

Notes on *Euonyma* MELVILL & PONSONBY in East Africa (Subulinidae).

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In the debris on the floor of the once extensive but now rapidly disappearing riverine forest, bordering the rivers in the Chania and Thika gorges some 27 miles north of Nairobi, a quite rich molluscan fauna is to be found. This includes a species of *Euonyma* but, although the shells are frequent, only one living specimen has been found despite careful searching by several collectors.

CONNOLLY (1923) synonymised *E. achilles* PRESTON with *E. magilensis* (CRAVEN) and specifically stated that juveniles have a thickened adult-looking peristome at all stages and that PRESTON had proposed a manuscript name for one of these stages — a Latin epithet meaning 'shortest'. One of the specimens PRESTON was going to use for a type is in the British Museum (Nat. Hist.) and was collected in the Igembi Hills, Kenya. I have, however, had serious doubts that only one species is involved; all the specimens found in the Thika gorges — some three dozen — have been roughly the same size, about 17.5-19.5 mm. in length. It seems very curious that if these are all juveniles no adults have been found, unless the animal radically changes its habits when over 2 cm. long in such a way that adult shells are never found. Then again it must be admitted that smaller shells have not been found either. In an attempt to throw some light on the problem, a careful comparison has been made of all the available material in the National Museum, Nairobi and I am grateful to the authorities of the Zoological Museum, Berlin and the British Museum (Nat. Hist.) for allowing me to examine the material in their collections. Fortunately I collected *E. magilensis* close to the type locality in the E. Usambaras, Tanganyika and have dissected it. In this species juveniles of all sizes are normally found together. A study of the shells and anatomy leaves no doubt that the Thika and Usambara snails belong to different species. The relationship of the Thika shells to *E. achilles* is not so evident, since very few specimens of the latter are available, but I believe the Thika material belongs to a distinct taxon for which I have taken up PRESTON's manuscript name. There are a number of endemic molluscs in these gorges one of which, *Maizania hildebrandti thikensis* VERDCOURT, retains juvenile characteristics when adult.

Key.

1. Shell olive-brown to buff-brown
1. Shell whitish or pale greenish-cream
2. Shell about 2 cm. tall
2. Shell about 5 cm. tall

E. magilensis.

2

E. curtissima.

E. achilles.

***Euonyma magilensis* (CRAVEN).**

Figs. 1, 2, 6, 7.

- 1880 *Bulimus magilensis* CRAVEN, Proc. zool. Soc. Lond., 1880: 217, pl. 22 f. 3.
1897 *Opeas magilensis*, — MARTENS, Beschalte Weichethiere, in Deutsch-Ost-Afr., 4 (1): 126.
1906 *Euonyma magilensis*, — PILSBRY, Man. Conch., (2) 18: 45, pl. 10 figs. 82, 83.
1923 *Euonyma magilensis*, — CONNOLLY, Ann. Mag. nat. Hist., (9) 11: 357.

Material I have seen is cited below and is in the National Museum, Nairobi unless otherwise stated.

Distribution: Tanganyika. Between the East Usambaras and Mt. Mlinga, Magila, A. CRAVEN (holotype in British Museum (Nat. Hist.)); East Usambaras, between Monga and Amani, in debris of *Newtonia*, *Cephalosphaera*, *Allanblackia* rain forest, 3000 ft., March 1950, B. VERDCOURT AF (animals preserved in spirit) and Amani, Dec. 1956, B. VERDCOURT (animals preserved in spirit); 'Tanga, Kwamkoa' (presumably Kwamkoro near Amani), KARASEK (Berlin); near Amani, Mt. Bomole, VOSSELER (Berlin); Usambara, CONRADT (Berlin); Tanga, KARASEK (Berlin); just north of Tanga, near Amboni, Mkulumuzi Caves, in forest remnants near the sea on craggy outcrops of Jurassic limestone, June 1950, B. VERDCOURT (VENMANS collection in Zoological Museum, Amsterdam); Zanzibar coast, in woods under stones, W. SCHMIDT (Berlin) (probably collected on the mainland and not on the island). Also in the Berlin Museum are some juvenile specimens from Uganda, Runsono and Butumbi collected by STUHL-MANN originally labelled '*Ennea excavata* juv.' but later placed under the above species. The specific identity of these remains uncertain; no *Euonyma* has been reported from that area.

