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Notes on Kenya Land and Freshwater Snails 5. Records of Vertiginidae and Valloniidae from Kenya, Zanzibar, and Tanganyika ¹⁾

by

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The appearance of Dr. ADAM's excellent paper (1954) has prompted me to list a few records of the families from Kenya and also to mention some interesting specimens collected recently in Zanzibar and Tanganyika. First I have given a check list of the species known from East Africa. Systems of arrangement of these families differ and the one employed by THIELE in his handbook is used here. CONNOLLY (1939) and others use the family name Pupillidae instead of Vertiginidae and he also refers *Pupisoma* to the Pupillidae subfamily Nesopupinae instead of to the Valloniidae as both ADAM and THIELE do.

VERTIGINIDAE

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1. *Negulus kenianus* (Preston, 1912)

Preston, 1912, Proc. Zool. Soc., vol. for 1912, p. 189, pl. 31 fig. 6 (*Alaea k.*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 103, pl. 5 fig. 14.

Type locality: Mt. Kenya, 6,000—9,000 ft. Probably only known from the type collected by ROBIN KEMP.

2. *Truncatellina naivashaensis* (Preston, 1911)

Preston, 1911, Rev. Zool. Afr., vol. 1, p. 219, pl. 11 fig. 3 (*Ennea n.*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 89, pl. 9 fig. 21; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 734, fig. 2A.

Type locality: Kenya, Naivasha.

2a. *Truncatellina naivashaensis* (Preston, 1911) var. *elgonensis* (Preston, 1913)

¹⁾ No. 4, see: Basteria, vol. 17, p. 16 (1953).

Preston, 1913, Proc. Zool. Soc., vol. for 1913, p. 211 (*Ennea n.* var. *elg.*); Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 734, fig. 2B.

Type locality: Uganda, Mt. Elgon. Probably not worth a name and ADAM does not keep it up.

3. *Truncatellina mutandaensis* (Preston, 1913)

Preston, 1913, Proc. Zool. Soc., vol. for 1913, p. 211, pl. 34 figs. 13, 13A (*Ennea m.*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 90, pl. 9 figs. 19, 20; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 735, fig. 2C.

Type locality: S. W. Uganda, between Lake Mutanda and Lake Kivu. Possibly not distinct from *Tr. naivashaensis*, but insufficient material has been collected to be certain.

4. *Truncatellina flavogilva* Germain, 1934

Germain, 1934, Bull. Mus. Nat. Hist. Nat. (2), vol. 6, p. 381; editors, 1952, Journ. de Conchyliol., vol. 92, p. 175, pl. 8 fig. 24.

Type locality: Tanganyika, New Moshi, by River Rau, S. foot of Kilimanjaro, 800 m. The original figure is poor and shows only the base of the shell. ADAM did not see the type, but believes that the species is probably distinct. Further material is needed.

NESOPUPINAE

5. *Nesopupa iota* (Preston, 1911)

Preston, 1911, Ann. Mag. Nat. Hist. (8), vol. 7, p. 463, pl. 11 fig. 2 (*Ennea i.*); Pilsbry, 1920, Man. Conch. (2), vol. 25, p. 361, pl. 34 fig. 6a; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 762, fig. 12C.

Type locality: Kenya, between Rumuruti and Mt. Kenya. Known only from the type.

6. *Nesopupa densestriata* Adam, 1954

Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 771, figs. 12L, 12M.

Type locality: Belgian Congo, Parc National Garamba. Recorded from the Malagarasi Delta area of Lake Tanganyika.

PUPILLINAE

7. ? *Pupilla duplicata* (Preston, 1911)

Preston, 1911, Ann. Mag. Nat. Hist. (8), vol. 7, p. 470, pl. 11 fig. 22 (*Fauxulus d.*); Pilsbry, 1917, Man. Conch. (2), vol. 24, p. 127, pl. 41 fig. 3 (*Gastrocopta d.*); Connolly, 1939, Ann. S. Afr. Mus., vol. 33, p. 376, pl. 12 fig. 16 (*Gastrocopta d.*); Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 789, fig. 18.

