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The brush-furred rats of Angola and southern Congo: description of a new taxon of the *Lophuromys sikapusi* species complex

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Abstract

A series of brush-furred rats of the *Lophuromys sikapusi-ansorgei* species complex, collected in the vicinity of Kikwit (south-western Congo) was studied craniometrically and proved to belong to the new species, *Lophuromys angolensis*. Additional specimens from Angola were found in museum collections.
The new species is differentiated from *L.sikapusi* (Gabon, Congo - Brazzaville) and from *L.ansorgei* (Uganda) by univariate and multivariate analysis of skull and teeth measurements. No clear morphological differences are apparent.

Key-words : Rodentia, Muridae, *Lophuromys*, systematics, craniometrics, zoogeography, biodiversity, Africa.

Résumé

Des analyses craniométriques d'une série de crânes de Lophuromys, collectés aux environs de Kikwit (Congo sud-ouest) montrent qu'ils appartiennent à la nouvelle espèce *Lophuromys angolensis*, faisant partie du complexe d'espèces *Lophuromys sikapusi-ansorgei*.
La nouvelle espèce est différenciée de *L.sikapusi* (Gabon, Congo-Brazzaville) et de *L.ansorgei* (Uganda) par des analyses univariés et multivariés des mensurations crâniennes et dentaires. Une identification morphologique claire est difficile.

Mots clés : Rodentia, Muridae, *Lophuromys*, systématique, craniométrie, zoogéographie, biodiversité, Afrique.

Introduction

Between the 10th of June and the 28th of August 1995 an extensive international effort was organised in the vicinity of Kikwit (Congo) under the auspices of the WHO (Geneva) and the Centers of Disease Control and Prevention (CDC-Atlanta, USA) hoping to identify the reservoir-organisms of the virus responsible for the sudden outbreak of Ebola Hemorrhagic Fever (EHF) in this region. Part of the resulting collection of small mammals, mainly Rodentia and Insectivora, was deposited for further taxonomical identification at the laboratory for Evolutionary Biology (University Antwerpen - RUCA) (LEIRS H. ET AL. 1999).
Little adequate museum-material being available from this region of Africa, it is likely that this collection will be of great importance for the further taxonomical characterisation of most of the mammalian taxa represented.
The "brush-furred rats" collected in the vicinity of Kikwit pertain to the "non-speckled" *Lophuromys sikapusi* (TEMMINCK, 1853) and to the "speckled" *Lophuromys flavopunctatus* THOMAS, 1888 species-complexes. This was to be expected since THOMAS (1904), HATT (1940), HILL & CARTER (1941), SCHOUTEDEN (1945), HAYMAN (1963), RIBEIRO ET AL. (1964), RIBEIRO (1974) already mentioned the presence of representatives of at least one of both species-complexes in this region. We were able to examine most of these specimens conserved in the collections of the most important European and American musea. Unfortunately this was not the case for the specimens identified by CRAWFORD-CABRAL (1998) in the collections of the Angolan and Portuguese research institutes (Centro de Zoologia of the Instituto de Investigaçâo Cientifica Tropical in Lisbon – Portugal; the Instituto Superior de Ciências da Educaçâo in Lubango – Angola; Laboratorio de Biologia do Museo do Dondo in Dundo – Angola). Where we had the opportunity to verify the *Lophuromys* collections covering Angola (British Museum of Natural History, American Museum of Natural History, Field Museum of Natural History, Zoologische Museum Berlin von Humboldt Universität) we were struck by the poor quality of the available skulls, which reduced the already limited sample size even more. Yet, in spite of this important restriction, it became clear that the important morphological variation in the "non-speckled" *Lophuromys* had to be imputed to the presence of a different species in this region. Thanks to the Kikwit series we are able to show, through a metrical study of the skulls and teeth, that the population of the *Lophuromys sikapusi* species complex south of the Congo river (northern Angola – southern Congo) has to be described as a new species.