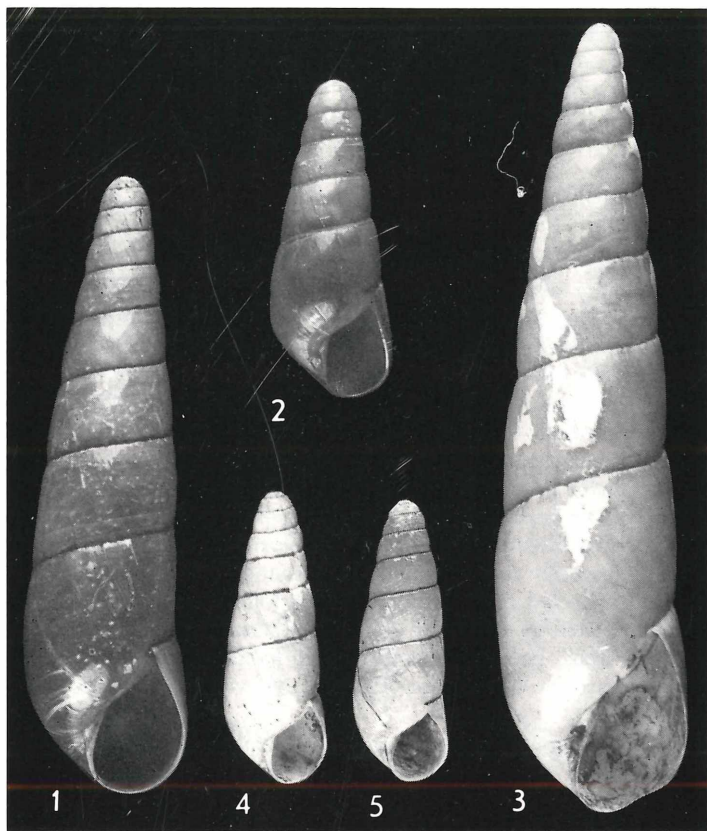
VERDCOURT specimen AF was collected in spirit and sent to the late H. WATSON who never found time to examine it; it had dried up by the time I retrieved it some ten years later and put it in the Nairobi Museum. This specimen has a broken apex and measures 31 mm. in length and 9.5 mm. in width; when fresh it was a rich buff-brown colour. The eggs were oval, white, 4.5×3.5 mm. and completely filled by the embryonic shell. The radula was extracted from the dried up animal and has the formula 30-32: C: 30-32 \times 89; the immediate laterals have an entocone but the marginal teeth seem to lack one. The two specimens obtained at Amani in 1956 are rich glossy orange-brown and measure 41×11 and 21×8 mm. respectively; eggs from the adult measured 4.7×4 mm. The largest of the Amboni shells measured 37 mm. in length. CRAVEN's original description gives the size as $30-35 \times 9$ mm. and of 9-10 whorls; MARTENS gives the dimensions of SCHMIDT's specimens as 50×8 mm. and of 9.5 whorls.

The sole is not divided into marked zones save near the tail, pale yellowish in front, greyish behind, smooth in front save for slight grooves along the margins; rear portion deeply striate in outer areas and slightly striate in inner area. Hind body and very short tail blackish-grey; fore-body paler grey, perhaps in part due to the inflated state of this portion in the preserved material. Just below and on either side of the jaw there are two subparallel raised ridges (fig. 7). These ridges or flaps are more produced in this species and the one later described than in any other animal of the family I have seen. In *Krapfiella mirabilis* PRESTON for example there are scarcely any ridges and reduced lower tentacles; in *Achatina* there are traces of flaps and four clear tentacles; in *Pseudoglossula* four tentacles and traces of flaps; but in *Subulona* and *Oreohomorus* there are flaps similar to those in the *Euonyma* under consideration, but less developed. The genital opening is not close to the tentacles. The lower part of the genital ducts is figured in fig. 6; the penis and its retractor run between the ocular retractors.

