

Trachycystis langi n. sp., a new land snail from the Natal Drakensberg range, South Africa (Gastropoda Pulmonata: Charopidae)

A.C. VAN BRUGGEN

c/o Nationaal Natuurhistorisch Museum, P.O. Box 9517, 2300 RA Leiden, The Netherlands

Trachycystis langi n. sp. is described from Oliviershoek in the Natal Drakensberg range (South Africa), and classified with Connolly's group x (1939). The shell closely resembles that of *T. subpinguis* Conn. from the east slopes of the Natal and Transvaal escarpment.

Key words: Gastropoda, Pulmonata, Charopidae, *Trachycystis*, taxonomy, Natal, South Africa.

Many years ago an assortment of mixed southern African shell material was received on loan from the Museum of Comparative Zoology, Harvard University, Cambridge (Mass., U.S.A.). This material contains a sample of *Trachycystis* from Natal. Close scrutiny revealed it to represent a hitherto undescribed taxon. It is now obvious that for the time being no further material will become available, so that attention is drawn to the new taxon by formal description.

Acknowledgements are due to Prof. K.J. Boss and his staff (Museum of Comparative Zoology, Harvard University, Cambridge, Mass., abbreviated MZC) and to Dr. P.B. Mordan and Mr. F. Naggs (Natural History Museum, London, BMNH) for the loan of specimens. The photographs are due to the professional skill of A. 't Hooft, staff photographer of the Institute of Evolutionary and Ecological Sciences of Leiden University. Mr. W.D. Haacke of the Transvaal Museum (Pretoria) and Mr. D.J. Pienaar, Research Officer of the Kruger National Park (Skukuza), kindly supplied details on the life and activities of Herbert Lang and thereby confirmed the locality of the new species (see below).

The abbreviation l/d stands for the ratio length (height)/major diameter as an indication of the shape of the shell in question; this ratio is calculated from micrometer readings, so that these data may differ slightly from those calculated from the measurements in mm.

The genus *Trachycystis* Pilsbry, 1893 (type species *Helix bisculpta* Benson, 1851), endemic to the Afrotropical Region, was originally classified with the Endodontidae. Solem (1976, 1978, 1982), however, has shown that this family is restricted to the islands of the Pacific. The Endodontidae old style have now been divided by Solem into the Punctidae (cosmopolitan minus South America), Charopidae (showing a tricontinental southern pattern, vide Van Bruggen, 1980), and Endodontidae s.s.

Trachycystis s.l. is widely distributed in Africa (mainly southern and East Africa) and is most diverse in southern Africa (at least 106 species south of the Zambezi, fide Van Bruggen, 1969: 87). Diversity on the species level reveals the existence of certain more or less well-defined groups, for which a number of names are available. For practical purposes Connolly (1939: 187-248, review of southern African taxa; additional data in Van Bruggen & Verdcourt, 1965; Van Bruggen, 1970; Sirgel, 1980; Van Bruggen,

1982¹) subdivides *Trachycystis* in southern Africa into 17 groups, termed "subgeneric units" by Van Bruggen (1978: 894), viz. *Trachycystis* s.s., *Cyclocystis* Watson, 1934, *Chalcocystis* Watson, 1934, *Phaulocystis* Watson, 1934, *Psichion* Gude, 1911, *Lyrocystis* Watson, 1934, *Xerocystis* Watson, 1934, *Phortion* Preston, 1910, *Liparocystis* Watson, 1934, *Chilocystis* Watson, 1934, and seven unnamed units. Van Bruggen & Verdcourt (1965) added *Dendrotrichia* as another subgenus. Anatomical details are known for all of these and also for two of the unnamed groups. Almost all such data are from Watson (1934). Zilch (1959: 216-218) recognizes ten subgenera in *Trachycystis*, i.e. solely the ones enumerated by name by Connolly (1939). Vaught (1989: 94) only recognizes six of the above Watsonian taxa as subgenera (considering *Chilocystis* a synonym of *Chalcocystis*), but she overlooked *Dendrotrichia*. Incidentally, she even suggests a family Trachycystidae. In view of the sometimes considerable differences between the various groups, these probably all represent separate genera.

