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CANTHARUS (POLLIA) VERMEULENI N.SP. (MOLLUSCA, PROSOBRANCHIA, BUCCINIDAE) FROM WEST AFRICA

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ABSTRACT

Cantharus (Pollia) vermeuleni n. sp. (Buccinidae) is described from material collected off St. Louis, Senegal, West Africa. Additional specimens from off the Cape Verde Islands and Ghana are recorded. The problems of classification of the genus are briefly reviewed. It is concluded that the species has a non pelagic development. Notes on associated organisms are given: four species of bryozoans (*Antropora tincta*, *A. minus*, *Rhyncozoon bispinosa* and *Hippopetraliella africana*) and one species of cirriped were found on the gastropod shells, which also may be attacked by a boring bivalve (*Lithophaga aristata*).

INTRODUCTION

In 1956 I recorded the Indo-West Pacific buccinid *Cantharus fumosus* (Dillwyn, 1817) (= *C. proteus* (Reeve, 1846)), see Cernohorsky 1971: 155, Fig. 67) from West Africa. The record was based on a sample from off St. Louis, Senegal, kept in the Zoological Museum, Amsterdam. Since then I have received a collection of marine molluscs collected off Ghana by Mrs. J. Edmunds; the material contains two samples of the same species. This gave rise to a renewed study of the whole material with the result that the earlier identification can not be upheld and that the three samples are herein assigned to a new species.

MATERIAL EXAMINED

- 1) Off St. Louis, Senegal, West Africa; depth: unknown; date: 1906; Mr. F. P. Vermeulen, collector; 14 specimens (holotype + 13 paratypes), 3 empty shells.
- 2) Tema Bay, Ghana, West Africa; depth: 38 m;

2 March 1968; Mrs. J. Edmunds, collector; 1 specimen (with dry soft parts).

- 3) Off Keta, Tema Bay, Ghana, West Africa; depth: 27-33 m; 1970: Mrs. J. Edmunds, collector; 4 specimens (1 or 2 with dry soft parts).

Most of the specimens are overgrown with Cirripedia and Bryozoa which conceal much of the protoconch and the shell sculpture of the teleoconch. Only a few of the specimens have a fully developed aperture. For these reasons the descriptions of the protoconch and the aperture are based on two of the paratypes.

Holotype: an intact specimen from St. Louis, Senegal, 27 mm long and devoid of sessile organisms.

Paratypes: the remaining 13 specimens from the same locality.

The holotype and the paratypes are kept in the Zoological Museum, Amsterdam; the two samples from off Ghana are kept in the Zoological Museum, University of Copenhagen.

SYSTEMATIC DESCRIPTION

Cantharus (Pollia) vermeuleni n. sp.

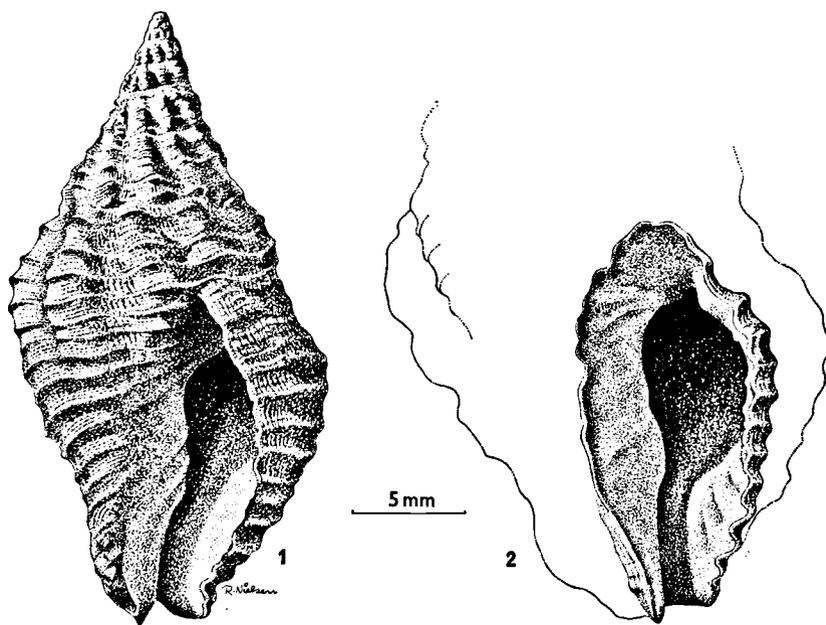
1897 *Cantharus proteus* (pars) Locard p. 319 [not Reeve, 1846].