***Euonyma curtissima* n. sp.**

Figs. 4, 5, 8.

Shell narrowly conical, turrated, tapering, minutely rimate, obtuse at the apex and basally rounded, pale creamy-horn-coloured, glossy. Whorls 8, gradually increasing, slightly convex, with very faint curved striae, scarcely perceptible to the naked eye, strongest just near the suture; suture lightly impressed with a light impressed line below it on the last part of the last whorl (not present in most specimens but observable in the holotype). Aperture ovate-pyriform, acute above, smoothly rounded below; peristome rather thick, receding below.



Figs. 1-2. *Euonyma magilensis* (CRAVEN), $\times 2$. Tanganyika, E. Usambaras, Amani, B. VERDCOURT. — 1) shell of adult; 2) juvenile shell.

Fig. 3. *Euonyma achilles* PRESTON, $\times 2$, — presumed paratype, National Museum, Nairobi.

Figs. 4-5. *Euonyma curtissima* VERDCOURT n. sp., $\times 2$. Kenya, Thika, Chania Gorge, B. VERDCOURT. — 4) paratype; 5) holotype.

Dimensions: (of holotype) height 19.5 mm., breadth 7 mm.; height of aperture 5.75 mm., breadth 4 mm.; length of last whorl 9.8 mm. (of other specimens)

Height	19.5	19.5	19.5	18.5	18.0	18.0	17.7	17.5	17.0	16.5	16.0
Breadth	7.0	6.5	6.2	6.2	6.0	6.5	6.5	6.0	6.0	6.0	6.0

Distribution: Kenya. Thika, Chania Gorge, May 1961, B. VERDCOURT and same locality, 19 Sept. 1953, B. VERDCOURT (both lots in National Museum, Nairobi) and same locality, living specimen, May 1964, B. VERDCOURT (holotype, SMF 186867); Thika Gorge, 18 June 1960, R. M. POLHILL 147 (National Museum, Nairobi); Igembu Hills. (British Museum (Nat. Hist.)).

The lower part of the genital ducts is shown in Fig. 8. There are clearly some differences from *E. magilensis* in the structure of the penial complex but only one specimen of each has been available for examination. The radula has the formula 23 : C : 23 \times 72 and is very similar to that of the last species save that the entocones of the marginal teeth are distinctly more obvious.

***Euonyma achilles* PRESTON.**

Fig. 3.

1913 *Euonyma achilles* PRESTON, Rev. Zool. Bot. Afric., 3: 54, pl. 4 f. 7. (sphalm. *Enonyma*).