Occurrence of *Trachycystis* outside continental Africa is so far only confirmed for the Comoro Islands. Fischer-Piette & Vukadinovic (1974: 31-32) in their annotated list of land molluscs from that archipelago enumerate three species of *Trachycystis* (i.e. one in *Trachycystis* s.s. and two in *Psichion*). The type species of *Psichion* is *Helix miliaris* Morelet, 1887, an endemic Comoro species. Knowledge of anatomical details of this species is limited to a description of the peculiar radula by Thiele (1931: 573-574). Watson (1934: 172-174) has discussed *Psichion* and considers it a subgenus of *Trachycystis*; he has dissected various South African species which, on account of the radula, he attributes to *Psichion*. In his discussion he states that "Both authors [i.e. Gude and Thiele], however, seemed to be unaware that the group is by no means confined to the Comoro Islands." (Watson, 1934: 173).

The new species described below belongs to Connolly's (1939: 216) unit "(x) Group of *teretiuscula* M. & P.", defined as "Insignificant little shells with practically smooth apical and finely striate later whorls." Connolly classifies eight species with this group, among which *Trachycystus subpinguis* Connolly, 1922, from the Natal and Transvaal uplands.

***Trachycystis langi* n. sp.**

(figs. 1-3, 7, 9)

Diagnosis. — A species of *Trachycystis* belonging to Connolly's (1939) group x, close to *T. subpinguis*, but with a smaller and higher shell with more pronounced radial sculpture.

Description of shell (figs. 1-3, 7, 9). — Shell small, depressed, perforate, thin, fairly smooth and glossy, pale corneous. Spire little exerted, sides more or less straight. Whorls five or slightly more, gradually increasing, rounded, slightly inflated, first one-and-a-half faintly micropunctate, remainder sculptured all over with faint, fairly close, almost straight transverse striae (subcostulae, probably nothing but accentuated growth-striae; there are narrow intervals), crossed by close and regular microspiral lines, which are particularly noticeable on the base of the shell; sutures simple and well-defined. Aperture oblique, lunate, labrum thin and sharp, little receding in profile, columella short, weak and concave, margin shortly and narrowly reflected, hardly concealing the narrow umbilicus.

¹ Only three species (all new) have been added to the southern African list since publication of Connolly's review in 1939: *Trachycystis (Dendrotrichia) sylvicola* Van Bruggen & Verdcourt, 1965, from Zimbabwe/Mozambique; *T. contrasta* Sirgel, 1980, and *T. leuocarina* Sirgel, 1980, both from the southern Cape Province.

specimen	height x maj. diam.	l/d	height x maj. diam. aperture	number of whorls
holotype	3.2 x 4.5 mm	0.72	2.0 x 2.5 mm	/ 5
paratype	3.4 x 4.7 mm	0.72	2.4 x 2.6 mm	5
paratype	3.5 x 4.7 mm	0.74	2.5 x 2.9 mm	5+

Table 1. Measurements of the shells of the type series of *Trachycystis langi* n. sp. (MCZ). Whorls 5+ indicates 'slightly more than 5 whorls'. See also figs. 1-3, 7, and 9.

Measurements of shell (height x major diameter, see table 1): 3.2-3.5 x 4.5-4.7 mm, l/d 0.72-0.74, aperture (height x major diameter) 2.0-2.4 x 2.5-2.9 mm, whorls 5-5+. A juvenile shell of 2.3 x 3.2 mm, l/d 0.71, has only 4¹/₄ whorls.

Anatomy. — Unknown.

Distribution. — So far only known from the type locality, Oliviershoek in the Natal Drakensberg range on the borders of Lesotho and the Orange Free State.

