



Description of a new genus and twelve new species of marine bivalves from tropical West Africa, with comments on other taxa from the area

Descripción de un nuevo género y doce nuevas especies de bivalvos marinos de África occidental tropical, con comentarios sobre otros taxones del área

Rudo von COSEL* & Serge GOFAS**

Recibido el 5-V-2017. Aceptado el 14-XI-2017

ABSTRACT

Twelve species of marine bivalves from tropical West Africa are described: *Glans afra* n. sp., *Crassatina guineensis* n. sp., *Diplodonta (Felania) nizeryi* n. sp., *Kurtiella zabii* n. sp., *Moerella leloeuffi* n. sp., *Donax (Machaerodonax) pseudocutangulus* n. sp., *Microcirce antei* n. sp., *Pitar nicklesi* n. sp., *Pitar (Costellipitar) longior* n. sp., *Pholas (Thovana) bissauensis* Cosel & Haga n. sp., *Pholadidea eborensis* Cosel & Haga, n. sp., *Barnea (Anchomasa) ghanaensis* Huber, n. sp. The new genus *Huberimactra* is proposed for two species hitherto included in *Anatina* Schumacher, 1817. The type species of the tellinid genus *Atlantella* Huber, Langleit & Kreipl, 2015 is shown to have an internal portion of the ligament and a hinge configuration similar to *Moerella* Fischer, 1887, and the two taxa are therefore held as synonyms. The species *Atlantella ryalli* Huber, Langleit & Kreipl, 2015 is consequently considered as a synonym of *Moerella donacina* (Linnaeus, 1758). The specific name *cumana*, currently in usage in the combination *Macomopsis cumana* (O.G. Costa, 1830) is declared *nomen protectum* against the senior synonym *Tellina pellucida* Spengler, 1798, declared *nomen oblitum* under provisions of ICZN art. 23.9.

RESUMEN

Se describen doce especies de bivalvos marinos de África occidental tropical: *Glans afra* n. sp., *Crassatina guineensis* n. sp., *Diplodonta (Felania) nizeryi* n. sp., *Kurtiella zabii* n. sp., *Moerella leloeuffi* n. sp., *Donax (Machaerodonax) pseudocutangulus* n. sp., *Microcirce antei* n. sp., *Pitar nicklesi* n. sp., *Pitar (Costellipitar) longior* n. sp., *Pholas (Thovana) bissauensis* Cosel & Haga n. sp., *Pholadidea eborensis* Cosel & Haga, n. sp., *Barnea (Anchomasa) ghanaensis* Huber, n. sp. El género nuevo *Huberimactra* se propone para dos especies hasta ahora incluidas en *Anatina* Schumacher, 1817. Se muestra que la especie tipo del género *Atlantella* Huber, Langleit & Kreipl, 2015 en la familia Tellinidae, tiene una porción interna del ligamento y una configuración de charnela similar a *Moerella* Fischer, 1887, por lo que los dos taxa se consideran como sinónimos. La especie *Atlantella ryalli* Huber, Langleit & Kreipl, 2015 se considera entonces como sinonimia de *Moerella donacina* (Linnaeus, 1758). El nombre específico *cumana*, actualmente en uso en la combinación *Macomopsis cumana* (O.G. Costa, 1830), es declarado *nomen protectum* frente al sinónimo más antiguo *Tellina pellucida* Spengler, 1798, declarado *nomen oblitum* bajo las disposiciones del CINZ art. 23.9.

* Muséum National d'Histoire Naturelle, Département Systématique et Evolution (Case Postale 51), 55, Rue Buffon, F-75231 Paris Cedex 05, France

** Departamento de Biología Animal, Facultad de Ciencias, Universidad de Málaga. Campus de Teatinos - E-29071 Málaga, Spain

INTRODUCTION

The taxonomy of marine bivalves of tropical West Africa has been studied by the first author for several decades (COSEL, 1989, 1990, 1993, 1995, 2006; SALAS & COSEL, 1991; OLIVER & COSEL, 1992a,b; COSEL & SALAS, 2001) with the final goal of producing a comprehensive identification handbook including all known species from shore to the edge of the continental shelf, from Rio de Oro to southern Angola. About 90 new species were described in these papers, adding to the ca. 350 species of bivalves known from West Africa when this work started. Since then additional undescribed species have been discovered, either as a result of the thorough examination of the material in MNHN already in the process of being sorted, or originating from scientific cruises or shore collecting after 1995. The purpose of this paper is to provide formal descriptions for these species, in order to prepare their entries in the forthcoming guide to the tropical West African bivalves.

In the last decade, the publication of the "Compendium of Bivalves" (HUBER, 2010; 2015) has been a landmark in bivalve systematics, providing a comprehensive view of the class worldwide. In some cases, which will be detailed hereafter, we may not agree with the views expressed there, but these will be considered and discussed if rebutted.

Much of the newly available material was obtained during several cruises of the R/V "André Nizery", with participation of the first author, undertaking trawling surveys (CHALGUI I,

CHALGUI II, CHALBIS I, CHALBIS II) on the upper shelf of Guinea Bissau and Guinea Conakry, and the mapping of sediments on the continental shelf of Guinea Conakry (SEDIGUI I, SEDIGUI II) (Domain & Bah, 1993) Other material was obtained during the cruises BENCHACI I on R/V "Antea" in August 1998, on a transect off Grand Bassam, Côte d'Ivoire (LE LŒUFF ET AL., 2000) and additional shore collecting in Côte d'Ivoire.

All the type specimens and examined material is housed in Museum National d'Histoire Naturelle, Paris (hereafter, MNHN) unless otherwise stated.

Abbreviations

leg.: legit, collected by
jv: juvenile
lv: left valve
rv: right valve
spm: live collected specimen, with soft parts
sh: complete bivalve shell, without soft parts
sta.: collecting station in an expedition.
CRO, Centre de Recherches Océanographiques, Abidjan
GTS: Guinean Trawling Survey
IRD: Institut de recherche pour le développement (formerly ORSTOM)
MNHN: Muséum National d'Histoire Naturelle, Paris
ZMB: Zoologisches Museum der Humboldt-Universität, Berlin
ZMUC: Zoological Museum, University of Copenhagen

SYSTEMATICS

Family CARDITIDAE

Genus *Glans* Megerle von Mühlfeld, 1811

Glans (Glans) afra n. sp. (Figures 1, 2, 3, 5A)

Type material: Holotype (spm, dry, 12.3 x 8.9 x 7.9 mm, MNHN IM-2000-33725) and 8 paratypes (spm, dry, 9.0 x 6.8 x 6.3 to 20.2 x 15.3 x 12 mm, MNHN IM-2000-33726), leg. Gofas 1983, all from the type locality.

Type locality: São Tomé, Praia Mouro Peixe (0°24.5'N, 06°38'E, on rocks 0-2 m).

Other material examined: Mauritania — off Mauritania (20°20'N, 16°22'W, 10 m), Mission Port-Etienne 1965, leg. Marche-Marchad, 13 lv, 11 rv [not typical]; SW of Nouakchott (17°44'N, 16°27'W, 100 m), dredged “Léon Coursin”, leg. Marche-Marchad 03.II.1957, 1 rv [mixed with valves of *Centrocardita aculeata*]; Cap Blanc, rocky shore, leg. Bouchet V.1983, 1 lv. Senegal — Dakar area (48-98 m), dredged R/V “Gérard Tréca”, leg. Marche-Marchad 1954-1955, 3 lots totalizing 1 spm, 9 lv, 4 rv; N-Casamance, Senegal (12°44.5'N, 17°27.3'W, 40 m), dredged R/V “Louis Sauger”, leg. Cosel 28.III.1988, 7 lv, 3 rv. Guinea — Conakry, old collection MNHN, 5 lv, 2 rv; W of Baie de Sangarea, Guinée (9°40'N, 14°05'W, 18 m), dredged R/V “Calypso”, Golfe de Guinée sta. 7, leg. Marche-Marchad 17.V.1956, 1 rv. Liberia — Robertsport (6°40'N, 11°23'W, 51 m), dredged R/V “Calypso” Golfe de Guinée sta. 12, leg. Marche-Marchad 1956, 3 lv, 2 rv. Ghana — Takoradi (4°36.5'N, 1°31'W, 50 m), dredged R/V “Calypso” Golfe de Guinée sta. 25, leg. Marche-Marchad 1956, 1 spm; off Bonyere Beach (4°58'N, 2°41'W, 20 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier 19.III.1964, 1 lv, 1 rv; Cape Coast, trawled 26-31 m on hard bottoms, leg. Le Lœuff 10.II.1968, 1 spm. Côte d’Ivoire — between Grand Lahou and Sassandra (5°04'N, 5°18'W, 30 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier 01.IV.1964, 5 lv, 1 rv, 1 spm; off Tabou (4°30'N, 7°09'W, 35 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier, 1 spm; Sassandra (5°03'N, 5°25'W, 20-25 m), dredged R/V “La Rafale”, GTS sta. 18, leg. Cherbonnier, 1 spm; Abidjan area (5°01.5'N, 3°23.5'W, 70 m), trawled R/V “La Rafale”, GTS, leg. Cherbonnier 22.III.1964, 2 rv; Abidjan area (5°07'N, 3°22'W, 20 m), trawled R/V “La Rafale”, GTS, leg. Cherbonnier 21.III.1964, 4 lv, 2 rv; Abidjan area (35-50 m), dredged R/V “Reine Pokou”, leg. Le Lœuff 1966-1973, 3 lots totalizing 11 lv, 9 rv, 9 spm. Nigeria — off mouths of the Niger (4°00'N, 6°11'E, 34 m), R/V “Calypso” Golfe de Guinée sta. 28, leg. Marche-Marchad 26.V.1956, 5 spm; off mouth of Niger (4°03'N, 6°12'E, 32 m), dredged R/V “Calypso” Golfe de Guinée 1956 sta. 29, leg. Marche-Marchad 26.V.1956, 9 spm, 193 lv, 145 rv. São Tomé — The type material and: São Tomé (0°20'N, 6°46'E, 10 m), dredged R/V “Calypso” Golfe de Guinée sta. 64, leg. Marche-Marchad, 2 spm. (9.5 x 7.5 x 6.1 mm, 20.2 x 14 x 13 mm); Baia de Ana Chaves (0°21.0'N, 6°43.8'E, 5 m on calcareous algae), dredged R/V “Calypso” Golfe de Guinée sta. T3, leg. Marche-Marchad 06.VI.1956, 1 lv; Praia Lagarto (0°22'N, 6°44'E, 5-6 m on calcareous algae), dredged, R/V “Calypso” Golfe de Guinée sta. T18, leg. Marche-Marchad 11.VI.1956, 4 spm (up to 4.8 x 4.0 x 3.5 mm); Praia Milha (0°21.6'N, 06°43.0'E, shore), leg. Gofas XI.1983, 5 lv, 3 rv; Praia das Conchas (0°24.5'N, 6°37.2'E, shore), leg. Gofas XI.1983, 1 spm (13.0 x 10.4 x 10.1 mm); Esprainha (0°19.9', 6°31.2'E, 0-2 m), leg. Gofas XI 1983, 2 spm, 2 lv, 1 rv. Príncipe — between Ponta da Mina & Santa Ana (1°39.3'N, 7°26.5'E, 10-12 m), R/V “Calypso” sta. P1, leg. Marche-Marchad 25.VI.1956, 4 spm; facing Cais de Santa Ana (1°39.5'N, 7°26.1'E, 11 m), on calcareous algae, sand and shell debris, R/V “Calypso” Golfe de Guinée sta. P3, leg. Marche-Marchad 26.VI.1956, 2 spm; between Ponta da Mina and Ponta Novo Destino (1°39.2'N, 7°26.4', 8-10 m), on calcareous algae, R/V “Calypso” Golfe de Guinée sta. P21, leg. Marche-Marchad 4.VII.1956, 1 spm, 1 lv. Congo (Brazzaville) — Pointe-Noire, beach drift, leg. Cosel XII.1985, 3 lots totalizing 6 lv, 6 rv, 2 spm. Gabon — Île Conga, baie de Corisco, leg. Jean 17.VI.1955, 1 rv, 2 lv; Cap Esterias, (0°47.5'N, 09°19'E, rocks on shore), leg. P. Bernard 1980-1989, 46 spm. (5.7 x 4.2 x 3.4 mm to 12.3 x 8.5 x 7.9 mm); Port Gentil, beach bordering lagoon, muddy sand with wrecks (0°43'S, 8°47'E), leg. P. Bernard 1980-1989, 12 spm (7.2 x 6.8 x 5.0 to 14.2 x 10.3 x 10.3 mm); Île Banié (0°49'N, 09°25'E, sandbanks, intertidal), leg. P. Bernard 1980-1989, 27 spm., 2 lv, 2 rv. Angola — off Ambrizete (6°57'S, 12°23'E, 45 m), box corer, leg. Gofas 1983, 1 lv; Ambrizete, shore below lighthouse, 3 lv, 7 rv; 10 km S of Ambrizete, shore drift, 1 rv; off Ilha de Luanda (8°44'S, 13°12'E, 40-60 m), leg. Gofas 1981-1985, 1 spm (7.5 x 5.6 x 5.2 mm), 7 lv, 1 rv; Praia São Tiago (8°38'S, 13°24.6'E, 1-2 m), leg. Gofas 1981-1985, 9 spm. (5.40 x 4.2 x 3.5 mm to 16.3 x 11.9 x 11.2 mm), 1 rv.

Derivatio nominis: meaning “African”, alluding to the large distribution in West Africa.

Description: Shell up to 25 mm long, quite thick and solid, variable in shape, rather elongate, rectangular to subrectangular, inflated. Beaks near the anterior end, prosogyrous. Prodissoconch small, lenticular in shape, smooth, without differentiated parts. Early dis-

soconch with only commarginal wrinkles, rest of dissoconch with 20-23 elevated radial ribs, the prominent top part demarcated by a deep groove on each side. Top of the ribs with more or less marked transverse nodules on anterior and median parts, posterior ribs with

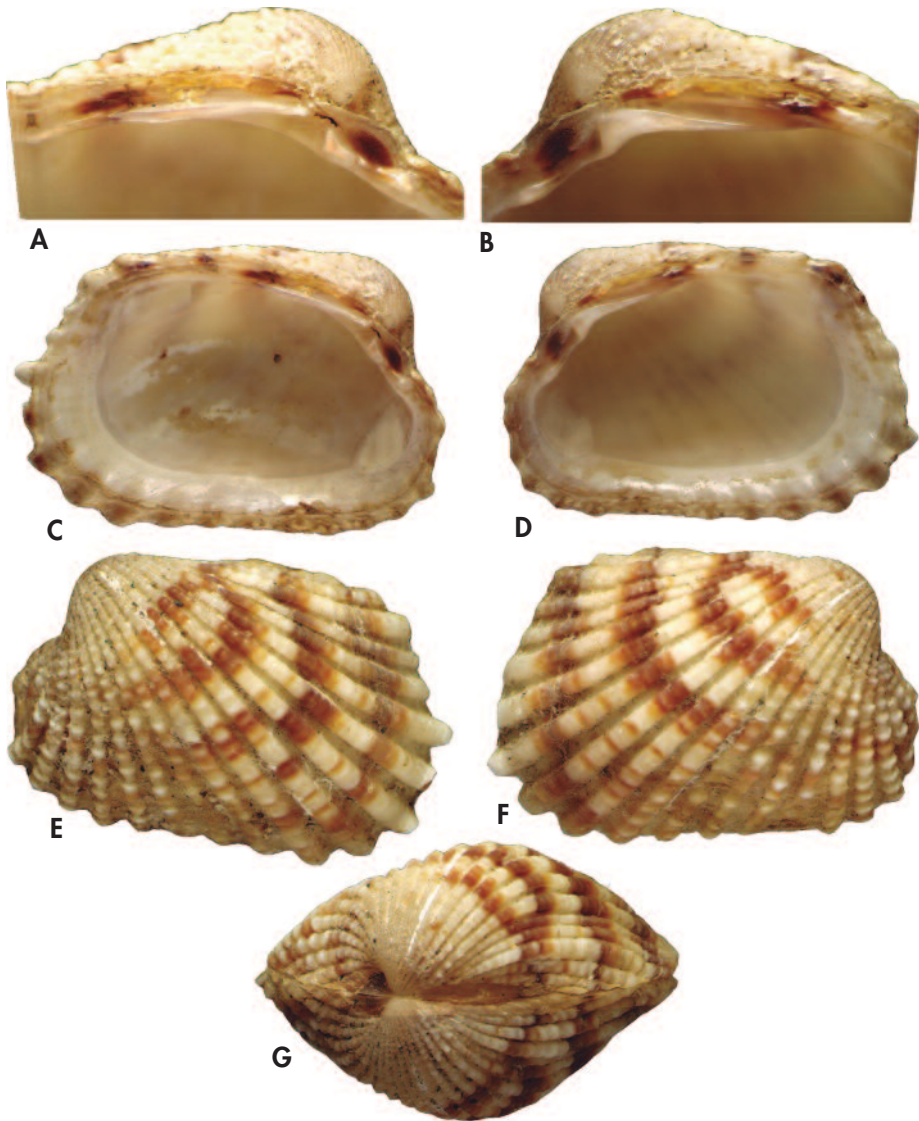


Figure 1. *Glans afra* n. sp. Holotype (spm) from São Tomé, Praia Mouro Peixe, leg. Gofas (12.3 mm). A, B: hinge; C, D: internal views; E, F: external views; G: dorsal view. Left valves to the left, right valves to the right.

Figura 1. Glans afra n. sp. Holotipo (ejemplar recolectado vivo) de São Tomé, Praia Mouro Peixe, col. Gofas (12,3 mm). A, B: charnela; C, D: vistas internas; E, F: vistas externas; G: vista dorsal. Valvas izquierdas a la izquierda, valvas derechas a la derecha.

broadly separated scales. Along the posterior dorsal margin there are two to three thinner ribs, situated in a depressed area behind the umbones.

Lunule small, heart-shaped and impressed, no escutcheon. Inner margin with knobs corresponding to the termination of the interspaces of the ribs; on

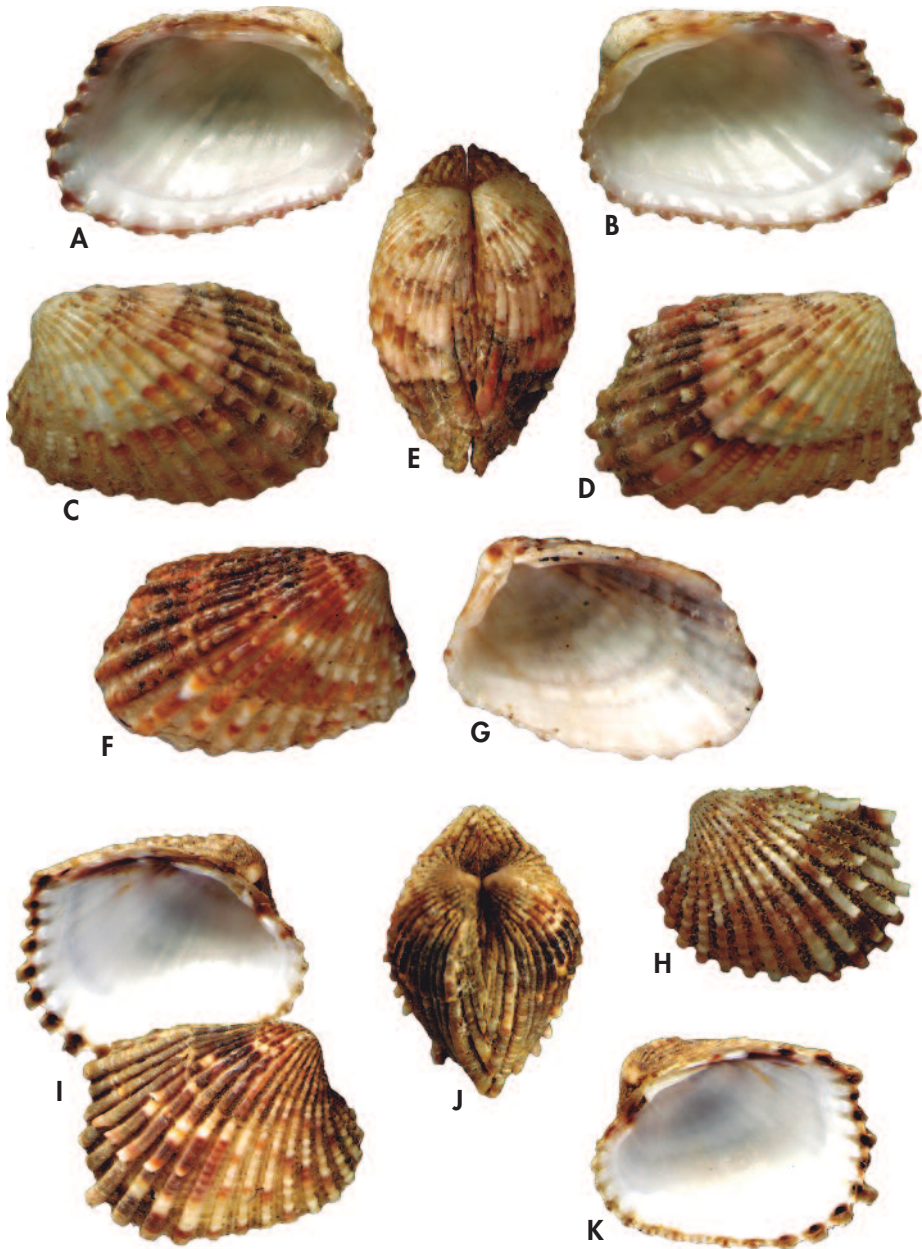


Figure 2. *Glans afra* n. sp. A-E: paratype (spm) from São Tomé, Praia Mouro Peixe, leg. Gofas (18.0 mm); F, G: right valve from Pointe Noire, Plage Sauvage (13.0 mm); H: left valve from Principe Island, Ponta da Mina, R/V “Calypso” sta. P7 (6.5 mm); I-K: specimen from off Ilha de Luanda, 40-60 m, leg. Gofas (7.5 mm).

Figura 2. *Glans afra* n. sp. A-E: paratipo (spm) de São Tomé, Praia Mouro Peixe, col. Gofas (18,0 mm); F, G: valva derecha de Pointe Noire, Plage Sauvage (13,0 mm); H: valva izquierda de Isla do Principe, Ponta da Mina, B/O “Calypso” sta. P7 (6,5 mm); I-K: ejemplar de Ilha de Luanda, 40-60 m, col. Gofas (7,5 mm).

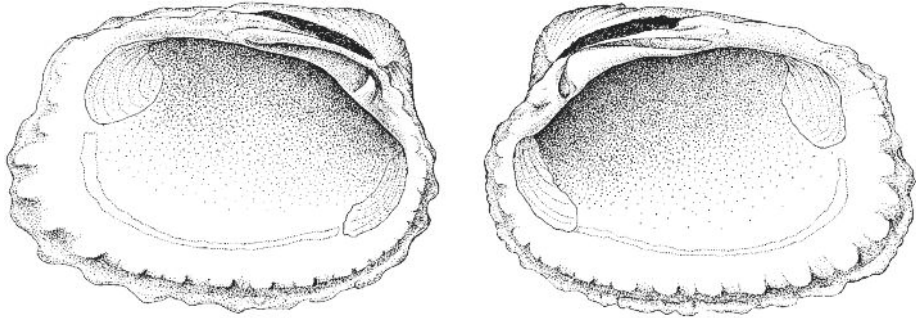


Figure 3. *Glans afra* n. sp. Inside of a specimen from Praia São Tiago, Angola, leg. Gofas (15.9 mm)
Figura 3. Glans afra n. sp. Interior de un ejemplar de Praia São Tiago, Angola, col. Gofas (15,9 mm)

fresh shells this margin is bordered by thin projections in continuation of the ribs (eroded on beached shells).

Hinge plate comparatively narrow. Left valve with two rather widely separated and divergent cardinals, the anterior one small, triangular, the posterior one blade-like, nearly parallel to the postero-dorsal margin, and a very small anterior lateral. Right valve with a very strong cardinal, triangular and prolonged posteriorly into a narrow ridge, and a very small anterior lateral interlocking ventrally to that of the lv. Ligament external, sunken in a narrow groove.

Colour of outside whitish with irregular brown zones, broadly commarginal, or with smaller brownish streaks, spots and flecks. Occasionally ground colouration pinkish. Inside white, sometimes with light to dark brown in the postero-dorsal part, brown on the flange-like projections along the margins. Periostracum thin, dull and light yellowish brown.

Distribution: Mauritania to northern Angola (Luanda); Cape Verde Islands; São Tomé, Ilha do Príncipe, Annobon, from the material examined; also reported in the Canaries (HERNÁNDEZ ET AL., 2011: 345-346, pl. 110R, as *Glans trapezia*). There is a large distributional gap before the known range of *Glans trapezia*, an "inner Mediterranean" species absent from the Alboran Sea. The record of *Glans trapezia* from Portu-

gal by NOBRE (1931) is based on a valve listed by MACANDREW (1851: 269) as dredged off Cape Santa Maria (Algarve) in 30-60 fathoms, and is most likely, given the area and depth indicated, to be a misidentified *Centrocardita aculeata*.

Biotope: Byssally attached to rocks, on the undersides of stones and other hard substrata, but also free on sandy bottom with shell debris, from shallow water (just below low tide level) to about 70 m, not uncommon. The occurrence of a large population (R/V "Calypso" sta. 29) off the mouth of the Niger is puzzling, but there are no data on the nature of the bottom.

Remarks: This species resembles, and is probably related to the Mediterranean *Glans trapezia* (Linnaeus, 1767), the type species of the genus (Figures 4A-G, 5B). It has been reported from West Africa under this specific name (Tomlin & Shackelford, 1915, as *Cardita trapezia*; Nicklès, 1952; 1955, as *Beguina trapezia*; HERNÁNDEZ ET AL., 2011). The West African taxon grows to well over 20 mm long whereas Mediterranean specimens are usually less than 10 mm long and hardly ever larger than 12 mm. *Glans trapezia* is more rectangular in shape, with a more vertical posterior margin, never posteriorly rounded as in the larger specimens of *G. afra*. The ribs are less numerous, somewhat coarser in *Glans trapezia*, the anterior ones with more prominent nodules, and the posterior ribs also nodose, not forming

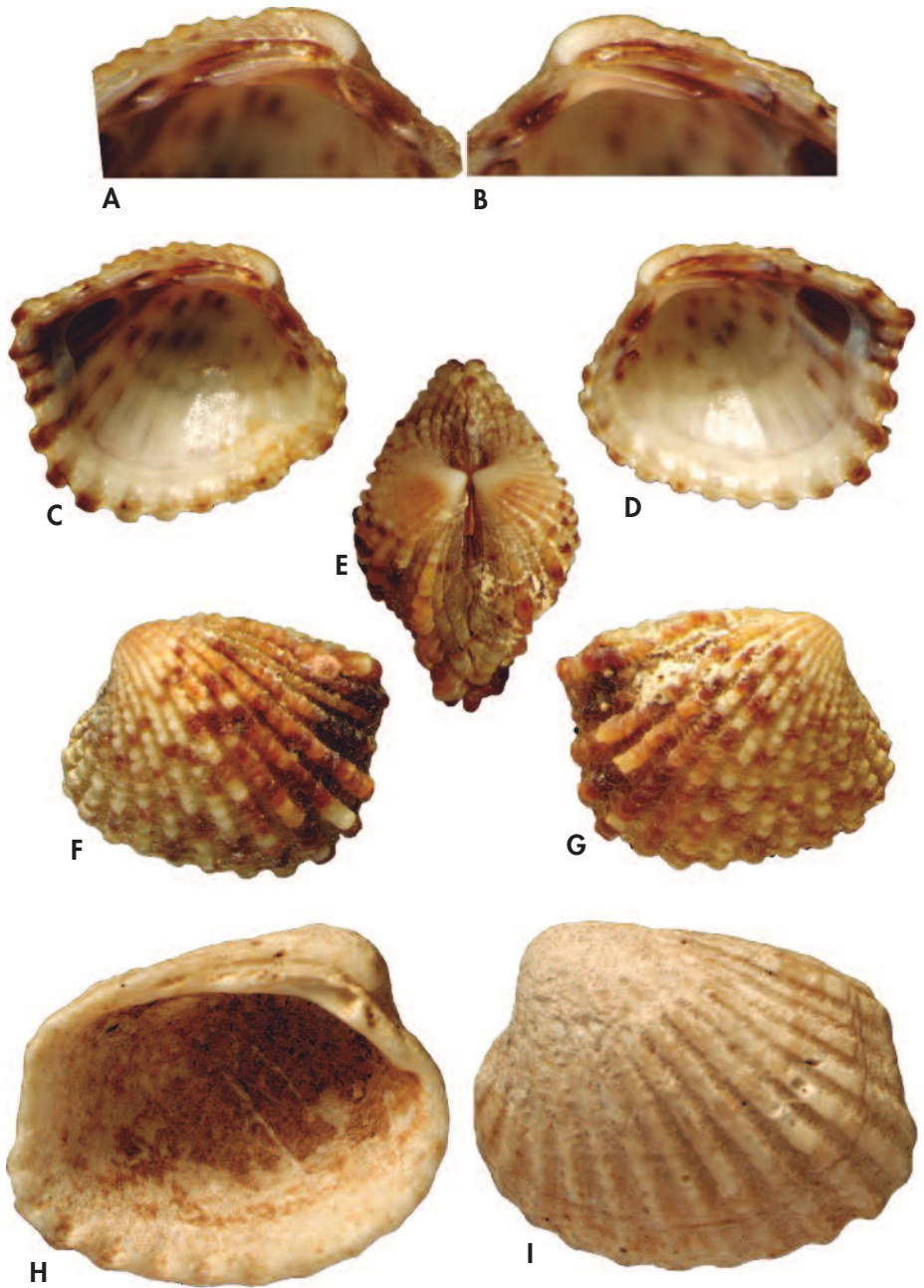


Figure 4. A-G: *Glans trapezia* (Linnaeus, 1767), specimen from Djidjelli, Algeria, collection Etienne Nelva (6.9 mm). H-I: syntype of *Actinobolus sulcidentatus* Rochebrune, 1882, presumably the figured one (20.0 mm).

Figura 4. A-G: Glans trapezia (Linnaeus, 1767), ejemplar de Djidjelli, Argelia, colección Etienne Nelva (6,9 mm). H-I: sintipo de *Actinobolus sulcidentatus* Rochebrune, 1882, presumiblemente el figurado (20,0 mm).

