ORYX VOL 25 NO 3 JULY 1991

A new forest shrew from southern Tanzania

Rainer Hutterer, Paulina D. Jenkins and Walter N. Verheyen

A new species of shrew, Crocidura desperata *n. sp. (Mammalia: Soricidae), is described from specimens recently collected in the Rungwe Forest and the Uzungwe Mountains in southern Tanzania. It is a large and long-furred shrew closely resembling* Crocidura lanosa *from Mt Kahuzi in eastern Zaire. Like other small mammals with a relict distribution, the newly discovered species appears to be highly vulnerable to forest destruction.*

Introduction

During the past decade the study of the mammal fauna of unexplored remnant mountain forests of Tanzania has led to a number of interesting discoveries, such as a new subspecies of primate from the Uzungwe Mountains (Homewood and Rodgers, 1981) and four new species of shrew from the Uluguru and Usambara Mountains (Dippenaar, 1980; Jenkins, 1984; Hutterer, 1986). During November 1987 members of the Tanzanian–Belgian Rodent Project collected small mammals in the Rungwe Mountains in southern Tanzania. Among the insectivores collected there were two specimens of a striking shrew not known to science. They match a third specimen from the Uzungwe Mountains in the collections of the British Museum.

Specimens and methods

The new material is part of the collections of the Tanzanian–Belgian Rodent Project (TBRP), which are currently housed in the University of Antwerp. Other material mentioned is in The Natural History Museum, London (BMNH), and the Museum Alexander Koenig, Bonn (ZFMK). The terminology used for measurements and dentition has been explained elsewhere (Jenkins, 1984; Hutterer, 1986). Details of technical names are found in Allen (1938) and Ansell (1989). Measurements mentioned in the description refer to the holotype (first figures) and paratype (second figures).

The new forest shrew

Crocidura desperata, *new species*

Specimens. Holotype TBRP 6259, adult male, collected 23 September 1987 by Jan Stuyck in the mountain bamboo zone of the Rungwe Mountains (09°08'S, 33°40'E; above 2000 m), southern Tanzania. The specimen is preserved in spirit, the skull is cleaned; condition good. The holotype will be deposited in the Musée royale de l'Afrique centrale, Tervuren, Belgium. Another adult male (TBRP 6255, paratype) was collected with the holotype. Referred specimen: BMNH 87.252 male, picked up dead 31 March 1985 at Ngwazi Estate (08°20'S, 35°58'E; c. 2000 m), Uzungwe Mountains, Tanzania. The specimen was collected by T. C. E. Congdon and donated by K. M. Howell, University of Dar-es-Salaam.

Diagnosis and description. A large (body mass 24/26 g) greyish-brown shrew; pelage long and dense; tail covered by long bristle hairs over 73 per cent of its length; ears short relative to body size; claws strongly developed. Skull large (condylo-incisive length 27.0/26.0 mm) with elongated rostrum and narrow interorbital region; upper incisors long and gracile, upper unicuspids elongated, last upper molar reduced in size, last lower molar with a simple talonid.

One of the prominent characters of the new species is its long and woolly pelage with dorsal hairs 10 mm long in both Rungwe specimens. The colour of the dorsal pelage is deep greyish-brown with a slight speckling, that of the ventral pelage paler grey, with a gradual transition between both. The hairs are very soft. Hands and feet are the same colour as the venter. The tail is bicoloured, dorsally dark brown, ventrally grey. The tail is thick at its base and densely covered by long bristles up to 12 mm in length over 76/70 per cent of its total length. The tail of the holotype has a white tip.

The proportions of *C. desperata* n. sp. are that of a

terrestrial shrew with some modifications suggesting a subfossorial life (Figure 1). The body is large for a shrew, 80/101 mm in length; the tail (67 mm) is 66.3/83.8 per cent of head and body length; the fore- and hindfeet (19.0/18.6 mm) are long and bear well-developed claws (longest claw of forefoot 2.6/2.5 mm, of hindfoot 2.6/2.8 mm); the dorsal surface of the foot is almost hairless and shows scales similar to those of *Myosorex*; the ears (7.1/8.3 mm) are short relative to head and body length.

The skull (Figure 2) is long and slender (condylo-incisive length 27.0/26.0 mm; upper toothrow length 11.8/11.3 mm). The dorsal profile is straight with a narrow crest running over the midline of the skull; the braincase (greatest width 11.0 mm) is large and oval-shaped in dorsal view; the interorbital region (5.2/5.1 mm) is narrow; the rostrum (bimaxillary width 7.9–8.0 mm) is long and narrow; the pterygoid extends back to the anterior border of the inferior articular facet.

