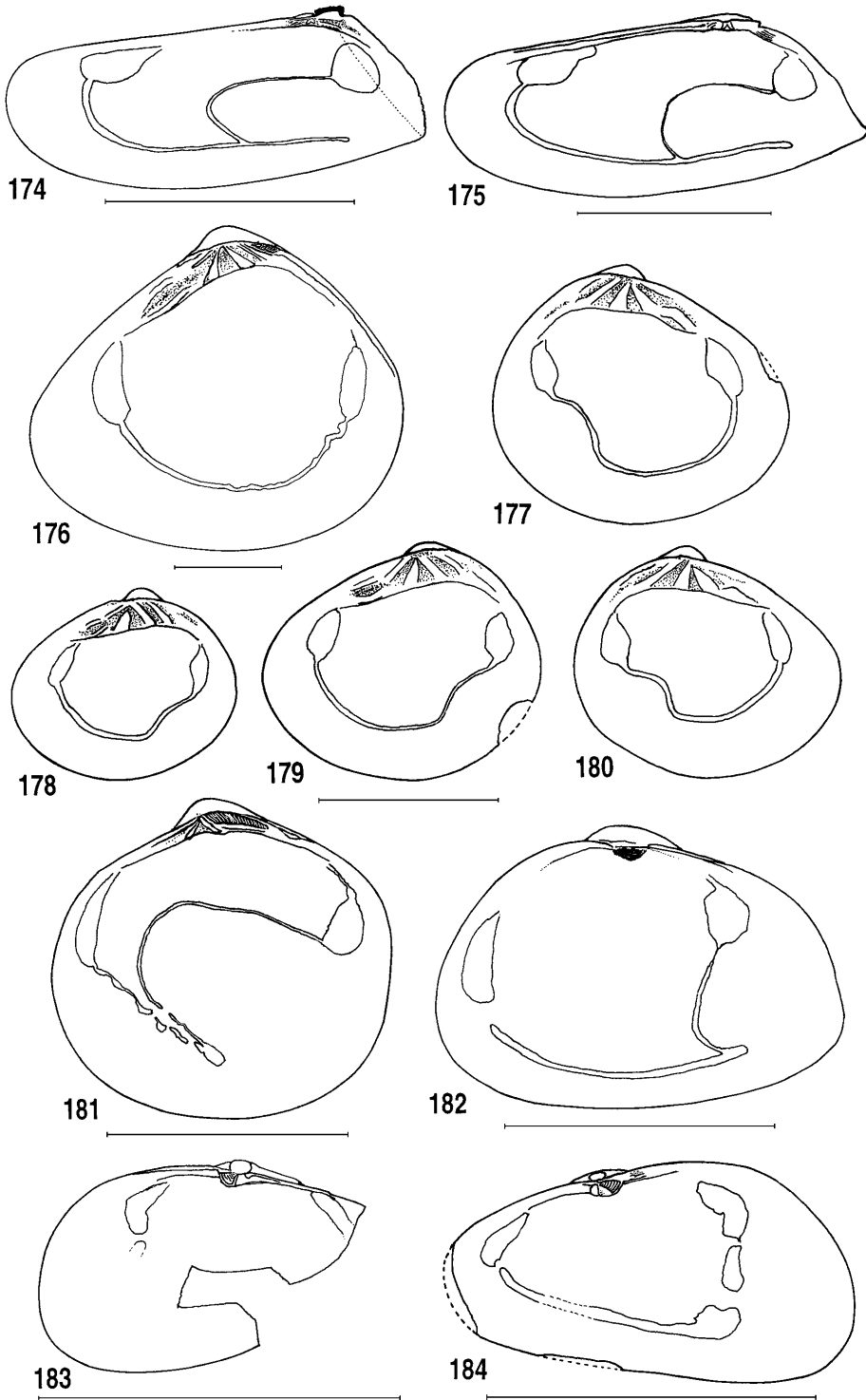
(Right page and next) Figures 150-184. Views of the insides in several species, mostly of right valves, to show internal features not or not well visible in the photos. Scales: 10 mm, unless stated otherwise. 150: *Orobitella solida* n. sp., Cacucaco, Angola, paratype MNHN; 151: *Lozouetia distorta* n. sp., paratype MNHN, Cameroon, 3° 27.4' N, 9° 22.6' E, 46 m (scale: 5 mm); 152: *Basterotia clancula* n. sp., Ponta do Mussulo, Angola; 153: *Maetra angolensis* n. sp. juv. Cacucaco, Angola; 154: *Maetra micronitida* n. sp., Cap Roxo, Casamance, 12° 20.7' N, 16° 53.1' W, 15 m; 155: *Maetra acutissima* n. sp., Pointe-Noire, Congo, off Plage ORSTOM, 3-4 m; 156: *Maetra inconstans* n. sp., Casamance, 12° 47.2' N, 17° 12.4' W, 24 m; 157: *Raeta senegalica* n. sp., paratype ANSP, Banana, Zaïre; 158: *Tellina (Moerella) boucheti* n. sp., SEDIGUI 494; 159: *Tellina (Moerella) bertrandi* n. sp., Pointe-Noire, Congo, off Plage ORSTOM, 5-7 m; 160: *Tellina (Moerella) modica* n. sp., paratype, SEDIGUI 45 (scale: 5 mm); 161: *Tellina (Moerella) pseudopusilla* n. sp., SEDIGUI 544 D (scale: 5 mm); 162: *Tellina (Moerella) oryza* n. sp., holotype (scale: 5 mm); 163: (for comparison) *Tellina (Moerella) pusilla* Philippi, 1836, Ile de Ré, Atlantic France, Locard colln., MNHN (scale: 5 mm); 164: *Tellina (Oudardia) crosnieri* n. sp., Abidjan, Côte d'Ivoire; 165: *Tellina (Oudardia) densestriata* n. sp., paratype ZMC, Casamnce, 12° 46.9' N, 17° 