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Notes on the genus Maizaniella (Gastropoda, Prosobranchia: Maizaniidae), with the description of a new species from West Africa

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As a consequence of the discovery of new material from Zaïre, the (sibling) taxa *Maizaniella* (*Spirulozania*) *lilliputiana* and *M.* (*S.*) *lukolelensis* are redefined. *M.* (*S.*) *hiemalis* n. sp. is described from Mt. Nimba, West Africa. A new key to all nine species in *Maizaniella* is provided.

Key words: Gastropoda, Prosobranchia, Maizaniidae, *Maizaniella*, taxonomy, West Africa, Zaïre.

INTRODUCTION

In the period December 1989-January 1990, Mr. A.J. de Winter (Wageningen) spent some time as a research associate in the malacology department of the Muséum National d'Histoire Naturelle in Paris. He discovered some interesting shell material of the genus *Maizaniella* Bequaert & Clench, 1936 (family Maizaniidae), which he passed on to the present author for evaluation. The sum total of the knowledge of this Afrotropical genus was summarized by Van Bruggen (1982), who recognized four subgenera with an aggregate of eight species. Unfortunately, no anatomical data were available at that time, a state of affairs which cannot be remedied yet. Two samples belonging to the Paris museum materially adding to the knowledge of the genus, are discussed below. The authorities of the museum kindly permitted duplicates to be retained for the Rijksmuseum van Natuurlijke Historie, Leiden.

Abbreviations used are 1/d for the ratio length/major diameter as an indication of the shape of the shell (here calculated from micrometer readings, so that the figures calculated from the measurements in mm will not always agree), MNHNP for Muséum National d'Histoire Naturelle, Paris, R for the number of major ribs on the body whorl of the shell (Van Bruggen, 1982: 180), Rfvbw for the number of major ribs observed on the body whorl in front view (Van Bruggen, 1982: 187), and RMNH for Rijksmuseum van Natuurlijke Historie, Leiden.

THE STATUS OF MAIZANIELLA LILLIPUTIANA AND M. LUKOLELENSIS

A sample of seven shells, glued on to a narrow strip of blue paper, bears the following data (original label) "Maizania (s.s.) lukolensis/Epoque actuelle/Bozene, Belgian Congo." It appears to have been obtained from the famous collector J.L. Staadt, as shown by another label "Coll. Staadt 1969". The specimens were carefully removed from the strip of paper, so that they could be studied in detail.

The measurements may be summarized as follows (see table 1): 2.0-3.1 × 2.7-4.2 mm, 1/d 0.69-0.77, R = 22-28, Rfvbw = 10-12, 3-3 1/4 whorls, aperture 1.2-1.9 ×

height × maj.diam.	l/d	R	Rfvbw	whorls	aperture height × maj.diam.
2.0 × 2.7 mm	0.74	26	10	3	1.2 × 1.3 mm
2.2 × 3.2 mm	0.69	23	11	3	1.3 × 1.3 mm
2.5 × 3.2 mm	0.77	22	10	apex dam.	1.5 × 1.5 mm
2.6 × 3.4 mm	0.77	22	10	3¼	1.7 × 1.6 mm
2.6 × 3.6 mm	0.72	24	11	3+	1.7 × 1.6 mm
3.0 × 4.0 mm	0.75	28	12	3¼	1.7 × 1.7 mm
3.1 × 4.2 mm	0.74	23	10	3¼	1.9 × 1.9 mm

Table 1. Measurements of shells of additional *Maizaniella* (*Spirulozania*) material from Bozene, Zaïre (MNHNP, RMNH). The third specimen from the top has a damaged apex, so that the whorls cannot be counted.

1.3-1.9 mm. It is obvious that the top three specimens in table 1 are juveniles, with a major diameter of 3.2 mm or less and 3 whorls only. The four remaining shells are most likely to be adult, and their measurements may be summarized as 2.6-3.1 × 3.4-4.2 mm, l/d 0.72-0.77, R = 22-28, Rfvbw = 10-12, 3 + -3 1/4 whorls, aperture 1.7-1.9 × 1.6-1.9 mm.