Type locality: Kenya, between Rumuruti and Mt. Kenya. CONNOLLY also records this from the Transvaal. Only the type is known from East Africa.

8. *Pupilla fontana* (Krauss, 1848)

Krauss, 1848, Südafr. Moll., p. 80, pl. 5 fig. 6; Küster, 1850, Conch. Cab. (2), vol. 1 part 15, p. 122, pl. 16 figs. 9—12 (*Pupa f.*); Preston, 1911, Rev.

Zool. Afr., vol. 1, p. 218, pl. 11 fig. 5 (*Ennea iredalei*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 207, pl. 16 figs. 1—23; Connolly, 1939, Ann. S. Afr. Mus., vol. 33, p. 391, pl. 12 fig. 13 (full synonymy).

Type locality: Transvaal, Mooi River. Type locality of *Ennea iredalei*: Kenya, Naivasha. Widely distributed in South Africa and extending to Kenya and Abyssinia.

9. *Pupoides coenopictus* (Hutton, 1834)

Hutton, 1834, J. Asiat. Soc. Bengal, vol. 3, pp. 85, 93 (*Pupa c.*); Preston, 1912, Proc. Zool. Soc., vol. for 1912, p. 188, pl. 31 fig. 17 (*Leucochiloides soror*); Germain, 1918, Bull. Mus. Nat. Hist. Nat., vol. 24, p. 263 (*Buliminus c.*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 123, pl. 13 figs. 1—3 (see also pl. 14 fig. 7 and pl. 17 fig. 3).

Type locality: Beeana, near Agra, India. Type locality of *Leucochiloides soror*: Kenya, Chanler Falls, River Eusso Nyiro. Widely distributed in India; also occurring in S. and E. Africa, Cuba, etc. (possibly introduced). The classification and synonymy of this genus is so involved that accurate ranges can not yet be worked out. When numerous other "species" are finally sunk into *P. coenopictus* its range may well be considerable.

9a. *Pupoides coenopictus* (Hutton, 1834) var. *sennaariensis* (L. Pfeiffer, 1855)

Pfeiffer, 1855, Malak. Blätt., vol. 2, p. 177 (*Pupa s.*); Taylor, 1880, Journ. of Conchol., vol. 3, p. 143 (*Bulimus zanguebaricus*, Taylor indicates a figure, but none could be found in the copy of the reference used); Preston, 1912, Proc. Zool. Soc., vol. for 1912, p. 188, pl. 31 fig. 16 (*Leucochiloides chanlerensis*); Preston, 1913, Rev. Zool. Afr., vol. 3, p. 52, pl. 4 fig. 5 (*L. consanguineus*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 131, pl. 14 fig. 1, 2 (*Pupoides sennaariensis*), p. 134 (*P. zanguebaricus*), p. 135, pl. 14 fig. 6 (*P. chanlerensis*), p. 135, pl. 14 fig. 9 (*P. consanguineus*).

Type locality: Sudan, Sennaar. Type locality of *Bulimus zanguebaricus*: Zanzibar; not recollected since GIBBONS collected the type. Type locality of *Leucochiloides chanlerensis*: Kenya, Chanler Falls, River Eusso Nyiro. Type locality of *L. consanguineus*: Kenya, Gazi. Widely distributed in Abyssinia, Eritrea, Egypt, and East Africa.

9b. *Pupoides coenopictus* (Hutton, 1834) var. *samavaensis* (Paladilhe, 1872)

Paladilhe, 1872, Ann. Mus. Civ. Stor. Nat. Genova, vol. 3, p. 14, pl. 1 figs. 20—21 (*Bulimus s.*); Taylor, 1880, Journ. of Conchol., vol. 3, p. 142 (*Bulimus bawriensis*, as in the previous case no figure was apparently published, although indicated in the text); Preston, 1912, Proc. Zool. Soc., vol. for 1912, p. 188, pl. 31 fig. 19 (*Leucochiloides gaziensis*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 127, pl. 13 figs. 8, 10, 11 (*Pupoides samavaensis*), p. 134 (*P. bawriensis*), p. 135, pl. 14 fig. 8 (*P. gaziensis*).

