

**Verrucarion demeryi, a new semi-slug from Sierra Leone  
(Mollusca: Pulmonata: Urocyclidae)**

A.J. DE WINTER

c/o Rijksmuseum van Natuurlijke Historie, P.O. Box 9517, 2300 RA Leiden, The Netherlands

*Verrucarion demeryi* nov. spec. is described from Sierra Leone, West Africa. *Verrucarion* is recorded for the first time from the rain forest area West of the Dahomey Gap and constitutes a first example of a urocyclid semi-slug genus distributed all over the African forest belt.

Key words: Gastropoda, Pulmonata, Urocyclidae, semi-slug, *Verrucarion*, taxonomy, West Africa, Sierra Leone, Dahomey Gap.

In the Rijksmuseum van Natuurlijke Historie, Leiden (RMNH) an old, unidentified sample of large semi-slugs was discovered, apparently representing an as yet unknown species of *Verrucarion* Van Mol, 1970. The possibility that this species has already been formally described after its shell cannot be ruled out completely. However, shell characters are generally of little use in this group and it seems best to treat the nominal taxa described after their shells only as nomina dubia (Van Mol, 1970: 11).

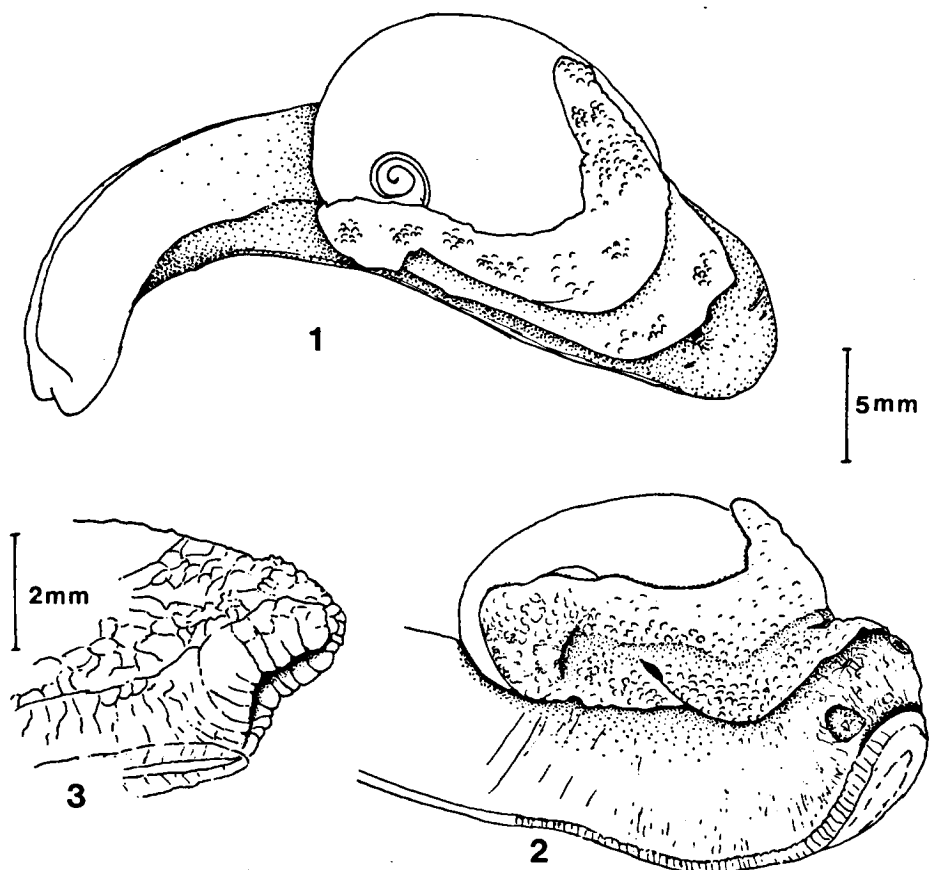
The genus *Verrucarion* at present includes three species from Cameroon and three from Zaïre, of which the most conspicuous common characters are the presence of a distinct vagina, and the large distance between the atrium and the spermooviduct, which is caused either by a long vagina or a long uterus and/or free oviduct.