In running down the key in Van Bruggen (1982: 182-183), it transpires that the material under review belongs to the subgenus *Spirulozania* Van Bruggen, 1982. However, something goes wrong when the final item, no. 7, is reached, where *Maizaniella lilliputiana* (Morelet, 1873) and *M. lukolelensis* (Bequaert & Clench, 1936) are separated. These obviously closely allied species are distinguished by their R values combined with shell height and major diameter.

Table 2 serves to compare the numerical data of the two taxa involved and the new specimens (MNHNP material). The second column refers to material of *M. lilliputiana* from Bozene, the very locality from which the Paris museum specimens derive. If the shells represent two different taxa, then they might show character displacement where they occur together. The data of table 2 lead to the following conclusions.

— (a) Height of the shell. Although there is a neat separation between the two taxa involved, the new material covers the range of both; the average values do not assist either.

— (b) Major diameter of the shell. This shows more or less the same picture.

— (c) l/d. This, again, shows more or less the same picture, apart from the fact that the range of variation of *M. lilliputiana* covers that of all categories completely. Attention should be drawn to the fact that so far the new material matches that of *M. lilliputiana* from Bozen perfectly.

— (d) R values. Here again we see that there is a noticeable separation between the two taxa in question, but that the MNHNP material links these two beautifully, with the proviso that the Paris museum specimens are almost wholly within the range of *M. lilliputiana.*

— (e) Rfvbw values. This is one of the most characteristic differences between the two taxa involved and, indeed, there is a clear separation here. The new material agrees with *M. lukolelensis* in this respect.

Summarizing, table 2 does not assist us in assessing the taxonomic position of the Paris museum material with any confidence. Only one of the five characters considered supplies a clear-cut distinction, i.e. the number of major ribs in front view.

	M. lilliputiana n = 5	*M. lilliputiana* Bozene shells n = 3	*M. lukolelensis* n = 2	MNHNP n = 4
height	2.5-2.9 (2.7) mm	2.8-2.9 (2.8) mm	2.9-3.1 (3.0) mm	2.6-3.4 (2.8) mm
major diameter	3.2-3.9 (3.7) mm	3.8-3.9 (3.8) mm	3.7-4.1 (3.9) mm	3.4-4.2 (3.8) mm
l/d	0.68-0.78 (0.74)	0.73-0.75 (0.74)	0.76-0.77 (0.76)	0.72-0.77 (0.74)
R	25-30 (28)	25-28 (26)	19-22 (20)	22-28 (24)
Rfvbw	>12	>12	10	10-12 (11)

Table 2. Measurements of shells of *Maizaniella* (*Spirulozania*) *lilliputiana*, *M.* (*S.*) *lukolelensis*, and of the MNHNP sample; average values between brackets. The three Bozene shells of *M. lilliputiana* are shown separately in the second column; their data are included in those of the first column.

This character, indeed, allows us to unequivocally separate Bozene material. This also makes one hesitate to synonymize the two nominal taxa. After all, these conclusions have been based on very little material (a total of 11 shells). Also, there is an additional character separating *M. lilliputiana* and *M. lukolelensis*. As shown by figs. 4, 9, 14, and 5, 10, 15 respectively in Van Bruggen (1982), the latter taxon clearly has much more prominent major ribs than the former. Of course, only the holotypes of both taxa are shown, but it seems to be a character that is consistent. In view of the fact that the major ribs appear to be the main diagnostic feature in this group, the material from Bozene in the Paris museum is provisionally labelled *M. lukolelensis*. It is hard to judge in how far there is a bias towards this taxon; the fact is that the specimens were submitted s.n. *Maizania lukolensis* (sic). The key to the species has to be emended accordingly; this will be effected at the end of the present paper, because of the inclusion of the new species described below.

