

Taxonomy of tropical West African bivalves. VI. Remarks on Lucinidae (Mollusca, Bivalvia), with description of six new genera and eight new species

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ABSTRACT

Thirteen species of Lucinidae from continental shelf, slope and bathyal habitats off tropical West Africa are treated. Six genera and eight species are described as new: *Lamylucina exgaini* n. gen., n. sp. from the infralittoral, *Tinalucina aequatorialis* n. gen., n. sp. from the circalittoral W of Bioko (Fernando Poo) Island, *Afrolucina discontinua* n. gen., n. sp. from the lower shelf and upper slope (circalittoral), *Lucinoma atalantae* n. sp. from the bathyal of the Cape Verde Basin off Mauritania (2000 m), *Lucinoma myriamae* n. sp., *Graecina karinae* n. gen., n. sp. and *Joellina dosiniiformis* n. gen., n. sp. from reducing sediments on the slope off northern Angola and *Divaricella (Egracina) chavani* n. sp. from the infralittoral zone. Furthermore, a new genus, *Falsolucinoma* n. gen. is introduced for *Lucina leloeuffi* Cosel, 1989. Two species of *Anodontia* Link, 1807, recently described, are re-included here. *Lucinoma vestita* (Dautzenberg & Fischer, 1906) from the upper slope (600 m) at Cape Verde Islands is rediscussed. Like many other West African species, the more littoral *Afrolucina discontinua* n. gen., n. sp. and *Divaricella (E.) chavani* n. sp. show distribution gaps along the West African coast and thus fall into the context of the hydrographical conditions of this coast.

KEY WORDS

Mollusca,
Bivalvia,
Lucinidae,
tropical West Africa,
deep-sea,
zoogeography,
chemosymbionts,
new genera,
new species.

RÉSUMÉ

Taxonomie de bivalves d'Afrique occidentale tropicale. VI. Remarques sur des Lucinidae (Mollusca, Bivalvia), avec description de six genres nouveaux et huit espèces nouvelles.

Sont traitées 13 espèces de Lucinidae du plateau continental, du talus et de l'abysal au large de la côte d'Afrique occidentale tropicale. Six genres sont introduits et huit espèces nouvelles sont décrites: *Lamylucina exgaini* n. gen., n. sp. de l'infra-littoral, *Tinalucina aequatorialis* n. gen., n. sp. du circa-littoral Ouest de l'île de Bioko (Fernando Poo), *Afrolucina discontinua* n. gen., n. sp. du plateau inférieur et du talus supérieur (circa-littoral), *Lucinoma atalantae* n. sp. du bathyal du Bassin du Cap-Vert au large de la Mauritanie (2000 m), *Lucinoma myriamae* n. sp., *Graecina karinae* n. gen., n. sp. et *Joellina dosiniformis* n. gen., n. sp. des sédiments réducteurs sur le talus au large du Nord de l'Angola, et *Divaricella (Egracina) chavani* n. sp. de la zone infra-littorale. De plus, *Falsolucinoma* n. gen. est introduit pour *Lucina leloeuffi* Cosel, 1989. Deux espèces du genre *Anodontia* Link, 1807, récemment décrites, sont incluses ici. *Lucinoma vestita* (Dautzenberg & Fischer, 1906) du talus supérieur (600 m) des Îles du Cap-Vert est rediscuté ici. Comme beaucoup d'autres espèces ouest-africaines, les espèces *Afrolucina discontinua* n. gen., n. sp. et *Divaricella (E.) chavani* n. sp. provenant du littoral et du plateau continental présentent des discontinuités de distribution le long de la côte ouest-africaine, ainsi rentrent-elles dans le contexte des conditions hydrographiques de cette côte.

MOTS CLÉS

Mollusca,
Bivalvia,
Lucinidae,
Afrique occidentale tropicale,
eaux profondes,
zoogéographie,
chémysymbiontes,
genres nouveaux,
espèces nouvelles.

INTRODUCTION

The Lucinidae are among the six bivalve families which are presently known as being chemosymbiotic (Schweimanns & Felbeck 1985; Taylor & Glover 2000; Glover *et al.* 2004); the other families being Vesicomidae, Solemyidae, members of the family Mytilidae (e.g., the genera *Bathymodiolus* Kenk & Wilson, 1985; *Gigantidas* Cosel & Marshall, 2003; and *Tamu* Gustafson, Turner, Lutz & Vrijenhoek, 1998), Thyasiridae and Teredinidae (see Cavanaugh 1983; Felbeck 1983; Reid & Brand 1986; Fisher 1990; Reid 1990; Distel & Roberts 1997; Williams *et al.* 2004 and further references cited therein). Lucinid species host chemoautotrophic sulphide-oxidizing bacteria in their gills. They inhabit a large array of biotopes in depths between the intertidal zone and more than 2000 m and are mostly associated with dysaerobic habitats: reducing sediments, often with concentrations of sunken wood and other plant debris, anoxic black mud, mangrove areas, dense

roots of seagrass beds (see Glover & Taylor 1997), cold seeps (Okutani & Hashimoto 1997; Salas & Woodside 2002; this paper) and even hydrothermal vents (Glover *et al.* 2004). Although lucinid species are able to feed on particles (Reid & Slack-Smith 1998), a large part of their nutrition is derived from endosymbiotic bacteria (Taylor & Glover 2000). This endosymbiosis is a major reason for the current focus of interest in the biology of Lucinidae, and, as a consequence, the systematics and taxonomy of this interesting family attract bivalve researchers and are the subjects of several recent publications.

The Lucinidae are a much more diverse family than previously thought. The number of Recent species was estimated at about 250 (Boss 1971), and that still was the "state of the art" when the last major systematic revision of the family was published by Bretsky (1976). However, during the last decade, many new species, subgenera and genera have been described, mostly but not exclusively from the Indo-West Pacific biogeographical province, from both

shallow water (Taylor & Glover 1997a, b, 2002, 2005; Glover & Taylor 1997, 2001; Glover *et al.* 2003), and deep water (Okutani & Hashimoto 1997; Salas & Woodside 2002; Bouchet & Cosel 2004; Glover *et al.* 2004; Cosel & Bouchet unpubl. data). Many of these deep water species are unexpectedly large. Additionally, a considerable number of other species still remains to be named. So, it seems very unlikely that the statement of Dall (1901), that Lucinoidea were more species-rich during the Tertiary than in the Recent, can be supported: the actual number of Recent species is now estimated at more than 500, the number of fossil, now extinct species may be in the same order.

After the publication of most of the then undescribed marine bivalve species of tropical West Africa (Cosel 1989, 1990, 1993, 1995; Cosel & Salas 2001; Oliver & Cosel 1993a, b; Salas & Cosel 1991; Salas & Rolan 1991) in preparation of an identification guide, some new taxa remain undescribed, among others in the family Lucinidae. Furthermore, several unknown and mostly large Lucinidae were discovered during recent oceanographic expeditions, most of them from deep water habitats. Thirty-two species of Lucinidae are now known from tropical West African waters, they are listed in Appendix. It is remarkable that also in the Mediterranean, a large lucinid bivalve was discovered and described only very recently (*Lucinoma kazani* Salas & Woodside, 2002).

In this paper, six new genera are introduced and eight new species described, among them, one well known species in clarification of an unclear taxonomic situation. Four of the species treated here are large species from deep water. Moreover, five other species are redescribed in detail and placed in the context of our present knowledge of the Lucinidae.

ABBREVIATIONS

BMNH	The Natural History Museum, London;
IRD	Institut de Recherche pour le Développement, Paris (formerly ORSTOM);
IRSNB	Institut royal des Sciences naturelles de Belgique, Brussels;
MNHN	Muséum national d'Histoire naturelle, Paris;
MOM	Musée océanographique, Monaco;
ZMC	Universitets Zoologisk Museum, Copenhagen;
lv.	left valve;
rv.	right valve;

sh.	dead-collected bivalve specimen;
spm	live-collected specimen;
v.	single valve.

SYSTEMATICS

Order VENEROIDA

H. Adams & A. Adams, 1856

Superfamily LUCINOIDEA Fleming, 1828

Family LUCINIDAE Fleming, 1828

Genus *Lamylucina* n. gen.

TYPE SPECIES. — *Phacoides (Lucinoma) gaini* Lamy, 1920.

SPECIES INCLUDED. — *Lamylucina gaini* (Lamy, 1920) n. comb.; *Lamylucina exgaini* n. sp.

ETYMOLOGY. — In memory of Édouard Lamy, who was the first "modern" revisor of Lucinidae and who described the type species of this genus.

DISTRIBUTION. — Tropical West Africa.

DIAGNOSIS. — Shells small, up to 20 mm, subcircular to circular, very compressed. Beaks small, almost median or slightly in front of the vertical midline. Surface with fine, more or less widely spaced to contiguous commarginal ridges or lamellae, some of them becoming more or less lamellate on the antero- and postero-dorsal margin. Posterior area delimited by a shallow radial depression. Lunule very short and broad, escutcheon very long and narrow. Inner margin smooth. Hinge with one small cardinal tooth in the right valve and two in the left valve, often very weak to almost obsolete. No lateral teeth. Ventral prolongation of the anterior adductor scar rather long but small and narrow.

REMARKS

This genus is distinguished from other Lucinidae by the extremely flat valves, the long but narrow diverging part of the anterior adductor scar, the small umbo, the regular commarginal sculpture and the more or less leafy prolongations of the commarginal ridges on the dorsal margin. The most closely similar genus may be *Lamellolucina* Taylor & Glover, 2002, which has more tumid shells, more widely spaced lamellae, a crenulate margin and a shorter diverging part of the anterior adductor scar. That genus is mainly Indo-Pacific with *L. reyrei* (Nicklès, 1955) being the only tropical West African species.

TABLE 1. — *Lamylucina gaini* (Lamy, 1920) n. comb.: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
15.2 × 14.7	Bissagos, lectotype	1.0
15.0 × 15.2	Guinea, SEDIGUI, stn 362	1.0
15.0 × 14.2	Guinea, SEDIGUI, stn 82	1.1
14.9 × 13.6	Guinea, SEDIGUI, stn 277	1.1
14.6 × 13.6	Guinea, SEDIGUI, stn 154	1.1
14.2 × 13.9	Guinea, SEDIGUI, stn 277	1.0
13.4 × 13.3	Bissagos, paralectotype 1	1.0
12.6 × 11.4	Guinea, SEDIGUI, stn 367	1.1
12.0 × 10.9 × 3.6	Guinea, SEDIGUI, stn 368	1.1
11.8 × 11.4	Bissagos, paralectotype 2	1.0
8.9 × 8.1	Equatorial Guinea	1.1
8.2 × 7.8	Principe, <i>Calypso</i> , 1956, stn P 7	1.1
8.1 × 7.4	Principe, <i>Calypso</i> , 1956, stn P 14	1.1
8.0 × 7.3	Bissagos, paralectotype 3	1.1
7.3 × 7.1	Principe, <i>Calypso</i> , 1956, stn P 14	1.0

Lamylucina gaini (Lamy, 1920) n. comb.
(Figs 1; 2A; 4)

Phacoides (Lucinoma) gaini Lamy, 1920: 192-194.

TYPE MATERIAL. — The material present in MNHN on which the description of *L. gaini* n. comb. is based were not specifically designated as types, it consists of three right valves and one left valve from the Bissagos Archipelago (Guinea-Bissau) and one left valve from Conakry (Guinea), these were to be considered as syntypes. As Lamy (1920) did not give a precise type locality, and as the specimen from Conakry belongs to another species (described in the next entry), the most typical specimen, and not the two smaller, figured specimens, from the Bissagos Islands lot is here selected as lectotype, and the other specimens are paralectotypes. The type locality is the locality cited by Lamy for this lot.

TYPE LOCALITY. — Passage between Soga and Rouba, Bissagos Islands, Guinea Bissau.

OTHER MATERIAL EXAMINED. — **Guinea.** Nearshore continental shelf, SEDIGUI cruises, 9°03'N-9°48'N, 17-39 m, most taken by bottom grab, some by dredge, RV *André Nizery*, X.1988, leg. R. von Cosel, V.1988, 13 lots, sh. and v. (all MNHN).

Ilha do Principe. Baía de Santo Antonio, entrance, 15 m, RV *Calypso*, Golfe de Guinée, stn P 14, numerous v. (MNHN). — Between Punta da Mina and Punta Novo Destino, 6 m, RV *Calypso*, Golfe de Guinée, stn P 7, 6 rv., 1 lv. (MNHN). — Praia de Santo Antonio, RV *Calypso*, Golfe de Guinée, stn P 22, 2 v. (MNHN).

Equatorial Guinea. 01°40'S, 09°25'E, 150 m, in sediment core, communicated by S. Gofas, 1 rv. (MNHN).

Gabon. Cap Esterias, Pointe Idolo, on sandbank,

14.XI.1988, leg. R. von Cosel, 1 small chipped rv. (MNHN).

DISTRIBUTION. — Senegal (Dakar) to Guinea (Sierra Leone border) and Gabon; Sao Tomé, Ilha do Principe.

DESCRIPTION

Shell small, 9-20 mm, rather thin but appearing solid, subcircular to circular, almost as long as high (length/height ratio 1.13-1.15), slightly inequilateral, equivalve, very compressed. Beaks just in front of the vertical midline. Anterior part broadly rounded, with a shallow inflexion between the middle part and the rounded corner to the antero-dorsal margin which is straight. Postero-dorsal margin slightly convex, posterior margin rounded, with a more or less indistinct, rounded postero-dorsal corner. Ventral margin well and evenly rounded.

Exterior with regular, fine and thin commarginal lamellae (about 40-55 in large specimens) which on the very early part are more closely spaced than on the disk. Interspaces smooth. Part of the lamellae becoming more lamellate to foliate on the antero-dorsal and postero-dorsal margins. Postero-dorsal area separated by a rather broad and shallow radial depression. Antero-dorsal area small, delimited by a sharp groove which also separates the disk sculpture with commarginal ridges from the foliate sculpture.

Hinge plate moderately narrow, right valve with a single small cardinal tooth, no lateral. Left valve

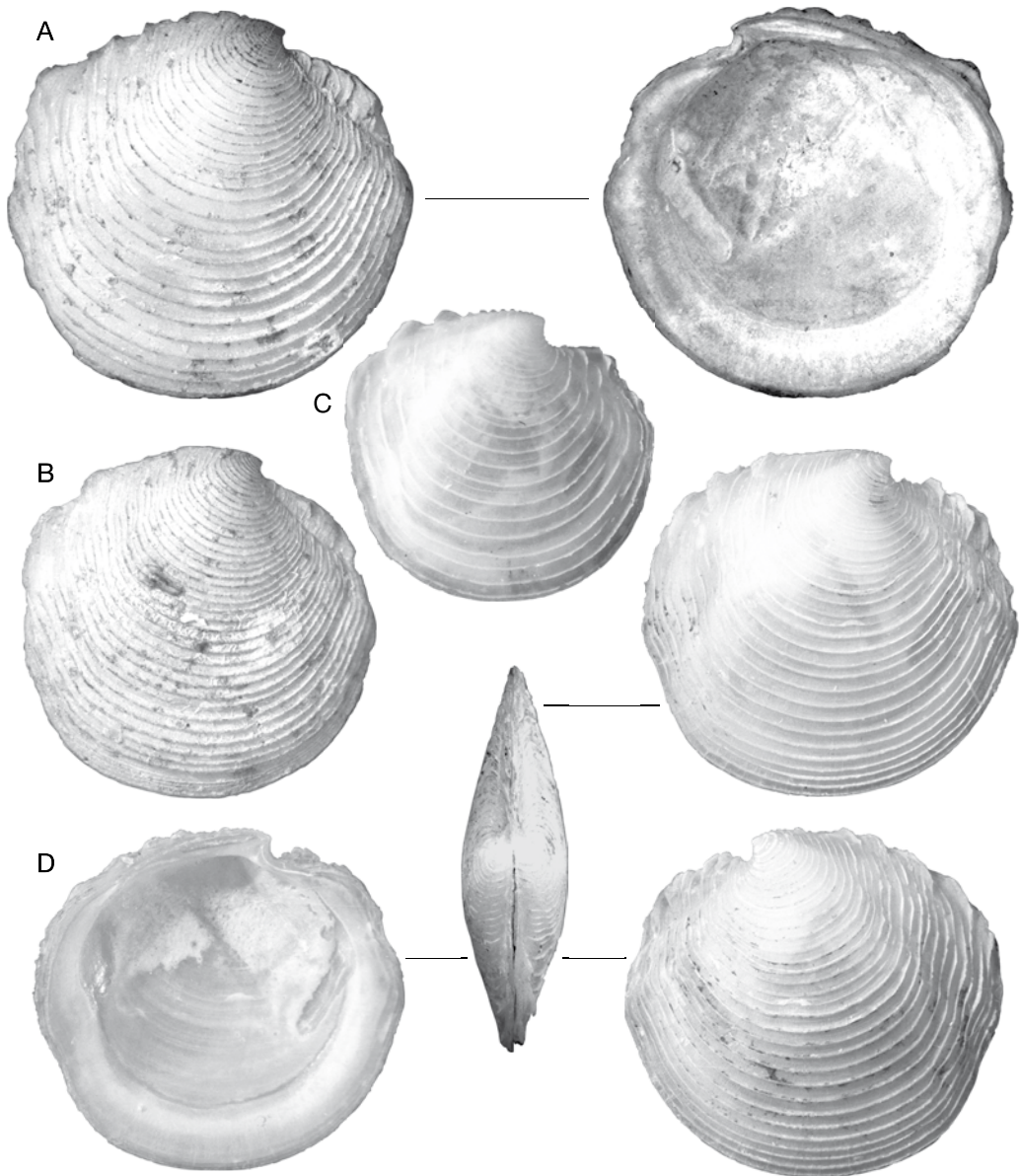


FIG. 1. — *Lamylucina gaini* (Lamy, 1920) n. comb.: **A**, lectotype (here designated), Passage between Soga and Rouba, Bissagos Islands, Guinea Bissau, 15.2 mm (MNHN), exterior and interior view of rv.; **B**, paralectotype 1, same locality, 13.4 mm (MNHN), exterior of rv.; **C**, Ilha do Principe, RV *Calypso*, Golfe de Guinée, stn P 14, 15 m, 7.0 mm, exterior of rv.; **D**, Guinea, W of Baie de Sangarea, 9°42'N, 14°05'W, 16 m, SEDIGUI, stn 369, 12.0 mm, exterior of both v., interior of lv., dorsal view.

with one anterior and one posterior simple cardinal, no laterals. Lunule very short, broad and heart-shaped, somewhat asymmetrical, laterally

slightly more prominent in the right valve, deeply inset; escutcheon long and extremely narrow, almost nonexistent. Anterior adductor scar small and

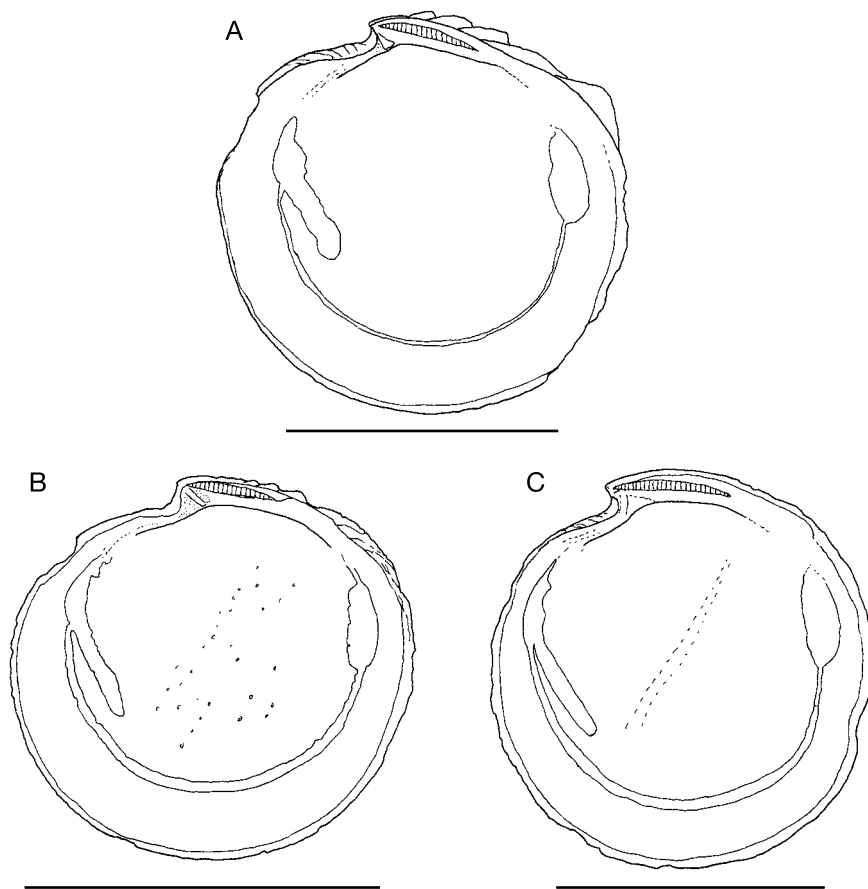


FIG. 2. — Half schematic drawings of the insides of right valves: **A**, *Lamylocina gaini* (Lamy, 1920) n. comb., lectotype; **B, C**, *Lamylocina exgaini* n. gen., n. sp.; **B**, holotype; **C**, Ilha do Principe, RV *Calypso*, Golfe de Guinée, stn P 17. Scale bars: 10 mm.

narrow, with moderately long ventral part separate from the pallial line, this latter meeting the muscle impression almost in the middle. Inner margin of valves smooth.

Valves entirely white; periostracum not seen.

Measurements are provided in Table 1.

BIOTOPE

In fine, more or less muddy sand, from shallow water to about 30 m.

REMARKS

Lamylocina gaini n. comb. is characterized by the very flat valves, the commarginal lamellae with

clearly defined interspaces which are broader than the lamellae, and the well marked prolongations of these lamellae on the antero- and postero-dorsal keel.

Lamylocina exgaini n. sp.
(Figs 2B, C; 3; 4)

Phacoides (Lucinoma) gaini Lamy, 1920: 192-194 (*partim*).

TYPE MATERIAL. — Holotype: Guinean continental shelf, W of Kaporó, 9°42'N, 15°21'W, 32 m, RV *André Nizery*, SEDIGUI, stn 344, 22.V.1988, complete shell (MNHN).