1909 *Cantharus fumosus* (pars) Nobre p. 18 [not Dillwyn, 1817].

1956 *Cantharus fumosus* Knudsen p. 41, pl. 2, fig. 4.

Diagnosis. — A *Cantharus* having a spire with 10 axial ribs and 4 sharp spiral cords on the spire whorls; body whorl with 9 axial ribs, about 13 spiral cords and a fine, irregular reticulate microsculpture; outer lip with 10 sharp lirae and a well-developed anal denticle.

whorls with 10 ribs, body whorl with 9, including apertural rib. Spire with 4 well-developed spiral cords; spiral cords close set and equidistant on posterior whorls. Posteriormost spiral cord in anterior region more prominent than remaining ones, separated from adjacent spiral cord and from suture by broader interstices. Body whorl 13 spiral cords, all equidistant except for posteriormost one. Cords of anterior whorls narrow and distinct; interstices between cords 2-3 times the breadth of a cord. Interstices with 3-4 up to 5-6 fine spiral lines. Body whorl and adjacent part of previous whorl with fine scaly axial sculpture,



1. Holotype of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal, W. Africa. 2. Paratype (aperture) of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal W. Africa.

Description. — Teleoconch with about $6\frac{2}{3}$ solid whorls; body whorl constituting 69% of total length of shell. Spire conical, straight in outline, with an apical angle of 50° . Periostracum thin, light brown. Suture shallow, somewhat undulating on anterior whorls. Axial sculpture well developed, consisting of broad rounded ribs; ribs of posterior whorls separated by interspaces narrower than the breadth of a rib and arranged in continuous oblique rows. Ribs of body whorl less demarcated and of unequal size; interspaces separating ribs 2-3 times breadth of a rib. Posterior

particularly distinct in interstices between ribs; sculpture crosses spiral lines forming an irregular microsculpture. Aperture oval in outline, with short well-demarcated anterior canal and well-delimited anal canal. Parietal wall with a thin callus; callus posteriorly forming reflected edge of anal canal and merging into outer lip. Spiral ridges of body whorl, particularly 4-5 ridges closest to anal canal continuing below callus into aperture. Anterior part of columella with a ledge, anterior limit of which forms beginning of anterior canal. Anterior part of columella with 5-7 indistinct

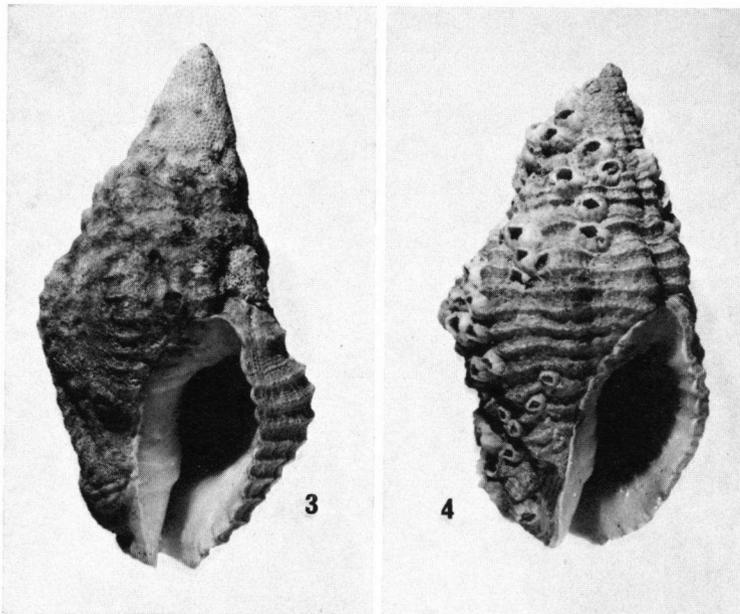
ridges arranged approximately at right angles to longitudinal axis of shell. Ledge with two ridges more prominent than remaining ones; anterior-most ridge forming a distinct spiral ridge on columella. Anal canal delimited by a parietal and an anal denticle, both distinct; besides anal denticle, outer lip provided with ten lirae continuing into shell interior as far as first interspace between apertural rib and adjacent rib and reflecting interspaces between spiral ridges of external surface. Anterior canal short, broad and widely open, delimited by anteriormost lira; anterior end of canal dorsally reflected.

white, the brown colouration extending into adjacent part of columellar callus as oblique streaks.

