The genus *Mitrolumna* (Gastropoda, Turridae) in West Africa

El género *Mitrolumna* (Gastropoda, Turridae) en África Occidental

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ABSTRACT

Five species of *Mitrolumna* Bucquoy, Dautzenberg and Dollfus, 1883, are identified from West Africa, mostly from recent unpublished findings. Three species from Senegal, already known, are revised: *M. monodi* (Knudsen, 1956), *M.* cf *crenipicta* Dautzenberg, 1889 and *M. smithi* (Dautzenberg and Fischer, 1896). Two species are described as new for science: *Mitrolumna senegalensis* spec. nov. from Senegal and *Mitrolumna saotomensis* spec. nov. from São Tomé, Príncipe and Annobón.

RESUMEN

Cinco especies del género *Mitrolumna* Bucquoy, Dautzenberg y Dollfus, 1883, han sido encontradas en África occidental, la mayoría de ellas de hallazgos recientes no publicados. Tres especies ya conocidas de Senegal: *M. monodi* (Knudsen, 1956), *M.* cf *crenipicta* Dautzenberg, 1889 and *M. smithi* (Dautzenberg and Fischer, 1896). Dos especies más se describen como nuevas para la ciencia: *Mitrolumna senegalensis* spec. nov. de Senegal y *Mitrolumna saotomensis* spec. nov. de São Tomé, Príncipe y Annobón.

KEY WORDS: *Mitrolumna*, Lusitanian Province, West Africa, variability, distribution, new species.
PALABRAS CLAVE: *Mitrolumna*, Provincia Lusitanica, África Occidental, variabilidad, distribución, especies nuevas.

INTRODUCTION

The genus *Mitrolumna* was described by BUCQUOY, DAUTZENBERG AND DOLLFUS (1883), and several species are known in the Lusitanian Province.

M. olivoidea (Cantraine, 1835), type species of the genus, is known as a common and somewhat variable species, ranging at infralittoral and circalittoral levels throughout the western basin of the Mediterranean and the neighbouring Atlantic. *M. crenipicta* Dautzenberg, 1889, described from one beached shell collected in the Açores Islands, has been recognized by several authors as ranging throughout the southwest Mediterranean, the adjacent Atlantic and the Canarian Archipelago.

Two more species have been described in the last century from deep levels off the Açores Islands: *M. dalli* (Dautzenberg and Fischer, 1896) and *M. smithi* (Dautzenberg and Fischer, 1896). More recently, two other species have been described: *M. wilheminae* van Aartsen, Menkhorst and Gittenberger, 1984, from a subtidal level in the Strait of Gibraltar,

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and *M. melitensis* Mifsud, 1993 from circalittoral levels off Malta.

Many published taxa (*clandestina, columbellaria, columbellaris, granulosa, greci, leontocroma, major, oliviformis, striarella*, etc.) are presently considered synonyms or forms of these species. However, all the taxa of *Mitrolumna* from the Lusitanian Province deserve a complete revision, including the study of intraspecific variability, the range of geographic and bathymetric distribution of the species, and the possible description of new taxa based on phenae recently discovered off the Açores Islands, Canary Islands (Figs. 22, 49) and Western Sahara (Figs. 9-11). Such a revision is under study by C. Mifsud (pers. com.)

Little is known about *Mitrolumna* in West African waters. Records of only two species ascribable to *Mitrolumna* are to be found in the literature: one species described on the basis of four shells by KNUDSEN (1956) from Gorée Islands (Dakar, Senegal) as *Mitra monodi*, and another species designated in the same paper as *Mitromorpha olivoidea* (Cantraine) from a single shell collected at a bathyal level off the Cap Vert Peninsula, Dakar, Senegal.

The area of West Africa included in our study is that extending from Capo Blanco, North of Mauritania to the northern border of Namibia.

Investigations by both authors demonstrated the occurrence of several different phenae in Senegal waters, and also some others from the islands off the Guinean Gulf. These phenae are presented in this work and they are provisionally ascribed to appropriate taxa.

Abbreviations

MNHN Muséum National d'Histoire Naturelle, Paris
MNCN Museo Nacional de Ciencias Naturales, Madrid
MOM Museo Oceanographique, Monaco
CAP collection A. Peñas, Vilanova i la Geltrú
CER collection E. Rolán, Vigo
CFB collection F. Boyer, Sevran
CJP collection J. Pelorce, Le Grau du Roi
sp, live collected specimen
s, empty shell
f, fragment
j, juvenile

RESULTS

Family TURRIDAE Swainson, 1840
Subfamily Mitromorphinae Casey, 1904
Genus *Mitrolumna* Bucquoy, Dautzenberg and Dollfus, 1883

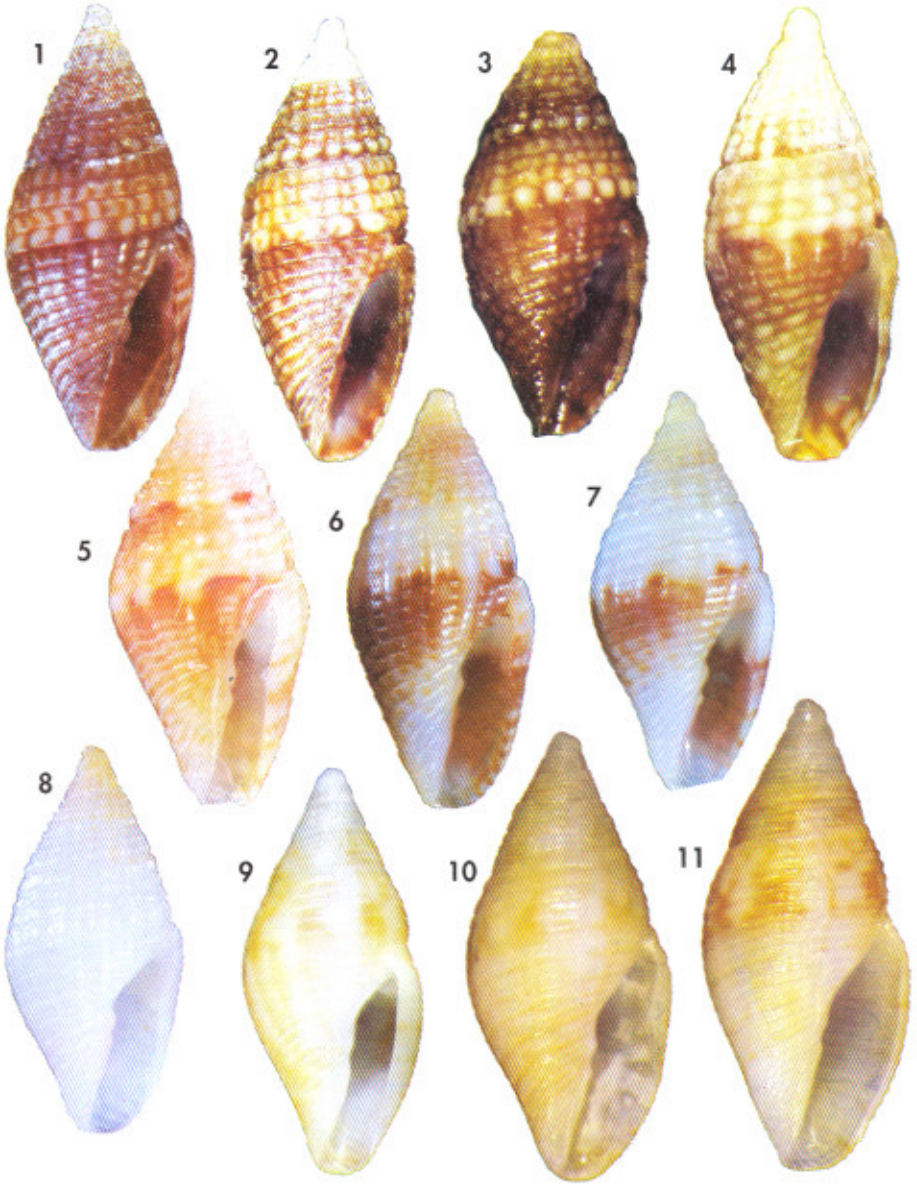
Type species by original designation, *Mitra olivoidea* Cantraine, 1835