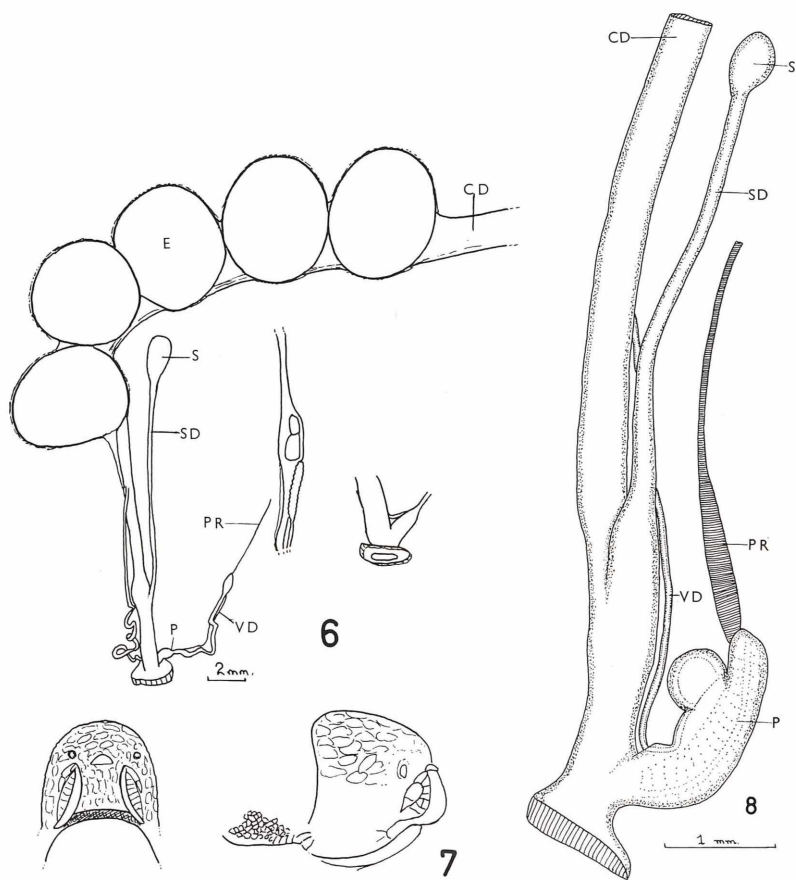
Very little material of this has been seen, namely two paratypes and a third specimen, probably also a paratype. In the National Museum, Nairobi is a single specimen (Fig. 3) (no. F. 281 with a very dubious locality and mixed with *Homorus (Subulona) egregius* PRESTON bearing the same number) which exactly matches the description and figure given by PRESTON. PRESTON's type measures 51 \times 12.5 mm. and the Nairobi specimen 52.5 \times 12 mm. PRESTON apparently presented to the Coryndon Museum in its very early days a considerable number of paratypes or topotypes but only the labels remain of most of them. The shells were destroyed by the careless activities of a former untrained worker who used them for display purposes! There is a label showing that a specimen of *Euonyma achilles* was presented to the museum and it is certain that it formerly accompanied the specimen mentioned above. No material has been collected recently but the type locality, Mt. Uruguess, has scarcely ever been visited by collectors during the past 50 years.

The narrow apex, pale colour and diverse habitat with quite different zoogeographic affinities do not support CONNOLLY's view that this is synonymous with *E. magilensis*.

Distribution: Kenya. Mathews Range, Mt. Uruguess, A. B. PERCIVAL (holotype in Musée Royal de l'Afrique Centrale, Tervuren; paratypes in British Museum (Nat. Hist.), Zoological Museum, Berlin and National Museum, Nairobi).

Apart from the species mentioned above, a number of other snails have been referred to the genus *Euonyma* by CONNOLLY and others. One group of smaller shells with strong, almost straight, rather spaced costulae are clearly not congeneric with the large glossy species already discussed but until some knowledge of their anatomy is available it is pointless to erect further generic names. There is no evidence whatever that the larger species are really congeneric with the type of *Euonyma* [*E. laeocochlis* (MELVILL & PONSONBY)] which

has a sinistral shell with an acute conoid, not blunt obtuse apex; the species with a blunt apex are only to be distinguished from *Opeas* by size and, as H. B. BAKER has shown, *Opeas* can be subdivided on anatomical grounds. Until a comparative study has been made of numerous Subulinidae, generic concepts in the African material are meaningless. Over 200 species have been described from eastern Africa and at least 50 more I have seen can not be associated with any of these; revisional work would be an immense task for which the necessary material has not been collected.



Figs. 6-7. *Euonyma magilensis* (CRAVEN). — 6) lower part of genital ducts from the adult specimen Fig. 1 with atrium and junction of vas deferens in inset; 7) jaw flaps of same specimen.

Fig. 8. *Euonyma curtissima* VERDCOURT n. sp. — lower part of genital ducts of holotype Fig. 5.

Symbols: CD common duct, E eggs, P penis, PR penial retractor, S spermatheca, SD spermathecal duct, VD vas deferens.

The costulate group comprises the following names but I feel that several will prove to be synonyms.

1923 *Euonyma arthuri* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 636, pl. 19 f. 19.

Distribution: Kenya. Mathews Range, Mt. Uraguess, A. B. PERCIVAL, (holotype in British Museum (Nat. Hist.)); paratype in Laboratoire de Malacologie, Paris); same locality, C. F. HEMMING (National Museum, Nairobi); S. Kinangop, Kiburu, R. M. POLHILL (National Museum, Nairobi).