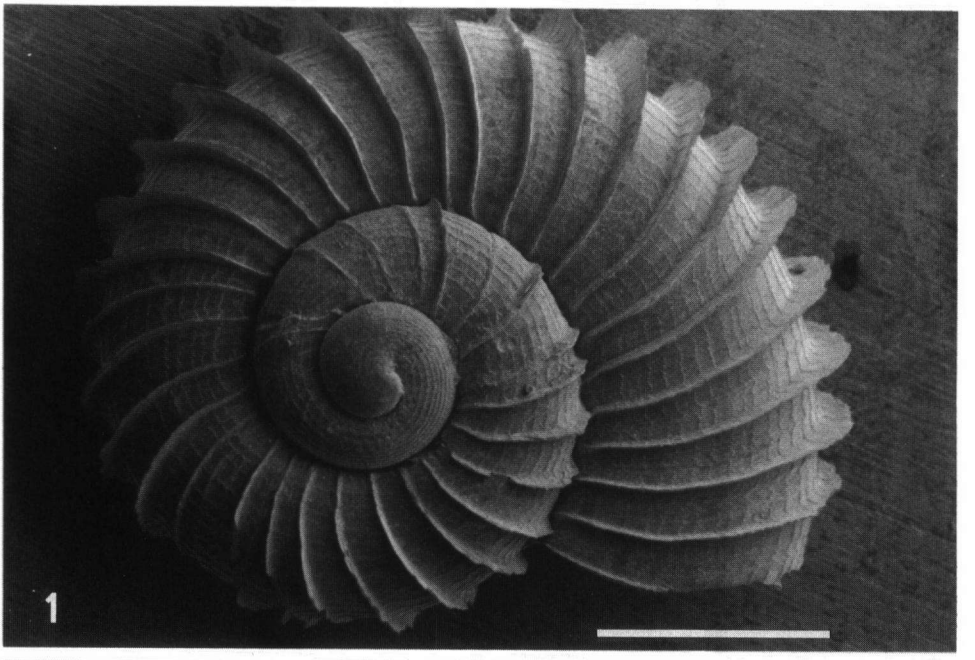
It is not unlikely that the two above taxa have to be considered sibling species. Evident, but minor and so far consistent, differences militate against synonymy. Two warnings have to be sounded here. First, specimens should be carefully examined in order to establish whether the major ribs are not worn, which may be the case in poorly preserved specimens. Secondly, we know nothing about the autecology of the taxa under discussion. Do they occupy the same microhabitat? After all, the labels simply read 'Bozene' without further details.

A NEW SPECIES FROM WEST AFRICA[1]

Maizaniella (Spirulozania) hiemalis nov. spec.
(figs. 1-5)

Diagnosis. — A small, depressed species with distant flange-like and slightly undulating costulae and spiral sculpture; this species has a medium number of costulae per surface unit.