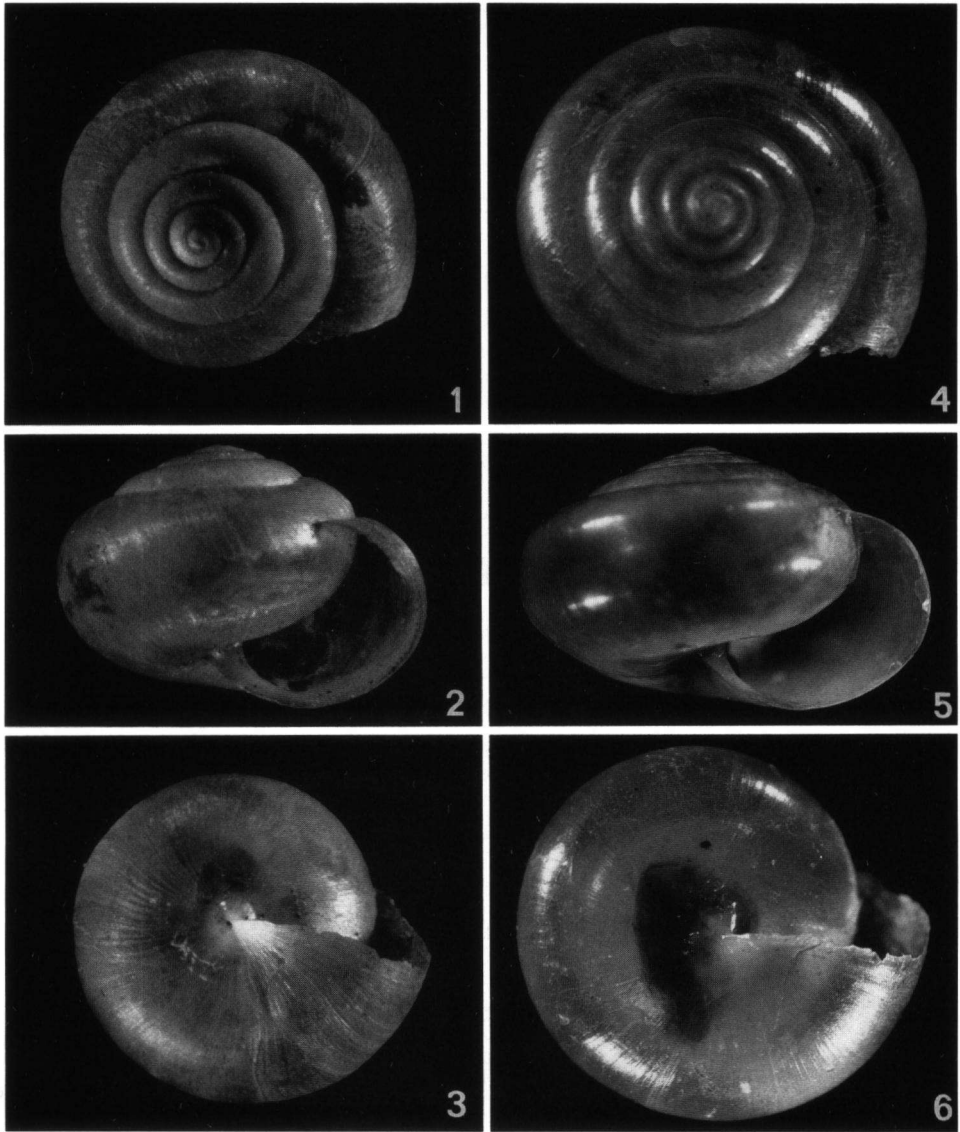
Material examined. — South Africa, Natal, Oliviershoek (Oliver's Hook, 28°41' S 29°10'E), 1000-1500 m.s.m., leg. H. Lang (holotype, MCZ 315748, figs. 1 and 3; two paratypes, MCZ 315749-50, see figs. 2, 7 and 9; and a juvenile shell, expressly excluded from the type material, MCZ).

