

THE STUDY OF SNAILS AND SLUGS IN EAST AFRICA

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Most members of the Society probably see a few snails during their rambles, but have not been able to identify them. Many may not have realised that they are worth collecting. Much material is still needed from East Africa particularly by local Museums. Every member can help by collecting. Material complete with the animal preserved in spirit is particularly needed. Almost any species of snail drowned, and then preserved is of great value for anatomical investigations. Any member thinking of specialising on a particular group could do a considerable amount of new work. The writer is willing to receive material at the East African Herbarium, P.O. Box 5166, Nairobi and attempt identifications. Any material received will be put in the study collection of the Coryndon Museum.

Snails and slugs belong to the Mollusca which is the second largest group in the animal kingdom, following the insects in abundance of individuals and species. It comes a very poor second, however, there being perhaps about 70,000 described molluscs as against a million or more insects. The phylum Mollusca contains a wide variety of animals which would perhaps not be associated with each other by a layman. Octopi, mussels, chitons, slugs, sea and land shells all belong to the same phylum. It is not a very easy group to define; most of the members of it have a shell which is laid down by tissues known as the mantle; those having a head develop a highly characteristic rasping organ termed a radula (about which more will be said in another article); most species have a muscular foot used for locomotion; and all have a rather complicated nervous and reproductive system. In this paper we are concerned with only two out of the five main groups contained in the phylum—the Univalves (Gastropoda) and the bivalves (Lamellibranchiata). Snails and slugs are of course closely related to marine shells but students and collectors usually concentrate on one group or the other.

Non-marine mollusca have always been favourites with amateur naturalists and although the group impinges but little on the layman, there is a very large amount of literature devoted to the subject. There are two national journals in England alone and 15 others published throughout the world which are well-known. There are innumerable obscure ones. Despite this general activity the East African fauna is not well-known. If one finds a snail in Europe, North America or South Africa there are lavishly illustrated monographs which render naming it easy. If, however, one tries to name a snail in Kenya one is faced with a very difficult task. There is no faunistic work which has in it a compilation of the scores of scientific papers which have been written on East African land and fresh-water mollusca. This literature is very scattered in German, Italian, French and English language journals. Unless one has a very good knowledge of the genera of tropical African mollusca, and an extensive library the naming of individual specimens is difficult in the extreme.

There is no professional specialist in the group in East Africa, neither is there a good collection from which one could at least name by comparison. The existing collection at the Coryndon Museum is a good nucleus and when organized and expanded will be invaluable to anyone wishing to study East African Mollusca.

Mention should be made of the annually published Zoological Record, a publication the more recent volumes of which are available at the library of the Coryndon Museum. Abstracts of nearly all papers published on Mollusca are included in the appropriate section of this publication and readers can see what work has been done.

There are other difficulties. The study of East African mollusca is strangled by the indifferent work of some of the previous students. These people described large numbers of species from poor "dead" (i.e. devoid of animal) shells without reference to anyone else's work at all. The whole stage is therefore cluttered with synonymy. One sends the same species to three people at different museums and as often as not one gets three different names back. This state of affairs* always happens until a group is revised and synonymies sorted out. In many groups such revisions were carried out long ago (birds, mammals, butterflies etc). Without a knowledge of the anatomy of a snail it is often quite impossible to put it in its correct genus. The dissection of a minute snail is a very skilled job. These early workers paid no attention to this side and the correct genus of several hundred species will be unknown until material is reobtained from the type localities and dissected. It will be as well to give a very rough idea of the work which has been done and what books are available. All the early explorers and many missionaries (French in particular) picked up a few shells e.g. Speke and Grant, Burton, Schweinfurth, Last, Grandidier, Emin Pasha, et al. and these were described chiefly by J. Bourguignat, a Parisian naturalist well-known for his incredible splitting and enormous output, who has left chaos everywhere, Crosse and Ancey, both French, Edgar Smith of the British Museum, the greatest expert of his day, and many others. Their papers are to be found in *Journal of Conchology*, *Proc. Malacological Soc.*, *J. de Conchyliologie*, and private publications. The exceedingly odd fauna of Lake Tanganyika which has led to raging arguments concerning the history of the lake has a voluminous literature of its own which increases yearly. The earlier literature is admirably summarised by Cunnington (1920). The first compilatory work is that by the great expert Edouard von Martens (1898) but it deals mostly with Tanganyika. Although it is exceedingly rare and the nomenclature outdated it is very useful since nothing else has appeared. The monumental works on the mollusca of the Belgian Congo by Pilsbry and Bequaert (1919 & 1927) are of great value particularly where the Mollusca of Uganda are concerned. Connolly's works on the mollusca of Portuguese East Africa (1925) and South Africa (1939) are also helpful. During this present century numerous papers have been published by Preston, D'Ailly, Dautzenberg, Connolly, etc. and these may be found in *Proc. Zoo. Soc.*, *Rev. Zool. Afr.*, *Ann. Mag. Nat. Hist.*, and elsewhere. Preston's work was based

