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FIRST RECORD OF *MYOSOREX* (MAMMALIA: SORICIDAE) FROM MALAWI WITH DESCRIPTION AS A NEW SPECIES, *MYOSOREX GNOSKEI*

Julian C. Kerbis Peterhans
Roosevelt University
430 S. Michigan Ave., Chicago, IL 60605, USA
&
Division of Mammals, Field Museum of Natural History
Chicago, IL, 60605-2496, USA
jkerbis@fieldmuseum.org

Rainer Hutterer
Zoologisches Forschungsmuseum Alexander Koenig
Adenauerallee 160, D-53113 Bonn, Germany
r.hutterer.zfmk@uni-bonn.de

Potiphar Kaliba, Lovemore Mazibuko
Museums of Malawi
P.O.Box 30360, Chichiri, Blantyre, 3, Malawi

ABSTRACT

We describe a new species of *Myosorex* from Nyika National Park, northern Malawi. *Myosorex gnoskei* (the Nyika burrowing shrew) represents the first record of the genus from the country. Recently collected between pine plantations and adjacent to the headquarters of a major national park, this new species of shrew highlights the need for further comprehensive sampling of habitats, even those thought to be 'well-known' and adjacent to human disturbance. The specimen was taken at an elevation of 2285 m., suggesting a relict montane distribution. In cranial dimensions, this new species of shrew rivals *Myosorex kihaulei,* and ranks second only to *Myosorex schalleri* as the smallest described member of the genus. This new record also fills in a major gap in the distribution of the genus in the regions of the Albertine and Malawi Rifts. There are no published records in the region between 3°05'S (just north of Lake Tanganyika) and 14°30'S (south of Lake Malawi). This void includes the countries of Angola, Zambia, Malawi, Democratic Republic of Congo (SE), Tanzania (W), and Zimbabwe (N).

Keywords: *Myosorex*, shrew, new species, Albertine Rift, Malawi Rift

INTRODUCTION

The genus *Myosorex* has a relict distribution in eastern and central Africa as the 9 member species are found exclusively in isolate montane zones (1140–4000 m) in eastern and Central Africa (nine species). The sole exception is a specimen of *M. geata* (Allen & Loveridge, 1927) collected by Loveridge at Vituri (*ca*. 610 m), Uluguru Mountains, Tanzania. The genus does occur in lower elevation habitats at southern latitudes [five species within southern Africa; summarized in Hutterer (2005)]. Until recently, only two localities for the genus had been documented between 3ºS and 18ºS (figure 1). The first was *M. geata* from the Uluguru Mountains of central Tanzania (Allen & Loveridge, 1927). The second was an undocumented record of *M. cafer* (Sundevall, 1846) from Tete District, Mozambique (Smithers & Tello, 1976), but that specimen(s) cannot be confirmed as its whereabouts is not known. Stanley and Hutterer (2000) recently described *M. kihaulei* (Stanley and Hutterer, 2000)from the Udzungwa Mountains of central Tanzania (ca. 8ºS), and Stanley *et al*. (2005a) described a related Myosoricine (*Congosorex phillipsorum*) Stanley et al 2005a), also from the Udzungwa Mountains. However, none of these forms are known from the Albertine or Malawi Rifts. Here we report on a newly collected specimen from Nyika National Park, northern Malawi at *ca*. 10º35'S. The distinctive characters of this specimen enable us to describe it as a species new to science.

Description of the study area

Nyika National Park, centered on 10°33'S and 33°50'E, lies in northern Malawi and was declared Malawi's first national park in 1965. After expanding to 3134 km^2 in 1978, it became the largest National Park in Malawi. As part of the Malawi Rift, the plateau component of the National Park comprises the 'largest montane complex in south-central Africa' (Dowsett-Lemaire, 1985), with some 1800 km^2 above 1800m. This specimen was captured on the central plateau within the Park. The habitat of the plateau is dominated by rolling *Loudetia-Andropogon* grassland with scattered patches (2–3% of total area) of forest, many of which are centered on small streams and valleys (Chapman & White, 1970; Dowsett-Lemaire, 1985). A few relict patches of juniper (*Juniperus procera* Endl.) persist. Only the wet eastern escarpment, overlooking Lake Malawi, supports moist forest (*Ficalhoa-Ocotea*). Additional habitats include *dambos* (seasonally inundated, shallow wetlands on the plateau) and patches of stunted, broad-leaf, woodland with typical height of only 7.5–9.0 m (Von der Heyden, 2004).

