

Size and distribution of *Archachatina ustulata*, a South African achatinid land snail, with the description of a new subspecies

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*Archachatina (Tholachatina) ustulata* (Lamarck, 1822), a species of the Afrotropical endemic pulmonate gastropod family Achatinidae, is a fairly well known taxon, restricted to the southeastern parts of South Africa. Connolly (1939: 302-303, pl. X fig. 3) has covered its nomenclatorial history and given a good description and figure of the shell. Mermod (1951: 746, fig. 90) has discussed and figured the holotype shell. Both these authors have used the name *Achatina ustulata*. Bequaert (1950: 202) and Van Bruggen (1965: 80) have merely listed the species under its now correct name, while Van Bruggen (1967: 22-24, fig. 10) has reviewed the distribution and dimensions of the shell in addition to supplying a first description and figure of the genital anatomy. Therefore this achatinid was considered seemingly well-known. However, a sample recently acquired by the Musée Royal de l'Afrique Centrale, Tervuren (Belgium; abbreviation MRAC) and in 1981 recognized as belonging to the above species by Prof. A. R. Mead, adds new data of considerable interest. This material was collected far beyond what was considered the range of the species and the shells appear to be aberrant in size. For reasons given below the new material is considered to represent a new subspecies. The nominate form and the new subspecies may be distinguished as follows:

Shell length 53-85 mm, 6¼-7 whorls, coastal southeastern Cape Province from ca. 21°30'E to ca. 24°E . . . . . *A. ustulata ustulata*  
Shell length 87-120 mm, 7¾-8¼ whorls, Pondoland . . . . . *A. ustulata limitanea*

*Archachatina (Tholachatina) ustulata limitanea* nov. subsp.

Diagnosis. - A northern subspecies of *A. ustulata* characterized by comparatively large shells with more whorls than in the south.

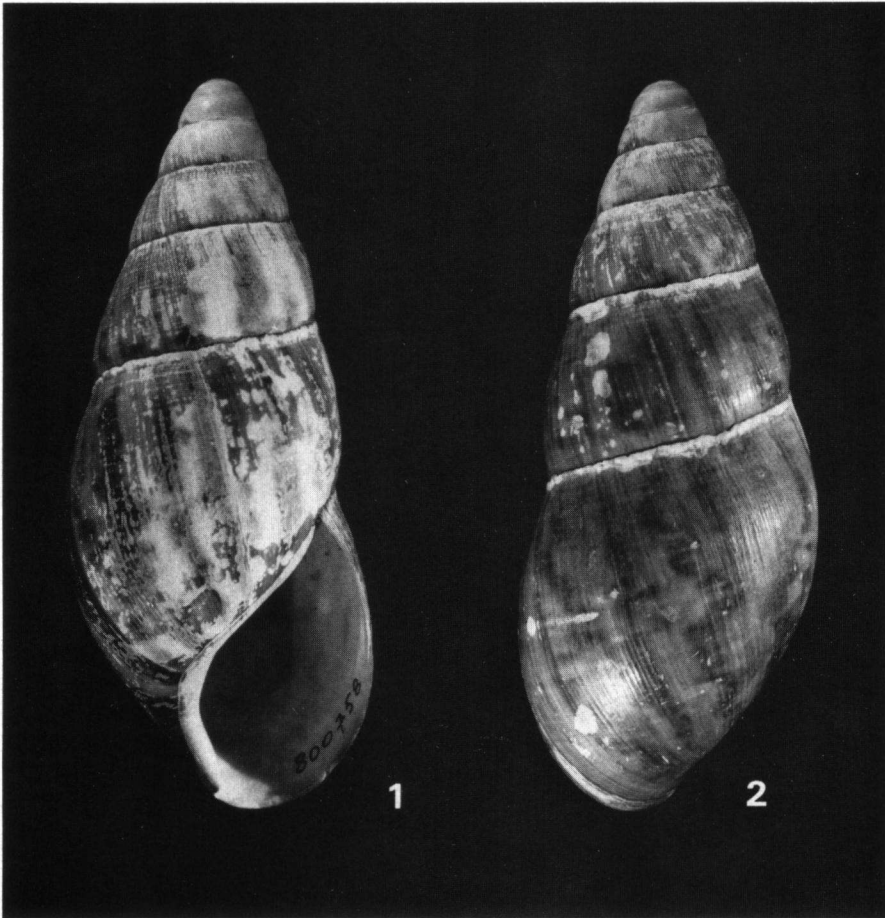
Description. - See diagnosis, numerical data in table 1 and the discussion below.