entirely on shells and he described things in the wrong genera and even families. He was a dealer and his work is indescribable. A very useful summary of his new species is given by Schouteden (1936) and indication is made as to which of his types are at the Congo Museum (a very large percentage are). Lists of Smith's and Connolly's papers may be found in the mollusca library of the British Museum.

Following is a list of the families represented in East Africa together with the main genera which they contain. Typical representatives of the families are shown on Plate 1. In a future paper a key to the families will be given and mention made of the most important species.

GASTROPODA (Shells in one piece—usually twisted)

Order PULMONATA (air-breathers)

Fam. Streptaxidae: a predominating group in E.A., often minute, carnivorous. Chief genera:— *Gulella*, *Ptychotrema*, *Edentulina*, *Gonaxis*, *Marconia*, *Tayloria*, *Steptosteles* and *Varicosteles*. (Fig. 1.)

Fam. Helicarionidae: thin-shelled species with animal barely able to retract into its shell. *Helicigrion*, *Sheldonia*, *Thapsia*, *Zingis* etc. (Fig. 2).

EXPLANATION OF THE FIGURES.

1. *Gulella fortidentata* (Sm.) Kondoa-Irangi, T.T., Streptaxidae.
2. *Helicarion* sp., Helicarionidae.
3. *Ledoulxia* sp. Ledoulxiidae.
4. an Urocyclid slug, Urocyclidae.
5. *Achatina fulica* Bowdich, Kenya coast, Achatinidae.
6. a European species of *Delima* to show the shape of the Clausiliidae.
7. *Cerastus nobilior* Preston, Muguga, Kenya, Enidae.
8. *Caecilioides* sp., Ferusaciidae.
9. underside of a Veronicellid slug.
10. *Lymnaea caillaudi* (Bgt.), Moshi, T.T. Lymnaeidae.
11. *Burnupia* sp., Ancyliidae.
12. *Pila adusta* (Rve.), Zanzibar, Pilidae.
13. *Biomphalaria sudanica* (Mts.), Rungwe, T.T., Planorbidae.
14. *Caelatura* sp., Unionidae.
15. *Melanoides tuberculata* (Mull.), L. Kivu, Thiaridae.
16. *Viviparus* sp., Viviparidae.
17. *Bithynia humerosa* Mts., L. Kivu, Hydrobiidae.
18. *Tropidophora* sp., Pomatiidae.

N.B.—Many of the figures are generalised and are merely to give an idea of the shapes encountered in the various families.