At one time, montane evergreen forest was the dominant vegetation community but, due to fires, the extensive forests were heavily impacted and reduced. Evidence from Chilinda suggests that severe fires occurred between 9800 and 4900 years B.P. resulting in extensive forest destruction (Shroder, 1976; cited in Dowsett-Lemaire, 1985). Increased human impact prevented forest regeneration resulting in vegetation dominated by fibrous peat (product of sedges, reeds and grasses). A further contributing element to forest destruction was a tradition of prehistoric iron-smelting, evidenced by scattered smelting stations, creating a need for fuel wood (Cater, 1954; Rangley, 1960). Cater notes that 'nyika' means 'to burn well' in the local Tumbuka language. The Plateau appears never to have been permanently inhabited (Chapman & White, 1970; Dowsett-Lemaire, 1985) since the soils are not conducive to growing crops (Chapman & White, 1970). Henderson (1900) provides one of the earliest accounts of the plateau: 'There is no forest of any kind, only grass veldt with mean scrub in the hollows'. Fires continue to have a major impact today. The presence of endemic taxa of francolin (*Scleroptila levaillantii crawshayi* Ogilvie-Grant, 1896), weaver

(*Ploceus baglafecht nyikae* Benson, 1938), babbler (*Illadopsis pyrrhoptera nyasae* Benson, 1939), and lark (*Mirafara*

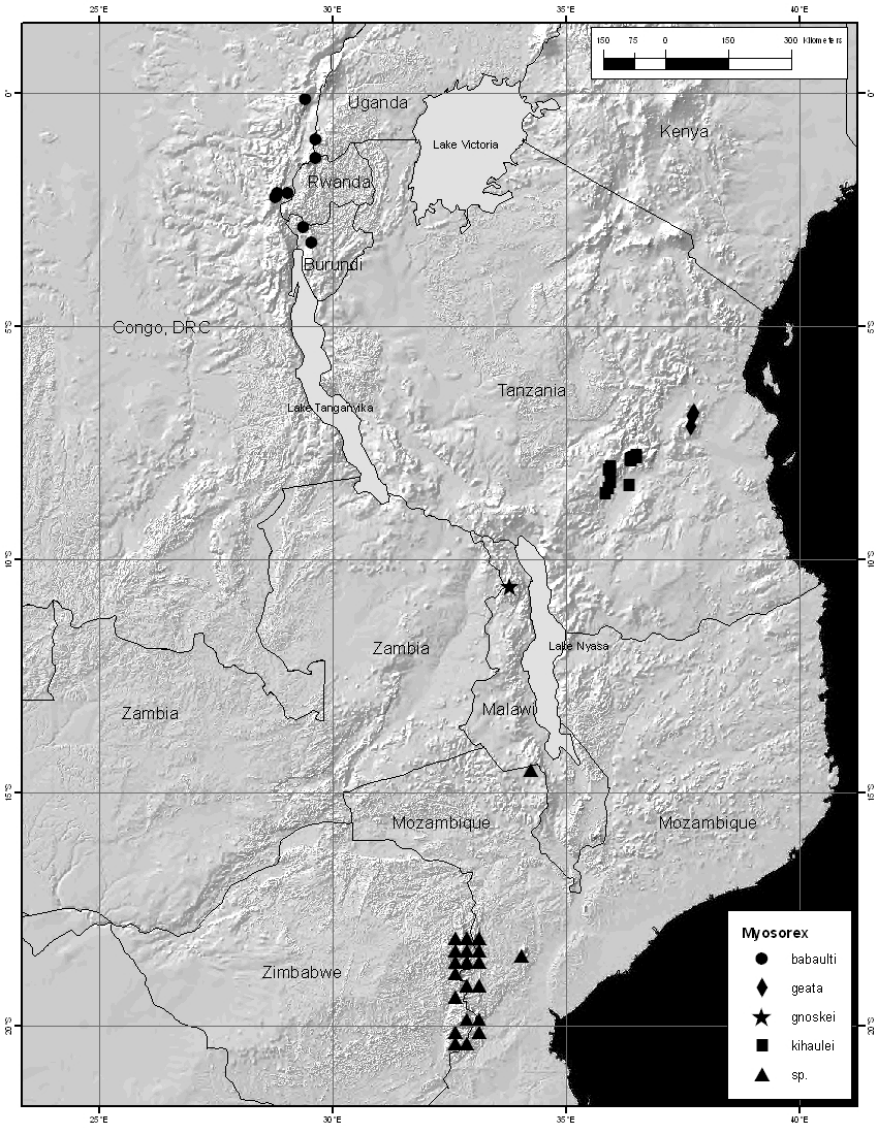

Figure 1. Distribution of documented Myosorex *taxa across afromontane habitats in the Eastern Arc, Albertine Rift, and Malawi Rift, showing the intermediate locality of* Myosorex gnoskei.

africana nyika Benson, 1939) hint at the long-term persistence of these grasslands (Benson, 1953; Meadows, 1984). In his review of geomorphology, sediments and soils, Meadows (1984) concludes by stating that the current vegetation regime on the Nyika predates the arrival of man *ca*. 12 000 years ago.

Exotic conifers (*Pinus patula* Schltdl. & Cham.) and *Eucalyptus spp*. were established by the Malawi Forest Department prior to the Park's gazetting. Today, the only maintained exotic plot is the 1200 ha forest adjacent to Chilinda Camp, the base of operation during the capture of the new

species. Mean monthly temperatures at Chilinda range between 11°C (June–July) with occasional night frosts, and 16°C in November–December (Dowsett-Lemaire, 1985). Easterly winds can be especially cold in July–August. Mean annual rainfall near the Chilinda Camp is 1160 mm (793–1589 mm) with a single rainy season between November and April (inclusive).