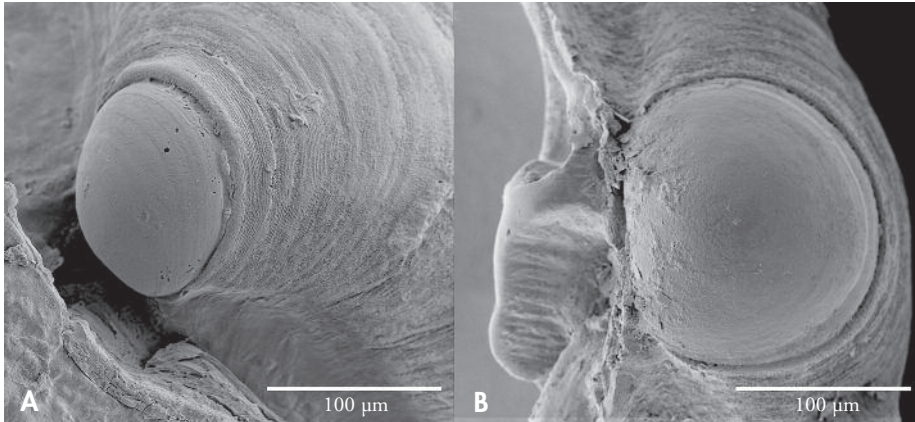


Figure 5. Prodissoconchs. A: *Glans afra* n. sp., right valve of a specimen from Praia São Tiago, Angola; B: *Glans trapezia* (Linnaeus, 1767), right valve of a juvenile specimen from Les Embiez, Mediterranean coast of France.

Figura 5. Prodissoconchas. A: *Glans afra* n. sp., Valva derecha de un ejemplar de Praia São Tiago, Angola; B: *Glans trapezia* (Linnaeus, 1767), valva derecha de un ejemplar juvenil de Les Embiez, costa mediterránea de Francia.

broadly spaced scales as in *G. afra*. Inside, *Glans trapezia* has a more rounded and well-marked posterior adductor scar, usually tinged with brown, whereas that of *G. afra* is always white and rather indistinct. The prodissoconch of the West African species is smaller (120 µm in diameter instead of 160 µm).

Glans sulcidentata (originally described as *Actinobolus sulcidentatus* Rochebrune, 1882, pp. 252-253, pl. 18 fig. 2) from Pleistocene deposits of Santiago, Cape Verde Islands, somewhat resembles the larger specimens of this species. It differs in being much less inequilateral and, mostly, by the different configuration of the cardinal tooth of the left valve, large and triangular whereas it is not very large and forms a narrow ridge

in *Glans afra*. The type lot (syntypes: Cape Verde Islands, leg. Cessac, 3 lv, 2 rv, MNHN IM-2000-33782, labelled "*Actinobolus* n. sp." by Rochebrune; Figure 4H-I herein) is in MNHN and the specimen figured here agrees in size with that figured by ROCHEBRUNE (1882).

Another similar species is the Western Atlantic *Glans plata* (Ihering, 1907) but this is flatter, with a thinner shell, and more numerous ribs.

Juveniles of *Centrocardita aculeata* (Poli, 1795) are distinguished by lacking distinctive colour bands, and by having a more rounded posterior edge and fewer, distinctly more curved ribs at the anterior end (SCAPERROTTA, BARTOLINI & BOGI, 2013).

Family CRASSATELLIDAE

Genus *Crassatina* Kobelt, 1881

Crassatina guineensis n. sp. (Figures 6, 7)

Type material: Holotype (spm, dry, 24.2 × 20.1 × 12.4 mm, MNHN IM-2000-33751): Guinea, W of Île Kouffin (10°33'N, 15°44'W, 26 m), trawled R/V "André Nizery", SEDIGUI II sta. B1CH, leg. Cosel 27.X.1988. Paratype (spm, dry, 21.0 × 17.5 × 10.3 mm, MNHN IM-2000-33752), same locality; Paratype (25.3 × 21.5 × 13.7 mm, MNHN IM-2000-33753), W Ile Kouffin (10°30' N, 15°43.5' W, 21

m), dredged R/V "André Nizery", SEDIGUI II sta. B2DW, leg. Cosel 27.X.1988; Paratypes (4 rv, 6 lv, IM-2000-33754), W Île Kouffin (10°33'N, 15°44'W, 26 m), dredged R/V "André Nizery", SEDIGUI II sta. B1gDW, leg. Cosel 27.X.1988; Paratypes (3 spm, dry, 23.1 x 19.5 x 17.9 mm to 24.0 x 20.9 x 12.7 mm; 1 rv, 3 lv, MNHN IM-2000-33755), W Île Yomboya (10°27'N, 15°37.5'W, 39 m), dredged R/V "André Nizery", SEDIGUI II sta. B4gDW, leg. Cosel 28.X.1988.

Type locality: Guinean shelf, W of Île Kouffin (10°33'N, 15°44'W, 26 m).

Other material examined: Mauritania — 3 miles W of Kiaoué (20°02'N, 16°22'W, 6 m), leg. Marche-Marchad 06.V.1995, 3 rv. Senegal — Dakar region, Baie de Hann, low tide, IV.1908, leg. Mission Gruvel, 1 lv.; off Cap Manuel, 18 m, leg. Marche-Marchad 01.III.1967, 1 lv; from South of Dakar to Saloum (no precision), shallower than 40 m, leg. Leung Tack 1983, numerous jv and adult spm; off Saloum, 35-37 m, dredged R/V "Gérard Tréca", leg. Marche-Marchad 08.III.1955, 1 spm; off Casamance (12°40'N to 13°02'N, 17°00'W to 17°30'W, 18 - 36 m), dredged R/V "Louis Sauger", 25-29.III.1988, 14 lots with several spm; off Diembéring, Casamance (12°29.6'N, 17°24.3'W, 35 m), dredged R/V "Louis Sauger", leg. Cosel 28.III.1988, 1 spm. (23.4 mm). Guinea — Guinean continental shelf, SEDIGUI cruises (9°30'N-10°27'N and 12°42'W-16°10'W, 20-49 m), R/V "André Nizery"; bottom grab, trawl or dredge, leg. Cosel V.1988 or X.1988, 16 lots with several spm, sh or v. Sierra Leone — (8°27'N, 13°49'W, 25 m), dredged, West African Fisheries Research Institute, leg. Longhurst 09.XII.1954, 2 sh, 1 v. Angola — Cape Palmeirinhas, 20-30 m, leg. Gofas 1981-1985, 1 rv; Baia do Limagem (13°17.7'S, 12°39.3'E, 0-2 m), leg. Gofas XII.1981, 1 spm; Baia de Santa Maria (13°25.3'S, 12°32.5'E, 10 m, sand), leg. Gofas XII.1981, 2 rv.

Derivatio nominis: Named after the country in which the type locality is situated.

Description: Shell medium-sized, up to 25 mm long, very thick, solid and strong, rather compressed, somewhat variable in outline, trigonal, more or less longer than high, with anterior margin narrowly rounded, posterior part tapering and posterior margin narrowly rounded-truncated. Ventral margin in its anterior half convex, in its posterior part almost straight. Beaks slightly in front of the vertical midline.

Surface with numerous, close-set commarginal ridges, on the anterior part regular and on the posterior part near or just in front of the posterior angle becoming slightly irregular and often weaker or obsolete. Posterior angle rounded and indistinct. On the posterior slope between the posterior angle and a second more sharper posterior angle, ridges becoming more irregular, especially in the middle of the valve, then ending there abruptly, leaving a smooth zone between the second posterior angle and the escutcheon. Lunule and escutcheon delimited by shallow but well-marked incisions. Periostracum light yellowish brown to dark brown, usually persistent on the whole shell. Inner margin crenulate.

Hinge plate very broad, in the right valve with a strong and long anterior cardinal parallel to the antero-dorsal

margin and continuing as the lower anterior lateral to over the upper extremity of the anterior adductor scar; upper (dorsal) anterior lateral very thin and coinciding with the anterior-dorsal margin; posterior cardinal strong and broad, almost vertical, posterior lateral long, strong and coinciding with the postero-dorsal margin.

Hinge with a very thick cardinal platform situated beneath the umbones. Left valve with a rather long and strong anterior cardinal and a thinner posterior cardinal, anterior lateral more developed in its lower half, posterior lateral long and well developed. Upper (dorsal) posterior lateral almost coinciding with the postero-dorsal margin. Resilifer small, not reaching the lower margin of the hinge plate. Pallial line entire, no pallial sinus. Inner margin strongly crenulate.

Outside whitish to pinkish white, with pinkish to red blotches and zigzag markings, arranged obliquely, radially or irregularly. Inside white with pinkish hue to light brownish on the inner part and on the postero-ventral part. Specimens from Angola more brownish.

Distribution: Disjunct distribution from Mauritania (20°N, rare) and Senegal to Guinea (9°30'N), a single record from Sierra Leone, then southern

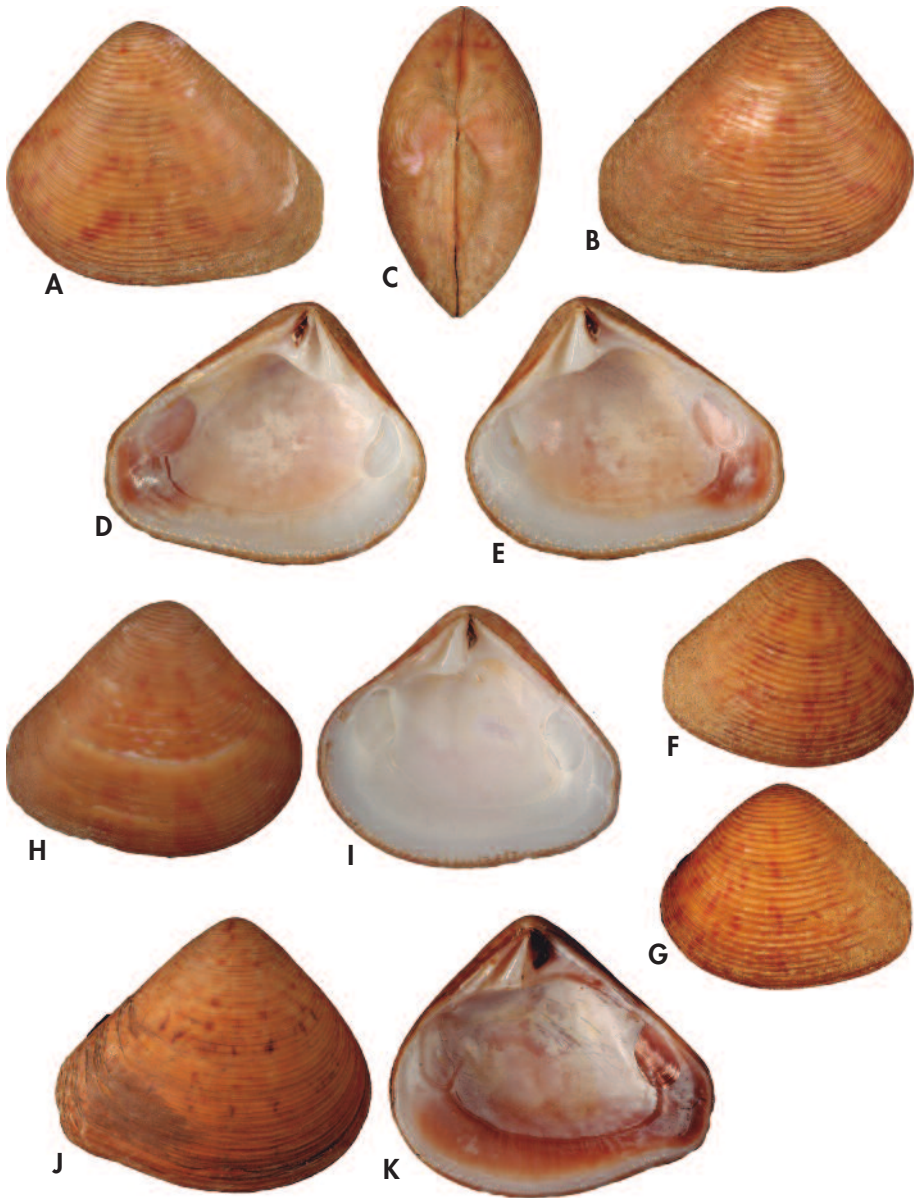


Figure 6. *Crassatina guineensis* n. sp. A-E: holotype (spm), W of Île Kouffin, Guinea (10°33'N, 15°44'W, 26 m), trawled R/V "André Nizery", SEDIGUI B1 CH, leg. Cosel 27.X.1988 (24.2 mm); F, G: paratype, same locality, (21.7 mm); H, I: W of Île Yomboya, Guinea (10°27'N, 15°37.5'W, 39 m), dredged R/V "André Nizery", SEDIGUI B4grDW, leg. Cosel 28.X.1988 (24.0 mm). J-K: 1336-1337 Baia dos Limagens, S-Angola, leg. Gofas (27.3 mm).

Figura 6. *Crassatina guineensis* n. sp. A-E: holotipo (ejemplar colectado vivo), W de Île Kouffin, Guinea (10°33'N, 15°44'W, 26 m), arrastre B/O "André Nizery", SEDIGUI B1 CH, Cosel, 27.X.1988 (24,2 mm); F, G: Paratipo, misma localidad, (21,7 mm); H, I: W de Île Yomboya, Guinea (10°27'N, 15°37.5'W, 39 m), dragado B/O "André Nizery", SEDIGUI B4grDW, col. Cosel 28.X.1988 (24,1 mm). J-K: 1336-1337 Baia dos Limagens, S-Angola, col. Gofas (27,3 mm).

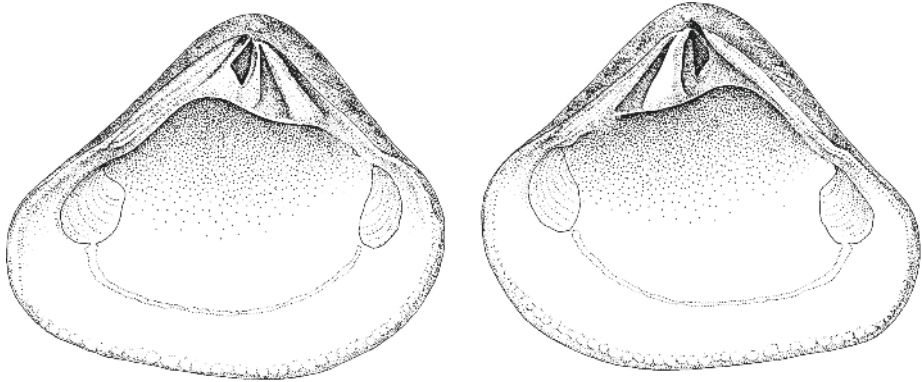


Figure 7. *Crassatina guineensis* n. sp. Inside of a specimen from off Diembéring, Casamance, Senegal (12°29,6'N/17°24,3'W, 35 m), dredged R/V "Louis Sauger", leg. Cosel 28.III.1988 (23.4 mm)

Figura 7. *Crassatina guineensis* n. sp. Interior de un ejemplar recogido frente a Diembéring, Casamance, Senegal (12°29,6'N/17°24,3'W, 35 m), dragado B/O "Louis Sauger", col. Cosel 28.III.1988 (23,4 mm)

Angola, where it is only known from Benguela.

Biotope: In fine and mixed sand, partly with calcareous algae and shell debris, also in sand between rocks, from shallow water (1-2 m below low tide) to about 40 m. On the Guinean shelf, the species is more frequent from 20 m to 40 m, it is common in the northern part but becomes rare south of Cape Verga.

Remarks: This species is close to but consistently distinct from *C. ornata* (Gray in Griffith & Pidgeon, 1833) for which it was hitherto mistaken. It is distinguished by its slightly more compressed shell and the finer sculpture with always densely spaced commarginal ridges on the entire exterior of the valves. *Crassatina ornata* (Figure 8) has coarser commarginal ridges than *C. guineensis* n. sp., they end well in front of the posterior angle. However, the most important difference of *C. ornata* is the sculpture of coarser irregular waves in the umbonal region which are not strictly commarginal but slightly descending towards posterior; the hinge plate is slightly less broad. Moreover, the colouration of *C. guineensis* n. sp.

often consists of pinkish instead of chestnut brown spots, the inside is whitish with pinkish or light brownish hue, whereas in *C. ornata*, the interior is stained with dark brown along the margin. *Crassatina guineensis* n. sp. is confined to the regions with seasonal upwelling, it is common in the north but rare in Angola where it has a slightly different appearance with more brownish colouration.

The "real" *C. ornata* (Gray in Griffith & Pidgeon, 1833), later redescribed as new species under the same specific name by REEVE (1842, 1843), is distinguished by the presence of the typical, prominent and more widely spaced subcommarginal waves on umbonal region and earlier part of the shell. which are oblique and slightly descending towards posterior. *Crassatina ornata* shows the typical distribution pattern of species confined to the islands in the Gulf of Guinea (e.g. *Nodipecten nodosus* (Linnaeus, 1758), *Lyrocardium aeolicum* (Born, 1778)): it is known from the islands in the Gulf of Guinea (Sao Tomé, Principe) and on the continental coast only on the small strip between Libreville and Port-Gentil, Gabon.

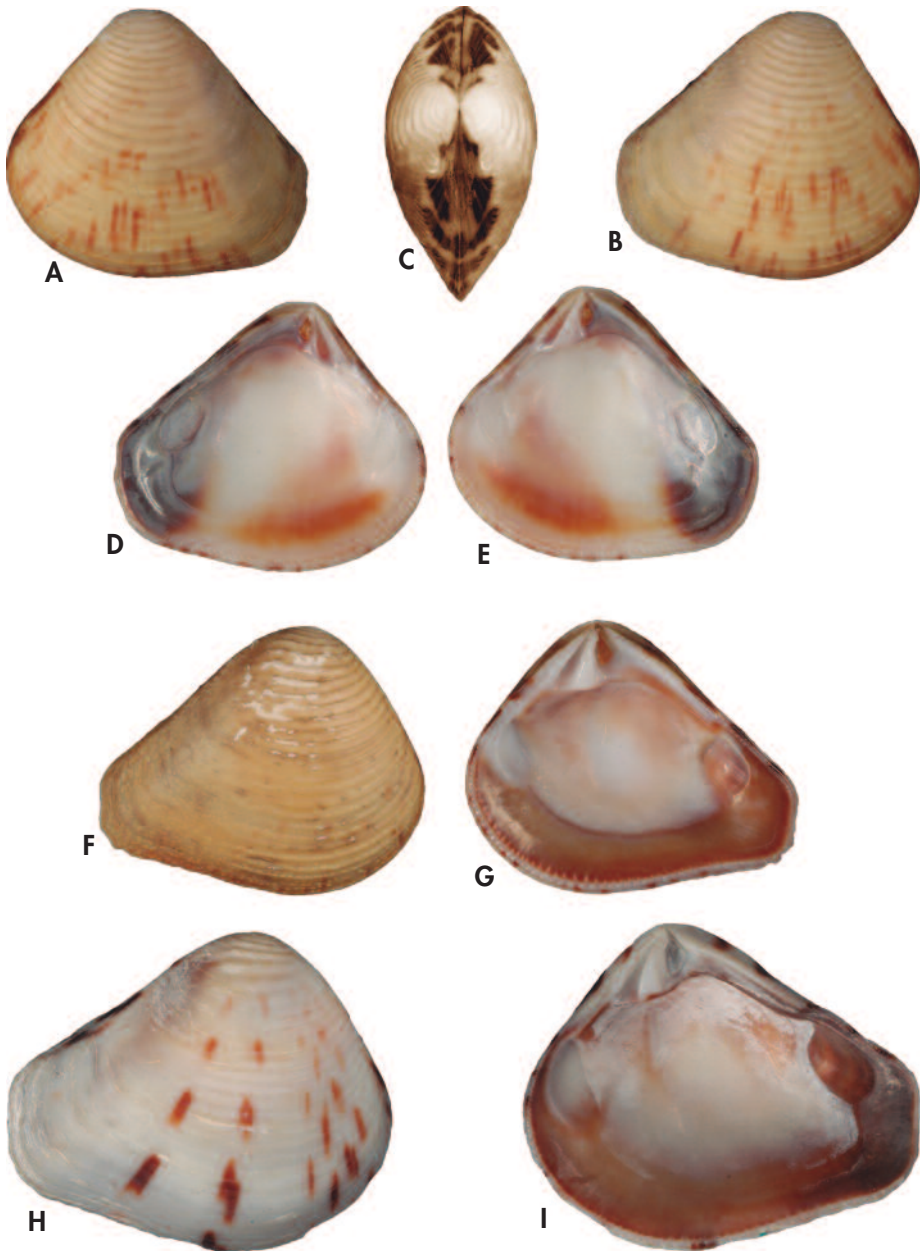


Figure 8. *Crassatina ornata* (Gray, 1833). A-E: Cais de Santa Ana, Ilha do Principe, 11 m, dredged R/V “Calypso” Golfe de Guinée sta. P3, leg. Marche-Marchad (21.3 mm); F, G: São Tomé, old collection MNHN, identified as *C. ornata* by Shuttleworth (23.2 mm); H, I: Baie de la Mondah, Île Banié, Baie de Corisco, Gabon, leg. P. Bernard (26.8 mm).

Figura 8. *Crassatina ornata* (Gray, 1833). A-E: Cais de Santa Ana, Ilha do Principe, 11 m, dragado B/O “Calypso” Golfe del Guinée sta. P3, col. Marche-Marchad (21,3 mm); F, G: São Tomé, colección antigua MNHN, identificada como *C. ornata* por Shuttleworth (23,2 mm); H, I: Baie de la Mondah, Île Banié, Baie de Corisco, Gabón, col. P. Bernard (26,8 mm).

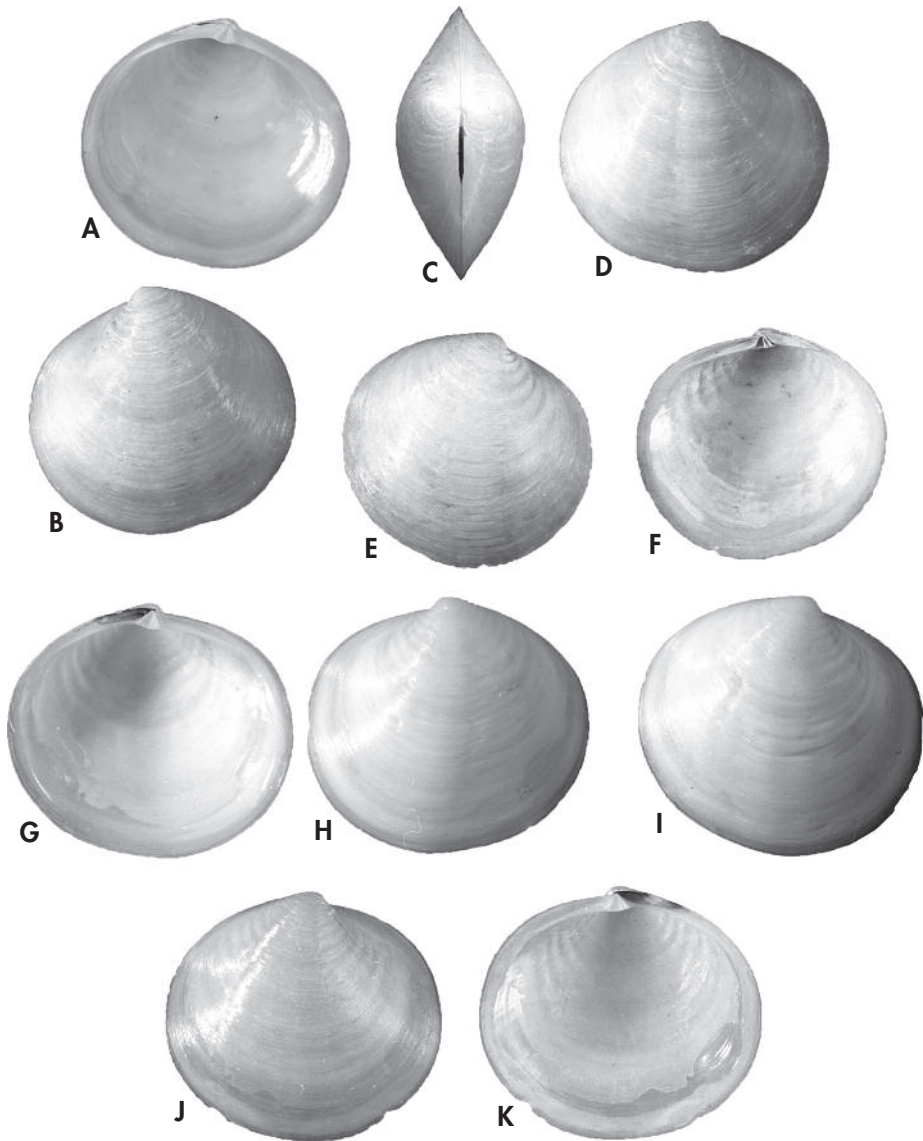


Figure 9. *Diplodonta (Felania) nizeryi* n. sp. A-D: holotype (sh), W of Île Kabak, Guinea (9°18'N, 13°45'W, 21 m), R/V "André Nizery", SEDIGUI I sta. 159, leg. Cosel 16.V.1988 (21.6 mm); E, F: paratype 1, W of Río Nuñez, Guinea (10°37'N, 14°52.5'W, 20 m), trawled R/V "André Nizery", CHALGUI 7, haul 69, leg. Cosel 03.X.1988 (18.5 mm); G-I: off Abidjan, Côte d'Ivoire, 20 m, dredged R/V "Reine Pokou", leg. Le Lœuff (21.4 mm); J, K: Komo Rive droite, Libreville, Gabon, on sandflat, leg. Cosel XII.1985 (16.8 mm).

Figura 9. Diplodonta (Felania) nizeryi n. sp. A-D: holotipo (concha completa), W de Île Kabak, Guinea (9°18'N, 13°45'W, 21 m), B/O "André Nizery", SEDIGUI I sta. 159, col. Cosel 16.V.1988 (21,6 mm); E, F: paratipo 1, W de Río Nuñez, Guinea (10°37'N, 14°52,5'W, 20 m), arrastre B/O "André Nizery", CHALGUI 7, muestra 69, col. Cosel 03.X.1988 (18,5 mm); G-I: frente a Abidjan, Côte d'Ivoire, 20 m, dragado B/O "Reine Pokou", col. Le Lœuff (21,4 mm); J, K: Komo orilla derecha, Libreville, Gabón, sobre arena, col. Cosel XII.1985 (16,8 mm).

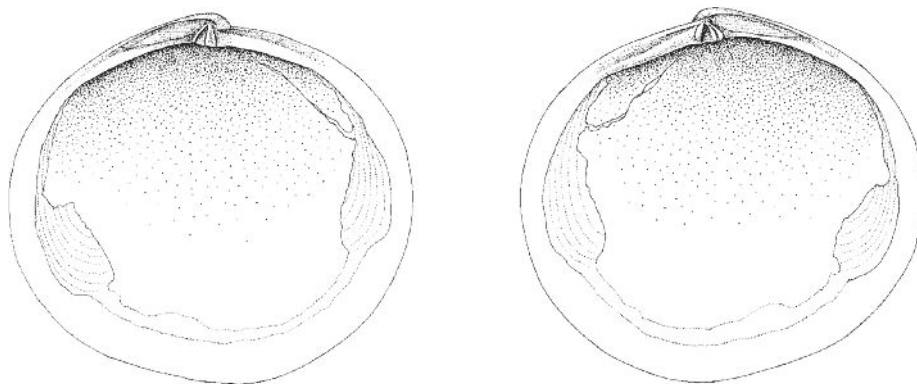


Figure 10. *Diplodonta (Felania) nizeryi* n. sp. Inside of a specimen from Guinea (9°54'N/14°18,5'W, 15 m), R/V "André Nizery", leg. Cosel 26.V.1988 (21.1 mm).

Figure 10. *Diplodonta (Felania) nizeryi* n. sp. Interior de un ejemplar de Guinea (9°54'N/14°18,5'W, 15 m), B/O "André Nizery", col. Cosel 26.V.1988 (21,1 mm).

Family UNGULINIDAE

Genus *Diplodonta* Bronn, 1831

Subgenus *Felania* Récluz, 1851

Diplodonta (Felania) nizeryi n. sp. (Figure 9, 10)

Type material: Holotype (sh, 21.6 x 20.1 x 10.2 mm, MNHN IM-2000-33756), Guinean shelf, W of Île Kabak (9°18'N, 13°45'W, 21 m), bottom grab, R/V "André Nizery", SEDIGUI I sta. 159, leg. Cosel 16.V.1988. Paratypes (2 sh, 18.0 x 16.8 x 8.3 mm and 19.8 x 18.9 x 9.3 mm, MNHN IM-2000-33757), Guinean shelf, W of Île de Quito (10°00'N, 14°20.5'W, 15 m), bottom grab, R/V "André Nizery", SEDIGUI I sta. 488, leg. Cosel 26.V.1988; Paratype (1 rv, 18.5 x 16.9 mm, MNHN IM 2000-33777) W of Rio Nunez (10°37'N, 14°52.5'W, 20 m), trawled R/V "André Nizery", CHALGUI 7 trait 69, leg. Cosel 03.X.1988.

Type locality: Guinea, W of Île Kabak (9°18'N, 13°45'W, 21 m).

Other material examined: Guinea — W of Sierra Leone border (9°06'N, 13°25.7'W, 7 m), dredged, R/V "André Nizery", SEDIGUI I sta. 74, leg. Cosel 14.V.1988, 1 lv; NW of Île Tamara (9°30'N, 13°53'W, 10 m), dredged, R/V "André Nizery", SEDIGUI I sta. 264DW, leg. Cosel 19.V.1988, 1 sh (20.8 x 19.5 x 10.2 mm), 1 lv; Iles Tamara – Kassa (9°30'N, 13°47'W, 8 m), dredged, SEDIGUI I sta. 266, leg. Cosel 19.V.1988, 1 lv; W of Kaporo (9°36'N, 13°44'W, 3 m), dredged, R/V "André Nizery", SEDIGUI I sta. 268, leg. Cosel 20.V.1988, 1 lv; W of Kaporo (9°36'N, 13°57'W, 21 m), dredged, R/V "André Nizery", SEDIGUI I sta. 273, leg. Cosel 20.V.1988, 1 spm. (13.5 x 12.1 mm); Roume, Iles de Los, beach on North side, leg. Cosel 29.V.1988, 1 rv. Côte d'Ivoire — Abidjan region, 20 m (no precision), trawled, R/V "Reine Pokou", leg. Le Lœuff 22.VIII.1968, 1 spm (21.2 x 19.4 x 10.5 mm); Abidjan region, 22 m, trawled, R/V "Reine Pokou", leg. Le Lœuff 10.III.1966, 1 jv spm; between Jacquville and Grand Lahou (5°09'N, 4°39'W, 20 m), dredged, R/V "La Rafale", GTS dragage 8, leg. G. Cherbonnier 31. III.1964, 1 jv lv; off Grand Bassam (5°09.2'N, 3°47.2'W, 30 m), dredged R/V "Antea", BENCHACI I sta. 12D, leg. Cosel & Le Lœuff 17.VIII.1998, 3 rv, 2 lv (24.8 x 22.1 to 25.0 x 23.7 mm); off Grand Bassam (5°10.7'N, 3°46.8'W, 25 m), trawled R/V "Antea", BENCHACI I sta. 3a, leg. Cosel & Le Lœuff 15.VIII.1998, 1 lv (29.8 x 27.6 mm); off Grand Bassam (5°11.3'N, 3°46'W, 20 m), dredged R/V "Antea", BENCHACI I sta. 3D, leg. Cosel & Le Lœuff 15.VIII.1998, 1 lv. (26.7 x 23.8 mm). Gabon — Libreville, Komo Rive Droite, on sand bank at low tide, leg. Cosel 14.XI.1985, 4 rv, 2 lv (up to 23.0 x 21.0 mm); Libreville, Phare de Gombé, Komo Rive Gauche, beach drift, leg. P. Bernard 1986, 1 lv.