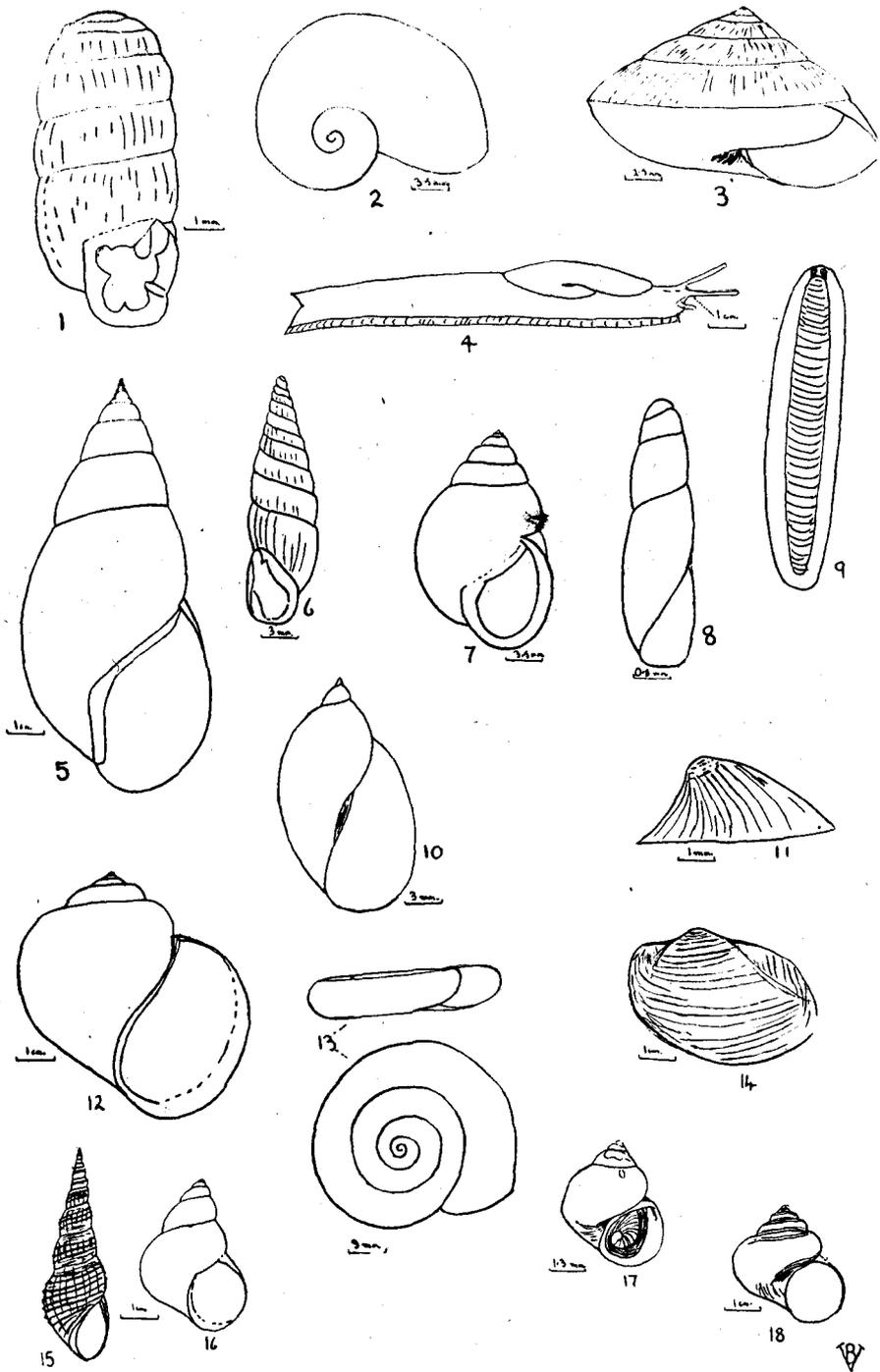


Plate 1.

Fam. Ledoulxiidae: conical thin-walled shells usually very sharply angled on periphery. *Ledoulxia*, *Trochozonites*, *Sitala*, *Kaliella* etc. (Fig. 3.)

Fam. Urocyliidae: slugs, external shell absent. *Trichotoxon*, *Atoxon*, etc. (Fig. 4.)

Fam. Vitrinidae: like small *Helicarions* superficially. *Vitrina*.

Fam. Endodontidae: usually minute and flattened snails. *Trachycystis*, *Punctum*.

Fam. Helicidae: true snails such as English 'Garden Snail' usually at high altitudes in E.A. *Halolimnohelix*, and numerous dubious genera proposed by Preston in the Zonitidae !