In order to avoid confusion nomenclature of the different parts of the genital tract largely follows Van Mol (1970). All comparisons with related species are based on the descriptions and drawings provided by Van Mol (1970).

***Verrucarion demeryi* nov. spec.**

Material. — Holotype (RMNH alc. 9201, soft parts; RMNH 55956, shell fragments) and three paratypes (RMNH alc. 9302, soft parts; RMNH 55957, shell fragments): Sierra Leone, Sulumah (= Sulima?) river, about 3 km NW. of Juring (about 7°00'N11°30'W), February 1891, A.F. Demery leg.

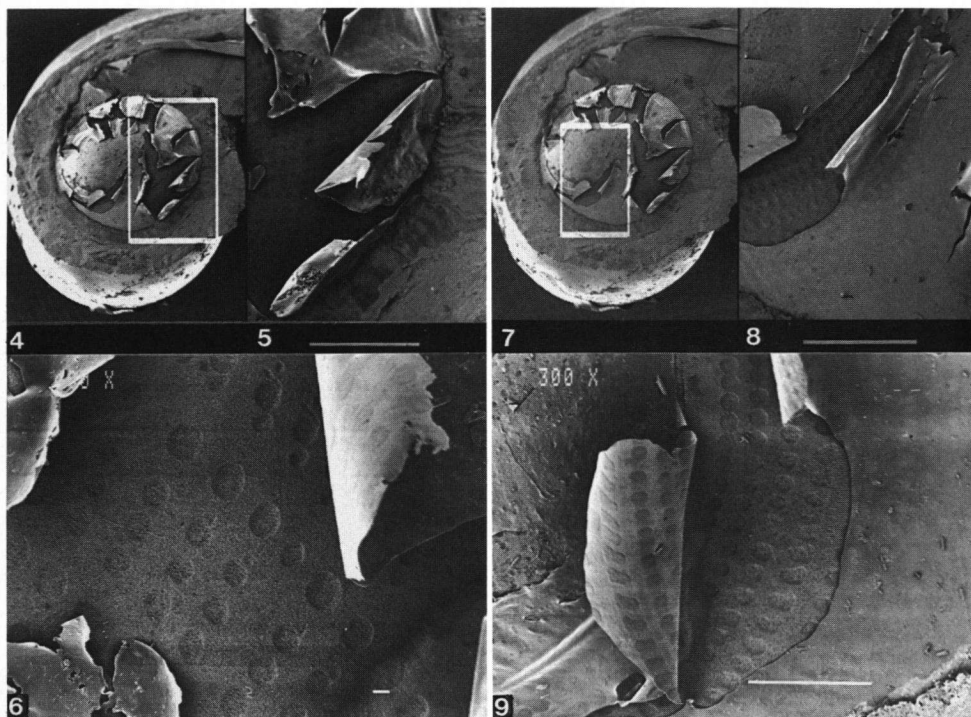
External appearance (figs. 1-3). — All specimens are adults and measure between about 39 and 50 mm. Probably they were not relaxed prior to fixation; length of holotype 50 mm. Tail relatively long and laterally compressed. Body uniformly beige, probably due to decolouration; only underneath the front lobe of the mantle there are two parallel dark bands, running from the upper tentacle to the anterior basis of the visceral hump. Right mantle lobe much larger than the somewhat triangular left one. Mantle lobes wrinkled with small tubercles. Caudal gland with a narrow vertical opening and no conspicuous apical process.



Figs. 1-3. Paratype of *Verrucarion demeryi* n. sp.; 1-2, external appearance; 3, caudal gland.

Shell (figs. 1, 4-9). — Shell relatively solid. Dimensions of the only undamaged shell, from a paratype of 39 mm,  $16 \times 11$  mm, with  $2\frac{1}{2}$  whorls; height not measured. The first  $1\frac{1}{2}$  whorls sculptured with pits, regularly arranged both in spiral and axial rows. The pits measure up to about  $25\ \mu\text{m}$ . In one axial row at most about 25 pits visible. Last whorl with growth lines only.

