

New taxa of *Pseudoglessula* O. BOETTGER
from East Africa and an annotated synopsis
of the East African species

(Mollusca, Stenogyridae).

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With 39 figures.

The taxa described below have been compared with material in many European museums and nothing resembling them could be found. A review of all the species described from Africa failed to reveal any description which fitted any of them. This is, however, scarcely surprising since all were obtained in areas where few if any molluscs have previously been collected.

Pseudoglessula mahariensis n. sp.

Fig. 1, 2, 3.

Shell elongate, narrowly ovate-conic, rather solid, yellowish horn-coloured, more or less mat in adults but glossy in immature specimens, imperforate or with a narrow deep umbilicus in some small shells. Spire with sides straight or very slightly concave towards the apex; apex obtuse. Whorls 8.5, slightly convex, regularly increasing, rather strongly ribbed. The first two whorls have 7-8 ribs per mm., not so marked as those on the third whorl save in young unworn shells; 3rd. and 4th. whorls with 8 very distinct ribs, 5th. with 6 clear ribs, 6th. with 5 clear ribs and 7th. and 8th. with 4-5 less clear ribs all per mm. respectively. In immature shells the base of the body whorl is smooth. There is no spiral element in the sculpture. Aperture elliptic-pyriform, white inside; outer lip thick, reflected. Columella straight above, curved below with a slight to quite strong fold, the curve giving a spout-like appearance to the left hand side of the aperture. The columella cannot be described as truncate but slopes to the left in the type; in some shorter specimens the columella is subtruncate and reflected over the narrow deep umbilicus.

Dimensions of holotype: length 33 mm., breadth 12 mm., aperture, height 13.1 mm., breadth 6.5 mm.; other specimens vary from 25.5-29.0 mm. in length, 11.0-11.5 mm. in breadth and aperture 10.8-11.0 mm. in height and 6.7 mm. in breadth. Even the shorter specimens have 8-8.5 whorls.

Locality Tanganyika. Western Province, Mahari Peninsula, all the material cited below is from this general locality and was collected by members of the Second Oxford University Tanganyika Expedition. Kungwe Mountain, south ridge on second

last saddle, soil of 'elfin forest' (dwarfed trees with long *Usnea*), 8,000 ft., 11 Sept., 1959, D. H. ECCLES (holotype SMF 183452) (paratypes in British Museum (Nat. Hist.) and Coryndon Museum, Nairobi) and same ridge, under stones on sharp ridge in elfin forest, 7,800 ft., 11 Sept., 1959, J. A. COOKE (Coryndon Museum). Kungwe Camp II, forest floor, 5,900 ft., 12 Sept., 1959, J. A. COOKE (Coryndon Museum). Salimagulu, under stones, 8 Sept., 1959, no collector given, very worn (Coryndon Museum). About 3 miles south of Mgambo, under stones on stony ridge, 3,600 ft., 6 Oct., 1959, D. H. ECCLES (Coryndon Museum). Kasicha River, under dead logs, 3,450 ft., 20 July, 1959, J. A. COOKE 38 (Coryndon Museum).

P. mahariensis is undoubtedly closely related to *P. ptychaxis* (SMITH), the type of which was collected at Ujiji by the Rev. E. C. HORE. I examined this in the British Museum (Nat. Hist.) and it differs from the new species in its less solid shell, much finer apex, shorter form with more convex sides to the spire and the more open umbilicus. The sculpture is similar in the two species but the riblets are rather closer in *ptychaxis*; in both species a fold crosses the columella but the holotype of *ptychaxis* has the columella straighter; it may not, however, be quite adult.

Through the kind cooperation of Dr. R. KILIAS of the Zoological Museum in Berlin I have been able to compare the new species with types or paratypes of three of THIELE's species which sounded from their descriptions as if they might have been closely similar. *P. obtusata* THIELE (Rugegewald, 1800 m., SCHUBOTZ) has a much wider blunter apex, a thinner shell and a glossier periostracum; *P. intermedia* THIELE (Kwidschi Island, GRAUER) has a slightly broader apex, a greenish-brown, not brown, thinner shell with the spire not at all concave and the two apical whorls with stronger ribs which are quite twice as far apart as they are in *P. mahariensis*; *P. elatior* THIELE (Kwidschi Island, GRAUER) has very similar sculpture to *P. mahariensis* and is closely related but it is more olive-green in colour and shinier than the Kungwe species and the aperture is not spout-like on the left hand side. (Figs. 8, 9, 10).

One specimen of *P. mahariensis* had been preserved in spirit but had not been previously drowned and was found to be useless for dissection. A small juvenile in spirit from Salimagulu was destroyed in order to prepare a radula slide. The radula was found to be quite typical of the genus and had the formula 11.9.C.9.11-13.

***Pseudoglessula acutissima* n. sp.**

Figs. 4, 5.

Shell rather broadly subulniform, rather thin, horn-coloured with a faint sheen, very narrowly rimate. Spire with more or less straight sides, apex very acutely pointed; under a very strong magnification it may be seen that the actual apex is involute and the side of the first whorl flattened or slightly concave. Whorls 7.5, slightly convex, regularly increasing; the first strongly, distantly costate, next 1.5 whorls strongly costate (about 5 per mm.); rest of whorls closely ribbed (7-10 per mm.) the lowest two whorls with the ribs much more obscure than is the case of the middle three whorls which have the ribs rather clear cut; there is no spiral sculpture; suture simple, moderately impressed, at the extreme apex forming a smooth narrow area bordering the involution. Aperture elliptic-pyriform, outer lip thin, receding slightly to the

base. Columella straight with an oblique fold two thirds of the way down giving a subtruncate appearance, margin slightly overhanging the very narrow umbilical slit.

Dimensions: length 15.1 mm., breadth 5.5 mm., aperture, height 5.2 mm., breadth 2.8 mm.

Locality: Tanganyika. West Usambaras. Shume, 1955, B. VERDCOURT (holotype SMF 183453, paratypes SMF 183454/4 and Coryndon Museum) and same area, Sungwe, near Shume, 1950, M. GANE (in the collection of the late L.A.W.C. VENMANS now in the Zoological Museum, Amsterdam).

Eleven specimens of this species were obtained by me, mostly rather poor worn shells but the species is well characterised. At a first glance it appears to be closely allied to *P. conradti* (MARTENS) which is common in the Usambaras, but it differs in its much sharper apex and in the subtruncate columella. It is equally similar to *P. introversa* (SMITH) but that has a broader shell with a much blunter apex which is more obviously involute and also a narrow umbilicus instead of a mere slit. (Fig. 11, 12).

***Pseudoglessula uniplicata* (SMITH).**

1890 *Bulimus* (*Cerastus*?) *uniplicatus* SMITH, Ann. Mag. nat. Hist., (6) 6: 135, pl. 5 fig. 10.

***uniplicata occidentalis* n. subsp.**

Figs. 6, 7

Shell ovoid-conic, brown, widely perforate; spire with straight sides, apex obtuse. Whorls 6.5, quite markedly convex, regularly increasing, strongly, crisply ribbed. The sculpture is fairly uniform over the shell and the ribs are well spaced, varying from 4 per mm. on the body whorl to 8 per mm. on the 3rd. whorl; the apical whorls are not well preserved but the ribs are spaced similarly to those on the 3rd. and 4th. whorls. There is a very faint pattern of diagonal lines visible at higher powers. Aperture oval, rather short, outer lip sharp in the specimens available, columella curved, well reflected over the deep umbilicus; no fold nor trace of truncation present. There is a spiral raised line continuing across the body whorl from the top of the aperture.