Type locality: Arabia, Aden. Type locality of *Bulimus bawriensis*: Zanzibar Channel, Bawri Island. Type locality of *Leucochiloides gaziensis*: Kenya, Gazi. Widely distributed: Bombay, Aden, Iraq, East Africa.

For a discussion of this classification see last section of this note.

10. *Microstele iredalei* (Preston, 1912)

Preston, 1912, Proc. Zool. Soc., vol. for 1912, p. 188, pl. 31 fig. 18 (*Leucochiloides i.*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 148, pl. 14 fig. 18, pl. 17 fig. 7.

Type locality: Kenya, Eusso Nyiro. Unknown save from the original lot collected by ROBIN KEMP.

11. *Lauria desiderata* (Preston, 1911)

Preston, 1911, Ann. Mag. Nat. Hist. (8), vol. 7, pl. 11 fig. 21 (*Jaminia d.*); Pilsbry, 1922, Man. Conch. (2), vol. 27, p. 62, pl. 8 fig. 16; Germain, 1934, Bull. Mus. Nat. Hist. Nat. (2), vol. 6, p. 382 (*L. alluaudi*); editors, 1952, Journ. de Conchyliol., vol. 92, p. 175, pl. 8 fig. 25 (*L. alluaudi*).

Type locality: Mt. Kenya, 9,000—10,000 ft. Type locality of *L. alluaudi*: Kenya, Mt. Kinangop, 3,800 m., collected by ALLUAUD and JEANNEL. By kind permission of Drs. REES, RANSON, and DARTEVELLE I carefully examined several paratypes and the holotypes of both PRESTON's and GERMAIN's species. In the former shells the parietal lamella is slightly less developed, but the shells are perhaps not entirely adult.

GASTROCOPTINAE (THIELE places them in the Chondrininae)

12. *Gastrocopta klunzingeri* (Jickeli, 1874)

Jickeli, 1874, Nova Acta Leop. Carol., vol. 37, p. 116, pl. 5 fig. 8 (*Pupa kl.*); Preston, 1913, Proc. Zool. Soc., vol. for 1913, p. 205, pl. 33 figs. 13, 13a (*Ennea insulsa*); Pilsbry, 1917, Man. Conch. (2), vol. 24, p. 120, pl. 22 fig. 3 (*Gastrocopta klunzingeri*); Pilsbry, 1918, Man. Conch. (2), vol. 24, p. 359 (*G. insulsa*); Pilsbry, 1921, Man. Conch. (2), vol. 26, p. 229, pl. 1 figs. 14, 15, 16; Pilsbry, 1926, Man. Conch. (2), vol. 27, p. 209 (*Ennea insulsa*); Connolly, 1925, Ann. Mag. Nat. Hist. (9), vol. 15, p. 479 (*Gastrocopta insulsa*); Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 791, fig. 19A—F.

Type locality: Abyssinia. Occurs also in the Belgian Congo, Kenya, Tanganyika, and Senegal.

13. *Gastrocopta jeanneli* Germain, 1934

Germain, 1934, Bull. Mus. Nat. Hist. Nat. (2), vol. 6, p. 381; editors, 1952, Journ. de Conchyliol., vol. 92, p. 173, pl. 8 fig. 23; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 789.

Type locality: Kilimanjaro, near Bismarck Hill, 2,700—2,800 m. Probably allied to ? *Pupilla duplicata* (Preston).