Genitalia (figs 10-12). — The numerous small acini of the ovotestis fully occupy about the first  $1\frac{1}{2}$  whorls. Because of the brittle condition of the material only the anterior genitalia were examined in some detail. Vagina rather long, about as long as the penis; it has a muscular outer wall, with internally longitudinal folds. At the upper part of the vagina strong bundles of muscles are present, which attach it to the left side of the body wall. Uterus strongly swollen, almost to the extent of a caecum, narrowing abruptly into the short and slender free oviduct. Duct of the bursa copulatrix about as long as the vagina. Bursa copulatrix elongate oval, clearly separated from the bursal duct. The low swelling of the atrium between the entrance of penis and vagina is caus-



Figs. 4-9. Apical whorls (very worn) of *Verrucarion demeryi* n. sp.; 4-6 and 7-9, magnification of different areas. Scales, figs. 5 and 7: 1 mm; fig. 7, 10  $\mu$ m; fig. 8, 100  $\mu$ m.

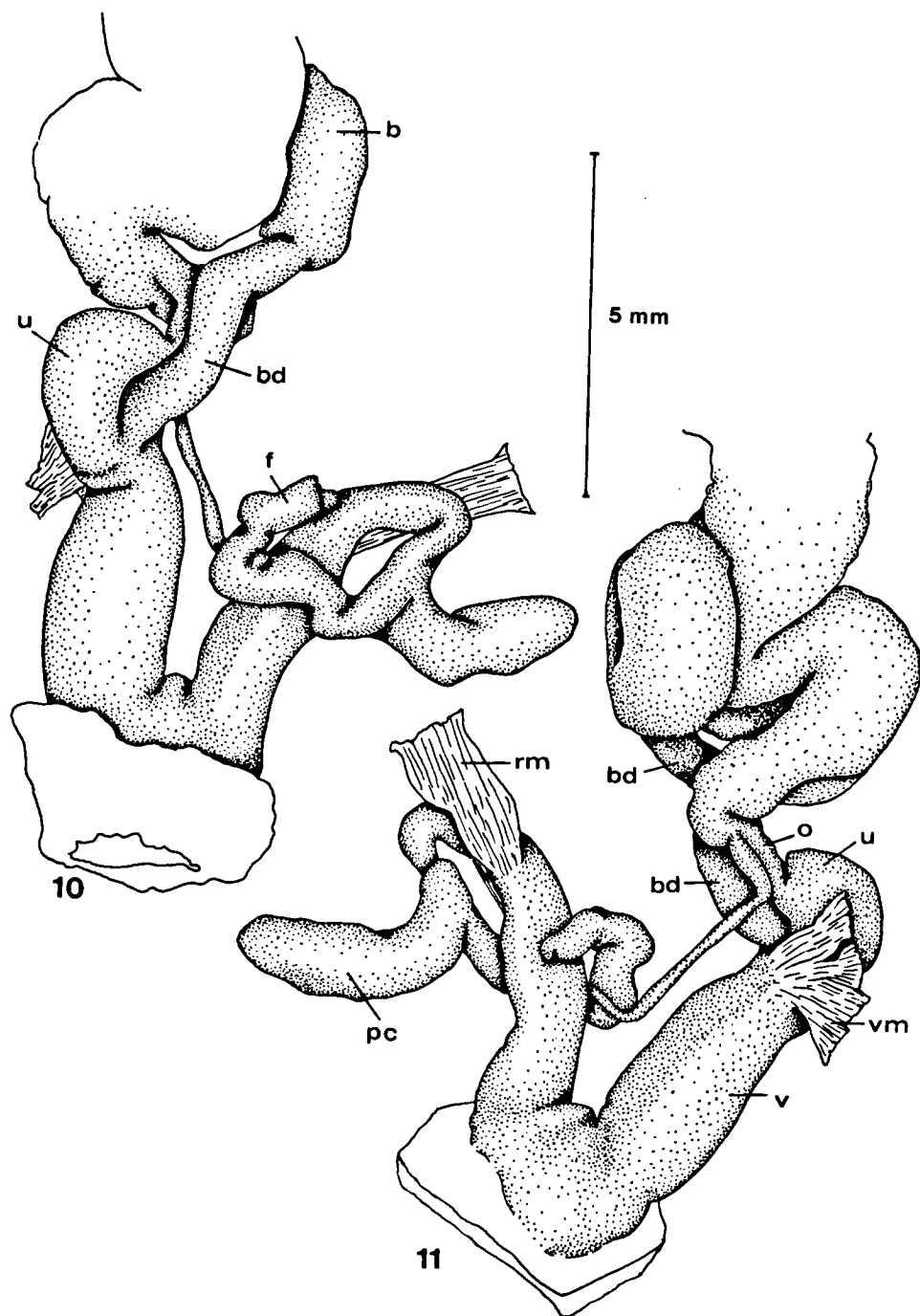
ed by two rolls of tissue inside the atrium. Penis muscular and shining, surrounded by a closely adherent penial sheath; internally there are about eight longitudinal folds, which merge into some papilla-like structures near the opening into the atrium. Penial caecum digitiform, three to four times as long as wide, positioned about halfway the flagellum and the penial retractor muscle. Flagellum rather short compared to that in other species in the genus. There is no sarcobelum. Remnants of spermatophores were not found.