Dimensions of the holotypus: length 13.5 mm., breadth 6.7 mm., aperture, height 5 mm., breadth 3.5 mm. The paratype is 7.5 mm. broad.

Locality Tanganyika. Western Province. Buha District, Kasakela Reserve, 16 miles north of Kigoma, 20, Nov., 1962, B. VERDCOURT (holotype SMF 183455, paratype SMF 183456).

This new race differs from the nominate race in having a wider umbilicus and no fold at all on the columella. It must also be close to *P. bessei* (BOETGER) but that is more slender according to the description (12.3-14.3 × 5.5-5.9 mm.); I have not seen any material. All three belong to the group typified by *P. stublmanni* (MARTENS) which is a much smaller species. The shells in this group tend to be rather dark and are clearly ribbed with crisp widely spaced costae and covered with a fine microscopic diagonal pattern. Other species known from West Africa and Angola belong to this group which is an ancient forest element.

No revision of the genus has appeared since PILSBRY (1905) reviewed the species in the Manual of Conchology but at that time many others although described were not mentioned because they were masquerading in the Enidae. Many species have of course also been described during the time which has elapsed. Comparisons with material in collections or wading through descriptions is the only method of naming at present available. The following synopsis is a guide to help cut down the work of comparison so far as the East African species are concerned. I suspect several species I have retained will eventually have to be sunk. This account is based on material in the Coryndon Museum, Nairobi and I also acknowledge the courtesy of the curators of the collections preserved in the British Museum (Nat. Hist.) and the Zoological Museum, Berlin in allowing me to examine their material of the genus. Some species I have had to add from the information given in their descriptions alone.

Key to the species of *Pseudoglessula* known from East Africa:

1. Shell very narrow, 3.0-4-times as long as broad (*Ischnoglessula* PILSBRY) 2
 — Shell broader 7
2. Shell corneous or yellowish, 8.8-22.1 × 2.4-5.4 mm. 3
 — Shell much darker and not so slender 5
3. Shell 22.1 × 5.4 mm.; a slight keel on the body whorl; ribs close and regular, rather closer on the first whorl and obsolete on the base of the body whorl
perobtusata CONNOLLY.
 (May occur in Uganda.)
- Shell smaller 4
4. Shell 9.5-14.6 × 2.5-2.7 mm.; a spiral thread around the middle of the body whorl
gracillima PILSBRY.
 (Uganda: Bwamba Forest; Entebbe¹) (fig. 15).
- Shell 8.8-9.2 × 2.4-2.8 mm.; transverse ribs crossed by traces of spiral sculpture, no thread seen in type
pitmani CONNOLLY.
 (Uganda: Entebbe).
5. Shell glossy, dark olive with some brown streaks, 9-10.5 × 3 mm.; ribs rather widely spaced, some 14 visible on the body whorl from above . . .
elegans (MARTENS) [= *subfuscidula* PILSBRY²].
 (W. Uganda. Kenya: Kakamega Forest) (fig. 13).
- Shell dull due to a fine decussate sculpture between the ribs; ribs closer together, 20-30 visible 6
6. Shell clay-coloured with broad lighter and darker streaks, 9.5-10.3 × 3.2-3.3 mm.; ribs 7-8 per mm. on the last whorl
cruda PILSBRY.
 (Uganda: Entebbe) (fig. 14).
- Shell brown, 7.9-10 × 2.7-3.5 mm.; ribs 4-5 per mm. on the last whorl
mutandana CONNOLLY [= *mutabilis* CONNOLLY³].
 (SW. Uganda. Kenya: Mara River; Kakamega Forest).

¹) The Entebbe shells need comparison with *P. lemairei* DAUTZENBERG & GERMAIN.

²) This synonymy is based on the examination of type material in the Berlin Zoological Museum and the British Museum (Nat. Hist.).

³) I agree with Dr. W. ADAM's annotation to this effect on the type material in the British Museum (Nat. Hist.) but would suggest that *P. mutandana* is only a form of *P. cruda*.

- 7 Columella very clearly truncate or with a distinct fold which gives a subtruncate appearance 8
- Columella smoothly rounded into the basal margin of the aperture or with only a trace of truncation; or shell subtruncate only when juvenile but almost rounded in the adult shell with only an indistinct angle between the columella and the basal margin (*Kempioconcha* PRESTON and *Pseudocerastus* GERMAIN) 22
8. Shell with clear spiral bands of darker colour; columella clearly truncate 9
- Shell unicolorous, not banded 10
9. Shell yellow-brown with dark bands; 7.5 whorls, 24.5-30.5×11.5-13.5 mm.
leroyi fasciata CONNOLLY [= *fasciata* CONNOLLY = *kirkii* (CRAVEN) non (DOHRN)]
(Tanganyika: Usambaras) (fig. 16).
- Shell reddish-chestnut or wine-coloured with pale olivaceous bands; 9 whorls, 29-40×13.5-16 mm.
leroyi leroyi (BOURGUIGNAT).
(Tanganyika: Usambaras; Ngurus) (fig. 17, 22).
10. Shell very large about 40×16 mm.; columella clearly truncate *leroyi leroyi*.
(see above). 11
- Shell much smaller 11
11. Shell 32-34×12-13 mm., rather dark brown, fairly glossy; apical two whorls carinate, with widely spaced transverse ribs; rest of the shell covered with strong ribs of about the same spacing; last whorl carinate. sp. near *calabarica* (PFEIFFER).
(Two specimens in BM labelled SW. Uganda in CONNOLLY's handwriting⁴).
- Shell with apical whorls not carinate 12
12. Shell pale to dark brown with bluish aperture, 28-30×13 mm., columella clearly truncate
prestoni SMITH.
(Tanganyika: W. Usambaras; Ulugurus; Ukami).
- Shell smaller or if as long columella not clearly truncate but merely with a fold or if as long and columella truncate then shell narrower and apex finer . . . 13
13. Columella clearly truncate 14
- Columella with a fold 17
14. Shell deep olive-brown⁵), 25-28×11-11.5 mm. *gracilior* SMITH.
(Tanganyika: W. Usambaras, Mkusi; Ulugurus, Bunduki; Ukami) (figs. 18, 20).
- Shell smaller 15
15. Shell 21-21.5×9.5-10 mm.
gracilior var.
(Tanganyika: Ukaguru Mts.; J. BOND) (fig. 19).
- Shell under 20 mm. tall 16
16. Shell olive-brown, faintly carinate around the middle of body whorl; 15-16×7-7.5 mm. *subcarinifera subcarinifera* (SMITH).
(Tanganyika: Mamboia).
- Shell palest horn colour, faintly carinate around the middle of the body whorl; 18-19×8-8.5 mm. *subcarinifera major* (SMITH)⁶.
(Tanganyika: Mamboia).
- 17 Shell over 25 mm. tall, apex obtuse 18
- Shell under 25 mm. tall 20

⁴) The occurrence in Uganda of this species at present only recorded from W. Africa or of a species closely allied to it would not be entirely surprising but the specimens may be wrongly localised.

⁵) The types are worn and pale.

