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## A new species of *Crocidura* Wagler, 1832 (Soricidae) from Zambia

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**Abstract.** A new species *Crocidura anselli* is described from the Northwestern Province of Zambia. It is a chocolate-brown species, in size comparable to *C. fuscomurina*, but with a unique combination of external and cranial characteristics that readily distinguish it from other small species of African *Crocidura* such as *ludia*, *niobe* and *bottegi*.

**Key words.** Mammalia, Soricidae, *Crocidura anselli* n. sp., Zambia.

### Introduction

The taxonomy and distribution of the mammals of Zambia, including the Soricidae, have been well documented particularly by W.F.H. Ansell (e.g., 1960, 1978). During an extensive survey, under his guidance, of the mammals of that country, three small dark-brown *Crocidura* specimens were collected in the Northwestern Province by P.D.H. Ansell in 1973. These specimens are listed as "*Crocidura* sp. indet." by W.F.H. Ansell (1974: 5), who mentions that J.A.J. Meester (*in litt.*) had informed him that they differ from *Crocidura bicolor* Bocage, 1889 (a name antedated by *C. fuscomurina* [Heuglin, 1865], *fide* Hutterer, 1983), the only *Crocidura* species of comparable size that occurs in Zambia. The three specimens were subsequently labelled "*Crocidura* cf. *ludia*" by N.J.D.

Reexamination of the specimens in the light of Hutterer's (1983) revision of *C. fuscomurina* convinced us that they represent yet another undescribed species of African *Crocidura*.

The type series is deposited in the Livingstone Museum, Livingstone, Zambia (NMZ, holotype, one paratype) and the Harrison Zoological Museum, Sevenoaks, England (HZM, one paratype). For comparisons we used material from the British Museum (Natural History), London (BM), the United States National Museum, Washington (USNM), the Staatliches Museum für Naturkunde, Stuttgart, the Naturhistorisches Museum, Basel, Museum für Naturkunde der Humboldt-Universität, Berlin, the American Museum of Natural History, New York, the Transvaal Museum, Pretoria, and the Museum Alexander Koenig, Bonn.

External measurements were taken from specimen labels or from the study skins, and skull measurements with callipers and a Wild Stereo microscope. Most of the measurements used in this report were defined and figured by Dippenaar (1977).

### *Crocidura anselli* n. sp.

**Holotype:** NMZ 3675, skin and skull of an adult male, collected by P.D.H. Ansell, 5 August 1973; field number PDHA 339. Condition good, except for a patch without fur on underside of skin and a piece of bone broken out of the occipital region of skull. **Type locality:** Kasombu Stream (= Isombu River, *fide* Ansell, 1978: 105) 4100 ft. (11° 16' S, 24° 06' E), Mwinilunga District, Zambia.

Paratypes: HZM, A.793, adult female, same data as holotype; NMZ 3674, adult male, Nyansowe Stream, 4000 ft. (12° 13' S, 25° 32' E), Solwezi District. Both preserved as skins and skulls.

Diagnosis: Uniformly dark brown. Tail moderately long (80 % of HB) with low pilosity, i.e., long bristlehairs restricted to proximal 60 % of tail; close to *Crocidura ludia* Hollister, 1916, but smaller in all external and cranial measurements, and with a relatively wider braincase and maxillary region.

Measurements: Table 1.

Distribution: The species is known only from two localities in northwestern Zambia. It might occur in southern Zaire and eastern Angola.

Habitat: NMZ 3675 was caught in "Interior gallery forest".

Etymology: Named after W. F. H. Ansell, who has made significant contributions to our knowledge of Zambian mammals, and his son P. D. H. Ansell, the collector of the type series.

Description: *Crocidura anselli* is comparable in size to *Crocidura fuscomurina* (Heuglin, 1865) and *Crocidura bottegi* Thomas, 1898. In external appearance it is rather similar to *C. bottegi*: pelage and extremities are deep chocolate-brown, as are the outer surface ears and the tail. The underside is only slightly washed with greyish brown, most notable on the throat of the holotype, less so in the two paratypes. The proximal 44.7–58.5 % of the pelage are short, about 4 mm at mid-dorsum.

The skull (Fig. 1) is characterized by a broad and high-domed braincase, a short interorbital region, and a slender but rather deep rostrum. The shape of the condylar process of the mandible in posterior view (Fig. 2) is similar to that of *C. ludia*, but smaller.

The first upper incisor has a long, sharp tip; the posterior part of the tooth is large with a long cutting edge (Fig. 2). The first unicuspid is large and pointed, the second

Table 1: Measurements of the holotype and paratype of *Crocidura anselli* n. sp. In millimetres except where stated otherwise.