MATERIALS AND METHODS

Rodents and shrews in the Chilinda Dam locality were sampled using snap traps and a pitfall line. Three traplines each consisted of 20 Museum Specials (17.5 by 8.5 cm) and 10 Victor Rat traps, were set along a 150 m transect. Pitfalls consisted of 11 buckets, separated at 10 meter intervals. Plastic sheeting, 0.5 m high and buried several centimeters, served as a drift fence between buckets. Buckets were 30 cm in height, with a diameter of 24.5 cm at the bottom and 28.8 cm. at the top. Thirty Victor (17.5 x 8.5 cm) and Museum Special traps (14 x 7 cm) were set along a 150 m transect. The traps were baited with peanut butter. One hundred and nine rodents and shrews were collected during 674 trap nights for a trap success of 16.2%. Field work at the site was conducted between June 21 and June 30, 2004. No rain fell during the field season.

External measurements were recorded on the fresh carcass in the field by LM with a ruler (to the nearest mm). These included: total length (Tot), tail vertebrae (Tail), hind foot including claw (HF), length of ear from notch (Ea), and weight (Wt) in grams. Head and body length (HB) was obtained by subtracting Tail from Tot. Flesh from the thigh was preserved in buffer (DMSO) for genetic studies (Seutin *et al.*, 1991). In the field, specimens were fixed in formalin; upon arrival at the Field Museum of Natural History (FMNH), they were transferred to 75% ethanol. Measurements of Tail, HF and Ea were repeated by JKP at the FMNH approximately 2 months later with the use of a digital caliper (to the nearest 0.01 mm) and a binocular microscope. Differences between field measurements and those undertaken in lab are most likely due to the osmotic properties of the alcohol and the associated shrinkage it induces. Cranial-dental measurements generally follow Dippenaar (1977). These include: condylo-incisive length (CI), upper tooth row length (UTR), maxillary breadth (MB), greatest braincase width (GW), height of cranial capsule (HCC), least interorbital width (IO), mandible and incisor length (MD), lower tooth row length (LTR), breadth across post-glenoid processes (PGL), and minimal height of the coronoid process of mandibular ramus (COR).

With the exception of the type (and only specimen) of *M. schalleri* (Heim de Balsac, 1966), only adult specimens were included in the analyses. Adulthood was determined on the basis of the fusion of the basioccipital-basisphenoid suture. A list of specimens examined is presented in the Appendix.

Acronyms for museum collections used in this report are: AMNH, American Museum of Natural History, New York; FMNH, Field Museum of Natural History, Chicago; MNHN, Museum National d'Histoire Naturelle, Paris; TRP, Tanzanian Rodent Program, University of Antwerp; and ZFMK, Zoologisches Forschungsmuseum Alexander Koenig, Bonn. MLWM= Malawi Mammal Number (original field number). For the map (figure 1), localities of *Myosorex* in Mozambique were estimated from Smithers & Tello (1976, p. 31), and for Zimbabwe they were taken as the center of the squares depicted in Smithers & Wilson (1979, p. 18). Coordinates of the type locality of the new species were taken with a hand-held Magellan 'Color Trak' GPS. In the Appendix (Specimens Examined) "5M, 3F, 1?" refers to five males, three females, and one unsexed specimen. Reference to 'unicuspids' and dental nomenclature follows Hutterer & Schlitter (1996). Taxonomy follows Hutterer (2005).

SPECIES DESCRIPTION

The Nyika burrowing shrew. *Myosorex gnoskei* n. sp**.**

Holotype

FMNH 191568, original number MLWM 133, adult female, dentition well worn, fluid-preserved specimen (70% ethanol). The skull was removed and preserved as a skeletal preparation at the Field Museum of Natural History in late August, 2004. Some damage to left side of basicranium. Collected on 30 June, 2004, by the Malawi Mammal Team (L. Mazibuko and N. Gawami) led by P. Kaliba. Specimen was retrieved from a Museum Special mouse trap with peanut butter as bait.

Type locality and Distribution

Known only from the type locality (figure 1). The trapping station was 200 m north of the Chilinda Guest House within Nyika National Park, Malawi (10º34'37"S, 33º48'30"E, 2285 m).

Etymology

The specific epithet honours Mr. Thomas Gnoske in recognition of his important contributions to the knowledge of African vertebrates, particularly birds and mammals. His skills in the field and as a preparator are only matched by his personal skills, especially his engagement and commitment to host country collaborators.

Diagnosis

Size small for a member of the genus (body mass, 8 g, CI=20.47 mm). Pelage tricolored, resulting in a mottled appearance. Tail bicolored. An exceptionally narrow-skulled member of the genus, as reflected in the reduced MB (6.1 mm) and GW (9.9 mm). Interparietal bone about twice as wide as long. Upper 4th unicuspid very large (3/4 the size of the second upper unicuspid), visible in lateral view and clearly separating upper 3rd unicuspid from upper P4. Upper third unicuspid equal in size to upper first unicuspid. Upper M3 very large and long. Lower P2 large and visible in medial view.

Description.