Measurements of shell (see table 1): 87.2-117.6 x 36.1-44.5 mm, 1/d 2.38-2.64, 7¾-8¼ whorls.

Distribution (fig. 3). - South Africa, Pondoland.

Material. - South Africa, Transkei, Lusikisiki District, in a patch of forest ('coastal evergreen forest') near the Umzimhlava (Mzimhlava) River mouth, February 1980, M. O. E. Baddeley leg. (MRAC 801.429: holotype, figs. 1-2, no. 12 of table 1; MRAC 800.758: 5 numbered paratypes, nos. 9-11, 13, 15 of table 1, and 4 unnumbered paratypes; Rijksmuseum van Natuurlijke Historie, Leiden: 1 paratype, no. 14 of table 1).

Derivatio nominis. - *limitaneus* (Latin), an adjective meaning 'on/from the border', referring to the occurrence of the new subspecies at the northern limits of the range and also on the border of Transkei/Natal in South Africa.



Figs. 1-2. *Archachatina (Tholachatina) ustulata limitanea* nov. subspec., holotype shell (MRAC 801.429) natural size. A. 't Hooft phot.

Originally the range of *Archachatina ustulata* was established as "the coastal forest region in the eastern Cape Province from the Gouritz [Gourits] River in the west to the Koege [Couga, Kouga] River in the east, without, however, reaching either of these rivers." (Van Bruggen, 1967: 22). Somewhat rashly the author continued, "All other recorded localities, viz., Durban, Pondoland and Port Nolloth (Connolly, 1939), are very probably based on misidentified or wrongly labelled material." The position as regards these localities is now the following.

Port Nolloth is situated in the northwestern Cape Province at  $29^{\circ}17'S$   $16^{\circ}51'E$ , not all that far south of the Orange River mouth. Port Nolloth therefore, is within the Karoo-Namib region as delimited by Werger (1978b), a complex of desert and semidesert areas obviously wholly unsuitable for *A. ustulata*. Apart from that, the Port Nolloth record in

no.	length x maj. diam.	l/d	number of whorls	locality data and source
1	53.8 x 23.4	2.30	6¼	Wilderness area, Van Bruggen, 1967
2	55.0 x 22.5	2.44	6¼	Wilderness area, Van Bruggen, 1967
3	55.6 x 23.6	2.36	6¼	Wilderness area, Van Bruggen, 1967
4	56.6 x 21.8	2.60	6½	George, Van Bruggen, 1967
5	66.8 x 26.5	2.52	7	Wilderness area, Van Bruggen, 1967
6	75.2 x 32.0	2.32	7	unknown, Mermod, 1951 (holotype of <i>A. ustulata</i> )
7	84.0 x 37.0	2.27	-	Keurbooms R. bush, Connolly, 1939, pl. X fig. 3
8	85.0 x 32.0	2.66	-	unknown, Connolly, 1939
9	87.2 x 36.6	2.38	7¾	Umzimhlava R. mouth, MRAC
10	88.0 x 36.8	2.39	8	Umzimhlava R. mouth, MRAC
11	91.5 x 36.1	2.53	7¾	Umzimhlava R. mouth, MRAC
12	95.8 x 38.3	2.50	8	Umzimhlava R. mouth, MRAC (holotype of <i>A. u. limitanea</i> )
13	98.7 x 38.6	2.56	8	Umzimhlava R. mouth, MRAC
14	99.1 x 38.2	2.59	8	Umzimhlava R. mouth, RMNH
15	117.6 x 44.0	2.67	8¼	Umzimhlava R. mouth, MRAC

Table 1. Shell measurements in mm of *Archachatina ustulata* (Lam.). Nos. 1-8 represent *A. u. ustulata*, nos. 9-15 *A. u. limitanea* nov. subspec. No. 6 is the holotype of the nominate form, no. 12 the holotype of *A. u. limitanea*; nos. 9-11, 13-15 are paratypes of the latter. The abbreviation l/d stands for the ratio length/major diameter as an indication of the shape of the shell.