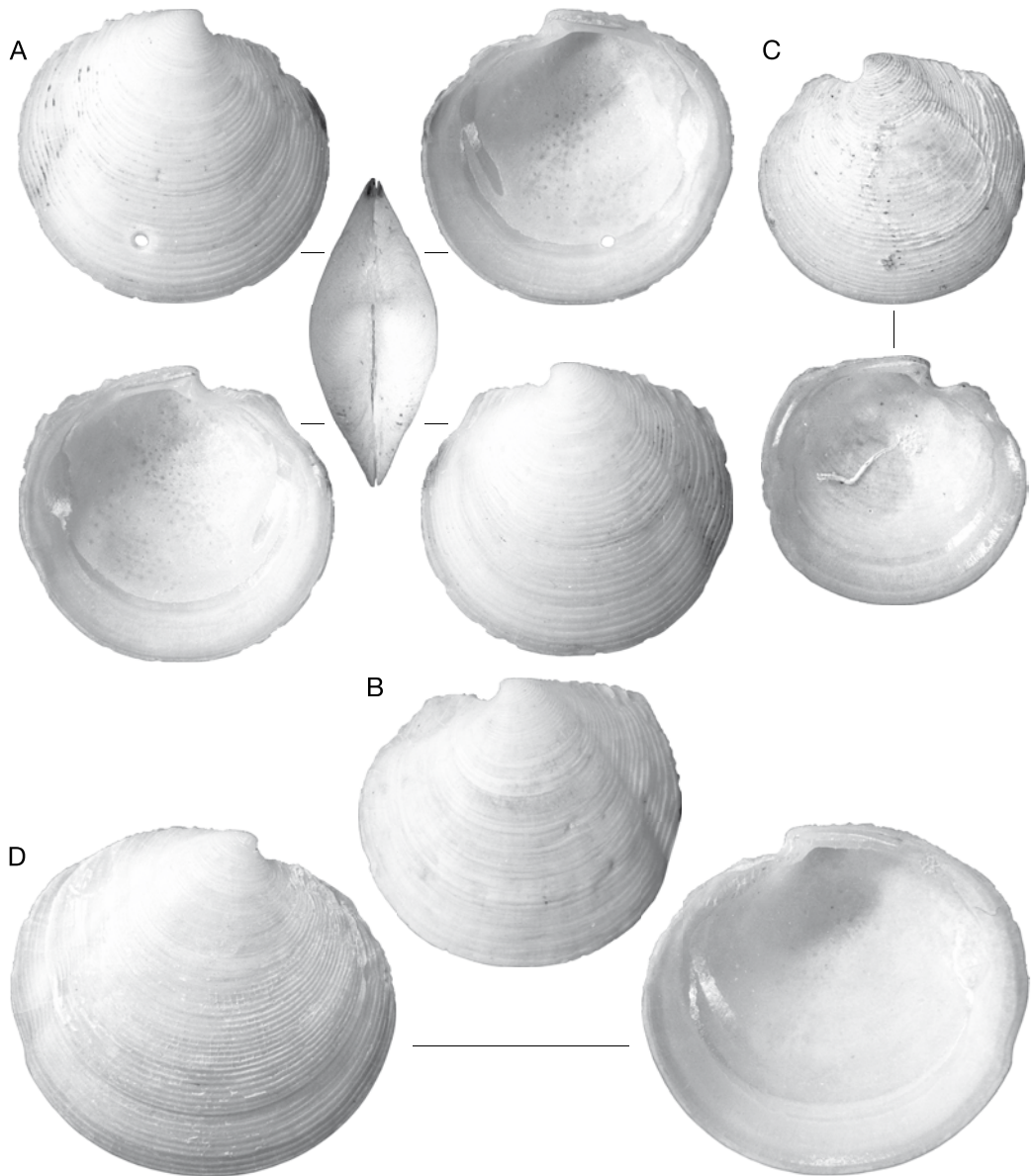


FIG. 3. — *Lamylucina exgaini* n. gen., n. sp.: **A**, holotype, W of Kaporo, Guinean continental shelf, 9°42'N, 15°21'W, 32 m, RV *André Nizery*, SEDIGUI, stn 344, 22.V.1988, 11.4 mm (MNHN), exterior and interior of both v., dorsal view; **B**, paratype, same locality, 13.1 mm (MNHN), exterior of lv.; **C**, paralectotype of *Lucina gaini* Lamy, 1920, Conakry, 9.4 mm (MNHN), exterior and interior of lv.; **D**, Guinea, W of Ile Konebomby, 9°48'N, 15°02.5'W, 33 m, SEDIGUI, stn 399, 16.4 mm, exterior and interior of rv.

Paratype: same locality, 1 rv. (MNHN).

TYPE LOCALITY. — Kaporo, Guinea.

ETYMOLOGY. — The fact that this species was hitherto always identified as *L. gaini* n. comb. is expressed in the name.

OTHER MATERIAL EXAMINED. — **Senegal**. Dakar region, S of Gorée, 110-112 m, dredged RV *Gérard Tréca*, 18.II.1954, leg. I. Marche-Marchad, 1 rv. (MNHN). — Same locality, 95-98 m, 1 lv. (MNHN). — Dakar region (no details), 129-150 m, dredged RV *Gérard Tréca*, 24.I.1958, leg. I.

TABLE 2. — *Lamylucina exgaini* n. gen., n. sp.: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
19.4 × 18.2	Ghana, <i>Calypso</i> , 1956, stn 26	1.1
17.8 × 17.3	Guinea, SEDIGUI, stn 617	1.0
16.8 × 16.1	Guinea, SEDIGUI, stn 544D	1.0
16.3 × 16.2	Gabon, Cap Esterias	1.0
15.7 × 14.7	Guinea, SEDIGUI, stn 544D	1.1
15.5 × 14.2	Guinea, SEDIGUI, stn 446	1.1
15.0 × 14.6	Guinea, SEDIGUI, stn 617	1.0
14.5 × 13.6	Senegal, Casamance, 40 m, <i>Louis Sauger</i>	1.1
14.3 × 14.7	Principe, <i>Calypso</i> , 1956, stn P 17	1.0
13.5 × 13.3	Senegal, Dakar	1.0
13.1 × 12.0	Guinea, paratype	1.1
12.2 × 11.1	São Tomé, <i>Calypso</i> , 1956, stn T 18	1.1
11.4 × 10.8 × 4.6	Guinea, holotype	1.1
9.4 × 9.0	Guinea, Conakry paralectotype of <i>L. gaini</i> n. comb.	1.0
8.9 × 8.5	Senegal, Casamance, 40 m, <i>Louis Sauger</i>	1.0

Marche-Marchad, 1 rv., 1 lv. (MNHN). — N Casamance, 12°44.5'N, 17°37.3'W, 40 m, dredged RV *Louis Sauger*, III.1988, leg. R. von Cosel, 1 rv., 1 lv. (MNHN) — N Casamance, Kafountine, 12°57.5'N, 17°16.8'W, 35 m, dredged RV *Louis Sauger*, III.1988, leg. R. von Cosel, 3 lv. (MNHN).

Guinea-Bissau. Southern part, 11°11'N, 16°59'W, 26 m, dredged RV *André Nizery*, 22.IV.1988, leg. R. von Cosel, 1 rv. (MNHN).

Guinea (Conakry). Conakry (no details, paralectotype of *Phacoides gaini* Lamy, 1920), 1 lv. (MNHN). — Guinean continental shelf, SEDIGUI cruises, 9°03'N-10°12'N, 24-57 m, bottom grab or dredge, RV *André Nizery*, V.1988 and X.1988, leg. R. von Cosel, 36 lots with numerous sh. and v. (MNHN).

Sierra Leone. Off Sherbro Island, 7°15.5'N, 12°61'W, 64 m, dredged RV *Calypso*, Golfe de Guinée, stn 10, 14.V.1956, leg. I. Marche-Marchad, 1 rv., 3 lv. (MNHN).

Côte d'Ivoire. Abidjan region (no precision), leg. I. Marche-Marchad, 1 lv. (MNHN).

Ghana. 4°37'N, 0°50' W, 90-100 m, dredged RV *Calypso*, Golfe de Guinée, stn 26, 24.V.1956, leg. I. Marche-Marchad, 1 rv. (MNHN).

Ilha do Principe. Off Praia Grande, 12 m, dredged RV *Calypso*, Golfe de Guinée, stn P 17, 3.VII.1956, leg. I. Marche-Marchad, 1 rv. (MNHN).

São Tomé. Off Praia Lagarto, 5-6 m, dredged RV *Calypso*, Golfe de Guinée, stn T 18, leg. I. Marche-Marchad, 11.VI.1958, 1 rv. (MNHN).

Gabon. Cap Esterias, Pointe Idolo, on sandbank, 14.XI.1988, leg. R. von Cosel, 1 v. (MNHN). — Port-Gentil, Plage de la Sogara, beachdrift, 11.I.2004, leg. R. von Cosel, 2 v. (MNHN).

DISTRIBUTION. — Senegal (Dakar region) to Gabon, São Tomé, Ilha do Principe.

DESCRIPTION

Shell small, 9-20 mm, rather thin but appearing solid, circular, almost as long as high (length/height ratio 1.0-1.1), slightly inequilateral, equivalve, very compressed. Beaks about in or just in front of the vertical midline. Anterior part broadly rounded, with a very shallow inflexion between the middle part and the rounded corner to the short antero-dorsal margin. Postero-dorsal margin more or less convex, posterior margin evenly rounded, with an indistinct, rounded postero-dorsal corner. Ventral margin rounded.

Exterior with more or less irregular, fine, very densely spaced and thin, rounded commarginal ridges or cords, giving the surface a somewhat glossy appearance. Occasionally narrow, smooth interspaces. Ridges in the middle part coalescing in some specimens resulting in some nearly smooth areas. Only few of the commarginal cords may become lamellate or somewhat foliate on the antero-dorsal and postero-dorsal margin. Occasionally some deeper incised growth stages. Postero-dorsal area separated by a broad and very shallow radial depression. Antero-dorsal area very small and narrow, delimited by a sharp groove.

Hinge plate moderately narrow, right valve with a single small cardinal, no lateral. Left valve with one anterior and one posterior simple cardinal, no laterals visible. Hinge teeth very shallow and often reduced to completely missing. Lunule very small

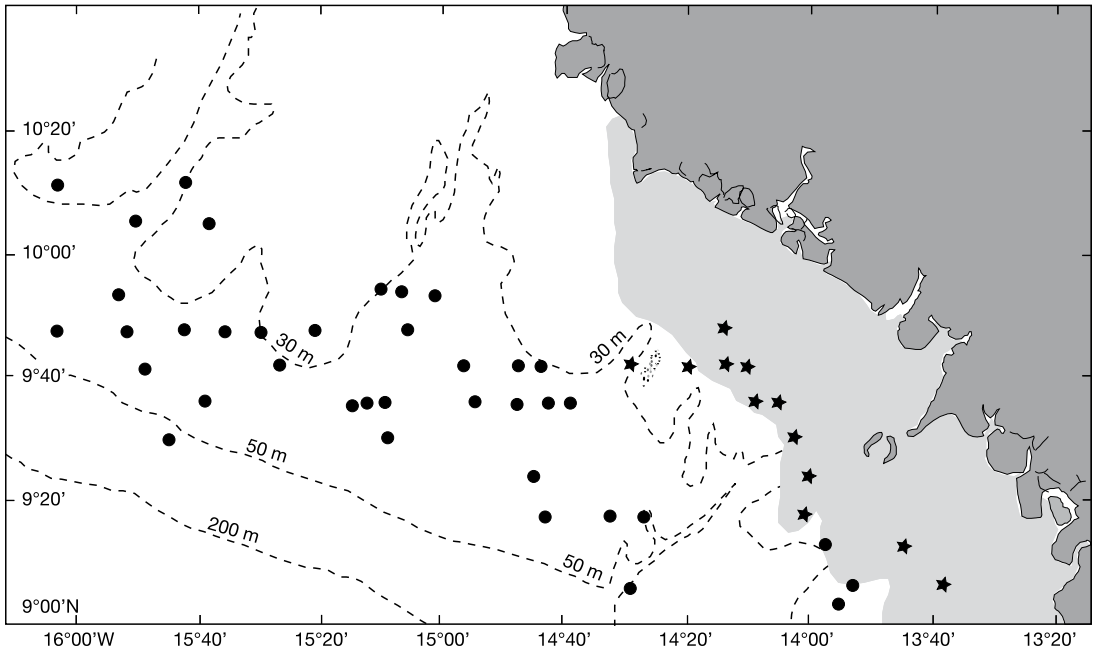


FIG. 4. — Distribution of *Lamylucina gaini* (Lamy, 1920) n. comb. (★) and *Lamylucina exgaini* n. gen., n. sp. (●) on the continental shelf of Guinea. Light grey area marks the sandy-muddy bottom, the clear area is pure sand, partly with gravel and shell debris.

and heart-shaped, asymmetrical, laterally slightly more prominent in the right valve, deeply inset; escutcheon almost nonexistent. Anterior adductor scar very small and narrow, with moderately long and narrow ventral part separate from the pallial line, the latter meeting the muscle impression above the middle. Inner margin of valves smooth.

Valves entirely white; periostracum not seen.

Measurements are provided in Table 2.

BIOTOPE

Fine and mixed sand, without muddy components, mostly from about 25 m downward to 150 m, only on the coast of Gabon and the islands of the Gulf of Guinea in shallower water.

REMARKS

Lamylucina exgaini n. gen., n. sp. is similar to *L. gaini* n. comb., with which it was previously confused. The principal difference from *L. gaini* n. comb. is the external sculpture with the much more close-set commarginal sculpture consisting of

fine rounded and broader cords rather than ridges or lamellae. These cords often touch each other or even merge to a certain extent, whereas in *L. gaini* n. comb., the lamellae always have more or less large, clearly defined interspaces. In contrast to *L. gaini* n. comb., the leaf-like prolongations of a part of the commarginal ridges are very much reduced or absent, and the postero-dorsal margin is often more sloping; with the valves thus appearing subcircular. The anterior adductor scar, especially its diverging part is somewhat narrower. The cardinals are less developed and may be completely absent.

Both species were encountered sympatrically in some places (Gabon, Ilha do Principe), without intergrades.

During the SEDIGUI cruises on the Guinean shelf, *L. gaini* n. comb. was found in more inshore waters on fine sandy substrates but always with a more or less high portion of mud, whereas *L. exgaini* n. gen., n. sp. is confined to more offshore localities, living in sandy bottom without mud (see Fig. 4). The two species have clearly different

sediment preferences, and in certain localities like the Guinean shelf, they also seem to prefer different depths but this is not always the case.

Genus *Tinalucina* n. gen.

TYPE SPECIES. — *Tinalucina aequatorialis* n. sp.

SPECIES INCLUDED. — *Tinalucina aequatorialis* n. sp.; *T. inanis* (Prashad, 1932) n. comb.

ETYMOLOGY. — Dedicated to my colleague Tina Molodtsova in acknowledgement of her work-up of the collection of antipatharians of MNHN.

DISTRIBUTION. — Inner Gulf of Guinea, tropical West Africa, and Indo-West Pacific (Sumbawa, Indonesia).

DIAGNOSIS. — Shells small, mostly under 10 mm, variable in outline, subcircular, slightly longer than high to almost as long as high, moderately tumid, with a broad anterior and posterior part and a more or less truncated, very slightly or not indented posterior margin. Anterior margin more convex in its middle part. Beaks in or just in front of the vertical midline. Umbones rather prominent. Surface with more or less developed, densely spaced fine commarginal lamellae, which may be obsolete on the middle part of the disk. Antero-dorsal area small and hardly separated, a depression may be visible. Posterior angle rounded, postero-dorsal depression broad and shallow but well developed. Lunule small, not too narrow, only slightly asymmetrical. Escutcheon entirely filled with the ligament. Hinge plate more or less narrow, with slight vestiges of one or two cardinals. Diverging part of anterior adductor scar short and broad, with a length of about half the total length of the scar. Inner margins smooth.

REMARKS

The species of this genus are characterized by a combination of features: small size, nearly equal-sized adductor scars with the short and broad anterior adductor with short diverging part, well set-off posterior area and somewhat irregular surface of the valves. The other species in the genus is *Tinalucina inanis* n. comb., which was placed in *Dentilucina* (*Dentilucina*) by Prashad (1932). *Dentilucina* P. Fischer, 1887 (type species: *Venus jamaicensis* Spengler, 1784), however, is an objective synonym of *Phacoides* Agassiz, 1845. The two species united in the new genus *Tinalucina* n. gen. demonstrate again a close relationship between the molluscan fauna

of tropical West Africa and that of the Indo-West Pacific realm.

Tinalucina aequatorialis n. sp. (Figs 5; 6A, B)

TYPE MATERIAL. — Holotype: Equatorial Guinea, W of Bioko Island (formerly Fernando Poo), off the coast of Cameroon, 3°50'20"N, 8°21'40"E, 98 m, in silty bottom, a fresh empty shell, taken by corer, Gardline Survey 2003, stn VIO 2, 6.8 × 6.0 × 3.0 mm (BMNH 20040254).

TYPE LOCALITY. — Bioko (formerly Fernando Poo), Equatorial Guinea.

ETYMOLOGY. — After Equatorial Guinea, in which the type locality is situated.

DISTRIBUTION. — Inner Gulf of Guinea, only known from the type locality and possibly restricted to the Cameroon deeper shelf and adjacent islands.

DESCRIPTION

Shell very small (holotype 6.8 mm long), rather thick and solid, equivalve, moderately inflated, subcircular but more tending to rectangular-polygonal, slightly longer than high, length/height ratio 1.1. Umbones prominent, beaks slightly in front of the vertical midline. Antero-dorsal (lunular) margin markedly concave, antero-dorsal corner narrowly rounded, well marked. Anterior margin rounded, more so on its middle part, ventral margin rounded, less convex in its middle part. Posterior margin nearly vertically truncated, with a very slight sinuosity in the middle and with broadly rounded postero-dorsal and postero-ventral corners.

Exterior somewhat irregular, with irregularly but mostly densely-spaced, shallow, commarginal lamellae and a few growth lines. Anterior angle almost absent, anterior radial depression obsolete, antero-dorsal area indistinct. Posterior angle rounded, posterior radial depression broad and well defined, ending in a very shallow indentation of the posterior margin. Lunule small, moderately narrow, slightly asymmetric, longer than broad, a little sunken; escutcheon absent, ligament deeply sunken.

Hinge plate narrow but strong, right valve with a rudimentary single cardinal tooth, an anterior

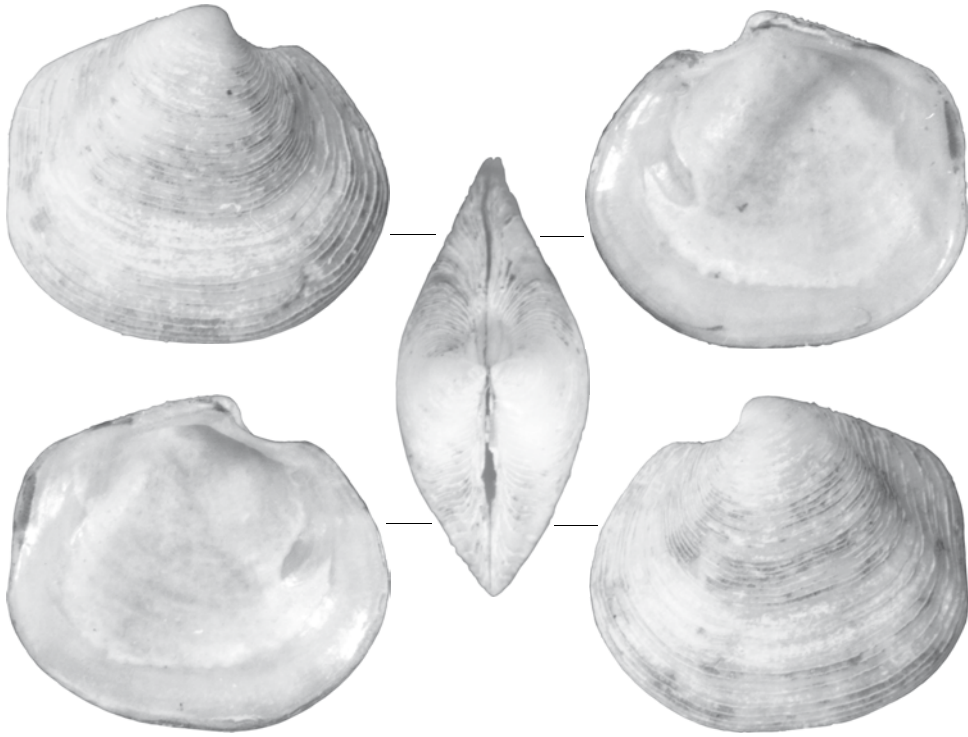


FIG. 5. — *Tinalucina aequatorialis* n. gen., n. sp., holotype, W of Bioko Island (formerly Fernando Poo), Equatorial Guinea, off the coast of Cameroon, 3°50'20"N, 8°21'40"E, 98 m, 6.8 mm (BMNH), exterior and interior of both v., dorsal view.

lateral and vestiges of a posterior lateral. Left valve with two small cardinals, an anterior lateral and the vestiges of a posterior lateral. Anterior adductor scar rather short, with short and broad diverging part, the pallial line meeting the scar slightly above its middle. Inner margin smooth.

Valves entirely white, periostracum thin and almost colourless, eroded on large parts of the valves.

REMARKS

The only comparable species is the Indo-Pacific *T. inanis* n. comb. (see Fig. 6C), which grows only slightly larger than *T. aequatorialis* n. gen., n. sp., up to 10 mm; it is further distinguished by the smooth middle part of the valves, however, both species share the somewhat irregular valve surface, the general shell outline, the hinge dentition and the equi-sized adductor scars. The only other very small tropical West African lucinid species, *Loripes*

(*Keletistes*) *legouxi* (Nicklès, 1952) (Fig. 6D), is easily distinguished by its internal ligament and its much more tumid valves. *Tinalucina aequatorialis* n. gen., n. sp. was found together with juveniles of *Afrolucina discontinua* n. gen., n. sp. (described herein, see below) of about the same size.

Genus *Falsolucinoma* n. gen.

TYPE AND ONLY SPECIES. — *Lucina leloeuffi* Cosel, 1989.

ETYMOLOGY. — In spite of the differences, at a first glance and external view, the valves resemble a *Lucinoma*, and this is expressed in the name (*falsus*, Latin = false).

DISTRIBUTION. — Northern Gulf of Guinea, tropical West Africa.

DIAGNOSIS. — Shells large, subcircular-triangular, compressed, with short and conspicuously rostrate anterior part and broad and longer posterior part.

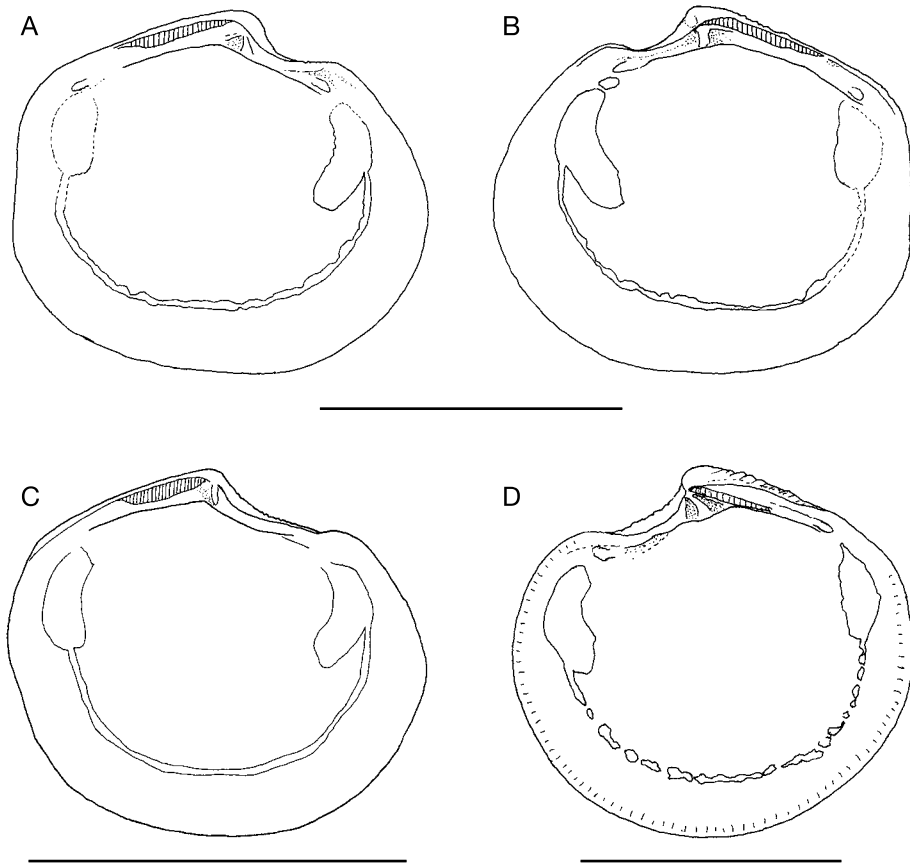


FIG. 6. — Half schematic drawings of the insides of valves: **A, B**, *Tinalucina aequatorialis* n. gen., n. sp., holotype (BMNH), interior of lv.; **B**, interior of rv.; **C**, *Tinalucina inanis* (Prashad, 1932) n. comb., holotype (Zoologisch Museum Amsterdam), interior of lv.; **D**, *Loripes (Keletistes) legouxii* (Nicklès, 1952), Côte d'Ivoire, continental slope (no precision), dredged RV *Reine Pokou*, leg. Le Loeuff, interior of rv. (for comparison). Scale bars: A, B, 5 mm; C, 10 mm; D, 2.5 mm.