Derivatio nominis: Named after the research vessel "André Nizery" of the then ORSTOM (now IRD) from which most of the material of this species was taken.

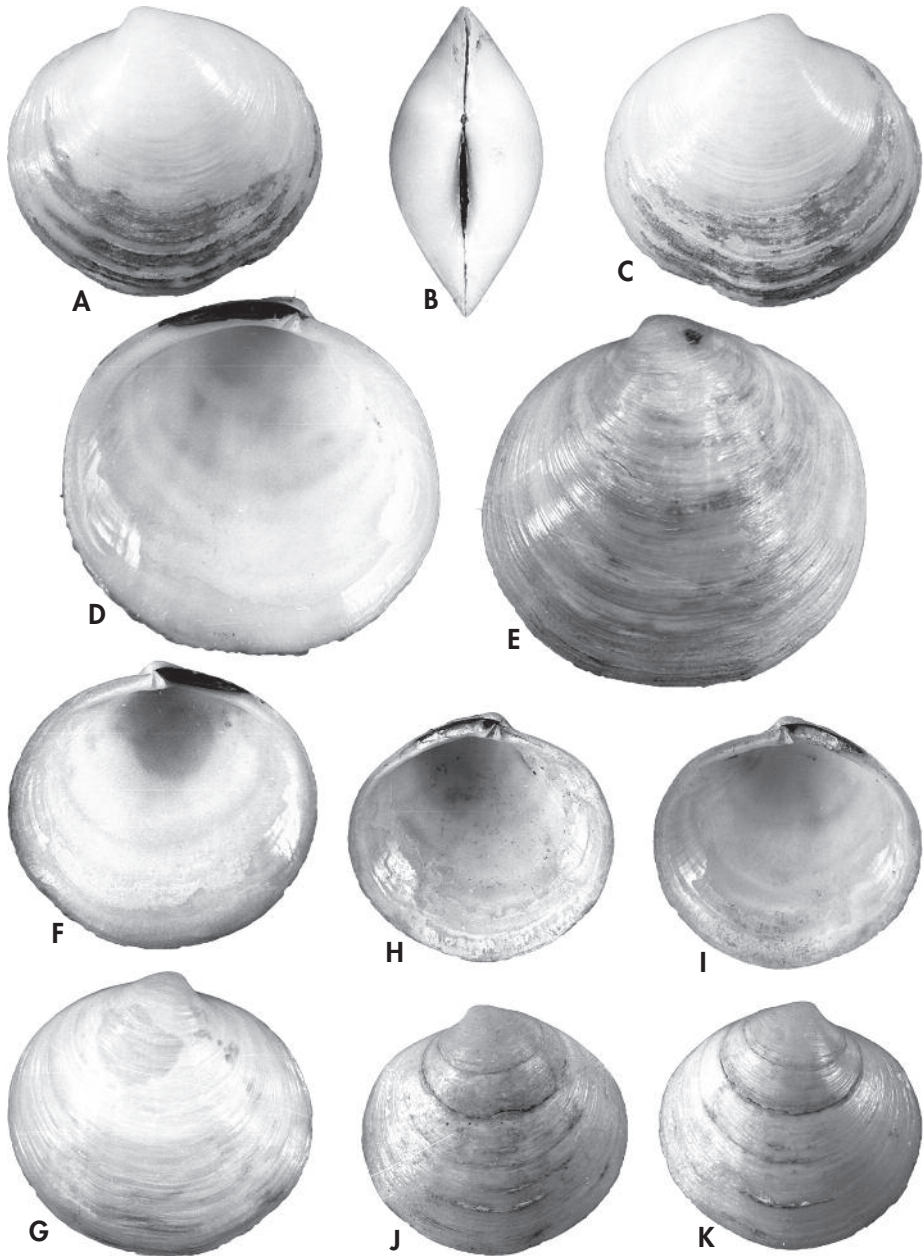


Figure 11. *Diplodonta (Felania) diaphana* (Gmelin, 1791). A-C: M'Bour Senegal, beach drift, leg. Cosel 22.III.1988 (35.1 mm); D, E: Pointe-Noire, Congo Brazzaville, leg. Orjebine (IFAN) (61.6 mm); F, G: Cacuo, Bengo prov., N-Angola, on beach, leg. Gofas (50.5 mm); H-K: holotype of *Diplodonta gruneri* Dunker, 1853, ZMB, no locality (29.4 mm).

Figura 11. *Diplodonta (Felania) diaphana* (Gmelin, 1791). A-C: M'Bour Senegal, arrojado a playa, col. Cosel 22.III.1988 (35,1 mm); D, E: Pointe-Noire, Congo Brazzaville, col. Orjebine (IFAN) (61,6 mm); F, G: Cacuo, provincia de Bengo, N-Angola, en la playa, col. Gofas (50,5 mm); H-K: holotipo de *Diplodonta gruneri* Dunker, 1853, ZMB, sin localidad (29,4 mm).

Description: Shell medium-sized, up to 30 mm long, somewhat variable in shape, rather thin and fragile subcircular to circular, slightly longer than high, somewhat inequilateral, equivalve, not much inflated. Beaks more or less median. Anterior part broadly rounded. Postero-dorsal margin evenly convex, posterior margin rounded, with. Ventral margin well and evenly rounded.

Exterior with very fine, close, irregular commarginal striae and growth lines and occasional small dents. Umbonal (earlier) part of antero- and postero-dorsal slope with regular commarginal waves which are reflected on the interior, which disappear on the later, more marginal zone and which are not developed on the central part of the valves.

Hinge plate moderately narrow, right valve with two cardinals, the posterior one bifid, left valve with one anterior bifid and one posterior simple cardinal, no laterals. Resilium moderately long and rather narrow. Lunule absent.

Adductor scars long, situated unusually ventrally, their greater part below the horizontal midline. Anterior adductor scar long and narrow, situated very close to the anterior margin. Short pallial line between the scars broad, with a short still broader

widening just in front of the posterior scar. Inner margin of valves smooth.

Valves entirely white or with very pale reddish-brownish hue in the middle, only seen in specimens from Côte d'Ivoire. Periostracum very thin, glossy, translucent and colourless.

Distribution: Senegal (Dakar) to Guinea (Sierra Leone border) and Gabon; São Tomé, Ilha do Principe.

Biotope: In fine, muddy sand, and fine sand, also with shell debris, from shallow water (3 m) to about 30 m, in Gabon probably also at low tide.

Remarks: This species was provisionally identified as *Diplodonta (Felania) gruneri* (Dunker, 1846), however, examination of the holotype in ZMB Berlin (Figure 11 H-K) revealed that *D. gruneri* is a synonym of *D. diaphana* (Gmelin, 1791), and the species here treated was undescribed. It differs from *D. diaphana* (Figure 11) by its smaller and less protruding umbones, the thinner shell and the characteristic commarginal waves on the earlier parts of the anterior and posterior slope. The rather ventrally situated adductor scars are a character of *Felania*, but in *D. (F.) nizeryi* they are situated even more ventrally than in other *Diplodonta (Felania)* species.

Family MONTACUTIDAE

Genus *Kurtiella* Gofas & Salas, 2008

Kurtiella zabii n. sp. (Figures 12, 13, 14)

Type material: Holotype (sh, 8.1 × 4.7 × 3.5 mm, MNHN IM 2000-33778), off Grand Bassam, Côte d'Ivoire (5°09.2'N, 3°47.2'W, 30 m), dredged R/V "Antea", BENCHACI I sta. 12D, leg. Cosel & Le Lœuff 17.VIII.1998. Paratypes (10 lv, 4.8 × 2.7 to 9.8 × 5.4 mm; 10 rv, 6.5 × 3.7 mm to 9.8 × 5.7 mm; MNHN IM 2000-33779), same locality.

Type locality: Côte d'Ivoire, off Grand Bassam (5°09.2'N, 3°47.2'W, 30 m).

Other material examined: **Mauritania** — SW of Nouakchott (17°44'N, 16°27'W, 100 m), dredged R/V "Léon Coursin", leg. Marche-Marchad 03.II.1957, 1 lv, 1 rv. **Senegal** — South of Gorée (95-98 m), dredged R/V "Gérard Tréca", leg. Marche-Marchad 18.II.1954, 4 lv, 3 rv (9.7 × 5.5 to 10.5 × 6 mm); off Gorée, dredged R/V "Gérard Tréca" stn.55.7.5.6, leg. Marche-Marchad 05.VII.1955, 1 lv + 1 rv. **Sierra Leone** — Robertsport (6°40'N, 11°23'W, 51 m), dredged R/V "Calypso" Golfe de Guinée sta. 12, leg. Marche-Marchad 19.V.1956, 1 rv. **Liberia** — off Sherbro Island (7°15.5', 12°51'W, 54 m), dredged R/V "Calypso" Golfe de Guinée sta. 10, leg. Marche-Marchad 19.V.1956, 2 rv; between Monrovia and Buchanan (5°59'N, 10°27'W, 62 m), R/V "Atlantide" sta. 57, 1 lv (ZMUC). **Côte d'Ivoire** — off Grand Bassam, dredged R/V "Antea", BENCHACI I, leg. Cosel & Le Lœuff 1998: 13 stations (5°04'N to 5°11.5'N, 3°46' to 3°48.6'W, 20-64 m), totalizing 214 lv, 195 rv (includes the type material); Abidjan region (30-50 m), dredged R/V "Reine Pokou", leg. Le Lœuff 1966, 5 lots totalizing 19 lv, 17 rv, 1 sh. (7.0 × 4.0 × 2.7 mm), 1 spm. (8.3 × 4.7 × 3.5 mm); W of Grand Lahou (5°04'N, 5°18'W,

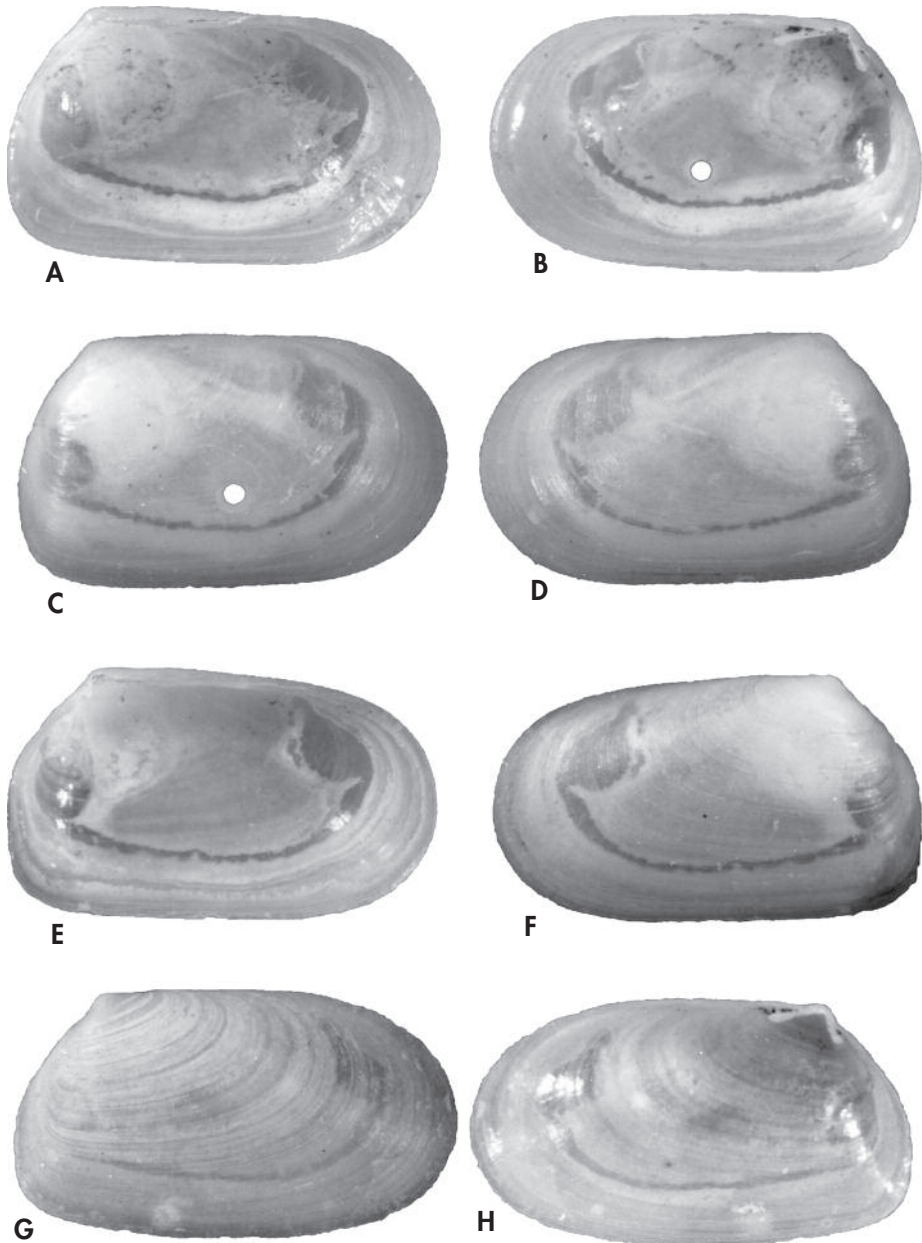


Figure 12. *Kurtiella zabii* n. sp. A-D: holotype MNHN, Côte d'Ivoire, off Grand Bassam ($5^{\circ}09.2'N$, $3^{\circ}47.2'W$, 30 m), small dredge, R/V "Antea", BENCHACI sta. 12D, leg. Le Lœuff & Cosel 17.VIII.1998 (8.1 mm); E, F: paratype 1, same locality (8.1 mm); G, H: shell from Cape Palmeirinhas, Luanda prov., N-Angola, dredged 60-80 m, leg. Gofas (7.5 mm).

Figura 12 *Kurtiella zabii* n. sp. A-D: holotipo MNHN, Costa de Marfil, radial frente a Grand Bassam ($5^{\circ}09,2'N$, $3^{\circ}47,2'W$, 30 m), draga pequeña, B/O "Antea", BENCHACI sta. 12D, col. Le Lœuff & Cosel 17.VIII.1998 (8,1 mm); E, F: paratipo 1, misma localidad (8,1 mm); G, H: concha de cabo Palmeirinhas, provincia de Luanda, N-Angola, dragado 60-80 m, col. Gofas (7,5 mm).

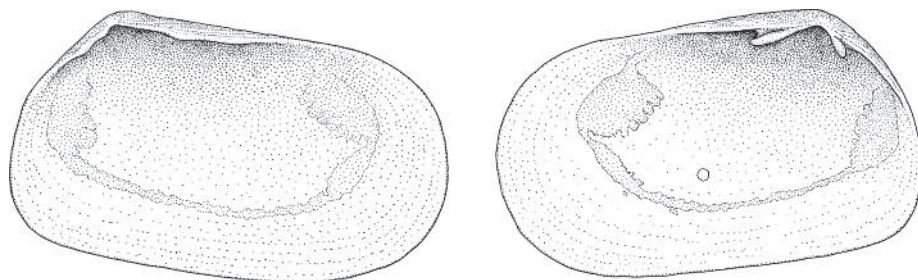


Figure 13. *Kurtiella zabii* n. sp., inside of the holotype (8.1 mm)

Figure 13. *Kurtiella zabii* n. sp., interior del holotipo (8,1 mm)

30 m, very muddy sand), dredged R/V “La Rafale”, GTS, leg. Cherbonnier 01.IV.1964, 4 lv, 1 rv; off Tabou (4°20'N, 7°06'W, 90 m), R/V “Atlantide” sta. 64 (ZMUC), 1 lv; off Tabou (4°27'N, 7°07'W, 66 m), R/V “Atlantide” sta. 66 (ZMUC), 1 lv. **Benin** — off Ouidah (6°10'N, 2°05'E, 200 m), dredged R/V “Léon Coursin”, leg. Marche -Marchad, 5 lv + 7 rv. **Nigeria** — off mouth of the Niger (4°03'N, 6°12'E, 32 m), dredged R/V “Calypso” Golfe de Guinée sta. 29, leg. Marche-Marchad 26.V.1956, 10 lv, 8 rv (6.1 x 3.6 to 10.0 x 5.7 mm). **Gabon** — Libreville (0°25'N, 9°00'E, 73 m), dredged R/V “Calypso” Golfe de Guinée sta. 45, leg. Marche-Marchad 08.VI.1956, 1 lv (10.0 x 5.8 mm). **Cameroon** — off Victoria/Limbe (4°05'N, 8°28'E, 51 m), R/V “André Nizery” sta. CC31, leg. J. Monteillet III.1991, 3 rv (up to 8.9 x 5.0 mm); off Victoria/Limbe (4°05'N, 8°28'E, 53 m), R/V “André Nizery” sta. CC32, leg. J. Monteillet III.1991, 4 lv, 1 rv. **Congo (Brazzaville)** — Konkouati region (4°00'S, 10°59'E, 19 m), trawler “Kounda”, leg. Cosel XII.1985, 1 lv, 1 rv. **Angola** — Cabinda, W of Landana (5°14'S, 11°51'E, 52 m), silty mud, dredged R/V “André Nizery” sta. 938, leg. Kouyoumontzakis, 1 lv; off Ambrizete (6°57'S, 12°23'E, 45 m), box corer, leg. Gofas 1983, 1 rv; off Ilha de Luanda (8°44'S, 13°12'E, 40-60 m), leg. Gofas 1981-1985, 11 lv, 5 rv, and 4 more lots from Luanda area, 50-120 m, leg. Gofas 1981-1985, totalizing 9 lv, 19 rv, 1 sh (5.1 x 2.4 x 1.9 mm); off Luanda (8°30'S, 13°14'E, 45 m), R/V “Atlantide” sta. 136, 1 sh (ZMUC, 6.8 x 4.1 x 2.6 mm).

Derivatio nominis: This species is dedicated to our colleague Guillaume Soko Zabi from CRO Abidjan, with whom, together with P. Le Lœuff (IRD), the first author participated in the BEN-CHACI cruise off Grand Bassam, Côte d'Ivoire, and who assisted us in many ways during our stay in Côte d'Ivoire.

Description: Shell up to 10.5 mm in length (mean h/l ratio 0.56), compressed (w/l ratio 0.4), equivalve, strongly inequilateral, moderately robust. Outline elongate, subquadrangular. Anterior part of dorsal margin mostly straight, then gradually merging into the evenly rounded anterior margin. Ventral margin also mostly straight and nearly parallel to the dorsal margin. Postero-dorsal margin at first abruptly sloping behind the umbone, then becoming slightly convex. Posterior margin convex, with maximum convexity at the transition to ventral margin. Inner edges of valves smooth, tightly appressed ventrally.

Beaks situated towards the posterior 1/5th. Prodissoconch (Figure 14A-B) 470

µm in maximum diameter, with distinct prodissoconchs 1 and 2. Prodissoconch 1 elongate with straight dorsal margin and curved ventral margin, about 90 µm in its maximum diameter, distinctly bulging over the surface of prodissoconch 2, which is subcircular, convex, ornamented with faint growth lines; surface of prodissoconch 1 with a texture recalling that of hammered copper. Dissoconch with very fine growth lines; sometimes with a very faint microsculpture of antimarginal threads in its early part, visible only under SEM (Figure 14B).

Hinge plate narrow, extending dorsally on either sides of the beaks, over approximately half of the shell length,

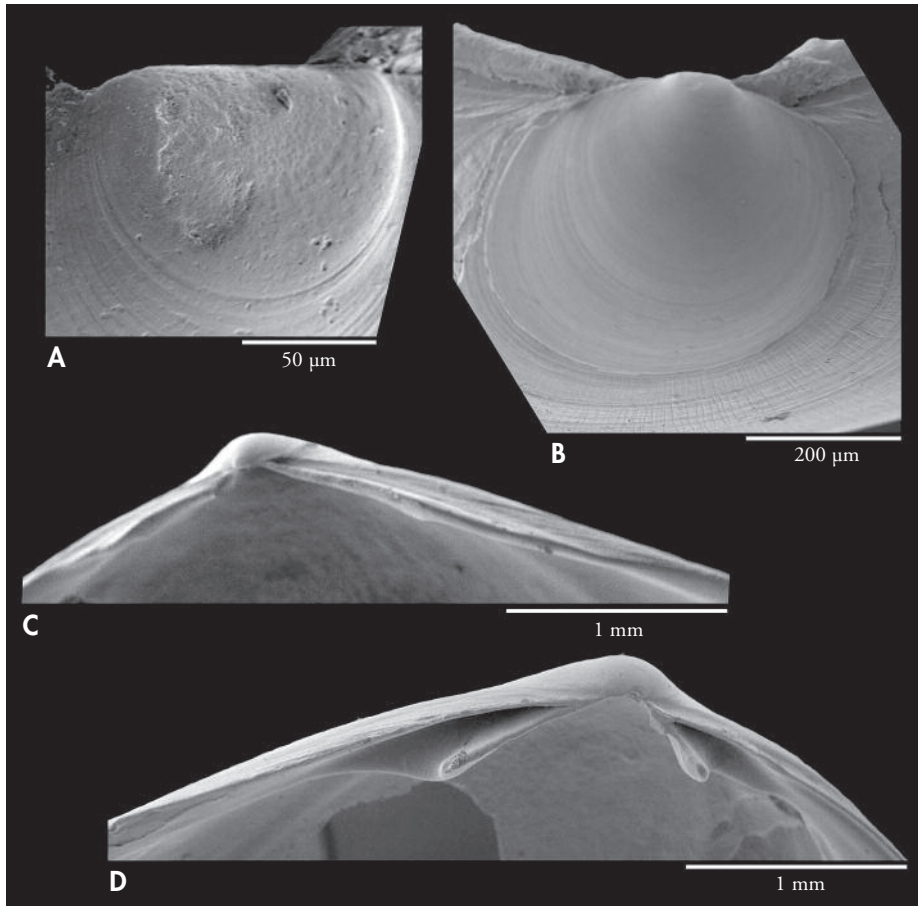


Figure 14. *Kurtiella zabii* n. sp., paratypes from the type locality. A: prodissoconch I of a left valve 6.7 mm long; B: prodissoconch (I + II) of the same valve; C: hinge of the same valve; D: hinge of a right valve 6.4 mm long.

Figura 14. *Kurtiella zabii* n. sp., paratipos de la localidad tipo. A: prodissoconcha I de una valva izquierda de 6,7 mm de largo; B: prodissoconcha (I + II) de la misma valva; C: charnela de la misma valva; D: charnela de una valva derecha 6,4 mm de largo.

interrupted beneath the beaks by a notch in which a large internal ligament is lodged. Lateral teeth narrow and elongate, straight, thin but well-marked on the left valve, diverging ca. 130°; strong and short, distinctly offset from the hinge plate, diverging ca. 100° on the right valve. Lunule and escutcheon indistinct.

Adductor scars subequal, irregularly shaped, the anterior one sometimes slightly larger; pallial line very thick,

continuous, departing from the posterior scar nearly parallel to the ventral margin.

Shell colour white.

Distribution: From Mauritania to Northern Angola (Luanda area), more common off Côte d'Ivoire.

Biotope: On sedimentary bottoms of the continental shelf, 20 to 200 m but mostly between 50 and 100 m.

Remarks: NICKLÈS (1955) reported erroneously *Kurtiella bidentata* (Montagu, 1803)

[as *Montacuta bidentata*] based on the specimens collected by the “Atlantide” expedition. Some of those specimens are *Kurtiella africana* Gofas & Salas, 2016 whereas others from “Atlantide” sta. 57, 64, 66 and 136 represent *Kurtiella zabii*. This species is also figured in HUBER (2015: 156) as *Kurtiella* sp. 3.

Kurtiella zabii is readily distinguished by its rather large size for the

genus, and by the insertion of the pallial margin on the posterior adductor scar, starting parallel to the ventral margin, nearly horizontal, whereas it is steeply sloping downwards in the posterior region of *Kurtiella africana* and *Kurtiella bidentata* (see GOFAS & SALAS, 2016). Its prodissoconch, with distinct prodissoconch I and II, denotes planktotrophic development as in the two latter species.

Family MACTRIDAE

The family Mactridae is diagnosed by inverted V-shaped paired cardinals in the left valve and the large internal portion of the ligament (termed “resilium” by DALL, 1895) set in a well developed and generally protruding chondrophore. The configuration of the ligament is of importance for the definition of genera among Mactridae (LAMY, 1917-1918), according to whether the internal resilium is separated from the external ligament by a shelly lamina (e.g. *Mactra*) or not (e.g. *Spisula*), whether the external ligament is connected to the resilium (*Scissodesma*), or is absent (e.g. *Mulinia*, *Rangia*). Genus level systematics of the family has recently been tackled by HUBER (2010, 2015), SIGNORELLI & PASTORINO (2011, 2012a, 2012b) and SIGNORELLI (2012).

Most members of the family are distributed either in the subfamily Mactrinae, with well developed laterals, a mostly equilateral shell and siphons retractable within the shell, or the subfamily Lutrariinae, with laterals inconspicuous, and in most cases an inequilateral shell gaping posteriorly. The small subfamily Kymatoxinae (= Pteroposidinae), with the genera *Anatina* and *Raeta*, has recently been transferred to

the family Anatinellidae, still within superfamily Mactroidea, by SIGNORELLI & CARTER (2016).

Nineteen species of Mactridae are currently known from West Africa and, for two of them, an appropriate genus seems to be lacking. NICKLES (1950) placed “*Mactra*” *vitrea* Gray, 1837 in the genus *Labiosa* Möller, 1832, an objective synonym of *Anatina* Schumacher, 1817 (type species: *Anatina pellucida* Schumacher, 1817 = *Mactra anatina* Spengler, 1802, Caribbean). COSEL (1995) described *Mactra inconstans* remarking that the arrangement of the hinge teeth was reminiscent of that found in *Mac-trinula* Gray, 1853, but also noted difference with the type species of the latter, the Indo-Pacific *Mactra plicataria* Linnaeus, 1758. HUBER (2015: 837) placed “for the time being” both species in *Anatina*, awaiting better. The type species of *Anatina* was first named as a primary homonym of *Mactra vitrea* Spengler, 1802 and *Mactra vitrea* Dillwyn, 1817, both latter names based on CHEMNITZ’S (1785) unavailable name *Mactra vitrea*, which is the Venerid *Clementia papyracea* (Gmelin, 1791), and HUBER (2015) provided the replacement name *Anatina grayi*.

Genus *Huberimacra* n. gen. (Figures 15, 16)

Type species: *Mactra vitrea* Gray, 1837 (= *Anatina grayi* Huber, 2015)

Derivatio nominis: The new genus is dedicated to Markus Huber, author of the “Compendium of Bivalves”, who first recognized this genus as undescribed and wrote (HUBER, 2010: 754) that “Definitely, in mactrids some new genera are necessary, i.e. (...) for *M. inconstans* and *M. vitrea*”.

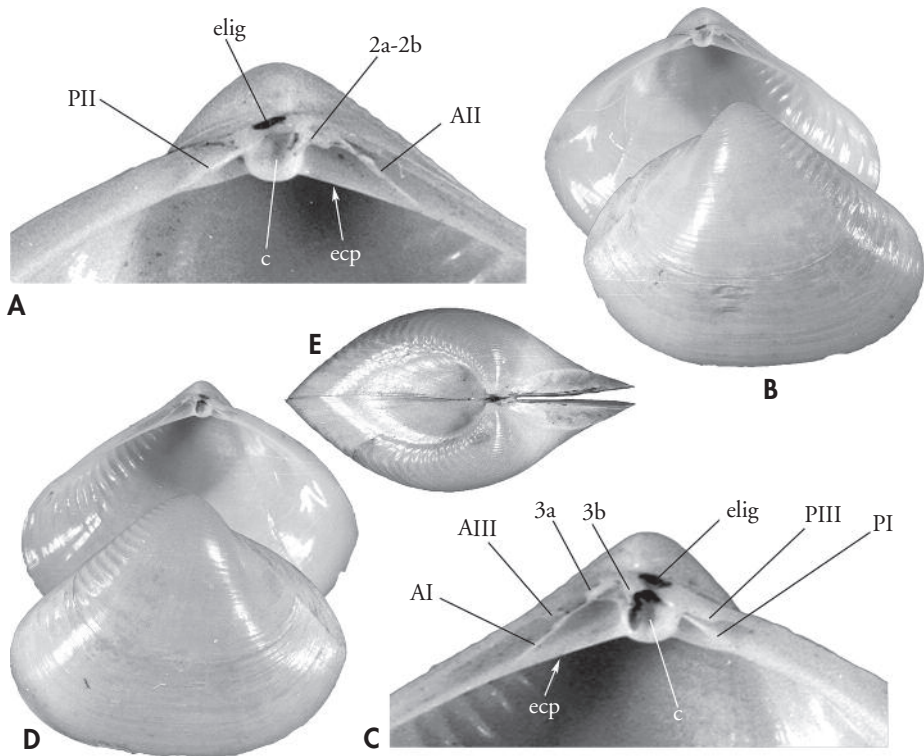


Figure 15: *Huberimactra grayi* (Huber, 2015), Kafountine, Casamance, Senegal, 3-6 m, leg. Cosel III.1988 (49.7 mm). A: detail of the hinge of the left valve; B: complete shell showing inside of the left valve and outside of the right valve; C: detail of the hinge of the right valve; D: inside of the right valve and outside of the left valve; E: dorsal view, posterior end to the right. Abbreviations, AI-AIII: anterior laterals; c: chondrophore; ecp: lamellar edge of the cardinal platform; elig: external ligament; PI-PIII: posterior laterals; 2a-b: fused cardinals of the left valve; 3a, 3b: cardinals of the right valve. *Figura 15: Huberimactra grayi* (Huber, 2015), Kafountine, Casamance, Senegal, 3-6 m, col. Cosel, III.1988 (49,7 mm). A: detalle de la charnela de la valva izquierda; B: concha completa mostrando el interior de la valva izquierda y el exterior de la valva derecha; C: detalle de la charnela de la valva derecha; D: interior de la valva derecha y exterior de la valva izquierda; E: vista dorsal, extremo posterior a la derecha. Abreviaturas, AI-AIII: laterales anteriores; c: condróforo; ecp: borde laminar de la plataforma cardinal; elig: ligamento externo; PI-PIII: laterales posteriores; 2a-b: cardinales fusionados de la valva izquierda; 3a, 3b: cardinales de la valva derecha.

Diagnosis: Shells small to medium-sized, oval, variable in shape, very thin and fragile. Surface smooth or on the early umbonal part fine commarginal waves. Lunular area broad weakly to well delimited. Posterior angle formed by ridge or keel. Inside with short and very broad, well rounded pallial sinus and a row of small secondary scars dorsal to the pallial line.

Cardinal platform moderately broad, with a deep chondrophore situated beneath the umbones, inconspicuous and ill-shaped cardinal teeth, lamellar anterior and posterior lateral teeth, and a thin, blade-like lower edge, spanning between the tips of the anterior and posterior laterals.