⁶) *P. leroyi*, *prestoni*, *gracilior* and *subcarinifera* form a recognisable group characterised by the clearly truncate columella and faint peripheral keel below which the body whorl is glossier and less costate.

18. Shell rather thick, imperforate or narrowly perforate, 25.5-33×11-12 mm.; aperture thick, white; columella with a fold, often marked but not truly truncate; left hand side of aperture sometimes spout-like *mahariensis* VERDCOURT.
(Tanganyika: Mahari Peninsula) (figs. 1-3).
— Shell thinner 19
19. Shell narrowly conic, olive-green or greenish-brown, 30.5-31×12-13 mm.; apical whorls with costae quite widely spaced; base of shell glossy and smoother; a small fold on the columella and aperture slightly spout-like on left hand side *intermedia* THIELE.
(E. Congo) (fig. 9).
— Shell conical, perforate, 26.5-30.5×11-14 mm.; apex finer with closely spaced costae; aperture thin, columella straight and with a small fold; left hand side of the aperture not spout-like *ptychaxis* (SMITH).
(Tanganyika: Shores of L. Tanganyika, Ujiji, Kigoma, Mahari etc.)
(has been wrongly synonymised with *boivini*).
(note: this half couplet contrasts also with first half of 18 above in case 'thinness' has been misinterpreted)
20. Shell perforate, 14×7.3 mm.; apex obtuse; columella fold very small *see uniplicata* (SMITH).
— Shell scarcely perforate; apex slightly involute with apical whorls keeled 21
21. Shell rimate, greenish-corneous, 15.5-16×7 mm.; apical whorls with very spaced but rather obscure ribs, rest obscurely transversely striate and covered with fine diagonal lines which are sometimes raised and minutely lamellate; a fold on the columella gives a subtruncate appearance; lower part of body whorl shining; aperture 6×4 mm. *introversa* (SMITH)⁷⁾.
(Tanganyika: Mamboia) (figs. 11, 12).
— Shell slender, scarcely perforate, corneous, 15.1×5.5 mm.; spire very acutely pointed, apical whorls with much stronger coarser ribs than the rest of the shell which is closely ribbed and bears no trace of a diagonal micro-sculpture; columella with an oblique fold; aperture 5.2×2.8 mm. *acutissima* VERDCOURT.
(Tanganyika: W. Usambaras)⁸⁾ (figs. 4, 5).

7) The generic placing of this is uncertain; it undoubtedly has some of the features of a *Cerastus* and SMITH's original placing may be nearer the truth — only an examination of the animal will show. C. R. BOETTGER (1913) figures a shell under this name but I do not think it is correctly identified.

8) The following species which would key into this group might be found in southern Tanganyika: shell narrowly conic, spire with straight sides, pale corneous; 22-24×8.5-9.5 mm.; apical whorls with costae very much more widely spaced than on the lower whorls where they are quite close; columella with an obvious fold

cressyi CONNOLLY.
(Mozambique: Macequece).

Figs. 1-3. *Pseudoglessula mahariensis* n. sp. — 1) holotype. — 2, 3) paratypes, Tanganyika, Kungwe, ×2.

Figs. 4, 5. *Pseudoglessula acutissima* n. sp. — 4) holotype. — 5) holotype with enlargement of apex, Tanganyika, W. Usambaras, ×3.

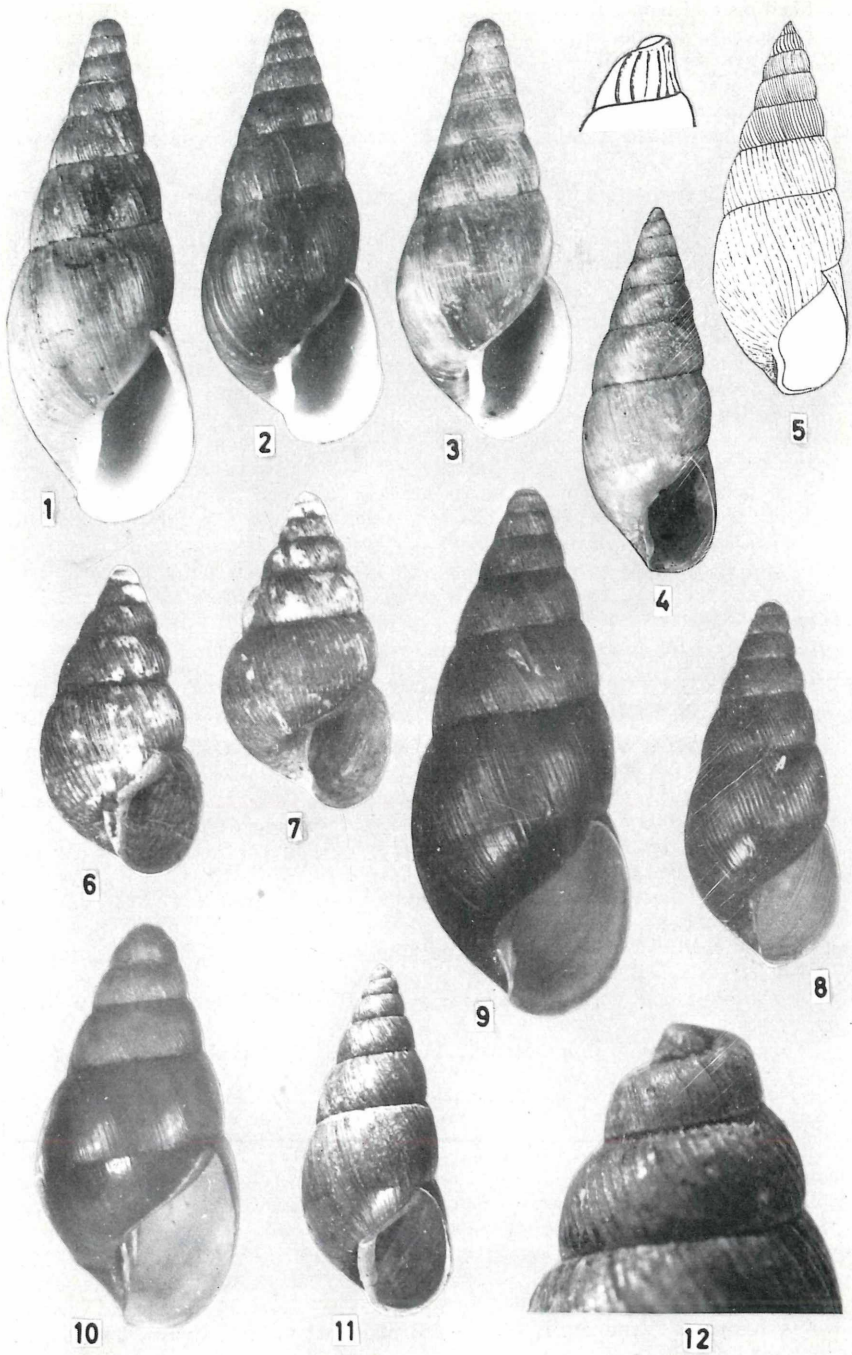
Figs. 6, 7. *Pseudoglessula uniplicata occidentalis* n. subsp. — 7) paratype. — 6) holotype, Tanganyika, Kasakela, ×3.

Fig. 8. *Pseudoglessula elatior* THIELE, holotype, ×2.