Mitrolumna monodi (Knudsen, 1956) (Figs. 1-8)

Mitra monodi Knudsen, 1956: 519, pl. 1, fig. 1. [Type locality: Baie de Gorée, Dakar, 15 m].

Type material: Holotype in MNHN (5.9 x 2.8 mm).
Other material studied: Senegal: 1 sp, 2 s, diving, 1-2 m, Cap Vert Peninsula (CJP); 22 s, 13-15 m, Tacoma, Gorée (CJP); 2 s, 3 j, 25 m Groupe Teni Mbot (CJP); 7 sp, 40 m, Grand Thiouriba (CJP); 10 s, 3 j, 0-1 m, Anse Bernard, Dakar (CFB); 1 sp, 1 s, 32 m, Epopal (CFB); 29 s, beached, Almadies (CFB); 4 sp, Petite Corniche, Dakar (CER); 6 sp, 13 m, Tacoma (CFB); 1 sp, Cap Vert Peninsule (CJP); 3 s, Petit Thiouriba, 30 m, Dakar (CER); 1 s, 250 m, Mboro (CFB).

Description: See KNUDSEN (1956). Knudsen gave an accurate drawing of a subadult biconical shell with a granular sculpture. The upper part is whitish, the lower part is dark. The species was founded on a lot of 4 shells. The outline



Figures 1-8. *Mitrolumna monodi*. 1: 4.4 mm, Peninsule of Cap Vert (CJP); 2: 7.0 mm, Anse Bernard (CFB); 3: 5.0 mm, Petit Thouriba, Dakar, Senegal (CFB); 4: 5.1 mm, Tacoma, Gorée I., Dakar (CFB); 5: 4.2 mm, Tacoma (CJP); 6: 3.8 mm, Epopal (CFB); 7: 4.0 mm, Tacoma (CJP); 8: 3.8 mm, Tacoma (CJP). Figures 9-11. *Mitrolumna* sp. 9: 5.3 mm, Dahkla, Western Sahara (CER); 10, 11: 5.7 mm, 5.3 mm, Dahkla, Western Sahara (CFB).

Figuras 1-8. Mitrolumna monodi. *1: 4,4 mm, península de Cap Vert (CJP); 2: 7,0 mm, Anse Bernard (CFB); 3: 5,0 mm, Petit Thouriba, Dakar, Senegal (CFB); 4: 5,1 mm, Tacoma, Gorée I., Dakar (CFB); 5: 4,2 mm, Tacoma (CJP); 6: 3,8 mm, Epopal (CFB); 7: 4,0 mm, Tacoma (CJP); 8: 3,8 mm, Tacoma (CJP). Figuras 9-11.* Mitrolumna *sp. 9: 5,3 mm, Dahkla, Sáhara occidental (CER); 10, 11: 5,7 mm, 5,3 mm, Dahkla, Sáhara occidental (CFB).*

and the decoration of the holotype matches the shell pictured in Figure 5. The protoconch is totally white.

The adult shell has a length of 4.2 to 7.2 mm.

The animal is uniformly white, with no operculum.

Radula (Fig. 46): The radula is toxoglossan with marginal teeth only. Their number is about 134. The position of the teeth seems similar to that of *Conus* with the greater part aligned in a radular sac and a small group in a different direction in a radular caecum. Each tooth has a wider and more compact base and a ligament connected to it. There is a slight enlargement in the upper third of the radular tooth. For a shell of 4.2 mm, the size of the radular tooth was 0.08 mm.

Habitat: *M. monodi* has been collected on hard bottoms, in short algae, from low tide level to 40 m. Numerous samplings on soft bottoms made in Baie de Gorée (5-20 m) and on Petite Côte (Pointe Sarène, 3-8 m) have not yielded any specimen of the species, which seems to indicate that it is restricted to hard bottoms.

Distribution: *M. monodi* is distributed in small colonies around the Peninsula of Cap Vert. The species is apparently the best represented of the micro-turrids from hard bottoms at infralittoral levels in the area.

The shell trawled at Mboro (North Senegal, 250 m) may have been transported, due to the steep slopes and strong currents at this locality. However, its good state of preservation suggests that transport had been recent and that the species may also occupy bottoms from the lowest circalittoral levels and range at least along the whole North Senegal coast.

Discussion: KNUDSEN (1956) described the present species in the genus *Mitra*, deceived by the immature condition of the anterior part of the shell. Nevertheless, its belonging to the Mitromorphinae is well testified by the presence of the two faint columellar plaits.

The adult shell of *M. monodi* is very variable (Figs. 1-8). Outline suboval (Figs. 1-4) to sharp biconical (Fig. 5). Extreme colourations are from dark brown (Figs. 1-3) to pure white (Fig. 8). The general pattern is bicoloured, with a medium tendency to a whitish upper part and honey brown lower part.