Measurement		NMZ 3674 ♂	NMZ 3675 ♂ holotype	NZM A.793 ♀
Head and body length	HB	58	58	56
Tail length	T	47	51	41
Hindfoot length (s.u.)	HF	11	12	10.5
Ear length	E	—	8	7.5
Pilosity of tail (%)		44.7	51.0	58.5
Weight in g		4.2	5	—
Condylar-incisive length	CI	17.7	17.6	16.8
Basal length	BL	15.9	15.6	15.1
Palatal length	PL	7.2	7.3	6.9
Greatest width	GW	8.4	8.3	8.0
Bimaxillary width	BW	5.5	5.5	5.5
Least interorbital width	LIW	4.2	3.9	4.1
Posterior median height	PMH	4.7	4.6	4.6
Upper toothrow length	UTRL	7.6	7.4	7.2
Lower toothrow length incl. I <sub>1</sub>	LTRL	7.0	6.9	6.7
Width of M <sup>3</sup>	M <sup>3</sup> -W	1.20	1.20	1.20
Length of M <sup>3</sup>	M <sup>3</sup> -L	0.64	0.64	0.60

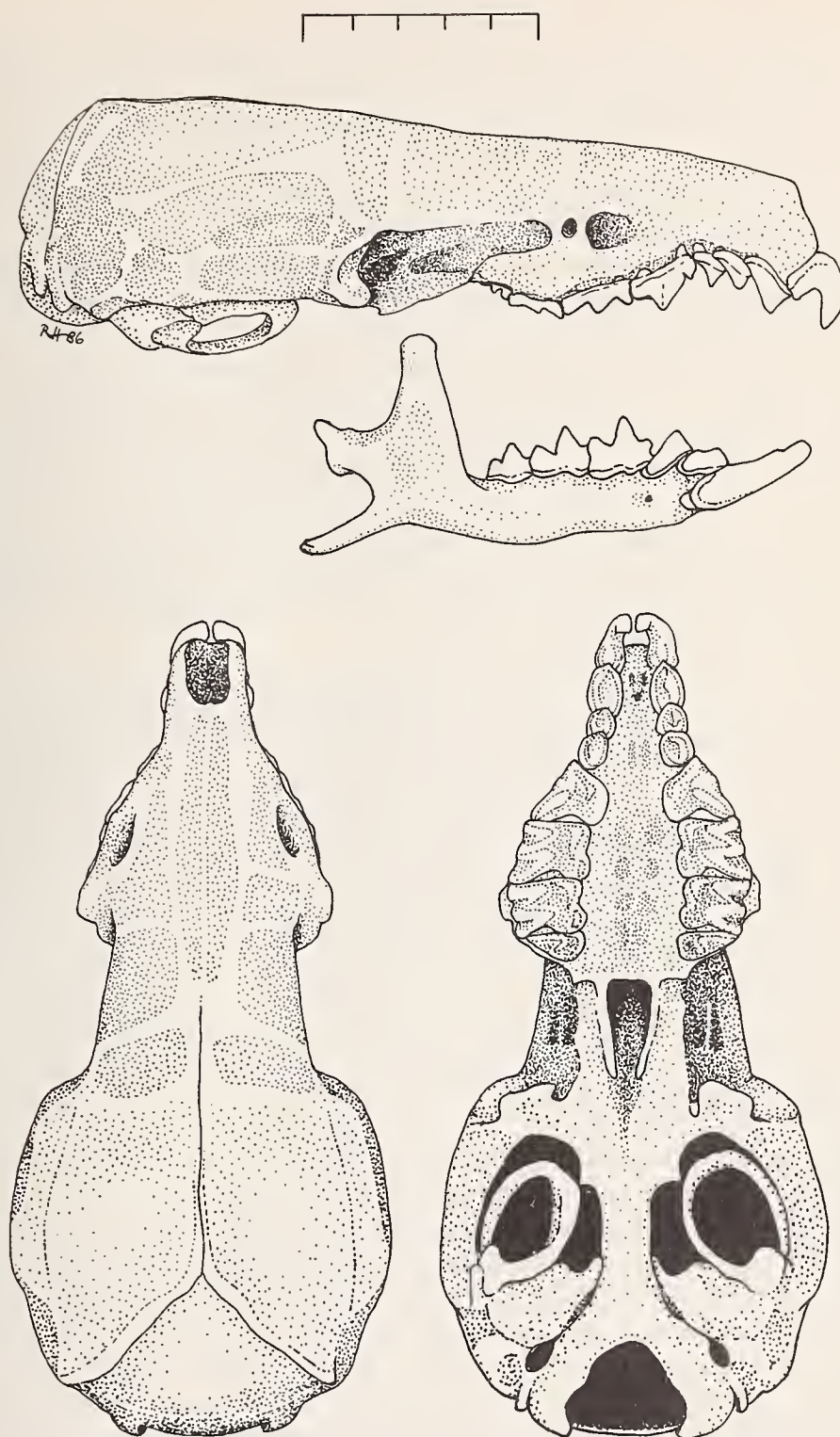


Fig. 1: *Crocidura anelli* n. sp.: skull of holotype (NMZ 3675) in lateral, dorsal, and ventral view. Scale in millimetres.