Pelage mottled (tri-colored) with brownish appearance. On dorsum, individual hairs 7.0 mm long. Each hair composed of a 5.5 mm slate grey base followed by a ca. 1.0 mm yellowish band, terminating in a *ca* 0.5 mm dark brown tip. Belly fur bicolored. Individual hairs from base up to 85% of length slate grey, with yellowish tips on remainder. Tail of moderate length (52% HB); long bristle hairs absent. Tail thin and noticeably bicolored, dark brown hairs above, blond hairs below. Claws short (forefoot=2.4 mm, hindfoot=1.9 mm). Manus and pes lighter in appearance on medial aspect due to less dense fur. Teats appear to be curiously set into inguinal 'pockets'. They may be anomalous in number (two on the left side, none visible on the right side) as the species is known only by the holotype.

Body small (8 g), skull small (CI=20.47 mm). Skull long with a slender rostrum. Braincase (9.9) and maxilla (6.1) narrow. Dorsal profile of braincase slightly domed (figure 2). Interparietal bone (*sensu* Heim de Balsac and Lamotte, 1956) twice as wide as long (figure 3), the posterior suture being partly fused with the occipital. Upper 4th unicuspid very large (3/4 the size of the second upper unicuspid) and visible in lateral view; fully involved in tooth row (figure 4). The upper 4th unicuspid clearly separates upper 3rd unicuspid from upper 4th premolar. Upper 3rd unicuspid sub-equal in size to upper 1st unicuspid. Upper P4 lightly built with expansive posterior concavity (figure 4) between metastyle and talonid; parastyle long and hook-like in lateral view (figure 3). Upper M^1 and M^2 also lightly built with large vacuities. Upper M^3 very long and heavily built. One small anterior lateral (foramen vasculaire = sinus canal foramen of Meester 1963, Fig. 12) and one small posterior medial (basisphenoid fenestration) post-pterygoid foramina present (Gasc, 1963).

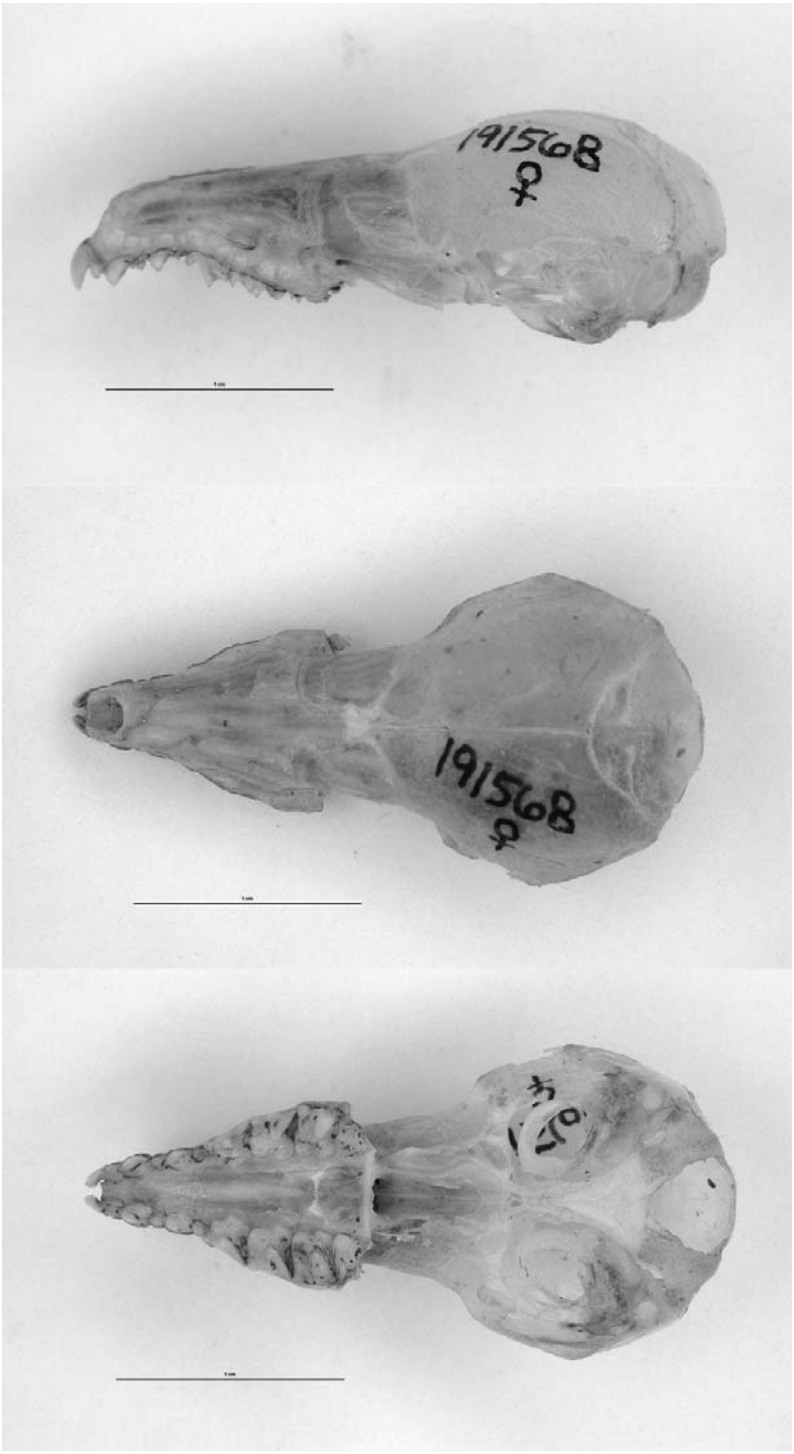

Figure 2. Skull of the holotype of Myosorex gnoskei *n. sp. (FMNH 191568) in dorsal, ventral, and lateral views.*