Etymology. — The species is named after Herbert Lang (1879-1957), famous zoological collector and field worker in Africa and also for a short time Curator of Mammals at the American Museum of Natural History (New York) (see Wynne, 1969: 116). Much of his fame derives from the American Museum Congo Expedition (1909-1915), where he played a vital role. During this expedition Lang collected many non-marine molluscs, reason why there is already a number of species named after him (vide e.g. Pilsbry, 1919, 6 taxa; Pilsbry & Bequaert, 1927, 5 taxa). After the Vernay-Lang Angola Expedition (1925) he settled in South Africa (1926). Lang was one of the earliest collectors of terrestrial snails in the Kruger National Park (Letaba, Nwanedzi, and Pafuri areas in the northern districts, 1932). Another notable achievement was the Vernay-Lang Kalahari Expedition (Bechuanaland/Botswana, 1930) (most data kindly supplied by Messrs. Haacke and Pienaar).

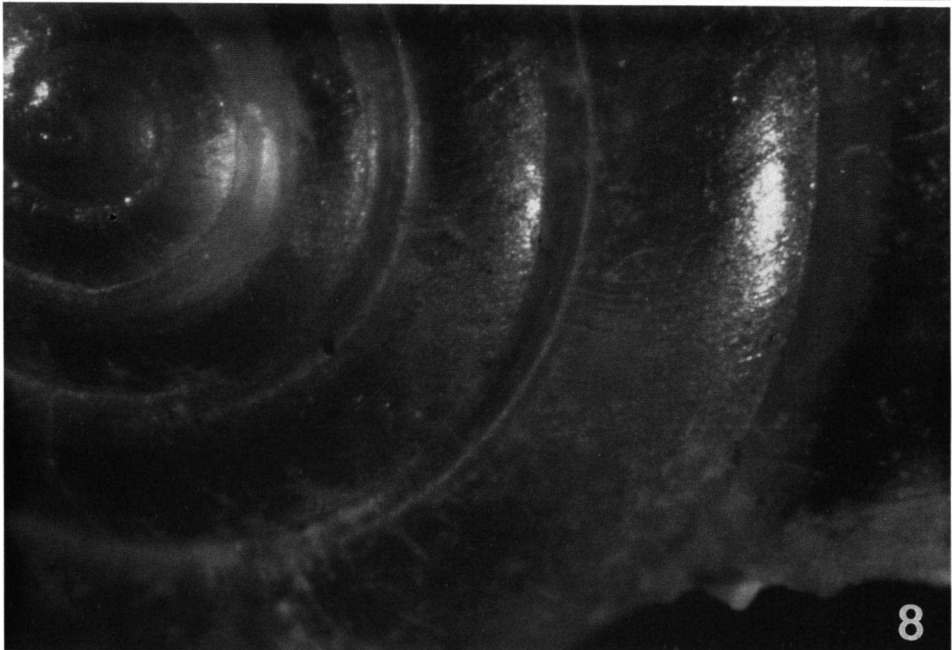
The shell of the new species is somewhat similar to that of *T. subpinguis*, which calls for a close comparison. The following material of *T. subpinguis* (all BMNH) was examined for comparison with *T. langi* (see table 2): South Africa, Natal, Pietermaritzburg, Botanical Gardens, BMNH 1937.12.30.4826-31 [holotype (figs. 4-6, 8,10) and 5 paratypes]; Karkloof (Forest, near Karkloof Falls, NE. of Howick), "Dr. Price-Jones", BMNH 1956.5.12.33-35 (3 shells); Karkloof, leg. A.J. Taynton, BMNH no number (ex Natal Museum via H.C. Burnup, preliminary number 546) (4 shells of which one heavily damaged); Transvaal, Shiluwane Dist. (S. of Tzaneen), Mt. Manotsuri, leg. Rev. H.A. Junod, BMNH 1937.12.30.4832-33 (2 shells). The dimensions of the above, presumed adult, shells (table 2) may be summarized as 3.4-3.9 x 5.0-6.0 mm, l/d 0.61-0.69, aperture 2.2-2.7 x 2.6-3.4 mm, whorls 5¹/₄-6.