[1] It is perhaps appropriate to draw attention to an important addition to the scanty literature on the limited number of Afrotropical terrestrial prosobranchs. Adam (1987) has added two more species, viz. *Cyathopoma straeleni* and *Maizania* (*Micromaizania*) *kazibae*, both from the Upemba National Park in southern Zaïre.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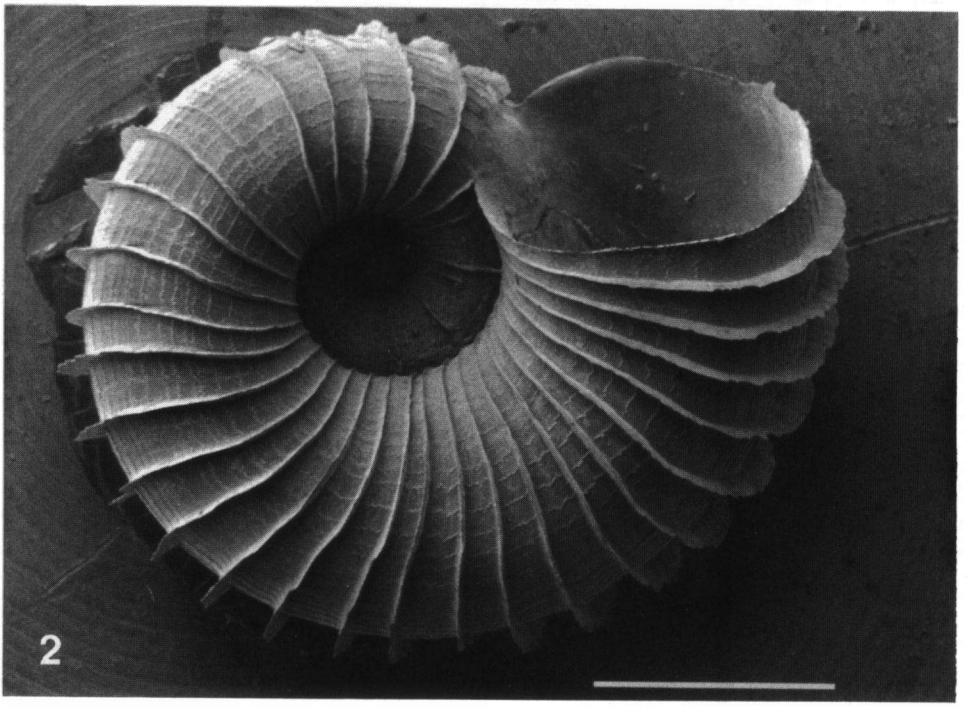
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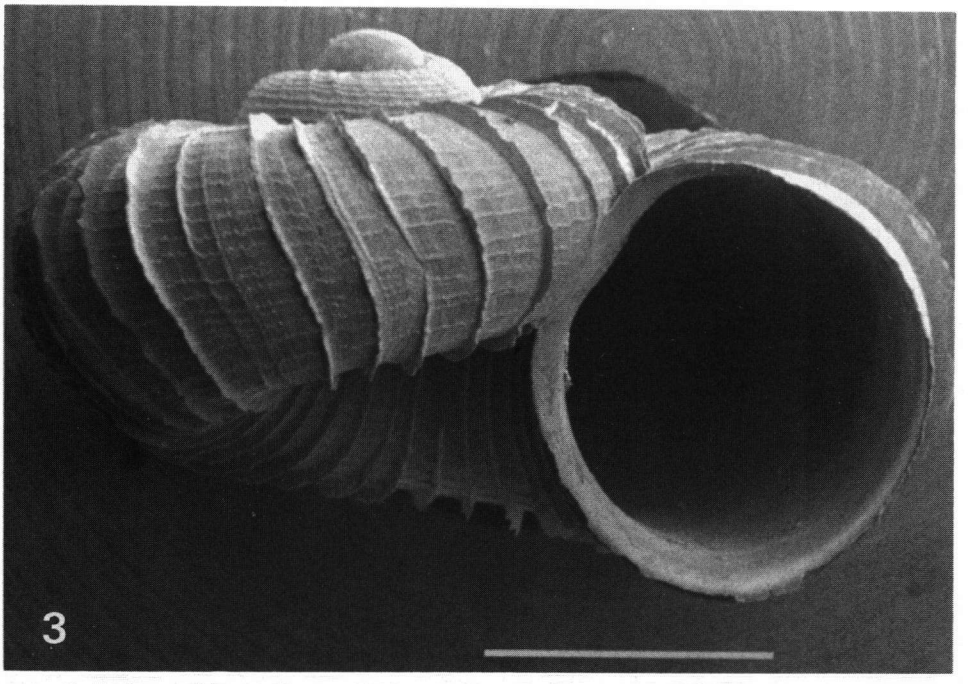
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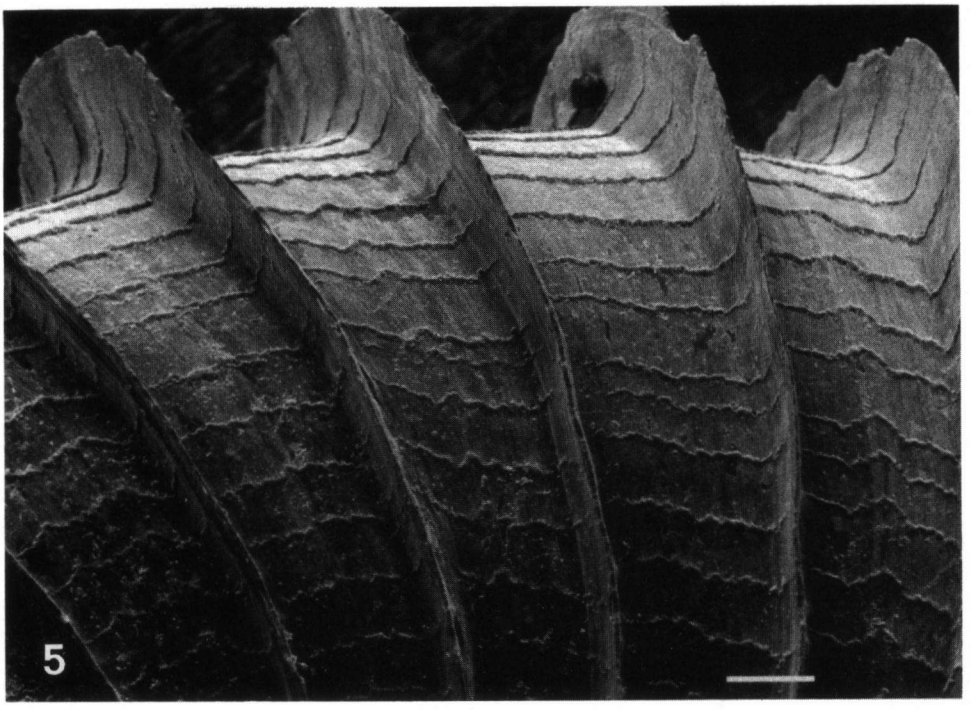