Anterior and posterior area well demarcated. Surface with 10-15 conspicuous, thin, raised and widely spaced commarginal lamellae and smooth interspaces. Lunule very small and short, slightly asymmetric, escutcheon long and deeply sunken, delimited by a keel and almost entirely filled by ligament. Hinge plate narrow, left valve with two cardinal teeth, a strong anterior lateral and a smaller, narrower knob above it, and a narrow posterior lateral; right valve with two cardinals, two anterior laterals and two posterior laterals. Ligament short. Adductor scars small for the shell size, diverging part of anterior adductor scar very short and rather narrow, tapering; pallial line meeting the scar about in its middle. Inner margins smooth, but radial wavy sculpture on the zone between pallial line and margin and occasionally a few vestiges of irregular crenulations.

REMARKS

This genus is characterized by the strong anterior and posterior laterals in both valves, the small anterior adductor scar with the short and narrow diverging part and the short and rostrate anterior part of the shell. Externally it reminds a *Lucinoma*, with which it has in common the toothed hinge and the lamellose exterior with well separated anterior and posterior areas. There are also *Lucinoma* species with rostrate anterior margins (e.g., in this paper), but to a lesser extent. Moreover, the very much forward placed umbones, the more conspicuously rostrate anterior margin and the very small diverging part of the anterior adductor scar clearly distinguish

Falsolucinoma n. gen. The highly asymmetric lunule and the short anterior adductor scar place the genus closer to the *Myrtea* group; however, species of *Myrtea* are smaller and often more tumid with their characteristically raised escutcheonal keel, often with tiny and dense spines. Their outline is more regular with the umbones placed less forward.

There is only one other genus known which has a similarly short and rostrate anterior part and a very short diverging part of the anterior adductor scar. It occurs in the Indo-West Pacific and will be published elsewhere (Cosel & Bouchet unpubl. data). Species of that genus, however, are more elongate, they have very densely spaced commarginal lamellae, the diverging lower part of the anterior adductor scar is much broader, and their hinge plate is narrower and almost toothless.

The genus most similar to *Falsolucinoma* n. gen. is *Lamellolucina* Taylor & Glover, 2002, which is predominantly Indo-West Pacific, but one species, *L. reyrei* (Nicklès, 1955) occurs in West Africa. It is also characterized by prominent and more or less widely spaced commarginal lamellae, a similar hinge dentition with strong laterals and a generally rather short extension of the anterior adductor scar. *Falsolucinoma* n. gen. differs in the absence of a regularly crenulate margin, the more forward placed umbones, the less asymmetric lunule and the much larger size.

Falsolucinoma leloeffi (Cosel, 1989) n. comb.
(Figs 7; 8)

Lucina leloeffi Cosel, 1989: 315, 316, pl. 1, figs 1-3.

TYPE MATERIAL. — Holotype: E Liberia, off Cap des Palmes, c. 4°10'N, 7°40'W, 250 m, dredged RV *Reine Pokou*, 13.X.1971, leg. Le Loeuff (IRD), 1 lv. (MNHN). Paratypes: same locality, 2 lv. (MNHN).

TYPE LOCALITY. — Cap des Palmes, E Liberia, tropical West Africa.

OTHER MATERIAL EXAMINED. — **Cameroon.** 1 spm (MNHN) taken by RV *Fridtjof Nansen* during a cruise off the coast of Cameroon for FAO purpose. Data of the specimen unknown.

DISTRIBUTION. — Gulf of Guinea, apparently from western Côte d'Ivoire to Cameroon.

DESCRIPTION

Shell large, up to 56 mm long, length/height ratio 1.2, relatively thin-shelled, but solid, inequilateral, compressed, subcircular-triangular-rostrate, slightly variable in outline and length/height ratio. Beaks situated at or just behind the anterior third of the valve. Anterior part triangular-rostrate, anterior margin pointed. Posterior part broad, posterior margin obliquely truncate. Postero-dorsal corner rather broadly rounded. Antero-dorsal margin nearly straight, postero-dorsal margin slightly convex. Ventral margin behind the anterior point slightly concave, then to postero-ventral corner evenly rounded, this latter narrowly rounded.

Exterior with 10-15 conspicuous, prominent, thin, raised and widely spaced commarginal lamellae: 15 in the holotype, 10 and 14 in the paratypes, which on the early and middle part of the valves are evenly spaced, and may become slightly more closely spaced ventrally. Interspaces smooth, with shallow commarginal growth waves. Posterior area with a broad and shallow radial depression, separated from the disk by a broadly rounded posterior angle. Anterior area with a well marked and sharp radial depression, ending in a sinuosity in the upper anterior margin. Anterior angle narrowly rounded.

Hinge plate narrow, in the left valve with a small anterior cardinal and a narrow lamellar posterior cardinal, a strong anterior lateral and a narrow and long posterior lateral and above both more or less strong, tooth-like reinforcements. Right valve with a short, thick, bifid and only slightly inclined anterior cardinal and a thin, oblique posterior cardinal. Two anterior laterals with a deep depression between them; lower lateral more forward placed than upper lateral. Lower posterior lateral narrow but rather strong, upper posterior lateral thin and much weaker. Ligament short. Lunule very short and small, deeply sunken, slightly asymmetric, escutcheon almost entirely filled by the ligament. Adductor scars small, anterior scar with short, rather narrow and somewhat tapering diverging part, pallial line meeting the scar about in its middle. Inner margin of valves not visibly and regularly crenulate but with shallow

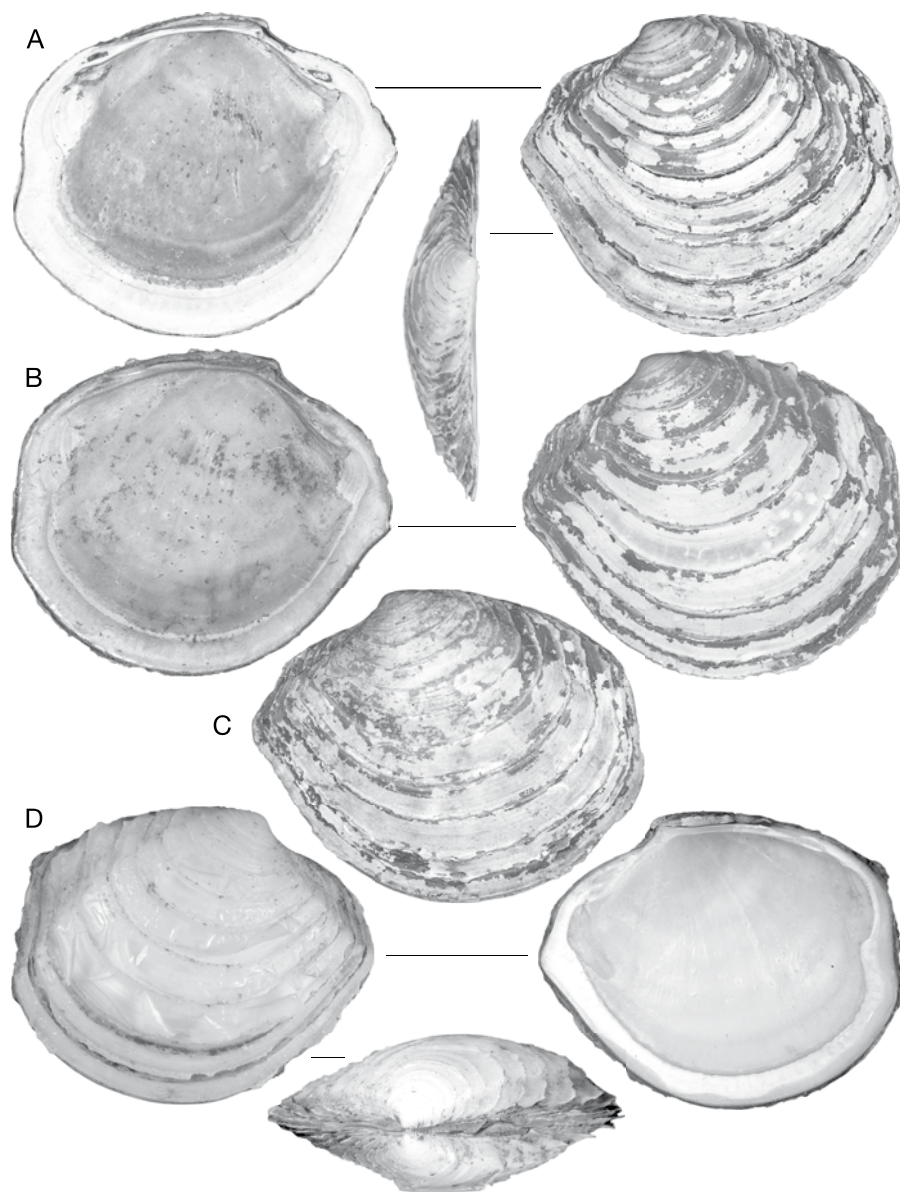


FIG. 7. — *Falsolucinoma leloeffi* (Cosel, 1989) n. comb.: **A**, holotype, off Cap des Palmes, E Liberia (c. 4°10'N, 7°40'W), 250 m, lv., dredged RV *Reine Pokou*, leg. Le Loeuff, 13.X.1971, 55.3 mm (MNHN), interior, exterior and dorsal view of lv.; **B**, paratype 1, same locality, 54.3 mm (MNHN), interior and exterior of lv.; **C**, paratype 2, same locality, 56.5 mm (MNHN), exterior of lv.; **D**, off Cameroon (without any precision), trawled RV *Fridtjof Nansen*, live-collected spm, 48.3 mm (MNHN), exterior and interior of lv., dorsal view.

radial waves on the zone between pallial line and margin and sometimes a few vestiges of irregular crenulations.

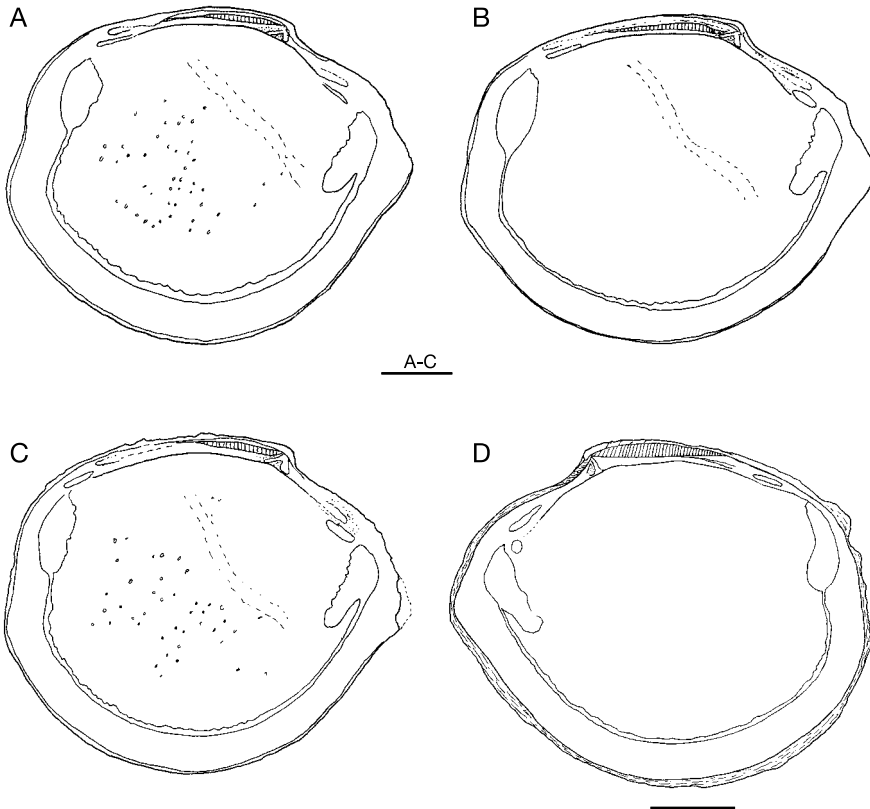
Valves entirely white; periostracum rather strong,

almost white-translucent to pale straw-coloured or brownish, often peeling off in the interspaces of the lamellae.

Measurements are provided in Table 3.

TABLE 3. — *Falsolucinoma leloeuffi* (Cosel, 1989) n. comb.: measurements (in mm) and length/height ratio. Non type specimen is voucher specimen.

Shell length × height × tumidity	Specimen	Length/height ratio
56.5 × 45.0	Liberia, paratype	1.3
55.3 × 46.4	Liberia, holotype	1.2
54.3 × 46.6	Liberia, paratype	1.2
48.3 × 40.0 × 20.0	Cameroon	1.2

FIG. 8. — *Falsolucinoma leloeuffi* (Cosel, 1989) n. comb., half schematic drawings of the insides of valves: **A**, holotype; **B**, **C**, paratypes, all insides of lv.; **D**, spm from off Cameroon, inside of rv. Scale bars: 10 mm.

REMARKS

As for the genus. The most similar looking species is *Lamellolucina jawa* Taylor & Glover, 2002, from Madura, Indonesia. It has a similar general shell shape, a similar hinge dentition and also extremely small adductor scars but is distinguished by the smaller size, the more circular outline, the presence of a finely and regularly crenulate margin and

much more densely spaced commarginal lamellae. *Falsolucinoma leloeuffi* n. comb. was described only from three right valves, but fortunately now a single complete live-collected specimen, albeit without any precise data, became available. It was trawled by the RV *Fridtjof Nansen* in the Gulf of Guinea, apparently off Cameroon; the known range is thus extended considerably eastward.

Genus *Afrolucina* n. gen.

TYPE AND ONLY SPECIES. — *Afrolucina discontinua* n. sp.

ETYMOLOGY. — The name reflects that this genus was discovered on the African shelf.

DISTRIBUTION. — Tropical West Africa.

DIAGNOSIS. — Shells small, subcircular, slightly longer than high, rather compressed. Beaks slightly in front of the vertical midline. Surface with numerous fine and more or less densely spaced commarginal lamellae, umbonal area appearing smooth. Interspaces with very fine growth lines. Antero-dorsal angle very shallow, anterior area well marked. Postero-dorsal area separated by a rounded posterior angle. Lunule short, broad, markedly asymmetrical, in the right valve broad, in the left valve very narrow, sunken. Escutcheon long, narrow and sunken. Hinge line curved, hinge with one small, well defined cardinal tooth in the right valve and two in the left valve. Anterior and posterior lateral teeth in the right valve indistinct, in the left valve almost obsolete. Anterior adductor scar rather elongate, with diverging part about half its length or slightly shorter. Posterior adductor scar small. Inner margins smooth.

REMARKS

This genus is most similar to a group of deeper water lucinids from the Indo-Pacific discussed in detail by Cosel & Bouchet (unpubl. data), which comprises some new genera, however, none of them are really identical to *Afrolucina* n. gen. This Indo-Pacific group has superficial resemblance to *Lucinoma*, but that genus is characterized by the presence of well developed hinge teeth and a long and slender diverging part of the anterior adductor scar which meets the pallial line near the upper (dorsalward) end of the impression. The species of the group here discussed have a nearly edentulous hinge, whereas in the West African *Afrolucina discontinua* n. gen., n. sp., small cardinals are present. The spectacular lunular asymmetry indicates affinities of *Afrolucina* n. gen. to the *Myrtea* group and is not seen as this in the Indo-West Pacific genera. All genera, however, share a much shorter and broader diverging part of the anterior adductor scar, which is met by the pallial line in its middle, another character of the *Myrtea* group.

The genus *Tinalucina* n. gen. is distinguished by the more tumid valves, the more protruding um-

bones, the more regular commarginal sculpture, the more equal-sized adductor scars with short and broad diverging part of the anterior one, the less asymmetrical lunule and the smaller shell size.

Afrolucina discontinua n. sp.

(Figs 9-11)

TYPE MATERIAL. — Holotype: Côte d'Ivoire, off Grand Bassam, 70 m, dredged RV *Reine Pokou*, 1977, leg. Le Loeuff (IRD), 1 fresh sh. (MNHN).

Paratypes: Abidjan region (no more precision), dredged RV *Reine Pokou*, 1965-1974, leg. Le Loeuff, 2 sh., 1 juv. sh., 2 lv. (MNHN); 1 sh., 1rv. (BMNH).

TYPE LOCALITY. — Grand Bassam, Côte d'Ivoire.

ETYMOLOGY. — This species is a good example of the several West African species with a disjunct distribution, and that is expressed in the name.

OTHER MATERIAL EXAMINED. — **Senegal.** Dakar, 14°43'N, 17°30'W, 205-230 m, dredged RV *Gérard Tréca*, 18.III.1958, leg. I. Marche-Marchad, 1 rv., 1 lv. (MNHN). — 14°51.5'N, 17°30'W, 180-165 m, dredged RV *Gérard Tréca*, 18.III.1958, leg. I. Marche-Marchad, 1 rv., 2 lv., 1 fragm. (MNHN). — Baie de Gorée, 80-250 m, dredged RV *Gérard Tréca*, 20.II.1956, leg. I. Marche-Marchad, 1 chipped lv. (MNHN). — S of Gorée, 95-98 m, dredged RV *Gérard Tréca*, 18.II.1954, leg. I. Marche-Marchad, 1 lv. (MNHN).

Liberia. Near the border to Côte d'Ivoire, 4°31.5'N, 8°31'W, 64 m, dredged RV *Calypso*, 20.V.1956, 1 lv., 1 rv. (MNHN).

Côte d'Ivoire. Abidjan region (no precision), 100 m, dredged RV *Reine Pokou*, leg. Le Loeuff, 1 juv. v. (MNHN). — 4°27.5'N, 7°09'W, 50 m, dredged RV *La Rafale*, 6.IV.1964, leg. G. Cherbonnier, 1 juv. rv. (MNHN). — Off S. Pedro, 4°36'N, 6°33'W, 100 m, dredged RV *La Rafale*, 7.IV.1964, leg. G. Cherbonnier, 1 spm (MNHN). — Off Grand Bassam, 5°04.0'N, 3°45.8'W, 64 m, dredged RV *Antéa*, 16.VIII.1998, leg. R. von Cosel, 1 juv. lv. (MNHN).

Equatorial Guinea. W of Bioko Island (formerly Fernando Poo), off the coast of Cameroon, 3°50'20"N, 8°21'40"E, 98 m, in silty bottom, taken by corer, Gardline Survey 2003, stn VIO 2, 1 juv. sh. (BMNH). — Same region, 4°01'16"N, 8°36'06"E, 70 m, taken by corer, Gardline Survey 3003, stn NEA-I, 1 juv. sh. (BMNH). — Same region, 4°00'45"N, 8°24'15"E, 74 m, taken by corer, Gardline Survey 3003, stn BOC3FC, 1 juv. sh. (BMNH).

Congo (Brazzaville). N'Kossa oilfield, 5°53.12'S, 11°38.30'E, 200 m, leg. L. Bigot, 23.IX.1995, 1 rv. (MNHN).

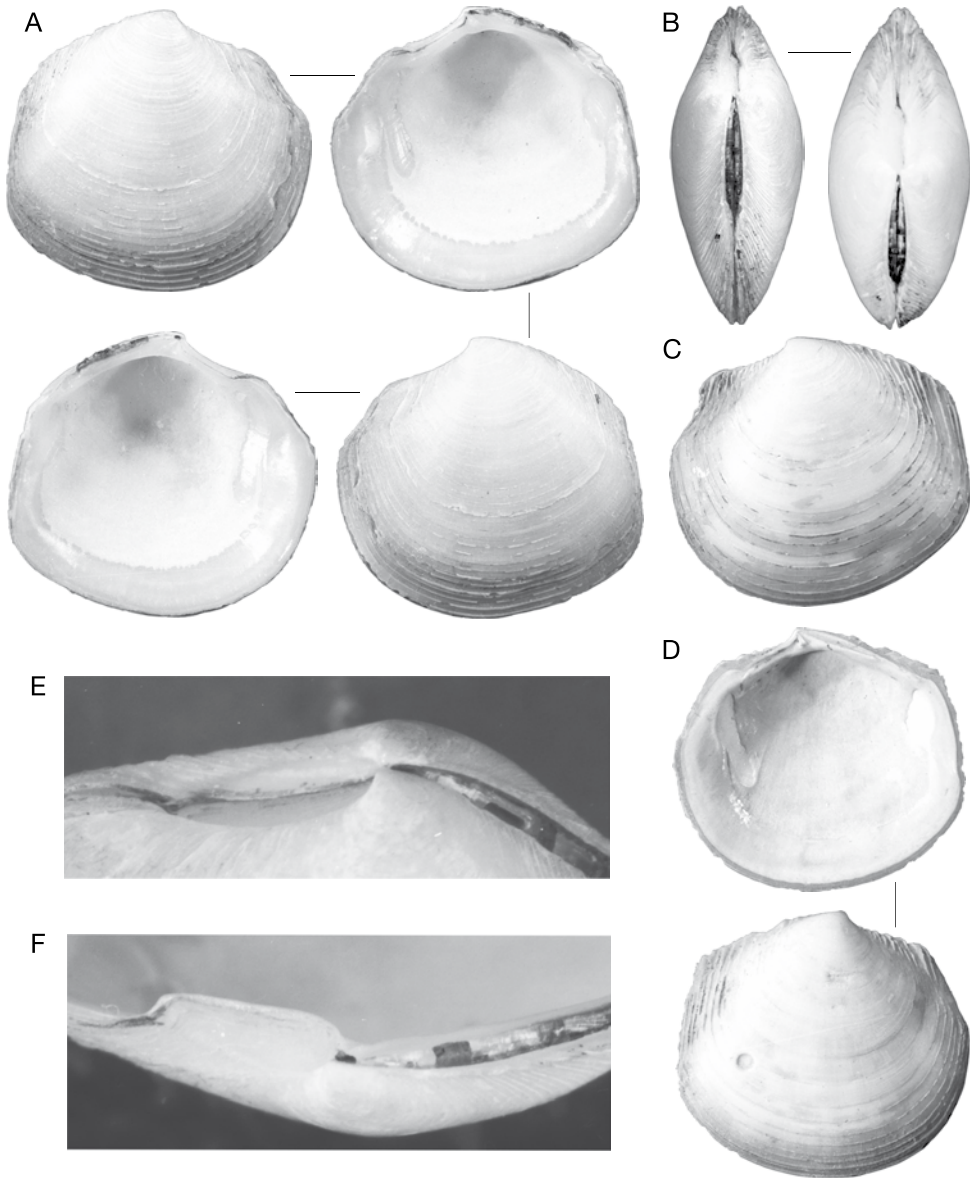


FIG. 9. — *Afrolucina discontinua* n. gen., n. sp.: **A**, holotype, off Grand Bassam, Côte d'Ivoire, 70 m, dredged RV *Reine Pokou*, leg. Le Loeuff, 1977, 17.4 mm (MNHN), interior and exterior of both v.; **B**, two different dorsal views of holotype to show asymmetrical lunule; **C**, paratype, Abidjan region, continental shelf (no precision), 15.9 mm (MNHN), exterior of lv.; **D**, off Mussulo, Luanda Province, Angola, 100 m, 14.7 mm, interior and exterior of rv.; **E**, **F**, close-up photos of asymmetrical lunule in holotype.