A scrutiny of the metric data in tables 1 and 2 shows that the shell of *T. langi* is smaller than that of *T. subpinguis*, which latter also has comparatively lower l/d values, i.e. is more flattened:

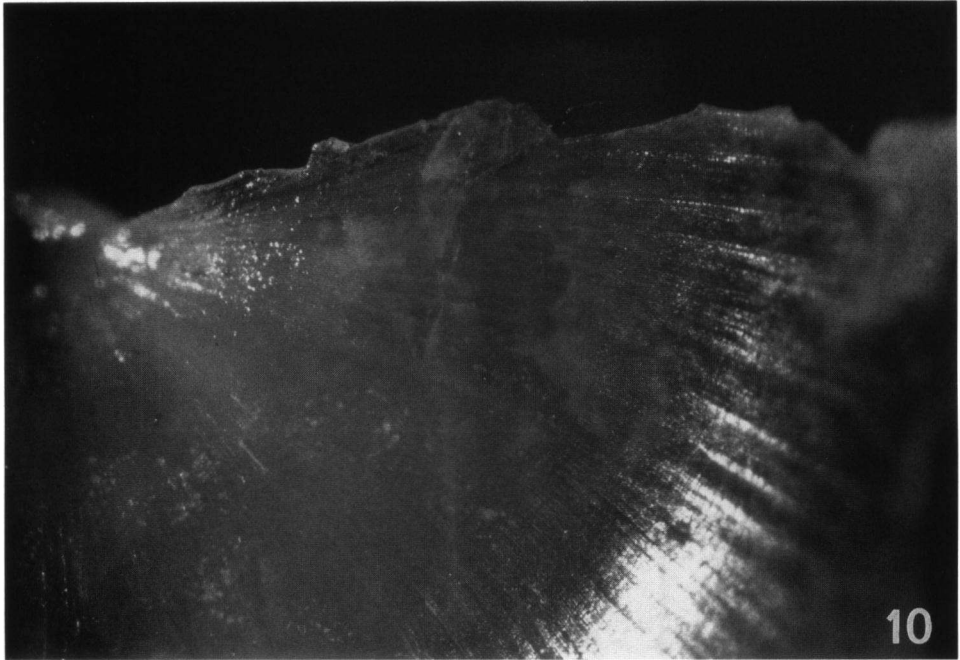
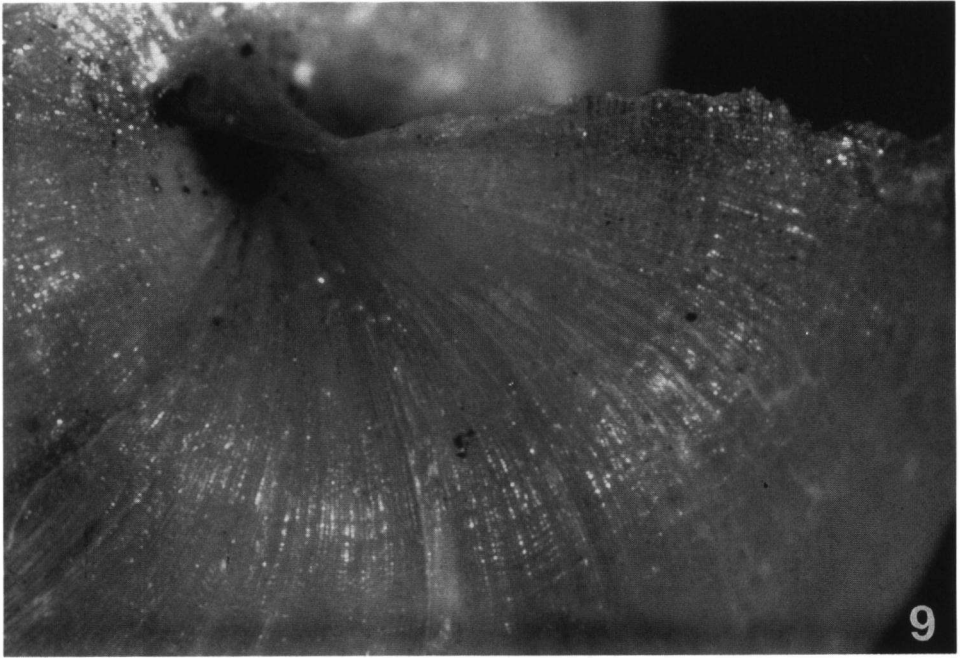
<i>T. langi</i>	3.2-3.5 x 4.5-4.7 mm, l/d 0.72-0.74, whorls 5-5+ (n=3)
<i>T. subpinguis</i>	3.4-3.9 x 5.0-6.0 mm, l/d 0.61-0.69, whorls 5 ¹ / ₄ -6 (n=12)