29.9' W, 45 m; 166: *Macoma (Psammocoma) inexpectata* n. sp., off Ponta das Lagostas, Luanda, Angola, 30-50 m; 167: *Macoma (Psammocoma) pseudofallax* n. sp., off St. Louis, Senegal, 580 m; 168: *Gastrana orstomi* n. sp., paratype IRSNB, Abidjan; 169: *Abra pini* n. sp., holotype, Longa, Senegal, 600 m; 170: *Abra intesi* n. sp., holotype, Abidjan, 100-250 m; 171: (for comparison) *Abra jarli* Nicklès, 1955, holotype ZMC, 2° 9' N, 9° 27' E, 260-650 m, "Atlantide" sta. 120, 1. III. 1946; 172: *Donax verdensis* n. sp., paratype MNHN, Santa Maria, Ilha do Sal; 173: *Donax (Capsella) domaini* n. sp., SEDIGUI 405; 174: *Donax (Machaerodonax) phariformis* n. sp., holotype ANSP, Banana, Zaïre; 175: (for comparison) *Donax (Machaerodonax) acutangulus* Reeve, 1854, figured syntype BMNH 1985034, Cuming colln. Mouth of the Gaboon; 176: *Parvicirce donacina* n. sp., holotype, Ponta do Mussulo, Angola; 177-180: (for comparison) *Parvicirce goodallioides* (Cossmann, 1886), Eocene of Paris Basin, Le Renard colln. (note the slightly variable pallial sinus) (both scale: 5 mm); 181: *Mysia marchali* n. sp., Guinea, 10° 01' N, 14° 36' W, 15 m; 182: *Cryptomya africana* n. sp., paratype MNHN, Grand Lahou, Côte d'Ivoire; 183: *Paramya africana* n. sp., fragment of left valve, off mouth of the Congo river, 5° 41.9' S, 11° 42.6' E, 106 m, R/V "Meteor", M 6-6 sta. 100-1B, Paleo. Inst Würzburg Univ.; 184: *Paramya africana* n. sp., paratype SMF, 5° 41.9' S, 11° 42.6' E, 105 m (both scale: 5 mm).