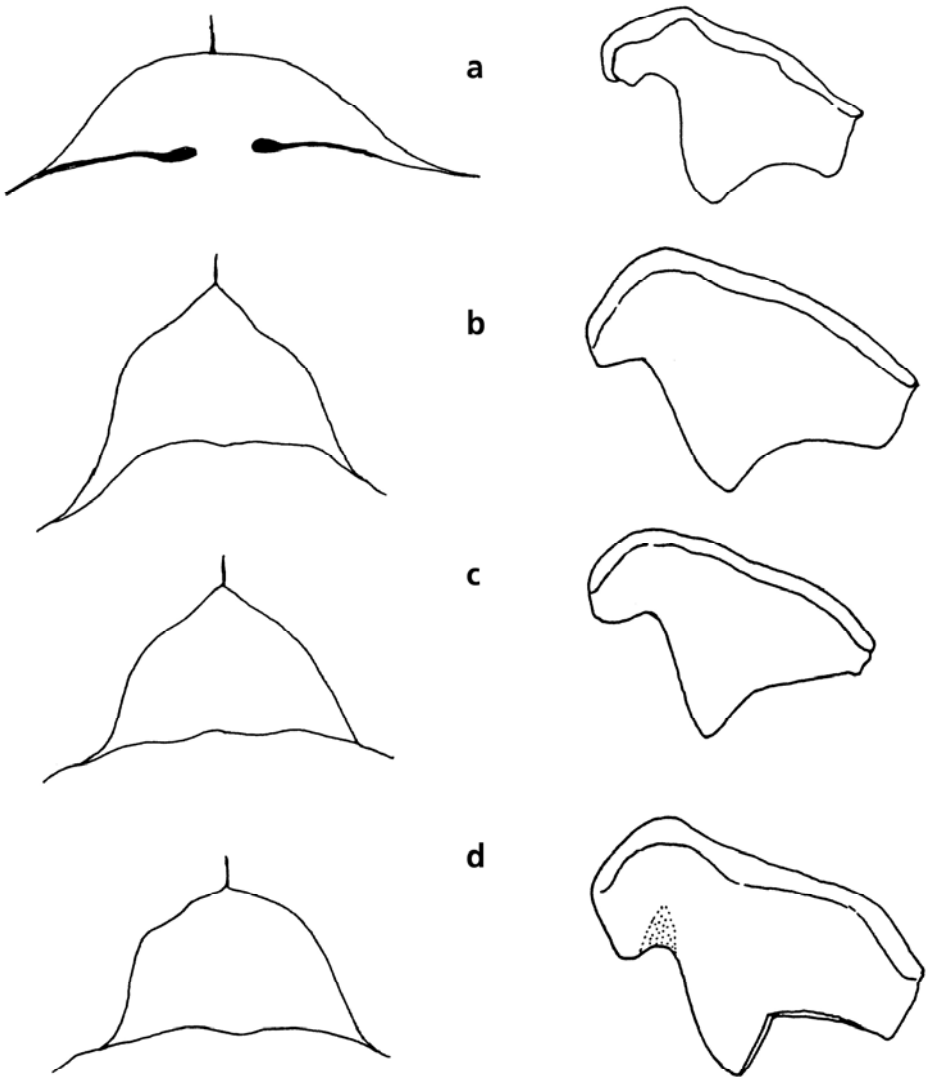

Figure 3. Interparietal bone (left) and Upper P4 (right, in lateral view) of (a) Myosorex gnoskei *n. sp. (holotype), (b)* M. geata*, (c)* M. kihaulei*, and (d)* M. varius *(Thomas, 1906).*

Two denticulations to lower incisor. Lower P2 relatively large and visible in medial view. Lower P4 almost as wide as long, cutting surface with the V-pattern, typical in myosoricine shrews. Lower M3 very long. Large gap between M_3 and ascending ramus. Mandibular ramus vertically shallow. Posterior hook to ascending ramus of mandible. Lightly built and concave articular facet to the glenoid process of the mandible.