Jaw (fig. 13). — Oxygnathous, with a somewhat excentric weak median projection.

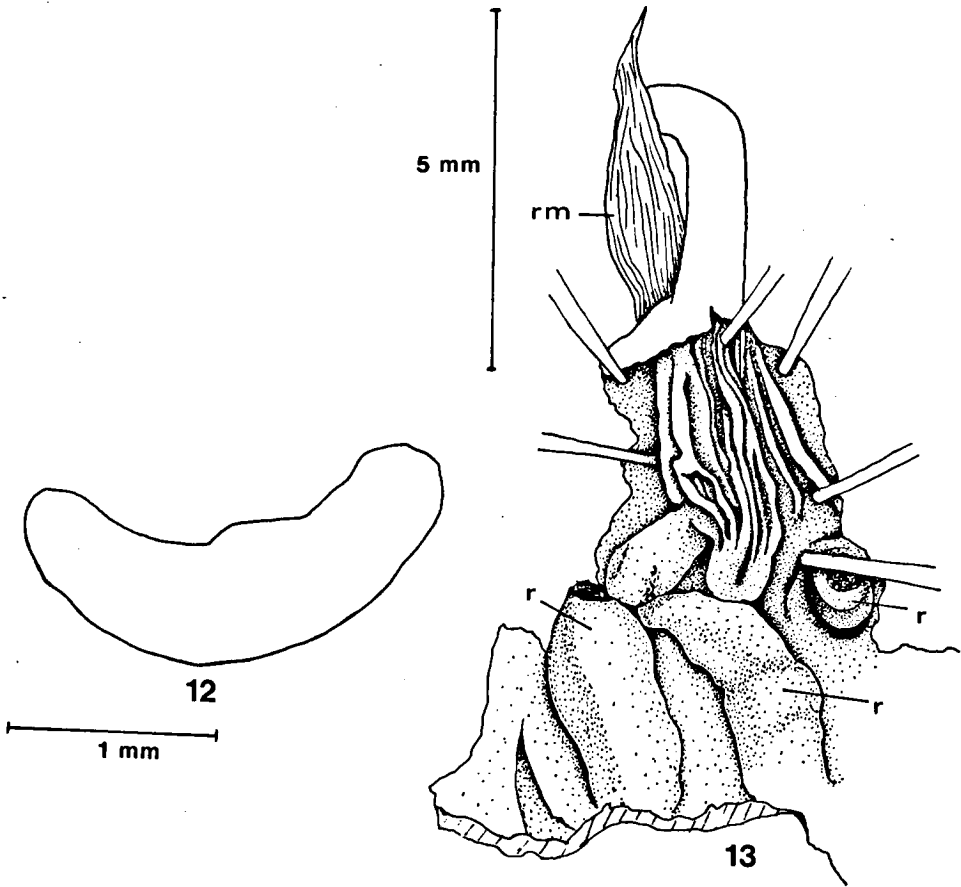
Radula (figs. 14-18). — There are about 125 teeth in half a row, which is the largest number known in the genus. Transition of laterals into marginals unclear; endocone reducing very gradually, disappearing somewhere between the 30th and 40th tooth.