The shell may have a sculpture of coarse nodules on strong spiral cords (Fig. 3) or dominant axial ribs (Fig. 4). Some shells are almost smooth. The external lip can be regularly arched (Fig. 7) or deeply inflexed (Fig. 5).

Such differences in shell features could suggest the occurrence of sibling species. In fact, all morphological and chromatic intergrades were observed in shells of live collected material, and the occurrence of a single variable species is corroborated by constant features of the animal, the protoconch and of the habitat.

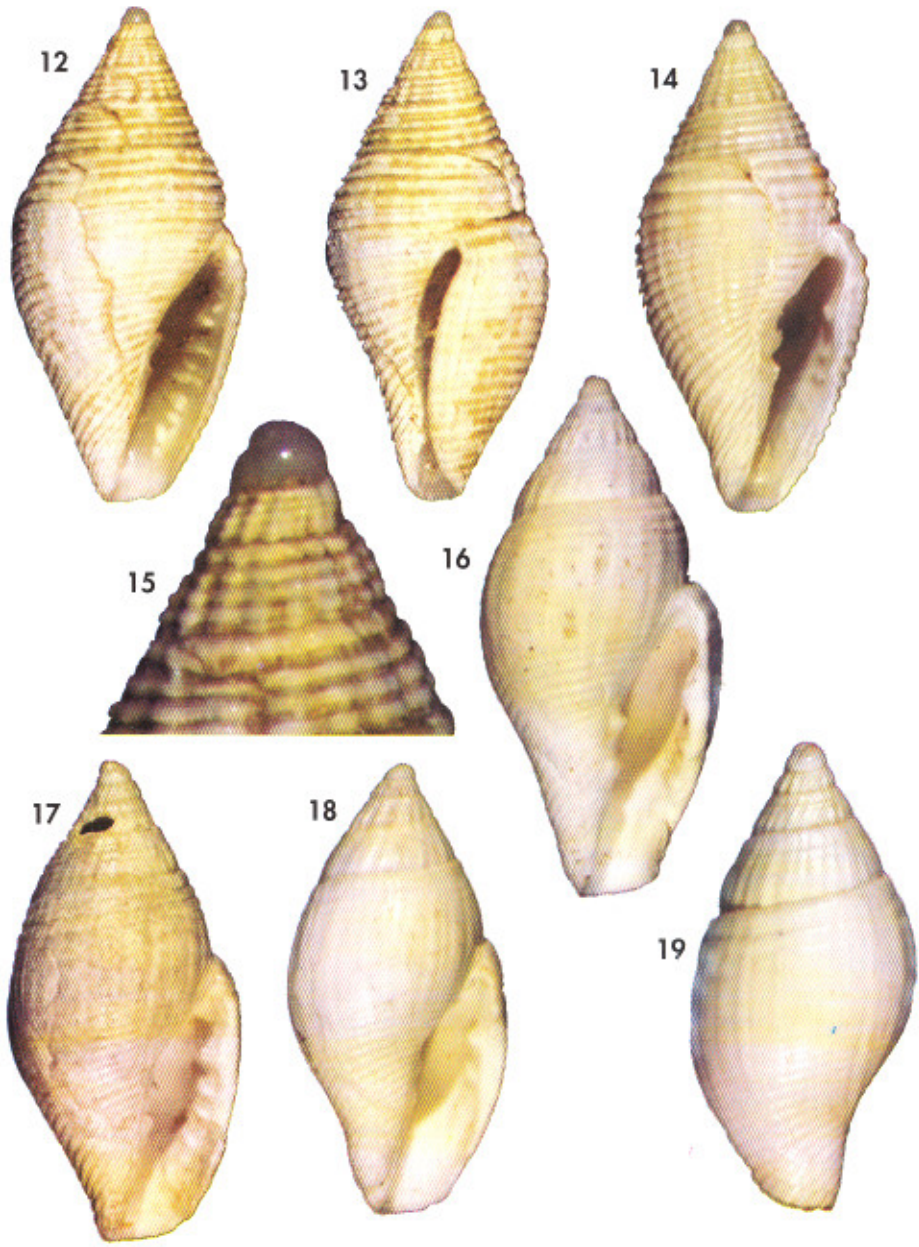
Large, slender suboval and dark shells seem to be restricted to shallow water on the southern side of the Cap Vert Peninsula (Anse Bernard, 0-1 m, and Tacoma wreck, 7-13 m).

The dark forms of *M. monodi* may be differentiated from *M. olivoidea* by their subsutural light colour and the white protoconch. The shells with white and brown colour can be differentiated from *M. wilhelminae* (Fig. 23), which is wider, with more numerous spiral cords, no axial sculpture in the last whorls and, frequently, with spiral darker bands.

Mitrolumna cf *crenipicta* Dautzenberg, 1889

Mitrolumna olivoidea Cantraine var. *crenipicta* nov. var. Dautzenberg, 1889: 31, pl. 2, figs. 6a-6c. [Type locality: San Miguel, Açores, on the beach].
Mitromorpha olivoidea (Cantraine) Knudsen, 1956: 525, pl. 2, fig. 12.

Type material: Holotype of *M. crenipicta* in MOM (5 mm), figured in VAN AARTSEN ET AL. (1984, fig. 205a).



Figures 12-15. *Mitrolumna senegalensis* spec. nov., off Lompoul, Senegal. 12, 13: Holotype, 7.95 mm, (MNHN); 14: paratype (MNCN); 15: protoconch of the holotype. Figures 16-19. *Mitrolunma smithi*, off St. Louis, Senegal. 16: adult, 8.5 mm (CFB); 17: adult, 7.4 mm (CER); 18: juvenile, 6.7 mm (CER); 19: juvenile, 5.9 mm (CFB).

Figuras 12-15. Mitrolumna senegalensis *spec. nov., frente a Lompoul, Senegal. 12, 13: holotipo, 7,95 mm, (MNHN); 14: paratipo (MNCN); 15: protoconcha del holotipo. Figuras 16-19.* Mitrolunma smithi, *frente a St. Louis, Senegal. 16: adulto, 8,5 mm (CFB); 17: adulto, 7,4 mm (CER); 18: juvenil, 6,7 mm (CER); 19: juvenil, 5,9 mm (CFB).*

Description: See DAUTZENBERG (1889). A shell collected at 200-600 m off Cap Vert Peninsula, Dakar, Senegal, is figured by KNUDSEN (1956, pl. 1, fig. 12) as *Mitromorpha olivoidea* (Cantraine). A shell from the Mediterranean (Alboran Island) is pictured in MIFSUD (1993: 16). The protoconch of the holotype of *M. crenipicta* is in poor condition and not adequate for a diagnosis.