Figs. 1-6. Shells of species of *Trachycystis*, highly enlarged. 1, 3, Holotype of *T. langi* n. sp. (MCZ 315748), Oliviershoek, apical and bottom views, actual size 3.2 x 4.5 mm; 2, paratype of *T. langi* (MCZ 315750), apertural view, actual size 3.5 x 4.7 mm. 4-6, Holotype of *T. subpinguis* Conn. (BMNH 1937.12.30.4826-31), Pietermaritzburg, Botanical Gardens, apical, apertural and bottom views, actual size 3.7 x 5.4 mm. Photographs A. 't Hoof.



Figs. 7-8. Highly enlarged details of upper surface sculpture of shells of *Trachycystis langi* n. sp. (fig. 7, paratype, MCZ 315750, Oliviershoek, actual size 3.5 x 4.7 mm) and *T. subpinguis* Conn. (fig. 8, holotype, BMNH 1937.12.30.4826-31, Pietermaritzburg, Botanical Gardens, actual size 3.7 x 5.4 mm). Photographs A. 't Hoof.



Figs. 9-10. Highly enlarged details of surface sculpture on the base of shells of *Trachycystis langi* n. sp. (fig. 9, paratype, MCZ 315750, Oliviershoek, actual size 3.5 x 4.7 mm) and *T. subpinguis* Conn. (fig. 10, holotype, BMNH 1937.12.30.4826-31, Pietermaritzburg, Botanical Gardens, actual size 3.7 x 5.4 mm). Photographs A. 't Hooft.

specimen	height x maj. diam.	l/d	height x maj. diam. aperture	number of whorls
paratype	3.1 x 4.7 mm	0.66	2.3 x 2.6 mm	/ 5½
Karkloof T	3.4 x 4.9 mm	0.69	2.4 x 2.7 mm	5¼
paratype	3.4 x 5.0 mm	0.67	2.4 x 2.6 mm	5¾
paratype	3.4 x 5.1 mm	0.67	2.2 x 2.7 mm	6-
paratype	3.4 x 5.1 mm	0.66	2.4 x 2.6 mm	6-
Karkloof T	3.4 x 5.4 mm	0.63	2.5 x 3.0 mm	5½
Karkloof T	3.5 x 5.7 mm	0.61	2.5 x 3.0 mm	5½
Manotsuri	3.6 x 5.2 mm	0.68	2.5 x 3.0 mm	5¾
paratype	3.6 x 5.5 mm	0.66	2.5 x 3.1 mm	6
holotype	3.7 x 5.4 mm	0.69	2.5 x 3.0 mm	6
Karkloof PJ	3.7 x 5.7 mm	0.65	2.5 x 3.1 mm	6-
Karkloof PJ	3.9 x 5.7 mm	0.67	2.7 x 3.4 mm	5¼
Manotsuri	3.9 x 5.9 mm	0.66	2.6 x 3.1 mm	6-
Karkloof PJ	3.9 x 6.0 mm	0.65	2.7 x 3.4 mm	5¼