Figs. 1-5. *Maizaniella* (*Spirulozania*) *hiemalis* n. sp., holotype, Mt. Nimba, MNHN. Scales figs. 1-3: 1 mm 4-5: 100 μm. S.E.M. photographs J. Goud (RMNH).

Description. — Shell (figs. 1-5) small, corneous, depressed turbinate, wider than high, umbilicate, with slightly produced spire with blunt, mamillate apex, thin but fairly solid, transparent when fresh. Whorls 3-3 1/4, convex, separated by narrow, impressed sutures; apical whorls fairly prominent and somewhat inflated, remainder rapidly increasing in size. Body whorl comparatively large, almost circular in cross section. Aperture large and circular, peristome simple and acute, without reflection, practically free with only a fairly limited area in the upper left touching the body whorl, labrum nearly straight and somewhat receding in profile. Umbilicus wide and deep, revealing all whorls right up to the apex, very slightly overhung by the aperture. Whorls covered with thin, corneous, deciduous periostracum; initial part of shell (apex) smooth or weakly pitted, thereafter c. one whorl finely spirally engraved, remaining whorls with prominent and distant, flange-like raised costulae; interstices much wider than costulae, covered with very fine growth striae or secondary riblets and spiral sculpture, in such a manner that the spiral component is always the most prominent element, so that the pattern is hardly ever reticulate.

Operculum fairly small, permitting deep withdrawal into the shell, circular, thin and corneous, half transparent, concentric and flattish, with between four and five whorls (exact number cannot be established because no isolated opercula could be studied).

height × maj.diam.	l/d	R	Rfvbw	whorls	aperture height × maj.diam.
2.2 × 3.2 mm	0.67	30	12	3+	1.5 × 1.5 mm
*2.1 × 3.4 mm	0.63	30	13	3+	1.4 × 1.5 mm
2.4 × 3.6 mm	0.68	30	15	3¼	1.4 × 1.5 mm
2.5 × 3.7 mm	0.67	36	c.14	3¼	aperture damaged

Table 3. Measurements of the shells of the type series of *Maizaniella* (*Spirulozania*) *hiemalis* n. sp.; the holotype has been indicated by an *.