VALLONIIDAE

1. *Pupisoma orcula* (Benson, 1850)

Benson, 1850, Ann. Mag. Nat. Hist. (2), vol. 6, p. 251 (*Helix o.*); Pilsbry, 1920, Man. Conch. (2), vol. 26, p. 31, pl. 2 figs. 1—5; Connolly, 1939, Ann. S. Afr. Mus., vol. 33, p. 413, textfig. 33; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 807, fig. 24B.

Type locality: India, near Benares. Recorded from Japan, India, Philippines, Java, S. Africa, Rhodesia, Mauritius, Belgian Congo, and Kenya.

2. *Pupisoma renschi* K. Pfeiffer, 1952

Pfeiffer, 1952, Arch. Molluskenk., vol. 81, p. 90, pl. 1 fig. 2.

Type locality: Tanganyika, Mt. Meru, 1,700 m.¹)

3. *Acanthinula expatriata* Preston, 1911

Preston, 1911, Ann. Mag. Nat. Hist. (8), vol. 7, p. 469, pl. 11 fig. 17; Pilsbry, 1926, Man. Conch. (2), vol. 27, p. 194, pl. 32 fig. 9; Adam, 1954, Vol. Jubil. V. van Straelen, vol. 2, p. 806.

Type locality: Mt. Kenya, 9,000—10,000 ft. This species has only been collected twice and is very close to the common European *A. aculeata* (Müll.). Further material is required.

4. *Acanthinula azorica* Pilsbry, 1926

Pilsbry, 1926, Man. Conch. (2), vol. 27, p. 193, pl. 32 figs. 7, 8.

Type locality: Azores. Occurs in Uganda, see records.

It will be seen that many of the above species have only been collected once. This is partly due to their minute size. The attention of collectors, particularly those ascending mountains is drawn to the need for much more material.

RECORDS FROM EAST AFRICA

All the material cited, unless otherwise stated is preserved in the Coryndon Memorial Museum, Nairobi, and additional material is in the institutions mentioned.

Truncatellina naivashaensis (Preston)

KENYA: Naivasha, leg. HALE CARPENTER (Brit. Mus. (Nat. Hist.)).

Pupilla fontana (Krass.)

KENYA: Naivasha, leg. HALE CARPENTER (Brit. Mus. (Nat. Hist.)); same locality, 18 miles along 'Lake Road' from its junction with the main road, under bark of *Acacia xanthophloea*, Dec. 1954, leg. B. VERDCOURT (spirit material).

Pupoides coenopictus (Hutton) var. *coenopictus* (Hutton)

KENYA: Fergusons Gulf, Lake Rudolf, raised beds near the shore, not living, leg. J. G. WILLIAMS; Drift of River Turkwell, Turkana, leg. C. F. HEMMING (Coll. Inst. Roy. Sci. Nat, Belge).

¹) Specimens of this species or a very closely related one have been found on Mt. Kenya by Mr. Malcolm Coe during the recent I.G.Y. expedition. Dr. Adam is publishing a note on this material.

TANGANYIKA: Two miles E. of Lake Natron, under *Acacia* bark, April 1955, leg. P. R. HESSE (one individual of 7 whorls, 5×2 mm).

P. coenopictus (Hutton) var. *sennaariensis* (Pfr.)

KENYA: Drift of River Turkwell, Turkana, leg. C. F. HEMMING (Coll. Inst. Roy. Sci. Nat. Belge). The majority closely matched '*Leucochiloides consanguineus* Preston' but one 5×1.8 mm. of 7 whorls was longer, more slender and intermediate between '*L. chanlerensis*' and '*L. soror*' of PRESTON.

P. coenopictus (Hutton) var. *samavaensis* (Palad.)

KENYA: Fergusons Gulf, Lake Rudolf, with var. *coenopictus*, leg. J. G. WILLIAMS; Drift of River Turkwell, Turkana, leg. C. F. HEMMING (Coll. Inst. Roy. Sci. Nat. Belge). These Turkana shells are good matches of '*Leucochiloides gaziensis* Preston'.