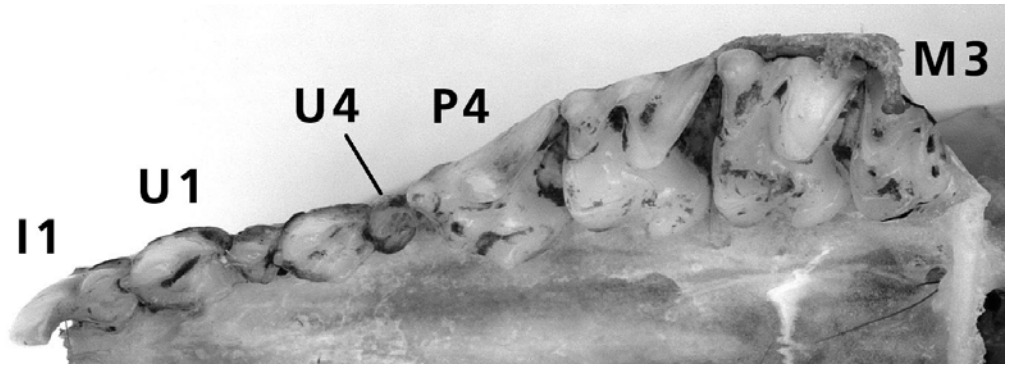

Figure 4. Upper tooth row of the holotype Myosorex gnoskei *n. sp. (FMNH 191568), showing the large upper fourth unicuspid (U4) that is fully involved in the tooth row, the posterior concavity of the upper P4, and the large upper M3. First incisor (I1) to the left, third upper molar (M3) to the right.*

Comparisons

Myosorex gnoskei is easily distinguished from its congeners by a combination of a short tail, a large and distinctively shaped M^3, and a narrow skull (GW and MB). Due to its small cranial size (CI=20.47), the specimen needs comparison only with congeners with a CI below 22.0: *M. babaulti* (Heim de Balsac and Lamotte, 1956), *M. geata*, *M. kihaulei*, *M. schalleri,* and *M. tenuis* (Thomas & Schwann, 1905).

Myosorex gnoskei is readily distinguished from *M. babaulti* by its tri-colored dorsal fur, longer tail, and short and narrow skull (CI, GW, MB) with shorter tooth rows (UTR, LTR).

The short claws, tri-colored pelage, and narrow skull align *M. gnoskei* most closely with *M. geata* and *M. kihaulei*. Smaller mensural characters distinguish *M. gnoskei* from *M. geata* (table 1), especially its narrower skull (MB, PGL and GW), lower skull height (HCC), shorter tooth rows, and much smaller upper incisor whilst boasting a much larger upper 4th unicuspid and upper M3 (figure 2). Its upper 3rd unicuspid is elongate compared to the more square-like dimension seen in the corresponding tooth of *M. geata*. Some specimens of *M. kihaulei* are actually smaller than *M. gnoskei* in several cranial dimensions (*e.g.*, CI, UTR and COR); however, the narrower skull and lower cranial vault, reflected in MB, GW, PGL, and HCC distinguish *M. gnoskei* (table 1). The minimum measurement for GW in *M. kihaulei* males (9.67 mm, table 1) reported by Stanley & Hutterer (2000) was done so in error (Stanley, personal comm.); no available specimens of *M. kihaulei* have a GW of less than 10.26 mm. In addition, *M. gnoskei* has a narrower and longer upper 3rd unicuspid, the 4th is substantially larger and fully involved in the UTR and its upper M3 is longer.

Comparisons with *M. schalleri* are difficult because this taxon is represented solely by the type specimen, a juvenile. A soricid of young age will typically have a more narrow MB and a shorter CI (pers. obs.). *M. gnoskei* is distinguished from *M. schalleri* by its shorter tail and mottled pelage. *M. schalleri* is dull black in color both dorsally and ventrally. *M. gnoskei* has a much taller coronoid (COR), longer and broader skull (CI, GW and MB), a very large upper 4th unicuspid, and the parastyle of the P^4 is much better developed. Both species share the wide and short interparietal (table 1, figure 3).

M gnoskei is distinguished from *M. tenuis* by its mottled tri-colored dorsal fur. This contrasts against the 'warm dark bistre brown... approaching black in some specimens' described by Thomas & Schwann (1905, p.131) for *M. sclateri*, a character similarly

diagnostic of *M. tenuis*. *M. gnoskei* is significantly smaller in all absolute cranio-dental length dimensions than *M. tenuis* (CI 20.47 vs. 21.7 and UTR 8.58 vs. 9.5) except for GW (9.91 vs 10.2 in *M. tenuis*); an important difference in shape. Moreover, *M. tenuis* is only known from south of the Zambezi River. Further documentation of *M. tenuis* is still needed through surveys, specimens, descriptions, morphometrics, and illustrations (such as for the M^3).

Table 1 External and cranio-dental measurements for five species of Myosorex. *External measurements (in mm) include: total length (Tot), head and body length (HB), tail vertebrae (Tail), hind foot including claw (HF), length of ear from notch (Ea), length of fore claw (Fclaw) and length of hind claw (Hclaw), and weight (Wt) in grams .*

Species	N	Tot	HB	Tail	HF	Ea	Wt	Tail/HB	Fclaw[2]	Hclaw[2]
gnoskei[1]	1	114	75	41	14	9	8	54.7%		
gnoskei[2]	1			37	13	8			2.4	1.9
schalleri[3]	1		52.5	44	12	-	-	83.8%		
geata[4]	6	113	72	41	13.2	7.15	9.35	57%	2.43	2.04
kihaulei[4]	10	116	76.3	40.7	12.8	8.6	9.5	54%	2.28	1.99

Cranio-dental measurements (in mm) include: condylo-incisive length (CI), upper tooth row length (UTR), maxillary breadth (MB), greatest braincase width (GW), height of cranial capsule (HCC), breadth across post-glenoid processes (PGL), least interorbital width (IO), mandible and incisor length (MD), lower tooth row length (LTR), and minimal height of the coronoid process of mandibular ramus (COR).