and third are subequal in size, all three unicuspid having a well-developed cingulum. The parastyle of the upper premolar is low and closely attached to the tooth; the talon of P<sup>4</sup> lingually expands beyond the margins of the first and second molar. The third upper molar is medium-sized. The lower incisor has a rounded tip and a slightly undulated cutting surface. The second lower incisor is bicuspid. The lower premolar (P<sub>4</sub>) has a metaconid on the posterolingual ridge. The third lower molar shows traces of an entoconid ridge, as noted by Ansell (1974).

**Comparisons:** Differences between species of "pygmy shrews" are often subtle and correct identification may require the examination of both external and cranial characters. We list here the species that are similar to or might be confused with the new species. Only one of them is known to occur in the same area.

*Crocidura fuscomurina*, which occurs widely in Zambia (see Ansell, 1978: map 15), is distinguished from *C. anselli* by its bicoloured appearance, its pale, often thick tail with high pilosity (usually 60–80 %). The skull is flatter and narrower (PMH = 4.2 mm, GW = 7.9 mm in the holotype of *C. fuscomurina*; PMH = 4.6–4.7 mm, GW = 8.0–8.4 mm in *C. anselli*) and the rostrum is more slender and flat. There are also differences in the dentition. The first upper incisor of *C. fuscomurina* is shorter, the unicuspid teeth are less pointed, and the parastyle of the fourth upper premolar is set apart, not closely attached to the tooth.

*Crocidura bovei* Dobson, 1888, a species known only from the type series from Vivi and Kwako, Zaire, and Luanda, Angola, may be a subspecies of *C. fuscomurina*, taking into consideration specimens in the Naturhistorisches Museum Basel that agree with Dobson's description. The species was described as having a silvery grey belly, and the published measurements do not differ from those of *C. fuscomurina*. The name *Crocidura bovei* was not considered by Hutterer (1983) in his revision of *C. fuscomurina*.

*Crocidura elgonius* Osgood, 1910, occurs in montane areas of western Kenya and northeastern Tanzania (Honacki *et al.*, 1982). It is distinguished from *C. anselli* by its greyer pelage, higher pilosity of the tail (holotype = 75 %), and by consistently smaller skull measurements (CI = 16.1–17.1 mm, BW = 4.6–5.2 mm, GW = 7.2–7.6 mm, PMH = 3.7–4.1 mm, UTRL = 6.5–7.0 mm; n = 6; cf. Table 1. The first upper incisor does not show a similarly long cutting edge on the posterior part of the tooth as in *C. anselli* (Fig. 2). Also, in posterial view the condylar process of the mandible is smaller.

*Crocidura bottegi* is known from forested areas in Ethiopia, northern Kenya and some parts of West Africa (Honacki *et al.*, 1982). In colouration and the low pilosity of the tail (holotype = 10 %) it is comparable to *C. anselli*, but it is smaller in all external (T = 29–34 mm, HF = 9 mm; n = 8) and cranial measurements (CI = 15.1–16.3 mm, GW = 6.5–7.6 mm, UTR = 6.3–7.1 mm; n = 10). Other differences include the shape of the first upper incisor (Fig. 2), the large and complex third upper molar, L-shaped condylar process (Fig. 2), and the rounded braincase of *C. bottegi*.

*Crocidura ludia* is known only from the holotype from Medje, northeastern Zaire, and two additional specimens in the USNM from Tandala, northwestern Zaire. The species was included in *C. dolichura* Peters, 1876, by Heim de Balsac & Meester (1977) but it differs in colour (reddish brown versus greyish brown), tail characteristics (short and partly hairy versus long and naked) and size of the skull (small versus large).

*Crociodura ludia* is similar to *C. anseli* but differs in its larger external ( $T = 60\text{--}64$  mm,  $HF = 12\text{--}14$  mm;  $n = 3$ ) and cranial ( $CI = 18.2\text{--}19.0$  mm,  $PMH = 5.4\text{--}5.5$  mm,  $UTRL = 8.1\text{--}8.3$  mm;  $n = 3$ ) measurements, although two width measurements ( $BW = 5.4\text{--}5.5$  mm,  $GW = 8.1\text{--}8.3$  mm) are similar, indicating that the skull of *C. ludia* is more compressed laterally than in most species of the *C. dolichura* species group. Also, the teeth, e.g., the first upper incisor (Fig. 2) and the condylar process of the mandible of *C. anseli* and *C. ludia* are similar but differ in size. *Crociodura ludia* is a species of the tropical lowland forest of northern Zaire.