Fam. Achatinidae: a predominating group, often very large, turreted. *Achatina*, *Burtoa*, *Limicolaria*, *Opeas*, *Pseudopeas*, *Curvella*, *Subulina*, *Pseudoglessula*, *Krapfiella*, *Bocageia*, *Nothapalus*, *Zootecus*, etc. (Fig. 5.)

Fam. Clausiliidae: elongate snails abundant in Europe, China, etc. but very rare in Africa; only two species have been described, both in the genus *Clausilia* but certainly not belonging to it. I have found a single specimen of an *Austrobalea* at Moroto, Uganda (Oct. 1952). (Fig. 6.)

Fam. Pupillidae: minute cylindrical shells of temperate places. *Truncatellina*, *Pupilla*, *Pupoides*, *Jaminia*, *Fauxulus* (latter two Preston records).

Fam. Vertiginidae: Preston described an "*Alaea*" (=Vertigo) but I know nothing of it.

Fam. Enidae: conical shells. *Cerastus*, *Conulinus*, *Rachidina*, *Rachistia* etc. (Fig. 7).

Fam. Pyramidulidae: predominantly temperate, mostly minute species. Preston has described an *Acanthinula* from Mt. Kenya.

Fam. Ferussaciidae: minute white elongate snails. *Caecilioides*. (Fig. 8).

Fam. Succineidae: usually semiaquatic, but in E.A. often found on rocks and bark. *Succinea*.

Fam. Veronicellidae: peculiar flattened slugs: *Veronicella* etc. (Fig. 9).

Fam. Lymnaeidae: abundant conical aquatic snails with mouth on right hand side. *Lymnaea*. (Fig. 10).

Fam. Planorbidae: flattened disc-like snails, or like *Lymnaea* with mouth on opposite (left) side, abundant in stagnant water. '*Planorbis*', *Biomphalaria*, *Gyraulus*, *Segmentina*, *Bulinus*, *Physopsis*, etc. (Fig. 13).

Fam. Ancyliidae: freshwater limpets, minute shells resembling the familiar marine limpets in shape but not at all related. Several "*Ancylus*" have been described from E.A. but do not belong to that genus. (Fig. 11).

Order PECTINIBRANCHIA (mouth of shell with a close-fitting lid).

Fam. Cyclophoridae: land snails with very rounded whorls. *Maizania*.

Fam. Pomatiidae: similar to last but with strong spiral grooves. *Tropidophora*. (Fig. 18).

Fam. Pilidae: large globular aquatics often in swamps, *Pila*, *Lanistes*. (Fig. 12).

Fam. Viviparidae: similar to last but more conical. *Viviparus*, *Neothauma*. (Fig. 16).

Fam. Thiariidae: mostly elongated water snails: *Cleopatra*, *Melanoides*, and 16 genera entirely endemic to Lake Tanganyika which are peculiarly marine in their appearance. (Fig. 15).

Fam. Syrnolopsidae: small shells peculiar to Lake Tanganyika. *Syrnolopsis*, *Anceya*.

Fam. Hydrobiidae: Minute aquatics. *Bithynia* (= *Bulimus*). (Fig. 17).

Fam. Assimineidae: small aquatic snails usually estuarine. Preston has described an inland genus which is dubious. *Eussoia*, *Assimineia*.

Order ASPIDOBRANCHIA.

Fam. Hydrocenidae: small littoral shells, mostly South African, one from Kenya. *Hydrocena*.

Fam. Neritidae: familiar nerites of the sea. *Neritina* occurs in estuaries.

Little has been said about the Bivalves but the following families and genera occur in East Africa: Unionidae (*Unio*, *Caelatura*, *Parreysia*, *Grandidiera*, etc.). Mutelidae (*Aspatharia Mutela*, *Iridina*, *Pseudospatha*, etc.). Cyrenidae (*Corbicula*), Etheriidae (*Etheria*). Sphaeriidae (*Pseudocorbicula*, *Sphaerium*, *Pisidium*.) (Fig. 14).

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