Material and Methods

For the description of the craniological measurements, age-classes, acronyms of museums and institutes, as well as the statistical methods, we refer to VERHEYEN, COLYN & HULSELMANS (1996). Where needed, more details are provided in the legends of the graphs.
The data-sets used are concentrated in annexes to this paper.

Only complete skulls with fully erupted M^3 were retained in the analyses (age-classes 1-2-3-4); specimens with severely eroded teeth were excluded (cl. 5).
In view of our limited series, we made no attempt to evaluate the sexual dimorphism in our new taxon, since we know that sexual dimorphism is of little importance in the skull and teeth dimensions of the *Lophuromys sikapusi*-species complex.
A selection of 19 cranial measurements was made out of the 24 available to finalise our multivariate analyses (see table 1). This selection was the result of the need to plot a number of essential type-specimens and some geographical unique specimens on the multivariate graphs. For the statistical analyses we used the PC-pack Statistica 5.1. (STATSOFT INC, 1998)
The composition of our operational units can be consulted in Appendices 1,2 and 3. The corresponding metrical data sets can be obtained through e-mail (hulsel@ruca.ua.ac.be).
The necessity to split the available Angolan and Congolese material into different geographical subunits (Luhanda - Huambo - Kinshasa) became apparent through morphological observation and a series of preliminary analyses and plots.
The known geographical distribution of our new species is shown in fig.1. The alphabetical list of the collecting localities is grouped in table 2.

NUMBER	ACRONYMS	MORPHOMETRICAL CHARACTERS
M 1	GRLS	Greatest length of skull
M 2	PRCO	Condylobasal length
M 3	HEBA	Henselion-basion
M 4 *	HEPA	Henselion-palation
M 5 *	PAFL	Length of palatal foramen
M 6 *	DIA1	Length of diastema
M 7 *	DIA2	Distance between alveolus M1 and cutting edge of upper incisor
M 8 *	INTE	Smallest interorbital breadth
M 9 *	ZYGO	Zygomatic breadth
M10 *	PALA	Smallest palatal breadth
M11 *	UPTE	Length of upper cheekteeth; alveolar distance
M12 *	UPDA	Breadth of upper dental arch
M13 *	M1BR	Greatest breadth of first upper molar
M14 *	ZYPL	Smallest breadth of zygomatic plate
M15	BNAS	Greatest breadth of nasals
M16	LNAS	Greatest length of nasals
M17 *	LOTE	Length of mandibular teeth ; alveolar distance
M18 *	CHOB	Greatest breadth of choanae
M19 *	BULL	Length of auditory bulla
M20 *	BRCA	Greatest breadth of braincase
M21 *	DINC	Depth of upper incisor
M22 *	ROHE	Mediosagittal projection of rostrum heigth
M23 *	ROBR	Greatest rostrum breadth
M24 *	PCPA	Distance between coronoid and angular processes

Table 1.
Recapitulation and short description of the measurements as used in this study. For a full description we refer to VERHEYEN W.N. et al. (1996). Only measurements marked with * were retained for the multivariate analyses.

Description of Lophuromys angolensis sp.n.

HOLOTYPE ■ KMMA 97-021-M-1; ad. female; spirit specimen; skull complete; collected by H. LEIRS (05 july 1995) at Mbwambala (05.03 S; 18.55 E) at an altitude of 500m (collecting nr 1110; trap.stat.nr17).

PARATYPES ■ 45 specimens (28 ad.males; 17 ad.females); all collected in the vicinity of Kikwit but at different localities.

