

# A new record of '*Achatina*' *vassei* Germain, 1918 (Gastropoda, Pulmonata, Achatinidae) from Mozambique – an unsolved problem

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'*Achatina*' *vassei* Germain, 1918, of which so far only the holotype is known (figured), is now recorded from Gorongosa National Park in Mozambique (Sofala Province) north of the road Beira-Mtare (Zimbabwe). The systematic position is still unclear because of the lack of anatomical data; this taxon is probably a restricted-range species centred on the plateau of Central Mozambique. A list of the terrestrial molluscs of the 'Greater Gorongosa Ecosystem' from the literature and specimens in the Leiden Museum is added; *Curvella whytei* E.A. Smith, 1899, is recorded as new for Mozambique.

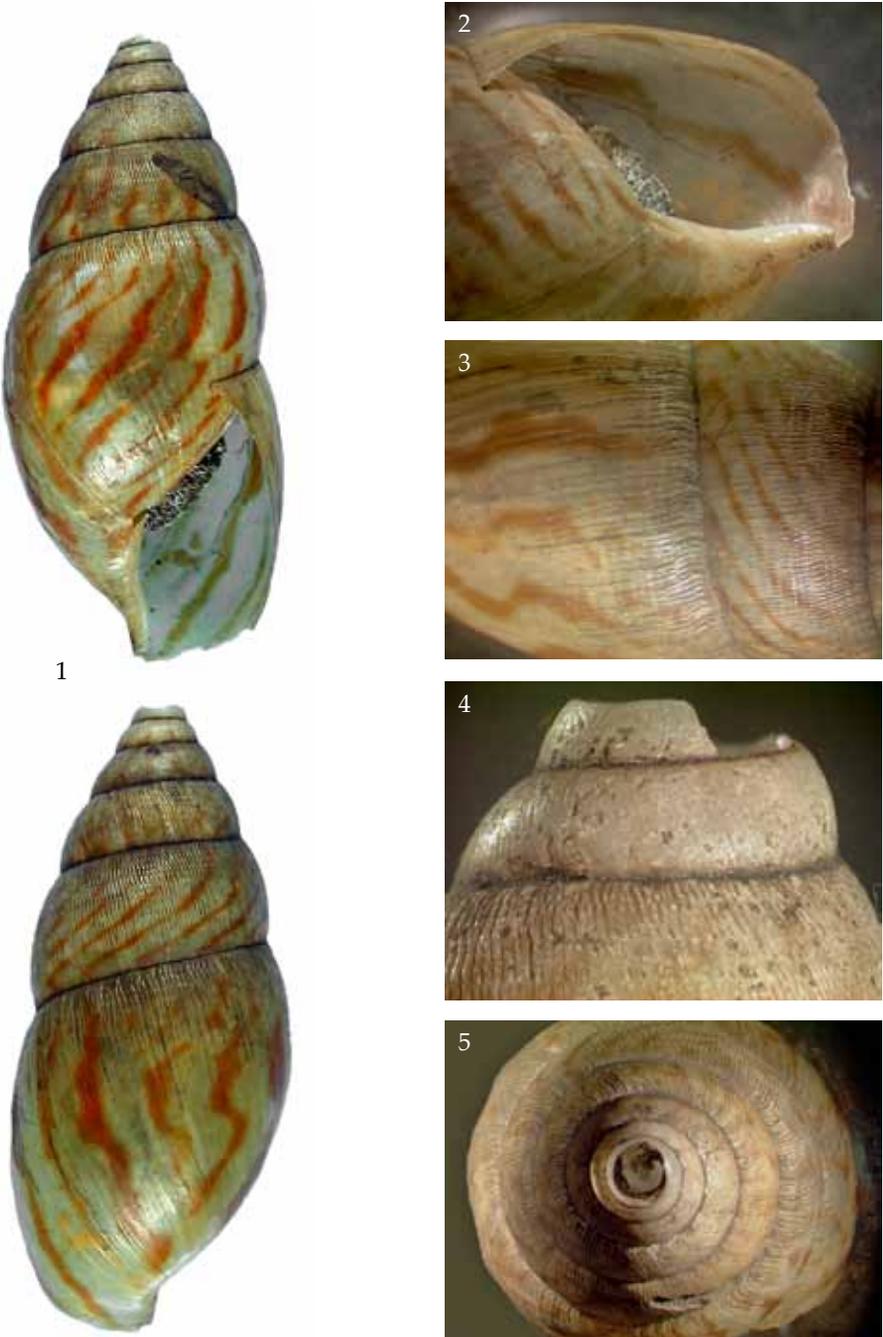
## Introduction

In 1975 the well-known South African ecologist/conservationist Ken L. Tinley donated a lot of mollusc material from the Gorongosa National Park s.l. in Mozambique (Sofala Province) to the author; among this there is a sample of nine smallish achatinid shells (Netherlands Centre for Biodiversity Naturalis, Leiden: RMNH). These defied identification for many years; visits to various museum collections throughout the years yielded only doubtful opinions. Only recently renewed examination has revealed their real identity. Contacts with colleagues Drs Mary Seddon and Ben Rowson in the National Museum of Wales (Cardiff) resulted in colour photos of the holotype of '*Achatina*' *vassei* (figs 1-5) becoming available for scrutiny which made abundantly clear that Tinley's shells belong to this taxon.

In view of the fact that there is only one specimen in the type lot in the Muséum National d'Histoire Naturelle, Paris (MNHN Mollusca No. 21490) and because the original author only gives measurements of a single shell (which data more or less agree with those of the specimen in question), the only conclusion can be that the Paris museum shell is the holotype of '*Achatina*' *vassei*. Incidentally, Germain's figs 29-30 on p. 368, although intrinsically poor, obviously do depict the shell under discussion; details such as the flame pattern, which is highly individualized in achatinid shells, agree closely<sup>1</sup>. As witnessed by Germain's figures initially the shell had an undamaged apex and the original description states that there are 7½ whorls.