Northern Angola. Ambrizete, 80 m, 1982-1986, leg. S. Gofas, 1 juv. rv. (MNHN). — Ilha de Luanda, 120 m, 1982-1986, leg. S. Gofas, 1 rv., 3 lv. (MNHN). — Off Mussulo, 90-100 m, 1982-1986, leg. S. Gofas, 1 rv. (MNHN). — Palmeirinhas, 60-80 m, 1982-1986, leg.

S. Gofas, 7 rv., 3 lv. (MNHN).

Second morph, somewhat longer and regular commarginal lamellae:

Bénin. Off Ouidah, 6°10'N, 2°05'E, 200 m, dredged RV *Léon Coursin*, 22.XI.1958, leg. I. Marche-Marchad,

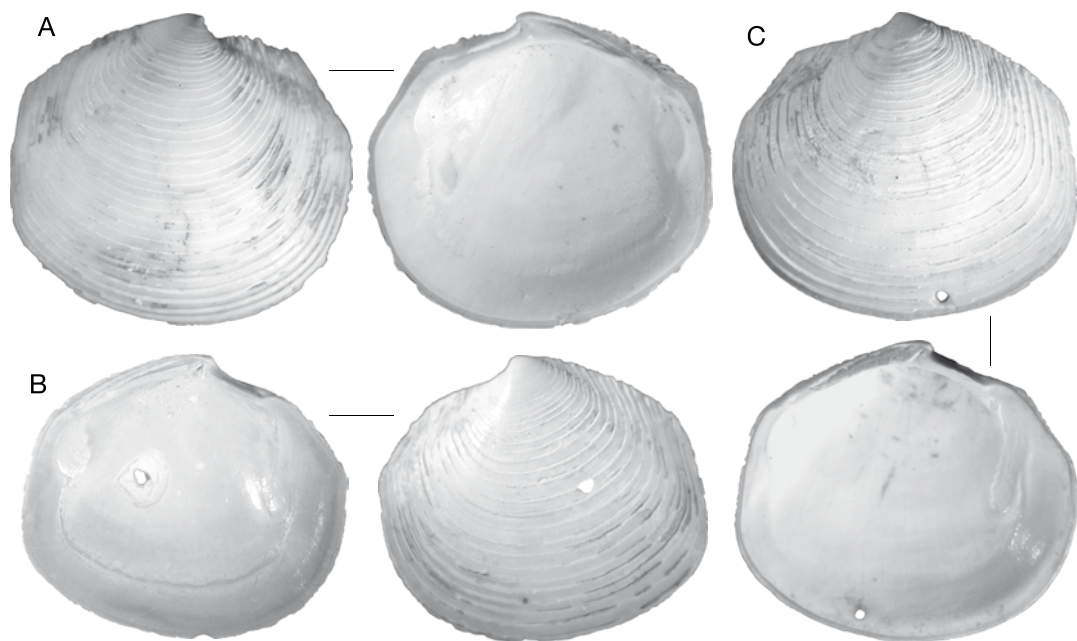


FIG. 10. — *Afrolucina discontinua* n. gen., n. sp., second "morph": **A**, off Ouidah, Bénin, 6°10'N, 2°05'E, 200 m, dredged RV *Léon Coursin*, 14.1 mm, exterior and interior of rv.; **B**, off Ilha de Luanda, N Angola, 120 m, 13.2 mm, interior and exterior of lv.; **C**, off Niger delta, 4°05'N, 5°28'E, 90-105 m, dredged RV *Calypso*, Golfe de Guinée, 1956, 15.0 mm, exterior and interior of lv.

3 rv., 2 lv. (MNHN).

Nigeria. Off Niger delta, 4°05'N, 5°28'E, 90-105 m, dredged RV *Calypso*, 26.V.1956, 1 lv. (MNHN).

Northern Angola. Ilha de Luanda, 120 m, leg. S. Gofas, 1 lv. (MNHN).

DISTRIBUTION. — Senegal (Dakar); Côte d'Ivoire to inner Gulf of Guinea (northern Cameroon, Bioko); northern Angola (Luanda). Not recorded from Guinea-Bissau to Liberia (border to Côte d'Ivoire) and from southern Cameroon to the Congo Republic which may indicate distribution gaps in the tropical zone proper.

DESCRIPTION

Shell 12-18 mm long, rather solid, somewhat variable in outline and sculpture, subcircular (length/height ratio 1.1), inequilateral, equivalve, compressed. Beaks just in front of the vertical midline. Anterior margin with a slight but rather sharp corner to the antero-dorsal margin. Antero-dorsal margin divided into two short, concave to almost straight parts with a corner between them, the upper part comprising the lunular area. Posterior margin obliquely truncated, with rounded corners.

Postero-dorsal margin slightly convex. Ventral margin well rounded.

Exterior with numerous thin, more or less densely-spaced commarginal lamellae, which are often eroded and which may be obsolete on the first umbonal 10 mm of the valve, with surface appearing smooth. Interspaces with very fine growth lines. Antero-dorsal area well separated, with denser commarginal lamellae and wrinkles and a shallow radial depression in the middle. Postero-dorsal area separated by a rounded posterior angle.

Hinge plate narrow, hinge with one small but generally distinct oblique cardinal tooth in the right valve and two in the left valve. Anterior and posterior laterals in the right valve appearing as very small and indistinct knobs, in the left valve almost obsolete. Lunule short and rather broad, markedly asymmetrical, sunken; left valve with a strong and more or less protruding lunular plate which inserts directly under the much narrower lunular plate of the right valve into a socket under and parallel to it (Fig. 9E, F). Anterior cardinal of

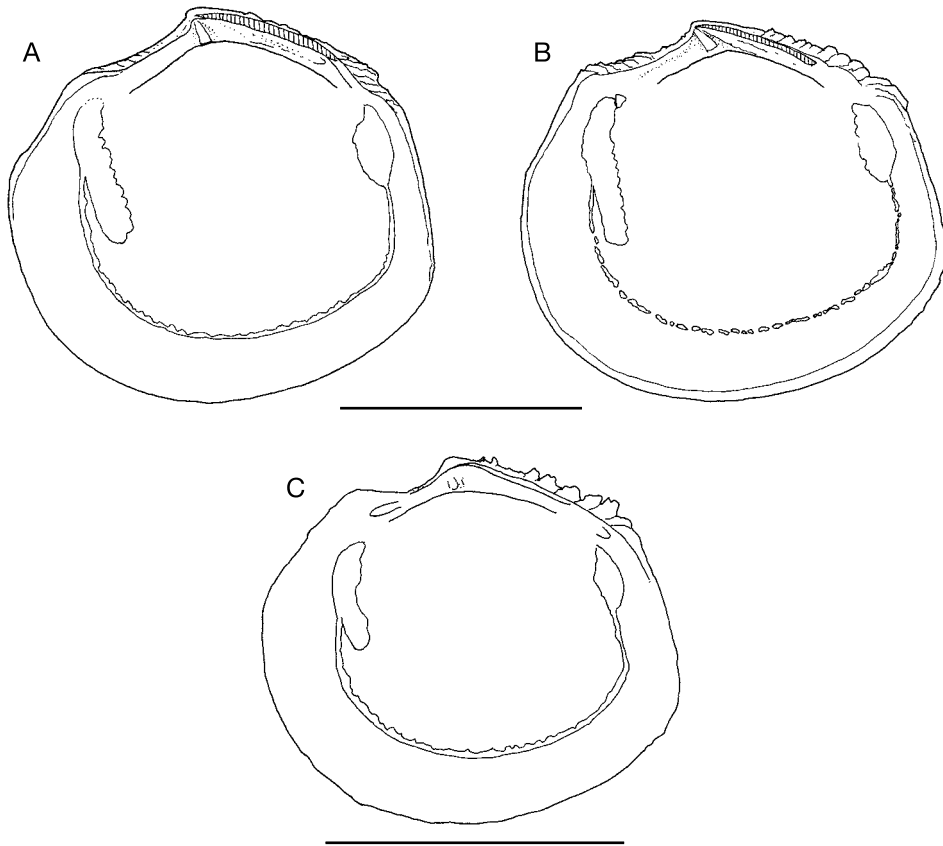


FIG. 11. — *Afrolucina discontinua* n. gen., n. sp., half schematic drawings of the insides of right valves: **A**, holotype; **B**, paratype; **C**, juvenile specimen from Bioko (Fernando Poo), 4°01'16"N, 8°36'06"E, 70 m, Gardline Survey 2003 (BMNH). Scale bars: A, B, 10 mm; C, 5 mm.

the left valve partly or completely integrated into the lunular plate. Escutcheon long, narrow and sunken. Anterior adductor scar fairly small, with short ventral part separate from the pallial line, this latter meeting the scar about in its middle or just before it. Pallial line often divided into a line of close-set separate impressions (Fig. 11B). Inner margin of valves smooth.

Colour of valves entirely white, periostracum very thin, yellowish brown, on the earliest part of the valves thinner to obsolete.

There exists a second "morph", of which a few valves were collected off Bénin, Nigeria and off northern Angola (Fig. 10). The valves have regular and rather densely spaced commarginal lamellae

over the whole valve surface and are occasionally slightly more elongate. As very little material is available, and as there might be intergrades to the "normal" form, I leave them as a variety within *A. discontinua* n. gen., n. sp.

Measurements are provided in Table 4.

BIOTOPE

In soft sediment, most probably fine muddy sand, from 50 to about 230 m.

REMARKS

In outline, this species resembles somehow *Graecina karinae* n. gen., n. sp. (see next entry) but is easily distinguished by the sharp antero-dorsal corner, the

TABLE 4. — *Afrolucina discontinua* n. gen., n. sp.: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
18.4 × 17.6	Côte d'Ivoire, paratype (MNHN)	1.0
17.4 × 16.1 × 7.4	Côte d'Ivoire, holotype (MNHN)	1.1
17.4 × 15.6	Côte d'Ivoire, paratype (BMNH)	1.1
15.9 × 14.3	Côte d'Ivoire, paratype (MNHN)	1.1
15.0 × 13.3	Nigeria, <i>Calypso</i> , 1956, stn 27	1.1
14.7 × 13.4	Angola, Mussulo	1.1
13.6 × 12.4 × 5.1	Côte d'Ivoire, <i>Rafale</i> , stn DR 17	1.1
13.6 × 12.3 × 5.2	Côte d'Ivoire, paratype (BMNH)	1.1
13.0 × 11.4 × 4.5	Côte d'Ivoire, paratype (MNHN)	1.1
12.3 × 11.5	Liberia, <i>Calypso</i> , 1956, stn 15	1.1
12.0 × 10.8	Senegal, Dakar, <i>Gérard Tréca</i>	1.1
10.1 × 9.3 × 3.7	Côte d'Ivoire, paratype (MNHN)	1.1
5.6 × 5.3 × 2.4	Côte d'Ivoire, paratype (MNHN)	1.1

obliquely truncated posterior margin, the sculpture, the often interrupted pallial line and the smaller size.

The distributional range of *Afrolucina discontinua* n. gen., n. sp. coincides with the different zones of seasonal upwelling on the coast of tropical West Africa: Senegal in the Northern zone of Alternance (see Intés & Le Loeuff 1984; Le Loeuff 1993; Le Loeuff & Cosel 1998) with strong upwelling during northern winter, Côte d'Ivoire and Bénin in the central atypical tropical zone with intermittent seasonal upwelling and Angola in the Southern zone of Alternance with upwelling in southern winter. The species seems not to be present in the northern (Guinea to Liberia) and southern (southern Cameroon to Gabon) typical tropical zones and also not in the zones with weaker upwelling adjacent to the zones of Alternance (Guinea-Bissau in the North and Congo in the South). However, recently a few very small specimens were found west of Bioko (Fernando Poo), which is already in the southern typical tropical zone and within the influence of the Niger delta. The species may need some regular influence of upwelling.

Genus *Graecina* n. gen.

TYPE AND ONLY SPECIES. — *Graecina karinae* n. sp.

DISTRIBUTION. — Northern Angola (Ambrizete), tropical West Africa.

DIAGNOSIS. — Shells medium-sized, subcircular, slightly longer than high, rather compressed. Beaks in front of the vertical midline. Surface with thin commarginal lamellae or cords only on the earlier part of the valves, becoming obsolete and then absent ventrally. Rest of the valves with growth lines and some coarser "growth stages". Anterior area with two shallow radial depressions, anterior angle indistinct. Postero-dorsal area indistinct and not separated by a visible posterior angle. Lunule long, narrow, slightly asymmetrical, sunken. Escutcheon long, narrow and sunken, delimited by a sharp and prominent, narrowly laminate keel, but no long lamellate prolongations. Hinge arched, in the right valve with one well developed cardinal tooth and sometimes the vestiges of a posterior cardinal, and anterior and posterior laterals. Left valve with two cardinals and well marked anterior and posterior laterals. Anterior adductor scar rather elongate, with moderately long diverging part, pallial line meeting the scar in about its middle or just above it. Posterior adductor scar small. Inner margins smooth.

ETYMOLOGY. — The name goes back to Roman history as already does the name of the type genus of Lucinidae, *Lucina* (Lucina is the Roman goddess of childbirth). *Lucina* is believed to have been the baptismal name of Pomponia Graecina, a noble Roman lady and wife of the conqueror of Britain, Aulus Plautius. The new genus *Graecina* n. gen. honours the same person as the genus *Lucina*.

REMARKS

This genus has an overall appearance of a large *Myrtea*, especially with its raised and sharp escutcheon keel, however, the valves are much more compressed, and the anterior adductor scars are more elongate, with a longer diverging part. In shell form and outline

and with the small posterior adductor scar, this genus looks most similar to a new genus under description by Cosel & Bouchet (unpubl. data), however, *Graecina* n. gen. is much larger, has well defined cardinal and lateral teeth and commarginal lamellae on the earlier part of the valves; the pallial line meets the anterior adductor scar at a higher point and thus leaves a longer ventral diverging part. Another genus, especially similar in size and form of the anterior adductor is also under description by Cosel & Bouchet (unpubl. data). In that genus, the hinge is toothless, the hinge line is less bent and the lunule is shorter.

Graecina karinae n. sp.
(Figs 12; 13)

TYPE MATERIAL. — Holotype: N Angola, Angola Margin, W of Ambrizete, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000, leg. R. von Cosel, lv. (MNHN).

Paratypes: same locality, 3 rv., 1 lv. (MNHN); 2 rv. (BMNH).

TYPE LOCALITY. — Ambrizete, Northern Angola, tropical West Africa.

ETYMOLOGY. — Dedicated to my colleague Karine Olu-Le Roy from IFREMER, in acknowledgement of her longtime kind collaboration on bivalves of cold seeps.

OTHER MATERIAL EXAMINED. — **Nigeria.** S of Port Harcourt, 3°42.28'N, 7°47.59'W, 425 m, taken by corer, RV *Le Suroit*, stn GUINNESS 2, 2.IX.1993, leg. P. Cochonat, 2 fossilized lv., 1 rv. (MNHN).

Northern Angola. Angola Margin, off Ambrizete, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000, leg. R. von Cosel, associated specimens, 6 lv., 9 rv., all old and partly chipped or worn (MNHN).

DISTRIBUTION. — Nigeria; Northern Angola.

DESCRIPTION

Shell medium-sized, up to about 40 mm long, rather thick and solid, somewhat variable in outline, subcircular (length/height ratio 1.1), inequilateral, equivalve, rather compressed. Beaks well in front of the vertical midline. Anterior part broadly rounded, anterior margin evenly convex. Posterior part rounded, posterior margin convex but

occasionally obliquely truncated, with rounded postero-ventral corner. Antero- and postero-dorsal margins sloping, with a curved hinge line; margin between the lunular area and the anterior margin strongly curved. Postero-dorsal margin convex, occasionally more so in its upper part behind the umbones. Ventral margin rounded, in the middle less convex.

Exterior with thin commarginal lamellae or cords, only on the earlier third or fourth or sometimes the very earliest part of the valves, becoming obsolete and then absent towards ventrally. Interspaces with very fine growth lines only. Rest of the valves with strong, dense and rather regular growth lines and some coarser "growth stages". Antero-dorsal area with two shallow radial depressions, one closely under the lunular area, the other somewhat more below it, anterior angle indistinct. Postero-dorsal area indistinct and not separated by a visible posterior angle.

Hinge plate narrow and arched. Hinge in the right valve with one well developed cardinal tooth and sometimes the vestiges of a posterior cardinal, and long and narrow anterior and posterior laterals. Left valve with one well developed cardinal and a narrow and short anterior cardinal, and narrow, well marked anterior and posterior laterals. Lunule rather long, narrow, slightly asymmetrical, somewhat broader in the right valve, sunken. Escutcheon long, narrow and sunken, delimited by a sharp, raised and serrated keel, but no highly lamellate prolongations. Anterior adductor scar rather small, long, with moderately long diverging part, pallial line meeting the scar in about its middle or just above it. Posterior scar small but rather broad. Inner margin of valves smooth.

Valves presumably white in life but in the dead collected samples chalky or light greyish. Periostracum thin, light greenish brown, when present.

Measurements are provided in Table 5.

BIOTOPE

All collected specimens are rather aged single valves. They were trawled, together with complete shells and/or valves of two other lucinid species, also described herein (see below), on a site at the Angola shelf margin (ZAIANGO Program, site B) where

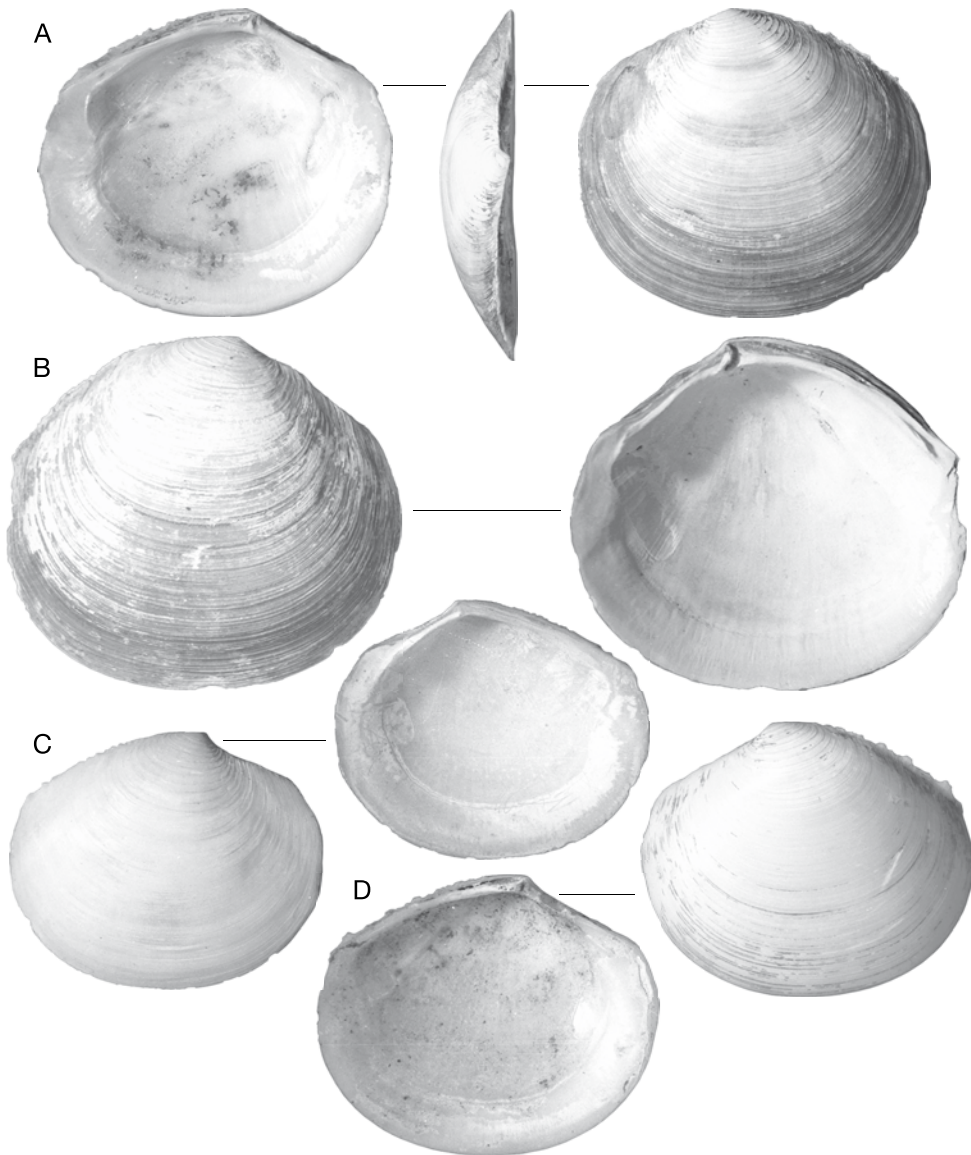


FIG. 12. — *Graecina karinae* n. gen., n. sp.: **A**, holotype, Angola Margin, W of Ambrizete, N Angola, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, leg. R. von Cosel, 29.VIII.2000, 31.8 mm (MNHN), interior, exterior and dorsal view of lv.; **B**, paratype 1, same locality, 36.0 mm (MNHN), exterior and interior of rv.; **C**, South of Port Harcourt, Nigeria, 3°42.28'N, 7°47.59'W, 425 m, RV *Le Suroit*, 23.1 mm, exterior and interior of rv.; **D**, same locality, 26 mm, exterior and interior of lv.

about 20 to 45 m high, circular mounds of deep water coral (*Lophelia pertusa* (Linnaeus, 1758)) are present (Dekindt *et al.* 2001; Olu-Le Roy pers. comm.). On these mounds, living corals are on top and on the higher parts, whereas dead corals and

debris are found on the lower part and at the bases. The lucinid shells and valves were on the sediment around and in depressions between the mounds. In the trawl, which had passed on an almost N-S line just at the base of coral mounds in a depth of

TABLE 5. — *Graecina karinae* n. gen., n. sp.: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height (no tumidity)	Specimen	Length/height ratio
41.3 × 35.5	Angola, paratype (BMNH)	1.2
41.1 × 35.5	Angola, paratype (MNHN)	1.2
39.6 × 34.6	Angola, paratype (MNHN)	1.1
39.4 × 36.3	Angola, paratype (MNHN)	1.1
39.0 × 34.1	Angola, associated specimen	1.1
37.9 × 32.8	Angola, associated specimen	1.2
36.0 × 32.2	Angola, paratype (MNHN)	1.1
31.8 × 27.7	Angola, holotype (MNHN)	1.1
31.6 × 26.2	Angola, associated specimen	1.2
30.4 × 26.7	Angola, paratype (BMNH)	1.1
29.5 × 27.0	Angola, paratype (MNHN)	1.1
26.0 × 21.4	Nigeria, Port Harcourt	1.2
23.1 × 19.0	Nigeria, Port Harcourt	1.2

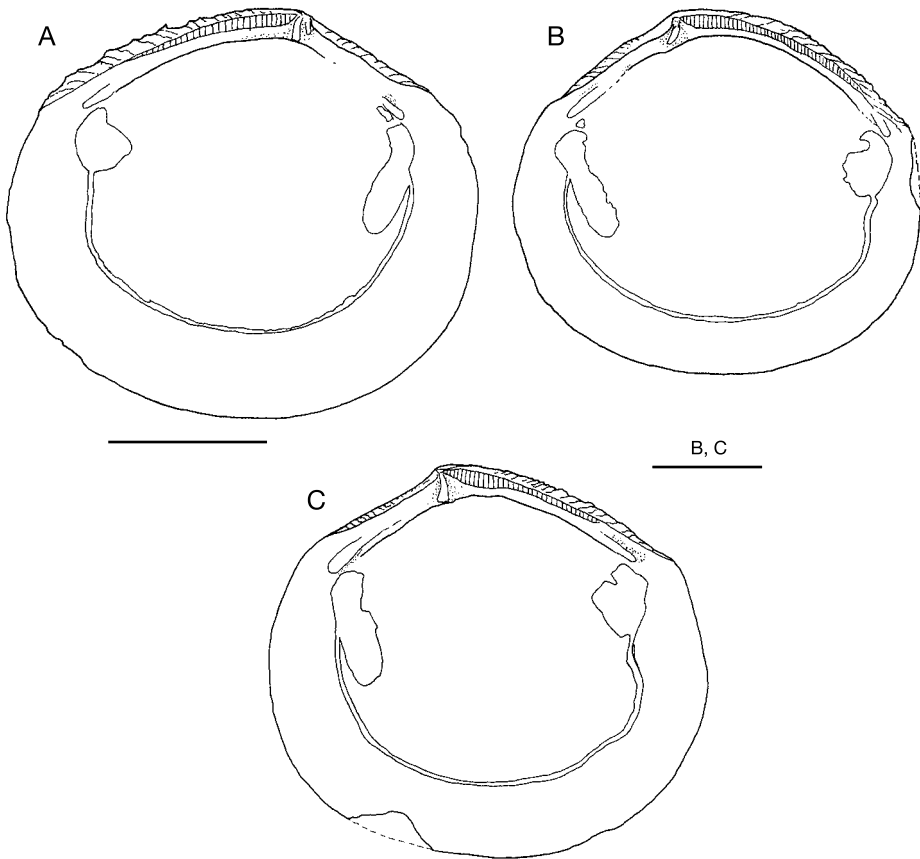


FIG. 13. — *Graecina karinae* n. gen., n. sp., half schematic drawings of the insides of valves: **A**, holotype, lv.; **B, C**, paratypes, rv. Scale bars: 10 mm.