Connolly (1939: 303) is shown with a question mark. In the present author's opinion Port Nolloth might be a mistaken spelling for Port St. Johns on the Transkei coast, a locality where the species may now be expected to occur. Pondoland as a generalized term for the northeastern Transkei, i.e., the areas south of the border of Natal, would include both the new locality of the Tervuren museum material and Port St. Johns. Incidentally, Port St. Johns has always been a minor coastal resort; some terrestrial mollusc material has been collected in the area (see the records scattered throughout Connolly, 1939). Finally, Durban should remain as a doubtful record. The land snails of Durban and surroundings are reasonably well known and it is considered unlikely that achatinids of the size of *A. ustulata limitanea* would have been overlooked for more than a century. Land molluscs have been collected in this area almost from the city's inception in 1824.

The new Transkei locality greatly enlarges the known range of the species (fig. 3). There is a considerable gap of more than 500 km in a straight line between the Pondoland locality and the Koega River. It is to be expected that once the species had a more or less continuous range in the Eastern Cape Province from about the Gourits River at ca. 21°30'E to the southern border of Natal at ca. 30°30'E (or even beyond that). Nowadays the distribution is certain to be patchy because of the interrupted habitat. Much of the original vegetation has disappeared, particularly in and around the main urban centres, such as Port Elizabeth, East London, and others. Next to clearance for settlement and agriculture, the various types of forest have also suffered from human depredation as sources of timber and firewood. However, there have been some natural intervals in the hypothetical continuous range in the form of some ancient and semi-arid river valleys, such as the Sundays, the Great Fish and the Great Kei Rivers. Because of their geological history and the different types of vegetation, these intervals are of

great biogeographical significance (see e.g., Stuckenberg, 1962, particularly as regards the importance of the Great Fish R. as a barrier between two different centres).

A close look at the two areas from where *A. ustulata* has now been recorded, reveals a number of ecological differences. As regards climate, the southern centre is within the Winter Rainfall Area. Moreover, this part of the country is still encompassed in the phytochorological division of Capensis, although much of the habitat of *A. ustulata* should rather be classified as Afromontane forest sensu White (1978: 506). This fairly extensive forest-belt is completely enclosed by Capensis (see fig. 12 in Werger, 1978a). The northern centre of the achatinid under discussion is part of the Summer Rainfall Area and phytochorologically is within the Indian Ocean Coastal Belt sensu Moll & White (1978). In fact, the boundaries of Winter/Summer Rainfall Areas and Capensis (with the inclusion of the coastal Afromontane forest)/Indian Ocean Coastal Belt cut right across the possibly once continuous range of *A. ustulata*. Indeed, in more than one respect the differences between the southern and northern centres are greater than those between the northern centre and the Durban area. Incidentally, a glance at published distributions of land molluscs in southern Africa (Van Bruggen, 1969, 1978; Connolly, 1939) shows that a pattern as exhibited by *A. ustulata* is not at all uncommon.

The measurements for a total of 15 specimens are available (see table 1), which can be divided into two groups of 7 (one specimen is unlocalized) for the southern (*A. u. ustulata*: nos. 1-5, 7-8) and northern (*A. u. limitanea*: nos. 9-15) centres, respectively. The size range for the species is 53.8-117.6 x 21.8-44.0 mm, l/d 2.27-2.67, 6¼-8¼ whorls, which is considerable. The smallest known adult shell is less than half the size of the largest known adult specimen. The southern (S) and northern (N) specimens compare as follows:

S 53.8- 85.0 x 21.8-37.0 mm, l/d 2.27-2.66, 6¼-7 whorls

N 87.2-117.6 x 36.1-44.0 mm, l/d 2.38-2.67, 7¾-8¼ whorls

Average figures show that the northern material is significantly larger and slightly more slender than that from the south:

S 65.3 x 26.7 mm, l/d 2.45

N 96.8 x 38.4 mm, l/d 2.52

The northern sample contains four more damaged and perhaps not fully adult shells with lengths 64.0, 77.5, 83.5, and 88.0 mm; these would influence the average length in so far that this would be brought down to 90.1 instead of 96.8 mm. However, an average shell length of 90.1 mm is still well in excess of an average of 65.3 mm as known in the south.

In fact, apart from their size (and possibly shape), the northern shells do not differ materially from the southern ones. Superficially the apex seems to be somewhat coarser and even more bulbous in Pondoland than in the south. There are no noticeable differences in the (deciduous) periostracum and the colour pattern. In the northern material the sculpture may be a trifle more coarse than in the southern shells.