Fig. 9. *Pseudoglessula intermedia* THIELE, holotype, ×2.

Fig. 10. *Pseudoglessula obtusata* THIELE, holotype, ×2.

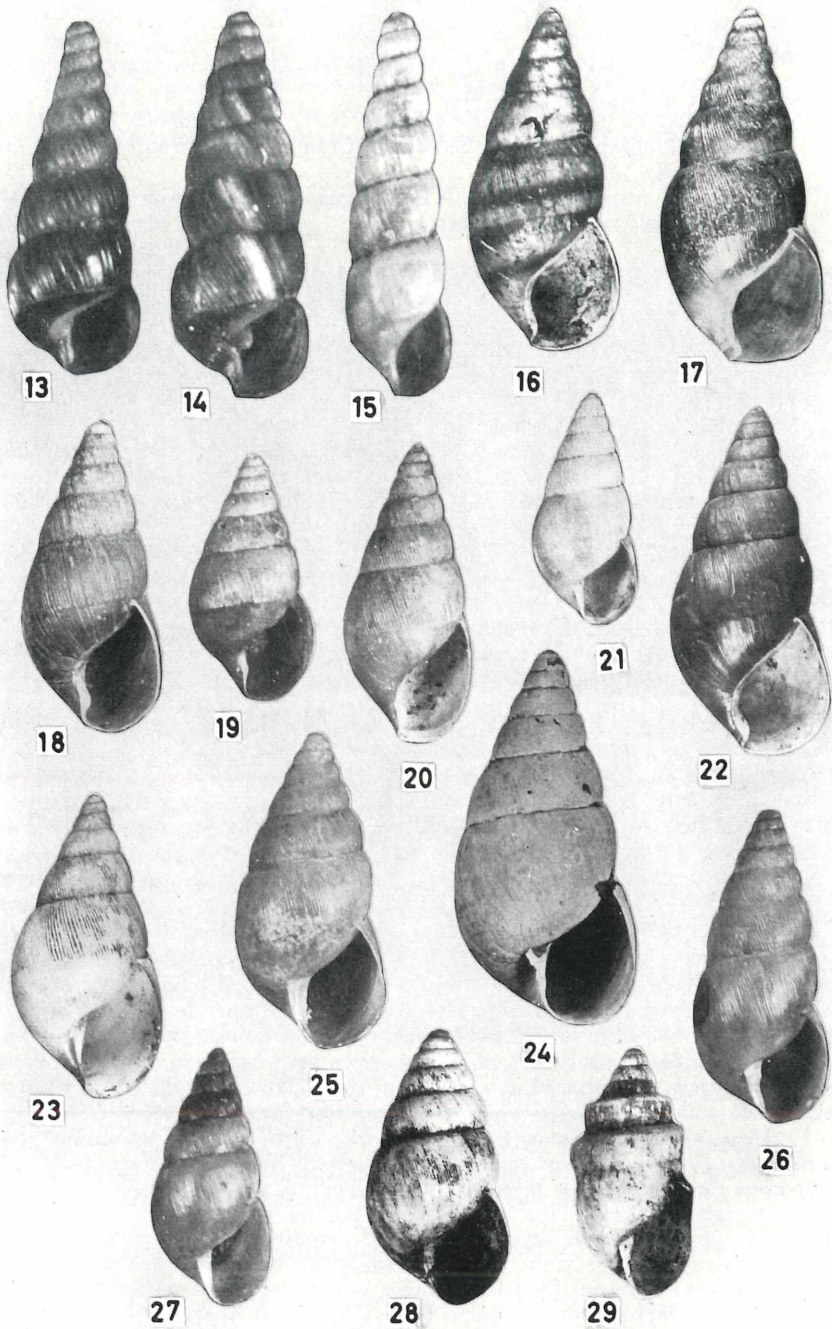
Figs. 11, 12. *Pseudoglessula introversa* (SMITH). — 11) holotype, ×3. — 12) apex, ×20.



22. Shell over 14 mm. tall	23
— Shell under 14 mm. tall	38
23. Shell over 25 mm. tall .	24
— Shell under 25 mm. tall . .	34
24. Columella with a small fold	25
— Columella without a fold, rounded or forming a faint angle with the basal margin	27
25. Shell thick	see <i>mahariensis</i> .
— Shell thinner	26
26. Shell thin, 26.5-30.5×11-14 mm.; apical whorls with costae slightly more widely spaced than on the lower whorls	see <i>ptychaxis</i> .
— Shell thin, 30.5-31×12-13 mm.; apical whorls with costae quite widely spaced	see <i>intermedia</i> .
27. Shell rather solid, elongate-ovoid with rounded sides, reddish-brown, 27×11.5 mm.; apical whorls coarsely costate, remainder finely costate; columella not truncate but convex, tinged lilac and with a granular parietal callus; aperture somewhat spout-like on left hand side	
	<i>pilsbryi</i> CONNOLLY [= <i>kivuensis</i> (PRESTON) non PRESTON] ⁹⁾ . (Ruanda/Congo: Kivu).
— Shell thinner and without the other characters combined	28
28. Aperture not spout-like on the left hand side, columella smoothly rounded into the basal margin; shell usually corneous or brown	29
— Aperture somewhat spout-like on the left hand side or if not then shell olive-green	32

⁹⁾ See Note 3 for an explanation of this.

- Fig. 13. *Pseudoglessula elegans* (MARTENS), Uganda, Entebbe, G. D. HALE CARPENTER, ×5.
- Fig. 14. *Pseudoglessula cruda* PILSBRY, Uganda, Entebbe, G. D. HALE CARPENTER, ×5.
- Fig. 15. *Pseudoglessula gracillima* PILSBRY, Uganda, Bwamba, E. PINHEY, ×5.
- Fig. 16. *Pseudoglessula leroyi fasciata* CONNOLLY, Tanganyika, E. Usambaras, Amani, B. VERDCOURT, ×³/₂.
- Fig. 17. *Pseudoglessula leroyi leroyi* (BOURGUIGNAT), Tanganyika, W. Usambaras, Shume, B. VERDCOURT, ×³/₂.
- Fig. 18. *Pseudoglessula gracilior* SMITH, Tanganyika, Uluguru Mts., Bunduki, J. BOND, ×³/₂.
- Fig. 19. *Pseudoglessula gracilior* SMITH var., Tanganyika, Kilosa, Ukaguru Mts., J. BOND, ×³/₂.
- Fig. 20. *Pseudoglessula gracilior* SMITH, Tanganyika, W. Usambaras, Mkusi, P. J. GREENWAY, ×³/₂.
- Fig. 21. *Pseudoglessula* sp. near *liederi* (MARTENS), Tanganyika, Ngorongoro, E. J. BROWN, ×³/₂.
- Fig. 22. *Pseudoglessula leroyi leroyi* (BOURGUIGNAT), Tanganyika, W. Usambaras, Shume, B. VERDCOURT, ×³/₂.
- Fig. 23. *Pseudoglessula* cf. *obtusa* BOETTGER, Tanganyika, Rondo Plateau, T. CLAW, ×³/₂.
- Fig. 24. *Pseudoglessula kirkii* (DOHRN), Mozambique, Gorongoza Mt., E. PINHEY, ×2.
- Figs. 25-29. *Pseudoglessula boivini* (MORELET). — 25) Kenya, Kilifi, J. G. WILLIAMS, ×2. — 26, 27) Tanganyika, Bagamoyo, B. VERDCOURT, ×2. — 28) short broad variety; Kibwezi, Kenya, B. VERDCOURT, ×2. — 29) abnormal variety; Kenya, Ukunda, B. VERDCOURT, ×2.