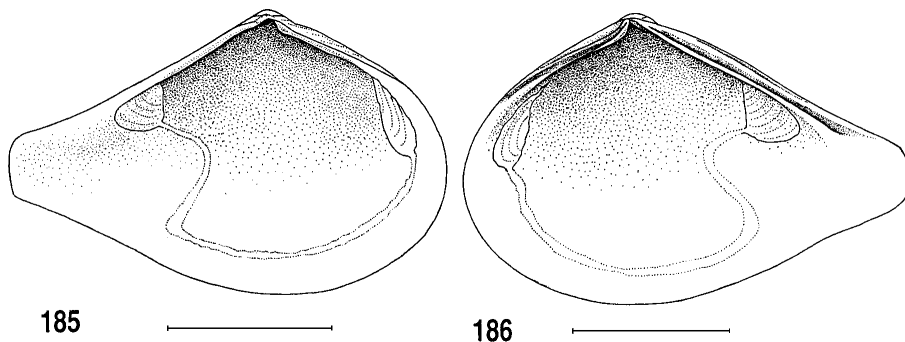
(Página derecha y siguientes) Figuras 150-184. Vista del interior de varias especies, la mayoría de la valva derecha, para mostrar las características internas que no se perciben, o no se aprecian bien en las fotos. Escalas: 10 mm, a menos que se indique lo contrario. 150: *Orobitella solida* spec. nov., Cacucaco, Angola, paratipo MNHN; 151: *Lozouetia distorta* spec. nov., paratipo MNHN, Cameroon, 3° 27,4' N, 9° 22,6' E, 46 m (escala: 5 mm); 152: *Basterotia clancula* spec. nov., Ponta do Mussulo, Angola; 153: *Maetra angolensis* spec. nov. juv. Cacucaco, Angola; 154: *Maetra micronitida* spec. nov., Cap Roxo, Casamance, 12° 20,7' N, 16° 53,1' W, 15 m; 155: *Maetra acutissima* spec. nov., Pointe-Noire, Congo, frente a Plage ORSTOM, 3-4 m; 156: *Maetra inconstans* spec. nov., Casamance, 12° 47,2' N, 17° 12,4' W, 24 m; 157: *Raeta senegalica* spec. nov., paratipo ANSP, Banana, Zaire; 158: *Tellina (Moerella) boucheti* spec. nov., SEDIGUI 494; 159: *Tellina (Moerella) bertrandi* spec. nov., Pointe-Noire, Congo, frente a Plage ORSTOM, 5-7 m; 160: *Tellina (Moerella) modica* spec. nov., paratipo, SEDIGUI 45 (escala: 5 mm); 161: *Tellina (Moerella) pseudopusilla* spec. nov., SEDIGUI 544 D (escala: 5 mm); 162: *Tellina (Moerella) oryza* spec. nov., holotipo (escala: 5 mm); 163: (para comparación) *Tellina (Moerella) pusilla* Philippi, 1836, Ile de Ré, Atlantic France, Locard colln., MNHN (escala: 5 mm); 164: *Tellina (Oudardia) crosnieri* spec. nov., Abidjan, Costa de Marfil; 165: *Tellina (Oudardia) densestriata* spec. nov., paratipo ZMC, Casamnce, 12° 46,9' N, 17° 29,9' W, 45 m; 166: *Macoma (Psammocoma) inexpectata* spec. nov., frente a Ponta das Lagostas, Luanda, Angola, 30-50 m; 167: *Macoma (Psammocoma) pseudofallax* spec. nov., frente a St. Louis, Senegal, 580 m; 168: *Gastrana orstomi* spec. nov., paratipo IRSNB, Abidjan; 169: *Abra pini* spec. nov., holotipo, Longa, Senegal, 600 m; 170: *Abra intesi* spec. nov., holotipo, Abidjan, 100-250 m; 171: (para comparación) *Abra jarli* Nicklès, 1955, holotipo ZMC, 2° 9' N, 9° 27' E, 260-650 m, "Atlantide" sta. 120, 1. III. 1946; 172: *Donax verdensis* spec. nov., paratipo MNHN, Santa Maria, Ilha do Sal; 173: *Donax (Capsella) domaini* spec. nov., SEDIGUI 405; 174: *Donax (Machaerodonax) phariformis* spec. nov., holotipo ANSP, Banana, Zaire; 175: (para comparación) *Donax (Machaerodonax) acutangulus* Reeve, 1854, sintipo BMNH 1985034, Cuming colln. Boca del Gabón; 176: *Parvicirce donacina* spec. nov., holotipo, Ponta do Mussulo, Angola; 177-180: (para comparación) *Parvicirce goodallioides* (Cossmann, 1886), Eoceno de la llanura de París, Le Renard colln. (nótese el seno paleal ligeramente variable) (ambas escalas: 5 mm); 181: *Mysia marchali* spec. nov., Guinea, 10° 01' N, 14° 36' W, 15 m; 182: *Cryptomya africana* spec. nov., paratipo MNHN, Grand Lahou, Costa de Marfil; 183: *Paramya africana* spec. nov., fragmento de la valva izquierda, de la boca del río Congo, 5° 41,9' S, 11° 42,6' E, 106 m, R/V "Meteor", M 6-6 sta. 100-1B, Paleo. Inst Würzburg Univ.; 184: *Paramya africana* spec. nov., paratipo SMF, 5° 41,9' S, 11° 42,6' E, 105 m (ambas escalas: 5 mm).