ZANZIBAR: 18 miles S. of Zanzibar City, dry bushland, in snag of bush, 7 Oct. 1954, leg. W. WILKINSON. This lot is a good match of '*Bulimus bawriensis* Taylor' *e desc.*, and Baw(r)i Island is close to this present locality.

Gastrocopta klunzingeri (Jickeli)

KENYA: Machakos, three dead 'shells, leg. C. F. HEMMING; Turkwell River Drift, very abundant, leg. C. F. HEMMING (Coll. Inst. Roy. Sci. Nat. Belge).

Pupisoma orcula (Benson)

KENYA: Edge of Karura Forest, 4 miles from Nairobi on the Thika road, on twig of *Albizia maranguensis*, 1 July 1954, leg. B. VERDCOURT; animal pale, darker above, blue-grey with minute spotting, mantle minutely spotted, two young in the uterus; shell 2×1.6 mm., aperture 1×0.9 mm., with strong transverse striae and quite noticeable spiral striae.

Acanthinula expatriata Preston

KENYA: Igembi Hills, 6,000 ft., a single specimen in Brit. Mus. (Nat. Hist.) under an MS name of PRESTON's referring to the angular whorls. There are unfortunately still many hundreds of specimens of East African land and freshwater shells in various museums bearing MS names of PRESTON; some are new species, but the vast majority need correlating with existing names.

A. azorica Pilsbry

UGANDA: Mbarara to Kigezi; a single specimen in the Brit. Mus. (Nat. Hist.) under a PRESTON MS name referring to the oblique costulae seems to be identifiable with this species despite the great separation of the localities. There are some rather similar varieties of *A. aculeata* and only the comparison of abundant materials will solve the problems of the true affinities of the African species of this genus.

NOTES ON THE *PUPOIDES* MATERIAL

To elucidate the validity of the various species and varieties of *Pupoides* fairly long series of fresh specimens from their actual habitats are needed. Only the Zanzibar material is of this type. The Turkwell Drift material was fairly readily sorted into groups equivalent to PRESTON's four species of *Leucochiloides*. Drift material however, represents material from an unknown (possibly large) number of localities and can give no idea of the variation within a given colony. The various records have been plotted on a graph (Fig. 1) with height and breadth as axes. Each unit rectangle represents a class defined by height and breadth measured to the nearest tenth of a millimetre. The number in a particular class is indicated by filling in the rectangle to an extent proportional to the number. The dimensions of certain types are superimposed on the graph. The results are as follows. The Zanzibar colony forms a fairly compact group ranging from $2.1-2.5 \times 4.1-4.8$ mm (☐). The specimens in the drift material identified as *P. consanguineus* form a group $1.5-2.0 \times 3.3-4.2$ mm (■); those identified as *P. coenopictus* a group $2.2-2.6 \times 5.0-6.0$ (□) and those as *P. gaziensis* a group $2.0-3.0 \times 4.2-5.7$ (X). Five specimens thought to be close to *P. chanlerensis* are $1.8-2.0 \times 4.8-5.0$ mm (◐). It will be seen that *P. consanguineus* forms a rather distinct group but that *P. gaziensis*, *P. coenopictus* and *P. bawriensis* run into each other, the names having been given to large fat, large slender and small fat individuals respectively. The few specimens towards the far right of the diagram which have the highest height/breadth ratio have 6 whorls visible in front. The rest have 5—5½ visible from the front. The type dimensions of *P. consanguineus*, *P. sennaariensis*, *P. chanlerensis* and *P. zanguibaricus* fall into the group I have identified as *P. consanguineus* save that *P. sennaariensis* is said to have 7 whorls i.e. 6 would be visible from the front. A specimen 5×1.8 mm to the right of this group has the correct general shape and the right number of whorls. I consider that the four names mentioned are sinkable into one. The type dimensions of *P. gaziensis* and *P. bawriensis* are very similar and fall into the part of the graph where the Zanzibar material and the Turkwell Drift material identified as *P. gaziensis* overlap. The type dimensions of *P. soror* and *P. coenopictus* are scattered in the group identified as *P. coenopictus*. The type dimensions of *P. coenopictus* var. *sama-vaensis* can be exactly matched by numerous specimens in the Turkwell Drift material identified as *P. gaziensis*. Only good living series can indicate whether or not these ideas are sound.