The size of the shell from Senegal is not given by Knudsen.

Habitat: Unknown.

Distribution: Açores, shallow water. Some specimens recorded from shallow or deep waters in the Mediterranean and the Canary Islands are referred to this species. The figure of KNUDSEN (1956) appears to extend the range of this species up to Senegal.

Discussion: The shell pictured by KNUDSEN (1956, fig. 12) as *M. olivoidea* closely resembles the original figure of *M. crenipicta*, both in the general outline of the shell and the pattern of the decoration. The shape of the holotype, as figured in VAN AARTSEN *ET AL.* (1984), is however somewhat different.

It might fall within the general range of variability of *M. monodi*, but it also corresponds to the range of the outline of the original figure of *M. crenipicta* from the Açores. When *M. monodi* shows a bicoloured pattern, the lighter part is always the upper one, and the dark part is the lower one; but the pattern presented by the shell of Knudsen is inverted.

M. wilheminae Aartsen, Menkhorst and Gittenberger, 1984 (Fig. 23) presents similarity to the shell of Knudsen. The geographic range of *M. wilheminae* needs checked, because the species does not seem to be restricted to the Strait of Gibraltar. We have examined shells from Alborán (CAP) and from Algeria (CER) that appear to be this species.

Mitrolumna senegalensis spec. nov. (Figs. 12-15)

Type material: Holotype (Figs. 12, 13), 7.95 x 3.7 mm, in MNHN. Paratype 1 (Fig. 14), 8.85 x 4.0 mm, in MNCN (15.05/43738); paratype 2, 8.15 x 4.0, in CER; paratypes 3-9, 7.5 x 3.9, 8.9 x 4.15, 9.0 x 4.2, 8.25 x 4.0, 8.25 x 3.8, 7.25 x 4.0 and 7.6 x 3.5 mm, in CFB, all from the type locality, trawled by Research Vessel, Marcel Pin, March 1991.
Etymology: From the type locality, situated off the northern coast of Senegal.
Type locality: Off Lompoul (Northern coast of Senegal, 150 m).

Description: Shell (Figs. 12-14) small, solid and fusiform, almost biconical. Protoconch smooth and shining, 1.5 whorls, somewhat produced, chesnut colored (Fig. 15). Teleoconch usually with 4-5 whorls, bearing a coarse sculpture of raised spiral cords, 4-5 per whorl on spire, the body whorl with 26-28 cords. Intervals between the cords on the body whorl decrease towards the base. Faint axial ribs are visible on the early whorls of the teleoconch, but absent on the two last whorls. Aperture somewhat narrow, representing 45-50 % of the total length. Outer lip straight. The columella bears 2 strong plaits; 6 to 8 wide spiral pleats inside the labrum, somewhat distant from the edge. The second upper pleat is the largest one and forms a small denticle. Colour whitish to tan.

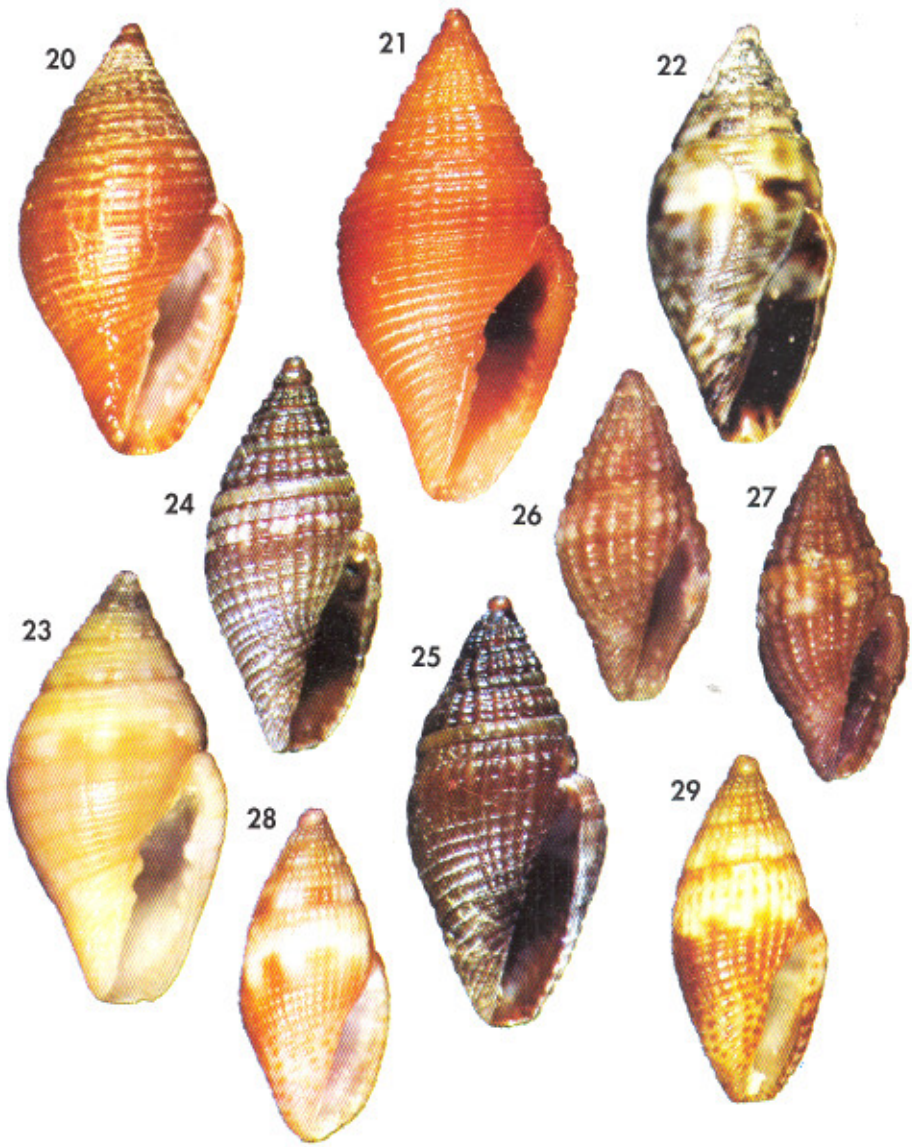
Adult shells length, 7.5 to 9.0 mm, width 3.8 to 4.15 mm.

The animal and radula are unknown.

Habitat: Unknown.

Distribution: Only known from the type locality.