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<sup>1</sup> Invoking ICZN Recommendation 73F, Avoidance of assumption as holotype, and thus considering the shell to represent a lectotype rather than a holotype, does not seem appropriate here.



Figs 1-5. Different views of the holotype of '*Achatina*' *vassei* Germain, 1918 (MNHN, Mollusca No. 21490): Andrada, Mozambique. Note shape and sculpture; actual length/height 40.5 mm (apical whorls lost). Photographs Dr Ben Rowson (National Museum of Wales, Cardiff).

### Systematic part

The new material is labelled as follows: 'Mozambique, Sofala Province, Gorongosa area, Cheringoma Plateau, scarp facing Rift Valley, in miombo and dry forest on white sand overlying calcrete, 10.v.1973, leg. K.L. Tinley, don./det. A.C. van Bruggen'. In Central-Southern Africa 'miombo' is a type of woodland dominated by trees of the genera *Brachystegia*, *Julbernardia* and *Isoberlinia*, all belonging to the subfamily Caesalpinioideae of the family Fabaceae (formerly Leguminosae). For measurements of the various specimens (figs 6-12), see table 1. The above specimens were collected together with material of two other land snail species (RMNH, see also below): *Tropidophora* (*Ligatella*) *ligata* (Müller, 1774) and *Pseudoglessula* (*Kempioconcha*) *kirki* (Dohrn, 1865).

The meagre literature records available are the following:

#### *Achatina vassei* Germain, 1918.

*Achatina* (*Achatina*) *vassei* Germain, 1918: 368, figs 29-30, type locality: 'environs d'Andrada' (figs 1-5), holotype in Muséum National d'Histoire Naturelle, Paris, Mollusca No. 21490.

*Achatina vassei*; Connolly, 1925: 169 [original quotation attributed to p. 161 instead of p. 368], locs. Andrada, Mt. Vengo, 'The type is immature, the measurements of a full grown adult being 63.2 × 24.3 mm'; Connolly, 1939: 321, loc. only 'Andrada District', no more mention of Mt. Vengo, only measurements given 40.5 × 18.0 mm [close to those given by Rowson in table 1, evidently applying to the same shell], aperture 20.0 × 8.5 mm, no more 'adult' shell discussed.