Figures 185-186. *Spheniopsis senegalensis* n. sp., off Cap Vert Peninsula, 200-170 m, 185: left valve; 186: right valve (scale: 1 mm).

Figuras 185-186. Spheniopsis senegalensis spec. nov., frente a la Península de Cabo Verde, 200-170 m, 185: valva izquierda; 186: valva derecha (escala: 1 mm).

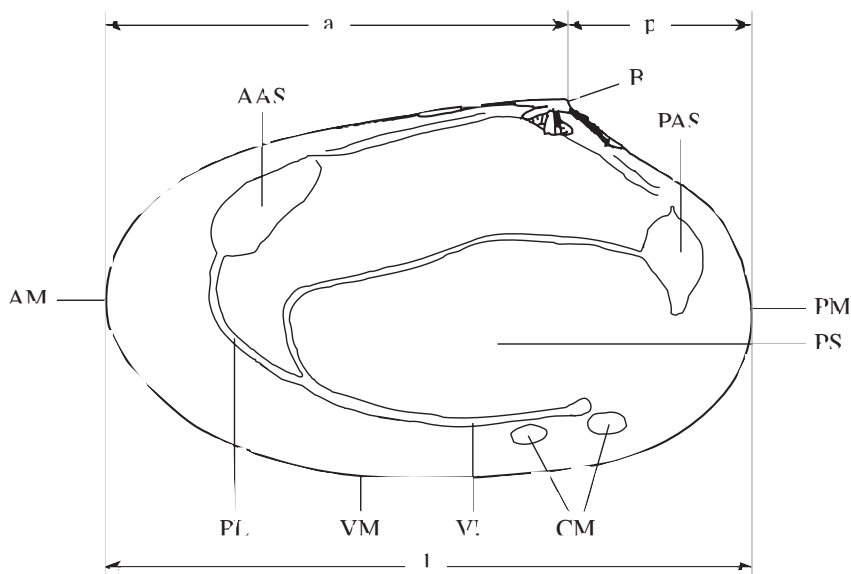


Figure 187. Diagram of a shell inside (right valve of *Tellina* (*Moerella*) *pseudopusilla* n. sp., Ambrizete, Angola, 7° 07' S, 12° 21' E, 80 m) with explanations of shell characters and parameters used in the descriptions. B: beaks; AM: anterior margin; PM: posterior margin; VM: ventral margin; AAS: anterior adductor scar; PAS: posterior adductor scar; PS: pallial sinus; VL: ventral limb of pallial sinus; PL: pallial line; CM: scars of cruciform muscle (in Tellinacea); a: anterior part; p: posterior part; l: shell length.