Discussion: The new species presents very distinctive features compared with other species known from the eastern Atlantic. The most comparable species is *Mitrolumna dalli* (Dautzenberg and Fischer, 1896), known from a single shell dredged at bathyal depths (1300 m) off the Açores Islands. The description and the figure of this holotype (see DAUTZENBERG AND FISCHER, 1896: 431-432, pl. 15, fig. 18 and BOUCHET AND WARÉN, 1980: 77, fig. 160) show a shell large for the genus (14 x 6 mm), with a slender suboval outline. The whorls are somewhat convex and bear



Figures 20, 21. *Mitrolumna olivoidea*. 20: shell, 5.9 mm, Getares, Algeciras (CFB); 21: shell, 8.3 mm, Vilassar del Mar (CAP). Figure 22. *Mitrolumna* sp., 6.4 mm, Arguineguin, Gran Canary (CFB). Figure 23. *Mitrolumna wilhelminae*, shell, 6.7 mm, Alborán (CAP). Figures 24, 25. *Mitrolumna saotomensis* spec. nov. 24: holotype, 5.0 mm (MNCN); 25: paratype, 5.3 mm (MNHN), Esprainha, São Tomé. Figures 26, 27. *Mitrolumna saotomensis* morpho 1, 4.2 mm, 4.4 mm, Tortuga I., Annobón. Figures 28, 29. *Mitrolumna saotomensis* morpho 2, 4.0 mm, 4.6 mm, Tortuga I., Annobón.
Figuras 20, 21. Mitrolumna olivoidea. *20: concha, 5,9 mm, Getares, Algeciras (CFB); 21: concha, 8.3 mm, Vilassar del Mar (CAP). Figura 22.* Mitrolumna *sp., 6,4 mm, Arguineguin, Gran Canaria (CFB). Figura 23. Mitrolumna wilhelminae, concha, 6,7 mm, Alborán (CAP). Figures 24, 25.* Mitrolumna saotomensis *spec. nov. 24: holotipo, 5,0 mm (MNCN); 25: paratipo, 5,3 mm (MNHN), Esprainha, São Tomé. Figuras 26, 27.* Mitrolumna saotomensis *morpho 1, 4,2 mm, 4,4 mm, Tortuga I., Annobón. Figures 28, 29.* Mitrolumna saotomensis *morpho 2, 4,0 mm, 4,6 mm, Tortuga I., Annobón.*

thick wavy cords (about 5 on teleoconch whorls and 20 on the body whorl) crossed by well spaced strong axial ribs. Intervals between the cords on the body whorl widen towards the anterior end. Because of these differences, the conjecture relationship between these species is probably not very close.

Mitrolumna smithi (Dautzenberg and Fischer, 1896) (Figs. 16-19)

Mitromorpha smithi Dautzenberg and Fischer, 1896: 432-433, pl. 15, fig. 19. [Type locality: Açores Islands, 800 m, Hirondelle Vessel, Stn. 34].

Type material: Holotype in MOM (6 x 3 mm).
Other material examined: Senegal: off Saint-Louis, 500 m, Research Vessel, M. Pin, 31 March 1987: 5 s, 1 j (CFB), 1 s, 1 j (CER).

Description: See DAUTZENBERG AND FISCHER (1896). The description is based on a single shell. Another shell was collected during Campaign Biacores off Açores Islands (390-620 m) and is recorded by BOUCHET AND WARÉN (1980: 78). However, no comment nor figure is given of this shell, and the variability of *M. smithi* in its type locality remains unknown. The holotype was described as having a decoration of spiral dull yellow bands on a white glossy background, correctly illustrated in the type figure. This decoration is now completely faded and the shell is whitish, faintly shining, as illustrated by an enlarged picture in BOUCHET AND WARÉN (1980, fig. 161). The material studied is white.

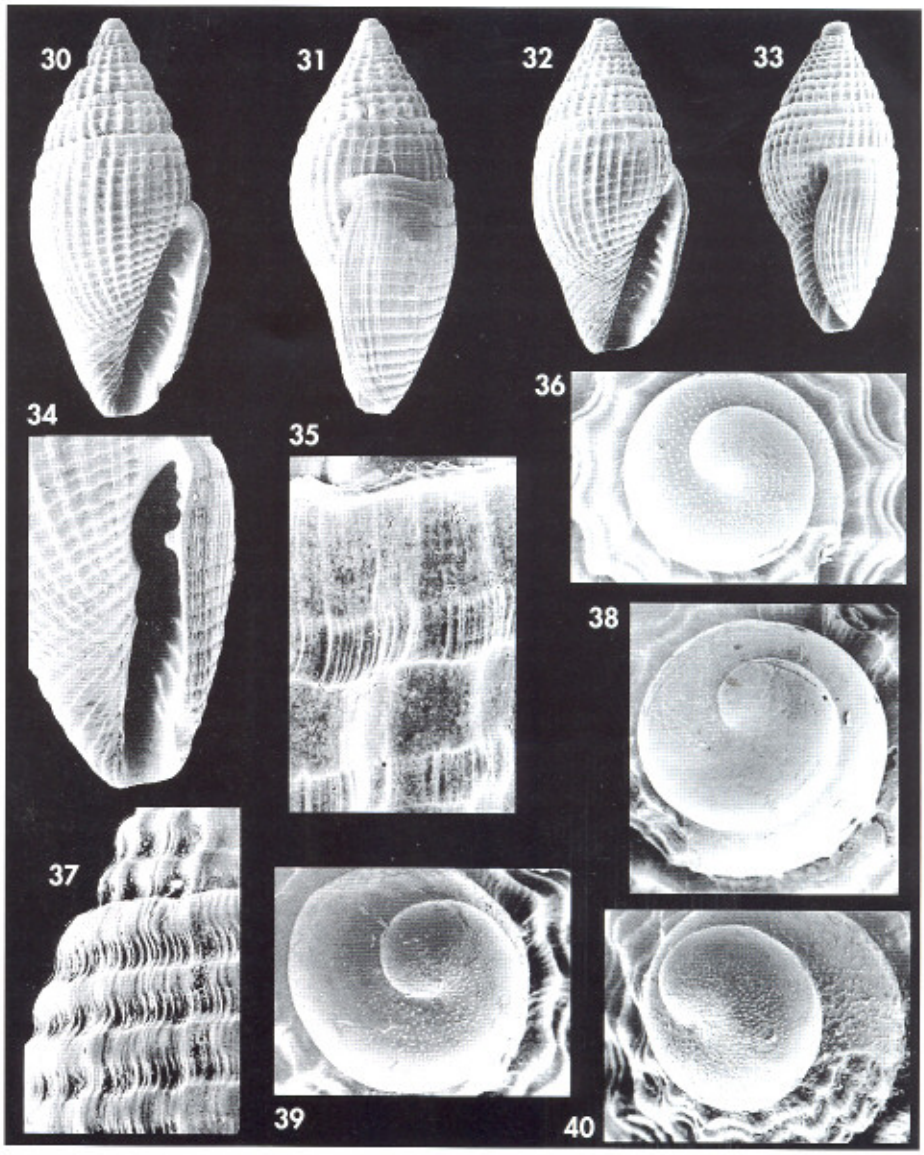
Animal and radula unknown (collected material consist only of empty shells).