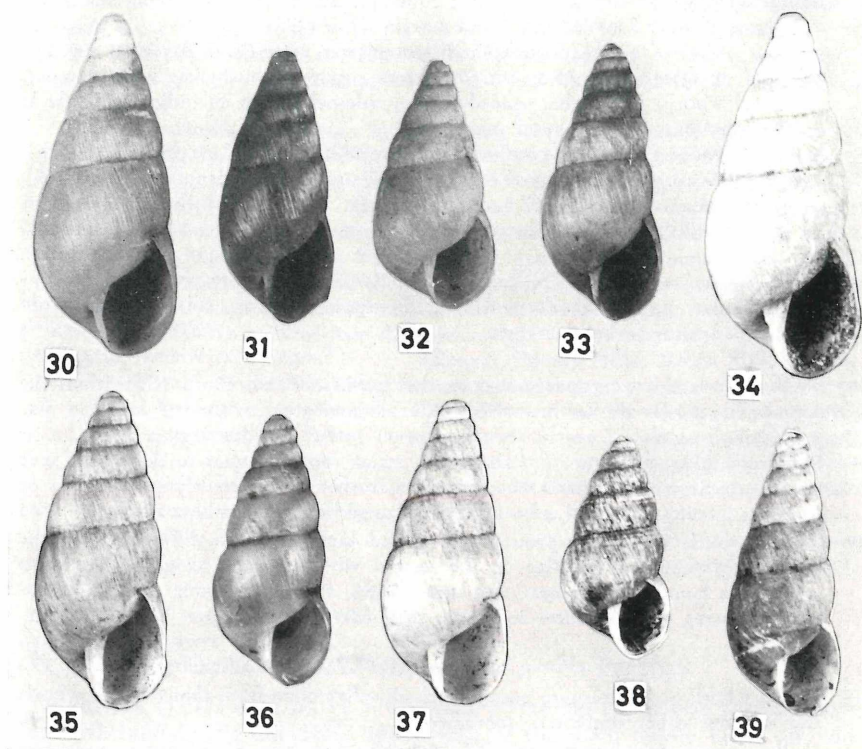


29. Shell 27-28×11 mm.; apical whorls with costae only slightly more widely spaced than on the lower whorls; columella smoothly rounded into the basal margin (*boivini*-group) *liederi* (MARTENS).
(Tanganyika: Kitohai; between Ukuledi and Umbemkuru, Mgao). 30
- Shell wider and with coarser costae 30
30. Shell 26-29.5×12-15 mm.; coarsely ribbed *cf. obtusa* BOETTGER¹⁰.
(Tanganyika: Rondo Plateau (T. CLAW); Lindi (Berlin Mus.) (fig. 23). 31
- Shell exceeding 30×15 mm. 31
31. Shell robust, ovate-conic, 35-35.5×17.5-20 mm., dark brownish-maroon; apex obtuse; columella smoothly rounded *obesa* GERMAIN¹⁰.
(Tanganyika: Kilwa). 31
- Shell ovate-conic, 32×15.5 mm.; apex obtuse; coarsely ribbed; columella smoothly rounded *obtusa* BOETTGER¹⁰.
(Tanganyika: Pugu). 31
32. Shell ovoid-conic, straw-coloured, 23.8×11.5 mm.; columella convex and aperture spout-like on the left hand side *burungaensis* (PRESTON).
(Congo: Mt. Mikeno, Burunga). 33
- Shell olive or greenish-brown 33
33. Shell ovoid-conic, greenish-brown, 23.5×12 mm. (type is not adult — it probably attains a much larger size); costae on main whorls rather close; apex blunt; base of shell glossy and smoother; columella convex; aperture somewhat spout-like on the left hand side *obtusata* THIELE.
(Ruanda: Rugege) (fig. 10). 35
- Shell olive, 24.5×13 mm. (a single juvenile; presumably the adult measures well over 25 mm.); costae on main whorls widely spaced, otherwise very similar to *obtusata* sp. near *obtusata* THIELE.
(Uganda: no precise locality (POWELL COTTON; BM)). 35
34. Shell squat, ovoid-conic; widely umbilicate; about 18-19×11-11.5 mm. 35
- Shell elongate, narrowly conic; imperforate to distinctly perforate 36
35. Shell 18×11 mm.; no spiral white lines in the shell substance *lasti* (SMITH)¹¹.
(Tanganyika: Mamboia). 36
- Shell 19×11.5 mm.; shell substance with obscure spiral white lines . . . *emini* (SMITH)¹¹.
(Tanganyika: Kidete, Mkata). 36
36. Shell narrowly conical, olive-green or corneous-olive, 21-22.5×9-10.25 mm.; apical whorls with slightly wider spaced costae, rest of whorls rather coarsely costate; base of shell smoother and glossy; columella with slight angle at junction with basal margin *elator* THIELE [= *keivuensis* (PRESTON)].
(Ruanda and E. Congo) (fig. 8). 36

¹⁰) I suspect that these three will prove to be conspecific and BOETTGER's name will be the correct name to use. GERMAIN actually applied the name *leroyi* mut. *obesa* to only one of the two shells he had available; the other he thought was true *leroyi* and he does not mention the columella in his description but I have seen his type in Paris. BOETTGER's name was proposed as a variety of *leroyi*. Neither of these two has anything to do with true *P. leroyi* which has a markedly truncate columella.

¹¹) These two are very similar but SMITH may have been correct in separating them; he states that *P. emini* is very close to *P. lasti* in form but is certain they are distinct; on comparison the spire of *emini* is seen to be more pointed, the aperture less lateral and the whorls exhibit numerous fine "transverse" (i. e. spiral in present terminology) white lines which seem to be in the texture of the shell. Strangely although the original material of *emini* is extensive neither of the two species has been recollected to my knowledge. *P. gibbonsi* (TAYLOR) from Mozambique is also similar but smaller, 16×9 mm. BOURGUIGNAT (1889) records this species from Tanganyika: Kondoia but the record is doubtful.

- Shell usually pale brown or corneous; mostly species of the coastal belt or arid central areas of Kenya and Tanganyika 37
37. Many species have been described which are in my opinion probably mere individual forms of *P. boivini* (MORELET) and I have arranged these in order of size. The apical whorls usually have the costae slightly more widely spaced than on the lower whorls but this varies greatly in degree. Names marked* are undoubtedly forms of *boivini*. GERMAIN's section *Pseudocerastus* is based on *boivini*.



Figs. 30-33. *Pseudoglessula boivini-subolivacea* complex. — 30-32) Zanzibar, Jembiani, OSTHEIMER 213083, $\times 2$. — 33) Zanzibar, Kiwani Bay, OSTHEIMER 214836, $\times 2$.
 Fig. 34. *Pseudoglessula* sp., Kenya, Kilifi, J. G. WILLIAMS, $\times 3$.
 Figs. 35, 37. *Pseudoglessula ingloria* CONNOLLY, Kenya, Vipingo, B. VERDCOURT, $\times 3$.
 Fig. 36. *Pseudoglessula margueritae* (PRESTON), Kenya, Mrima Hill, B. VERDCOURT, $\times 3$.
 Fig. 38. *Pseudoglessula stuhlmanni* (MARTENS), Uganda, Bwamba Valley, G. D. HALE CARPENTER, $\times 3$.
 Fig. 39. *Pseudoglessula conradti* (MARTENS), Tanganyika, E. Usambaras, Amani, B. VERDCOURT, $\times 3$.
 Fig. 11 and 12 are reproduced by permission of the Director, British Museum (Nat. Hist.); the rest were taken by the author.