Cardinal teeth appressed to the chondrophore and dorsal edge of the

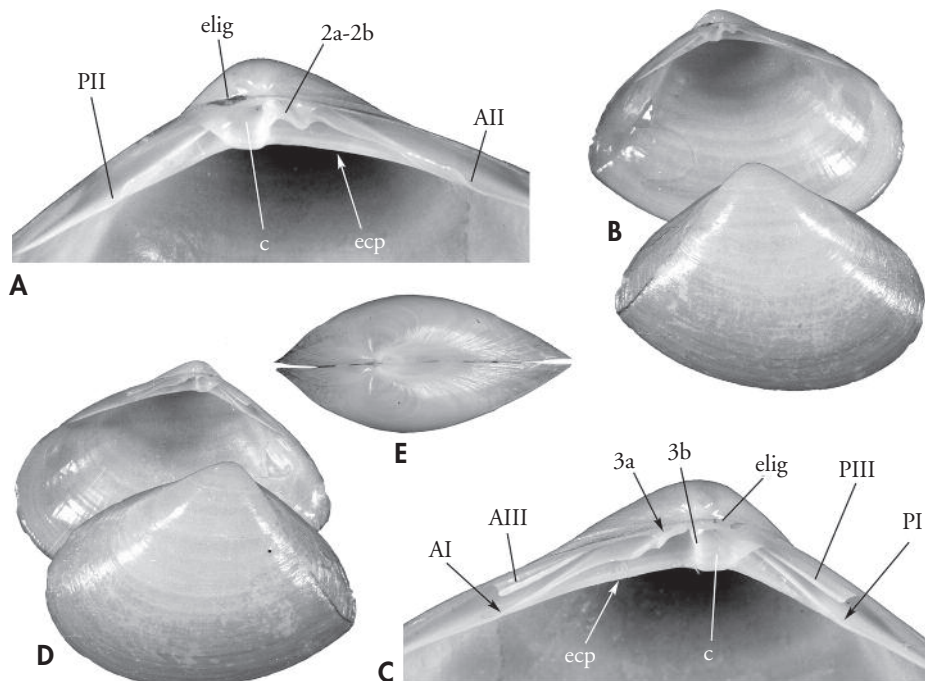


Figure 16. *Huberimactra inconstans* (Cosel, 1995), holotype MNHN, Praia de Buraco, Palmeirinhas, Luanda prov., N-Angola, low water of spring tide, leg Gofas, 1984 (22.3 mm). A: detail of the hinge of the left valve; B: complete shell showing inside of the left valve and outside of the right valve; C: detail of the hinge of the right valve; D: inside of the right valve and outside of the left valve; E: dorsal view, posterior end to the right. Abbreviations, AI-AIII: anterior laterals; c: chondrophore; ecp: lamellar edge of the cardinal platform; elig: external ligament; PI-PIII: posterior laterals; 2a-b: fused cardinals of the left valve; 3a, 3b: cardinals of the right valve.

Figura 16. *Huberimactra inconstans* (Cosel, 1995), holotipo MNHN, Praia de Buraco, Palmeirinhas, prov. Luanda, N-Angola, bajamar viva, col. Gofas 1984 (22,3 mm). A: detalle de la charnela de la valva izquierda; B: concha completa mostrando el interior de la valva izquierda y el exterior de la valva derecha; C: detalle de la charnela de la valva derecha; D: interior de la valva derecha y exterior de la valva izquierda; E: vista dorsal, extremo posterior a la derecha. Abreviaturas, AI-AIII: laterales anteriores; c: condróforo; ecp: borde laminar de la plataforma cardinal; elig: ligamento externo; PI-PIII: laterales posteriores; 2a-b: cardenales fusionados de la valva izquierda; 3a, 3b: cardinales de la valva derecha.

cardinal platform, two fused in an inverted V in the left valve and two separate in the right valve. Laterals blade-shaped and extremely thin compared to the intervening space, the anterior and posterior laterals well developed on left valve, the dorsal anterior and posterior laterals (AIII and PIII) reduced whereas AI and PI are well developed on right valve. External ligament very small or inconspicuous; internal ligament strong, inserted in a

characteristically triangular and slightly protruding resilifer.

Remarks: Unique features of *Huberimactra* are the configuration of the edge of the cardinal platform, drawn as a fine lamella spanning between the tip of the anterior and of the posterior laterals; the ill shaped, hardly functional cardinals closely appressed to the chondrophore posteriorly and to the dorsal edge of the cardinal platform anteriorly, and the blade-like laterals.

The above diagnosis is based on the type species. In *Huberimacra inconstans* (Cosel, 1995) these features are not so accentuated and the dorsal laterals of the RV are conspicuous and abruptly truncated distally, but otherwise the general architecture of the hinge is similar and justifies the placement in the same genus.

Anatina, now placed in family Anatinellidae, has other unique features which are not shared by the macrid species considered here, such as the chondrophore bordered by a thick rim and the widely gaping posterior end giving way to large, fused siphons which cannot be retracted in the shell. *Anatina* also has, unlike most Mactroidea, clearly opisthogyrous umbones. Unlike the two species discussed here, *Anatina* has a

hinge with conspicuous cardinal teeth and rudimentary laterals (see SIGNORELLI & PASTORINO, 2012a: 46). Excellent illustrations of living *Anatina* can be viewed on the Jaxshells website <www.jaxshells.org/duck19.htm>.

The hinge in *Macrinula plicataria* Linnaeus, 1767, is similar in that the chondrophore is large, the cardinals are inconspicuous and appressed to the anterior side of the chondrophore, those of the lv supported by small buttresses (see SIGNORELLI, 2012: 195), and in that the laterals are narrow and elevated lamellae. However the shell form and sculpture in that species is quite different, the cardinal teeth are more definite and the cardinal platform is not drawn out in a blade reaching the tips of the laterals.

Family TELLINIDAE

Genus *Moerella* P. Fischer, 1887 (Figures 17, 18, 19)

Material examined of *Moerella donacina*: France — Les Embiez, in sand of channels among *Posidonia*, 3-5 m, leg. Gofas 1968-1970, 28 sh, 15 lv, 18 rv; Les Embiez, plage des Salins (43°05.0'N, 05°47.2'E, 0-1 m), leg. Gofas 1968-1970, 12 sh. Spain — Caleta de Vélez, Málaga (36°44.45'N - 04°03.13'W, fine sand 10 m), leg. Gofas, 4 lv, 5 rv; Rincón de la Victoria, sand 1-5 m, leg. Gofas IX.1994, 3 sh, 4 lv, 3 rv; Calahonda, Málaga (36°29.4'N, 04°41.8'W, low water mark), leg. Gofas, 1 sh; Cabo Pino, Málaga (36° 29.1'N, 04°41.5'W, 15 m), leg. Ibañez Yuste II.2014, 2 sh, 1 rv; Cabo Pino (36° 28.5'N, 4°44.4'W, shell gravel 13-18 m), leg. López III.2001, 1 sh, 2 lv.; Fuengirola, Málaga, from fishing nets, 1 rv. Mauritania — SW of Nouakchott, Mauritania (17°44'N, 16°27'W), dredged "Léon Coursin", leg. Marche-Marchad 03.II.1957, 1 rv. Senegal — Dakar area (24-170 m), dredged R/V "Gérard Tréca", leg. Marche-Marchad 1954-1955, 13 lots totalizing 110 lv, 98 rv, 4 sh (up to 21.3 x 10.8 mm); S of Dakar (Petite Côte, 13°58.7'N, 17°26.8'W, 200 m), leg. Leung Tack 1981-84, 9 spm; N-Casamance (12°44.5'N, 17°27.3'W, 40 m), dredged R/V "Louis Sauger", leg. Cosel 28.III.1988, 2 lv, 2 rv; N-Casamance (12°55.5'N, 17°33'W, 65-75 m), dredged R/V "Calypso" sta. 4, leg. Marche-Marchad 16.V.1956, 1 sh. Guinea — W of Baie de Sangarea (9°42'N, 16°24.5'W, 169 m), R/V "André Nizery", SEDIGUI I sta. 323, leg. Cosel 22.V.1988. Chana — off Cape three Points (4°43.5'N, 2°45.5'W, 100 m), dredged "La Rafale", leg. Cherbonnier, GTS, 1 lv; Takoradi (4°43'N, 1°41'W, 46 m), R/V "Atlantide" sta. 75, 23.I.1946, 1 lv, 1 rv; Takoradi (4°36.5'N, 1°31'W, 50 m), R/V "Calypso" sta. 25, 24.V.1956, 1 rv. Benin — Ouidah (6°10'N, 2°05'E, 200 m), dredged "Léon Coursin": 1 lv. Cote d'Ivoire — Abidjan area, 40-60 m, leg. Le Lœuff 1966, 3 lots totalizing 6 lv, 4 rv, 2 sh. Angola — off Ilha de Luanda (8°44'S, 13°12'E, 40-60 m), leg. Gofas 1981-1985: 3 sh, 45 lv, 32 rv; off Cape Palmeirinhas, 60-80 m, 1 sh, 1 rv; Palmeirinhas, Buraco, 2 sh; Bay of Lucira (Bisonga), among calcareous algae 10-20 m, 1 rv.

Material examined of *Atlantella distorta*: France — Off the Rhone delta, muddy terrigenous sediments 50-100 m, leg. J. Picard 1965-1975, 20 spm, 3 sh; off Cap Bear (42°29.5'N, 03°10.5'E, 42 m, leg. Cosel & Vadon, 10.IX.1984, 1 jv spm. Spain; Barra de El Rompido, Huelva (37°09.7' to 37°11.1'N, 07°01.4' to 07°03.7', 9-15 m), 1 spm, 12 jv spm, 19 lv, 19 rv; Benalmádena Costa, Spain, from fishing nets, 2 spm. Guinea — W of Kaporó (9°36'N, 15°18'W, 35 m), R/V "André Nizery", SEDIGUI I sta. 300, leg. Cosel 21.V.1988. Côte d'Ivoire — off Abidjan (5°10.9'N, 3°52.3'W, 35m), dredged R/V "Reine Pokou", leg. Le Lœuff. Congo (Brazzaville) — Pointe-Noire, beach drift and dredged 3-7 m, leg. Cosel XII.1985, 4 lots totalizing 126 lv, 149 rv, 27 sh., 5 spm. Angola — Corimba (8°51.0'S,

13°10.5'E, 10-20 m on sand bar), leg. Gofas 1981-1985, 3 lots totalizing 84 lv, 89 rv, 29 sh. (mostly juveniles); Baia do Mussulo 10-12 m, 1 sh, 41 lv 47 rv.; Baia da Lucira (Cesar), 1 sh.

Material examined of *Asbjornsenia pusilla*: Spain — Barra de El Rompido, Huelva (37°09.7' to 37°11.1'N, 07°01.4' to 07°03.7', 9-15 m), leg. J.M. Remón, 1 spm; Barbate (36°10.5'N, 05°56.5'W, 15-16 m on shell gravel), 1 spm.

HUBER, LANGLEIT & KREIPL (2015) provided a comprehensive review of the family Tellinidae, in which they dismiss the accustomed view of two subfamilies (Tellininae and Macominae) supported by OLSSON (1961) and KEEN in MOORE (1969). They contend that the character of presence or absence of laterals is not consistent, and instead recognize nine subfamilies, six of them new, based on combinations of several characters including external shell sculpture, ligament morphology, and the patterns of pallial line and muscle scars. On these grounds they erected a new subfamily Moerellinae, to include those species having a small portion of internal ligament, in addition to the large external ligament usually present in members of this family. Additional character states supporting the new subfamily are (HUBER ET AL., 2015: 674) the small size (usually < 16 mm), strong rv laterals but wanting or marginally fused lv laterals.

The internal portion of the ligament is conspicuous and fully functional (Figure 17A-B, 18A-B) in *Asbjornsenia* (type species by monotypy, *Asbjornsenia striata* Friese, 1886 = *Tellina pygmaea* Lovén, 1846). It is inconspicuous and hardly functional in *Moerella* P. Fischer, 1887 (a replacement name for *Moera*

Adams & Adams, 1856, type species, *Tellina donacina* Linnaeus, 1758 by subsequent designation of Stoliczka, 1870: xvii). It must be emphasized that *Moera* was first described on the basis of having lateral teeth in one valve only; the character of the internal ligament in the type species was first noted by SMITH (1885: 105) and later elaborated on by COSEL (1995).

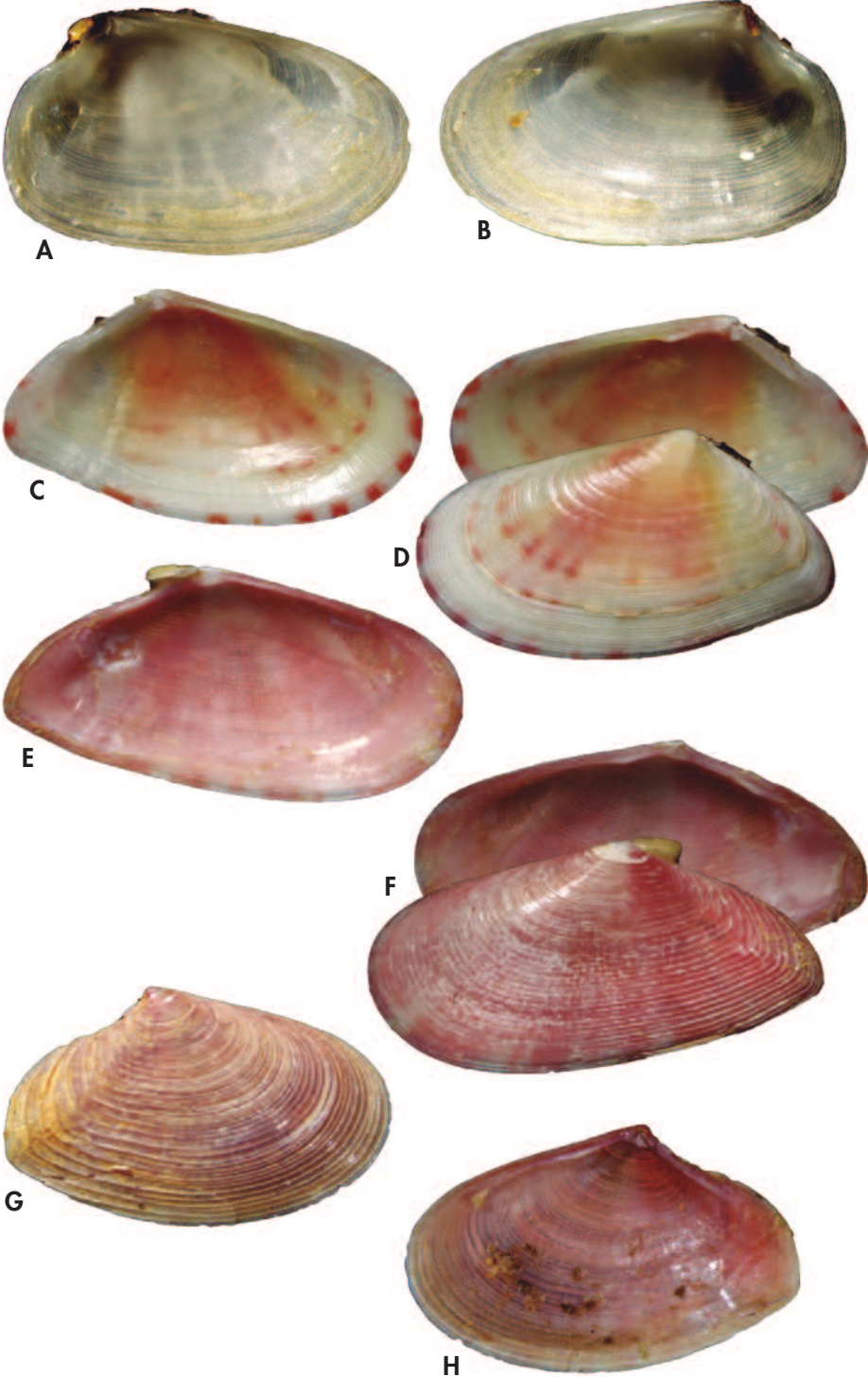
Conversely to Moerellinae, HUBER ET AL. (2015: 571) define the subfamily Tellininae as having, among other characters, a ligament lacking an internal portion. Within that subfamily, they erect a new genus *Atlantella* Huber, Langleit & Kreipl, 2015 (pp. 608-609) with type species *Tellina distorta* Poli, 1791.

HUBER ET AL. (2015: 608) differentiate *Moerella* (in subfamily Moerellinae) from *Atlantella* (in subfamily Tellininae) by "a distinct ligament and dentition condition" which, from the details given, amounts to (1) presence of a portion of internal ligament in *Moerella*, not *Atlantella* and (2) laterals strong and definite on the right valve and nearly wanting in the left valve of *Moerella*, weak but present in the left valve of *Atlantella*.

Examination of large series of *Moerella donacina* (Figure 17C-D, 18C-D)

(Right page) Figure 17. A, B: *Asbjornsenia pygmaea* (Lovén, 1846), specimen from Barra de El Rompido, Huelva, S. Spain, leg. J.M. Remón (3.0 mm). A: lv; B: rv, inner views. C, D: *Moerella donacina* (Linnaeus, 1758), specimen from Calahonda, Málaga, S. Spain, leg. Gofas (11.5 mm). C: inner view of lv; D: inner view of rv and outer view of lv. E, F: *Moerella distorta* (Poli, 1791), specimen from Benalmádena, S. Spain, leg. Gofas (10 mm). E: inner view of lv; F: inner view of rv and outer view of lv. G, H: specimen from Barra de El Rompido (3.0 mm), rv. G: outer view; H: inner view.

(Página derecha) Figura 17. A, B: *Asbjornsenia pygmaea* (Lovén, 1846), ejemplar de Barra de El Rompido, Huelva, España, col. J.M. Remón (3,0 mm). A: valva izquierda; B: valva derecha, vistas interiores). C, D: *Moerella donacina* (Linnaeus, 1758), ejemplar de Calahonda, Málaga, S. España, col. Gofas (11,5 mm). C: vista interior de la valva izquierda; D: vista interna de la valva derecha y vista exterior de valva izquierda). E, F: *Moerella distorta* (Poli, 1791), ejemplar de Benalmádena, S. España, col. Gofas (10 mm). E: vista interna de valva izquierda; F: vista interna de valva derecha y vista exterior de valva izquierda. G, H: ejemplar de Barra de El Rompido (3,0 mm), valva derecha. G: vista exterior; H: vista interior.



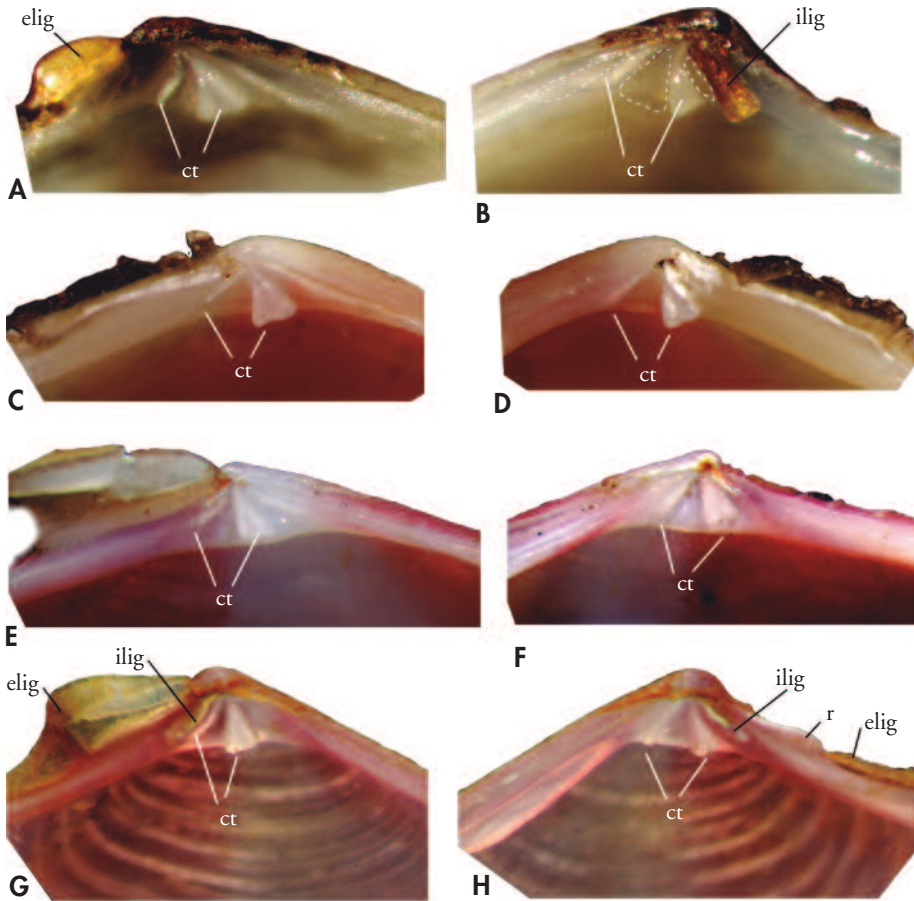


Figure 18. Hinges of the specimens of Figure 17. A, B: *Asbjornsenia pygmaea* (Lovén, 1846), specimen from Barra de El Rompido; C, D: *Moerella donacina* (Linnaeus, 1758), specimen from off Calahonda; E, F: *Moerella distorta* (Poli, 1791), specimen from Benalmádena; G, H: juvenile specimen from Barra de El Rompido. Abbreviations, ct: cardinal teeth; ilig: external portion of ligament; ilig: internal portion of ligament; r: ridge bordering the groove in which the external ligament was inserted. The dashed white line indicates position of opposite teeth. Left valves to the left, right valves to the right.

Figura 18. Charnelas de los ejemplares de la Figura 17. A, B: *Asbjornsenia pygmaea* (Lovén, 1846), ejemplar de Barra de El Rompido; C, D: *Moerella donacina* (Linnaeus, 1758), ejemplar de Calahonda; E, F: *Moerella distorta* (Poli, 1791), ejemplar de Benalmádena; G, H: ejemplar juvenil de Barra de El Rompido. Abreviaturas, ct: dientes cardinales; ilig: porción externa del ligamento; ilig: porción interna del ligamento; r: reborde de la ranura en la que se inserta el ligamento externo. La línea blanca discontinua indica la posición de los dientes opuestos. Valvas izquierdas a la izquierda, valvas derechas a la derecha.

and *Atlantella distorta* (Figure 17E-H, 18E-H, 19) from Europe and West Africa revealed that the internal portion of the ligament is extremely inconspicuous in *Moerella donacina*, and is present with

the same extension in *Atlantella distorta*, and that the degree of asymmetry in the laterals depends on the overall thickness of the shell. The general structure of the hinge has nevertheless been found to

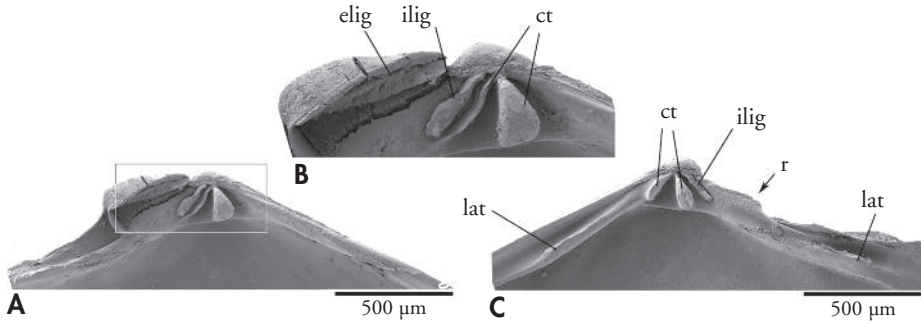


Figure 19. Scanning electron micrographs of the hinge of juvenile *Moerella distorta*, same specimen as Figure 18G-H. A: left valve; B: magnified view of the framed area; C: right valve. Abbreviations, ct: cardinal teeth; elig: external portion of ligament; ilig: internal portion of ligament; r: ridge bordering the groove in which the external ligament (here entirely attached to lv) was inserted.

Figura 19. Micrografías electrónicas de barrido de la charnela de Moerella distorta juvenil, mismo ejemplar de la Figura 18G-H. A: valva izquierda; B: vista ampliada del área enmarcada; C: valva derecha. Abreviaturas, ct: dientes cardinales; elig.: porción externa del ligamento; ilig: porción interna del ligamento; R: reborde de la ranura en la que se inserta el ligamento externo (aquí enteramente unido a la valva izquierda).

have the same pattern in all those species and the distinction is therefore unwarranted. Here we show (Figures 18-19) that the internal portion of the ligament in *Atlantella distorta* is similar to that observed in *Moerella donacina* or, if anything, more conspicuous. We could not find any essential difference between the structure of the hinge in these two species, which in some cases are even difficult to separate, and the genus *Atlantella* is here accordingly synonymized with *Moerella*.

Moerella is therefore diagnosed as having shells rather small to medium-sized, compressed, elongate, more or less suboval, slightly to markedly inequilateral with shorter posterior part, to almost equilateral. Anterior margin rounded, posterior margin rostrate. Surface with fine commarginal threads, towards the posterior end becoming more lamellar. Colouration variable from white to deep pinkish.

Hinge with two cardinal teeth on each valve, left valve with the anterior cardinal strong, triangular and bifid, the posterior cardinal a very narrow blade; right valve with conversely the anterior cardinal a narrow blade and the posterior cardinal strong, triangular and bifid; rv also

with two elongate laterals, the distal part of which may surpass the cardinal platform; laterals inconspicuous or wanting on the lv. Ligament mainly external, short, inserted in a groove; a small portion of internal ligament situated behind the posterior cardinal, narrow but reaching the ventral edge of the cardinal platform.

Without a distinction between *Moerella* and *Atlantella* based on the ligament character, the distinction between European/Senegalese *Moerella donacina* and the Angolan specimens described as *Atlantella ryalli* Huber, Langleit & Kreipl, 2015 becomes questionable. Those specimens were hitherto identified by us as *Moerella donacina* and are broadly sympatric with *Moerella distorta* in Angola, with the same habitat preferences as in Europe (*Moerella donacina* on bioclastic sand, *Moerella distorta* in more muddy bottoms). Admittedly, specimens from Angola are more elongate and more pointed posteriorly than European or Senegalese *Moerella donacina* and the species seems to be missing in a large area between Côte d'Ivoire and Angola, but there are many examples of such gaps (LE LOEUFF & COSEL, 1998) so both taxa are here considered as synonyms or, at most, geographical subspecies.

Moerella leloeffi n. sp. (Figures 20, 21)

Type material: Holotype (sh, 10.0 x 7.5 x 4.0 mm, MNHN IM-2000-33758), W Île Konebomby (9°48'N, 15°15'W, 23 m), bottom grab R/V "André Nizery", SEDIGUI I sta. 403, leg. Cosel 23.V.1988. Paratypes (1 rv, 9.4 x 7.5 mm; 3 lv, 8.9 x 6.9 mm to 11.3 x 8.4 mm; MNHN IM-2000-33759), same locality; Paratype (1 rv, 8.8 x 6.4 mm, MNHN IM-2000-33760), W Île Konebomby (9°48'N, 14°56.5'W, 36 m), SEDIGUI I sta. 397, leg. Cosel 23.V.1988; Paratypes (1 sh, 7.9 x 5.7 x 2.7 mm; 2 lv, 8.1 x 6.0 and 9.5 x 7.5 mm; MNHN IM-2000-33761), W of Île Yomboya (10°27'N, 15°50'W, 22 m), SEDIGUI II sta. 738, leg. Cosel 25.X.1988; Paratypes (4 rv, 8.4 x 6.8 to 13.3 x 10.2 mm; 3 lv, 8.3 x 6.0 mm to 13.3 x 9.9 mm; MNHN IM 2000-33762), W of Île Kouffin (10°33'N, 15°43'W, 23 m), SEDIGUI II sta. 765, leg. Cosel 26.X.1988.

Type locality: Guinean shelf, W. of Île Konebomby (9°48'N, 15°15'W, 23 m).

Other material examined: Senegal — Dakar area, 39-250 m, dredged R/V "Gérard Tréca", leg. Marche-Marchad 1954-1955, 7 lots totalizing 7 lv, 5 rv; Casamance, Kafountine (12°55.5'N, 17°17.2'W, 36 m), dredged R/V "Louis Sauger", leg. Cosel 27.III.1988, 1 lv. Guinea — Guinean continental shelf, SEDIGUI cruises (9°03'N to 10°39'N, 12°42'W to 16°10'W, 20-48 m), R/V "André Nizery"; bottom grab, trawl or dredge, leg. Cosel V.1988 or X.1988, 65 lots with several sh and numerous v. Côte d'Ivoire — Abidjan region (no precision), dredged R/V "Reine Pokou", leg. Le Lœuff, 1 rv, 2 lv. Cameroon — (04°05'N, 08°28'W, 53 m), trawled R/V "André Nizery", leg. J. Monteillet III.1991, 1 lv. Angola — 10 km S of Ambrizete, beach drift, leg. Gofas 1981-1982, 1 rv; Barra do Dande, soft bottom, 1-2 m, leg. Gofas 1982-84, 3 spm, 4 sh, 17 lv, 17 rv; Ilha de Luanda, 90 m, 1982-84, leg. Gofas, 1 sh (9.5 x 6.4 x 3.3 mm); Corimba (8°51.0'S, 13°10.5'E, 10-20 m on sand bar), leg. Gofas 1982-84, 1 spm. (7.8 x 5.3 x 2.7 mm); Cabo Ledo (approx. 09°36'S, 13°06'E, 40 m), leg. Gofas 1982-84, 4 sh, 1 rv. (up to 9.5 x 7.5 x 3.5 mm).

Derivatio nominis: Dedicated to our colleague and ORSTOM (now IRD) biologist Pierre Le Lœuff, with whom the first author had close collaboration during the years working on West African bivalves.

Description: Shell small, up to 13 mm long, variable in colour and thickness, broadly suboval in outline, thin and fragile (mostly specimens from Angola) to rather strong and solid, compressed. Anterior margin broadly rounded, posterior margin more narrowly rounded and slightly bent to the right., ventral margin gently convex. Beaks well behind the vertical midline.

Surface with very fine, faint, close-set, commarginal threads but apparently smooth and somewhat glossy at low magnification; few coarser growth lines may be present. There may be also some irregular radial streaks seen by transparency within the shell. Lunule long, narrow and ill-defined, escutcheon and external ligament short. Periostracum very thin and nearly colourless, usually completely eroded or present only on the marginal part of the valves.

Hinge plate narrow. Left valve with a strong, bifid anterior cardinal, definitely overhanging the edge of the cardinal platform, a short, very thin posterior cardinal, and with lateral teeth

hardly expressed. Right valve with an oblique, narrow anterior cardinal and a slightly larger and bifid posterior cardinal, clearly overhanging the edge of the cardinal platform; behind the cardinals is a small, very narrow but distinct internal ligament and resilial pit, reaching the lower edge of the cardinal platform.