TABLE 6. — *Lucinoma vestita* (Dautzenberg & Fischer, 1906): measurements (in mm) and length/height ratio.

Shell length × height × tumidity	Specimen	Length/height ratio
15.8 × 15.0 × 6.2	Cape Verde Islands, syntype (MOM, figured)	1.1
14.7 × 13.7 × 6.0	Cape Verde Islands, syntype 2 (MOM)	1.1
12.9 × 12.0 × 5.2	Cape Verde Islands, syntype 3 (MOM)	1.1

360–425 m, they came up as agglomerations of dead shells embedded in dark grey and very sticky mud, but none of the lucinids were collected alive or in very fresh state. Some valves had even pieces of solidified mud on them, which were difficult to remove. It is presumed that these Lucinidae species come from a site of reducing sediments where fluid emissions (methane or sulfide-rich) may still be slightly active or are no longer active, and where the fauna is dying out.

REMARKS

As for the genus.

Genus *Lucinoma* Dall, 1901

TYPE SPECIES. — *Lucina filosa* Stimpson, 1851, by original designation.

SPECIES INCLUDED. — Numerous species, worldwide.

DIAGNOSIS. — Shells medium-sized to very large, rather thin to strong and solid, very variable in outline, in general subcircular to somewhat triangular, but also almost circular to even short-oval. Anterior margin broadly rounded to more or less pointed. Umbones in front of the vertical midline. Surface with more or less pronounced commarginal ribs or lamellae and finer threads between them. Hinge with two well developed cardinal teeth in each valve and a small anterior lateral and often a small posterior lateral. Diverging part of the anterior adductor scar very long and more or less narrow.

REMARKS

Lucinoma is one of the most speciose lucinid genera; it is distributed worldwide, in tropical latitudes as well as in temperate and cold waters. In tropical West Africa, four species are known. More detailed comments on the genus will be given Cosel & Bouchet (unpubl. data).

Lucinoma vestita
(Dautzenberg & Fischer, 1906)
(Figs 14; 15A, B)

Phacoides (Lucinoma) vestita Dautzenberg & Fischer, 1906: 90-91, pl. 5, figs 1-5.

TYPE MATERIAL. — Figured syntype: Cap Verde Islands, near Maio, 15°14'N, 23°04.1'W, 628 m, muddy sand, trawled RV *Princess Alice*, 14.VIII.1901, 1 complete sh. (MOM); same locality, 3 other syntypes: 2 sh., 1 worn rv. (all MOM).

TYPE LOCALITY. — Maio, Cape Verde Islands.

DISTRIBUTION. — Only known from the Cape Verde Islands.

DESCRIPTION

Shell 12–16 mm long, thick and solid, subcircular, inequilateral, equivalve, compressed. Beaks slightly in front of the vertical midline. Anterior margin rounded, posterior margin obliquely rounded-truncated with rounded corners. Postero-dorsal margin slightly convex. Ventral margin evenly semicircular.

Exterior with numerous, very fine, irregular growth lines, occasionally more or less eroded on the umbonal part of the valves; commarginal lamellae only visible in the region of the posterior angle if at all. Earlier part of the valves appearing smooth. Posterior area delimited by gently rounded posterior angle, anterior angle absent.

Hinge plate very broad, especially under the umbones, with a rather thin anterior and a strong posterior cardinal tooth in the right valve and a strong, slightly bifid anterior and a thinner and more laminar posterior cardinal in the left valve. Anterior laterals in both valves small and knob-like but well defined, posterior laterals ill-defined or obsolete. Lunule quite broad with thick layer of periostracum. Escutcheon long and narrow, ligament deeply inset. Anterior adductor scar rather

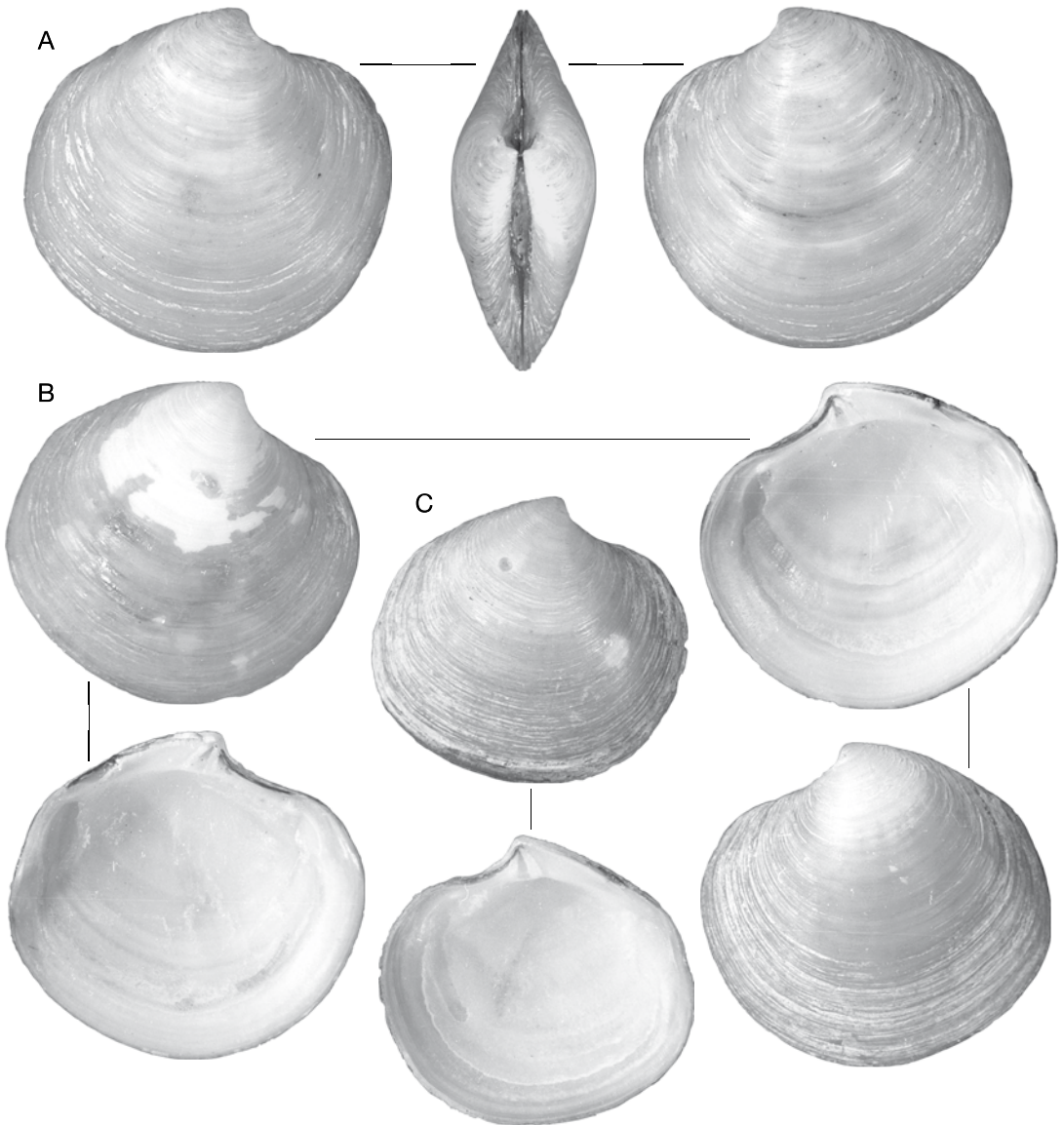


FIG. 14. — *Lucinoma vestita* (Dautzenberg & Fischer, 1906): **A**, figured syntype, near Maio, Cap Verde Islands, 15°14'N, 23°04.1'W, 628 m, muddy sand, trawled RV *Princess Alice*, 14.VIII.1901, 15.8 mm (MOM), exterior of both v., dorsal view; **B**, syntype 2, same locality, 14.7 mm (MOM), exterior and interior of both v.; **C**, syntype 3, same locality, 12.9 mm (MOM), interior and exterior of rv.

small, its diverging part very long and narrow. Inner margin of valves smooth.

Valves entirely white. Periostracum yellowish brown, on the earliest parts of the valve thin to obsolete (eroded).

Measurements are provided in Table 6.

BIOTOPE

Muddy-sandy bottom on the shelf slope at about 600 m.

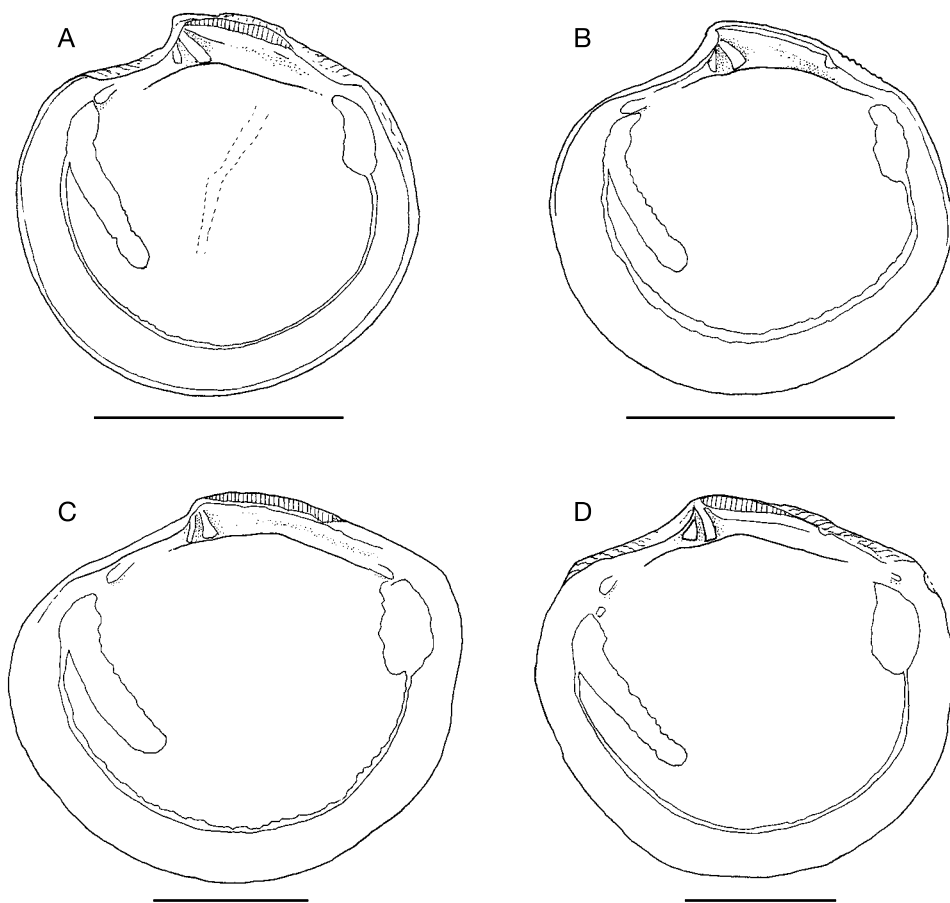


FIG. 15. — Half schematic drawings of the insides of right valves: **A, B**, *Lucinoma vestita* (Dautzenberg & Fischer, 1906); **A**, figured syntype; **B**, syntype 2; **C, D**, *Lucinoma atalantae* n. sp.; **C**, holotype; **D**, paratype 1. Scale bars: 10 mm.

REMARKS

This species is the smallest West African *Lucinoma*, it is distinguished from the other *Lucinoma* of the region by the very broad hinge plate under the umbones, which, together with the concave lunular area, gives the beaks a more raised appearance.

Lucinoma atalantae n. sp. (Figs 15C, D; 16)

TYPE MATERIAL. — Holotype: W of Mauritania, 20°32'N, 18°36'W, 2042 m, dredged RV *Atalante*, EUMELI 4, stn CP 16, 5.VI.1992, an alcohol preserved spm (MNHN). Paratypes: same locality, 2 sh. (MNHN).

TYPE LOCALITY. — Cape Verde Basin, W of Cap Blanc, Mauritania.

ETYMOLOGY. — Named after the RV *Atalante*, from which the type material was taken.

OTHER MATERIAL EXAMINED. — **Mauritania.** W of Cap Blanc, 20°41'N, 18°33'W, 2114 m, dredged RV *Atalante*, EUMELI 2, stn CP 03, 5.II.1992, 3 spm, 1 adult, 1 juv. sh. (MNHN). — 20°33'N, 18°35'W, 2003 m, dredged RV *Atalante*, EUMELI 2, stn CP 04, 5.II.1992, 1 juv. sh. (MNHN). — NW of Cap Blanc, 20°58.9'N, 18°13.6'W, 2112–2160 m, RV *Discovery*, stn 9133#5, 25.II.1976, 2 spm, 2 sh. (BMNH). — Same locality, 20°57.0'N, 18°11.0'W, 2110–2130 m, RV *Discovery* stn 11540, 2.IX.1987, 1 spm (BMNH).

DISTRIBUTION. — Only known from the Cape Verde Basin.

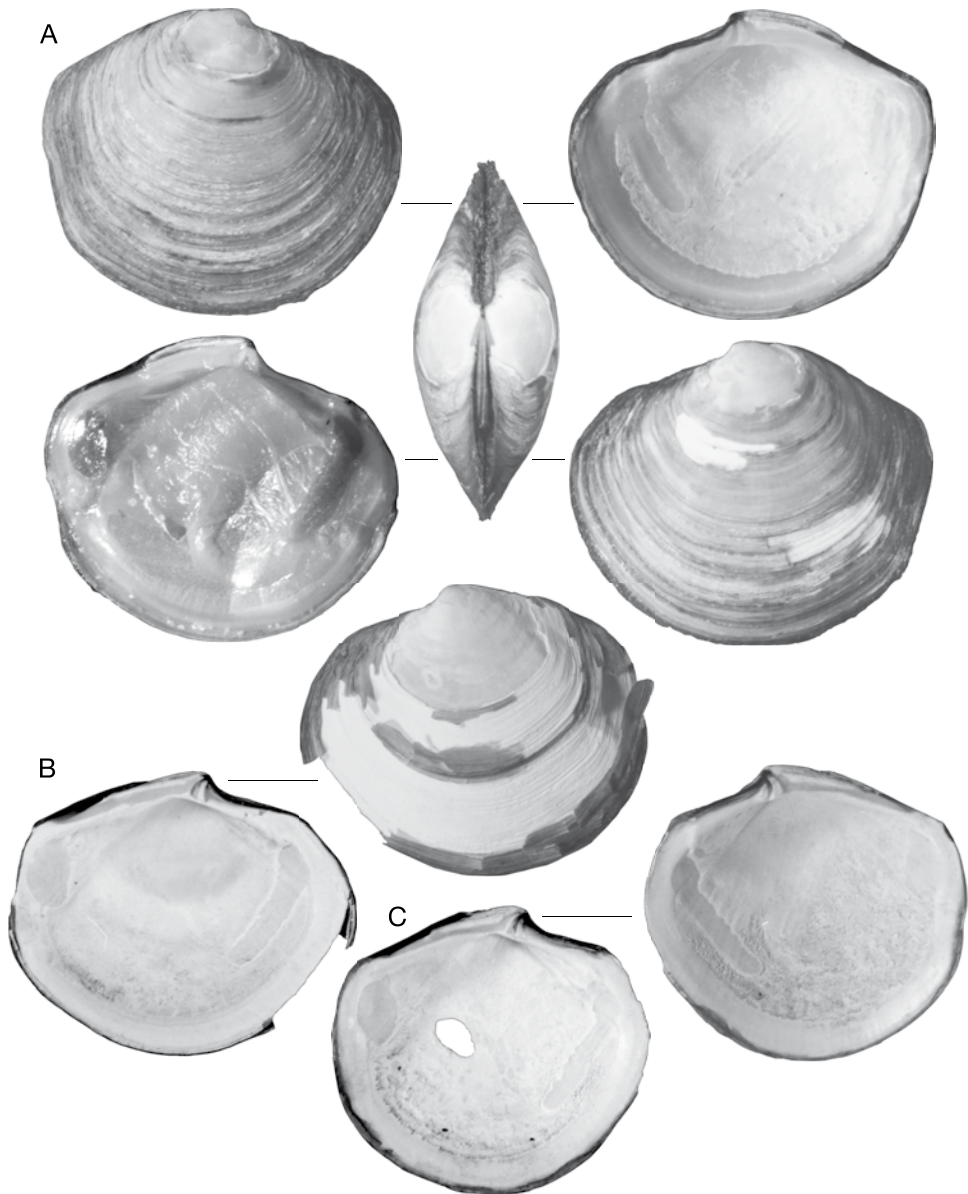


FIG. 16. — *Lucinoma atalantae* n. sp.: **A**, holotype, W of Mauritania, 20°32'N, 18°36'W, 2042 m, dredged RV *Atalante*, EUMELI 4, stn CP 16, 5.VI.1992, 29.1 mm (MNHN), exterior and interior of rv., exterior and interior with soft parts of lv., dorsal view; **B**, paratype 1, same locality, 29.1 mm (MNHN), interior and exterior of lv.; **C**, paratype 2, same locality, 26.7 mm (MNHN), interior of both v.

DESCRIPTION

Shell to 29 mm long, rather solid, variable in outline and sculpture, subcircular (length/height ratio between 1.1 and 1.2), compressed. Anterior margin rather narrowly

rounded, posterior margin more or less conspicuously truncated, occasionally slightly sinuous, with rounded corners. Ventral margin convex, nearly semi-circular. Beaks just in front of the vertical midline.

TABLE 7. — *Lucinoma atalantae* n. sp.: measurements in mm and length/height ratio. All non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
31.7 × 28.5 × 13.7	Mauritania, <i>Discovery</i> , stn 9133#5	1.1
29.1 × 24.9 × 11.6	Mauritania, holotype	1.2
29.0 × 24.6 × 9.5	Mauritania, paratype 1	1.2
28.7 × 24.1 × 11.1	Mauritania, <i>Discovery</i> , stn 11540	1.2
27.0 × 23.7 × 10.2	Mauritania, EUMELI 2, stn CP 03	1.1
26.7 × 24.1 × 11.4	Mauritania, paratype 2	1.1
25.1 × 21.0 × 9.7	Mauritania, EUMELI 2, stn CP 03	1.2
20.3 × 18.9 × 8.4	Mauritania, EUMELI 2, stn CP 03	1.1
11.7 × 10.3 × 4.4	Mauritania, EUMELI 2, stn CP 04	1.1
11.3 × 9.8 × 3.8	Mauritania, EUMELI 2, stn CP 03	1.2
10.7 × 9.0 × 3.7	Mauritania, EUMELI 2, stn CP 03	1.2
10.5 × 9.0 × 3.4	Mauritania, <i>Discovery</i> , stn 9133#5	1.2

Exterior with numerous, very fine, irregular growth lines and commarginal lamellae which in juvenile specimens are very close-set and evenly spaced, in adult and subadult specimens they are more irregularly and wider spaced, obsolete or entirely missing. Earlier part of the valves often eroded. Posterior area delimited by gently rounded posterior angle, anterior angle absent. Lunule sunken, with rather thick layer of periostracum on it. Escutcheon long and very narrow, ligament slightly sunken.

Hinge plate moderately broad, with two well developed cardinal teeth in each valve; posterior cardinal in the left valve rather thin and laminar. Laterals more or less indistinct. Diverging part of anterior adductor scar long. Inner margin smooth.

Valves white. Periostracum very strong, yellowish brown, on the earliest parts of the valve thinner to obsolete.

Measurements are provided in Table 7.

BIOTOPE

In soft sediment, most probably mud, found between 2003 and 2160 m.

REMARKS

Lucinoma atalantae n. sp. is distinguished from *L. vestita*, the most similar species, by its larger size, the thinner and slightly longer valves, the narrower hinge plate and the sculpture. *Lucinoma atalantae* n. sp. shows dense commarginal lamellae on the earlier part of the valve whereas *L. vestita* is smooth. Juveniles of *L. atalantae* n. sp. are closer

in outline to *L. vestita* but the narrower hinge line and the presence of commarginal lamellae remain distinguishing features. Both species have a different depth preference: *L. vestita* on the shelf slope at about 600 m, *L. atalantae* n. sp. much deeper, at about 2000 m. The two species have been taken at their type localities only, and we do not know their actual distribution range. Apart from an Indo-West Pacific species (under description by Cosel & Bouchet) which was found at 2570 m, *L. atalantae* n. sp. is the deepest-recorded lucinid species.

Lucinoma myriamae n. sp.

(Figs 17; 18A)

TYPE MATERIAL. — Holotype: N Angola, Angola margin, W of Ambrizete, 7°18.42'S, 12°04.60'E, 360–367 m, BIOZAIRE Program site ZB-B, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000, leg. R. von Cosel, a complete shell (MNHN).

Paratypes: same locality, 1 rv., 3 lv. (MNHN); 1 rv., 1 lv. (BMNH).

TYPE LOCALITY. — Ambrizete, Northern Angola, tropical West Africa.

ETYMOLOGY. — Dedicated to my colleague Myriam Sibuet, principal investigator of the ZAIANGO BIOL and BIOZAIRE program and cruise leader of ZAIANGO BIOL 2, in which the author participated and in which the species was taken.