*Achatina* (*Lissachatina*) *vassei*; Bequaert, 1950: 50 [also on p. 203: specimens of *Archachatina* (*Tholachatina*) *sandgroundi* Bequaert, 1950, 'in some collections' identified as *Achatina vassei*]; Van Bruggen, 1965: 80; Mead, 1995: 258 (*A. vassei* only mentioned as a species to be discussed at a later stage).

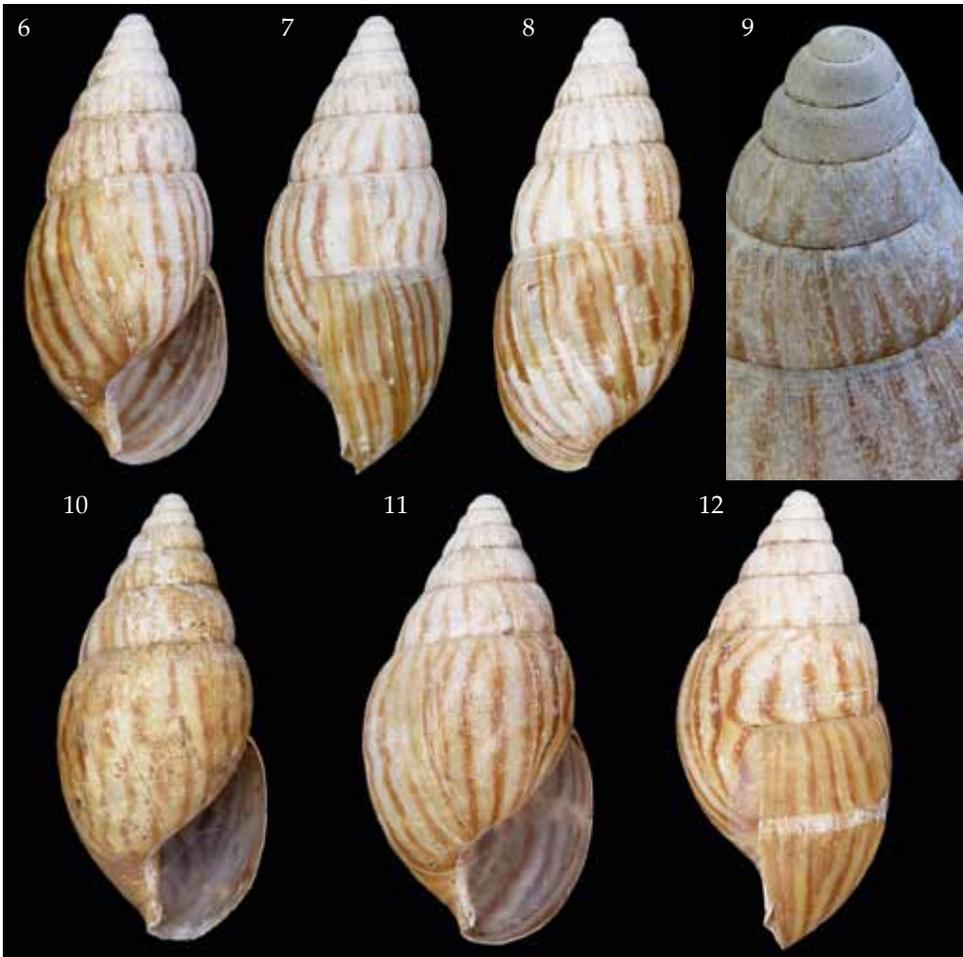
'*Achatina*' *vassei* is not mentioned in Mead (2004), who most likely rightly considered central Mozambique not to belong to South Africa s.l.

Description.— The new material (figs 6-12) may be described as follows. The somewhat thin and fragile shell is small compared to what is known from the other achatinids in southern Africa (length/height <45 mm with about 7½ whorls; this is in contradiction to Connolly, 1925: 169, who probably attributes a wrongly identified 63.2 mm long shell to this taxon – a statement *not* repeated in his 1939 monograph).