Laterals of rv quite strong and separated from the cardinal platform by a deep groove, the anterior one not parallel to the antero-dorsal margin and starting at a distance from the beak, the posterior lateral quite short, starting behind the posterior end of the ligament, and parallel to the margin.

Exterior white to cream in colour, tending to pale yellow on the umbonal half of the valve. Interior with same colour as exterior.

Distribution: This species obviously has a disjunct distribution, from Kayar (Grande Côte, Senegal) to Guinea (9°N); then one isolated record from Côte d'Ivoire and others from Cameroon and from northern Angola (Barra do Dande - Cabo Ledo).

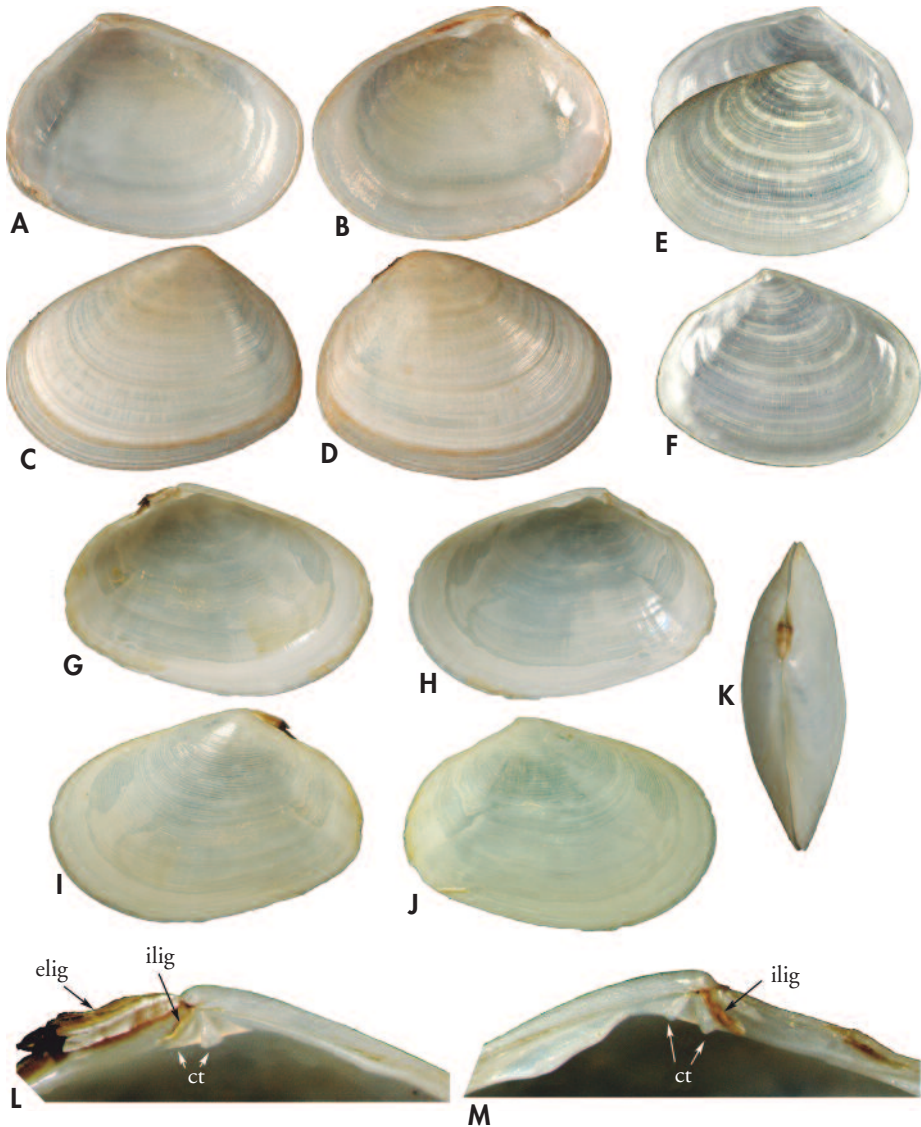


Figure 20. *Moerella leloeffi* n. sp. A-D: holotype (sh), W of Île Konebomby, Guinea (9°48'N, 15°15'W, 23 m), R/V "André Nizery", SEDIGUI I sta. 403, leg. Cosel 23.V.1988 (10.0 mm); E, F: Abidjan region, Côte d'Ivoire, continental shelf (no precision), dredged R/V "Reine Pokou", leg. Le Lœuff (6.6 mm); G-K: Baía de Corimba, N-Angola (10-20 m), leg. Gofas 1981-1985 (7.8 mm); L, M: hinge of the same specimen. Abbreviations, ct: cardinal teeth; elig: external portion of ligament; ilig: internal portion of ligament. Left valves to the left, right valves to the right.

Figura 20. *Moerella leloeffi* n. sp. A-D: holotipo (concha completa), W de Île Konebomby, Guinea (9°48'N, 15°15'W, 23 m), B/O "André Nizery", SEDIGUI I sta. 403, col. Cosel 23.V.1988 (10,0 mm); E, F: región de Abidjan, Côte d'Ivoire, plataforma continental (sin más detalles), dragado B/O "Reine Pokou", col. Le Lœuff (6,6 mm); G-K: Baía de Corimba, N-Angola (10-20 m), col. Gofas 1981-1985 (7,8 mm); L, M: charnela del mismo ejemplar. Abreviaturas, ct: dientes cardinales; elig: porción externa del ligamento; ilig: porción interna del ligamento. Valvas izquierdas a la izquierda, valvas derechas a la derecha.

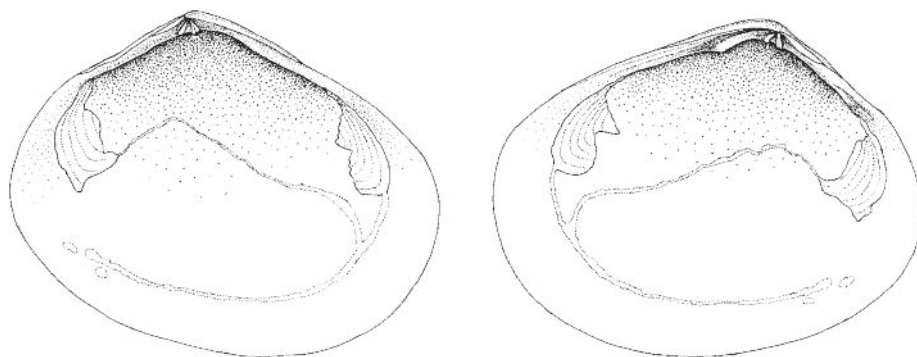


Figure 21. *Moerella leloeffi* n. sp. Internal view of a specimen from W of Île Kouffin, Guinea (10°30'N, 15°46.5'W, 27 m), R/V "André Nizery", SEDIGUI II sta. 762, leg. Cosel 26.X.1988 (7.3 mm).

Figura 21. *Moerella leloeffi* n. sp. Interior de un ejemplar de W de Île Kouffin, Guinea (10°30'N, 15°46,5'W, 27 m), B/O "André Nizery", SEDIGUI II sta. 762, col. Cosel 26.X.1988 (7,3 mm).

Biotope: In fine, mixed and coarse sand, also with gravel, offshore, from about 15 to 90 m, mostly between 20 and 50 m; not uncommon.

Remarks: This species is distinguished from the superficially somewhat similar *T. boucheti* by its shorter and distinctly more oval shell, by the stronger, thicker and shorter laterals in the right valve, and by lacking raised commarginal lamellae on the posterior part of the shell. A similar South African species is *T. (A.) canonica* Salisbury, 1934 which occurs from False Bay to East London. Apart from the two isolated records from

Côte d'Ivoire and Cameroon, the species has not yet been recorded from the two typical tropical zones; on the Guinean upper shelf, it is very common in the northern part (to about 9°30'N) but becomes more and more rare towards the Sierra Leone border, where only a single valve was taken. The specimens from Angola are slightly thinner and have somewhat more delicate hinge teeth, they are entirely white, whereas the specimens from Guinea are more variable and often stronger with light yellowish hue. The specimens from Senegal are mostly of the white variant.

Genus *Macomopsis* Sacco, 1901

Macomopsis cumana (O. G. Costa, 1830)

HUBER *ET AL.* (2015: 564) chose to systematically restore older names, even if not in usage, when "unambiguous tellinid type material in a scientific collection was present" and accordingly gave priority to *Tellina pellucida* Spengler, 1798 over *Tellina cumana* O.G. Costa, 1830. As we did previously (Cosel *et al.*, 2013), we consider that this goes against ICZN Art. 23.9.6. "The deliberate use of a name contrary to Article 23.9.1, or the mentioning of a name in a synonymy, or its mere listing

in an abstracting publication, or in a nomenclator or other index or list of names must not be taken into account in determining usage under Articles 23.9.1.1 and 23.9.1.2." and therefore consider those names still eligible as "nomen protectum". It was an easy task to find over 25 published references using this species name, in diverse fields such as ecology, palaeontology, archaeology, parasitology and others, this without taking into account any grey literature nor any paper published

in a spurious online-only “journal”. Furthermore, the species is also the eponym of a benthic community in West Africa (LE LŒUFF & INTES, 1993).

Published works using the specific epithet *cumana* as valid are, among others: APARICI-SEGUER *ET AL.* (1996), BERNASCONI, STANLEY & DI GERONIMO (1991), BRUNETTI & DELLA BELLA (2003), COSEL (1995), DOWIDAR & HASAN (1973), CHAREF, LANGAR & GHARSALLAH (2012), COLLIGNON (1960), CROCETTA, RENDA & COLAMONACO (2009), ELOUARD & ROSSO (1977), FERRERO, MERLINO & PROVERA (1997), GOFAS, MORENO & SALAS (2011: 646), GORDON (2000), HONKOOP *ET AL.* (2008), KEEN (1971: 900), KILBURN & RIPPEY (1982: 217), KORANTENG, OFORI-DANSON & ENTSUA-MEN-

SAH (2000), LE LŒUFF & INTES (1993), MARRINER *ET AL.* (2005), MARRINER, GOIRAN & MORHANGE (2008), MARTIN *ET AL.* (2015, as *Psammotreta cumana*), MICHEL, WESTPHAL & COSEL (2011), NIKIFOROS (2002: 208), NICKLÈS (1955: 209), RAFFI, STANLEY & MARASTI (1985), STANLEY (2007: 63), TAMAYO GOYA (2008), ZENETOS (1997), ZENETOS, VARDALA-THEODOROU & ALEXANDRAKIS (2005). Thereby, in application of ICZN Art. 23.9, the name *Tellina pellucida* Spengler, 1798, which to our knowledge has not been used in the 20th century and was used by HUBER *ET AL.* (2015) deliberately against Art. 23.9.1, is here declared “nomen oblitum”, and the junior synonym *Tellina cumana* O.G. Costa, 1830, “nomen protectum”

Family DONACIDAE

Genus *Donax* Linnaeus, 1758

Subgenus *Machaerodonax* Römer, 1870

Donax (Machaerodonax) pseudacutangulus n. sp. (Figures 22, 23)

Type material: Holotype (spm, dry, 12.5 x 5.4 x 3.8 mm, MNHN IM-2000-33727), Foz do Bengo, Angola, leg. Gofas 1984. Paratypes (10 spm, dry, 6.4 x 2.6 x 1.8 mm to 14 x 6.4 x 4.1 mm, MNHN IM-2000-33728) from the type locality.

Type locality: Cacucaco, Foz do Bengo (8°45'S, 13°23.5' E, 0-2 m at river mouth).

Other material examined: Senegal — Cap Skirring, S, Casamance, beach drift, leg. Cosel 15.III.1988, 2 lv, 3 rv. Congo (Brazzaville) — Pointe-Noire, beach drift, leg. Cosel XII.1985, 4 lots totalizing 4 lv, 4 rv, 3 sh (up to 9.4 x 4.4 x 2.8 mm). Angola — Ambrizete, below lighthouse (7°17.8' S, 13°53.1' E, shore), 6 lv, 6 rv; 10 km S Ambrizete, 2 sh, beach drift, 3 lv, 2 rv; Barra do Dande (8°28.1' S, 13°21.6' E, beach), leg. Gofas, 45 spm (mostly jv), 7 sh, 7 lv, 8 rv; Praia São Tiago (8°38' S, 13°24.6' E, beach), leg. Gofas, 11 spm, 17 sh, 1 lv, 1 rv; Cacucaco, Foz do Bengo (8°45' S, 13°23.5' E, 0-2 m at river mouth), 250 spm, 7 lv, 5 rv (includes type material); Ponta do Mussulo, Luanda prov., leg. Gofas, 13 lv, 3 rv (up to 16.1 x 7.0 mm); Pambala, Bengo prov., leg. Gofas, 3 spm, 1 sh; Cabo Ledo, leg. Gofas, 3 sh; Chapeu Armado (14°26.9' S, 12°20.5' E, sand in shallow water), leg. Gofas, 8 spm (11.2 x 5.2 x 3.2 to 14.1 x 6.3 x 4.6 mm), 1 rv; Moçâmedes, beach, leg. Gofas 1981-1985, 3 spm, 2 lv (up to 14.0 x 6.0 x 4.0 mm).

Derivatio nominis: The name alludes to the similarity with *Donax acutangulus* Deshayes in Reeve, 1854, with which it was hitherto confounded.

Description: Shell small, up to 16 mm long, little variable in shape, elongate-wedge-shaped, thin but solid, rather inflated, hardly gaping anteriorly and posteriorly. Anterior margin well rounded, ventral margin slightly to gently convex, antero-dorsal margin straight and never markedly concave. Posterior part short, posterior margin rather steep, either arched in the upper part or more or less evenly convex.

Ventral margins of the closed valves discordant: left valve very slightly overlapping the right valve. Beaks within the last third or at the beginning of the last fourth of the valves. Long, narrow and ill-defined lunule, no escutcheon. Surface smooth with fine, irregular growth lines and very faint, irregular radial striae, visible only under a lens (x 10-20). Posterior angle sharp and slightly protruding as a ridge over the posterior area. The

latter with very fine radial ridges, crossed by regular, fine, prominent, commarginal lamellae. Periostracum very thin, glossy and transparent. Interior of ventral and posterior margin very finely denticulate, only visible under a lens (x 10-20).

Valves white or often with colouration.

Distribution: Senegal (Cap Skirring, Casamance); Côte d'Ivoire (Grand Bassam); Congo Brazzaville (Pointe-Noire) to southern Angola (Moçâmedes, Namibe province). No records from the two tropical zones.

Biotope: In clean, fine sand. Most specimens were found in the transition zone between an open coast and a sheltered bay, from just below low water to about 5 m. Might be locally common, otherwise uncommon to rare.

Remarks: This species is distinguished from *D. acutangulus* Deshayes in Reeve, 1854 by its considerably smaller size, the more tumid and more elongate shell which is tapering towards anterior, with a markedly shorter posterior part. From the Casamance record, which geographically is quite close to the only known precise locality (Ouaran, Petite Côte) of *D. acutangulus*, the existence of two separate species might be inferred. HUBER (2010: 320) treats this species as *D. (M.) phariformis* Cosel, 1995, which, in fact, is another separate species which raises the number of *Donax (Machaerodonax)* in the eastern Atlantic to three species. There is not yet any record of *D. (M.) pseudacutangulus* from Guinea-Bissau to Equatorial Guinea; that might indicate a possible distribution gap.

Family VENERIDAE
Genus *Microcirce* Habe, 1951

Microcirce antei n. sp. (Figures 24, 25)

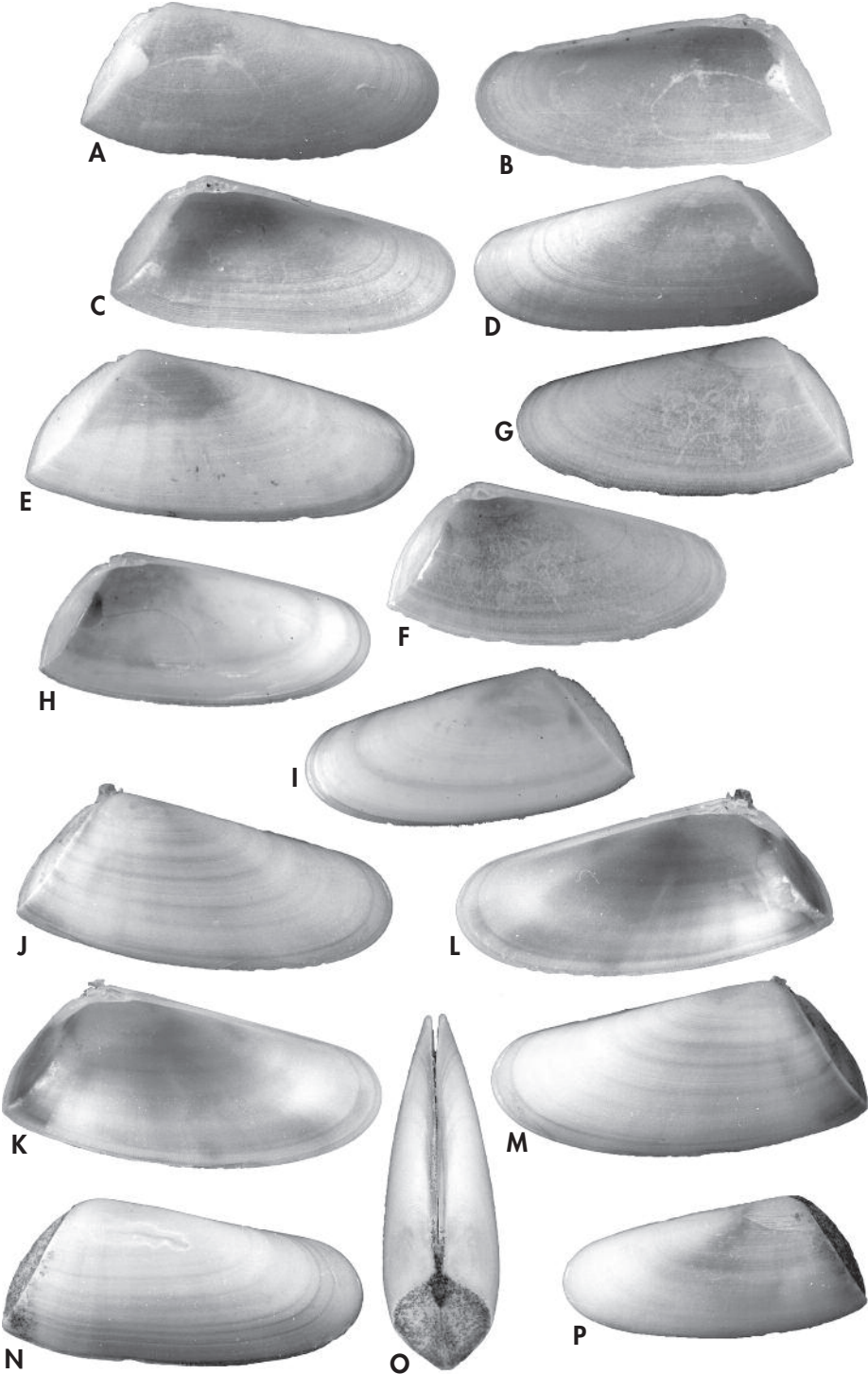
Type material: Holotype (spm, dry, 2.3 x 2.3 x 1.35 mm, MNHN IM-2000-33780), off Grand Bassam, Côte d'Ivoire (5°09.2'N, 3°47.2'W, 30 m), dredged R/V "Antea", BENCHACI sta. 12D, leg. Le Lœuff & Cosel 17.VIII.1998. Paratypes (26 spm, 0.75 x 0.72 x 0.44 mm to 2.15 x 2.1 x 1.3 mm; 8 sh, 1.2 x 1.2 x 0.5 m to 2.3 x 2.2 x 1.3 mm, 5 lv, 6 rv, 0.9 x 0.9 mm to 2,5 x 2.5 mm, MNHN IM-2000-33781) from the type locality.

Type locality: Côte d'Ivoire, Grand Bassam (5°09.2'N, 3°47.2'W, 30 m).

Other material examined: Guinea — Guinean continental shelf, SEDIGUI cruises (9°03'N to 9°12'N, 13°25'W to 13°47'W, 7-23 m), R/V "André Nizery"; bottom grab, trawl or dredge, leg. Cosel V.1988 or

(Right page) Figure 22. *Donax (Machaerodonax) pseudacutangulus* n. sp. A, B: Cap Skirring, S. Casamance, beach drift, leg. Cosel 15.III.1988 (10.4 mm); C, D: same locality (9.9 mm); E: Pointe-Noire, Congo (Brazzaville), Plage Sauvage, beach drift, leg. Cosel XII.1985 (11.0 mm); F, G: Baie de Pointe-Noire, Congo (Brazzaville) (4°43.25'S, 11°49.07'E, 8-9 m), dredged "Entouka" PN 515 DW, leg. Cosel & Thomassin 26.I.2012 (11.1 mm); H, I: Praia São Tiago, Bengo prov., N-Angola, 10.4 mm, leg. Gofas; J-M: holotype (spm.), Cacuo, Foz de Bengo, Bengo prov., N-Angola, 0-2 m at river mouth, leg. Gofas (12.5 mm); N, O: Chapeu Armado, Namibe prov., S-Angola, sand in shallow water, leg. Gofas (14.0 mm); P: same locality (10.7 mm).

(Página derecha) Figura 22. *Donax (Machaerodonax) pseudacutangulus* n. sp. A, B: Cap Skirring, S. Casamance, arrojado a playa, col. Cosel 15.III.1988 (10,4 mm); C, D: misma localidad (9,9 mm); E: 3716 Pointe-Noire, Congo (Brazzaville), Plage Sauvage, arrojado a playa, col. Cosel XII.1985 (11,0 mm); F, G: Baie de Pointe-Noire, Congo (Brazzaville) (4°43,25'S, 11°49,07'E, 8-9 m), dragado "Entouka" PN 515 DW, col. Cosel & Thomassin 26.I.2012 (11,1 mm); H, I: Praia São Tiago, provincia de Bengo, N-Angola, col. Gofas (10,4 mm); J-M: holotipo (ejemplar colectado vivo), Cacuo, Foz de Bengo, provincia de Bengo, N-Angola, 0-2 m en desembocadura de río, col. Gofas (12,5 mm); N, O: Chapeu Armado, provincia de Namibe, S-Angola, arena en fondo somero, col. Gofas (14,0 mm); P: misma localidad (10,7 mm).



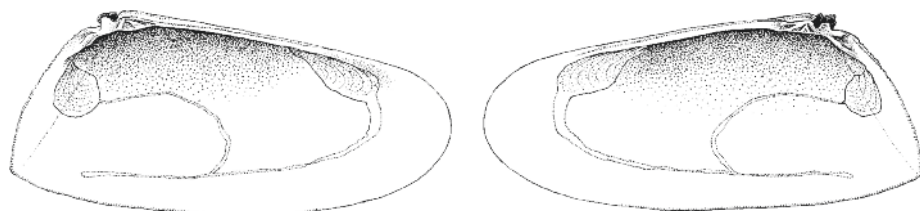


Figure 23. *Donax (Machaerodonax) pseudacutangulus* n. sp. Inside of a specimen from Praia São Tiago, Bengo, N-Angola, in sand, 1-2 m, leg. Gofas 1981-1982 (10.5 mm).

Figura 23. *Donax (Machaerodonax) pseudacutangulus* n. sp. Interior de un ejemplar de Praia São Tiago, Bengo, N-Angola, en arena, 1-2 m, col. Gofas 1981-1982 (10,5 mm).

X.1988, 9 lots totalizing 29 lv and 20 rv (up to 3.9 x 3.9 mm). Côte d'Ivoire — off Grand Bassam (5°06.4'N to 5°11.5'N, 3°45.9'W to 3°49.6'W, 20-50 m), dredged R/V "Antea", BENCHACI I, leg. Cosel & Le Lœuff VII-VIII.1998, the type material and 8 more lots totalizing 322 lv, 316 rv (up to 2.8 x 2.7 mm), 1 sh., 1 spm. Gabon — W of Panga, S-Gabon (3°13'S, 10°24'E, 25 m), dredged R/V "André Nizery", Congo sta. 1051, leg. Kouyoumontzakakis 1970-78. Congo (Brazzaville) — W of Landana (5°13'S, 11°52'E, 49 m), dredged R/V "André Nizery", Congo sta. 937, leg. Kouyoumontzakakis 1970-78, 1 lv. Angola — off Ilha de Luanda (8°44'S, 13°12'E, 40-60 m), leg. Gofas 1981-1985, 1 lv.

Derivatio nominis: Named after R/V "Antea" which collected most of the material of this species.

Description: Shell extremely small, up to 2.5 mm long, almost circular, rather solid, compressed. Beaks just in front of the vertical midline, slightly prosogyrous. Prodissoconch small, lens shaped, nearly smooth with indistinct commarginal growth lines. Lunule long and broad, not sunken and only delimited by a weak lunular incision, escutcheon very narrow and hardly visible. Surface near the ventral margin with fine, somewhat irregular, concentric ridges which may be well- to ill-defined and which become obsolete on the central part of the valves and towards the beaks. Inner margin of the valves smooth, distinctly bevelled and bearing indistinct commarginal grooves or ridges on the bevelled surface.

Hinge plate thick and broad, with both valves bearing three cardinal teeth placed below the beaks and a minute, short anterior lateral. Ligament external, posterior, approximately the same length as the largest cardinal teeth, deeply sunken. Left valve with anterior and median cardinal teeth conspicuous and fused proximally, posterior cardinal tooth minute, narrow and elongate; right valve with a strong, triangular

middle cardinal tooth, separated by a deep ^ shaped socket from the moderately developed anterior and posterior cardinal teeth. Anterior and posterior edge of the dorsal margin marked with conspicuous commarginal grooves which interlock with the opposite valve, and become more irregular and less conspicuous below the upper third of the shell.

Pallial line rather thick, not very distinct; sinus a very broad and shallow indentation only, the surface inside the sinus sometimes glossy and difficult to distinguish from the pallial line.

Valves whitish, occasionally on the postero-ventral part with a pale brownish hue. Inside white, outside colouration slightly showing through. Periostracum transparent and glossy.

Distribution: Recorded mostly from Guinea and Côte d'Ivoire, with scattered records from S-Gabon to Angola.

Biotope: In sandy-muddy and fine sandy bottom, from 20 to 60 m, only locally common, e.g. off Abidjan region, Côte d'Ivoire, rare in the southern part of its range.

Remarks: The species is distinguished from the sympatric *Gouldia minima* by its

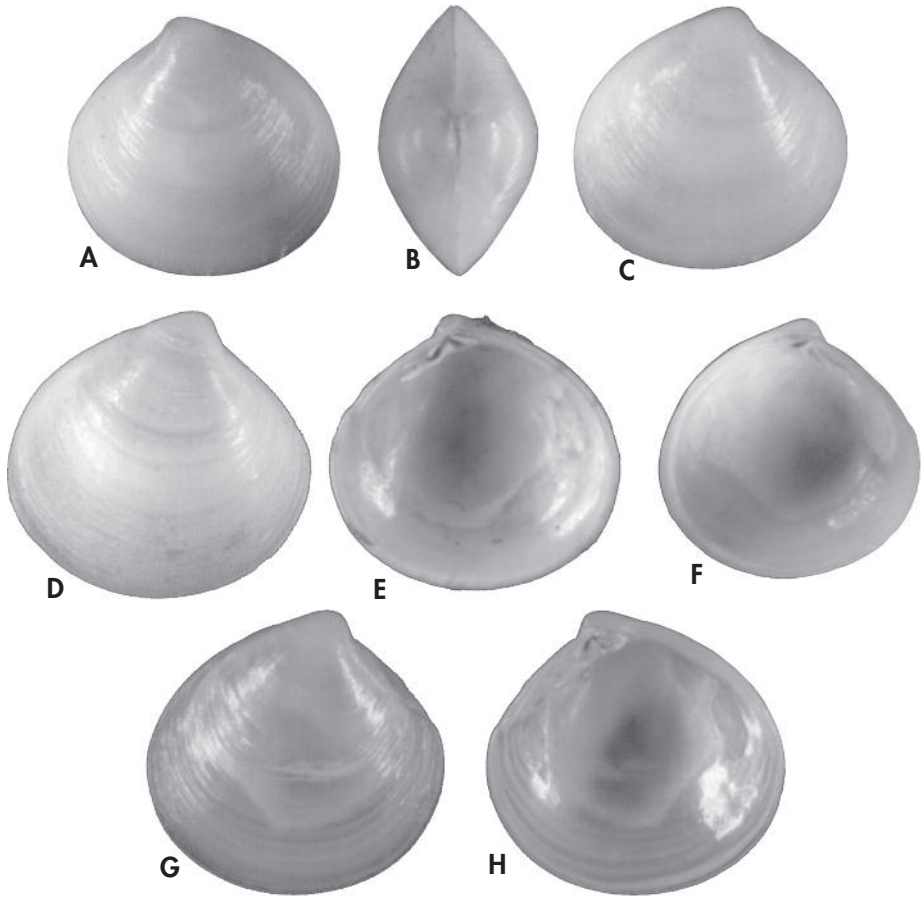


Figure 24. *Microcirce antei* n. sp. A-C: holotype (spm), off Grand Bassam, Côte d'Ivoire ($5^{\circ}09.2'N$, $3^{\circ}47.2'W$, 30 m), dredged R/V "Antea", BENCHACI sta. 12D, leg. Le Lœuff & Cosel 17.VIII.1998 (2.3 mm); D: paratype, rv, same locality (2.5 mm); E: off Grand Bassam, Côte d'Ivoire ($5^{\circ}08.9'N$, $3^{\circ}49.6'W$, 35 m), dredged R/V "Antea", BENCHACI sta. 13D, leg. Le Lœuff & Cosel 17.VII.1998 (2.3 mm); F: same locality (2.4 mm); G, H: W of Panga, S-Gabon ($3^{\circ}13'S$, $10^{\circ}24'E$, 25 m), dredged R/V "André Nizery", Congo sta. 1051, leg. Kouyoumontzakis 1970-1978 (2.2 mm).