Habitat: Unknown.

Distribution: The species was known only from the type locality. The discovery of a population from Senegal, proposed here as conspecific, allow us to extend the distribution of the species to northern Senegal. It can be observed that the bathymetric range is rather homogeneous (Açores: 800 and 390-620 m; Senegal: 500 m). On the basis of these data, it is assumed that the species is distributed in the medium-bathyal zone, possibly off most of northwest Africa. This last point remains however to be verified by further sampling, as a discontinuous distribution is also possible.

Discussion: The shells discovered in northern Senegal (Figs. 16-19) show very similar features to *M. smithi* as in the original description and figure. The similarity is well-correlated for shell size (6.9 to 8.5 mm in Senegal versus 6 mm for the holotype), proportions and outline; pattern of spiral levelled cords and the tendency to a smooth central body whorl; shape of the aperture and labrum; 5 to 6 pleats inside the labrum, the upper one forming a strong denticle; slightly sigmoid columella bearing 2 medium sized plaits. The protoconch is similar in the holotype (with a maximum diameter of 0.5 mm) and in the shells from Senegal (average width of 0.48 mm).

The sole differences may lie in details of the sculpture, principally in the fact that the spiral cords seem to be wider and less numerous in the holotype than in the shells from Senegal. However, it is observed that in shells from Senegal, the axial ribs and spiral cords are respectively more or less dominant on the teleoconch and on the last whorl, the smooth central zone of the body whorl and the smooth lower zone of the penultimate whorl are more or less wide, and width and number of spiral cords are somewhat variable depending on the individual. The holotype of *M. smithi* can be considered to belong to the same range of variability as the shells from Senegal. Our single reservation concerns the fact that there is no record of such a phena in the interval between the Açores Islands and Senegal.



Figures 30-33. *Mitrolumna saotomensis*. 30, 31: paratypes, 5.3 mm and 5.4 mm, Esprainha, São Tomé (CER); 32, 33: shells, 4.2 mm and 3.8 mm, Baia das Agulhas, Príncipe I. (CER); 34: detail of the aperture of a paratype (CER); 35: detail of the subsutural cord, Esprainha (CER); 36: protoconch of paratype (CER). Figure 37. *Mitrolumna olivoidea*, detail of the subsutural cord, La Herradura (CAP). Figure 38. Protoconch of *M. melitensis*, Murcia (CVG). Figures 39, 40. Protoconchs of *M. olivoidea*, La Herradura, Málaga (CAP).

Figuras 30-33. Mitrolumna saotomensis. *30, 31: paratipos, 5,3 mm y 5,4 mm, Esprainha, São Tomé (CER); 32, 33: conchas, 4.2 mm y 3.8 mm, Baia das Agulhas, Príncipe I. (CER); 34: detalle de la abertura de un paratipo (CER); 35: detalle de la cuerda subsutural, Esprainha (CER); 36: protoconcha de un paratipo (CER). Figura 37.* Mitrolumna olivoidea, *detalle de la cuerda subsutura, La Herradura (CAP). Figura 38. Protoconcha de* M. melitensis, *Murcia (CVG). Figures 39, 40. Protoconchas de* M. olivoidea, *La Herradura, Málaga (CAP).*

Mitrolumna saotomensis. spec. nov. (Figs. 24-36, 41-45)

Type material: Holotype (Fig. 24), 5.0 x 2.2 mm, in MNCN (15.05/43739). Paratype 1 (Fig. 25): 5.3 x 2.6 mm, in MNHN; paratypes 2-4: 5.5 x 2.3 mm, 4.7 x 2.1 mm, 4.4 x 2.0 mm, in CFB, and 22 paratypes more in CER. All from type locality.
Other material examined: São Tomé: 4 sp, 6 s, 3-4 m, Lagoa Azul (CER); 6 j, 8 m, Sant'Ana (CER); 10 s, 3 j, 1 f, 2-6 m, Praia Mutamba (CER); 13 s, 6 j, 4 m, São Tomé city (CER); 2 sp (destroyed for radular studies), 2 s, 7 j, 8 f, 4-9 m, Esprainha (CER). Príncipe: 3 sp, 8 m, Baia das Agulhas (CER). Annobón: morph 1: 15 s, 9 f, 8 m, Isla Tortuga (CER); 2 s, 10 m, Santo Antonio (CER); morph 2: 49 s, 20 f, 8 m, Isla Tortuga (CER); 4 s, 10 m, Santo Antonio (CER).
Etymology: The specific name refers to the island where the species was first collected.
Type locality: Esprainha, São Tomé, Republica de São Tomé and Príncipe.

Description: Shell (Figs. 24-25, 30-33) small, fusiform and solid. Protoconch (Fig. 36) with 1 and $^1/_4$ whorls, and about 450 μm maximum diameter; its surface is covered with fine granulations and is uniformly brown. Teleoconch of about 5 whorls with axial ribs crossed by spiral cords forming small nodules. The spiral cords number 3-4 on the spire whorls; on the last whorl there are a total of 17-20 cords, with 4-5 to the periphery. The subsutural cord (Fig. 35) is wider than the rest. The axial ribs are narrower than the interspaces. Last whorl is nearly $^2/_3$ the total length of the shell. In the latter middle part of the last whorl the ribs and cords are attenuated. The aperture (Fig. 34) is elongate and narrow. The outer lip has an anal notch at its upper part. There is an enlargement on the external lip but a little previous to the edge. The columella is oblique and presents 2 folds placed deeply near its middle part. The inner part of the outer lip has a large denticle at its upper third, 3 smaller above it and 5-8 below, all forming folds. The colour of the shell is brown, usually with a lighter subsutural band of varying width.

Dimensions: Larger specimens reach 6 mm. Shells from Príncipe (Figs. 32-33) are smaller, usually 4.5 mm in maximum size.

Animal: In specimens from São Tomé, the animal is whitish with numerous milky-white spots.