Table 2. Measurements of shells of *Trachycystis subpinguis* (BMNH). PJ=Price-Jones, T=Taynton, 6- stands for 'slightly less than 6 whorls'. The top two shells are probably immature. The holotype is shown in figs. 4-6, 8, and 10.

Note that there is little overlap between these figures. The more restricted number of whorls in *T. langi* might lead to it being considered the immature shell of *T. subpinguis*; however, comparison with immature shells of the latter shows the former to have higher l/d values:

<i>T. langi</i>	3.2 x 4.5 mm, l/d 0.72, whorls 5
<i>T. langi</i>	3.4 x 4.7 mm, l/d 0.72, whorls 5
<i>T. subpinguis</i>	3.1 x 4.7 mm, l/d 0.66, whorls 5½
<i>T. subpinguis</i>	3.4 x 4.9 mm, l/d 0.69, whorls 5¼
<i>T. subpinguis</i>	3.4 x 5.0 mm, l/d 0.67, whorls 5¾

There is also a small difference in the width (major diameter) of the aperture; shells with an aperture height of 2.5 mm have widths of 2.9 mm (*T. langi*) and 3.0-3.1 mm (*T. subpinguis*) respectively. Where the columella is reflected over the narrow umbilicus, it is noticeably wider in *T. langi* than in *T. subpinguis*, therefore the umbilicus appears to be narrowest in *T. langi*. The whorls of the new species are somewhat more inflated than those of *T. subpinguis*.

Finally, the surface sculpture is much more pronounced in *T. langi* than in *T. subpinguis*, which appears to be smooth and shiny, while *T. langi* is weakly but distinctly subcostulate, i.e. has pronounced growth-lines or subcostulae crossed by spiral threads. The spiral engraving is particularly pronounced on the base of the shell in *T. langi* and noticeably less so in *T. subpinguis*.

The metric data of the new species have only been derived from one sample limited to three shells, while those of *T. subpinguis* are based on fourteen specimens (among which two probably immature shells) from three localities. This calls for cautious evaluation of new material of the two taxa.

The material, labelled as "H. Lang Acc. 1001" (on 26 May 1938 200 lots of "African shells, mainly from the Kruger Nat. Part, Transvaal" were accessioned in the MCZ as no. 1001, fide Ms. Tanya Kausch) has another label in Dr. J.C. Bequaert's handwriting,

reading "acc to Connolly probab undescribed near subpinguis". It is clear that at that time (most likely shortly before the outbreak of World War II) Dr. Bequaert (MCZ) sent a lot of material to Major M.K. Connolly in London (BMNH) for his opinion. The acumen of Connolly in distinguishing between these two species is once again demonstrated here.

The main labels are in so far misleading that they state that Oliviershoek is situated in the "Krueger National Park". Of course, Lang is known to have collected there in 1932 (see above), but Mr. Pienaar (in litt. 28.VII.1994), after consulting senior and pensioned Kruger National Park staff, wrote "none knew of a place called 'Oliver's Hook' in the Kruger National Park". He kindly contacted Mr. W.D. Haacke (Pretoria), who "confirmed that Lang collected mostly in the Transvaal but apparently he did make a trip to the Drakensberg Mountains in Natal and on his way there he passed through Oliviershoek". Later Mr. Haacke (telefax of 4 November 1994) kindly communicated many more details on the life and activities of Herbert Lang, among which the following entry is most relevant: "Exped. Oliviershoek to Mont-aux-Source, Lesotho: Nov. 1930." Therefore we may accept Oliviershoek in the Natal Drakensberg range on the borders of Lesotho and the Orange Free State as the type locality of *T. langi*.