The anterior teeth are elongated; the upper first incisor forms a long, thin hook, and the lower first incisor is complementary in shape; the three upper unicuspids form asymmetric triangles (in side view) with the tip shifted towards incisor 1; unicuspid 1 is about twice as large as 2 and 3; in buccal view unicuspid 3 is smaller than 2 while the reverse relationship occurs in occlusal view; the cheekteeth (premolar 4 to molar 2) are not remarkably modified from the general condition in *Crocidura* but the third molar is reduced in length relative to the upper toothrow length. The lower molars are low-crowned, the third lower molar has a well-developed entoconid.

Remarks. The single specimen from the Uzungwe Mountains is intermediate in head and body and ear length but smaller in all other dimensions although its qualitative characters agree fairly well with the holo- and paratype. Remarkable differences exist in the hindfoot length (16.8 mm) and the dorsal hair length (6.5 mm). The pelage differs slightly in colouration: the dorsum is dark brown with a slight speckling of lighter brown; the bases of the hairs are slate grey. The venter is pale grey brown; the bases of the hairs are slate grey with grey or light brown tips; the transition between the dorsal and ventral colour on the flanks is narrow. The forelimb is slightly paler than the dorsum, the feet are the same colour as the dorsum. The tail is dorsally dark brown, lighter ventrally but not markedly bicoloured; the tip is of the same colour as the rest of the tail. Further material from the two mountains is necessary to decide whether we are dealing with individual or geographical variation. For the moment all three specimens are taken as representatives of a single species.

Comparisons. Crocidura desperata is rather similar to *Crocidura lanosa*, a species known from a small swamp area in the Kahuzi Mountains, eastern Zaire, and from Nyungwe Forest, Rwanda (Heim de Balsac, 1968). The species was named for its long pelage, which gives it the look of a juvenile *Scutisorex*. *Crocidura lanosa* differs from *C. desperata* by larger body size, a longer tail, low pilosity (33 per cent), and a slightly smaller skull. Also the form of the skull (Figure 2) and teeth are different. The front part of the skull is lower and more gracile, and the braincase is slightly domed. The incisors are much smaller and the shape of the unicuspids (side view) is less asymmetric. However, this similarity does not necessarily mean that both species are phylogenetically related. *Crocidura desperata* is obviously a highly specialized member of the genus, which makes it difficult to assign it to a certain species group. Based on a much more detailed analysis we have discussed two alternative hypotheses but are not able to make a clear evaluation. We therefore postpone a discussion of systematic relationships which will also include a more detailed technical description and comparison of the new species.

Distribution. So far known only from the Rungwe and Uzungwe Mountains, Tanzania.

Etymology. The specific epithet was chosen to point out the desperate situation of the new species, the survival of which is, like that of many other mountain forest endemics, entirely dependent on the preservation of the few remnant forests that still exist in that part of Africa.

Habitat, ecology and conservation

In the Rungwe Forest, the two *C. desperata* were caught in the mountain bamboo zone with *Arundinaria alpina* as the main plant. The extreme elongation of the incisors of the animals may indicate that the species is adapted to a special diet such as worms, a supposition which could be tested by future field studies. The small ears and the slight modification of the fore- and hindfeet suggesting a subfossorial life would point in the same direction but this hypothesis also requires testing by field studies.

Highly specialized forest shrews like *C. desperata* are trapped in the forest remnants left on slopes or on top of isolated mountains. These species are unable to adapt to marked

Figure 1. Sketch of *Crocidura desperata*, drawn from the holotype by Peter Boye. Length from nose tip to tail base is 80 mm.

habitat changes such as logging or conversion of forest into farmland. A study of the shrew communities of the Virunga Mountains (Hutterer *et al.*, 1987) has shown that some species may occur in secondary forest and extensively managed farmland adjoining sufficiently large areas of primary forest. However, some insectivores occur only in undisturbed forests, swamps or montane prairies. The same applies to rodents and