Etymology. — The species is named after its collector, A.F. Demery. In an account on the history of the RMNH, Gijzen (1938: 152) described him as a young Liberian who in 1889 at the request of Büttikofer came to Leiden to qualify himself in preparation of animals, after which he returned to his native country, where he collected mainly birds for the museum. He died in 1891.

Remarks. — *V. demeryi* resembles both *V. columellaris* (d'Ailly, 1896) and *V. camerunensis* (Degner, 1931) from Cameroon in its long vagina and bursal duct. *V. columellaris* lacks the conspicuous muscles on the vagina, has a much shorter penial caecum, which



Figs. 10-11. Anterior genitalia of holotype of *Verrucarion demeryi* n. sp. Abbreviations: b, bursa copulatrix; bd, bursal duct; f, flagellum; o, free oviduct; pc, penial caecum; rm, penial retractor muscle; u, uterus; v, vagina; vm, vaginal muscles.

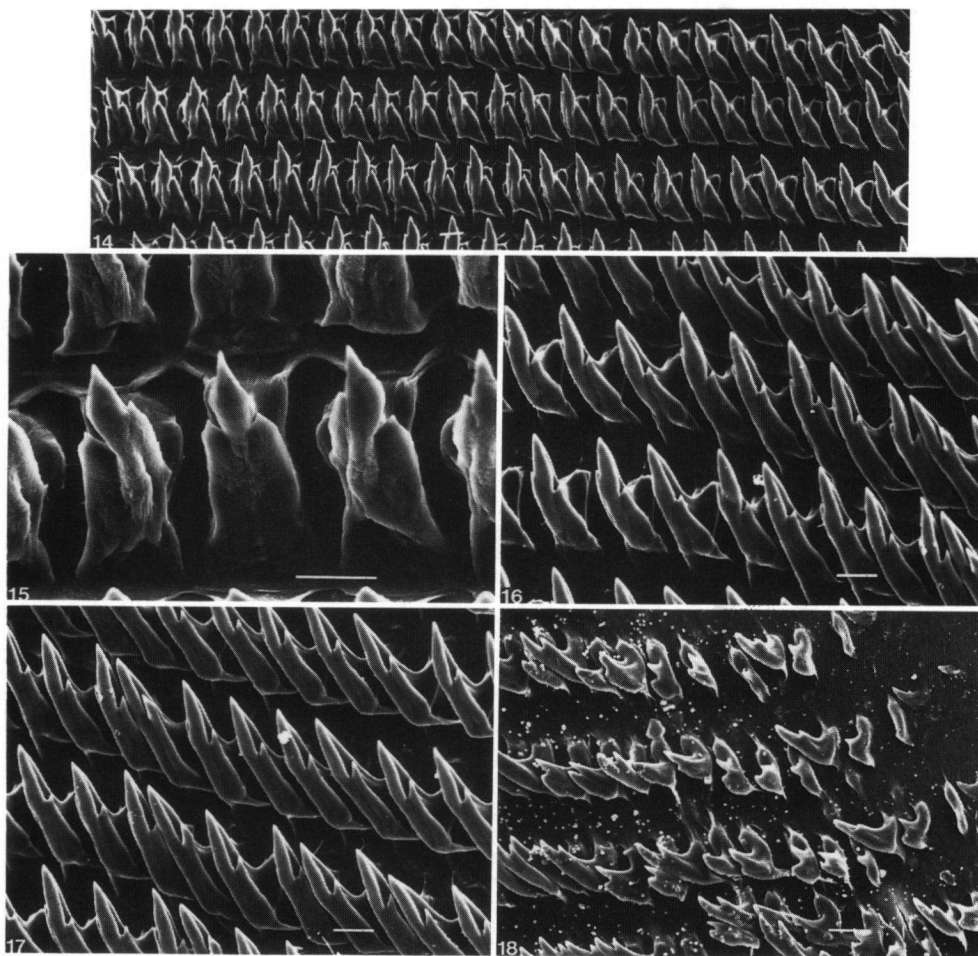


Figs. 12-13. *Verrucarion demeryi* n. sp. 12, internal organization of atrium and penis of holotype; 13, jaw of paratype. Abbreviations: r, rolls of tissue in atrium; others as in fig. 10.

is closer to the entrance of the vas deferens, and lacks the slender part of the free oviduct above the uterus. Moreover, *V. columellaris* has about half the size of *V. demeryi*. *V. camerunensis* has, among others, a different penial papilla, a more slender penial caecum, and lacks the conspicuous muscles. In all other known *Verrucarion* species the vagina is shorter. Only the Zaïrean species *V. ituriensis* Van Mol, 1970, and *V. kivuensis* Van Mol, 1970, have similar muscles on the vagina, but otherwise seem to have little in common with *V. demeryi*.

In view of differences in the shape and number of radular teeth (Connolly, 1928: 535, fig. 3), the species reported by Connolly as *Granularion spatiosus* (Preston, 1914) from Sierra Leone is not likely to be conspecific with the species here described.

Van Mol (1970: 66) considers *Verrucarion* a rather heterogeneous assemblage of species. The species described here may bridge the morphological gap between the