Radula (Fig. 47): The radular teeth are similar to that described for *M. monodi* being slightly wider. They number are about 130. For a shell of 4.0 mm, the size of the radular tooth is 0.08 mm and for a shell of 3.7 mm the tooth is 0.075 mm.

Habitat: Collected under rocks bearing short algae in 3-8 m.

Distribution: The new species has been recorded from São Tomé as *M. olivoidea* (Cantraine, 1835) by TOMLIN AND SHACKLEFORD, 1914; this record was cited later by KNUDSEN (1956) and FERNANDES and ROLÁN (1993). The original range of *M. olivoidea* is the Mediterranean Sea and it is extended to Casablanca (PASTEUR-HUMBERT, 1962). *M. saotomensis* is known from São Tomé, Príncipe and Annobón.

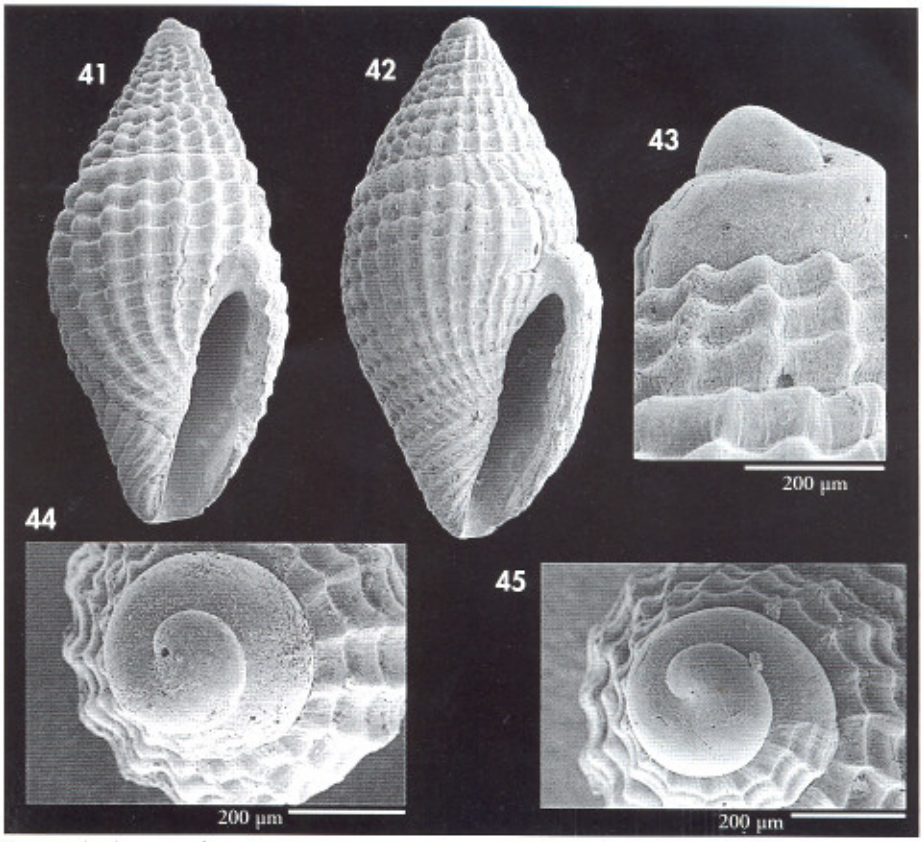
Discussion: Specific variability: we are including in the taxon *M. saotomensis*, shells from São Tomé, Príncipe and two morphs from Annobón.

The shells from Príncipe Island agree with those from São Tomé and are conspecific, being smaller in size.

The shells from Annobón Island (situated 200 Kms South of São Tomé) show sculptural differences, as follows, but appear to be conspecific. Two morphs of *Mitrolumna* are found here in the same samples. One of these morphs (Figs. 26-27) presents a very coarsely sculptured shell with a reduced number of axial ribs and thick, produced nodules, whereas the other morph (Figs. 28-29) has a finer sculpture with numerous axial ribs and small nodules. The ground colour is also different, the first being dark brownish orange, whereas the second is lighter.

In fact, these morphs could be extreme variations of *M. saotomensis*. The issue is about three points:

- the variability observed in the population from São Tomé and Príncipe



Figures 41-45. *Mitrolumna saotomensis.* 41: morpho 1, Tortuga I., Annobón (CER); 42: morph 2., Tortuga I., Annobón (CER); 43, 44: protoconch of morph 1, Tortuga I. (CER); 45: protoconch of morph 2, Tortuga I.

Figuras 41-45. Mitrolumna saotomensis. *41: morfo 1, Tortuga I., Annobón (CER); 42: morfo 2., Tortuga I., Annobón (CER); 43-44: protoconcha de morfo 1, Tortuga I. (CER); 45: protoconcha de morfo 2, Tortuga I.*

is far less than the variability observed in Annobón.

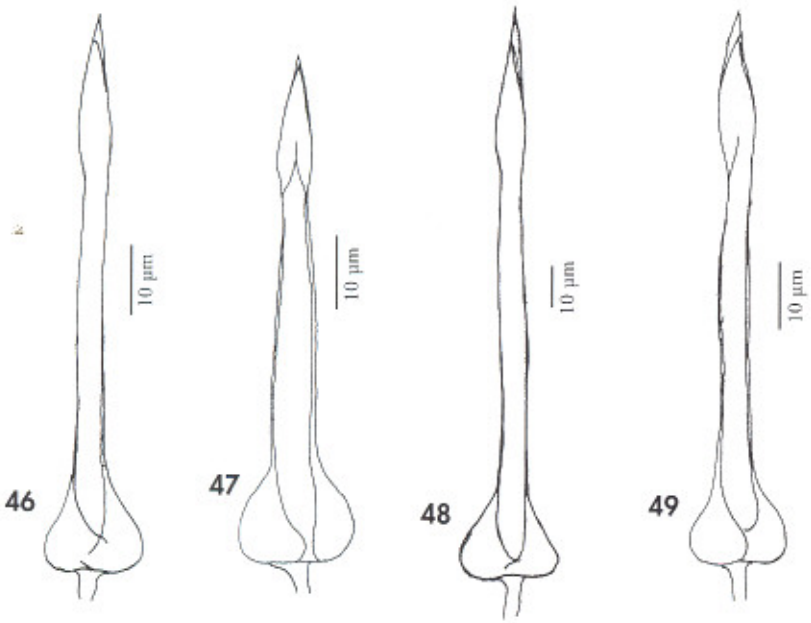
- we have not found clearly intergrading specimens between the two morphs in our material from Annobón, the most median form being represented by one single shell, as Fig. 42.