The length is always more than two times the maximum diameter, which is situated at about the level of the apex of the aperture. The length of the aperture is always less than half that of the shell; the length of the last whorl in front view is always under three quarters of the total length. The apex is comparatively blunt. The whorls are hardly convex, including the body whorl. The aperture is fairly narrow (greatest width just under

Table 1. Measurements in mm of four specimens of '*Achatina*' *vassei*, the first three referring to the largest shells of the Gorongosa area sample (RMNH) and the bottom one to the holotype specimen (MNHN, apex damaged, whorls 7½ in original description; type data supplied by Dr B. Rowson or calculated from photos). The abbreviation l/d stands for the relation length/major diameter as an indication of the shape of the shell.

height × max. diameter	l/d	length last whorl	aperture	whorls
44.0 × 19.7	2.21	30.4	19.3 × 10.5	7½
43.5 × 19.7	2.21	30.0	16.6 × 10.7	7½
43.5 × 19.7	2.21	28.0	18.0 × 10.4	7¼
40.5+ × 17.5	2.31	27.8	17.1 × 9.8	[6+]



Figs 6-12. Different views of various specimens of '*Achatina*' *vassei* in the RMNH sample: Cheringoma Plateau, Gorongosa area, Mozambique. Actual length/height 44.0 mm (figs 6-9), 43.5 mm (fig. 10), 40.4 mm (figs 11-12). Note repaired damage in figs 11-12. Photographs Dr A.S.H. Breure (RMNH).

the middle) with a thin outer lip; the columella is white, short and narrow, concave with a slight twist, obliquely truncate close to the base. The nepionic whorls are wrinkled and granulate, though always worn in the material studied. The sculpture consists of regular and close wrinkles resulting in a reticulate-granulate pattern, very prominent below the sutures but well visible on all whorls; in addition there are very faint growth striae. All specimens exhibit a close and fine zebra pattern with irregular, orange-brown flames on a yellowish-brown background; there is a very thin and deciduous periostracum. On the whole this seems to be a well-defined taxon because of the size, shape and sculpture of the shell.

Unfortunately no material is available for investigating the vital genital anatomy. Incidentally, as shown in figs 1-5, the animal of the type is still present withdrawn in

the shell. This implies that, after more than a century, at least studies of a molecular nature and of the radula are still feasible. However, the latter can only be done after destroying the shell which as regards a holotype of a presumably rare species is certainly not advisable.

The type locality Andrada (18°52'S 32°53'E) is situated just east of the border with Zimbabwe NE Mtare (formerly Umtali). The Gorongosa National Park s.l. (see below) is located somewhat to the north of the road Mtare-Beira. The United States Board on Geographic Names Gazetteer for Mozambique (1969) records 18°45'S 34°20'E for (Parque Nacional da) Gorongosa. Clancey (1996) shows the Gorongosa National Park (co-ordinates given for the headquarters camp at Chitengo) as 18°59'S 34°21'E and the Cheringoma Plateau as 18°30'-19°05'S 34°50'-35°10'E. Limited availability of material in collections suggests that '*A.*' *vassei* is probably a restricted-range species centred on the plateau of Central Mozambique. Of course, this is an area where little malacological exploration has been effected. The collector of the type shell, Guillaume Vasse, was a French big game hunter, who spent roughly two years (1904-1907) in central Mozambique with his wife, collecting mammals, birds, insects, molluscs (very few), and plants for the Paris museum. At that time there was already a railway connection from Beira through to Cape Town via Zimbabwe.

There is no material of this taxon in the Natal Museum, Pietermaritzburg (South Africa) (Herbert, in litt., 5.iii.2009) or the National Museum of Wales, Cardiff (Rowson, in litt., 22.ii.2009). In addition, '*A.*' *vassei* is not represented in the extensive Malaŵi collections in the Netherlands Centre for Biodiversity Naturalis, Leiden, nor among the unidentified Achatinidae (both dry and spirit collections) in this institution.