1923 *Euonyma blayneyi* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 636, pl. 19 f. 18.

Distribution: Kenya. Larogi Hills, A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)).

1923 *Euonyma eussoensis* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 638, pl. 19 f. 22.

Distribution: Kenya. Eusso Nyiro, R. KEMP (holotype in British Museum (Nat. Hist.)).

1923 *Euonyma fulgens* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 635, pl. 19 f. 29.
subsp. *fulgens*.

Distribution: Kenya. Mt. Marsabit, A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)).

subsp. *nyiroensis* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 635, pl. 19 f. 30.

Distribution: Kenya. Mt. Nyiro, collector not stated but probably A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)).

1923 *Euonyma percivali* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 636, pl. 19 f. 17;
VERDCOURT, Ent. Mon. Mag., 93: 41 (1957).

Distribution: Kenya. Eusso Nyiro to Marsabit, A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)); S. Kinangop, in ants' nests, VENN FEY (National Museum, Nairobi); Turi, D. C. THOMAS (National Museum, Nairobi).

1923 *Euonyma permitens* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 637, pl. 19 f. 21.

Distribution: Kenya. Eusso Nyiro, Chanler's Falls, R. KEMP (holotype British Museum (Nat. Hist.)).

1923 *Euonyma topazon* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 637, pl. 19 f. 20.
subsp. *topazon*.

Distribution: Kenya. Mathews Range, Mt. Uraguess, A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)); Turi, D. C. THOMAS; Molo, 8000 ft., J. G. WILLIAMS; Nyambeni Hills, HEMMING, HOWLAND & VERDCOURT; Kakamega Forest, M. POWELL (all in National Museum, Nairobi).

subsp. *igambiensis* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 637

Distribution: Kenya. Igembi Hills, A. B. PERCIVAL (holotype in British Museum (Nat. Hist.)).

Note: Further collections may show that *topazon*, *percivali* and *permitens* are forms of one species.

The other species described from East Africa and referred to *Euonyma* do not belong to either of the two groups mentioned and can with some confidence be placed in other genera.

1923 *Euonyma pareimena* CONNOLLY, Ann. Mag. nat. Hist., (9) 12: 634, pl. 19 f. 53.

Distribution: Kenya. Mau Escarpment, DOHERTY (holotype in British Museum (Nat. Hist.)).

Note: This has curved striae as in those species referred by CONNOLLY to *Opeas* and *Curvella* and is very unlikely to be generically distinct from *Opeas lamoense* (MELVILL & PONSONBY).

1934 *Euonyma koitobboensis* GERMAIN, Bull. Mus. nation. Hist. nat. Paris, 1934: 379; Editors, J. de Conch., 92: 172, pl. 8 f. 20 (1952).

Distribution: Kenya. Elgon, Koitoboss, R. JEANNEL (holotype in Laboratoire de Malacologie, Paris).

Note: From the figure this appears to be a *Pseudopeas* or to be very closely related to *Opeas euschemon* CONNOLLY, itself almost certainly a *Pseudopeas*.

Streptostele monotropha (GERMAIN).

1934 *Euonyma monotropha* GERMAIN, Bull. Mus. nation. Hist. nat. Paris, 1934: 379; Editors, J. de Conch., 92: 171, pl. 8 f. 19 (1952).

Distribution: Kenya. Cherangani Hills, R. JEANNEL (holotype in Laboratoire de Malacologie, Paris).

Note: The figure suggested that this was really a species of *Streptostele* and an examination of the type in Paris showed that it is definitely a *Streptostele* allied to *S. lenta* (SMITH) being very closely ribbed with about 15 costulae per mm.

Corrections to my paper Arch. Moll., 96 (1/2): 43-62 (1967):

page 52, footnote 10, line 4: for 'bat' read 'but'.

page 60, after *ptychaxis*: for *Bulimus* (*Bulimus*) read *Bulimus* (*Buliminus*).

page 60, after *subolivacea*: for *Bulimus* (*Bulimus*) read *Bulimus* (*Buliminus*).

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