- a) Shell ovoid-conic with tapering spire; 19-25×10-13.5 mm.; umbilicate; columella quite rounded at the base
kirkii (DOHRN) [= *bridouxii* (BOURGUIGNAT) = *arctistria* (KOBELT)].
 (Tanganyika: Kissemo; Magila. Mozambique) (fig. 24).
- b) Shell elongate-conic, 24.1×10.3 mm.; umbilicate; columella forming a distinct angle with the basal margin
monticula K. L. PFEIFFER.
 (Tanganyika: Oldeani).
- c) Shell elongate-conic typically 20×9 mm. but range probably 14-25×7.5-10.5; columella subtruncate when young but when adult with only an indistinct angle or a barely perceptible fold. *boivini* (MORELET) [= *mamboiensis* (SMITH)].
 (Kenya and Tanganyika, common in coastal districts and central areas)
 (see Note 2 for detailed distribution) (figs. 25-27).
- d) Shell elongate-conic, 20×8.5 mm.; columella subtruncate in young shells but almost entirely rounded into basal margin when adult
 sp.
 (Tanganyika: Ngorongoro Crater (E. J. BROWN)) (fig. 21).
- e) Shell elongate-conic, 15.5-18.5×7-7.5 mm., spire with slightly convex sides; apical whorls with rather spaced costae; columella with an indistinct angle at the junction with the basal margin
 **subolivacea* (SMITH) [= *Buliminus olivaceus* GIBBONS ex TAYLOR non PFEIFFER].
 (Zanzibar and coastal districts of Kenya and Tanganyika) (figs. 30-33).
- f) Shell elongate-conic, 17×7.5 mm.; columella with an indistinct angle at its junction with the basal margin
 **naegeleii* BOETTGER.
 (Tanganyika: Kipatimu).
- g) Shell elongate-conic, umbilicate, 13-15.5×6.5-8 mm.; spire with slightly convex sides; apical whorls with slightly spaced costae; columella smoothly rounded into the basal margin
kidetensis (SMITH)¹²
 (Tanganyika: Kidete; Mamboia).
38. Shell with rather well spaced costae, the spaces between much wider than the actual ribs; mostly darker brown in colour; inland areas or upland forest (a diagonal micro-pattern is nearly always present) ... 39
 — Shell resembling miniature *P. boivini* i. e. striae roughly equal to the costae save on the apical whorls where the costae are further apart; mostly pale brown or corneous in colour; coastal areas or lowland areas not far from the coastal belt 43
39. Apical whorls with very pronounced spaced lamellae quite different from the succeeding whorls; 7 lamellae on the second whorl and 21 costae on the third whorl; the lamellae often bear thin appendages; there is a strong diagonal striation crossing the transverse sculpture; shell narrowly perforate, 13-14×5-6 mm
conradti (MARTENS).
 (Tanganyika: E. and W. Usambaras)¹³ (fig. 39).
- Apical whorls with sculpture not so markedly dissimilar from that of later whorls and without other characters combined 40
40. Shell with an involute apex; 12.7×6.1 mm.; aperture 5×2.9 mm.; transverse costae very marked and covered with a microcancellate sculpture clear at x 14
transenna CONNOLLY.
 (Mt. Kenya).
- Without the above characters combined; shell conic, widely perforate; apical whorls with the same close ribs as later ones and the latter crossed by a very fine diagonal pattern visible under high powers only 41

¹² SMITH also refers here a small shell 11.5×5.5 mm. collected in Tanganyika: Usagara by Bishop HANNINGTON. This clearly belongs to the complex mentioned in couplet 44.

¹³ The record from 300 km. W. of L. Tanganyika (GRAUER coll.) is very dubious.

41. Shell 8-12.4×4.25-5.8 mm.
 . . *stuhlmanni* (MARTENS) [possibly = *terruleta* (MORELET), = *delicatula* (PRESTON)].
 (Angola. Congo. Uganda: Ruwenzori; Entebbe; Damba Island. Ethiopia) (fig. 38).
 — Shell larger 42
42. Shell 14×7.3 mm.; umbilicus rather narrow; columella with very small fold
uniplicata uniplicata (SMITH).
 (Tanganyika: Mamboia).
 — Shell 13.5×6.7-7.5 mm.; widely umbilicate; columella completely rounded
uniplicata occidentalis VERDCOURT.
 (Tanganyika: near Kigoma) (figs. 6, 7).
43. Shell ovoid-conic with sharp spire (43°); 11.5×5.8 mm., aperture 4.7×2.7 mm.;
 columella absolutely smoothly rounded
solitudinum CONNOLLY.
 (Kenya: Taru Desert).
 — Shell more elongate-conic 44
44. The following are as in the case of the *boivini* complex probably not distinct
 species but only local variants; in fact they are closely similar to *P. boivini* in
 all but size
- a) Shell narrowly perforate, 10.9-13.5×4.8-5.5 mm. (immature type is 10.9×
 4.8 mm.); apical angle 30°; aperture 4.5×2.2 mm.; no micro-pattern seen at
 x 16; columella forming a slight angle with the basal margin as *P. boivini*

ingloria CONNOLLY.
 (Kenya: Taru Desert; Vipingo, 20 miles N. of Mombasa) (figs. 35, 37).
- b) Shell narrowly perforate, 9.2-10×4 mm., aperture 3.5×2 mm.; apical whorls
 more coarsely costate and a very faint diagonal pattern visible under high
 powers in fresh specimens; body whorl with a faint keel; columella practi-
 cally smoothly rounded into the basal margin
margueritae (PRESTON)¹⁴.
 (Kenya: Shimba Hills; Mrima Hill) (fig. 36).
- c) Shell 12.25×5 mm., said by PRESTON to be distinguishable from *margueritae*
 by its larger size and somewhat finer sculpture and the whorls, of which there
 is an additional one, flatter
tribulationis (PRESTON).
 (Kenya: Shimba Hills).
- d) Shell perforate, 11.5×5.5 mm., very strongly costate; body whorl very faintly
 keeled; columella smoothly rounded into the basal margin
kidetensis (SMITH) var.
 (Tanganyika: Usagara).

Note 1.

The identity of *Pseudoglessula pusilla* PRESTON.