Measurements of shell: 2.1-2.5 × 3.2-3.7 mm, l/d 0.63-0.68, aperture 1.4-1.5 × 1.5 mm, R = 30-36, Rfvbw = 12-15 (for individual measurements see table 3).

Distribution. — Guinea, Mt. Nimba complex.

Material examined. — Guinea, Mt. Nimba complex, "Mt. Nimba N.E. 780-900 m. Tamisage A. Villiers 1/20 IX 46" (holotype, figs. 1-5, MNHNP; 2 paratypes, MNHNP; 1 paratype, RMNH 56403).

Derivatio nominis. — The new species has been named after Mr. A.J. de Winter of the Landbouwuniversiteit (agricultural university), Wageningen, as a token of appreciation for his work on African land molluscs; *hiemalis*, Latin = of the winter, as an adjective.

The new species agrees with *Maizaniella* (*Spirulozania*) *chapini* Van Bruggen, 1982, in its R values (30-36 and 31-36 respectively). However, the shells are easily differentiated by the new species having smaller and more depressed shells with somewhat more pronounced ribs. In addition, *M. hiemalis* and *M. chapini* (both so far only known from their respective type localities, that of the latter in eastern Zaïre) are significantly allopatric in their distribution.

The shells of *M. hiemalis* show some resemblance to those of *M. lilliputiana* and *M. lukolelensis*, two Central African taxa which are seemingly closely related to each other (see above). In fact, the new species may represent a vicariant taxon of this group beyond (= west of) the Dahomey Gap (see Van Bruggen, 1989), as shown by its distribution (Van Bruggen, 1982: 202, fig. 30). *M. hiemalis* may be distinguished from *M. lilliputiana* by its higher R values (30-36 and 25-30 respectively), by a more depressed shell (l/d 0.63-0.68 and 0.68-0.78 respectively), and more pronounced major ribs.

As compared to *M. lukolelensis*, the new species shows similar differences: R = 19-28 and 30-36, l/d 0.72-0.77 and 0.63-0.68 respectively. In addition, the shells of *M. hiemalis* are smaller than those of *M. lukolelensis* (2.1-2.5 × 3.2-3.7 mm and 2.6-3.4 × 3.4-4.2 mm respectively), and have higher Rfvbw values (12-15 and 10-12 respectively).

Locally *M. hiemalis* is easily recognized because *M.* (*S.*) *erroris* Van Bruggen, 1982, is the only representative of the subgenus *Spirulozania* west of the Dahomey Gap. *M. erroris* is characterized by the largest shell in the subgenus and by R values of between 40 and 77, which sets it widely apart from the new species.

French scientists have devoted a lot of attention to the Mt. Nimba complex on the borders of Guinea, Ivory Coast and Liberia. Most of their papers have been published in series emanating from the Institut Français de l'Afrique Noire, now the Institut Fondamental de l'Afrique Noire. However, so far there is only one paper available

on the non-marine molluscs (Binder, 1963), which does not make any mention of terrestrial prosobranchs. Some additional pulmonate records may be found in Forcart (1953), Van Mol (1970), Binder (1976), and Van Goethem (1977). This all adds up to c. 40 species, of which some six may be endemic to the area. It is a moot point whether *M. hiemalis* belongs to this particular assemblage.

The type locality is, unfortunately, somewhat vague and cannot be traced with confidence. On the other hand, the species would be expected to have a wide local distribution in suitable types of habitat. For details on the vegetation and flora of the Mt. Nimba complex refer to Schnell (1952); obviously there are various types of forest between 780 and 900 m above sea level. The specimens of *M. hiemalis* were collected by sieving the leaf litter on the forest floor ('tamisage').