OTHER MATERIAL EXAMINED. — **Nigeria.** S of Port Harcourt, 3°42.28'N, 7°47.59'W, 425 m, taken by corer, RV *Le Suroit*, GUINNESS 2, stn KG 2 N 11, 2.IX.1993,

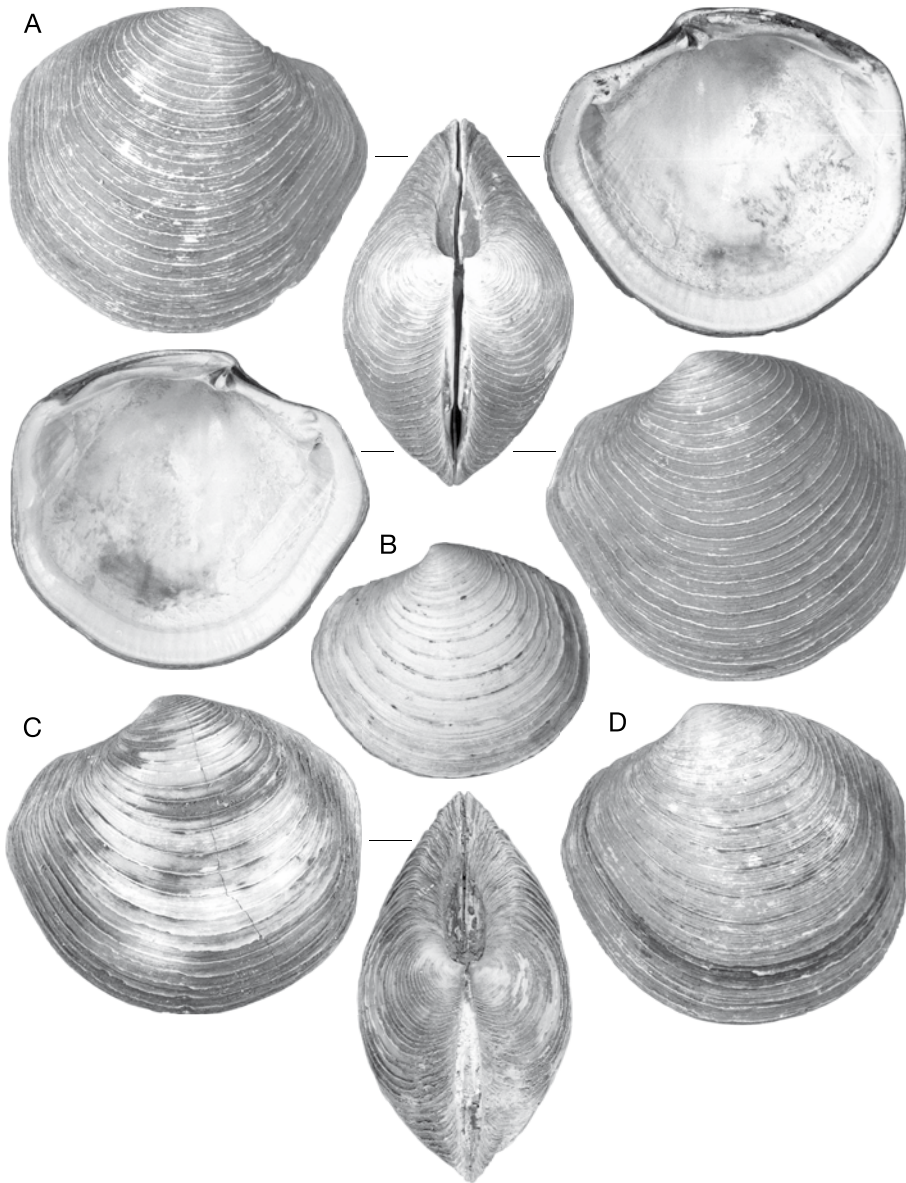


FIG. 17. — *Lucinoma myriamae* n. sp.: **A**, holotype, Angola Margin, W of Ambrizete, N Angola, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, leg. R. von Cosel, 29.VIII.2000, 51.2 mm (MNHN), exterior and interior view of both v., dorsal view; **B**, juvenile specimen, 20.5 mm, exterior of lv.; **C**, S of Port Harcourt, Nigeria, 3°42.28'N, 7°47.59'E, 425 m, RV *Le Suroit*, specimen from piston corer, in solidified mud, 42.5 mm, exterior of lv., dorsal view; **D**, paratype 1, 50.5 mm (MNHN), exterior of lv.

leg. P. Cochonat, 1 sh. with "fossilized" hardened mud between valves (MNHN).

Gabon. SW of Port-Gentil, 1°35.60'S, 8°34.69'E, 410 m, boxcorer, RV *Le Suroit*, GUINNESS 2, stn GGS 2 G10,

25.VIII.1993, leg. P. Cochonat, 1 lv. (MNHN).

Northern Angola. W of Ambrizete, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000, leg. R. von Cosel, associated

TABLE 8. — *Lucinoma myriamae* n. sp.: measurements (in mm) and length/height ratio. Non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
53.6 × 48.9	Angola, paratype (BMNH)	1.1
51.2 × 46.7 × 31.3	Angola, holotype	1.1
50.5 × 47.1	Angola, paratype (MNHN)	1.1
50.1 × 47.0	Angola, paratype (BMNH)	1.1
43.5 × 42.2	Angola, paratype (MNHN)	1.0
42.5 × 38.1 × 23.4	Nigeria, Port Harcourt	1.1
34.5 × 31.0	Angola, paratype (MNHN)	1.1
33.2 × 29.6	Angola, paratype (MNHN)	1.1
20.5 × 17.5	Angola, ZAIANGO BIOL 2, stn KGS 20	1.2

specimens: numerous rv. and lv. in part more or less worn (MNHN). — W of Ambrizete, 7°18.38'S, 12°04.72'E, 363 m, taken by boxcorer, RV *Thalassa*, ZAIANGO BIOL 2, stn KGS 20, 29.VIII.2000, leg. R. von Cosel, 1 juv. lv. (MNHN). — Same locality, 7°18.31'S, 12°04.82'E, 371–375 m, taken by ROV *Victor*, RV *Atalante*, BIOZAIRE 1, stn PL 79-3, 6.I.2001, leg. M. Sibuet, 1 sh. (MNHN).

DISTRIBUTION. — Gulf of Guinea: Nigeria to northern Angola.

DESCRIPTION

Shell to about 53 mm long, thick and solid, somewhat variable in outline, subcircular-triangular (length/height ratio mostly 1.1), rather inflated. Anterior part tapering, anterior margin narrowly and obliquely truncated, antero-ventral margin almost straight to straight. Posterior margin broadly rounded-truncated, with rounded corners. Ventral margin convex, more so in the middle than antero- and postero-ventrally. Antero-dorsal (lunular) margin straight to slightly concave, postero-dorsal margin convex. Beaks in front of the vertical midline. Exterior with strong, rather regularly and widely spaced commarginal lamellae which on the earlier parts of the valves are finer and closer-set and which are obsolete on the anterior area. Interspaces with numerous, densely spaced, somewhat irregular commarginal cords, becoming obsolete on the very early parts of the valves which may be eroded. Anterior area delimited by a rounded anterior angle, posterior area by a rounded and indistinct posterior angle. Lunule rather long and broad, sunken, with rather thick layer of periostracum on it. Escutcheon long and very narrow, delimited by a sharp keel, ligament sunken.

Hinge plate strong, moderately broad, with two well developed cardinals in each valve; posterior

cardinal in the left valve thinner than the others. Anterior and posterior lateral in the right valve present as strong and well distinct knobs. Left valve with two strong anterior laterals and one weaker posterior lateral. Diverging part of the anterior adductor scar long and narrow. Inner margin smooth but ventral part of the inner surface, especially between mantle line and margin, with strong radial undulations.

Valves whitish in life, periostracum rather thin and dirty brownish.

Measurements are provided in Table 8.

BIOTOPE

No live specimens found. On sticky mud near mounds of *Lophelia pertusa* near reducing sediments (for details see *Graecina karinae* n. gen., n. sp.), shells and valves found between 360–425 m.

REMARKS

Two “morphs” of this variable species can be distinguished: the morph on which the type lot is based (Figs 17; 18A), with rounded-triangular outline, and another, higher and more rounded morph with more dense commarginal sculpture (Figs 18B; 19), which is covered separately in the next entry. All kinds of intergrades occur between these two morphs, therefore, there is no separation on species level.

Lucinoma myriamae n. sp. (second morph) (Figs 18B; 19)

MATERIAL EXAMINED. — Northern Angola. W of Ambrizete, 7°18.42'S, 12°04.60'E, 360–367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000,

TABLE 9. — *Lucinoma myriamae* n. sp. (second morph): selected measurements (in mm) and length/height ratio (all from type locality).

Shell length × height × tumidity	Specimen	Length/height ratio
55.2 × 50.6	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
54.3 × 52.5	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
53.0 × 54.2	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
52.6 × 48.6	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
52.0 × 53.2	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
51.0 × 47.8	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
49.3 × 49.1	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
48.2 × 44.7	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
47.5 × 48.1 × 31.1	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
47.1 × 46.6 × 30.1	Angola, ZAIANGO BIOL 2, stn CP 09	1.0
47.0 × 44.1 × 34.7	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
42.4 × 38.5	Angola, ZAIANGO BIOL 2, stn CP 09	1.1
38.3 × 36.3 × 22.2	Angola, BIOZAIRE 1, PL 79-3	1.1
31.2 × 28.5	Angola, ZAIANGO BIOL 2, stn CP 09	1.1

leg. R. von Cosel, 3 sh., numerous rv. and lv. in part more or less worn (MNHN). — W of Ambrizete, 7°18.31'S, 12°04.82'E, 371-375 m, taken by ROV *Victor*, RV *Atalante*, BIOZAIRE 1, stn PL 79-3, 6.I.2001, leg. M. Sibuet, 1 sh., several v. and fragments, more or less worn (MNHN). — Same locality, 7°17.78'S, 12°02.66'E, 372-408 m, taken by ROV *Victor*, RV *Atalante*, BIOZAIRE 1, stn PL 77-1, 5.I.2001, leg. M. Sibuet, several mostly worn v. (MNHN).

DESCRIPTION

Shell to 53 mm long, thick and solid, variable in outline, subcircular (length/height ratio between 1.0 and 1.2), inflated. Anterior margin broadly rounded, with an indistinct truncation, antero-ventral margin almost more or less rounded. Posterior margin broadly rounded-truncated, with rounded corners. Ventral margin well convex. Antero-dorsal (lunular) margin straight to slightly concave, postero-dorsal margin convex. Beaks slightly in front of the vertical midline.

Exterior with rather densely to more widely spaced commarginal lamellae and on the interspaces with numerous, strong and dense, more or less irregular commarginal cords, becoming obsolete on the very early parts of the valves which may be eroded. Anterior area delimited by a rounded anterior angle, posterior area by a rounded posterior angle and often marked by a shallow to indistinct indentation of the posterior margin. Lunule and hinge dentition as in the "normal" morph.

Measurements are provided in Table 9.

REMARKS

This "morph" is distinguished from the type series by its shorter, higher and more rounded shells with much denser commarginal lamellae. The shells are often more tumid. There are all kinds of intermediates to the "normal morph". *Lucinoma myriamae* n. sp. with its two morphs shows well the plasticity of species of *Lucinoma* at a single locality. The nominate "morph" could be compared with *Lucinoma* species from the Indo-West Pacific of which one (under description by Cosel & Bouchet, unpubl. data) has the same outline and ornamentation.

A close-looking species is *Lucinoma kazani* Salas & Woodside, 2002, found live in the eastern Mediterranean in a cold seep area on mud volcanoes in the Anaximander Mountains at 1165-1854 m depth S of Turkey (Salas & Woodside 2002). However, *L. kazani* is smaller (up to 38.4 mm length), less high and has finer commarginal cords, also with strong and irregular growth lines between them (see Fig. 18C). The diverging part of the anterior adductor scar is somewhat broader and shorter as in *L. kazani*. The other large Atlantic species, *L. borealis* (Linnaeus, 1767) (northern Norway to Cap Blanc, Mauritania and throughout the Mediterranean), is more circular, slightly smaller (on the West African coast to a length of 40 mm), in average less tumid and, in contrast to *L. myriamae* n. sp., it has more densely spaced irregular commarginal ridges or lamellae.

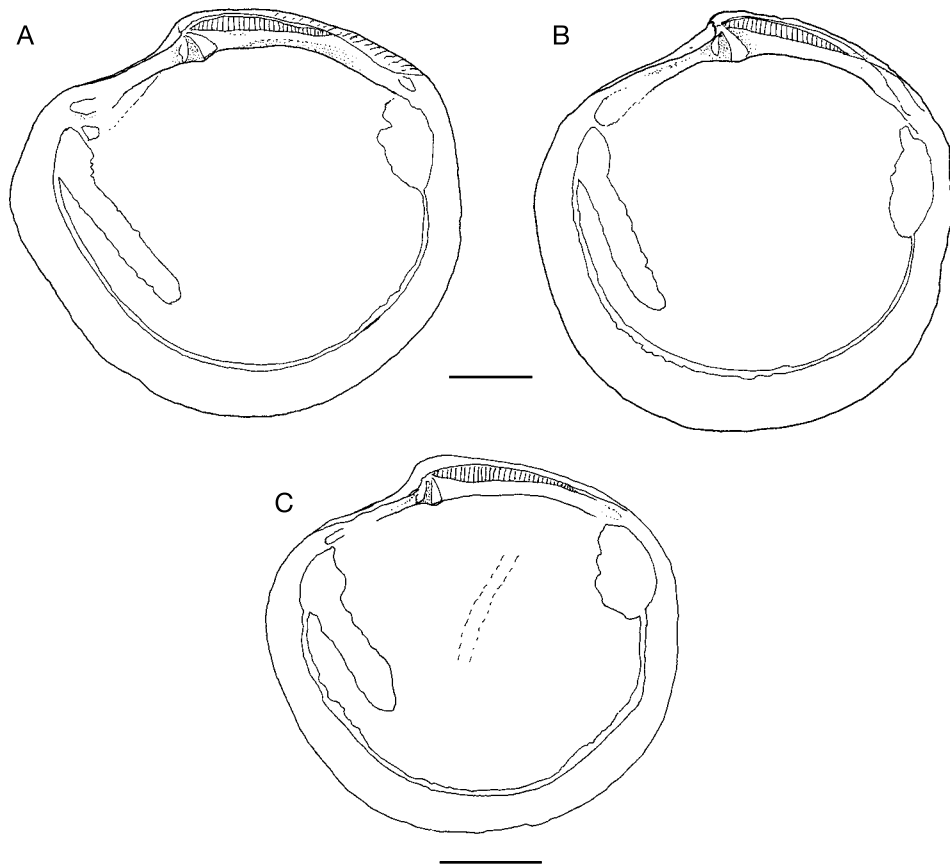


FIG. 18. — Half schematic drawings of the insides of right valves: **A, B**, *Lucinoma myriamae* n. sp.; **A**, holotype; **B**, second morph, N Angola, from type locality; **C**, *Lucinoma kazani* Salas & Woodside, 2002, Kazan Mud Volcano, Anaximander Mountains, eastern Mediterranean, holotype (MNHN) (for comparison). Scale bars: 10 mm.

An interesting fact is the similar distribution patterns of the cold seep species pairs *Lucinoma kazani*-*L. myriamae* n. sp. and *Isorropodon perplexum*-*I. bigoti* (Vesicomyidae, see Cosel & Salas 2001), of which one species lives on the seeps in the eastern Mediterranean and the other species off northern Angola.

Genus *Anodontia* Link, 1807

TYPE SPECIES. — *Anodontia alba* Link, 1807, by original designation.

SPECIES INCLUDED. — 25 species (Taylor & Glover 2005), worldwide.

DIAGNOSIS. — Shells small to very large, equivalve, inequilateral, very tumid to globose, thin to moderately thick, circular to subcircular, with more or less protruding umbones. Hinge plate very narrow, toothless, ligament plate horizontal to shell margin or slanting towards the interior of the valve. Surface smooth, with more or less pronounced irregular growth lines and stages. Anterior adductor scar small, with comparatively short and small diverging part.

REMARKS

A detailed worldwide revision of the genus has recently been published by Taylor & Glover (2005). The subgeneric classification followed here is also treated therein.

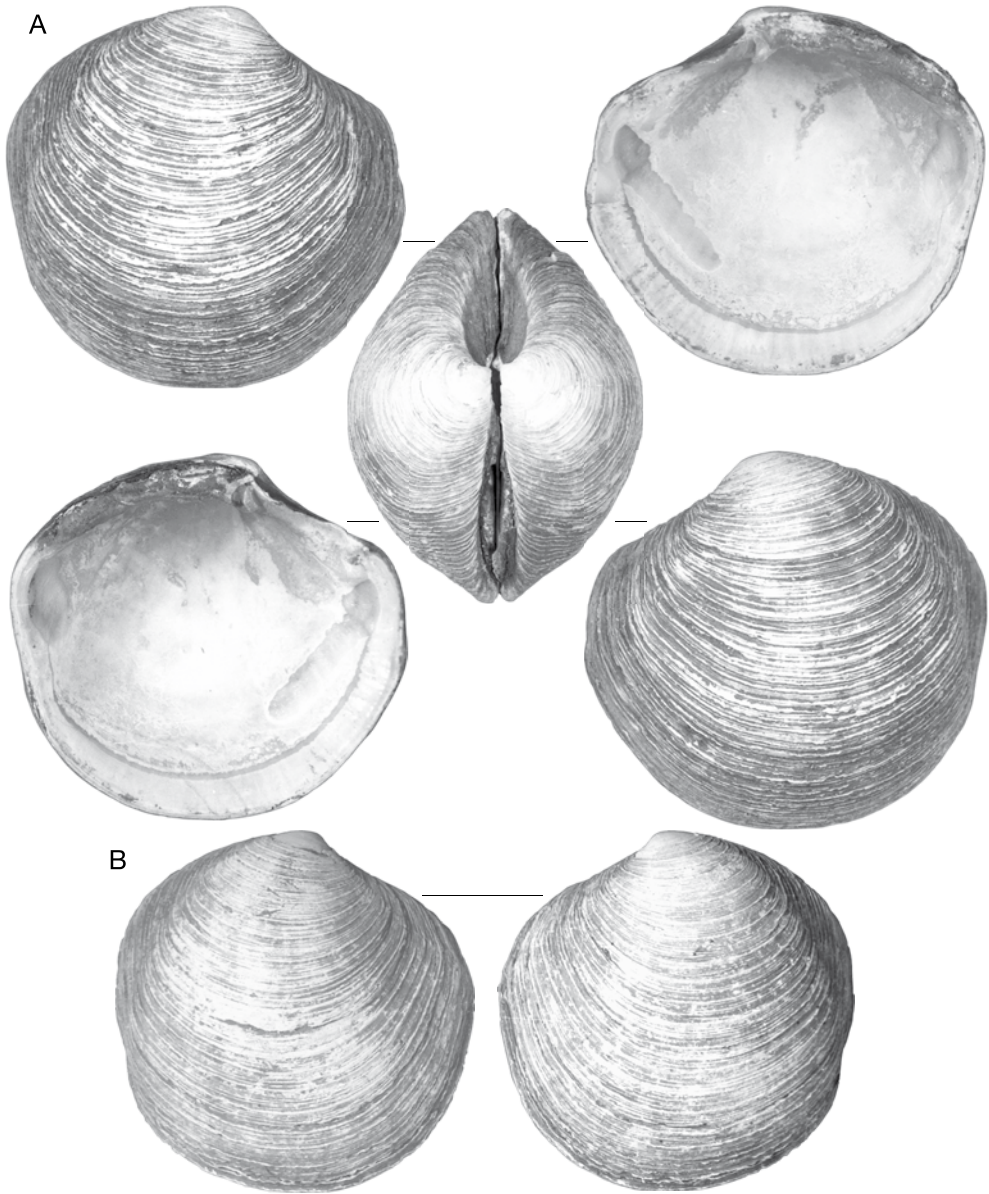


FIG. 19. — *Lucinoma myriamae* n. sp., second morph: **A**, a typical specimen, 47.1 mm, interior and exterior of both v., dorsal view; **B**, another specimen, 47.5 mm, exterior of both v., both from type locality.

Subgenus *Afrophysema* Taylor & Glover, 2005

Anodontia (Afrophysema) chevalieri
Cosel in Taylor & Glover, 2005
(Figs 20; 21A, B)

Anodontia (Afrophysema) chevalieri Cosel in Taylor & Glover, 2005: 308, figs 10A, 12A, 24E-H, 25.

TYPE MATERIAL. — Holotype: Gabon, Port-Gentil, Banc du Prince, 0°36.1'S, 8°48.1'E, 5-9 m, a complete shell (MNHN).

TABLE 10. — *Anodontia (Afrophysema) chevalieri* Cosel in Taylor & Glover, 2005: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height × tumidity	Specimen	Length/height ratio
42.1 × 38.0 × 30.0	Gabon, holotype (MNHN)	1.1
41.3 × 35.0 × 31.8	Gabon, paratype (MNHN)	1.2
35.8 × 33.7 × 28.4	Gabon, paratype (MNHN)	1.1
35.0 × 31.1 × 22.2	Gabon, paratype (BMNH)	1.1
33.6 × 29.5 × 25.4	Gabon, paratype (MNHN)	1.1
30.5 × 28.5 × 21.7	Côte d'Ivoire, Abidjan (leg. Le Loeuff)	1.1
29.4 × 26.1 × 20.0	Côte d'Ivoire, Abidjan (leg. Le Loeuff)	1.1
27.5 × 24.3 × 16.7	Gabon, Port-Gentil, associated specimen	1.1
26.5 × 23.8 × 17.4	Gabon, Port-Gentil, associated specimen	1.1
25.4 × 23.1 × 16.2	Côte d'Ivoire, Abidjan (leg. Le Loeuff)	1.1
25.0 × 21.5 × 15.7	Gabon, Port-Gentil, associated specimen	1.2
23.3 × 21.4 × 15.7	Gabon, Port-Gentil, associated specimen	1.1

Paratypes: same locality, 1980-1989, leg. C. Chevalier, 3 sh. (MNHN); 1 sh. (BMNH 20040252).

TYPE LOCALITY. — Port-Gentil, Banc du Prince, a shoal ENE of Cap Lopez, Mandji Peninsula, Gabon.

OTHER MATERIAL EXAMINED. — **Côte d'Ivoire.** Continental shelf in Abidjan region (no details), trawled RV *Reine Pokou*, 1975-1977, leg. P. Le Loeuff, 4 sh., 1 juv. sh., 1 lv. (MNHN).

Benin. Ouidah [Wydah], 6°10'N, 2°05'E, 200 m, dredged RV *Léon Coursin*, leg I. Marche-Marchad, 1 rv. (MNHN). — 6°05'N, 2°15'E, 180-320 m, trawled RV *Thierry*, Guinean Trawling Survey, stn 35/7, leg. G. Cherbonnier, 4.X.1963, 1 rv., 2 lv. (MNHN).

Gabon. Port-Gentil, Banc du Prince, 0°36.1'S, 8°48.1'E, 5-9 m, 1980-1989, leg. C. Chevalier, 7 associated specimens (sh.) (MNHN).

DISTRIBUTION. — Only known from Côte d'Ivoire, Bénin and Gabon.

DESCRIPTION

Shell to 42 mm long, rather thin but solid, equi-valve, inequilateral, very inflated, quite-variable in outline, more or less longer than high, subcircular to short-ovoid, length/height ratio 1.1. Umbones prominent, well protruding over the dorsal margin, directed forward, beaks well in front of the vertical midline. Anterior part short, anterior margin with a rather broadly rounded antero-dorsal corner, towards ventrally convex. Ventral margin well rounded and evenly convex. Posterior part broad, posterior margin well rounded, postero-dorsal corner indistinct, no postero-ventral corner.

Exterior without regular sculpture and only with coarse and very irregular growth lines and wrinkles and more pronounced growth stages. A few shallow, very broad and indistinct radial waves are also visible, especially under certain angle of view. Anterior and posterior angle absent. Lunule small and short, more or less narrow, almost symmetric, not sunken; escutcheon absent.