PRESTON (1911: 220, pl. 11 f. 6) when describing the above species stated
 "notwithstanding the immature appearance of the shells before me, I am con-
 vinced after an examination of a good series of specimens that they are in an

¹⁴ CONNOLLY states that this is smaller than *ingloria* and has a relatively shorter
 aperture but that it might prove to be conspecific. If, however, I have correctly identi-
 fied my material from Mrima Hill a locality close to the Shimba Hills then I think the
 two are distinct. In this material the shell is perforate, pale corneous-yellow, 10.5×
 4.5 mm.; apical whorls more coarsely costate than the body whorls, 2nd. visible whorl
 with 14 costae, 3rd. with 28 costae; body whorl with a faint keel; there is a faint
 diagonal pattern. Specimens from Kenya: Malindi (11×4.8 mm.) and Twiga, 12 miles
 S. of Mombasa (11.5-12×4.8-5 mm.) are darker with stronger ribs and probably re-
 ferable to *P. ingloria*. Shells from Kenya: Kilifi (15×6.5 mm.) link these smaller forms
 with the *P. boivini* complex. (fig. 34).

adult state" A glance at his figure is enough to show that they are not adult. During my examination of material of *Pseudoglessula* in the British Museum (Nat. Hist.), I studied a paratype of PRESTON's supposed new species and there is no doubt that it is not a *Pseudoglessula* at all but is based on very young specimens of some species of *Subuliniscus*. The latter genus is a difficult one and the described species are inadequately characterised. The immaturity of PRESTON's specimens renders a positive identification unlikely until further material has been collected in the type locality.

NOTE 2.

Pseudoglessula boivini — *P. subolivacea* complex.
 Details of material examined in the Coryndon Museum,
 Nairobi and the British Museum (Nat. Hist.)

Locality	Height (mm.)	Breadth (mm.)	Remarks
Kenya			
Lamu District:			
Kipini (WERNER) (BM)	20.0	10.0	Sides of spire straight
Kilifi District:			
Jilori, 15 miles W. of Malindi (R. M. POLHILL 220)	13.2	6.0	Sides of spire straight; apical costae well spaced
Same locality (R. M. POLHILL 219)	21.0	10.0	Sides of spire slightly rounded
Watamu (H. COPLEY in CM F 240)	17.0	8.5	Sides of spire straight
Kilifi (J. G. WILLIAMS)	23.5 22.0 21.5 20.5 20.0 19.0	10.0 9.0 8.8 9.5 9.5 9.5	Sides of spire straight; apical costae fairly widely spaced (Fig. 25)
Mombasa District:			
Mombasa (holotype? in BM)	20.0	9.0	MORELET gives 18×8 mm.
Mombasa (BM)	19.0 17.0 15.0	8.5 8.0 7.5	Sides of spire straight
Kwale District:			
Diani Beach (N. L. H. KRAUSS 5835) (BM & CM)	18.5 17.5	8.8 8.0	Sides of spire rounded; apical costae widely spaced
Ukunda (B. VERDCOURT)	17.5	8.0	An abnormal shell was also obtained (see fig. 29)
Gazi (ex PRESTON) (BM)	20.0 18.5 17.5	8.0 8.5 8.5	

Locality	Height (mm.)	Breadth (mm.)	Remarks
Shimba Hills (ex PRESTON) (B)	17.5	8.5	
Mrima Hill (B. VERDCOURT)	20.5	9.5	Apical costae well spaced
Teita District: Voi, Duharu Hill (J. ALEXANDER)	16.0 14.0 13.5	7.5 8.0 8.0	Sides of spire straight or rounded; apical costae close
Voi (J. ALEXANDER)	18.3 13.8	9.0 8.5	Sides of spire rounded; apical costae close
Machakos District: ¹⁵⁾ Kibwezi (B. VERDCOURT)	19.0 18.5	9.2 9.5	Sides of spire rounded; apical whorls with costae only slightly more widely spaced (fig. 28)
Kibwezi (S. CORYNDON)	16.0	8.5	Sides of spire rounded; apical costae not widely spaced
Kiboko (H. J. ALLEN TURNER) in CM 2354 (locality dubious)	18.0 16.5	8.8 8.5	Sides of spire rounded or more or less straight; apical costae widely spaced
Kanga, mile 139 from Mombasa on Nairobi road (B. VERDCOURT)	17.0	10.0	Shell broader and sides more rounded than in coastal specimens
Tanganyika ¹⁶⁾			
Bagamoyo District: Bagamoyo, Kaole (B. VERDCOURT)	22.0 21.0 20.5 20.0 19.0 17.8	9.0 9.8 9.0 9.0 8.8 8.0	Sides of spire straight; apical whorls with costae twice as far apart as on lower whorls (figs. 26, 27)
Mbiki R., Ruvu (J. ALEXANDER)	19.5 17.0 16.0	8.75 8.0 8.0	Sides of spire straight

¹⁵⁾ Shells from Ukamba (Kibwezi, Kanga, etc.) are relatively shorter and wider with a wider umbilicus and a more widely reflected columella; further material may show that there is a recognisable subspecies in this area.

¹⁶⁾ *P. boivini* is also recorded in the collections of the Zoological Museum in Berlin from Nyika, Tanga, Bagamoyo, Uluguru Mts., Kitohau, Kissemo and Urundi.

Locality	Height (mm.)	Breadth (mm.)	Remarks
Zanzibar			
Jembiani	23.5	9.5	Sides of spire straight; costae not widely spaced on apical whorls (fig.s 30, 31, 32)
5 miles S. of Zanzibar City (OSTHEIMER in ANSP 213083)	19.0 17.0	8.0 8.2	
Zanzibar (OSTHEIMER in ANSP 214847)	16.0	7.0	Sides of spire straight
Zanzibar (HUNGERFORD) (BM)	17.0	7.5	Sides of spire straight
SW. Zanzibar, Bunge, Kiwani Bay (OSTHEIMER in ANSP 214836)	18.0	7.5	Slim build; apical costae not widely spaced (fig. 33)
Bawri Is. (J. S. GIBBONS) (BM)	18.0	7.5	Sides of spire straight; paratypes of <i>subolivacea</i>
	16.5	7.0	
	15.5	7.0	
Mozambique			
Macequece District: (CRESSY) (BM)	21.0	9.5	Sides of spire straight
	19.0	9.0	
	18.0	8.5	
	11.5	6.5	
Nyasaland			
Nyika Plateau (A. WHYTE) (BM)	24.5	10.5	Sides of spire rounded; the smallest shells are adult and close to <i>kidetensis</i>
	23.0	10.0	
	23.0	10.5	
	22.5	10.0	
	22.5	10.0	
	21.5	10.0	
	20.5	9.5	
	20.0	9.5	
	20.0	10.5	
	19.5	10.0	
	19.5	10.0	
	18.0	7.0	
	18.0	9.5	
	17.0	9.0	
	14.0	7.5	
12.5	7.5		
Malosa (A. WHYTE) (BM)	17.5	8.5	Sides of spire straight
Masuku Plateau (A. WHYTE) (BM)	20.0	9.0	
Zomba (A. WHYTE) (BM)	18.5	8.5	
	18.0	8.0	
	16.0	8.0	
	16.0	8.0	
	16.0	7.5	
	15.0	7.5	

Locality	Height (mm.)	Breadth (mm.)	Remarks
Chiradzulu Mt. (A. WHYTE) (BM)	22.5	9.5	The smallest shell is adult and is intermediate with <i>kidetensis</i>
	21.5	9.0	
	20.0	9.0	
	19.0	10.0	
	18.0	9.5	
	18.0	9.0	
	16.5	8.5	
	16.5	9.0	
	16.5	8.0	
	14.0	8.0	

Rhodesia

„Rhodesia, 100 miles N. of Tete“ (J. F. QUEKETT) (BM)	18.5	9.5
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Natal

Elscheleselwanhla, Sibangwani District (TOPPIN) (BM)	21.0	9.5
	19.5	9.0

Note 3.