• MWAMBALA (05.03S;18.55E)		
KMMA	97-021-M-2; (ad.fem.;alc.+cr.; col.nr.165)	97-021-M-3; (ad.fem.;alc.+cr.; col.nr.200)
	97-021-M-4; (ad.male;alc.+cr.; col.nr.282)	97-021-M-5; (ad.male;alc.+cr.; col.nr.292)
	97-021-M-6; (ad.fem.;alc.+cr.; col.nr.328)	97-021-M-7; (ad.male;alc.+cr.; col.nr.354)
	97-021-M-8; (ad.fem.;alc.+cr.; col.nr.413)	97-021-M-9; (ad.fem.;alc.+cr.; col.nr.414)
	97-021-M-10; (ad.male;alc.+cr.; col.nr.535)	97-021-M-11; (ad.male;alc.+cr.; col.nr.575)
	97-021-M-12; (ad.male;alc.+cr.; col.nr.857)	97-021-M-13; (ad.fem.;alc.+cr.; col.nr.860)
	97-021-M-14; (ad.male;alc.+cr.; col.nr.871)	97-021-M-15; (ad.fem.;alc.+cr.; col.nr.931)
	97-021-M-16; (ad.male;alc.+cr.; col.nr.979)	97-021-M-17; (ad.male;alc.+cr.; col.nr.995)
	97-021-M-18; (ad.fem.;alc.+cr.; col.nr.1062)	97-021-M-19; (ad.male;alc.+cr.; col.nr.1109)
	97-021-M-20; (ad.male;alc.+cr.; col.nr.1111)	97-021-M-21; (ad.male;alc.+cr.; col.nr.1113)
	97-021-M-22; (ad.male;alc.+cr.; col.nr.1119)	
RUCA	1189 (ad.fem.;alc.+cr.; col.nr.1189)	1240 (ad.fem.;alc.+cr.; col.nr.1240)
	1244 (ad.male;alc.+cr.; col.nr.1244)	1349 (ad.fem.;alc.+cr.; col.nr.1349)
	1492 (ad.fem.;alc.+cr.; col.nr.1492)	1495 (ad.fem.;alc.+cr.; col.nr.1495)
	1991 (ad.male;alc.+cr.; col.nr.1991)	2265 (ad.fem.;alc.+cr.; col.nr.2265)
	2267 (ad.male;alc.+cr.; col.nr.2267)	2372 (ad.male;alc.+cr.; col.nr.2372)
	2528 (ad.male;alc.+cr.; col.nr.2528)	2709 (ad.fem.;alc.+cr.; col.nr.2709)
	2711 (ad.male;alc.+cr.; col.nr.2711)	2712 (ad.fem.;alc.+cr.; col.nr.2712)
• KAKOI (05°06S-18°57E)		
KMMA 97-021-M-27 (ad.male;alc+cr.;col.nr.1684)		
RUCA 2114 (ad.male;alc.+cr.;col.nr.2114)		2406 (ad.male; alc.+cr.;col.nr.2406)
• KIKWIT (05°02S-18°49E)		
RUCA 1955 (ad.male;alc.+cr.;col.nr.1955)		1970 (ad.male;alc.+cr.;col.nr.1970)
• KWANGA-NGAMZI (05°09íS-18°56íE)		
RUCA 2044 (ad.male;alc.+cr.;col.nr.2044)		2531 (ad.fem.;alc.+cr.;col.nr.2531)
• MBALAKA (05°00íS-18°53íE)		
RUCA 2728 (ad.male;alc.+cr.;col.nr.2728)		
• MENGA (05°03S-18°51E)		
RUCA 1844 (ad.fem.;alc.+cr.; col.nr.1844)		1845 (ad.male;alc.+cr.; col.nr.1845)

HABITAT The collector's notes indicate that the specimens were mostly caught in disturbed and highly disturbed secondary forest and primary forest.

ETYMOLOGY Since the known distribution of this new species covers the western highlands of Angola and only the southwestern part of Congo (along the rim of the central rainforest block) we decided to name it *L. angolensis*.