Species	n	CI	UTR	MB	GW	HCC	PGL[2]	IO	MD	LTR	COR[2]
schalleri[3]	1	18.9	8.4	5.4	8.3	5.9	-	4.4	-	7.9	4.2
gnoskei	1	20.47	8.58	6.08	9.91	6.1	6.65	4.19	12.52	7.76	5.15
geata[4]	6	20.89	9.06	6.44	10.54	6.60	7.16	4.42	13.06	8.22	5.37
kihaulei[4]	10	20.26	8.65	6.38	10.40	6.44	6.92	4.24	12.61	7.91	5.11
geata, range[4]	6	20.66-21.12	8.92-9.19	6.35-6.56	10.32-10.69	6.34-6.75	6.98-7.39	4.23-4.58	12.97-13.2	8.10-8.32	5.28-5.46
kihaulei, range[4]	10	19.67-20.85	7.99-8.99	6.25-6.50	9.91*-10.75	6.26-6.58	6.76-7.02	4.06-4.50	12.19-12.85	7.27-8.32	4.96-5.33

[1] *original field measurements by LM Mazibuko*
[2] *measurements taken at FMNH by JKP*
[3] *measurements of* M. schalleri *taken from the type by RH*
[4] *measurements averaged from males/females from Stanley & Hutterer (2000)*
** see text for explanation*

Affinities

The affinities of *M. gnoskei* are difficult to ascertain. A narrow skull and tri-colored, mottled pelage are shared by *M. geata, M. kihaulei*, and *M. gnoskei*. These three taxa are distributed from central Tanzania south to northern Malawi. Yet, a slender upper P4 with a long parastyle, and a wide interparietal bone (figure 3) are only shared by *M. gnoskei* and *M. schalleri*. Based on the configuration of the cranial capsule, Heim de Balsac (1967) called the latter species the most primitive member of the genus. The more oval shape of the skull (rather than hexagonal), the large in-line 4th upper unicuspid, the small claws, and the well-developed ears (9 *vs*. 5–6 mm) suggest that *M. gnoskei* is a primitive member of the genus (see Heim de Balsac & LaMotte, 1956; Heim de Balsac, 1967) since it is a less specialized burrower. It would also be instructive to compare *M. gnoskei* with the nearest *Myosorex* to

the south, recorded by Smithers & Tello (1976) from Mozambique at *ca*. 14º30' S; unfortunately, we have been unable to determine the institution where this specimen was deposited.

Ecology

Myosorex gnoskei is known only from the type locality. It is evidently uncommon, or else only seasonally active, as it was not encountered in several previous collecting efforts at this locality. This specimen was collected in a snap trap, not a pitfall line, indicating that it can be trapped using such time-honored collecting techniques; its absence from previous surveys is, therefore, puzzling.

The single specimen was retrieved early in the morning which suggests nocturnal activity, typical for the genus. Species composition of the small mammal community is presented in table 2. This assemblage includes an undescribed species of *Dendromus* (Kerbis Peterhans *et al.,* in prep).

The *M. gnoskei* specimen was collected within the premises of Chilinda Parks and Wildlife Camp, in shrub thickets (heathland including *Helichrysum whyteanum,* Britten. (Asteraceae)) and bracken fern along a shallow stream about 200 m north of the Chilinda Rest House. This area has pine plantations (*Pinus patula*) on the eastern and western sides separated by a valley with a perennial river. The river is impounded ca. 1 km downstream of the collection locality. Dominant plant species include sedges (Cyperaceae), bracken fern *Pteridium aquilinum*, (L.) Kuhn. (Dennstaedtiaceae) and evergreen shrubs. Other plants collected on the plateau by the research team include: *Lobelia baumannii* Engl. (Lobeliaceae), *Hypericum revolutum* Vahl. (Hypericaceae), *Hypericum peplidifolium* A.Rich (Hypericaceae), *Rumex abyssinicus* Jacq. (Polygonaceae), *Asplenium aethiopicum* (Burm.f.) Becheres. (Aspleniaceae), *Panicum maximum* Jacq. (Poaceae), *Carex conferta* A.Rich var. *lycurus* (K.Schum) Lye. (Cyperaceae), *Sonchus asper* (L.) Hill (Asteraceae), *Anthospermum usambarense* K.Schum (Rubiaceae), *Dryopteris athamantica* (Kunze) Kuntze (Dryopteridaceae).