- one of the variant characters observed in the morphs from Annobón (the number of axial ribs) could be of specific value. We note that, in the other species studied, the number of axial ribs, as well as the number of spiral cords, is not very variable (cf. the variability displayed in *M. monodi*, Figs. 1-8)

Although the variations could be of specific value it is more likely that they represent geographic or ecological variants. The axial and spiral structural variations are of degree only rather than kind. It is probable that further intergrades will be discovered with more material.

Comparison with other species: The new species shows affinity with *M. olivoidea* for shell features that species usually being larger, wider, more uniform in colour, with more spiral cords, and less evident axial sculpture on the last whorl.

As noted by VAN AARTSEN *ET AL.* (1984) there are some doubts about the true iden-



Figures 46-49. Radular teeth of *Mitrolumna* species. 46: *M. monodi*, specimen of 4.2 mm, Petite Corniche, Dakar; 47: *M. saotomensis*, specimen of 4.0 mm, Esprainha, São Tomé; 48: *M. olivoidea*, specimen of 6.1 mm, Getares, South Spain; 49: *Mitrolumna* sp., specimen of 6.8 mm, Arguineguin, Canary.

Figuras 46-49. Dientes radulares de las especies de Mitrolumna. *46:* M. monodi, *ejemplar de 4,2 mm, Petite Corniche, Dakar; 47:* M. saotomensis, *ejemplar de 4,0 mm, Esprainha, São Tomé; 48:* M. olivoidea, *ejemplar de 6,1 mm, Getares, South Spain; 49:* Mitrolumna *sp., ejemplar de 6,8 mm, Arguineguin, Canarias.*

tity of the taxon *M. olivoidea*. The original description of this species by CANTRAINE (1835) is superficial and the lectotype illustrated by CERNOHORSKY (1975, figs. 55-56) does not resolve by itself the questions created by the great variability of the forms attributed to *M. olivoidea* in the Mediterranean. The bathyal range of *M. olivoidea* is recorded from intertidal down to 70-90 m, at Marbella by F. Gubbioli (pers. com.) and 90 m at Elba Island in ARDOVINI AND COSSIGNANI (1999). A complete revision of this species, including its morphologic variability, will allow us to fully determine the specific status of *M. olivoidea* and to verify the possible occurrence of sibling species in the Mediterranean and adjacent Atlantic.

Except for the dubious mention from Senegal by KNUDSEN (1956), there are no records of *M. olivoidea* south of Casablanca (Morocco). Intensive collecting at infralittoral levels around the Peninsula of Cape Vert during the last fifty years on hard and soft bottoms (Marche-Marchad, Pin, Pelorce and Boyer, the two last collectors specializing in microgastropods during the last decade) leads us to conclude that *M. olivoidea* is absent in this area. The same can be said of Ghana, extensely sampled in recent years by Peter Ryall (pers. com.). The populations found in São Tomé, Príncipe and Annobón Islands must be considered as geographically separated from *M. olivoidea* by wide gaps.

The animal of *M. saotomensis* spec. nov. is white spotted on a whitish ground, whereas that of *M. olivoidea* (specimens from Getares, Algeciras) is

uniformly light sulphur yellow. This point is of importance for determination at the specific level, as the chromatism of the soft parts is very constant within each species of *Mitrolumna* examined for this character: *M. olivoidea* in Algeciras; *M.* sp, Gran Canaria (Fig. 22); *M. monodi*, in Dakar, Senegal.

The protoconchs of both species are similar (Figs. 36, 39-40) but are slightly larger in *M. olivoidea* (about 520-540 μm, whereas *M. saotomensis* is about 450 μm).

The radular teeth are similar, the teeth of *M. olivoidea* being more slender (Fig. 48) and with a higher number (184 teeth) in the specimen studied.

Another species with brown ground colour and with spiral sculpture is *M. melitensis* Mifsud, 1993; this can be distinguished by its more uniform ground colour, and by its larger size (usually reaching 9 mm). Furthermore, the 2-3 sutural cords are separated by deeper interspaces, the last whorl may have up to 30 spiral cords (about 16-21 in *M. saotomensis* spec. nov.) and the penultimate whorl has 6-9 (instead of 3-4 of *M. saotomensis*). *M. melitensis* also lacks the axial sculpture on the last whorl. Its protoconch (Fig. 38) is similar to that of *M. olivoidea*, presenting also fine granulations (usually absent in adult shells) but being wider (usually about 550 μm) and having a further 1/4 whorl.

M. saotomensis can be differentiated from the dark forms of *M. monodi* by several shell features: the first species has a dark protoconch instead of a whitish one, axial ribs extending all along the shell instead of disappearing towards the base, uniform brown ground colour on spire whorls lacking lighter nodules, and an enlargement on the external lip instead of an simple one.

CONCLUSIONS

Five species of the genus *Mitrolumna* from West Africa have been studied: three of them were previously known (*M. monodi*, *M. smithi* and *M.* cf *crenipicta*) and two are described as new (*M. senegalensis* and *M. saotomensis*).

The new species seem to have a restrict geographic range: *M. senegalensis* was only collected north of Senegal and *M. saotomensis* in the islands south of the Gulf of Guinea. *M. monodi* is also only known from Senegal. The other two species reported here are attributed to known taxa described from the Açores Islands, an oceanic archipelago situated at a much further distance on the northwest border of the Lusitanian Province.

Some of the studied species (*M. smithi*, *M. senegalensis* and *M.* cf *crenipicta*) appear to have low variability of shell morphology. The other two species (*M. monodi* and *M. saotomensis*) are variable in colour, shape and sculpture.

The radular teeth are very similar providing few useful characters for comparison althought those of M. saotomensis are broader. The protoconch is very similar in most of the species, however, this was not studied with SEM in some of them because erosion made this impractical.

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ADDENDUM

While the present paper was in press, Mifsud (April, 2001) published a work entitled "The genus *Mitromorpha* Carpenter, 1865 (Neogastropoda: Turridae) and

its subgenera with notes on the European species". In this paper, the author employs *Mitromorpha* Bucquoy, Dautzenberg and Dollfus, 1883 as a subgenus for the European species. Obviously, the shells of the types of *Mitromorpha* (*M. filosa* Carpentier, 1864) and *Mitrolumna* (*Mitra olivoidea* Cantraine, 1835) have some similarities in shell and radula, but also differences, firstly in the columellar pleats and, probably, in the internal thickening of the outern lip. At present, we have not enough information on the anatomy of the soft parts, for which a comparison has not been made. For this reason, we prefer to keep the name *Mitrolumna* as a genus-name for the West African species in this paper.

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