DIAGNOSIS *Lophuromys angolensis* is a new species of "unspeckled and short-tailed brush-furred" rat belonging to the *sikapusi-ansorgei* species complex.
It is cranially and dentally easily differentiated from the *nudicaudus-huttereri* species complex (VERHEYEN W.N. ET AL., 1996) and from *L. rahmi* (VERHEYEN W.N., 1964) the smallish endemic species from the mountainous region of Kivu (Congo).
Compared to the skulls of the *sikapusi*-representatives of the right bank of the Congo-river *L. angolensis* can be diagnosed by 1°/ its more slender and shorter rostrum, 2°/ its somewhat narrower braincase, 3°/ its more slender and somewhat shorter upper and lower dental arches. In short, *L. angolensis* is in all aspects somewhat smaller in craniometrical measures except for its INTE (nr 8), CMOB (nr 18) and DINC (nr 21) in which it equals the size of *Lophuromys ansorgei*.

REF. NR.	LOCALITY	COORDINATES	ALTITUDE
1	Boma	05.50S - 13.03E	100
2	Chipepe	12.11S - 15.52E	2600
3	Chitau	11.15S - 17.01E	1650
4	Duque de Bragança	08.59S - 16.09E	1000 - 1500
5	Franceville	01.40S - 13.31E	600
6	Kakoi	05.06S - 18.57E	500
7	Kalina	04.18S - 15.16E	350
6	Kikwit	05.03S - 18.51E	500
7	Kinshasa	04.18S - 15.18E	350

REF. NR.	LOCALITY	COORDINATES	ALTITUDE
6	Kuwanga	05.09S - 18.58E	500
8	Luhanda	09.18S - 17.05E	1000 - 1500
6	Mbalaka	05.00S - 18.53E	500
6	Mbwambala	05.03S - 18.51E	500
6	Menga	05.03S - 18.51E	500
9	Moco	12.30S - 15.15E	1500-2000
10	Mouila	01.50S - 11.02E	100
11	Odzala	00.37N - 14.37E	500
12	Soque	12.13S - 15.19E	1500-2000

Table 2. Alphabetical gazetteer of the collecting localities of the specimens of the *sikapusi* species complex included in this paper. The localities are followed by their co-ordinates and approximate altitudes (m). The numbers preceding the localities refer to fig.1 illustrating the known distribution of the species.