Protoconch: With $3\frac{1}{4}$ whorls, devoid of any sculpture and distinctly marked off from the teleoconch; colour uniformly brown.

Operculum: Horny with an irregular, coarse concentric sculpture. Nucleus located at anterior edge, antero-columellar corner forming a prominent, rounded angle of about 90° , posterior edge evenly curved; uniformly dark brown.

Radula: Rachidian tooth approximately square with a concave base and straight lateral edges.



3. Paratype ($\times 2.3$) of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal, W. Africa. 4. Paratype ($\times 2.3$) of *Cantharus vermeuleni* n. sp. from of St. Louis, Senegal, W. Africa.

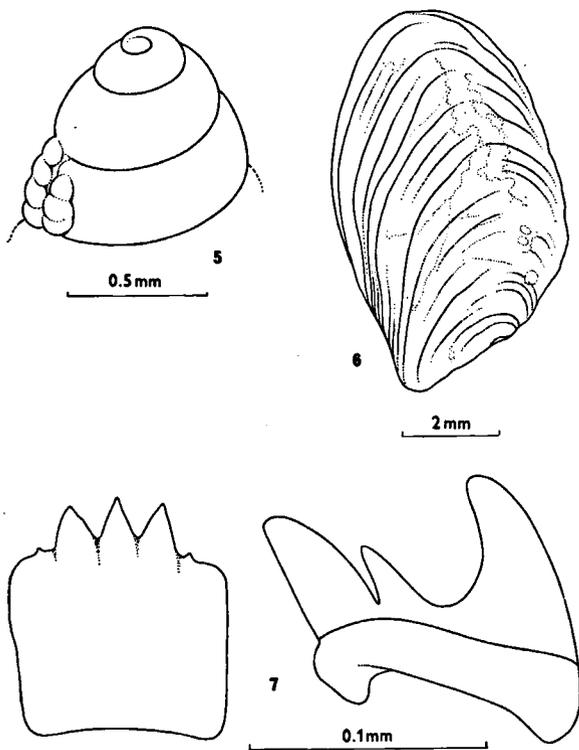
Measurements in mm.

Specimen	Length :	Breadth :	Remarks :
Holotype	27.0	15.7	Protoconch present
Paratype (largest shell)	33.7	19.8	Aperture developed ; protoconch absent
Paratype	32.3	19.6	Aperture developed ; protoconch absent
Ghana (largest shell)	22.2	12.9	Aperture developed ; protoconch absent

Colour: Light brown. Axial ribs, particularly those of body whorl, with irregular, brown spots, frequently arranged in two, somewhat irregular, spiral bands, one round the periphery, the other near the shell anterior. Spiral cords light, aperture

Cutting edge with three main cusps, central one largest, and one minute cusp on each side. Lateral tooth with three cusps, lateral one largest central one smallest. Median cusp without dentition on inner edge, base of lateral tooth concave with a median rounded projection.

Comparison. — *Cantharus vermeuleni* n. sp. differs greatly from *C. tranquebaricus* (Gmelin, 1791), the type species of the genus. The latter has a low spire, shouldered whorls, numerous spiral cords and an extremely short anterior canal (figure: Tryon 1881, p. 154, pl. 73, fig. 244). The holotype and two paratypes of *C. vermeuleni* have been compared with specimens of *C. fumosus*



5. Paratype (proteconch) of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal, W. Africa. 6. Paratype (operculum) of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal, W. Africa. 7. Paratype (radular teeth) of *Cantharus vermeuleni* n. sp. from off St. Louis, Senegal, W. Africa.

(Dillwyn, 1817) (figure: Cernohorsky 1971, p. 156, fig. 67) from New Guinea, kept in the British Museum (Nat. Hist.), London. In *C. vermeuleni* the spiral cords are fewer, sharper and more widely spaced. The anterior canal is shorter and more distinctly demarcated. In *C. fumosus* the axial ribs are dark and there is a well demarcated, narrow spiral band at the periphery. *C. vermeuleni* resembles the West Atlantic *C. cancellarius* (Conrad, 1846) (figures: Abbott 1974: 219, fig. 2412 and Robertson 1957: 3, fig. 3). The latter has less developed axial ribs, a large spiral rib on the columella had a poorly developed anal siphon. Another West Atlantic species, *C. (Pollia) tinctus* (Conrad, 1846) (figures: Abbott 1974: 219, fig. 2411 and Robertson 1957: 3, fig. 6), is similar to *C. vermeuleni*; the former has 10-14 weak axial ribs and 6-8 close-set and rounded spiral cords. The previously known species of *Cantharus* from

the East Atlantic and South Africa all differ markedly from the present one.