Ligament moderately long, broad, partly hidden by the postero-dorsal margin but not very deep sunken, on a broad nymph, which is obliquely, nearly "vertically" tilted towards the interior of the valves; therefore ligament and hinge plate appearing narrow at a horizontal view of the valve inside, full width of the ligament only visible from ventrally. In smaller specimens, ligament may be less broad.

Hinge plate very narrow and toothless. Anterior adductor scar small, with a rather narrow diverging part, the pallial line meeting the scar above its middle, occasionally at one third the length of the scar. Posterior adductor scar very small. Anterior, ventral and posterior margin on the inner side slightly, irregularly and very finely dentate, but on the very edge smooth.

Valves pure white. Periostracum very thin, pale straw coloured and mostly eroded.

Measurements are provided in Table 10.

BIOTOPE

In muddy-sandy bottom on the deeper shelf, apparently only in the Port-Gentil region of Gabon occurring shallower, from about 5 m downwards.

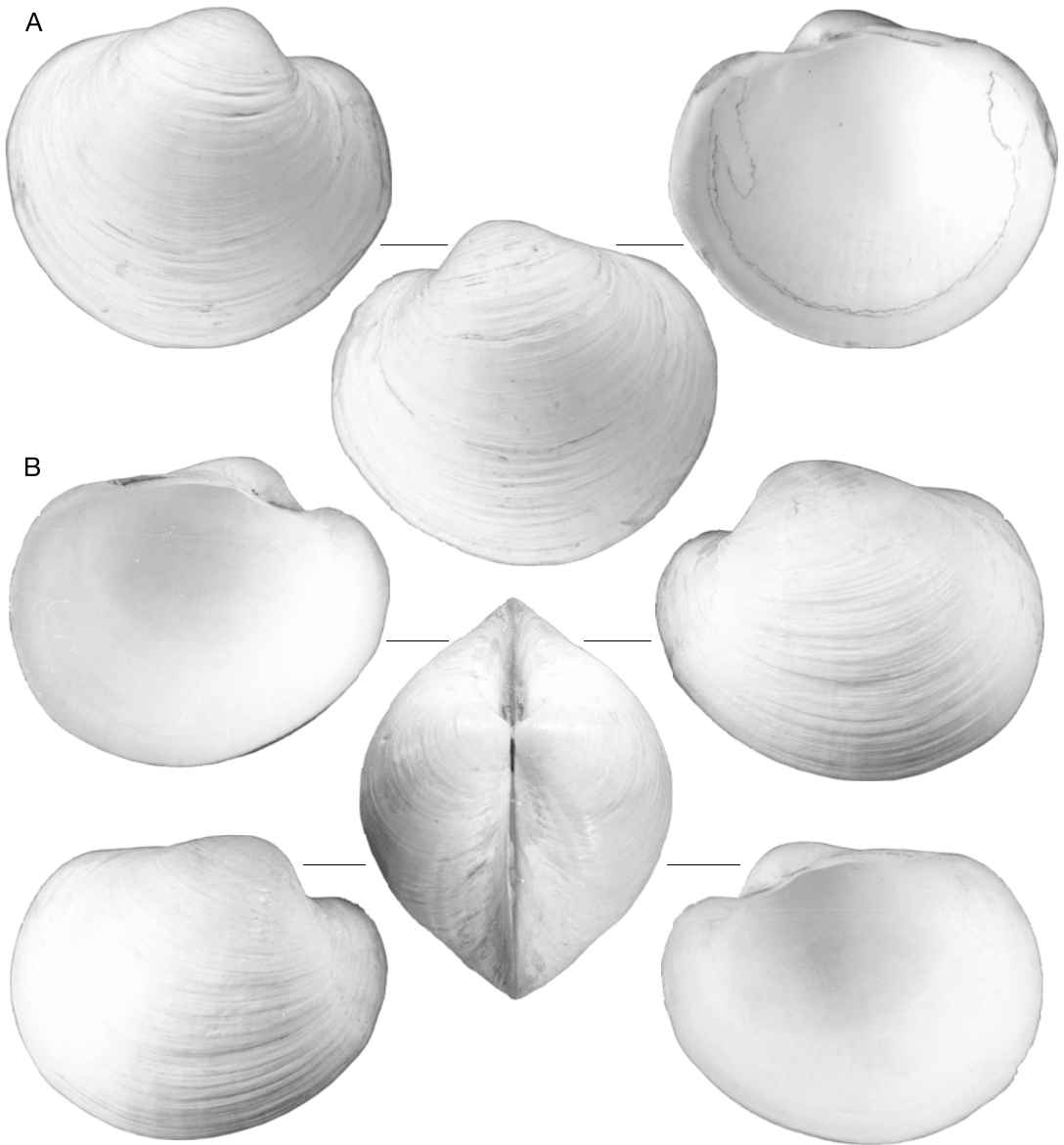


FIG. 20. — *Anodontia (Afrophysema) chevalieri* Cosel in Taylor & Glover, 2005: **A**, holotype, Port-Gentil, Gabon, Banc du Prince, 0°36.1'S, 8°48.1'E, 5-9 m, leg. C. Chevalier, 1980-1989, 42.1 mm (MNHN), exterior and interior of rv., exterior of lv.; **B**, paratype 1, same locality, 41.3 mm (MNHN), interior and exterior of both v., dorsal view.

REMARKS

This species is characterized by its very inflated shell, the broad ligamental nymph which is slanting towards the interior of the valve and the slightly dentate inner margin. A similar and possibly

sibling species is *Anodontia eutornus* (Tomlin, 1921) from the Indian Ocean coast of South Africa, SE Africa and SE Madagascar, described as *Cryptodon eutornus* by Tomlin (1921: 215, pl. 8, fig. 5). It has the same typical ovoid shell form

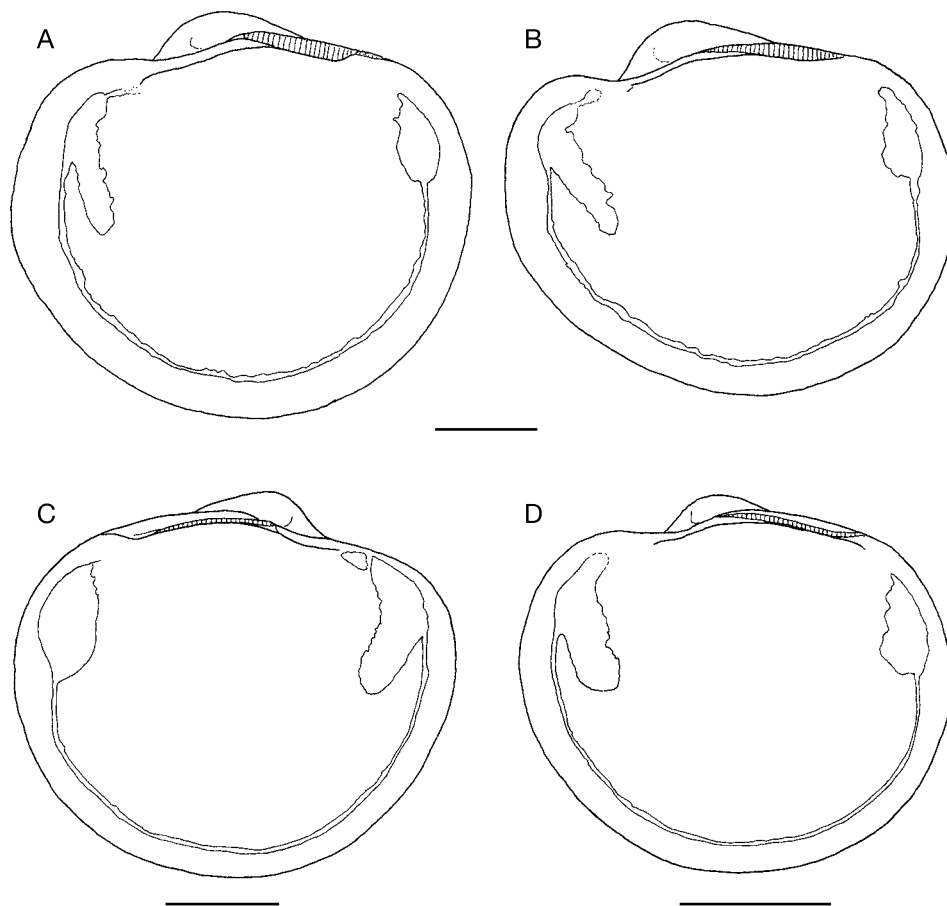


FIG. 21. — Half schematic drawings of the insides of valves: **A, B**, *Anodontia (Afrophysema) chevalieri* Cosel in Taylor & Glover, 2005; **A**, holotype, rv.; **B**, paratype 1, rv.; **C, D**, *Anodontia (Loripinus) senegalensis* Cosel in Taylor & Glover, 2005, off Cap Blanc, 20°34'N, 17°47'W, 90 m, trawled RV *Président Théodore Tissier*; **C**, lv.; **D**, rv. Scale bars: 10 mm.

and exceptional tumidity as *Anodontia chevalieri* but is still larger. Although that species had been well recognized by Barnard (1950: 181, pl. 28, fig. 5) with a figure of a typical specimen, in more recent works on South African molluscs, it was always mistaken for or synonymized with *A. edentula* (Linnaeus, 1758) (Barnard 1964; Kilburn & Rippey 1982; Steyn & Lussi 1998). This is additional evidence for the close affinity of the West African marine molluscan fauna with the Indo-Pacific, especially with the Indian Ocean. For further details, see Taylor & Glover (2005).

Subgenus *Loripinus* Monterosato, 1883

Anodontia (Loripinus) senegalensis
Cosel in Taylor & Glover, 2005
(Figs 21C, D; 22)

Anodontia (Loripinus) senegalensis Cosel in Taylor & Glover, 2005: 326, figs 11B, 12B, 42F-I, 43.

TYPE MATERIAL. — Holotype: Senegal, S of Gorée, 110-112 m, lv., dredged RV *Gérard Tréca*, leg I. Marche-Marchad, 18.II.1954 (MNHN).

Paratypes: Dakar region, 14°50.2'N, 17°29.5'W, 150 m, dredged RV *Tenace*, 15.III.1967, leg. I. Marche-Marchad, 2 rv. (MNHN); 1 lv. (BMNH 20040238).

TABLE 11. — *Anodontia (Loripinus) senegalensis* Cosel in Taylor & Glover, 2005: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

Shell length × height (no tumidity)	Specimen	Length/height ratio
36.6 × 32.1	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.1
31.0 × 27.0	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.1
29.5 × 25.6	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.2
27.5 × 24.0	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.1
24.4 × 21.1	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.2
23.3 × 21.1	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.1
20.8 × 18.2	Senegal, holotype (MNHN)	1.1
20.5 × 18.4	Mauritania, Cap Blanc, <i>Président Théodore Tissier</i>	1.1
19.9 × 18.0	Senegal, paratype (MNHN)	1.1
19.5 × 17.0	Senegal, Dakar	1.1
17.3 × 15.0	Senegal, paratype (BMNH, figured)	1.1
16.9 × 14.8	Senegal, Dakar	1.1
16.5 × 14.0	Senegal, Dakar	1.2
15.8 × 13.9	Senegal, paratype (MNHN)	1.1

TYPE LOCALITY. — Dakar, Senegal.

MATERIAL EXAMINED. — **Mauritania.** Off Cap Blanc, 20°34'N, 17°47'W, 90 m, trawled RV *Président Théodore Tissier*, 1936, 2 rv., 6 lv. (MNHN).

Senegal. Dakar region, 14°53.8'N, 17°30.8'W, 205-230 m, dredged RV *Gérard Tréca*, 18.III.1958, leg I. Marche-Marchad, 4 rv., 3 lv. (MNHN). — S of Gorée, 65 m, dredged RV *Gérard Tréca*, 18.II.1954, leg I. Marche-Marchad, 1 rv. (MNHN). — Baie de Gorée, 125-160 m, dredged RV *Gérard Tréca*, 14.II.1958, leg. I. Marche-Marchad, 1 juv. lv. (MNHN). — Dakar region (no precision), 129-150 m, dredged RV *Gérard Tréca*, 24.I.1958, leg. I. Marche-Marchad, 1 rv. (MNHN). — Dakar region (without any precision), leg. I. Marche-Marchad, 1 chipped rv. (MNHN).

DISTRIBUTION. — Off Mauritania (20°30'N) and Senegal.

DESCRIPTION

Shell to 37 mm long, thin but solid, equivalve, inequilateral, very inflated, variable in outline, sub-circular, somewhat longer than high, length/height ratio 1.1-1.2. Umbones prominent, well protruding over the dorsal margin, directed forward, beaks in front of the vertical midline. Anterior part short, anterior margin with a broadly rounded antero-dorsal corner, towards ventrally convex. Ventral margin well rounded and evenly convex. Posterior part broad, posterior margin well rounded, postero-dorsal corner indistinct, no postero-ventral corner.

Exterior without regular sculpture and only with fine, irregular growth lines and coarser growth

stages. A few very shallow and almost indistinct radial waves may be visible on large specimens, especially under a lens at certain angle of view. Anterior and posterior angle absent. Lunule very small and short, rather narrow, almost symmetric, not sunken; escutcheon absent.

Ligament moderately long, not sunken, on a narrow nymph, which is slanting towards the interior of the valves; therefore ligament and hinge plate appearing still narrower at a horizontal view of the valve inside, full width of the ligament only visible from ventrally.

Hinge plate very narrow and toothless. Anterior adductor scar with a short and rather broad diverging part, the pallial line meeting the scar above its middle, occasionally at almost one third the length of the scar. Posterior adductor scar very small. Anterior, ventral and posterior margin on the inner side almost smooth, occasionally the vestiges of inner crenulations are visible.

Valves white, periostracum not observed.

Measurements are provided in Table 11.

BIOTOPE

Most probably muddy bottom, on the deeper shelf between about 60 and 230 m.

REMARKS

This species is distinguished from *Anodontia chevalieri* by the smaller size, the shorter and broader diverging

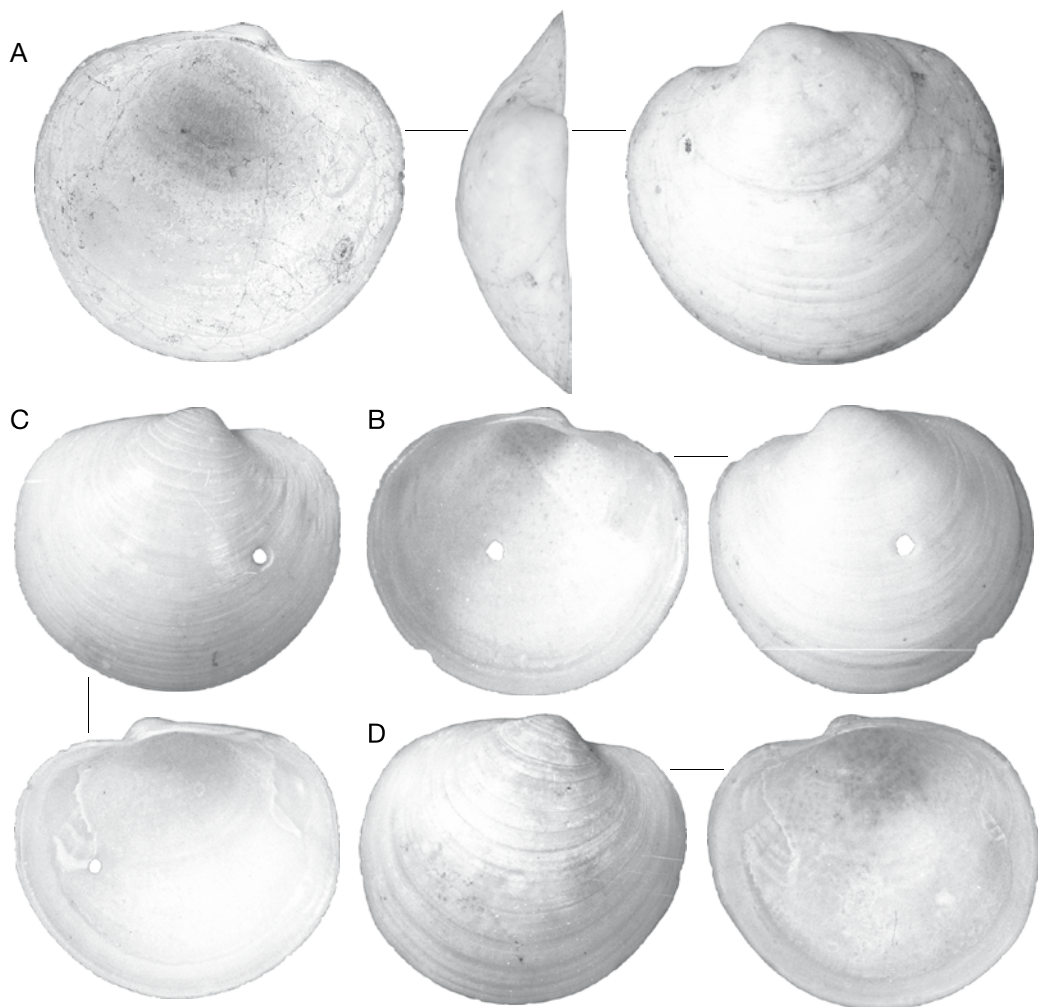


FIG. 22. — *Anodontia (Loripinus) senegalensis* Cosel in Taylor & Glover, 2005: **A**, holotype, S of Gorée, 110-112 m, lv., dredged RV Gérard Tréca, leg. I. Marche-Marchad, 18.II.1954, 20.8 mm (MNHN), interior, exterior and dorsal view of lv.; **B**, paratype, Dakar region, 14°50.2'N, 17°29.5'W, 150 m, dredged RV Tenace, leg. I. Marche-Marchad, 15.III.1967, 17.3 mm (BMNH), interior and exterior of lv.; **C**, Dakar region, 14°53.8'N, 17°30.8'W, 205-230 m, dredged RV Gérard Tréca, 16.5 mm, exterior and interior of rv.; **D**, same locality, 15.0 mm, exterior and interior of rv.

part of the anterior adductor scar and the narrower and shallower ligament, which is less slanting towards the interior of the valves. The inner margin is smooth (see also Taylor & Glover 2005).

Genus *Joellina* n. gen.

TYPE AND ONLY SPECIES. — *Joellina dosiniformis* n. sp.

DISTRIBUTION. — Off Ambrizete, northern Angola, tropical West Africa.

DIAGNOSIS. — Shells medium-sized, subcircular, slightly oblique towards posterior, hardly longer than high to almost as long as high, compressed, with a rather short and broad anterior part and a high, broad and oblique posterior part, without indentation. Anterior margin rounded and in its upper part slightly indented. Beaks well in front of the vertical midline. Umbones slightly prominent. Surface with irregular commarginal lamellae

TABLE 12. — *Joellina dosiniformis* n. gen., n. sp.: measurements (in mm) and length/height ratio.

Shell length × height (no tumidity)	Specimen	Length/height ratio
32.4 × 30.0	Angola, paratype (MNHN)	1.1
31.5 × 30.2	Angola, paratype (MNHN)	1.0
30.5 × 28.9	Angola, paratype (MNHN)	1.1
29.6 × 27.3	Angola, paratype (MNHN)	1.1
29.4 × 27.0	Angola, holotype (MNHN)	1.1
29.0 × 27.8	Angola, paratype (BMNH)	1.0

and growth lines. Antero-dorsal depression short and pronounced, postero-dorsal depression broad and ill-defined. Lunule very short, narrow, asymmetrical and deeply sunken, escutcheon very narrow and completely filled by the ligament. Hinge plate very broad with long posterior part, with one very small and vestigial cardinal in the right valve and socket in the left valve; laterals small to indistinct. Ligament short and broad. Diverging part of anterior adductor scar long and broad, with a length of about 2/3 the total length of the scar. Inner margins smooth.

ETYMOLOGY. — Dedicated to my colleague Joëlle Galeron (IFREMER, Brest) in acknowledgement for her close collaboration on the deep-water mollusc fauna.

REMARKS

This new genus is most close to the fossil genus *Pterolucina* Chavan, 1942, from the Upper Cretaceous to Tertiary (Miocene) (type species *Lucina coeloprocta* Cossmann, 1887, Upper Eocene of France), there is no Recent lucinid genus with which it can be compared, however, according to the description and figure in Chavan (1969), *Pterolucina* has more separated areas and a stronger hinge dentition.

Joellina dosiniformis n. sp.

(Figs 23; 24)

TYPE MATERIAL. — Holotype: N Angola, Angola margin, W of Ambrizete, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, 29.VIII.2000, leg. R. von Cosel, right valve (MNHN).

Paratypes: same locality, 1 rv., 3 lv. (MNHN); 1 rv. (BMNH).

TYPE LOCALITY. — Ambrizete, Northern Angola, tropical West Africa.

ETYMOLOGY. — The name characterizes the shell outline reminiscent of a *Dosinia*.

DISTRIBUTION. — Only known from the type locality.

DESCRIPTION

Shell to 32 mm long, somewhat variable in outline, rather thick and solid, equivalve, compressed, sub-circular, oblique towards posterior, hardly longer than high to almost as long as high, length/height ratio 1.0-1.1. Umbones not prominent and hardly protruding, directed forward, beaks well in front of the vertical midline. Anterior part short and broad, anterior margin in its upper part almost straight to hardly indented, with a rather broadly rounded antero-dorsal corner to the lunular area. Ventral margin well rounded and evenly convex. Posterior part broad and high, posterior margin obliquely truncated, postero-dorsal corner protruding towards posterior, rounded but pronounced, postero-ventral corner broadly rounded and more indistinct.

Exterior with irregularly and rather widely-spaced commarginal lamellae and dense and very irregular growth lines and wrinkles and coarser growth stages. Anterior angle almost absent, anterior radial depression sharply cut in, irregular, otherwise antero-dorsal area ill-defined. Posterior angle rounded, posterior radial depression broad and ill-defined. Lunule small and very short, narrow, asymmetric, deeply sunken; escutcheon very narrow, entirely filled by the ligament and delimited by a sharp keel.

Ligament short, broad and deeply sunken.