The conclusion to be drawn from these data is that obviously the northern *A. ustulata* have much larger shells with a higher number of whorls. This suggests clinal variation: with increasing temperatures northeastward the shells are becoming larger. South Africa's largest achatinid, *Metachatina kraussi* (Pfr.), shows a kindred type of cline in Natal-Zululand (Van Bruggen, 1969: 17-19); this case, however, was based on an evaluation of 57 specimens from more than twenty different localities over the whole range of the species. This is a pattern that perhaps may be expected to occur in the Achatinidae, a

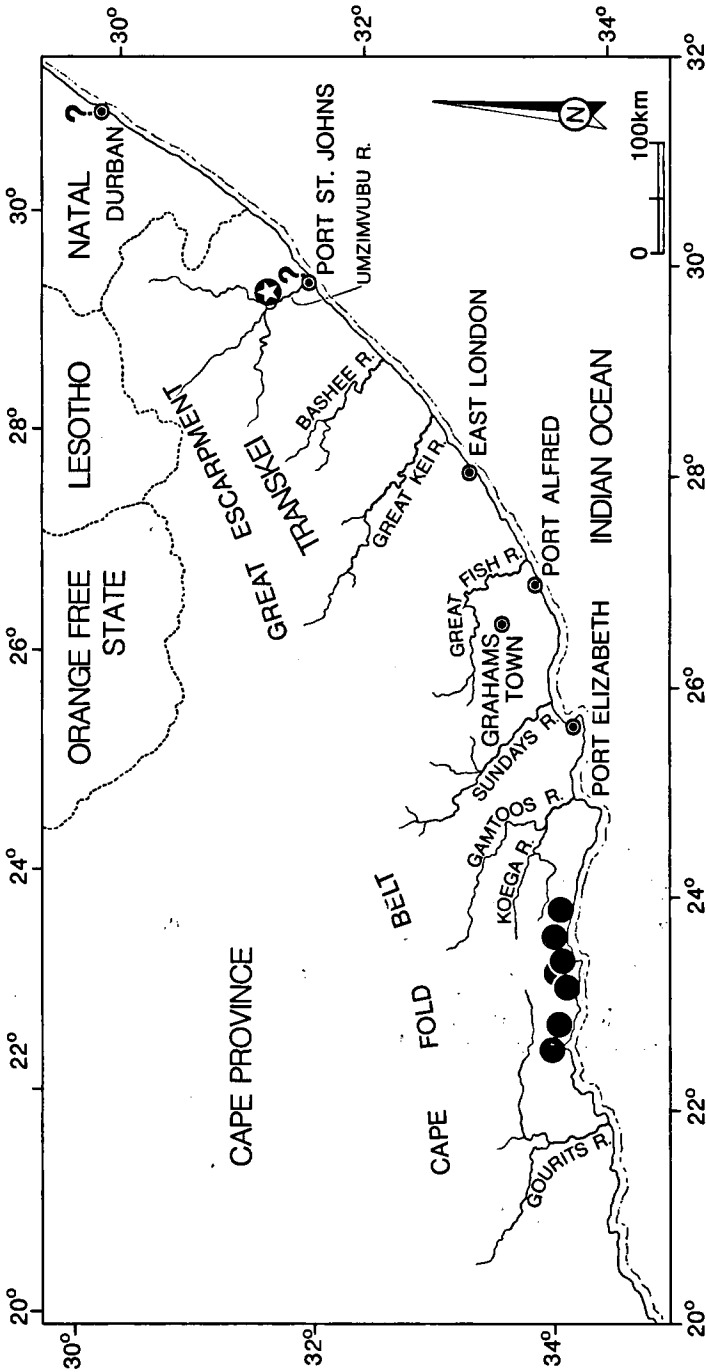


Fig. 2. Distribution of *Archachatina (Tholachatina) ustulata*, dots - *A. u. ustulata*, star - *A. u. limitanea*; note question marks near Port St. Johns and Durban. M. L. Brittijn del.

basically tropical group, which has dispersed southward into the cooler parts of the continent (see also Van Bruggen, 1978: 912-916).

As a final point, the taxonomic status of the northern populations should be discussed. In view of the fact that the northern populations have easily discriminated shells and are (and probably have been for a long time) virtually geographically isolated, it is proposed to consider the Transkei material a subspecies in its own right.

*A. u. limitanea* is accompanied at its type locality by *A. (T.) vestita* (Pfeiffer, 1855) (MRAC 800.756 and 801.007).

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