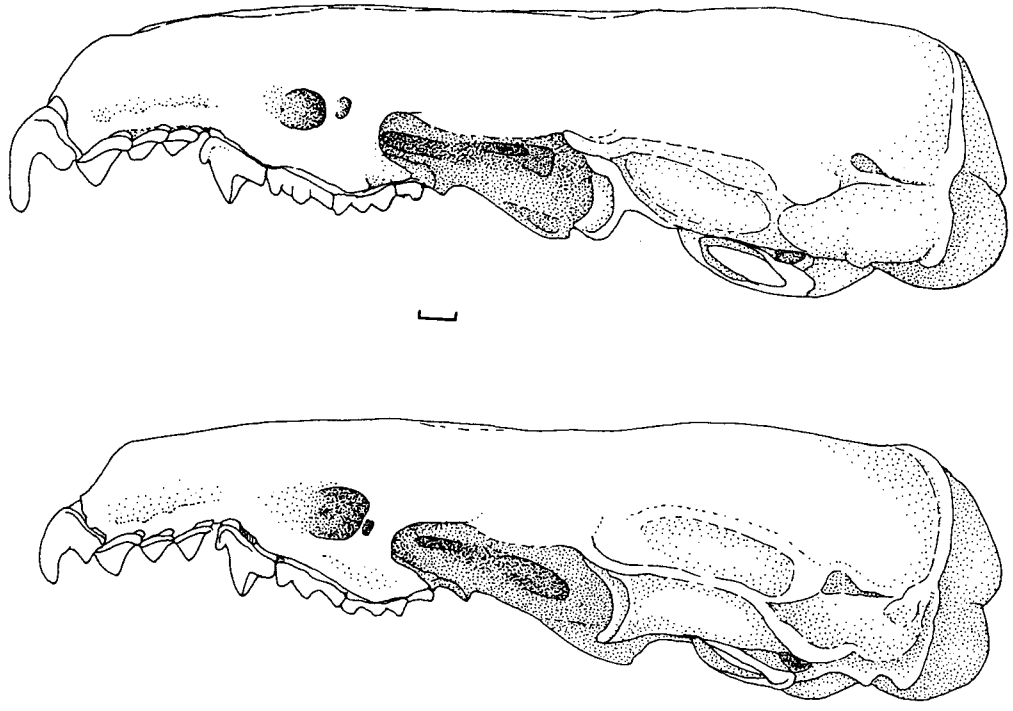

Figure 2. Side views of skulls of *Crocidura desperata* (TBRP 6259, the holotype) (top) and of *C. lanosa* (ZFMK 68.501) (bottom). Scale is 1 mm.

https://doi.org/10.1017/S0030605300034190 Published online by Cambridge University Press

Table 1. Distribution of some shrews in the forests of the Eastern Mountain Chain. All but *Crocidura allex* are endemic to Tanzania

	Kilimanjaro	Meru	Usambara	Uluguru	Uzungwe	Rungwe
Crocidura allex	x	x				
Myosorex zinki	x					
Crocidura monax	x			x	x	
Crocidura usambarae			x			
Crocidura tansaniana			x			
Sylvisorex h. usambarensis			x			
Sylvisorex h. howelli				x		
Crocidura telfordi				x		
Myosorex geata				x		
Myosorex sp.					x	x
Crocidura desperata					x	x

other small mammals. Their survival will depend upon the conservation of the habitats they live in. The IUCN/SSC Action Plan for the conservation of African Insectivora and elephant-shrews (Nicoll and Rathbun, 1990) therefore focuses on habitat protection rather than measures for individual species.

Tanzania has a number of forest islands strung along the Eastern Mountain Chain. They house an extremely rich vertebrate fauna with many endemic species. Seven species of shrews occur here and nowhere else, and a new *Myosorex* species currently under study may be added (Table 1). In several of these forest islands the remnant forest is seriously threatened (Schiøtz, 1981). The latter author therefore regards the conservation of the rapidly vanishing forests of the Eastern Mountain Chain as 'the most urgent conservation problem in Africa today'.

References

Allen, G.M. 1939. A checklist of African mammals. *Bull. Mus. comp. Zool.* **83**, 1–763.

Ansell, W.F.H. 1989. *African Mammals 1938–1988.* Trendrine Press, Zennor, UK.

Dippenaar, N.J. 1980. New species of *Crocidura* from Ethiopia and northern Tanzania (Mammalia: Soricidae). *Ann. Transv. Mus.* **32**, 125–154.

Heim de Balsac, H. 1968. Considérations préliminaires sur le peuplement des montages Africaines par les Soricidae. *Biol. Gabon.* **4**, 299–323.

Homewood, K.M. and Rodgers, W.A. 1981. A previously undescribed mangabey from Southern Tanzania. *Int. J. primatol.* **2**, 47–55.

Hutterer, R. 1986. Diagnosen neuer Spitzmäuse aus Tansania (Mammalia: Soricidae). *Bonn. zool. Beitr.* **37**, 23–33.

Hutterer, R., Van der Straeten, E., and Verheyen, W.N. 1987. A checklist of the shrews of Rwanda and biogeographical considerations on African Soricidae. *Bonn. zool. Beitr.* **38**, 155–172.

Jenkins, P.D. 1984. Description of a new species of *Sylvisorex* (Insectivora: Soricidae) from Tanzania. *Bull. Br. Mus. nat. Hist. (Zool.)* **47**, 65–76.

Nicoll, M.E. and Rathbun, G.B. 1990. *African Insectivora and Elephant-Shrews. An Action Plan for their Conservation.* IUCN, Gland, Switzerland.

Schiøtz, A. 1981. The Amphibia in the forested basement hills of Tanzania: a biogeographical indicator group. *Afr. J. Ecol.* **19**, 205–207.

Rainer Hutterer, Museum Alexander Koenig, Adenauerallee 162, D 5300 Bonn 1, Germany.

Paulina D. Jenkins, The Natural History Museum, Cromwell Road, London SW7 5BD, UK.

Walter N. Verheyen, Laboratorium Algemene Dierkunde, Universiteit Antwerpen, Groenenborgerlaan 171, B 2020 Antwerpen, Belgium.