Hinge plate broad, strong, with long posterior part. Hinge in the right valve with a very small single cardinal which may be reduced to a rudimentary knob and a small but well marked anterior lateral. Left valve with a socket for the cardinal knob of the right valve and the vestiges of anterior and posterior laterals. Anterior adductor scar large with long and

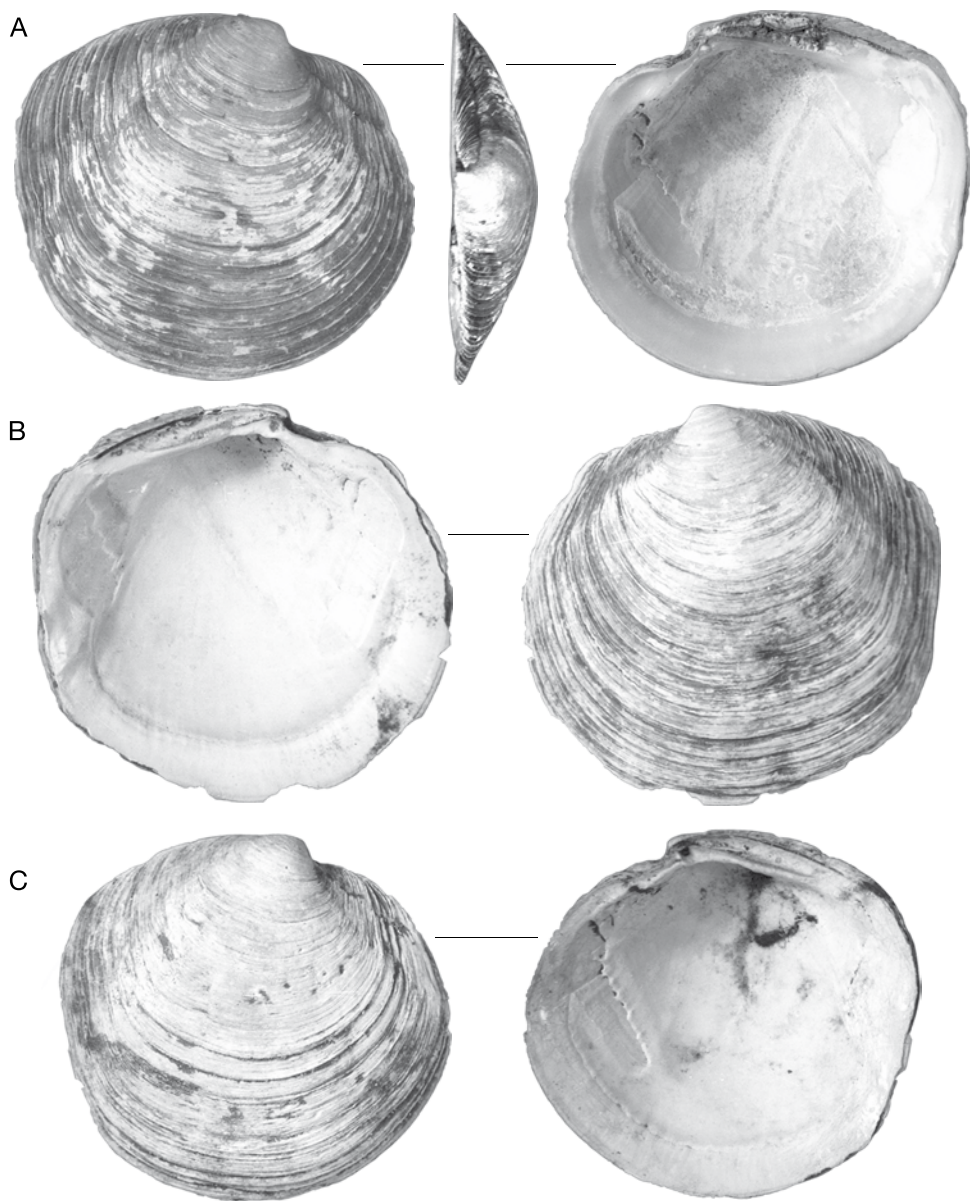


FIG. 23. — *Joellina dosiniformis* n. gen., n. sp.: **A**, holotype, Angola Margin, W of Ambrizete, N Angola, 7°18.42'S, 12°04.60'E, 360-367 m, trawled RV *Thalassa*, ZAIANGO BIOL 2, stn CP 09, leg. R. von Cosel, 29.VIII.2000, 29.4 mm (MNHN), exterior, interior and dorsal view of rv.; **B**, paratype 1, 31.5 mm (MNHN), interior and exterior of lv.; **C**, paratype 2, 29.0 mm (MNHN), exterior and interior of rv.

broad diverging part, the pallial line meeting the scar two thirds above its middle or slightly less. Posterior adductor scar rather large. Inner margin smooth.

Valves presumably white in life but the dead collected samples are light greyish. Periostracum thin, greenish brown, when still present.

Measurements are provided in Table 12.

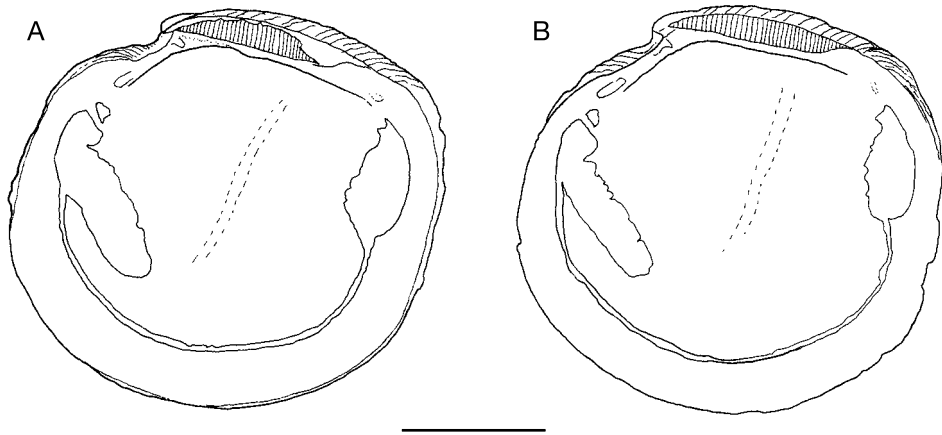


FIG. 24. — *Joellina dosiniformis* n. gen., n. sp., half schematic drawings of the insides of right valves: **A**, holotype; **B**, paratype 2. Scale bars: 10 mm.

BIOTOPE

As for *Graecina karinae* n.gen., n. sp. Only single valves taken.

REMARKS

As for the genus. This species is characterized by the strong resemblance of its outline to certain species of the venerid genus *Dosinia* Scopoli, 1777 with high posterior part (e.g., *Dosinia erythrea* (Römer, 1860)) and also the large hinge plate and the anteriorly placed, non-protruding umbones add to this resemblance. No other lucinid is known to have this combination of characters.

Genus *Divaricella* Martens, 1880
Subgenus *Egracina* Chavan, 1951

Divaricella (Egracina) chavani n. sp.
(Figs 25; 26)

Lucina ornata Reeve, 1850: sp. 48 (non Agassiz, 1845 nec C. B. Adams, 1847 [nom. nud.]).

Divaricella (Egracina) dentata var. *collignoni* Chavan, 1951: 20-22, figs 23, 24 (paratype), not fig. 24bis (holotype) [partim].

Divaricella (Egracina) dentata collignoni – Chavan 1969: N 506, fig. 5a-c.

TYPE MATERIAL. — Holotype: Gabon, Port-Gentil, Île aux Pigeons, 0°40.5'S, 8°45.3'E, muddy sand near mangroves,

1980-1989, leg. C. Chevalier, 1 sh. (MNHN).

Paratypes: same locality, 8 sh. (5 MNHN, 1 BMNH, 1 IRSNB, 1 ZMC).

Lucina ornata: lectotype (BMNH 1963.186), rv., selected by Dekker & Goud (1994: 127), no locality, ex Cuming coll.

Paralectotype (BMNH), a left valve.

D. dentata var. *collignoni*: type lot in Chavan collection (holotype, rv., Îles Glorieuses, coll. Chavan no. 1223; paratype, a sh., Corisco, coll. Chavan no. 668); the Chavan collection is now in University Lyon 1.

TYPE LOCALITY. — Île aux Pigeons, Port-Gentil, Gabon.

ETYMOLOGY. — In honour of André Chavan, who had made the first attempt to revise the *Divaricella* group.

OTHER MATERIAL EXAMINED. — **Senegal**. Cap Vert Peninsula, coll. de Cessac, 1 lv. (MNHN). — Off Saloum, Petite Côte, 35-37 m, dredged RV *Gérard Tréca*, 8.III.1955, leg. I. Marche-Marchad, 1 lv. (MNHN). — Casamance, 12°46.9'N, 17°29.9'W, 45 m, fine sand, dredged RV *Louis Sauger*, 29.III.1988, leg. R. von Cosel, 1 juv. lv. (MNHN). — Senegal (no precision), coll. Admiral de Hell, 1846, 1 sh. (MNHN).

Côte d'Ivoire. Abidjan region (no precision), leg. I. Marche-Marchad, 1 rv., 1 lv. (MNHN).

Gabon. Île Banié, southern part of Golfo de Corisco, sand, 3-6 m, 1986-1987, leg. P. Bernard, 2 sh. (MNHN). — Cap Esterias, Libreville, 1-4 m, 1986-1987, leg. P. Bernard, 2 rv. (MNHN). — Port-Gentil, sand, 2-5 m, 1986-1987, leg. P. Bernard, several v. (MNHN). — Port-Gentil, Plage de la Sogara, beach drift, 12.I.2004, leg. R. von Cosel, 1 sh., several v. (MNHN). — Gabon (no precision), 1853, coll. Aubry Lecomte, 2 sh., 1 rv. (MNHN). — 0°38.4'S, 8°46'E, sand with forams, 5 m, dredged RV *Calypso*, 10.VI.1956, leg. I. Marche-Marchad,

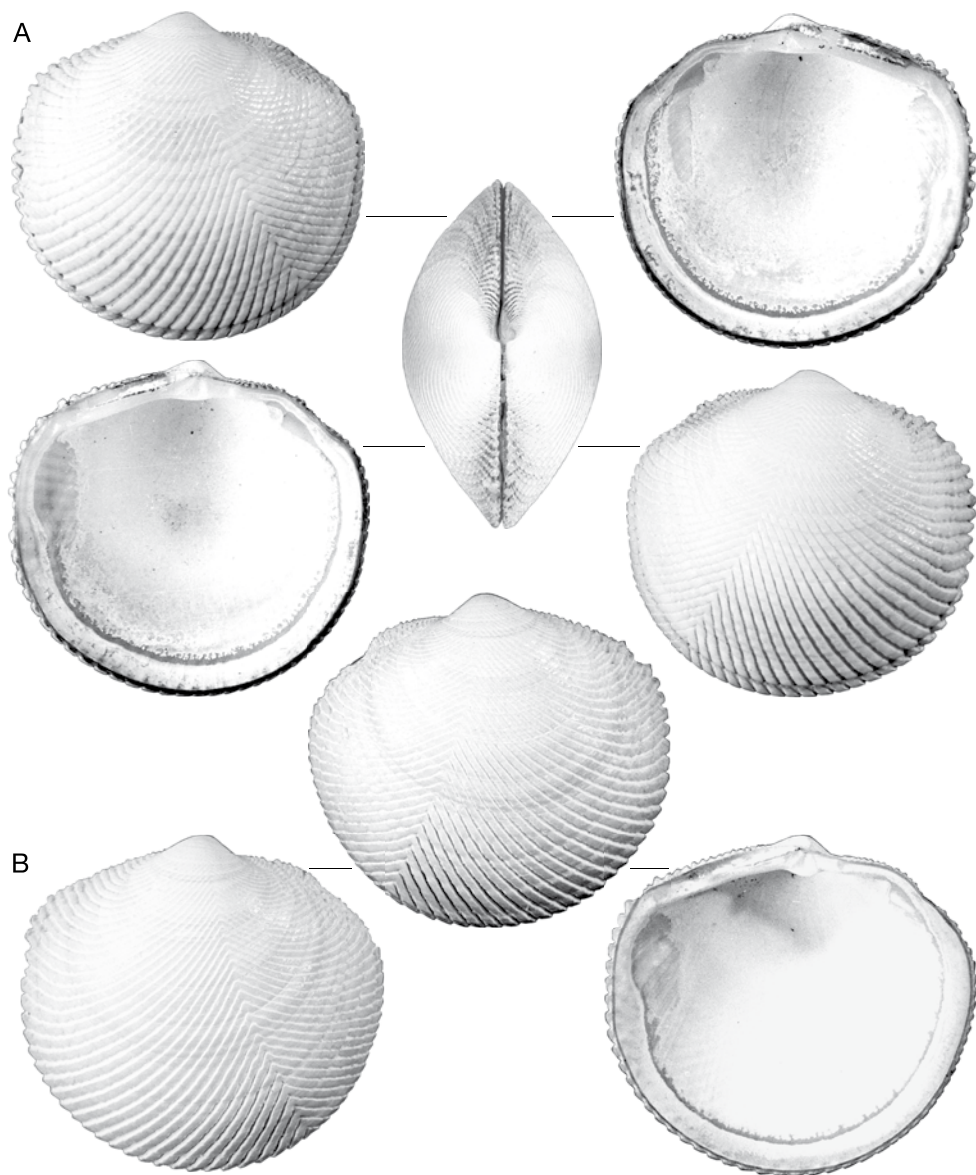


FIG. 25. — *Divaricella (Egracina) chavani* n. sp.: **A**, holotype, Île aux Pigeons, 0°40.5'S, 8°45.3'E, Port-Gentil, Gabon, muddy sand near mangroves, 1 sh., leg. C. Chevalier 1980-1989, 27.4 mm (MNHN), exterior and interior of both v., dorsal view; **B**, paratype, same locality, 25.1 mm (MNHN), exterior of rv., exterior and interior of lv.

1 juv. rv. (MNHN).
Congo (Brazzaville). Pointe-Noire, Plage Mondaine, beach drift, XII.1985, leg. R. von Cosel, 1 rv. (MNHN).

DISTRIBUTION. — Mauritania (Quaternary only, [Cou-

lombel 1980]), Senegal (Saloum to Casamance); Sierra Leone (Sherbro), Côte d'Ivoire to the Congo (Pointe-Noire). There are no records from Guinea-Bissau to Liberia and a distribution gap is very probable. The species is common in Gabon and rare elsewhere.

TABLE 13. — *Divaricella (Egracina) chavani* n. sp.: selected measurements (in mm) and length/height ratio. All non type specimens are voucher specimens.

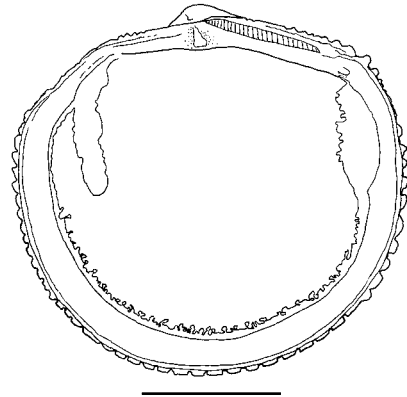
Shell length × height × tumidity	Specimen	Length/height ratio
29.8 × 28.5 × 16.1	Gabon, paratype (MNHN)	1.0
28.6 × 26.1 × 15.2	Gabon, paratype (BMNH)	1.1
28.3 × 26.7 × 15.9	Gabon (old collection)	1.1
27.4 × 25.7 × 15.6	Gabon, holotype (MNHN)	1.1
26.4 × 24.6 × 14.6	Gabon, île Banié	1.1
26.2 × 24.2 × 13.7	Gabon, paratype (MNHN, photographed)	1.1
26.1 × 25.4 × 14.1	Gabon, paratype (MNHN)	1.0
25.1 × 23.7 × 13.3	Gabon, paratype (MNHN)	1.1
24.2 × 22.2 × 12.2	Gabon, paratype (IRSNB)	1.1
22.3 × 20.6 × 11.8	Gabon, île Banié	1.1
22.0 × 20.3 × 11.9	Gabon, paratype (MNHN)	1.1
19.6 × 18.3 × 9.8	Gabon, paratype (ZMC)	1.1
16.8 × 15.6	Côte d'Ivoire, Abidjan, leg. Marche-Marchad	1.1

DESCRIPTION

Shell 15–28 mm long, rather solid, inflated, almost circular, length/height ratio 1.1. Beaks about in the middle. Antero-dorsal margin divided into two slightly concave to almost straight parts with a rounded corner between them and another rounded corner to the anterior margin. Postero-dorsal margin slightly convex, postero-dorsal corner more or less rounded, posterior margin somewhat truncated, ventral margin evenly and well rounded.

Exterior with fine, regular, dense, contiguous, divaricate ribs, with the line of sharp, V-shaped divarication going from the beaks to the antero-ventral margin. Sculpture more marked near the anterior and posterior margin than in the middle of the valve. Anterior area small, posterior area not distinguished.

Hinge in the right valve with a small, more or less pronounced anterior cardinal and a broad and bifid posterior cardinal. Left valve with a strong but rather thin anterior and a thin posterior cardinal. Both valves with an indistinct knob as anterior lateral under the distal end of the lunule, posterior lateral a small knob under the postero-dorsal corner. Lunule very small and short, somewhat sunken, asymmetrical, broad in the right valve, narrow in the left valve, no escutcheon. Ligament deeply sunken and only partly visible from the exterior at dorsal view. Anterior adductor scar with moderately long extension separate from the pallial

FIG. 26. — *Divaricella (Egracina) chavani* n. sp., half schematic drawing of the inside of the rv. of the holotype. Scale bar: 10 mm.

line, this latter meeting the impression at the end of the upper third.

Inner margin crenulate in reflection of the external sculpture.

Valves entirely white, periostracum not seen.

Measurements are provided in Table 13.

BIOTOPE

Sandy bottom, mostly in shallow water (1–6 m) but apparently also deeper.

REMARKS

This species was long known as *Lucina ornata* Reeve, 1850, but this name is preoccupied by Agassiz,

1845. Chavan (1951) considered his material from West Africa and from East Africa conspecific with the Caribbean *Divaricella dentata* (Wood, 1815) (syn. *D. serrata* (d'Orbigny, 1846)), but he separated them as a "nov. var.", *Divaricella (Egracina) dentata* var. *collignoni*. Moreover, Chavan designated this variety in the same entry as type species of his new subgenus *Egracina*. Chavan's type lot, however, as he admits himself ("forme africaine du *dentata-serrata* des Antilles") is a mixed lot: it consists of a specimen from West Africa ("Corisco") and a specimen of a close western Indian Ocean ("Îles Glorieuses") species which in his figure legend he designated explicitly as holotype (Chavan 1951: 21), the West African species being the paratype. Chavan's name is hence not available for the West African species.

Reeve's type lot in BMNH (no locality) consists of two syntypes (single valves) from which the right valve was selected lectotype by Dekker & Goud (1994). This valve has a more sloping postero-dorsal margin than most specimens from West Africa but it still might fall within the variability of the West African species. The other (left) valve has a stronger sculpture and is more likely to belong to another species. Moreover, Dekker & Goud (1994) synonymized *D. ornata* (Reeve, 1850) with *D. irpex* E. A. Smith, 1885, a totally different Australian species. To avoid confusion, the West African species is here described as new, and the holotype is taken from "modern" and well localized material.

The distribution pattern of this species is still somewhat enigmatic: it is rare in the southern (weaker) part of the northern zone of Alternance (Senegal: Petite Côte, Casamance, see Le Loeuff & Cosel 1998), it is absent from the northern typical tropical zone (Guinea-Liberia), and it is rare in the atypical tropical zone in the Gulf of Guinea (Côte d'Ivoire). It has not been recorded from Cameroon, however, on the coast of Gabon situated in the southern part of the southern typical tropical zone it is common; whereas in the weaker part of the southern zone of Alternance (Congo) it is present but rarer. Moreover, in the southern part of its range the species lives in quite shallow (1-6 m), whereas the few records from Senegal are from deeper water (35-45 m).

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APPENDIX

List of Lucinidae presently known from tropical West Africa (N Mauritania to S Angola). Depth ranges include records of empty shells and valves, the actual depths of living specimens may be much more restricted.

- Lucina* (s.l.) *capensis* (Thiele & Jaeckel, 1931): Angola (Porto Alexandre, Baía dos Tigres); South Africa (Algoa Bay). Apparently in the circalittoral.
- Lamylucina gaini* (Lamy, 1920) n. comb.: Senegal (Dakar); Gabon (Libreville); São Tomé, Ilha do Príncipe. 6-150 m.
- Lamylucina exgaini* n. gen., n. sp.: Senegal; Guinea to Gabon; São Tomé, Ilha do Príncipe. 30-60 m.
- Tinalucina aequatorialis* n. gen., n. sp.: Equatorial Guinea. About 100 m.
- Lamellocucina reyrei* (Nicklès, 1955): Mauritania (17°30'N); Ghana; Gabon (Port-Gentil); S Angola (Moçâmedes); São Tomé, Ilha do Príncipe. 40-200 m.
- Falsolucinoma leloeuffi* (Cosel, 1989) n. comb.: W Côte d'Ivoire to Cameroon. 200-425 m.
- Afrolucina discontinua* n. gen., n. sp.: Senegal (Dakar); Côte d'Ivoire; Nigeria; Cameroon; N Angola (Luanda). 50-250 m.
- Gracina karinae* n. gen., n. sp.: Nigeria, N Angola (7°18'S). 360-425 m.
- Ctena eburnea* (Gmelin, 1791): S Angola (Lucira, Moçâmedes); Cape Verde Islands; São Tomé, Ilha do Príncipe; Annobon; Ascension; St. Helena. 0-20 m.
- Linga adansonii* (d'Orbigny, 1839): Mauritania (Cap Blanc); Guinea (10°27'N); Côte d'Ivoire; Canary Islands; Cape Verde Islands. 0-36 m.
- Cardiolucina lamothei* (Dautzenberg, 1912): N Angola (Luanda); São Tomé. 5-200 m.
- Loripes lucinalis* (Lamarck, 1818): Irish Sea; Mauritania (17°30'N); Mediterranean; Black Sea. Low tide to 150 m.
- Loripes contrarius* (Dunker, 1846): Mauritania (Cap Blanc); Senegal (Dakar region); Gabon (Port-Gentil); S Angola (Baía dos Tigres). Low tide to 10 m.
- Loripes aberrans* Dautzenberg, 1910: Mauritania (subfossil, Holocene); Guinea; Congo Kinshasa (Banana). Shallow water in lagoons and estuaries.
- Loripes rhizoecus* Oliver, 1986: Nigeria (Niger delta). 1-3 m. Probably a form of *L. aberrans*.
- Loripes legouxii* (Nicklès, 1952): Senegal (Dakar); N Angola (Luanda); São Tomé, Ilha do Príncipe. 5-80 m.
- Megaxinus appendiculatus* (Locard, 1898): Mauritania; Sierra Leone (7°29'N); N and S Angola (Luanda, Lucira); Canary Islands (29°08'N); Cape Verde Islands. 30-250 m.
- Megaxinus transversus* (Bronn, 1831): Portugal; Mediterranean; Atlantic Morocco; Annobon. Shallow water to 40 m.
- Myrtea spinifera* (Montagu, 1803): Norway (63°N); Shetlands; Mediterranean; Sierra Leone (7°29'N); Côte d'Ivoire; Ghana; Equatorial Guinea (1°40'N); N Angola (Luanda). 35-250 m.
- Myrtea pseudocorbis* (Nicklès, 1952): Mauritania (19°N); Guinea-Bissau (10°49'N); N Angola (Luanda); S Angola (Lucira, Moçâmedes); Quaternary of Gabon. 30-150 m.
- Parvilucina capensis* (Jaeckel & Thiele, 1931): S Angola (Baía dos Tigres); South Africa (Alagoa Bay). About 250 m.
- Lucinoma borealis* (Linnaeus, 1767): Faroë and N Norway; Mauritania (20°30'N); Mediterranean. 50-500 m.
- Lucinoma vestita* (Dautzenberg & Fischer, 1906): Cape Verde Islands. 628 m.
- Lucinoma atalantae* n. sp.: Cape Verde Basin (Mauritania, 20°30'N). 2000-2100 m.
- Lucinoma myriamae* n. sp.: Nigeria; N Angola (7°18'S). 350 m.
- Anodontia (Afrrophysema) chevalieri* Cosel in Taylor & Glover, 2005: Côte d'Ivoire; Bénin; Gabon. 5-320 m.
- Anodontia (Loripinus) senegalensis* Cosel in Taylor & Glover, 2005: Mauritania (20°34'N); Senegal. 60-230 m.
- Anodontia subfragilis* (Dautzenberg, 1910): Mauritania (19°N); Senegal (Dakar); S Angola (Lucira, Moçâmedes); Cape Verde Islands. 5-200 m.
- Anodontia subrostrata* Cosel, 1989: Cameroon; Gabon (Libreville); N Angola (Luanda). About 70-90 m.
- Joellina dosiniiformis* n. gen., n. sp.: off N Angola (7°18'S). 360 m.
- Divaricella (Egracina) chavani* n. sp.: Senegal (Saloum to Casamance); Sierra Leone (Sherbro); Côte d'Ivoire; Gabon to Congo (Pointe-Noire). 3-10 m.
- Divaricella (Pompholigina) gibba* (Gray, 1825): Senegal (Casamance); Congo (Pointe Noire). 10-25 m.