Table 2. Small mammal fauna collected at the Chilinda Dam Site, Nyika National Park, Malawi (June 21–30, 2005)

Soricomorpha - Soricidae	
Crocidura hildegardeae (Thomas, 1904)	1
Crocidura nigrofusca (Matschie, 1895)	1
Crocidura olivieri (Lesson, 1827)	1
Myosorex gnoskei (this study)	1
Suncus megalura (Jentink, 1888)	2
Rodentia - Muridae	
Dendromus nyasae (Thomas, 1916)	3
Dendromus nov. sp.	2
Lophuroms Aquiles (True, 1892)	34
Aethomys chysophilus, (de Winton, 1897)	2
Aethomys nyikae (Thomas, 1897)	2
Grammomys dolichurus (Smuts, 1832)	2
Grammomys ibeanus (Osgood, 1910)	1
Mus triton (Thomas, 1909)	15
Otomys c.f. denti sungae (Bohmann, 1943)	2
Otomys udzungwensis (Lawrence and Loveridge, 1953)	3
Rhabdomys dilectus (de Winton, 1897)	55

DISCUSSION

The occurrence of *M. gnoskei* on the Nyika Plateau is typical of the distribution of *Myosorex*, which is endemic to disjunct high plateaus and mountain tops in afrotropical latitudes: *M. blarina* (Thomas, 1906) from Rwenzoris, Uganda and DR Congo (1960–4000 m, Kerbis Peterhans *et al.* 1998), *M. babaulti* from Bwindi-Impenetrable National Park, Uganda (1850 m, FMNH), and Virunga Volcanos (3100 m, Uganda & DRC, FMNH, Misonne, 1963), Kibira National Park, Burundi (2100 m, FMNH), Kahuzi-Biega National Park, DR Congo (1950–2100 m, AMNH); *M. eisentrauti* (Heim de Balsac 1968) from Bioko Island (2000–2400 m), Equatorial Guinea; *M. geata* from Uluguru Mountains, Tanzania [2,000' (610 m) and 7,500'(2290 m)], Allen & Loveridge, 1927; 1345–1535 m, Stanley & Hutterer, 2000); *M. kihaulei* from Udzungwa Mountains (1460–2000 m; Stanley & Hutterer, 2000), *M. okuensis* (Heim de Balsac, 1968) from Bamenda Plateau (1800–2100 m), Cameroon; *M. rumpii* (Heim de Balsac, 1968) from Rumpi Hills (1100 m), Cameroon; *M. schalleri* from Nzombe, Itombwe Forest, DR Congo (*ca.* 1664 m, Heim de Balsac, 1967), and *M. zinki* (Heim de Balsac & Lamotte, 1956) from Mount Kilimanjaro, Tanzania (2470–4000 m, Stanley *et al.*, 2005b). Perhaps their specialized, semi-fossorial, foraging habits (reflected in their long-claws, wedge-shaped skulls, generally reduced tail and ears) have enabled this group to survive the competition posed by the relatively recent radiation of the more derived *Crocidura*. By contrast, the southern African members are distributed at lower elevations (reviewed in Smithers, 1983) but, due to their greater latitudinal distance from the equator, are found in more temperate environments.

The new species was discovered in an area that had been frequently surveyed. Historical expeditions were summarized by Benson (1953). The Nyika Plateau was first surveyed for small mammals in 1896 by Alexander Whyte (Thomas, 1898), followed by McLounie and/or Sharpe in 1902. There seems to have been a hiatus in vertebrate surveys until Arthur Loveridge's expedition in 1948 (Lawrence & Loveridge, 1953) followed by Hanney (1962, 1965). More recent surveys of the Nyika Plateau include those described by Overton and Nursaw (1972), Happold & Happold (1989), and Chitaukali *et al.* (2001). In 1985, Happold & Happpold (1989) surveyed the very locality (Chilinda Dam) that we report on here. Our results indicate the role of serendipity in comprehensive species documentation; multiple surveys are necessary in order to fully document the small mammal fauna of a given area.

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Appendix 1: Specimens Examined

Myosorex babaulti: BURUNDI, Kibira NP, FMNH 148937 1M, 148938 1M, 148265 1M, 2100-2350 m; DR CONGO, Kahuzi-Biega NP, Tshibati, FMNH 189275 1M, ZFMK 68.545, 1F, Lwiro Falls, 2100 m, AMNH 180956-180961, 6M; UGANDA, Bwindi-Impenetrable NP, 1850 m, FMNH 160175 1M, Mgahinga Gorilla NP, 2980 m, FMNH 157410 1M. *Myosorex blarina*: DR CONGO, Rwenzori Mountains, FMNH 26285-26287 2M, 1F; UGANDA, Rwenzori Mountains NP, 144205-144211, 2M, 4F, 1?, 1900 m-3980 m. *Myosorex geata*: TANZANIA, Uluguru Mountains, Uluguru North Forest Reserve 1345-1535 m, FMNH 158298-158302, 158487 3M, 3F, Mbete, TRP 2305. *Myosorex kihaulei*: TANZANIA, Udzungwa Mountains, New Dabaga/Ulangambi Forest Reserve, 1816-1940 m, FMNH 169509-169516, 1?, 7F; West Kilombero Scarp Forest Reserve, 1140 m, FMNH 169501, 1?. *Myosorex schalleri*: DR CONGO, Itombwe Forest, area of Nzombe, *ca*. 1664 m (www.geonames.org), MNHN 1981-1107, M. *Myosorex varius* R. SOUTH AFRICA, Goodhope Estate 1425-1500 m, 165628 1M, 165588-165592, 1M, 3F, 1?, 165623-165627, 165667, 4F, 1M, 1?, Cape Province, ZFMK 82.135, 1F.