*Crociodura niobe* Thomas, 1906, is with certainty known only from the Ruwenzori and Kivu mountains in eastern Zaire (Dieterlen & Heim de Balsac, 1979). It is a dark reddish brown to dark brownish-grey shrew with long bristlehairs restricted to the proximal third of the tail. In external and cranial measurements it is similar to *C. ludia*, but the skull is less compressed laterally. From *C. anseli*, *C. niobe* differs in its larger external ( $T = 57\text{--}60$  mm,  $HF = 13\text{--}14$  mm;  $n = 4$ ) and cranial measurements ( $CI = 18.6$  mm,  $n = 1$ ;  $UTRL = 7.9\text{--}8.4$  mm,  $n = 3$ ).

Other species such as *Crociodura phaeura* Osgood, 1936, from Ethiopia or the widely distributed *Crociodura hildegardeae* Thomas, 1904, have considerably larger skulls.

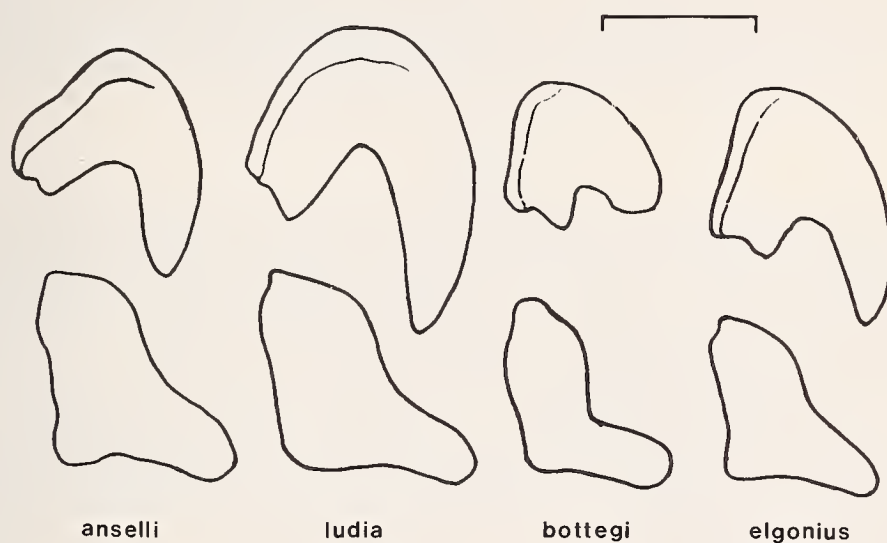


Fig. 2: First upper incisor in lateral view, and posterior surface of the condylar process of the mandible, in *Crociodura anseli* n. sp. (NMZ 3675, holotype); *C. ludia* (USNM 537685), *C. bottegi* (BM 98.2.5.6, paratype) and *C. elgonius* (BM 10.4.1.47, holotype). Scale = 1 mm.

**Relationships:** It is not possible to assign *Crociodura anseli* to a certain species group because it exhibits a somewhat enigmatic mixture of characters found in *C. bottegi* on one hand and *C. ludia*, as part of the *C. dolichura* species group, on the other hand. Both are members of the African forest fauna and must be considered as possible sister taxa of *C. anseli*. Before the discovery of the type material of *C. anseli* in 1973, nothing comparable had been found in Africa south of central Zaire.

It is possible that further collecting in northeastern Angola and southern Zaire will reveal further records, either of *C. anseli* or another species that may link *C. anseli* with one or the other species mentioned above. We hypothesize that *C. anseli* is a southern representative of the central African forest fauna, and that resemblances between *C. anseli* and *C. fuscomurina* are superficial and due to similarities in size.

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### Zusammenfassung

Eine neue Spitzmaus, *Crociodura anseli*, wird nach Material aus der nordwestlichen Provinz Zambias beschrieben. Es handelt sich um eine kleine schokoladenbraune Art, in der Größe vergleichbar mit *C. fuscomurina*, die sich jedoch durch eine charakteristische Kombination von äußeren Merkmalen und von Schädelmerkmalen von anderen afrikanischen *Crociodura* wie *ludia*, *niobe* und *bottegi* unterscheidet. Es wird vermutet, daß es sich bei *C. anseli* um eine randständige Reliktform der zentralafrikanischen Regenwaldfauna handelt.

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