Figura 24. *Microcirce antei* n. sp. A-C: holotipo (ejemplar colectado vivo), frente a Grand Bassam, Costa de Marfil ($5^{\circ}09,2'N$, $3^{\circ}47,2'W$, 30 m), dragado B/O "Antea", BENCHACI sta. 12D, col. Le Lœuff & Cosel 17.VIII.1998 (2,2 mm); D: paratipo, misma localidad (2,5 mm); E: frente a Grand Bassam, Costa de Marfil ($5^{\circ}08,9'N$, $3^{\circ}49,6'W$, 35 m), dragado B/O "Antea", BENCHACI sta. 13D, col. Le Lœuff & Cosel 17.VII.1998 (2,3 mm); F: misma localidad (2,4 mm); G, H: W de Panga, S-Gabon ($3^{\circ}13'S$, $10^{\circ}24'E$, 25 m), dragado B/O "André Nizery", Congo sta. 1051, col. Kouyoumontzakis 1970-1978 (2,2 mm).

much smaller size, the higher and more circular shell and the light colouration. The rounded outline and, above all, the presence of commarginal grooves and ridges on the anterodorsal and posterodorsal inner margins (Figure 18)

make it extremely similar to the Indo-Pacific *Microcirce dilecta* (Gould, 1851), reported from the Red Sea and redescribed in detail by OLIVER & ZUSCHIN (2001). As noted already by OLIVER & ZUSCHIN (2001: 9), *Gouldiopa* Iredale, 1924 (type

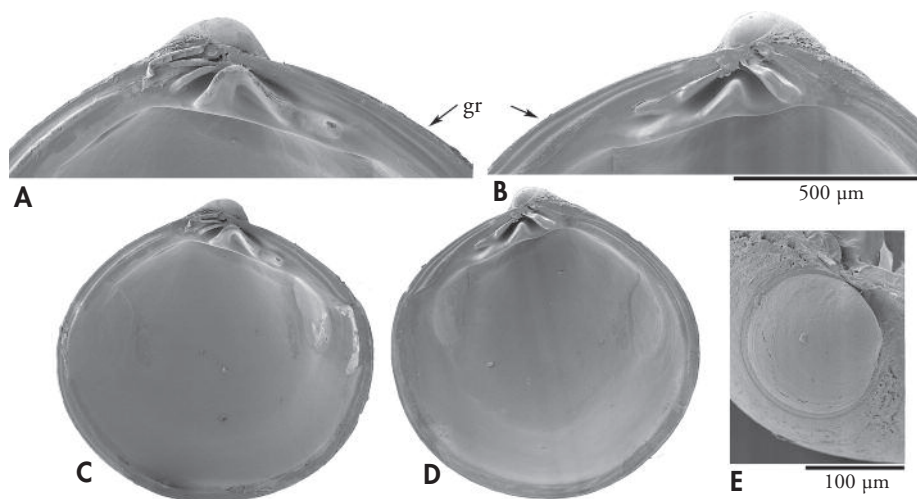


Figure 25. *Microcirce antei* n. sp., scanning electron micrographs of a paratype (spm), Off Grand Bassam, Côte d'Ivoire (5°09.2'N, 3°47.2'W, 30 m), dredged R/V Antea, BENCHACI sta. 12D, leg. Le Lœuff & Cosel, 17.VIII.1998 (2.2 mm). A, B: hinge; C, D: inside of the same specimen; E: prodissoconch of the same specimen, right valve. Left valve to the left, right valve to the right; gr: marginal grooves on the cardinal platform.

Figura 25. *Microcirce antei* n. sp., micrografías electrónicas de barrido de un paratipo (ejemplar colectado vivo), frente a Grand Bassam, Costa de Marfil (5°09,2'N, 3°47,2'W, 30 m), dragado B/O Antea, BENCHACI sta. 12D, col. Le Lœuff & Cosel 17.VIII.1998 (2,2 mm). A, B: charnela; C, D: vista interior del mismo ejemplar; E: prodissoconcha del mismo ejemplar, valva derecha. Valva izquierda a la izquierda, valva derecha a la derecha; gr: surcos marginales en la plataforma cardinal.

species by original designation: *Gouldia australis* Angas, 1865) takes precedence over *Microcirce* Habe, 1951 (type species by original designation: *Meretrix gordonis* Yokoyama, 1927 = *Microcirce dilecta* (Gould, 1861), Pleistocene of Japan) if these are considered synonyms. Con-

trary to HUBER (2010), we follow their view that they should be conserved apart until a broader revision is available, taking into account that *Gouldiopa australis* lacks the conspicuous commarginal grooves and ridges which could be a synapomorphy of *Microcirce*.

Genus *Pitar* Römer, 1857

Subgenus *Pitar* Römer, 1857

Pitar nicklesi n. sp. (Figures 26, 27, 28)

Type material: Holotype (spm, dry, 22.7 × 17.6 × 11.3 mm, MNHN IM-2000-33763), SE of Gorée, Senegal (14°41'N, 17°23.2'W, 17 m), dredged R/V "Louis Sauger", leg. Cosel 24.III.1988. Paratypes: (spm, dry, 22.0 × 16.7 × 11.8 mm, MNHN IM-2000-3376), off Gorée, Senegal (14°41'N, 17°23.3'W, 19 m), dredged R/V "Louis Sauger", leg. Cosel 30.III.1988; Paratypes (8 spm, dry, 14.4 × 12.3 × 7.9 mm to 21.7 × 17.8 × 12.5 mm, MNHN IM-2000-33765), off Baie de Hann, Dakar, Senegal, 10-20 m, commercial shrimpboat, leg. Pin IX.1987.

Type locality: SE of Gorée, Senegal (14°41'N, 17°23.2'W, 17 m).

Other material examined: Mauritania — continental shelf (17°24'N to 20°42'N, 16°15'W to 17°33'W, 16-93 m), dredged R/V "N'Diogo", leg. Richer de Forges 1981, 31 lots totaling 20 lv, 14 rv, 64 sh,

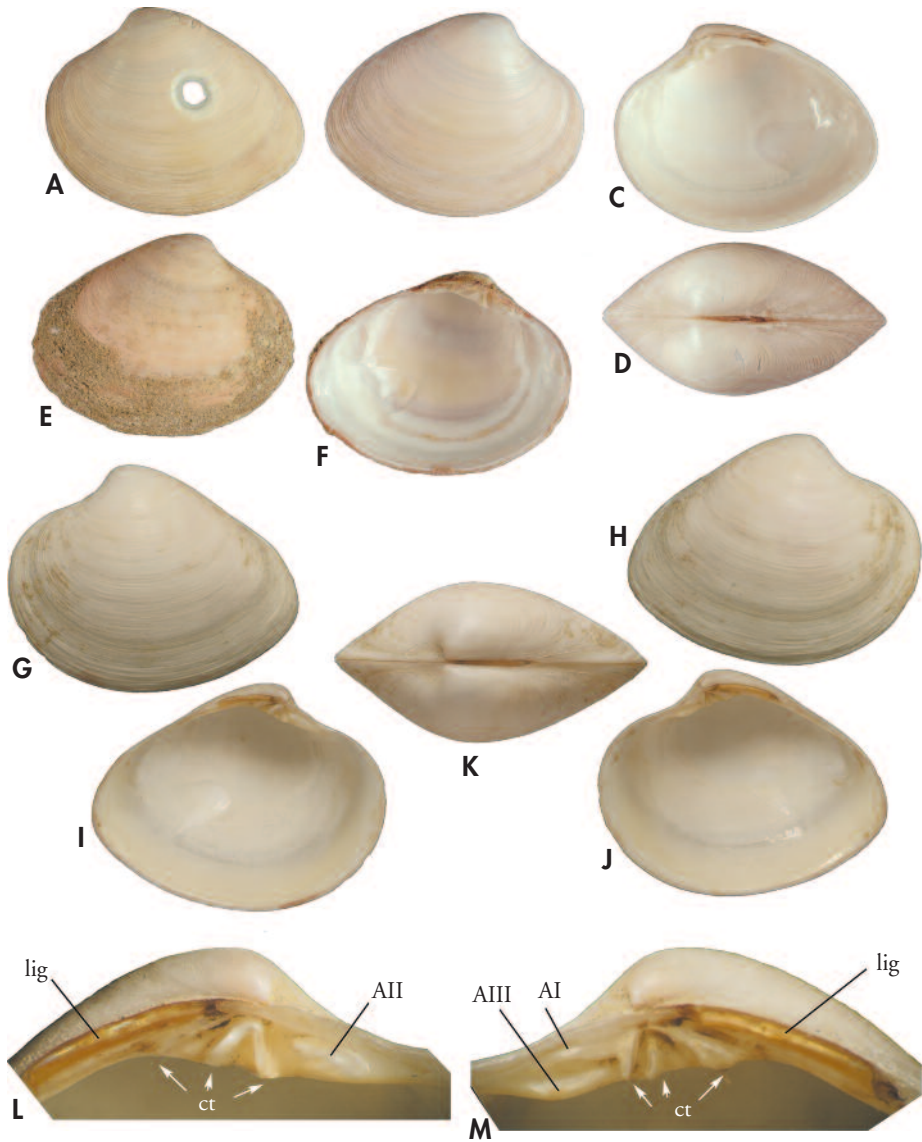


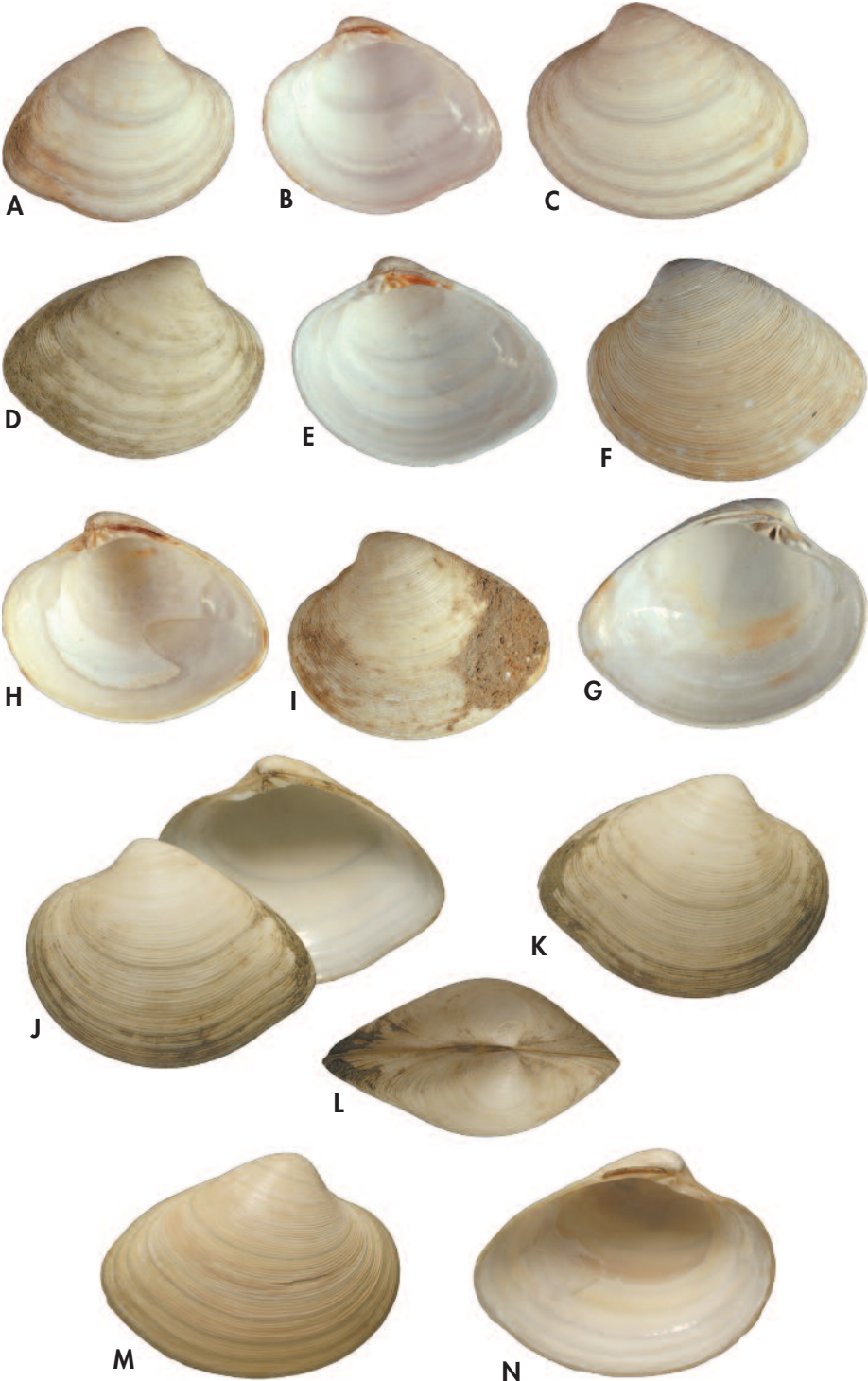
Figure 26. *Pitar nicklesi* n. sp. A-D: off Mauritania (20°06'N, 17°33'W, 76 m), dredged R/V "N'Diago", leg. Richer de Forges 28.X.1981 (17.5 mm); E, F: off Mauritania (17°54'N, 16°17'W, 58 m), dredged R/V "N'Diago", leg. Richer de Forges 1981 (17.5 mm); G-K: Holotype (spm), SE of Gorée, Senegal (14°41'N, 17°23.2'W, 17 m), dredged R/V "Louis Sauger", leg. Cosel 24.III.1988 (22.7 mm); L, M: detail of the hinge of the holotype. Abbreviations, AI-III: anterior lateral teeth; ct: cardinal teeth; lig: ligament.

Figure 26. *Pitar nicklesi* n. sp. A-D: frente a Mauritania (20°06'N, 17°33'W, 76 m), dragado B/O "N'Diago", col. Richer de Forges 28.X.1981 (17.5 mm); E, F: frente a Mauritania (17°54'N, 16°17'W, 58 m), dragado B/O "N'Diago", col. Richer de Forges 1981 (17.5 mm); G-K: holotipo (ejemplar colectado vivo), SE de Gorée, Senegal (14°41'N, 17°23.2'W, 17 m), dragado B/O "Louis Sauger", col. Cosel 24.III.1988 (22.7 mm); L, M: detalle de la charnela del holotipo. Abreviaturas, AI-III: dientes laterales anteriores; ct: dientes cardinales; lig: ligamento.

34 spm., many of them juveniles. Senegal — off St. Louis, Grande Côte, Senegal (40-50 m), leg. Pin 1987, 5 spm (21.0 x 17.6 x 12 mm to 22.4 x 18.0 x 12.4 mm); W of Langue de Barbarie, Senegal (15°52'N, 16°46'W, 65 m), dredged R/V “Léon Coursin”, leg. Marche-Marchad 01.II.1957, 4 spm, 3 jv spm, 13 lv, 13 rv; SE of Gorée (14°41'N, 17°23,2'W, 17 m), dredged R/V “Louis Sauger”, leg. Cosel 24.III.1988, 29 lv, 31 rv (same lot as holotype); off Gorée, Senegal (14°41'N, 17°23.3'W, 19 m), dredged R/V “Louis Sauger”, leg. Cosel 30.III.1988, 7 lv, 4 rv (same lot as paratype); Dakar area, 30-180 m, dredged R/V “Gérard Tréca”, leg. Marche-Marchad 1954-1967, 6 more lots totalizing 1 spm, 24 lv, 35 rv; Abéné, N-Casamance (13°01.8'N, 17°25.5'W, 53 m), dredged R/V “Louis Sauger”, leg. Cosel 29.III.1988, 1 spm (23.5 x 20.0 x 13.3 mm), 10 lv, 7 rv; Kafountine (12°57.5'N, 17°16.8'W, 35 m), 1 spm (18.9 x 15.0 x 10.2 mm), 7 lv; Casamance, dredged 10 m, leg. M. Pin II.1988, 15 sh, 31 lv, 29 rv; Casamance (12°55,5'N, 17°17,2'W, 36 m), dredged R/V “Louis Sauger”, leg. Cosel III.1988, 1 lv, 1 rv. Guinea — W of Île Yomboya, Guinea (10°27'N, 15°37.5'W, 39 m), dredged R/V “André Nizery”, SEDIGUI II sta. B4grDW, leg. Cosel 28.X.1988, 1 lv; off Conakry (9°36'N, 13°57'W, 18-30 m), dredged R/V. “Calypso” Golfe de Guinée, leg. Marche-Marchad 18.V.1956, 1 sh (21.8 x 17.8 x 12.0 mm), 2 lv; off Conakry (9°40'N, 14°05'W, 18 m), dredged R/V. “Calypso” Golfe de Guinée, leg. Marche-Marchad 17.V.1956, numerous jv valves; W of Baie de Sangarea (9°40'N, 14°05'W, 18 m), dredged R/V “Calypso” Golfe de Guinée sta. 7, leg. Marche-Marchad 17.V.1956, 11 lv, 7 rv [rounded form]; W of Baie de Sangarea (9°42'N, 14°02'W, 18 m), R/V “André Nizery”, SEDIGUI 370, leg. Cosel 23.V.1988, 13 spm, 1 sh, 15 lv, 18 rv [rounded form]; W of Baie de Sangarea (9°38'N, 14°06'W, 19 m), dredged R/V “André Nizery”, CHALGUI 6 haul 22, leg. Cosel 15.IV.1988, 19 spm [normal and rounded forms]. Liberia — (6°40'N, 11°23'W, 51 m), dredged R/V “Calypso” Golfe de Guinée sta. 12, leg. Marche-Marchad 19.V.1956, 1 rv. Côte d'Ivoire — off Tabou (4°30'N, 7°09'W, 35 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier, 1 sh, 1 lv, 1 rv; off Tabou (4°27,5'N, 7°09'W, 50 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier, 7 lv, 7 rv; W of Jacquville (5°06'N, 4°38.5'W, 50 m), dredged R/V “La Rafale”, GTS dr. 9, leg. Cherbonnier, 11 lv, 8 rv; Abidjan area (no more details), leg. Marche-Marchad, 7 lots totalizing 1 lv, 3 rv, 3 spm (mostly jv); Abidjan area (18-60 m), dredged R/V “Reine Pokou”, leg. Le Lœuff 1966-1970, 8 lots totalizing 8 sh and 9 spm (up to 18.5 x 13.8 x 9.6 mm). Ghana — Kanga (4°57'N, 2°42'W, 40 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier 19.III.1964, 1 lv, 1 rv; Takoradi (4°36,5'N, 1°31'W, 50 m), dredged R/V “Calypso” Golfe de Guinée sta. 25, leg. Marche-Marchad 1956, 1 lv. Benin — Ouidah (6°10'N, 02°05'E, 100 m), leg. Marche-Marchad, 2 lv, 1 rv (jv). Nigeria: off mouth of the Niger (4°03'N, 6°12'E, 32 m), dredged R/V “Calypso” Golfe de Guinée sta. 29, leg. Marche-Marchad 26.V.1956, numerous jv valves. Cameroon — Campo (2°22'N, 9°41'E, 45 m), R/V “Calypso” Golfe de Guinée sta. 42, leg. Marche-Marchad 07.VI.1956, 1 lv. Gabon — off Port-Gentil, Gabon, drilling site “Torpille” (0°55'S, 8°44,6'E, 30 m), leg. C. Chevalier, 1 lv. Equatorial Guinea — Río Benito (01°40'S, 09°25'E, 150 m), 2 lv, 3 rv. São Tomé — between Ponta Oquedelrey and São Sebastião, 5 m, R/V “Calypso” Golfe de Guinée

(Right page) Figure 27. *Pitar nicklesi* n. sp. A, B: off Jacquville, Côte d'Ivoire, 50 m, dredged R/V “Reine Pokou”, leg. Le Lœuff 11.VIII.1970 (14.6 mm); C: same locality (18.5 mm); D, E: São Tomé, between Ponta Oquedelrey and São Sebastião, 5 m, R/V “Calypso”, Golfe de Guinée sta. T23, leg. Marche-Marchad 13.VI.1956 (19.4 mm); F, G: off Pointe-Noire, Congo (Brazzaville), 104 m, dredged R/V “Ombango”, leg. Crosnier 06.XII.1966 (28.6 mm); H, I: Cacucuo, Bengo prov., N-Angola, dredged 5-10 m, leg. Gofas (16.8 mm); J-L: large, posteriorly pointed form found in Luanda area, off Ponta das Lagostas, Luanda prov., N-Angola, 30-50 m, shrimpboat “Victoria”, leg. Gofas (27.9 mm); M, N: same locality (28.6 mm); note the more narrow and delicate hinge plate.

(Página derecha) Figura 27. *Pitar nicklesi* n. sp. A, B: frente a Jacquville, Côte d'Ivoire, 50 m, dragado B/O “Reine Pokou”, col. Le Lœuff 11.VIII.1970 (14,6 mm); C: misma localidad (18,5 mm); D, E: São Tomé, entre Ponta Oquedelrey y São Sebastião, 5 m, B/O “Calypso”, Golfe de Guinée sta. T23, col. Marche-Marchad 13.VI.1956 (19,4 mm); F, G: frente a Pointe-Noire, Congo (Brazzaville), 104 m, dragado B/O “Ombango”, col. Crosnier 06.XII.1966 (28,6 mm); H, I: Cacucuo, provincia de Bengo, N-Angola, dragado 5-10 m, col. Gofas (16,8 mm); J-L: forma más grande y estrechada posteriormente que se encuentra en los alrededores de Luanda, frente a Ponta das Lagostas, provincia de Luanda, N-Angola, 30-50 m, arrastrero camaronero “Victoria”, col. Gofas (27,9 mm); M, N: misma localidad (28,6 mm); nótese la plataforma cardinal más estrecha y delicada.



sta. T23, leg. Marche-Marchad 13.VI.1956, 2 sh (20.3 x 16.3 x 10.8 mm, 19.3 x 15 x 10.3 mm), 1 lv. Principe — Baía de Santo Antonio, 15 m, dredged R/V “Calypso” Golfe de Guinée sta. P14, leg. Marche-Marchad 1956, 2 lv, 4 rv; (1°39.5'N, 7°26.8'E, 12 m), R/V “Calypso” Golfe de Guinée sta. 83, leg. Marche-Marchad 25.VI.1956, 1 lv. Congo (Brazzaville) — off Pointe-Noire, 104 m, dredged R/V “Ombango”, leg. Crosnier 06.XII.1966, 1 lv. Angola — Cacuaço 5-10 m, leg. Gofas 1981-1985, 3 spm (up to 16.8 x 13.8 x 9.4 mm), 1 lv, 12 jv spm, 2 lv, 3 rv; off Ponta das Lagostas, Luanda prov., N-Angola, 30-50 m, trawled shrimpboat “Victoria”, leg. Gofas, 25 sh, 11 rv, 9 lv, mostly juveniles; same locality, 27 spm. (7.8 x 6.7 x 4.4 to 30.0 x 23.5 x 16.3 mm), 30 sh (15.5 x 12.1 x 8.0 to 26.2 x 20.3 x 13.8 mm), 6 lv, 11 rv (20.2 x 15.8 to 31.2 x 23.4 mm) [deep fragile form]; off Ilha de Luanda, 75-80 m, leg Gofas 1981-1985, 3 spm, 2 sh, 3 lv, 5 rv [deep fragile form]; Corimba (8°51.0'S, 13°10.5'E, 10-20 m on sand bar), leg. Gofas 1980-1985, several lots totalizing 24 spm 1 sh, 9 lv, 7 rv, many of them juveniles; off Mussulo 50 m, 5 spm; off Mussulo, 90 m, 6 lv, 13 rv + 1 lv [deep fragile form]; Bay of Moçâmedes 5-10 m on mud, leg. Gofas, 1 jv sh; Praia Amelia, 40-60 m, 1 spm, 1 lv.

Derivatio nominis: This species is dedicated to Maurice Nicklès, as a tribute to his prominent contribution to the knowledge of West African mollusca.

Description: Shell up to 30 mm long, variable in shape, rounded-triangular to broadly suboval, quite thin but solid, inflated. Anterior margin broadly rounded, posterior margin narrowly rounded or more or less pointed. Ventral margin evenly rounded or with a short straight part postero-dorsally, smooth and bevelled inside. Beaks well in front of the vertical midline. Surface with fine, dense, irregular, frequently anastomosing commarginal ridges, which tend to be flatter and less distinct on the median part of the shell. Periostracum thin, dull, nearly colourless, not translucent, occasionally with sediment adhering to the posterior or postero-ventral part.

Hinge plate hardly longer than 1/4 of the total shell length. Ligament external, posterior, occupying little more than 1/5 of the shell length, sunken in a narrow groove. Left valve with anterior and median cardinal teeth conspicuous but not surpassing the edge of the cardinal platform, fused proximally, the median one thicker; posterior cardinal tooth narrow and elongate; lv also with a strong, stout anterior lateral tooth, parallel to the antero-dorsal margin. Right valve with a narrow, acute middle cardinal tooth, separated by a deep ^ shaped socket from the moderately developed anterior and posterior cardinal teeth which are connected by a low and narrow ridge; the crest of the posterior cardinal tooth bearing a groove so as to make it appear somewhat bifid; rv also with two unequal anterior laterals,

the dorsal one weaker, converging towards the antero-dorsal margin and making a right angle with the anterior cardinal, the other one thicker, parallel to the margin.

Outside white to cream, with a few pale greyish commarginal growth bands. Inside white.

Distribution: Mauritania (20°N) to northern Angola (Cacuaco, Bengo province).

Biotope: In muddy sand and fine sand from 15 to 100 m, most common between 20 and 50 m.

Remarks: The name *P. belcheri* (Sowerby, 1851) was first used by Dautzenberg (1912: 90-91, as *Meretrix belcheri*) and after him by NICKLÈS (1955: 177) for the species intended here. However SOWERBY'S (1851) original figure shows a quite different shell with strong commarginal ridges and a rounded outline. KILBURN (2000) lists *Pitar belcheri* as South-East Asian species, which is just as consistent as West Africa with the areas visited by Captain Belcher, collector of the type specimen. *Pitar belcheri* was also cited from Principe Island by RÖMER (1869) and DOHRN (1880: 168) but this record (RÖMER, 1869: 123, pl. 32 fig. 5) is based on a specimen of *P. virgo* (Gray, 1838) as already noted by TOMLIN & SHACKLEFORD (1913).

This the most variable and most “problematic” West African *Pitar*, and therefore a large array of specimens from all principal localities is shown here. Six other species of *Pitar* s. str. are reported from West Africa: *Pitar tumens* (Gmelin,

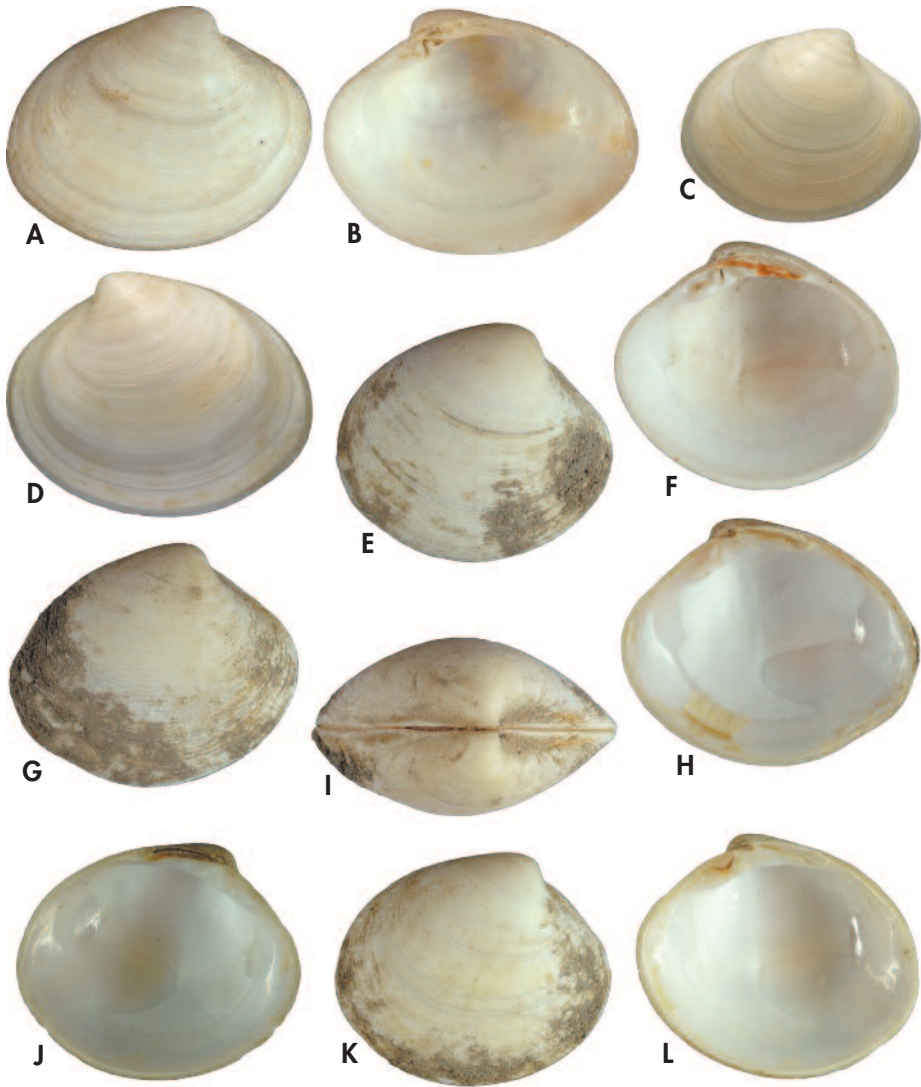


Figure 28. *Pitar* sp. aff. *nicklesi* n. sp., the posteriorly rounded forms. A, B: S of Gorée, Dakar, Senegal, 95-98 m, dredged R/V “Gérard Tréca”, leg. Marche-Marchad 18.II.1954 (15.6 mm); C: W of Baie de Sangarea, Guinée (9°40’N, 14°05’W, 18 m), dredged R/V “Calypso”, Golfe de Guinée sta. 7, leg. Marche-Marchad 17.V.1956 (14.0 mm); D: same locality (18.6 mm); E, F: W of Baie de Sangarea, Guinée (9°42’N, 14°02’W, 18 m), R/V “André Nizery”, SEDIGUI I sta. 370, leg. Cosel 23.V.1988 (20.0 mm); G-I: same locality (21.1 mm); J-L: W of Baie de Sangarea, Guinée (9°38’N, 14°06’W, 19 m), dredged R/V “André Nizery”, CHALGUI 6 haul 22, leg. Cosel 15.IV.1988 (18.7 mm).

Figura 28. Pitar sp. aff. *nicklesi* n. sp. . la forma más redondeada posteriormente. A, B: S de Gorée, Dakar, Senegal, 95-98 m, dragado B/O “Gérard Tréca”, col. Marche-Marchad 18.II.1954 (15,6 mm); C: W de Baie de Sangarea, Guinée (9°40’N, 14°05’W, 18 m), dragado B/O “Calypso”, Golfe de Guinée sta. 7, col. Marche-Marchad 17.V.1956 (14,0 mm); D: misma localidad (18,6 mm); E, F: W de Baie de Sangarea, Guinée (9°42’N, 14°02’W, 18 m), B/O “André Nizery”, SEDIGUI 370, col. Cosel 23.V.1988 (20,0 mm); G-I: misma localidad (21,1 mm); J-L: W de Baie de Sangarea, Guinée (9°38’N, 14°06’W, 19 m), dragado B/O “André Nizery”, CHALGUI 6, lance 22, col. Cosel 15.IV.1988 (18,7 mm).

1791), *Pitar virgo* (Gray, 1838), *Pitar erubescens* (Dunker, 1853), *Pitar elatus* (G.B. Sowerby III, 1908), *Pitar mediterraneus* (Aradas & Benoit, 1872) and *Pitar rudis* (Poli, 1795). Of these, four are easily differentiated: *Pitar tumens* has a large, thick, not very inflated shell with a broad and solid cardinal platform, and occurs only from southern Morocco to Senegal; *Pitar elatus* has a very characteristic outline, only slightly longer than high, rather pointed posteriorly and with the ventral margin having its maximum curvature in the central portion; *Pitar mediterraneus* and *Pitar rudis* have small, quite convex shells, the former white with strong commarginal grooves, the latter quite smooth with interrupted radial brown zones.