## Discussion

Since Mead's seminal papers (Mead, 1994, 2004) there are only three possibilities as regards the generic classification of '*Achatina*' *vassei*. There are two very characteristic monotypic genera: *Metachatina* Pilsbry, 1904, and *Burtoa* Bourguignat, 1889. In addition, *Bequaertina* Mead, 1994, in southern Africa is only represented by one species. '*Achatina*' *vassei* obviously does not belong to any of these three genera.

In the north-eastern part of southern Africa only three other genera of achatinids are known to occur, i.e. *Achatina* Lamarck, 1799 (widely distributed in sub-Saharan Africa; in southern Africa about ten species), *Cochlitoma* Férussac, 1821 (according to Mead, loc. cit.: 425 'endemic to southern Africa, south of the Tropic of Capricorn', at least 35 taxa), and *Bruggenina* Mead, 2004 (Mead, loc. cit.: 445 'The species in this Rift Valley genus centre in Tanzania, with outposts in Rwanda and Zimbabwe'; only one species in southern Africa). All three genera are easily defined by details of their genital anatomy. However, the shells of these taxa do show a great variety of size, shape and sculpture, so that at the moment no suggestion as to generic classification of '*Achatina*' *vassei* can be made.

Bequaert (1950: 50, 203) notes that 'in some collections' specimens of *Archachatina* (*Tholachatina*) *sandgroundi* Bequaert, 1950 [now *Bruggenina sandgroundi*], were identified as '*Achatina*' *vassei*. Comparison of the specimens under discussion with material of

*Bruggenina sandgroundi* shells in the Leiden Museum (Zimbabwe, Mt. Selinda, Chirinda Forest, c. 1200 m, 14-26.I & 6-8.II.1959, leg./don. A.C. van Bruggen) shows that there are few general differences apart from the fact that the apex of the *Bruggenina* shells is more dome-shaped than that of the '*A. vassei*' shells, and, of course, *B. sandgroundi* grows to a much larger size (<60 mm, fide Van Bruggen, 1972). This comparison therefore does not contribute to the generic allocation of '*A. vassei*'.

#### Land snails of the 'Greater Gorongosa Ecosystem'

The terrestrial malacofauna of Mozambique is underreported and undercollected so that on the whole exact data are scarce. Therefore it seems worthwhile to add a list of taxa of the Gorongosa area derived from the meagre available literature and the unpublished Tinley material in the Leiden Museum. The 'Parque Nacional da Gorongosa' does not include Mt. Gorongosa (situated to the west of the national park) nor the Cheringoma Plateau (situated to the east of the national park). National park boundaries have been altered in the course of last century but according to Tinley (in litt. and pers. comm.) the whole area may be termed the Greater Gorongosa Ecosystem. Except for the material from Mt. Gorongosa, most localities are inside or close to the borders of the Gorongosa National Park (now much degraded). Labelling includes ecological data. The following taxa have been recorded.

##### Pomatiidae (olim Pomatiasidae) Newton, 1891

*Tropidophora (Ligatella) anceps* (Von Martens, 1878): 2, Cundue Ravine, Cheringoma, beneath trees on N. rim of ravine, white sand over limestone, 27.v.1971 (compared to authenticated material in The Natural History Museum, London, 1976).

*T. (L.) insularis* (Pfeiffer, 1852)/*transvaalensis* (Melvill & Ponsonby, 1895): 2, Bunga inselberg, in thickets and forest on base of rock outcrops, viii.1968.

*T. (L.) ligata* (Müller, 1774): 1, Rift Valley floor, dry forest (= Tongaland dry forest) on white sand/Sangarasa dry forest (Rd 3) understory and forest litter, v.1971; 1, Rift Valley floor, mopane savanna wood on calcareous clays with sandy surface and thicket patches, mopane community rd. 5, collected from litter beneath mopane trees and shrubs, iii.1971; 1, Cheringoma Plateau, Urema-Muanza road, miombo woods on red sand, grass 100 cm ht., thicket patches, 8.v.1973; 4, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfizi Ravines, thicket and forest patches on limestone scarp, v.1969; 3, Cheringoma Plateau, scarp facing Rift Valley, in miombo thicket on white sand over calcrete, 10.v.1973.