Figs. 14-18. Radula of paratype of *Verrucarion demeryi* n. sp. 14, central tooth and about 20 laterals; 15, central tooth and first laterals; 16, lateromarginals, scale cuts through 26th tooth; 17, lateromarginals, scale cuts through 36th tooth; 18, outermost teeth. All scales 10  $\mu$ m.

three Cameroon species, which generally have a rather long vagina like in *V. demeryi*, and the three species from Zaïre, which all have a shorter vagina. Two species of the latter group share the vaginal muscles with *V. demeryi*, a feature apparently unknown in other genera of urocyclid semi-slugs (cf. Van Mol, 1970). Therefore, *Verrucarion* seems to be no more heterogeneous than a number of other genera recognized by that author.

**Distribution.** — According to Van Mol (1970: 66) *Verrucarion* is a rather rare genus, restricted to the rain forest belt from Cameroon to Kivu. The new species considerably enlarges the range of the genus to the forest area west of the so-called "Dahomey Gap". Recently Van Bruggen (in press) noticed, that no genera of urocyclid semi-

slugs (not including *Gymnariion*) are known to occur on both sides of this gap. *Verrucarion* is a first example of a genus in this group distributed all over the African rain forest belt.

Acknowledgements. — Drs. A.C. van Bruggen and E. Gittenberger kindly read a draft of the manuscript; K. Krom (RMNH) took the SEM photographs.

#### REFERENCES

- BRUGGEN, A.C. VAN, in press. The Dahomey Gap as evidenced by land molluscs, a preliminary report resulting from a reconnaissance of the literature. — Proceedings Ninth International Malacological Congress Edinburgh, 1986.
- CONNOLLY, M., 1928. The non-marine Mollusca of Sierra Leone. — Ann. Mag. Nat. Hist (10) 1: 529-551.
- GIJZEN, A., 1938. 'S Rijksmuseum van Natuurlijke Historie 1820-1915: 1-335. Rotterdam.
- MOL, J.J. VAN, 1970. Révision des Urocyclidae (Mollusca, Gastropoda, Pulmonata). Anatomie-Systématique-Zoogéographie, première partie. — Ann. Mus. r. Afr. Centr., Tervuren (8°), Sci. Zool. 180: 1-234.