Of more concern for comparison are *Pitar virgo* and *Pitar erubescens*, which are reciprocally allopatric and both broadly sympatric with *Pitar nicklesi* n. sp. *Pitar virgo*, which occurs from Senegal to Gabon and in the islands of the Gulf of Guinea, has a more tumid shell with an evenly rounded posterior margin, and has distinct, coarser commarginal ridges whereas those of *Pitar nicklesi* n. sp. are rather delicate; the colour also makes a difference, typically pinkish inside the valves in *Pitar virgo* and whitish in *Pitar nicklesi* n. sp. *Pitar erubescens*, which replaces *Pitar virgo* in the southern part of the range of *Pitar nicklesi* n. sp., differs from *Pitar virgo* in being definitely more elongate, more compressed laterally, with a thinner shell and a finer sculpture, and from *Pitar nicklesi* n. sp. in being also more compressed and by the very broadly rounded, almost truncate rather than pointed, posterior margin.

Smaller and more oval specimens with a broader posterior part, less pronounced commarginal grooves and a larger pallial sinus (Figure 28), are found from Senegal (Cape Verde Peninsula) to Guinea (Conakry). They even show sometimes characters in common with *P. virgo*, e. g. part of the surface with an acicular calcified periostracal layer as described by Glover & Taylor (2010) for other species of *Pitar*, and a pinkish hue on the beaks. These forms co-occur with the more pointed “normal” form with shorter pallial sinus and well-developed commarginal ridges. All kinds of intermediates are frequently encountered; a distinction in two different species is hence not tenable. Some specimens, especially from Mauritania, are partly smooth on the outside. All are provisionally grouped here under *P. nicklesi* and only DNA analysis of the different populations could clarify their systematic position and reveal possible cryptic species. This variety is found, together with the “nominal form”, in Senegal and Guinea. It is distinguished from the sympatric *Pitar mediterraneus* by the less inflated and less protruding beaks, the finer sculpture and the larger pallial sinus.

Some Angolan specimens, found in the Luanda area (Figure 27J-N), grow particularly large (to about 30 mm) and more triangular with tapering posterior part and very narrowly rounded posterior margin. They also have a narrower and more delicate cardinal platform and with a distinctly bifid posterior cardinal on the right valve. They may represent an additional species, but a large lot from off Ponta das Lagostas contains both forms and does not allow to separate them convincingly.

Subgenus *Costellipitar* Habe, 1951

Pitar (Costellipitar) longior n. sp. (Figure 29)

Type material: Holotype (sh, 18.2 × 13.5 × 7.8 mm, MNHN IM-2000-3376): Côte d’Ivoire, San Pedro (4°45’N, 6°35’W, 30 m), dredged R/V “La Rafale”, GTS, leg. Cherbonnier 05.IV.1964. Paratypes (2 sh, 14.0 × 10.8 × 6.4 mm and 14.8 × 11.2 × 6.8 mm, MNHN IM-2000-33767): Côte d’Ivoire, Abidjan region, off CRO Abidjan, 44 m, 14.2 mm dredged R/V “Reine Pokou”, leg. Le Lœuff 10.V.1966; Paratype (lv, MNHN IM-2000-33768), off Abidjan, Côte d’Ivoire, 50 m, dredged R/V “Reine Pokou”,

leg. Le Lœuff; Paratypes (3 spm, 1 rv, IM-2000-33769): off Grand Lahou, Côte d'Ivoire, 40 m, dredged R/V "Reine Pokou", leg. Le Lœuff 08.III.1966.

Type locality: Côte d'Ivoire, San Pedro (4°45'N, 6°35'W, 30 m).

Other material examined: Côte d'Ivoire — Abidjan area (no more details), leg. Marche-Marchad, 1 rv, 1 lv, 3 sh.; between Grand Lahou and Sassandra (5°04'N, 5°18'W, 30 m), dredged R/V "La Rafale", GTS, leg. Cherbonnier 01.IV.1964, 4 lv, 8 rv (jv); between Jacquville and Grand Lahou (5°06'N, 4°38.5'W, 50 m), dredged, R/V "La Rafale", GTS sta. 9, leg. Cherbonnier 31.III.1964, 4 lv, 1 jv spm; W of Abidjan (5°09'N, 4°39'W, 20 m), dredged, R/V "La Rafale", sta. 8, leg. Cherbonnier 31.III.1964, 1 spm (12.8 x 9.8 x 5.3 mm), 1 lv (jv); San Pedro (4°45'N, 6°35'W, 30 m), dredged R/V "La Rafale", GTS, leg. Cherbonnier 05.IV.1964, 1 spm, 4 lv, 3 rv (all jv, same lot as holotype); Abidjan area (20-45 m), leg. Le Lœuff, 8 lots totalizing 22 spm (up to 19.5 x 14.9 x 8 mm), 3 jv sh, 36 lv, 30 rv. Nigeria — Off mouth of Niger, Nigeria (4°03'N, 6°12'E, 32 m), dredged R/V "Calypso" Golfe de Guinée 1956 sta. 29, leg. Marche-Marchad 26.V.1956, 23 lv, 26 rv. Cameroon — off Victoria/Limbe (3°44'N, 9°11'E, 24 m), trawled shrimpboat "Campo Star", leg. Cosel 22-29.XI.1985, 1 rv, 1 lv; off Batoké (3°57'N, 9°05'E, 30-42 m), trawled shrimpboat "Campo Star", leg. Cosel 22-29.XI.1985, 1 sh; Bota-Batoke, Cameroon (3°37'N, 9°06'E, 23-31 m), shrimpboat "Campo Star", leg. Cosel 22-29.XI.1985, 1 sh; Victoria/Limbe - Bota, dredged 8-10 m, leg. Cosel 04.XII.1985, 1 lv, 1 spm; Campo (2°23'N, 9°41'E, 45 m), dredged R/V "Calypso" Golfe de Guinée 1956 sta. 42, leg. Marche-Marchad 07.VI.1956, 1 lv. Gabon — off Port-Gentil, Gabon, drilling site "Anguille" (0°47.4'S, 8°43.6'E, 25 m), leg. C. Chevalier 1989, 2 sh, 2 lv, 1 rv; Port Gentil, quaternary deposits, 1 rv (Nicklès, 1952, p. 95); "Rade du Gabon", Jousseau collection MNHN, 1 spm. Congo (Brazzaville) — off Conkouati (4°10'S, 11°15'E, 19 m), trawled "Kounda", leg. Cosel XII.1985, 2 lv, 5 rv (up to 24.6 x 17.8 mm). Congo (Kinshasa) — off Kipundji (5°56'S, 12°07'E, 22-25 m), dredged "Bossus Congo IV", leg. Crosnier 25-26.VIII.1965, 6 spm, 3 sh (up to 17.2 x 12.1 x 6.3 mm), 17 lv, 16 rv.

Derivatio nominis: The specific name alludes to the more elongate outline of this species, compared to *Pitar cor*.

Description: Shell small, usually up to 20 mm long, occasionally to 25 mm, elongate, suboval-triangular, thin and brittle, rather compressed. Anterior margin broadly rounded, posterior part prolonged and tapering, posterior margin narrowly rounded, beaks well in front of the vertical midline. Surface with strong and well-developed, dense, slightly irregular commarginal ridges and growth lines. Periostracum thin, dull, colourless and translucent, with a sometimes quite thick calcareous velvety layer on the surface, mostly persisting on the marginal part of the shell and consisting of microscopic aragonitic calcifications. Inner margin of valves smooth. Pallial sinus long and almost horizontal, reaching to under the beaks.

Hinge plate hardly longer than 1/4 of the total shell length. Ligament external, posterior, occupying about 1/4 of the shell length, sunken in a narrow groove. Left valve with anterior and median cardinal teeth conspicuous, distinctly surpassing the edge of the cardinal platform, fused proximally, the median one distinctly thicker; posterior cardinal tooth narrow

and elongate; lv also with a strong, stout anterior lateral tooth, pointing downwards so as to be nearly parallel to the anterior cardinal. Right valve with narrow, acute anterior and middle cardinal teeth, separated by narrow and deep socket; posterior cardinal tooth elongate, separated from the middle cardinal by a wide socket where the edge of the cardinal platform is receding; the crest of the posterior cardinal tooth bearing distally a small groove so as to make it appear somewhat bifid; rv also with two rather weak, subequal anterior laterals, nearly parallel to the antero-dorsal margin.

Outside white to cream, with light grey, irregular commarginal growth bands. Inside white, growth bands slightly showing through.

Distribution: Southern Casamance and Guinea (few records); Côte d'Ivoire to Gabon (also Quaternary of Port-Gentil), Congo (Brazzaville) to northern Angola (Cacuaco).

Biotope: In sandy mud and fine muddy sand, from about 18 to 50 m,

Remarks: This species is very close to the *Pitar cor* (Hanley, 1844) (Figure 30)

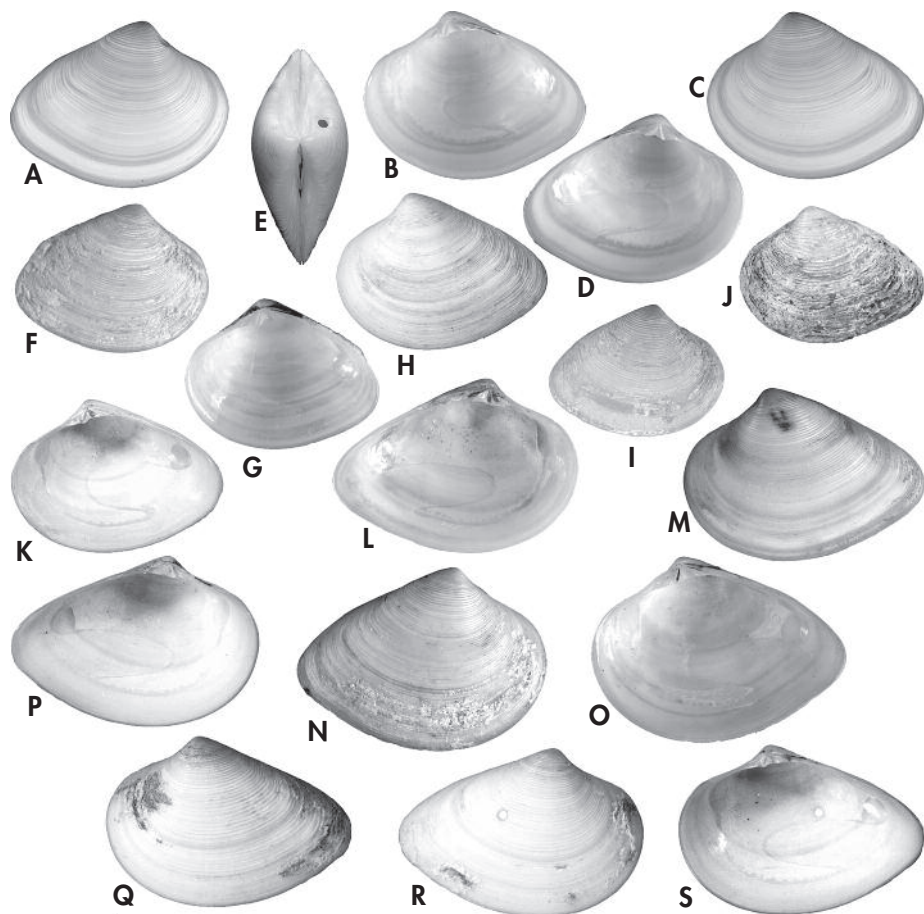


Figure 29. *Pitar (Costellipitar) longior* n. sp. A-E: holotype (sh), off San Pedro, Côte d'Ivoire ($4^{\circ}45'N$, $6^{\circ}35'W$, 30 m), dredged R/V "La Rafale", GTS, leg. Cherbonnier 05.IV.1964 (18.2 mm); F, G: Abidjan, Côte d'Ivoire, off CRO Abidjan, 44 m, dredged R/V "Reine Pokou", leg. Le Lœuff 10.V.1966 (14.2 mm); H: off Abidjan, Côte d'Ivoire, 50 m, dredged R/V "Reine Pokou", leg. Le Lœuff (17.6 mm); I: off Grand Lahou, Côte d'Ivoire, 40 m, dredged R/V "Reine Pokou", leg. Le Lœuff 08.III.1966 (13.6 mm); J: off Cameroon ($3^{\circ}44'N$, $9^{\circ}11'E$, 24 m), trawled shrimpboat "Campo Star", leg. Cosel 22-29.XI.1985 (12.1 mm); K: same locality (15.1 mm); L, M: off Port-Gentil, Gabon, drilling site "Anguille" ($0^{\circ}47.4'S$, $8^{\circ}43.6'E$, 25 m), leg. C Chevalier 1989 (19.1 mm); N, O: off Conkouati, Congo (Brazzaville) ($4^{\circ}10'S$, $11^{\circ}15'E$, 19 m), trawled "Kounda", leg. Cosel XII.1985 (20.0 mm); P-S: off Kipundji, Congo (Kinshasa) ($5^{\circ}56'S$, $12^{\circ}07'E$, 22-25 m), dredged "Bossus Congo IV", leg. Crosnier 25-26.VIII.1965 (17.3 mm).

Figure 29. *Pitar (Costellipitar) longior* n. sp. A-E: holotipo (concha completa), frente a San Pedro, Costa de Marfil ($4^{\circ}45'N$, $6^{\circ}35'W$, 30 m), dragado B/O "La Rafale", GTS, col. Cherbonnier 05.IV.1964 (18,2 mm); F, G: Abidjan, Costa de Marfil, frente al CRO Abidjan, 44 m, dragado B/O "Reine Pokou", col. Le Lœuff 10.V.1966 (14,2 mm); H: frente a Abidjan, Costa de Marfil, 50 m, dragado B/O "Reine Pokou", col. Le Lœuff (17,6 mm); I: frente a Grand Lahou, Costa de Marfil, 40 m, dragado B/O "Reine Pokou", col. Le Lœuff 08.III.1966 (13,6 mm); J: frente al Camerún ($3^{\circ}44'N$, $9^{\circ}11'E$, 24 m), arrastrero camaronero "Campo Star", col. Cosel 22-29.XI.1985 (12,1 mm); K: misma localidad (15,1 mm); L, M: Frente a Port-Gentil, Gabón, sitio de sondeo "Anguille" ($0^{\circ}47,4'S$, $8^{\circ}43,6'E$, 25 m), col. C Chevalier 1989 (19,1 mm); N, O: frente a Conkouati, Congo (Brazzaville) ($4^{\circ}10'S$, $11^{\circ}15'E$, 19 m), arrastrero "Kounda", col. Cosel XII.1985 (20,0 mm); P-S: frente a Kipundji, Congo (Kinshasa) ($5^{\circ}56'S$, $12^{\circ}07'E$, 22-25 m), dragado "Bossus Congo IV", col. Crosnier 25-26.VIII.1965 (17,3 mm).

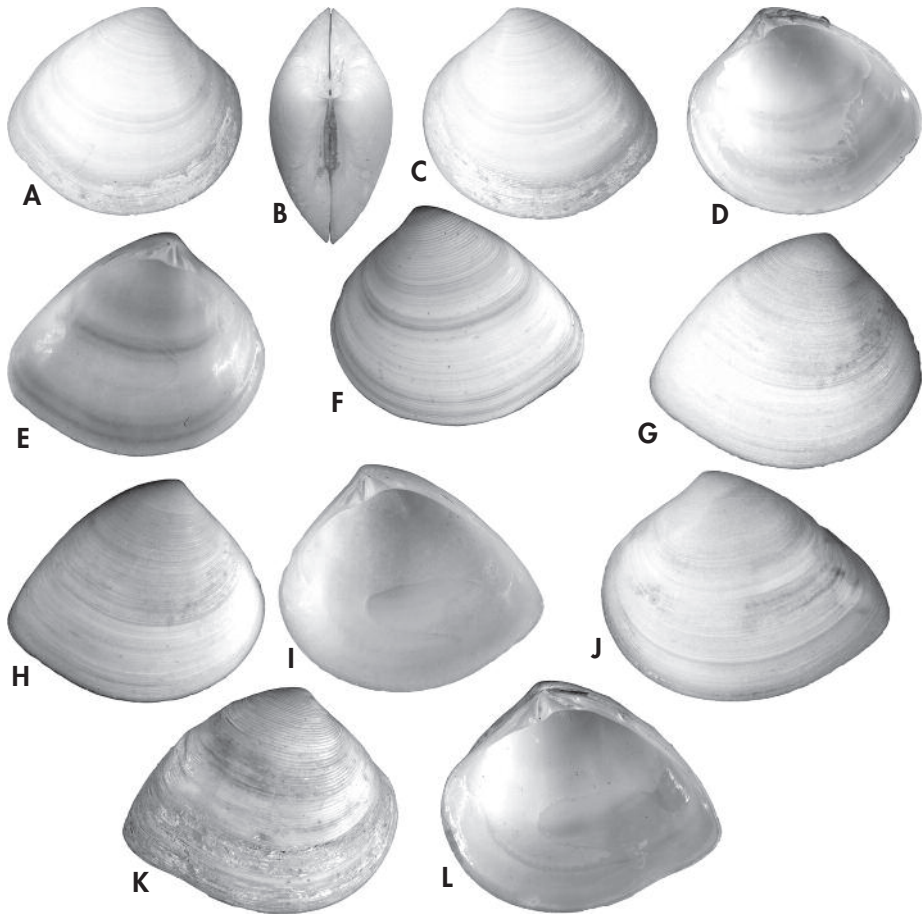


Figure 30. *Pitar* (*Costellipitar*) *cor* (Hanley, 1844). A-D: off Diembéring, S-Casamance ($12^{\circ}30.4'N$, $17^{\circ}16'W$, 21 m), dredged R/V “Louis Sauger”, leg. Cosel 27.III.1988 (15.6 mm); E, F: Pointe-Noire, Congo (Brazzaville), Plage Sauvage, beach drift, leg. Cosel XII.1985 (16.7 mm); G: Pointe-Noire, Congo (Brazzaville), Plage Mondaine, beach drift, leg. Cosel XII.1985 (22.0 mm); H, I: same locality (21.8 mm); J: same locality, 2 m (24.0 mm); K, L: Cacuaco, Bengo prov., N-Angola, 0-5 m, leg. Gofas 1982-1984 (20.6 mm).

Figura 30. *Pitar* (*Costellipitar*) *cor* (Hanley, 1844). A-D: frente a Diembéring, S-Casamance ($12^{\circ}30,4'N$, $17^{\circ}16'W$, 21 m), dragado B/O “Louis Sauger”, col. Cosel 27.III.1988 (15,6 mm); E, F: Pointe-Noire, Congo (Brazzaville), Plage Sauvage, arrojado a playa, col. Cosel XII.1985 (16,7 mm); G: Pointe-Noire, Congo (Brazzaville), Plage Mondaine, arrojado a playa, col. Cosel XII.1985 (22,0 mm); H, I: misma localidad (21,8 mm); J: misma localidad, 2 m (24,0 mm); K, L: Cacuaco, provincia de Bengo, N-Angola, 0-5 m, col. Gofas 1982-1984 (20,6 mm).

from which it had not been previously distinguished. However it differs by its more elongate shell with the umbones in a more anterior position, and its sculpture of densely spaced, fine but prominent commarginal ridges with

concave interspaces instead of finer, flatter and more close-set commarginal cords. The biotope is also different, *P. longior* being found on muddy subtidal bottoms whereas *P. cor* is found in sand close to shore.

Family PHOLADIDAE
Genus *Pholas* Linnaeus, 1758
Subgenus *Thovana* Gray, 1847

Pholas (Thovana) bissauensis Cosel & Haga n. sp. (Figure 31)

Type material: Holotype (sh, 21.2 x 9.5 x 9.5 mm, MNHN IM-2000-33770), trawled R/V "André Nizery", CHALBIS 2, haul 28, leg. Cosel 09.X.1988. Paratypes (7 sh, 16.8 x 6.1 x 5.2 mm to 18.5 x 8.0 x 8.0 mm; 2 lv, 1 rv (photo), 3 lv + 2 rv (no photo), MNHN IM-2000-33771), same data as holotype. Paratype (sh, 19 x 8.6 x 9 mm, MNHN IM -2000-33772), CHALBIS 2 haul 28D, same position.

Type locality: W of Ilha de Jeta, Guinea-Bissau (11°52'N, 16°27'W, 7 m, in compact clay).

Other material examined: Congo (Brazzaville) — Kouilou River mouth, Congo Brazzaville, 7.5-10 m, mud, in old wood pieces, 17.1 mm, commercial trawler "Kounda", leg. Cosel 17-18.XII.1985, 7 sh (9.8 x 4.8 x 4.5 to 17.0 x 7.5 x 7.6 mm), 3 lv, 4 rv. Angola — Praia São Tiago (8°38'S, 13°24.6'E, 1-2 m), leg. Gofas 1981-1982, 1 lv; Porto Alexandre, prov. Namibe, Angola, dredged 2 m, leg. Gofas, 1 lv.

Derivatio nominis: Named after the country in which the type locality is situated.

Description: Shell up to 45 mm long, very variable in length/height ratio, rather short to somewhat more elongate, inflated, gaping anteriorly and posteriorly. Anterior margin narrowly rounded, at its upper, antero-dorsal and reflected part more or less sharply bent, posterior part rounded to tapering, posterior margin broadly to more narrowly rounded. Umbones variable in position, usually at the anterior third of the valves. Umbonal reflections double, the inferior one being free on the antero-dorsal margin but firmly adhering to the umbones and the immediate posterior margin, the upper reflection linked to the lower one by about 10-14 septae.

Surface with irregular commarginal lamellae on which densely spaced corrugations are present along radial lines, most prominent on the anterior part. Pallial sinus broad. Apophysis small and rather narrow. Accessory plates not known.

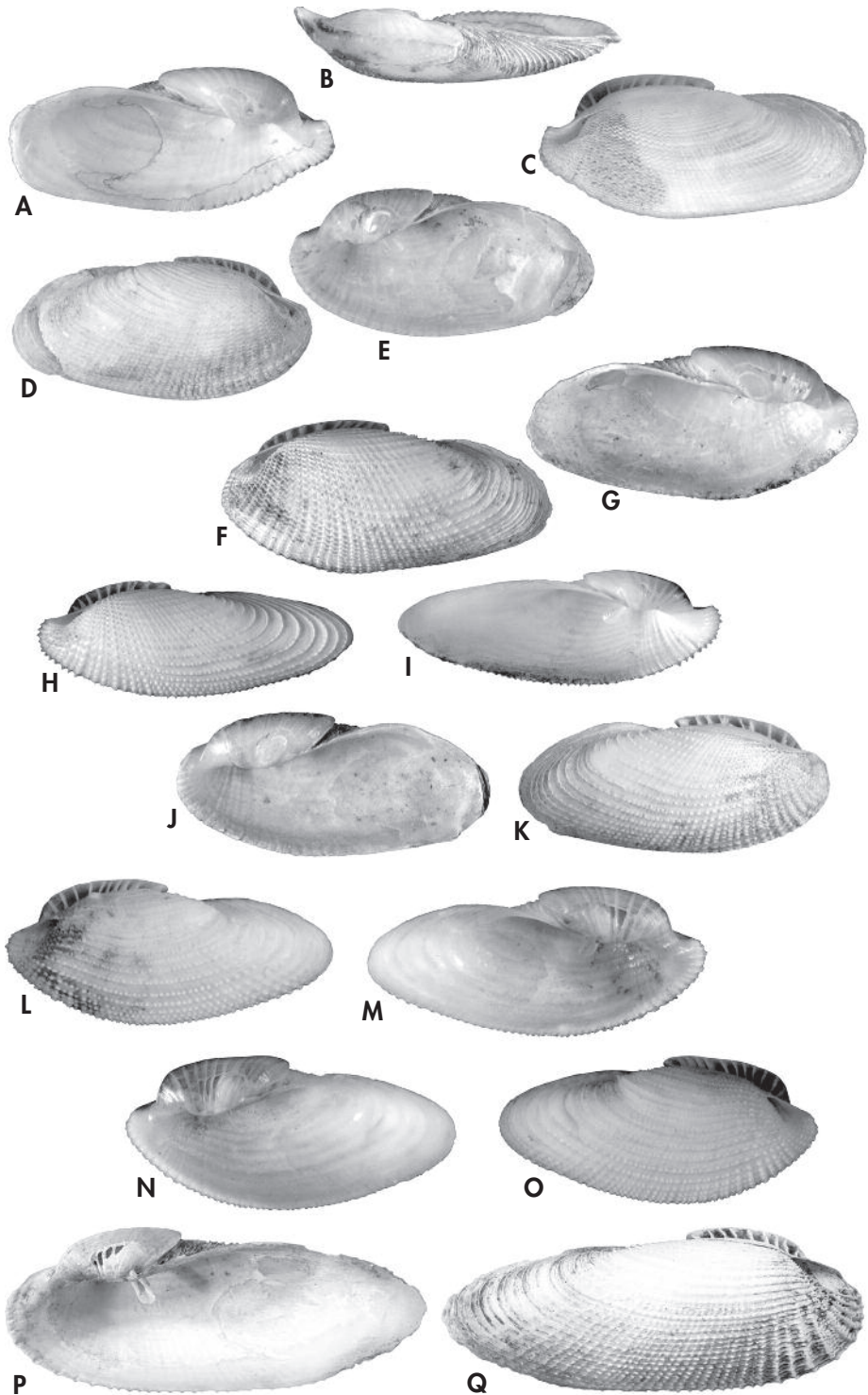
Outside and inside white.

Distribution: So far known from Guinea-Bissau, and from Congo Brazzaville to southern Angola (Porto Alexandre).

Biotope: Known to bore in firm clay and sunken and rotten wood, in shallow water, uncommon. The presence at river mouths and near estuaries indicates a certain tolerance of reduced salinities.

(Right page) Figure 31. *Pholas (Thovana) bissauensis* Cosel & Haga n. sp. A-C: holotype (sh), W of Ilha de Jeta, Guinea-Bissau (11°52'N, 18°27'W, 7 m, in firm clay), trawled R/V "André Nizery", CHALBIS 2, haul 28, leg. Cosel 09.X.1988 (lv 21.2 mm); D, E: paratype (rv), same locality (19.3 mm); F, G: paratype (lv), same locality (22.0 mm); H, I: paratype (lv), same locality (23.1 mm); J, K: paratype, same locality, dredged R/V "André Nizery", CHALBIS II haul 28D, leg. Cosel 09.X.1988 (rv, 19.0 mm); L-O: Kouilou River mouth, Congo Brazzaville, 7.5-10 m, mud, in old wood pieces, trawler "Kounda", leg. Cosel 17-18.XII.1985 (17.1 mm); P, Q: *Pholas campechiensis*, Abidjan region (no precision), Côte d'Ivoire, leg. Marche-Marchad (46.6 mm).

(Página derecha) Figura 31. *Pholas (Thovana) bissauensis* Cosel & Haga n. sp. A-C: holotipo (concha completa), W de Ilha de Jeta, Guinea-Bissau (11°52'N, 18°27'W, 7 m, en arcilla maciza), arrastre B/O "André Nizery", CHALBIS 2, col. Cosel 09.X.1988 (valva izquierda, 21,2 mm); D, E: paratipo (valva derecha), misma localidad (19,3 mm); F, G: paratipo (valva izquierda), misma localidad (22,0 mm); H, I: paratipo (valva izquierda), misma localidad (23,1 mm); J, K: misma localidad, arrastre B/O "André Nizery", CHALBIS II lance 28D, col. Cosel 09.X.1988 (valva izquierda, 19,0 mm); L-O: desembocadura del río Kouilou, Congo Brazzaville, 7,5-10 m, fango, en piezas de madera vieja, arrastrero "Kounda", col. Cosel 17-18.XII.1985 (17,1 mm); P, Q: *Pholas campechiensis*, región de Abidjan (sin precisión), Costa de Marfil, col. Marche-Marchad (46,6 mm).



Remarks: This species is distinguished from *Pholas campechiensis* by its smaller size and the shorter and more compact shell, especially by the relation of shell length to length of the upper reflection with the septae, which in *P.*

bissauensis is larger and more prominent. The sculpture on the anterior part is also different, with more densely packed radial series of corrugations, whereas in *P. campechiensis* those are rather widely spaced.

Genus *Pholadidea* Turton, 1819

Pholadidea eborensis Cosel & Haga, n. sp. (Figure 32)

Type material: Holotype (lv and part of rv, 38.6 x 19.2 x 19.0 mm, MNHN IM-2000-33773), Trou sans Fond Canyon, off Abidjan, Côte d'Ivoire (100-450 m), dredged "La Rafale" sta. 23, GTS, leg. Cherbonnier 09.IV.1964; Paratype 1: same locality (1 sh, 26.3 x 14 x 13 mm, MNHN IM-2000-33774); Paratypes 2-3: (1 lv, 49.5 x 23.3 mm; 1 rv, 51.5 x 24.2 mm, MNHN IM-2000-33775), Trou sans Fond Canyon (100-300 m), dredged R/V "Reine Pokou", leg. Le Lœuff 14.VI.1973; Paratype 4 (lv, 44.9 x 21.5 mm, MNHN IM-2000-33776), Trou sans Fond Canyon (80-150 m), dredged R/V "Reine Pokou", leg. Le Lœuff 13.II.1969.

Type locality: Trou sans Fond Canyon, off Abidjan, Côte d'Ivoire (100-450 m).

Derivatio nominis: Named after the country in which the type locality is situated.

Description: Shells up to 50 mm long (including callum), somewhat variable, elongate-rectangular, thin and brittle, inflated, anteriorly widely gaping when young, closed by callum when adult, posterior margin rounded in juvenile to subadult specimens, bluntly truncated in fully grown specimens. Umbones situated just in front of the second fourth of the valves. Umbonal reflection simple, raised, in adult specimens callum growing towards dorsally, attached also to the umbonal reflection and covering the anterior adductor. Surface of the anterior part with numerous, close-set, prominent, commarginal lamellae bearing short and small spines, posterior part with irregular, smooth lamellae and growth lines. Umbonal-ventral sulcus narrow. Posterior end extended by a tube-like siphonoplax.

Pallial sinus very broad and deep. Periostracum thin, eroded, persistent very close to the margins.

Outside and inside dirty white.

Distribution: Côte d'Ivoire, only known from the so-called "Trou sans Fond" Canyon off Vridi near Abidjan.

Biotope: Boring in mud and compact clay down to 300 m, uncommon.

Remarks: *Pholadidea eborensis* is very close to *P. loscombiana*, but it is easily distinguished by its much larger size and its slightly more elongate shape, the longer and narrower posterior part which at its posterior half is somewhat more tapering.

The species has yet been found only in the very sticky mud of the "Trou sans fond", probably in the slopes; there are no other records so far.