PRESTON (1913) described several species now recognised to belong to the genus *Pseudoglessula*. On p. 50 he describes an *Ena kivuensis* comparing it with *Glandina boivini* MORELET which is of course a *Pseudoglessula*; *Ena kivuensis* is I consider conspecific with *P. elatior* THIELE, 1911. Later, on p. 53 he characterises a subgenus *Kempia* clearly inferring it to be a subgenus of *Pseudoglessula*. He then describes *K. kivuensis* and *K. burungaensis* the name *Pseudoglessula* not being mentioned in the names prefixing the descriptions. He should of course have put *Pseudoglessula* followed preferably by *Kempia* in brackets and presumably *Kempia* must be accepted as a genus. The name is in any case preoccupied and was replaced by *Kempioconcha* PRESTON later in 1913. CONNOLLY (1923) saw that both these species given the epithet *kivuensis* were congeneric and proposed the new name *pilsbryi* for *Kempia kivuensis* since PILSBRY (1919) had also suspected that the two would prove to be congeneric.

Index of names with dates and original generic placing.

<i>acutissima</i> VERDCOURT n. sp., — <i>Pseudoglessula</i>	44, 48
<i>arctistria</i> KOBELT 1902, — <i>Buliminus</i> (<i>Cerastus</i>)	54
<i>boivini</i> MORELET, 1860, — <i>Glandina</i>	54
<i>bridouxii</i> BOURGUIGNAT, 1889, — <i>Bulimus</i>	54
<i>burungaensis</i> PRESTON, 1913, — <i>Kempia</i>	52

<i>calabarica</i> PFEIFFER, 1865, — <i>Achatina</i>	47	
<i>conradti</i> MARTENS, 1895a, — <i>Pseudoglessula</i>	54	
<i>cressyi</i> CONNOLLY, 1925, — <i>Pseudoglessula</i> (<i>Pseudocerastus</i>)		48
<i>cruda</i> PILSBRY, 1919, — <i>Pseudoglessula</i> (<i>Ischnoglessula</i>)		46
<i>delicatula</i> PRESTON, 1910b, — <i>Cerastus</i>	55	
<i>elatiior</i> THIELE, 1911, — <i>Pseudoglessula</i>	52	
<i>elegans</i> MARTENS, 1895a, — <i>Subulina</i>	46	
<i>emini</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i>)	52	
<i>fasciata</i> CONNOLLY, 1923, — <i>Pseudoglessula</i>	47	
<i>gibbonsi</i> TAYLOR, 1877b, — <i>Buliminus</i>	52	
<i>gracilior</i> SMITH, 1904, — <i>Pseudoglessula</i>	47	
<i>gracillima</i> PILSBRY, 1919, — <i>Pseudoglessula</i> (<i>Ischnoglessula</i>)		46
<i>hessei</i> BOETTGER, 1913a, — <i>Pseudopeas</i>	45	
<i>ingloria</i> CONNOLLY, 1923, — <i>Pseudoglessula</i> (<i>Pseudocerastus</i>)		55
<i>intermedia</i> THIELE, 1911, — <i>Pseudoglessula</i>	48, 50	
<i>introversa</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i> ?)	48	
<i>kidetensis</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i>)	54, 55	
<i>kirki</i> DOHRN, 1865, — <i>Buliminus</i>	54	
<i>kirki</i> CRAVEN, 1880, — <i>Achatina</i>	47	
<i>kiyuensis</i> PRESTON, 1913, — <i>Ena</i>	52, 59	
<i>kiyuensis</i> PRESTON, 1913, — <i>Kempia</i>	50, 59	
<i>lasti</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i>)	52	
<i>lemairei</i> DAUTZENBERG & GERMAIN, 1914, — <i>Pseudoglessula</i>		46
<i>leroyi</i> BOURGUIGNAT, 1889, — <i>Stenogyra</i>	47	
<i>liederi</i> MARTENS, 1895a, — <i>Buliminus</i>	52	
<i>mahariensis</i> VERDCOURT n. sp., — <i>Pseudoglessula</i>	43, 48, 50	
<i>major</i> SMITH, 1890, — <i>Stenogyra</i> (<i>Subulina</i>) <i>subcarinifera</i> var.		47
<i>mamboiensis</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i>)	54	
<i>margueritae</i> PRESTON, 1910a, — <i>Buliminus</i> ?	55	
<i>monticula</i> K. L. PFEIFFER, 1952, — <i>Pseudoglessula</i> (<i>Kempioconcha</i>)		54
<i>mutabilis</i> CONNOLLY, 1923, — <i>Pseudoglessula</i>	46	
<i>mutandana</i> CONNOLLY, 1923, — <i>Pseudoglessula</i>	46	
<i>naegelei</i> BOETTGER, 1913b, — <i>Pseudoglessula</i>	54	
<i>obesa</i> GERMAIN, 1916, — <i>Pseudoglessula</i> <i>leroyi</i> mut.	52	
<i>obtusa</i> BOETTGER, 1913b, — <i>Pseudoglessula</i> <i>leroyi</i> var.	52	
<i>obtusata</i> THIELE, 1911, — <i>Pseudoglessula</i>	52	
<i>occidentalis</i> VERDCOURT n. ssp., — <i>Pseudoglessula</i> <i>uniplicata</i>		45, 55
<i>olivacea</i> TAYLOR, 1877a, — <i>Buliminus</i>	54	
<i>perobtusa</i> CONNOLLY, 1923, — <i>Pseudoglessula</i>	46	
<i>pilsbryi</i> CONNOLLY, 1923, — <i>Pseudoglessula</i> (<i>Kempioconcha</i>)		50
<i>pitmani</i> CONNOLLY, 1930, — <i>Pseudoglessula</i>	46	
<i>prestoni</i> SMITH, 1904, — <i>Pseudoglessula</i>	47	
<i>ptychaxis</i> SMITH, 1880, — <i>Bulimus</i> (<i>Bulimus</i>)	48, 50	
<i>pusilla</i> PRESTON, 1911, — <i>Pseudoglessula</i>	55	
<i>solitudinum</i> CONNOLLY, 1923, — <i>Pseudoglessula</i> (<i>Pseudocerastus</i>)		55
<i>stuhlmanni</i> MARTENS, 1895b, — <i>Buliminus</i>	55	
<i>subcarinifera</i> SMITH, 1890, — <i>Stenogyra</i> (<i>Subulina</i>) ..	47	
<i>subfuscidula</i> PILSBRY, 1919, — <i>Pseudoglessula</i> (<i>Ischnoglessula</i>)		46
<i>subolivacea</i> SMITH, 1890, — <i>Bulimus</i> (<i>Bulimus</i>)	54	
<i>terrulenta</i> MCRELET, 1883, — <i>Bulimus</i>	55	
<i>transenna</i> CONNOLLY, 1923, — <i>Pseudoglessula</i> (<i>Pseudocerastus</i>)		54
<i>tribulationis</i> PRESTON, 1910a, — <i>Buliminus</i> ?	55	
<i>uniplicata</i> SMITH, 1890, — <i>Bulimus</i> (<i>Cerastus</i> ?)	48, 55	
<i>ussuwiensis</i> KOBELT, 1913, — <i>Pseudoglessula</i> [This is a <i>Nothapalus</i>]		

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