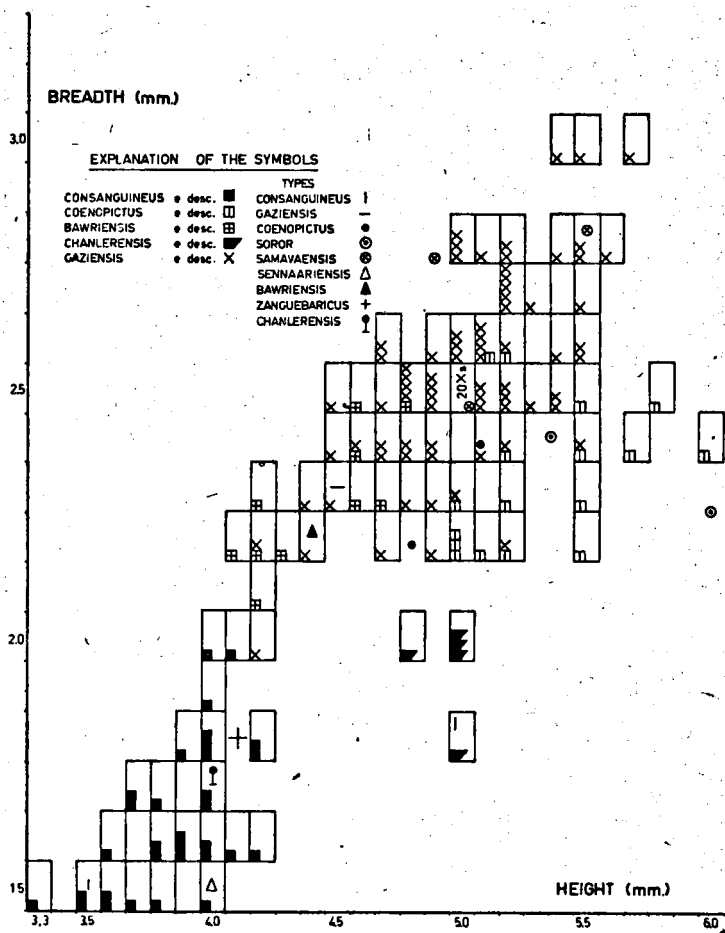


Fig. 1. Graph showing the measurements of various forms of *Pupoides*.

SUMMARY

Twenty species and varieties of Vertiginidae and Valloniidae are recorded from East Africa including two of the latter family for the first time. New synonymies are established in *Lauria* and *Pupoides*.

REFERENCES

- ADAM, W., 1954. Études sur les Mollusques de l'Afrique Centrale et des Régions Voisines 1. Vertiginidae et Valloniidae. Volume Jubilaire Victor van Straelen, vol. 2, pp. 725—817.
- CONNOLLY, M., 1939. A Monographic Survey of South African Non-marine Mollusca. Ann. S. Afr. Mus., vol. 33.

SAMENVATTING ¹⁾

Het eerste deel van deze publicatie bevat een lijst van de tot dusver uit Oost-Afrika bekende Vertiginidae en Valloniidae met verwijzingen naar de literatuur en opsomming van de vindplaatsen. In het tweede deel volgen een aantal nieuwe vindplaatsopgaven van sommige dezer soorten en een bespreking van de variatie van een aantal vormen van *Pupoides*. Meer materiaal is nodig om uit te maken met hoeveel soorten we hier te maken hebben.

¹⁾ Met toestemming van de auteur toegevoegd door de redactie.