##### Cerastidae Wenz, 1923

*Rachis jejuna* (Melvill & Ponsonby, 1893): 1, Rift Valley floor, mopane savanna wood on calcareous clays with sandy surface and thicket patches, mopane community rd. 5, collected from litter beneath mopane trees and shrubs, iii.1971; 2, Cundue Ravine, Cheringoma, beneath trees on N. rim of ravine, white sand over limestone, 27.v.1971.

*Rachis* spec. (Verdcourt, 1961: Mt. Gorongosa).

*Rhachistia sticta* (Von Martens, 1859); 4, Bunga inselberg, in thickets and forest on

base of rock outcrops, viii.1968; 1, Bunga inselberg, in thickets on rock outcrops on edge of Rift Valley, viii.1968; 2, Rift Valley floor, dry forest (= Tongaland dry forest) on white sand/Sangarasa dry forest (Rd 3) understory and forest litter, v.1971; 1, Cundue Ravine, Cheringoma, beneath trees on N. rim of ravine, white sand over limestone, 27.v.1971; 1 juv., Cheringoma Plateau, Urema-Muanza road, miombo woodland on white sand with grey at 130 cm (cf. poor coll. on red sand miombo), 10.v.1973; 11, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfizi Ravines, thicket and forest patches on limestone scarp, v.1969.

#### Achatinidae Swainson, 1840

'*Achatina*' *vassei* Germain, 1918 (see above).

*A. (Lissachatina) immaculata* Lamarck, 1822: 6, Bunga inselberg, in thickets on rock outcrops on edge of Rift Valley, viii.1968; 2, Rift Valley floor savanna, v.1973.

*Achatina* cf. *craveni* E.A. Smith, 1881: 1, Gogogo summit area, on open montane grasslands, c. 1800 m, 10.xi.1971.

#### Subulinidae Fischer & Crosse, 1877

*Homorus manueli* Preston, 1910: 12, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfizi Ravines, thicket and forest patches on limestone scarp, v.1969.

*Curvella nyasana* E.A. Smith, 1899: 1, Cheringoma Plateau, Urema-Muanza road, miombo woodland on white sand with grey at 130 cm (cf. poor coll. from red sand miombo), 10.v.1973.

*C. whytei* E.A. Smith, 1899: 4, Bunga inselberg, in thickets and forest on base of rock outcrops, viii.1968 (compared to type material in The Natural History Museum, London, 1976). This taxon, described from Malaŵi and also known to occur in Tanzania (Verdcourt, 2006), appears to be new for the fauna of Mozambique.

*Pseudoglessula (Kempioconcha) boivini* (Morelet, 1860): 1, Cheringoma Plateau, Urema-Muanza road, miombo woods on red sand, grass 100 cm ht., thicket patches, 8.v.1973; 24, Cheringoma Plateau, Urema-Muanza road, miombo woodland on white sand with grey at 130 cm (cf. poor coll. from red sand miombo), 10.v.1973.

*P. (K.) cressyi* Connolly, 1925 (Van Bruggen, 1964: Mt. Gorongosa).

*P. (K.) kirki* (Dohrn, 1865) (Van Bruggen, 1964: Mt. Gorongosa); 31 (+6 juv. + 2 eggs), Cheringoma Plateau, scarp facing Rift Valley, in miombo thicket on white sand over calcrete, 10.v.1973; 10, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfizi Ravines, thicket and forest patches on limestone scarp, v.1969.

#### Streptaxidae Gray, 1860

*Gonaxis cressyi* Connolly, 1922: 3, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfizi Ravines, thicket and forest patches on limestone scarp, v.1969.