Figura 187. Diagrama del interior de la concha (valva derecha de Tellina (Moerella) pseudopusilla spec. nov., Ambrizete, Angola, 7° 07' S, 12° 21' E, 80 m) con explicaciones de los caracteres y parámetros utilizados en las descripciones. B: umbos; AM: margen anterior; PM: margen posterior; VM: margen ventral; AAS: impresión del músculo aductor anterior; PAS: impresión del músculo aductor posterior; PS: seno paleal; VL: limbo ventral del seno paleal; PL: línea paleal; CM: impresiones del músculo cruciforme (en Tellinacea); a: parte anterior; p: parte posterior; l: longitud de la concha.

ser granules near the posterior margin. They are visible under a lens (x 10-20) only. Periostracum very thin, pale yellowish grey to nearly colourless.

Ligament internal, in strong, conspicuous, spoon-shaped resilifer; no lithodesma. Hinge without any teeth. Pallial sinus broad and rather short.

Valves nacreous white.

Measurements:

19.2 x 15.0	ht
21.1 x 17.1	pt MNHN
27.1 x 22.1	pt MNHN
16.6 x 12.6	SEDIGUI sta. 171

Distribution: Guinea (9° 24' N) to Angola (7° 55' S, NICKLES, 1955)).

Material examined: The type material. Guinea: W of Rio Morébaya, 9° 24' N, 13° 45' W, 13 m, 1 sh., 1 fragm., taken by bottom grab, R/V "André Nizery", SEDIGUI sta. 171, leg. von Cosel, 17. V. 1988, MNHN. Cameroon: Bota-Batoke, 4° 01' N, 8° 59' E, 48 m, 1 broken v., trawled

"Campo Star", leg. von Cosel, 22.-29. XI. 1985, MNHN.

Biotope: In fine, muddy sand, from shallow water (13 m) to well offshore (150-400 m), rare.

Derivatio nominis: The species is named after the Republic of Cameroon, where the type locality is situated and from where most known specimens originate.

Remarks: This species has been cited by NICKLES (1955) as *Periploma discus* Stearns, 1890, a species from tropical West America which is more rounded than the west African species. Also very close but somewhat shorter and more circular is an unnamed species from the Caribbean coast of Colombia, figured in COSEL (1986: 199). The genus *Periploma* was known from both coasts of America and the Indo-Pacific; it is now recorded for the first time from West African waters.