A NEW KEY TO THE SPECIES OF MAIZANIELLA

The redefinition of *Maizaniella* (*Spirulozania*) *lilliputiana* and *M.* (*S.*) *lukolelensis* in addition to the discovery of a new species, necessitates a revision of the key (Van Bruggen, 1982: 182-183). For the delimitation of *Maizaniella* against the other genera in the family Maizaniidae, the student is referred to Van Bruggen, 1985 (key on pp. 359-360).

For a discussion of the various shell characters in the genus, the reader should consult Van Bruggen (1982: 180-181). The main feature is the axial sculpture; this, combined with size and shape (i.e. 1/d), more or less defines the species. Although so far only limited material has been studied, it would appear that the range of variation of these characters sometimes is considerable. As regards the following key, potential users should take care to use it only to identify samples containing fully adult shells; subadult and juvenile shells cannot be named unless accompanied by full-grown specimens. Singletons should also be approached with due caution. Geographical data have only been added for convenience's sake.

1 a Shell comparatively large (major diameter from 10 to 12 mm), depressed, with very large number of ribs (R = c. 75-c. 100), which are close together; Cameroon — subgenus *Macromaizaniella* Van Bruggen, 1982, only species *M. preussi* (Von Martens, 1892).
  b Shell small (major diameter from less than 3 to c. 7 mm), depressed to turbinate, with more limited number of ribs (R = 7-77), which are normally fairly widely distant (interstices always much wider than ribs) 2
2 a Shell without traces of spiral sculpture, smallish (major diameter 5.5-6.7 mm), R = c. 23-43; Sierra Leone — subgenus *Maizaniella* s.s., only species *M. leonensis* (Morelet, 1873).
  b Shell with at least traces of spiral sculpture, small (major diameter always under c. 5 mm), R = 7-77 3
3 a Shell with few and irregular flange-like major ribs, R = 7-12, turbinate globose (1/d 0.78-0.87), small (major diameter 2.9-3.2 mm); Fernando Po — subgenus *Pteromaizaniella* Van Bruggen, 1982, only species *M. poensis* Van Bruggen, 1982.
  b Shell with many more ribs, R = 19-77, depressed turbinate (1/d 0.60-0.78), slightly larger (major diameter 3.2-4.9 mm) — subgenus *Spirulozania* Van Bruggen, 1982 4

4 a R = c. 40 or more, shell small (major diameter 3.6-4.9 mm) 5
b R = at the very most 40, but usually less, shell slightly smaller (major diameter 3.2-4.2 mm) 6
5 a R = c. 40-77, but usually 50 or more, shell 2.5-3.4 × 3.9-4.9 mm; ?Sierra Leone, Liberia, ?Zaïre ..... *M. erroris* Van Bruggen, 1982
b R = 43-49, shell 2.4-3.1 × 3.6-4.4 mm; Angola ..... *M. machadoi* Van Bruggen, 1982
6 a R = 30-36, maximum dimensions of shell 2.9 × 3.9 mm; Central and West Africa, westward beyond the Dahomey Gap 7
b R = 30 or less, maximum dimensions of shell 3.1 × 4.2 mm; Central and (eastern) West Africa, not beyond the Dahomey Gap 8
7 a Shell smaller (2.1-2.5 × 3.2-3.7 mm), more depressed (l/d 0.63-0.68); West Africa west of the Dahomey Gap ..... *M. hiemalis* n. sp.
b Shell larger (2.6-2.9 × 3.4-3.9 mm), less depressed (l/d 0.72-0.78); Zaïre ..... *M. chapini* Van Bruggen, 1982
8 a R = 25-30, Rfvbw more than 12, ribs fairly pronounced, shell smaller (2.5-2.9 × 3.2-3.9 mm), somewhat depressed (l/d 0.68-0.78); Gabon, Zaïre ..... *M. lilliputiana* (Morelet, 1873)
b R = 19-28, Rfvbw = 10-12, ribs noticeably pronounced, shell larger (2.6-3.1 × 3.4-4.2 mm), slightly less depressed (l/d 0.72-0.77); Zaïre ..... *M. lukolelensis* (Bequaert & Clench, 1936)

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