Barnea (Anchomasa) ghanaensis Huber, n. sp. (Figure 33)

Type material: Holotype (sh, 10.5 x 5.1 x 4.0 mm, MNHN IM-2000-33729), collected 8/2005 from fisherman's refuse, leg. Huber. Paratypes (3 sh, 1 lv, 2 rv, 10.2 x 5.0 x 4 mm to 19.2 x 8.6 x 7.5 mm, MNHN IM-2000-33730); Paratypes (4 sh, 2 lv, 2 rv, up to 19.5 x 8.7 mm) in Markus Huber's private collection; Paratypes (2 sh, 9.5 x 4.0 x 3.5 mm), Meeresmuseum Öhringen, all with the same data as the holotype.

Type locality: Ampenyi, NE of Sekondi-Takoradi, Western Ghana (5°05'N, 1°25'W, 5-10 m).

Other material examined: Angola — Praia São Tiago (8°38'S, 13°24.6'E, 1-2 m), leg. Gofas 1981-1982 (1 rv, 7.4 x 3.5 mm).

Derivatio nominis: Named after the country in which the type locality is situated.

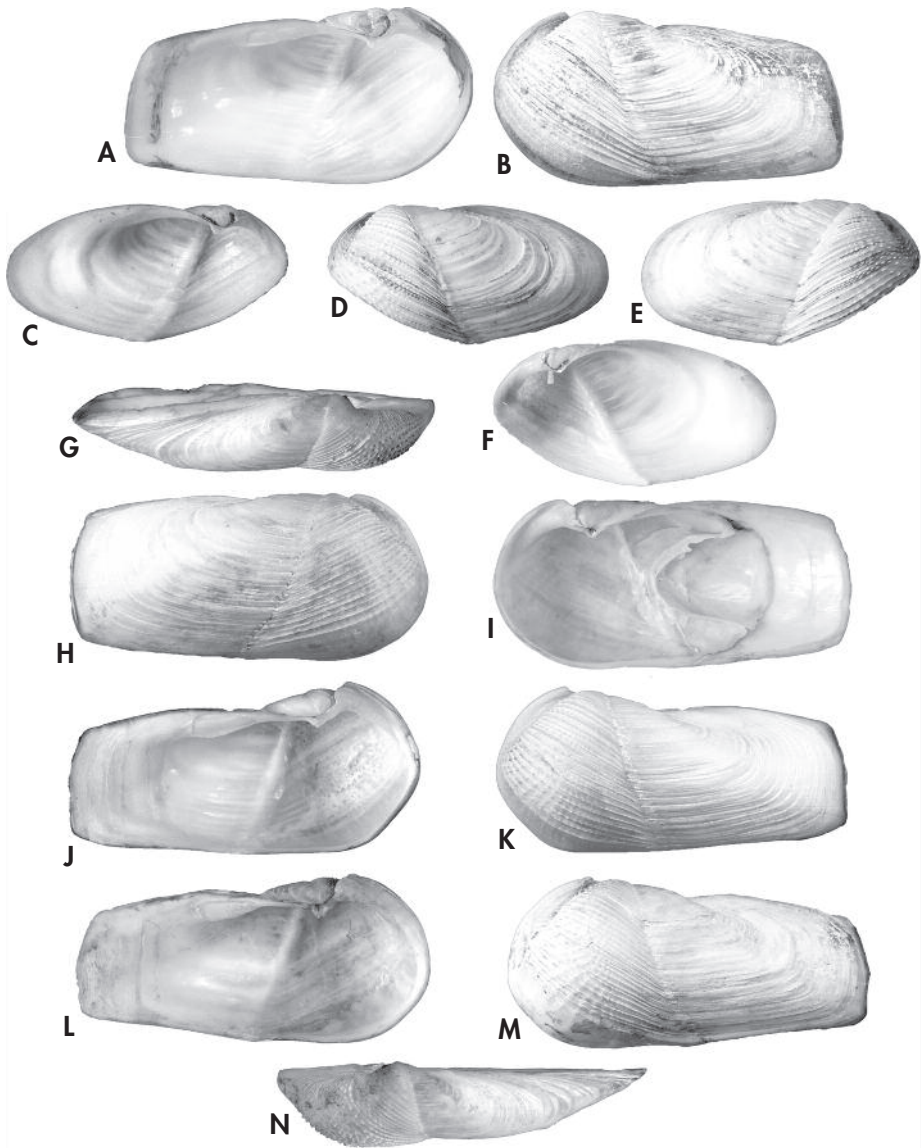


Figure 32. *Pholadidea eborensis* Cosel & Haga n. sp. A, B: holotype (sh, incomplete), Trou sans Fond Canyon, off Abidjan, Côte d'Ivoire (450-100 m), dredged "La Rafale" sta. 23, GTS. leg. Cherbonnier 09.IV.1964 (38.6 mm); C-F: same locality, paratype 1 (26.3 mm); G-I: Trou sans Fond Canyon (300-100 m), dredged R/V "Reine Pokou", leg. Le Lœuff 14.VI.1973 (51.5 mm); J, K: same locality (49.7 mm). L-N: Trou sans Fond Canyon (150-80 m), dredged R/V "Reine Pokou", leg. Le Lœuff 13.II.1969 (44.9 mm).

Figura 32. *Pholadidea eborensis* Cosel & Haga n. sp. A, B: holotipo (concha incompleta), cañón "Trou sans Fond", frente a Abidjan, Costa de Marfil (450-100 m), dragado "La Rafale" sta. 23, GTS, col. Cherbonnier 09.IV.1964 (38,6 mm); C-F: misma localidad, paratipo 1 (26,3 mm); G-I: cañón "Trou sans Fond" (300-100 m), dragado B/O "Reine Pokou", col. Le Lœuff 14.VI.1973 (51,5 mm); J, K: misma localidad (49,7 mm); L-N: cañón "Trou sans Fond" (150-80 m), dragado B/O "Reine Pokou", col. Le Lœuff 13.II.1969 (44,9 mm).

Description: Shell small, up to 20 mm long, elongate, inflated, very thin and fragile, widely gaping anteriorly and posteriorly. Anterior margin attenuate and narrowly rounded-angulate, posterior margin evenly rounded, rarely somewhat truncated in the middle. Postero-dorsal margins thin, at first distinctly directed upwards, then gently sloping downwards. Antero-ventral margin at the gape shallowly indented. Umbones in front of the vertical midline. Umbonal reflections long and simple, in their entire length free, but very close to the umbones. Surface with dense, irregular commarginal lamellae, on the anterior part strong and more lamellous, bearing short spines, on the posterior part gradually becoming somewhat weaker and more densely spaced. There are also radial ribs which cross the commarginal ridges at the spines. Apophysis long, very narrow and delicate. Accessory plate (protoplax) elongate, rounded anteriorly, bilobed posteriorly. Periostracum not observed.

Outside and inside white.

Distribution: Known only from Ghana (western part, NE of Secondi-Takoradi) and one valve from N-Angola (Praia São Tiago, Bengo Prov.)

Biotope: Found boring in red sandstone, from 5-10 m, locally common.

Remarks: The genus *Barnea* is characterized by having a simple (non-septate) umbonal reflection, a single anterodorsal accessory plate (protoplax), lanceolate in shape and long, thin internal apophyses; the subgenus *Anchomasa* us furthermore characterized by a very large pedal gape.

The new species is most close to the type species of the subgenus, *B. (A.) parva*, but the sculpture is more uniformly distributed over the whole shell,

whereas the sculpture in *B. parva* is stronger anteriorly, fading posteriorly. The radial ribs are also stronger in the new species. The umbonal reflection is detached throughout, whereas in *B. parva* it tends to be appressed posteriorly. Finally, a differential character is found in the postero-dorsal margin, which slopes markedly upwards just behind the umbone, marking a distinct notch in the dorsal profile, whereas this is not seen in *B. parva*. The specimens from the Pliocene of the Netherlands illustrated by JANSSEN, PEETERS & VAN DER SLIK (1984: pl. 91 fig. 228a-b; illustration reproduced by MONARI, 2009: Fig. 6C) are more similar, with respect to outline and sculpture, to the modern West African species than to Pleistocene *Barnea parva* from the Mediterranean (MONARI, 2009: fig. 6D) and extant *Barnea parva* from the European coast.

Barnea ghanaensis is readily distinguished from *B. (A.) truncata* by its much smaller size, the more elongate shape with rounded, not truncated, posterior margin, the much finer sculpture, and the fine and narrow apophysis. The umbones are placed less forward, and the anterior part is narrower than in *B. truncata*.

In contrast to *B. (A.) truncata*, *B. (A.) ghanaensis* lives in hard sandstone; it is as of yet only known from the two localities Ghana and N-Angola.

Another *Barnea (Anchomasa)* was recently discovered on the coast of West Sahara (HUBER, 2010; 2015). Like *B. (A.) ghanaensis*, it has a rounded posterior margin but is larger and somewhat more elongate. In contrast to *B. (A.) ghanaensis*, it was found in shallow muddy bottom; it is figured in ARDOVINI & COSSIGNANI, 2004, p. 292. Because of lack of sufficient material, it will not be named for the moment.

ACKNOWLEDGEMENTS

The authors thank Tom Schiøtte for the loan of specimens of *Kurtiella* collected by "Atlantide" expedition and housed in Zoologisk Museum, Copen-

hagen, Takuma Haga (now at Science Museum, Tokyo) for his collaboration in the description of two pholadid species and Markus Huber for entrusting us the

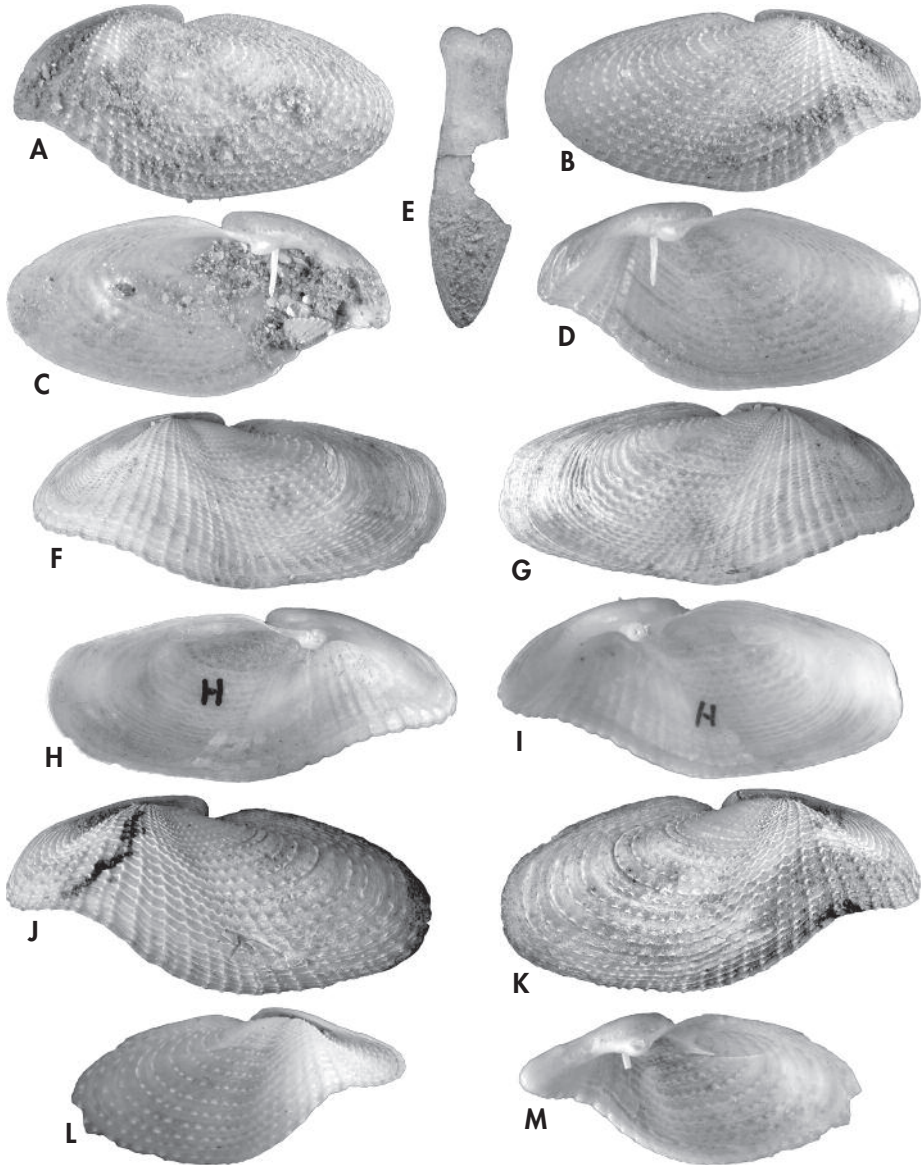


Figure 33. *Barnea (Anchomasa) ghanaensis* Huber, n. sp. A-D: holotype (sh), Ampenyi, NE of Sekondi-Takoradi, Western Ghana ($5^{\circ}05'N, 1^{\circ}25'W$, 5-10 m), from fisherman, leg. Huber (10.5 mm); E: protopecten of the holotype (4.8 mm, not to scale; posterior end upwards); F-I: same locality, paratype 1 MNHN (19.2 mm); J, K: same locality, paratype 2 MNHN (13.6 mm); L, M: Right valve from Praia São Tiago, Bengo prov., N-Angola, sandy bottom, 1-2 m, leg. Gofas 1981-1982 (7.4 mm).

Figura 33. Barnea (Anchomasa) ghanaensis Huber, n. sp. A-D: holotipo (concha completa), Ampenyi, NE de Sekondi-Takoradi, Ghana occidental ($5^{\circ}05'N, 1^{\circ}25'W$, 5-10 m), por pescador, col. Huber (10,5 mm); E: protopecten del holotipo (4,8 mm, no está a escala; el extremo posterior hacia arriba); F-I: misma localidad, paratipo 1 MNHN (19,2 mm); J, K: misma localidad, paratipo 2 MNHN (13,6 mm); L, M: Valva derecha de Praia São Tiago, provincia de Bengo, N-Angola, fondo arenoso, 1-2 m, col. Gofas 1981-1982 (7,4 mm).

publication of his description of *Barnea ghanaensis*. Drawings for figures 3, 7, 10, 21 and 23 were prepared by Catherine Vachelot with funding from IRD. Photographs for Figure 16 were taken by Manuel Caballer, as part of a project for

digitization of molluscan types in MNHN. Scanning Electron Micrographs were taken in the central support services for research at the University of Malaga, with the help of Gregorio Martin Caballero.

BIBLIOGRAPHY

- APARICI-SEGUER V., ROWLAND R.A., TAYLOR S. & GARCÍA-CARRASCO A.M. 1996. Molluscos infralitorales de la playa de Pinedo-El Saler (Valencia, Mediterráneo Occidental). *Iberus*, 14 (2): 93-100.
- BERNASCONI M.P., STANLEY D.J. & DI GERONIMO I. 1991. Molluscan faunas and paleobathymetry of Holocene sequences in the northeastern Nile delta, Egypt. *Marine Geology*, 99 (1-2): 29-43.
- BRUNETTI M.M. & DELLA BELLA G. 2003. Due nuovi bivalvi per il Pliocene italiano. *La Conchiglia*, 306: 15-19.
- CHEMNITZ J.H. 1795. *Neues systematischen Conchylien Cabinet*. Gabriel Nicolaus Raspe, Nürnberg. vol. 11, [xx] + 310 pp., pl. 174-213.
- COSEL R. VON 1989. Taxonomy of tropical West African bivalves I. Four new species of eulamellibranch bivalves. *Bulletin du Muséum National d'Histoire Naturelle*. (4) 11, sect. A (2): 315-331.
- COSEL R. VON 1990. Taxonomy of tropical West African bivalves. II. Psammobiidae. *Bulletin du Muséum National d'Histoire Naturelle*, (4) 11, sect. A, (4): 693-731.
- COSEL R. VON 1993. The razor shells of the eastern Atlantic. Part 1: Solenidae and Phariidae I (Bivalvia: Solenacea). *Archiv für Molluskenkunde*, 122 (Zilch Festschrift): 207-321.
- COSEL R. VON 1995. Fifty-one new species of marine bivalves from tropical West Africa. *Iberus*, 13 (1): 1-115.
- COSEL R. VON 2006. Taxonomy of tropical West African bivalves. VI. Remarks on Lucinidae (Mollusca, Bivalvia), with description of six new genera and eight new species. *Zoosystema*, 28 (4): 805-851.
- COSEL R. VON & SALAS C. 2001. Vesicomomyidae (Mollusca: Bivalvia) of the genera *Vesicomomya*, *Waisiuconcha*, *Isorropodon* and *Callogonia* in the Eastern Atlantic and the Mediterranean. *Sarsia*, 86 (4-5): 333-366.
- CHAREF A., LANGAR N.Z. & GHARSALLAH I.H. 2012. Stock size assessment and spatial distribution of bivalve species in the Gulf of Tunis. *Journal of the Marine Biological Association of the United Kingdom*, 92 (1): 179-186.
- COLLIGNON J. 1960. Observations faunistiques et écologiques sur les Mollusques testacés de la baie de Pointe-Noire (Moyen-Congo). *Bulletin de l'Institut Français d'Afrique Noire*, 23, sér. A (2): 411-464.
- CROCETTA F., RENDA W. & COLAMONACO G. 2009. New distributional and ecological data of some marine alien molluscs along the southern Italian coasts. *Marine Biodiversity Records*, 2: e23.
- DALL W.H. 1895. Synopsis of a review of the genera of Recent and Tertiary Macridae and Mesodesmatidae. *Proceedings of the Malacological Society of London*, 1 (5): 203-213.
- DAUTZENBERG P. 1912. Mission Gruvel sur la côte occidentale d'Afrique (1909-1910): Mollusques marins. *Annales de l'Institut Océanographique*, Paris, (Nouvelle Série) 5 (3): 1-111, pl. 1-3.
- DOMAIN F. & BAH M.O. 1993. *Carte sédimentologique du plateau continental guinéen à 1: 200 000*. Edition de l'ORSTOM, Institut Français de Recherche Scientifique pour le Développement en Coopération, Collection Notice Explicative n° 108. 15 pp.
- DOWIDAR N.M. & HASAN A.K. 1973. Notes on the bivalve and gastropod fauna in the region of Abou Kir Bay (Alexandria). *Rapports et Procès-Verbaux des Réunions, Commission Internationale pour l'Exploration Scientifique de la Mer Méditerranée, Monaco*, 22 (4): 71-72.
- ELOUARD P. & ROSSO J.C. 1977. Biogéographie et habitat des Mollusques actuels lagunomars du delta du Saloum (Senegal). *Geobios*, 10 (2): 275-296.
- FERRERO E., MERLINO B. & PROVERA A., 1997. Malacofauna Plioceniche astigiane concentrata da eventi ad alta energia. *Bollettino Malacologico*, 33 (1-4): 43-57.
- GLOVER E.A. & TAYLOR J.D. 2010. Needles and pins: acicular crystalline periostracal calcification in venerid bivalves (Bivalvia: Veneridae). *Journal of Molluscan Studies*, 76 (2): 157-179.
- GOFAS S., MORENO D. & SALAS C. 2011. *Moluscos marinos de Andalucía: II. Clase Gastropoda (Heterobranchia), clase Bivalvia, clase Scaphopoda, clase Cephalopoda, glosario e índices*. Servicio de Publicaciones e Intercambio Científico, Universidad de Málaga, Málaga. pp. i-xii, 343-798.

- GOFAS S. & SALAS C. 2016. *Kurtiella* (Bivalvia, Montacutidae) in West Africa. *Iberus*, 34 (1): 63-78
- GORDON C. 2000. Hypersaline lagoons as conservation habitats: macro-invertebrates at Muni Lagoon, Ghana. *Biodiversity & Conservation*, 9 (4): 465-478.
- HERNÁNDEZ J.M., ROLÁN E., SWINNEN F., GÓMEZ R. & PÉREZ J.M. 2011. *Moluscos y conchas marinas de Canarias*. ConchBooks, Hackenheim. 716 pp.
- HONKOOP P.J., BERGHUIS E.M., HOLTHUIJSEN S., LAVALEYE M.S. & PIERSMA T. 2008. Molluscan assemblages of seagrass-covered and bare intertidal flats on the Banc d'Arguin, Mauritania, in relation to characteristics of sediment and organic matter. *Journal of Sea Research*, 60 (4): 255-263.
- HUBER M. 2010. *Compendium of bivalves. A full-color guide to 3,300 of the world's marine bivalves. A status on Bivalvia after 250 years of research*. Hackenheim: ConchBooks. 901 pp., 1 CD-ROM.
- HUBER M. 2015. *Compendium of bivalves 2*. Harxheim: ConchBooks. 907 pp., 1 CD-ROM
- HUBER M., LANGLEIT A. & KREIPL K. 2015. Tellinidae. In Huber M. (Ed): *Compendium of bivalves 2*. Harxheim, ConchBooks: 167-297, 564-749
- JANSSEN, A.W., PEETERS, G.A. & VAN DER SLIK, L. 1984. De fossiele schelpen van de Nederlandse stranden en zeegaten, tweede serie, 8 (slot). *Basteria* 48: 91-219.
- KEEN A.M. 1969. Superfamily Tellinacea. Pp. N613-N643, In Moore R.C. (Ed.): *Treatise on Invertebrate Paleontology, Part N: Mollusca 6, Bivalvia*. Geological Society of America and University of Kansas Press, Lawrence.
- KEEN A.M. 1971. *Sea Shells of Tropical West America. Marine mollusks from Baja California to Peru*, ed. 2. Stanford University Press. xv + 1064 pp., 22 pls.
- KILBURN R.N. 2000. Family Veneridae in South-East Asia. *Phuket Marine Biological Center Special Publication*, 21 (3): 627-637.
- KILBURN R.N. & RIPPEY, E. 1982. *Sea Shells of Southern Africa*. Macmillan South Africa, Johannesburg, xi + 249 pp.
- KORANTENG K.A., OFORI-DANSON P.K. & ENTUSA-MENSAH M. 2000. Fish and fisheries of the Muni lagoon in Ghana, West Africa. *Biodiversity and Conservation*, 9 (4): 487-499.
- LAMY E. 1917-1918. Révision des Mactridae vivants du Muséum national d'Histoire Naturelle de Paris. *Journal de Conchyliologie*, 63 (3): 173-275 [1917]; 63 (4): 291-411 [1918].
- LE LŒUFF P. & COSEL R. VON 1998. Biodiversity patterns of the marine benthic fauna on the Atlantic coast of tropical Africa in relation to hydroclimatic conditions and paleogeographic events. *Acta Oecologica*, 19 (3): 309-321.
- LE LŒUFF P. & INTES A. 1993. La faune benthique du plateau continental de Côte-d'Ivoire. In Le Lœuff P., Marchal E. & Amon-Cothias J.B. (Eds.): *Environnement et ressources aquatiques de Côte-d'Ivoire*. Tome 1: Le milieu marin. Editions de l'ORSTOM: 195-236.
- LE LŒUFF P., KONAN J., ZABI G.S. & COSEL R. VON 2000. L'écosystème benthique au large de Grand-Bassam (Côte-D'ivoire). Situations comparées en saisons froides 1969 et 1998 (résultats de la campagne BENCHACI, 15-17 août 1998). *Document Scientifique et Technique du Centre IRD de Bretagne*, 85: 1-45.
- MACANDREW R. 1851. Notes on the distribution and range in depth of Mollusca and other marine animals observed on the coast of Spain, Portugal, Barbary, Malta, and Southern Italy in 1849. *Report of the 20th meeting of the British Association for the Advancement of Science*: 264-304.
- MARRINER N., MORHANGE C., BOUDAGHER-FADEL M., BOURCIER M. & CARBONEL P. 2005. Geoarchaeology of Tyre's ancient northern harbour, Phoenicia. *Journal of Archaeological Science*, 32 (9): 1302-1327.
- MARRINER N., GOIRAN J. P. & MORHANGE C. 2008. Alexander the Great's timbolas at Tyre and Alexandria, eastern Mediterranean. *Geomorphology*, 100 (3): 377-400.
- MARTIN D., NYGREN A., HJELMSTEDT P., DRAKE P. & GIL J. 2015. On the enigmatic symbiotic polychaete '*Parasyllidea humesi* Pettibone, 1961 (Hesionidae): taxonomy, phylogeny and behaviour. *Zoological Journal of the Linnean Society*, 174 (3): 429-446.
- MICHEL J., WESTPHAL H. & COSEL R. VON 2011. The mollusk fauna of soft sediments from the tropical, upwelling-influenced shelf of Mauritania (northwestern Africa). *Palaios*, 26 (7): 447-460.
- MONARI S. 2009. Phylogeny and biogeography of pholadid bivalve *Barnea* (Anchomasa) with considerations on the phylogeny of Pholadoidea. *Acta Palaeontologica Polonica*, 54 (2): 315-335.
- NICKLÈS M. 1950. *Mollusques testacés marins de la côte occidentale d'Afrique. Manuels Ouest-Africains*. Vol. 2. Lechevalier, Paris, 269 pp.
- NICKLÈS M. 1952. Mollusques du Quaternaire marin de Port-Gentil (Gabon). *Bulletin de la Direction des Mines et de la Géologie d'Afrique Equatoriale Française*, 5: 76-101.
- NICKLÈS M. 1955. Scaphopodes et Lamelli-branches récoltés dans l'Ouest Africain. *Atlantide Report. Scientific Results of the Danish Expedition to the Coasts of Tropical West Africa 1945-1946*, 3: 93-237.
- NIKIFOROS G. 2002. *Fauna del Mediterraneo*. Giunti, Firenze. 372 pp.
- NOBRE A. 1931. *Moluscos Marinhos de Portugal*. Instituto de Zoologia da Universidade do Pôrto, Pôrto, 466 pp., pls. 13-80.

- OLIVER P.G. & COSEL R. VON 1992a. Taxonomy of tropical West African bivalves: IV. Arcidae. *Bulletin du Muséum National d'Histoire Naturelle*: (4) 14, sect. A (2): 293-381.
- OLIVER P.G. & COSEL R. VON 1992b. Taxonomy of tropical West African Bivalves. V. Noetiidae. *Bulletin du Muséum National d'Histoire Naturelle*: (4) 14, sect. A (3-4): 655-691.
- OLIVER P.G. & ZUSCHIN M. 2001. Minute Veneridae and Kelliellidae from the Red and Arabian Seas with a redescription of *Kellia mihiacea* Issel, 1869. *Journal of Conchology*, 37 (2): 213-230.
- OLSSON A.A. 1961. *Mollusks of the tropical eastern Pacific, particularly from the southern half of the Panamic-Pacific faunal province (Panama to Peru)*. Panamic-Pacific Pelecypoda. Paleontological Research Institution, Ithaca. 574 pp, 86 pl.
- RAFFI S., STANLEY S.M. & MARASTI R. 1985. Biogeographic patterns and Plio-Pleistocene extinction of Bivalvia in the Mediterranean and southern North Sea. *Paleobiology*, 11 (4): 368-388.
- REEVE L.A. 1842. Monograph of *Crassatella*, a genus of Acephalous Mollusks (Family Macrtracea). *Proceedings of the Zoological Society of London*, 10, for 1842: 42-46.
- REEVE L.A. 1843. Monograph of the genus *Crassatella*. In *Conchologia Iconica*, vol. 1, pl. 1-3 and unpaginated text. L. Reeve & Co., London.
- ROCHEBRUNE A.T. 1882. Matériaux pour la faune de l'Archipel du Cap Vert. *Nouvelles Archives du Muséum National d'Histoire Naturelle*, (2) 4: 215-340, pls. 17-19.
- RÖMER E. 1869. *Monographie der Molluskengattung Venus, Linné.1. Band: subgenus Cytherea Lamarck*. Cassel, Th. Fischer, 126 p., 32 pl.
- SALAS C. & COSEL R. VON 1991. Taxonomy of tropical West African bivalves III. Four new species of Condylocardiididae from the continental shelf. *Bulletin du Muséum National d'Histoire Naturelle*, (4) 13, sect. A (3-4): 263-281.
- SCAPERROTTA M., BARTOLINI, S. & BOGI C. 2013. *Accrescimenti, stadi di accrescimento dei molluschi marini del Mediterraneo*. L'Informatore Picensi, Cupra Marittima. Volume 5, 192 pp.
- SIGNORELLI J.H. 2012. The molluscan genera *Mactrella* and *Mactrinula*: Taxonomic revision and redescription of type species. *Malacologia*, 55 (2): 191-202.
- SIGNORELLI J.H. & CARTER J.G. 2016. The Anatinellidae and Kymatoxinae: A Reassessment of Their Affinities within the Superfamily Mactroidea (Mollusca, Bivalvia). *American Malacological Bulletin*, 33 (2): 204-211.
- SIGNORELLI J.H. & PASTORINO G. 2011. Revision of the Magellanic Mactridae Lamarck, 1809 (Bivalvia: Heterodonta). *Zootaxa*, 2757: 47-67.
- SIGNORELLI J.H. & PASTORINO G. 2012a. Taxonomic revision of Brazilian Mactridae Lamarck, 1809 (Bivalvia: Cardiida). *Zootaxa*, 3245: 30-53.
- SIGNORELLI J.H. & PASTORINO G. 2012b. Revision of the living Mactridae (Bivalvia: Autobranchia) from Northern Argentina and Uruguay. *American Malacological Bulletin*, 30 (1): 85-101.
- SMITH E.A. 1885. Report on the Lamellibranchiata collected by HMS Challenger during the years 1873-1876. *Reports of the scientific results of the voyage of H.M.S. "Challenger"*, *Zoology*, 13 (part 35): 1-341, pl. 1-25.
- SOWERBY G.B. 1851. Monograph of the Genus *Cytheraea*. In Sowerby G.B. (Ed.): *Thesaurus Conchyliorum*, 2: 611-648, pls. 127-136. G.B. Sowerby, London.
- STANLEY J.-D. 2007. *Geoarchaeology: Underwater Archaeology in the Canopic Region in Egypt*. Oxford, Oxbow books, xiv + 128 p.
- STOLICZKA F. 1870-1871. The Pelecypoda, with a review of all known genera of this class, fossil and recent. In Oldham T. (Ed.): *Paleontologia Indica*, being figures and descriptions of the organic remains procured during the progress of the Geological Survey of India. Cretaceous Fauna of Southern India. Volume 3. *Memoirs of the Geological Survey of India, Calcutta*. pp. i-xxii, 1-537, pl. 1-50 [pp. 1-222, pl. 1-12 (1870); pp. i-xxii, 223—537, pl. 23-50 (1871)].
- TAMAYO GOYA J.C. 2008. Catalogo de los bivalvos marinos del sector central del Golfo de Valencia. *Iberus*, 26 (1): 69-80.
- TOMLIN J.R. LE B. & SHACKLEFORD, L.J. 1914-1915. The Marine Mollusca of São Thomé, I. *Journal of Conchology*, 14 (8): 239-256 [1914], 14 (9): 267-276 [1915].
- ZENETOS A. 1997. Diversity of marine Bivalvia in Greek waters: effects of geography and environment. *Journal of the Marine Biological Association of the United Kingdom*, 77 (2): 463-472.
- ZENETOS A., VARDALA-THEODOROU E. & ALEXANDRAKIS C. 2005. Update of the marine Bivalvia Mollusca checklist in Greek waters. *Journal of the Marine Biological Association of the United Kingdom*, 85 (4): 993-998.