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INDEX OF THE MENTIONED TAXA

Bold names refer to the new taxa

<i>Abra</i>	78, 79	<i>Corbula</i>	92, 94
<i>acutangulus</i> Deshayes, <i>Donax</i>	75	<i>cristata</i> Jeffreys, <i>Limopsis</i>	8
<i>acutissima</i> n. sp., <i>Mactra</i>	46, 51	<i>Crassatina</i>	34, 35, 36
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<i>ajar</i> (Bruguère), <i>Cardiocardita</i>	30, 32	<i>Ctenoides</i>	13
<i>alba</i> n. sp., <i>Crassatina</i>	34	<i>curta</i> Locard, <i>Corbula gibba</i> var.	96
<i>americana</i> Dall, <i>Spheniopsis</i>	98	<i>curvata</i> Koenen, <i>Spheniopsis</i>	98
<i>angolensis</i> n. sp., <i>Mactra</i>	43		
<i>angolensis</i> n. sp., <i>Petricola</i>	86	<i>daimeriesi</i> Vincent, <i>Spheniopsis</i>	98
<i>angolensis</i> n. sp., <i>Plicatula</i>	12	<i>dakarensis</i> n. sp., <i>Crassatina</i>	35
<i>antillensis</i> Dall, <i>Limopsis</i>	8	<i>delettrei</i> (Coquand), <i>Ctenoides</i> aff.	14
<i>arabica</i> Dillwyn, <i>Venus</i>	81	<i>densestriata</i> n. sp., <i>Tellina</i>	63, 66
		<i>denticulata</i> Sowerby, <i>Pitar</i>	87
<i>balalaika</i> n. sp., <i>Bornia</i>	22	<i>Diberus</i>	8
<i>Basterotia</i>	24	<i>Diplodonta</i>	14, 16
<i>belcheri</i> (Sowerby), <i>Pitar</i>	86	<i>discus</i> Stearns, <i>Periploma</i>	110
<i>bertrandi</i> n. sp., <i>Tellina</i>	57	<i>distorta</i> n. sp., <i>Lozouetia</i>	20
<i>bisulcata</i> (d'Orbigny), <i>Lithophaga</i>	9	<i>distorta</i> Poli, <i>Tellina</i>	63
<i>Bornia</i>	22	<i>divaricalx</i> Iredale, <i>Lithophaga</i>	9
<i>boucheti</i> n. sp., <i>Tellina</i>	55, 58	<i>domaini</i> n. sp., <i>Donax</i>	75
<i>broccchii</i> (Deshayes), <i>Diplodonta</i>	18	<i>donacina</i> n. sp., <i>Parvicirce</i>	80
<i>burnupi</i> Sowerby, <i>Donax</i>	78	<i>Donax</i>	72, 74, 75
<i>busoensis</i> (Yokoyama), <i>Cryptomya</i>	89		
		<i>elata</i> (Sowerby), <i>Pitar</i>	86
<i>californica</i> (Conrad), <i>Cryptomya</i>	89	<i>enigmatica</i> n. sp., <i>Diplodonta</i>	16
<i>californica</i> Dall, <i>Grippina</i>	98		
<i>callipyga</i> (Born), <i>Circenita</i>	81	<i>fragilis</i> (Forsskål), <i>Fulvia fragilis</i>	40
<i>camerunensis</i> n. sp., <i>Periploma</i>	102	<i>fragilis</i> (Linné), <i>Gastrana</i>	71
<i>candida</i> (Lamarck), <i>Macoma</i>	67, 68, 70	<i>Fulvia</i>	38
<i>Capsella</i>	75	<i>fusca</i> Kobelt, <i>Crassatella</i>	35
<i>Cardiocardita</i>	28, 31		
<i>Carditamera</i>	27	<i>gabonensis</i> n. sp., <i>Cardiocardita</i>	31
<i>carmenae</i> n. sp., <i>Lithophaga</i>	8	<i>galathea</i> Knudsen, <i>Limopsis</i>	5
<i>Caryocorbula</i>	92	<i>galathea</i> Hanley, <i>Tellina</i>	67, 68
<i>catherinae</i> n. sp., <i>Ctenoides</i>	13	<i>Galeomma</i>	23
<i>chenui</i> Cosel, <i>Pharus</i>	31	<i>Gastrana</i>	70
<i>chiclaya</i> Olsson, <i>Bornia</i>	23	<i>gibba</i> Olivi, <i>Corbula</i>	96
<i>Circe</i>	81	<i>glabrata</i> Linné, <i>Mactra</i>	52
<i>Circenita</i>	81	<i>goodallioides</i> (Cossm.), <i>Parvicirce</i>	80, 81, 82
" <i>Circentia</i> "	81	<i>Gouldia</i>	80, 82
<i>clancula</i> n. sp., <i>Basterotia</i>	24	<i>granum</i> n. sp., <i>Corbula</i>	94
<i>compressa</i> Brocchi, <i>Tellina</i>	63, 65, 66	<i>Grippina</i>	98
<i>congoensis</i> Jaeckel & Thiele, <i>Astarte</i>	36		
<i>congoensis</i> (Jaeckel & Th.), <i>Crassatina</i>	37	<i>hanleyi</i> Dunker, <i>Tellina</i>	56
<i>congoensis</i> n. ssp., <i>Fulvia fragilis</i>	38		
<i>contigua</i> (Dautzenberg), <i>Carditamera</i>	28	<i>inconstans</i> n. sp., <i>Mactra</i>	48