The two species under discussion are probably sympatric; all recorded localities are on the east slopes of the Drakensberg range in Natal and the Transvaal at attitudes of between 1000 and 1500 m. All records of *T. subpinguis* are from various types of forest. Unfortunately no details are known about the type locality of *T. langi* — there is sufficient kindred habitat available locally.

REFERENCES

- BRUGGEN, A.C. VAN, 1969. Studies on the land molluscs of Zululand with notes on the distribution of land molluscs in Southern Africa. — Zool. Verh. Leiden 103: 1-116.
- , 1970. Non-marine Mollusca. In: B. HANSTRÖM, P. BRINCK & G. RUDEBECK, eds., South African Animal Life 14: 445-476. Stockholm.
- , 1978. Land molluscs. In: M.J.A. WERGER (& A.C. VAN BRUGGEN), ed(s)., Biogeography and ecology of Southern Africa (2): 877-923. The Hague.
- , 1982. *Phortion occidentalis* n. sp., an extinct endodontoid land snail from Late Tertiary deposits at Langebaanweg, Cape Province. — S. Afr. J. Sci. 78: 108-111.
- & B. VERDCOURT, 1965. *Trachycystis* (*Dendrotrichia*) *syvicola*, a new subgenus and species from Rhodesia (Mollusca, Gastropoda Pulmonata: Endodontidae). — Zool. Meded. Leiden 40: 219-224.
- CONNOLLY, M., 1939. A monographic survey of South African non-marine Mollusca. — Ann. S. Afr. Mus. 33: 1-660.
- FISCHER-PIETTE, E., & D. VUKADINOVIC, 1974. Les mollusques terrestres des Iles Comores. — Mém. Mus. Natn. Hist. Nat. (N.S.) A Zool. 84: 1-76.
- PILSBRY, H.A., 1919. A review of the land mollusks of the Belgian Congo chiefly based on the collections of the American Museum Congo Expedition, 1909-1915. — Bull. Am. Mus. Nat. Hist. 40: i-x, 1-370.
- , & J. BEQUAERT, 1927. The aquatic mollusks of the Belgian Congo. With a geographical and ecological account of Congo malacology. — Bull. Am. Mus. Nat. Hist. 52: 69-602.
- SIRGEL, W.F., 1980. Two new species of the genus *Trachycystis* from South Africa (Mollusca, Gastropoda Pulmonata, Endodontidae). — Zool. Meded. Leiden 55: 97-113.
- SOLEM, A., 1976. Endodontoid land snails from Pacific islands (Mollusca: Pulmonata: Sigmurethra). Part I, Family Endodontidae: I-XII, 1-508. Chicago.
- , 1978. Classification of the land molluscs. In: V. FRETTER & J. PEAKE, eds., Pulmonates 2A: 49-79. London.
- , 1982. Endodontoid land snails from Pacific islands (Mollusca: Pulmonata: Sigmurethra). Part II, Families Punctidae and Charopidae, zoogeography: I-IX, 1-336.

- THIELE, J., 1929-1931. Handbuch der systematischen Weichtierkunde 1: I-VI, 1-778. Jena.
- VAUGHT, K.C., 1989. A classification of the living Mollusca (eds. R.T. ABBOTT & K.J. BOSS): i-xii, 1-195. Melbourne, Florida.
- WATSON, H., 1934. Natalina and other South African snails. — Proc. Malac. Soc. London 21: 150-198.
- WYNNE, O.E., 1969. Biographical key — names of birds of the world — to authors and those commemorated: i-iii, 1-246. Fordingbridge, Hants.
- ZILCH, A. 1959-1960. Gastropoda Euthyneura. In: O.H. SCHINDEWOLF, ed., Handb. Paläozool. 6 (2): i-xii, 1-834. Berlin-Nikolassee.