*G. elongatus* (Fulton, 1899) (Van Bruggen, 1964, s.n. *Afristreptaxis elongatus*: Mt. Gorongosa); 2, Gogogo summit grassland, c. 1800 m (snail confined to grasslands at 1800 m), 1969 & 1971; 6, Gogogo summit area, on open montane grasslands, c. 1800 m, 10.xi.1971.

*G. gwandaensis* (Preston, 1912): 2, Rift Valley floor, mopane savanna wood on calcareous clays with sandy surface and thicket patches, mopane community rd. 5, collected from litter beneath mopane trees and shrubs, iii.1971; 3, Cundue Ravine, Cheringoma, beneath trees on N. rim of ravine, white sand over limestone, 27.v.1971.

*Streptostele* (*Raffraya*) *inconspicua* Van Bruggen, 1964 (Van Bruggen, 1964: Mt. Gorongosa).

*Gulella lawrencei* Van Bruggen, 1964 (Van Bruggen, 1964: Mt. Gorongosa)<sup>2</sup>.

*G. sexdentata* (Von Martens, 1869): 1, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfeci Ravines, thicket and forest patches on limestone scarp, v.1969.

#### Charopidae Hutton, 1884

*Trachycystis* (*Dendrotrichia*) *syloicola* Van Bruggen & Verdcourt, 1965 (Van Bruggen & Verdcourt, 1965: Mt. Gorongosa).

#### Helicarionidae Bourguignat, 1877

*Sitala jenyysi* (Pfeiffer, 1845): 2, Cheringoma Plateau, Urema-Muanza road, miombo woods on red sand, grass 100 cm ht., thicket patches, 8.v.1973.

#### Urocyclidae Simroth, 1889

'*Atoxon*' spec. (Verdcourt, 1961: Mt. Gorongosa; see Van Goethem, 1977: 155, material not traced).

*Zingis brunneofasciata* Verdcourt, 1961 (Verdcourt, 1961: Mt. Gorongosa).

*Trochonanina bloyeti* Bourguignat, 1889: 1, Cheringoma Plateau, Urema-Muanza road, miombo woodland on white sand with grey at 130 cm (cf. poor coll. from red sand miombo), 10.v.1973.

*T. elatior* (Von Martens, 1866): 8, Cheringoma Plateau, scarp forest/thicket between Cundue and Nhamfeci Ravines, thicket and forest patches on limestone scarp, v.1969 (compared to authenticated material in The Natural History Museum, London, 1976).

*T. mozambicensis* (Pfeiffer, 1855): 1, Cundue Ravine, Cheringoma, beneath trees on N. rim of ravine, white sand over limestone, 27.v.1971.

A total of 28 taxa is enumerated here; obviously this is a poor representation of what does occur here (cf. 74 taxa in a kindred area in the Upemba National Park in Katanga, D.R. Congo, fide Van Bruggen & Van Goethem, 2007). The Mt. Gorongosa material was collected by invertebrate taxonomists and therefore includes small shells; the bulk of the Gorongosa s.l. material, however, was collected by a competent ecologist but therefore does not encompass taxa with small shells.

The majority of this assemblage of taxa is of a tropical nature, i.e. many species are close to the southern limits of their respective ranges. Indeed, only 11 of the 28 (*Tropidophora insularis/transvaalensis*, *T. ligata*, *Rachis jejuna*, *Rhachistia sticta*, *Achatina immaculata*, *A. craveni*, *Pseudoglessula boivini*, *Gonaxis elongatus*, *G. gwandaensis*, *Gulella sexdentata*,

<sup>2</sup> In Van Bruggen (1964) *G. cf. pervitrea* (Preston, 1913) is recorded from Mt. Gorongosa. However, later on this author revised his opinion (Van Bruggen, 2004: 48) stating that this specimen was probably an immature shell of *G. lawrencei*.

and *Trochonanina mozambicensis*) do cross the Limpopo River with a few localities in (mainly tropical/subtropical) South Africa. The few Mt. Gorongosa species are inhabitants of afro-montane forest, while the remaining taxa are known to occur in woodland-savanna type vegetation.

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