<i>inexpectata</i> n. sp., <i>Macoma</i>	68	<i>owenii</i> Hanley, <i>Donax</i>	78
<i>intesi</i> n. sp., <i>Abra</i>	79	<i>Oudardia</i>	63, 65
<i>jarli</i> Nicklès, <i>Abra</i>	79	<i>papyracea</i> (Bruguière), <i>Fulvia</i>	40
<i>Jouannetia</i>	98	<i>Paramya</i>	90
<i>lacunosa</i> (Reeve), <i>Cardiocardita</i>	31, 32, 34	Parvicirce n. g.	80
<i>lanceolata</i> Oliv. & Allen, <i>Limopsis cristata</i>	5	peliferus n. sp., <i>Pitar</i>	84
<i>Lazariella</i>	28	<i>penicillata</i> Carpenter, <i>Plicatula</i>	13
<i>Limopsis</i>	5, 6	<i>Periploma</i>	102
<i>lischkei</i> Lamy, <i>Ctenoides</i>	14	<i>Peronaea</i>	54
<i>Lithophaga</i>	8	<i>pessulatus</i> (Reeve), <i>Lithophaga</i>	9
<i>Litigiella</i>	20	<i>Petricola</i>	86
<i>longicallis</i> (Scacchi), <i>Abra</i>	79	phariformis n. sp., <i>Donax</i>	74
Lozouetia n. g.	20	<i>Pharus</i>	31
<i>lulati</i> Dautzenberg, <i>Modiolus</i>	10	<i>phaseolina</i> (Lamarck), <i>Thracia</i>	102
<i>Machaerodonax</i>	74	<i>philippiana</i> (Nyst), <i>Yoldiella</i>	5
<i>Macoma</i>	67, 68	<i>Pholadopsis</i>	98
<i>Mactra</i>	40, 43, 46, 48	pini n. sp., <i>Abra</i>	78
<i>Mactrinula</i>	48, 51	<i>Pitar</i>	84
marchadi n. sp., <i>Crassatina</i>	36	<i>planata</i> Linné, <i>Tellina planata</i>	55
marchali n. sp., <i>Mysia</i>	87	<i>Plicatula</i>	12
<i>matadoa</i> (Gmelin), <i>Gastrana</i>	71	<i>plumula</i> (Hanley), <i>Lithophaga</i>	9
micronitida n. sp., <i>Mactra</i>	40, 47, 51	<i>Potidoma</i>	20
<i>minima</i> (Montagu), <i>Gouldia</i>	82	<i>profundorum</i> (E.A. Smith), <i>Abra</i>	79
<i>minuta</i> (Philippi), <i>Limopsis</i>	8	<i>Psammocoma</i>	67, 68
modica n. sp., <i>Tellina</i>	62	<i>pseudobarbatus</i> Ockelmann, <i>Modiolus</i>	12
<i>Moerella</i>	55, 57, 58, 59, 62	pseudofallax n. sp., <i>Macoma</i>	67
<i>Modiolus</i>	9	pseudopusilla n. sp., <i>Tellina</i>	58, 60, 62, 63
<i>mucronata</i> (Philippi), <i>Lithophaga</i>	9	<i>pulchellus</i> Hanley, <i>Donax</i>	74
<i>Mysia</i>	87	<i>pusilla</i> Philippi, <i>Tellina</i>	58, 59, 62, 63
<i>natalis</i> Barnard, <i>Limopsis</i>	8	pyrenoides n. sp., <i>Limopsis</i>	6
<i>nicklesi</i> Ockelmann, <i>Modiolus</i>	10	<i>quadrata</i> (Hinds), <i>Basterotia</i>	27
nicklesi n. sp., <i>Nucula</i>	3	<i>Raeta</i>	51
<i>nicklesi</i> (Rosso), <i>Orobitella</i>	19	<i>regularis</i> (Sowerby), <i>Carditamera</i>	28
<i>nitida</i> (Spengler), <i>Mactra</i>	40, 43, 46, 47, 48	rolani n. sp., <i>Carditamera</i>	27
<i>nitidosa</i> Winckworth, <i>Nucula</i>	4	<i>rotundata</i> (Montagu), <i>Diplodonta</i>	16, 18
<i>nivea</i> (Gmelin), <i>Spisula</i>	52	roumei n. sp., <i>Thracia</i>	100
<i>Nucula</i>	3	<i>scalaris</i> (Braun), <i>Spheniopsis</i>	98
<i>nuculoides</i> (Conrad), <i>Semelina</i>	62	<i>scalpellum</i> Gray, <i>Donax</i>	75
obesa n. sp., <i>Cardiocardita</i>	28	<i>Semele</i>	62
<i>oblonga</i> E.A. Smith, <i>Basterotia</i>	27	<i>Semelina</i>	62
<i>Odoncineta</i>	100	<i>senegalensis</i> Philippi, <i>Mactra</i>	51, 52
<i>operculata</i> Philippi, <i>Corbula</i>	96	senegalensis n. sp., <i>Spheniopsis</i>	96
<i>Orobitella</i>	19	<i>senegalensis</i> (Philippi), <i>Standella</i>	51, 52
orstomi n. sp., <i>Gastrana</i>	70	senegalica n. sp., <i>Raeta</i>	51
orstomi n. sp., <i>Yoldiella</i>	5	solida n. sp., <i>Orobitella</i>	19
oryza n. s.p., <i>Tellina</i>	59	<i>Spheniopsis</i>	96
		<i>Spisula</i>	52