Assignment. — The classification of *Cantharus* and other genera within the Pisaniinae is uncertain. The problem has recently been discussed by Cernohorsky (1971, 1975), Ponder (1972) and Robertson (1957). Classification based on shell characters does not conform with a division based on radula morphology. Cernohorsky (1975) concluded that the radula is not particularly suitable as a diagnostic tool below the family level and stressed the importance of apertural characters, giving schematic figures of the apertures of several genera. Following this, the present species has been assigned to the genus *Cantharus* (see Cernohorsky 1975, fig. 3). The subgenus *Pollia* differs from *Cantharus* s. str. in that it lacks shouldered whorls. Several species of *Cantharus* s.l. have radulae similar to the present one, e.g., *C. tinctus* (Conrad) (see Robertson 1957, fig. 18); similar radulae are also found in species of *Pisania* (see Cernohorsky 1971, Ponder 1972).

Remarks. — Locard (1897) recorded *Cantharus proteus* (Reeve, 1846) (= *C. fumosus* (Dillwyn, 1817), see Cernohorsky 1971) from two stations of the Talisman expedition:

- 1) Talisman 1883. Rade de Porto Grande, St. Vincent, Cape Verde Isl. dragage 104 m; one shell (dry).
- 2) Talisman 1883. Praya, S. Tiago, Cape Verde Isl.; littoral; one shell (dry).

On inspection the two samples were found to have been merged. One shell is somewhat worn and heavily overgrown; it contains a hermit crab. This shell should be assigned to the present species. The other shell, which contains the soft parts, is *Cantharus viverratus* Kiener, 1834, a shallow water species distributed from Mauritania to Angola. Von Maltzan (1884) described three species assigned to *Cantharus* viz., *C. (Pollia) turricula*, *C. (P.) subsinuatus* and *C. (P.) multigranosus*, all originated from Gorée, Senegal. The descriptions were not accompanied by figures and no subsequent figures seem to be available. Judging from the descriptions, the three species differ widely from *C. vermeuleni* in shell proportions, number of axial ribs and spiral cords, and in the number of lirae of the interior outer lip.

Possibly the three species should be assigned to other genera.

Development. — The size of the protoconch, about 0.75 mm in height, indicates a nonpelagic development in the present species. Bandel (1976) described the egg capsule and development in *C. tinctus* (Conrad, 1846) from off Columbia, the Caribbean region. He found 80 to 200 embryos per capsule, all hatching as pelagic veligers. Bandel cites earlier investigations from Florida and Bermuda which indicate that the species may also have nonpelagic development. The capsules have the same number of eggs, but only 10% hatch, the remaining serving as nurse eggs.

Associated organisms. — Bryozoans are present on most shells and were particularly concentrated on the apex. The following four species were found on six shells examined (three from St. Louis, three from Ghana): *Antropora tincta* (Hastings), *A. minus* (Hincks), *Rhynchozoon bispinosa* (Johnston), *Hippopetraliella africana* Cook. All species have previously been recorded from West Africa.

Nearly all the shells from St. Louis have unidentified cirripeds attached, some in considerable number, sometimes forming a dense population. The cirripeds show a tendency to concentrate on the dorsal side of the shell, although they are frequently also found elsewhere. Most of the cirripeds are dead; most individuals have diameters of 2-3 mm, the largest being 5-7 mm. They appear to originate from at least two spatfalls. The Ghana specimens do not carry any Cirripedia.

Several specimens from St. Louis had their shells bored by mytilid bivalves assigned to *Lithophaga aristata* (Dillwyn, 1817). The crossed posterior prolongations of the valves, characteristic of the species (figure: Turner & Boss 1962, p. 105, pl. 69, 70), are distinctly visible. In some gastropods five to six bivalves could be observed, in other cases only empty valves were present. The largest *Lithophaga* were 5 mm long, excluding the posterior prolongation. From the observed borings it was not possible to detect any preference of the site of the borings. According to Turner & Boss (op. cit.), *L. aristata* may reach 52 mm in length; it bores into a wide variety of mollusc shells and in calcareous rocks. It is distributed in

the tropical, subtropical and warm temperate areas of the Western and Eastern Atlantic and in the Eastern Pacific (Panamic region).

In a few instances the gastropod shells had what appear to be unfinished bore holes of a predatory gastropod.

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