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<i>Standella</i>	52	<i>triquetra</i> (Reeve), <i>Crassatina</i>	35
<i>striata</i> E.A. Smith, <i>Corbula</i>	92	<i>trunculus</i> Linné, <i>Donax</i>	72, 74
<i>striatella</i> Lamarck, <i>Macra</i>	52	<i>tumens</i> (Gmelin), <i>Pitar</i>	86
<i>strigosa</i> Gmelin, <i>Tellina</i>	55	<i>turtoni</i> Sowerby, <i>Galeomma</i>	24
<i>subovata</i> (Conrad), <i>Paramya</i>	92	<i>uncinata</i> n. sp., <i>Jouannetia</i>	98
<i>subtrigonum</i> Jeffr. in Fischer, <i>Lepton</i>	20	<i>undata</i> n. sp., <i>Diplodonta</i>	14
<i>Tellina</i>	54, 55, 57, 58, 59, 62, 63, 65	<i>undata</i> (Pennant), <i>Mysia</i>	88
<i>tenella</i> Jeffreys, <i>Limopsis</i>	5	<i>Varicorbula</i>	94
<i>tenera</i> (Sowerby), <i>Ctenoides</i>	14	<i>verdensis</i> n. sp., <i>Donax</i>	72
<i>thorsoni</i> Ockelmann, <i>Modiolus</i>	12	<i>verdensis</i> n. sp., <i>Modiolus</i>	9
<i>Thracia</i>	100	<i>virginiae</i> nom. nov., <i>Corbula</i>	92
<i>Tivela</i>	82	<i>virgo</i> (Gray), <i>Pitar</i>	86
<i>transversus</i> Sowerby, <i>Donax</i>	75	<i>vittatus</i> (da Costa), <i>Donax</i>	74
<i>trapezia</i> (Linné), <i>Glans</i>	28	<i>Yoldiella</i>	5
<i>tripartita</i> n. sp., <i>Galeomma</i>	23		
<i>tripla</i> Linné, <i>Tivela</i>	82		

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