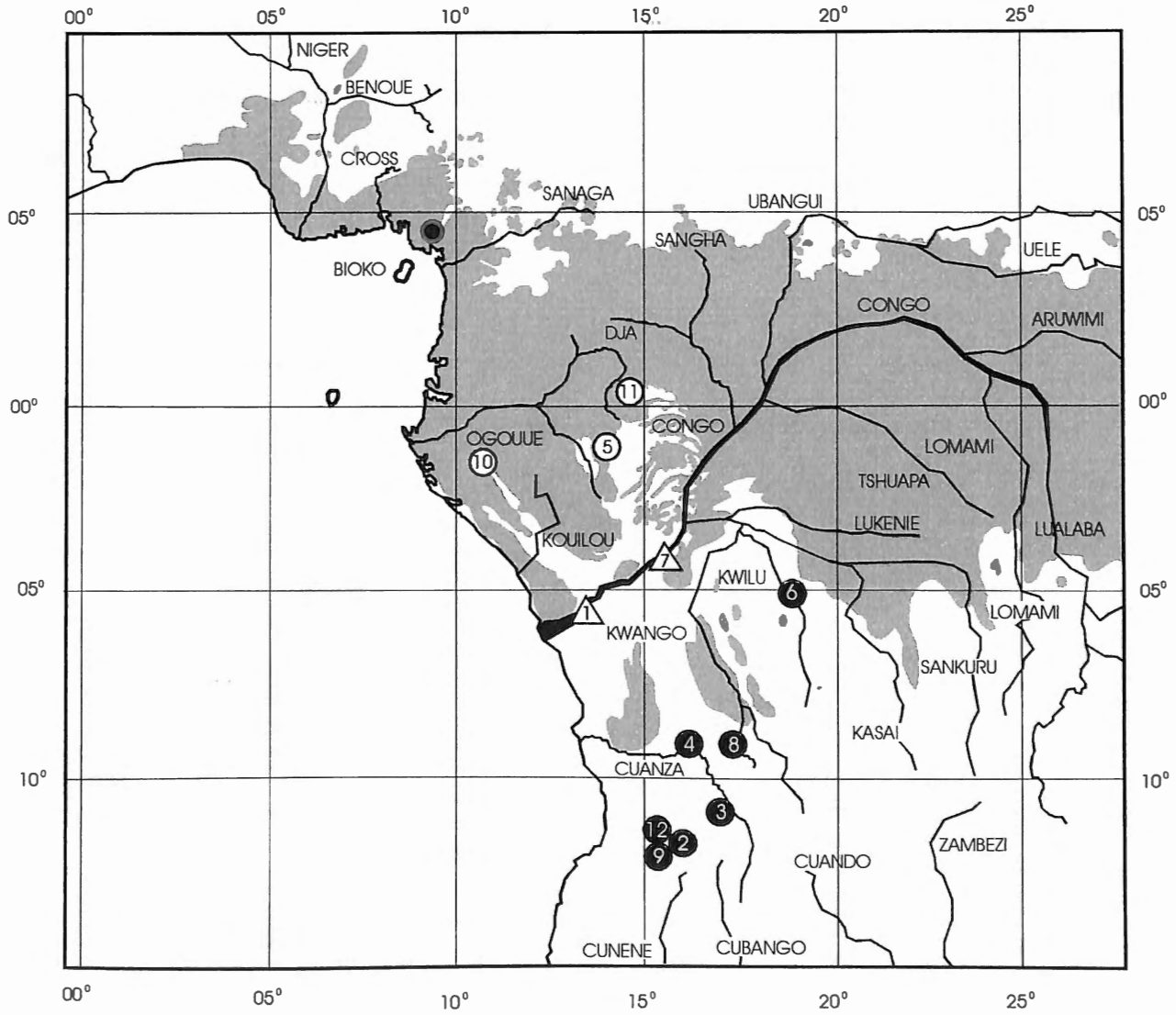

Fig.1. Geographical distribution of the *Lophuromys sikapusi* species-complex studied in this publication. The following symbols characterise the collecting localities of

- ● *Lophuromys angolensis* VERHEYEN et. al., 2000
- △ *Lophuromys* cfr. *ansorgei* DE WINTON, 1896
- ○ *Lophuromys sikapusi* (TEMMINCK, 1853)

The numbers refer to the co-ordinates and altitudes of the localities as described in table 2.
The contours of the forested regions are copied from the maps published by SAYER ET AL. (1992).

Discussion of the morphological characters (table 3)

Since the available external measurements have been collected by different researchers, using slightly different methods, it is impossible to make statistically valid comparisons. We can however note that *Lophuromys angolensis* sp.n. has a general bodyweight of about 80% of *L. sikapusi* for a slightly superior total length which is mostly due to a somewhat greater taillength.
Concerning the pelage we do not see any important difference between our new species and the other representatives of the *sikapusi* species complex. We note however that in some specimens the pelage has a slightly speckled appearance which is atypical for these *Lophuromys* pertaining to the "unspeckled" *sikapusi* species complex. Since all specimens of our type-series have been conserved in ethylalcohol, after being initially fixed in neutralised formalin, we can not evaluate the slight colour differences in the pelage that might eventually exist when compared to other *Lophuromys* species.
As for the craniological characteristics we refer to the diagnosis.

Discussion of the morphometrical data

UNIVARIATE ANALYSIS (TABLE 4,5 AND 6)

Table 4, listing the basic statistics of the samples, shows M18 to be highly variable, indicating again that this is an unreliable measure (VERHEYEN ET AL. 1996).
In table 5 the samples of *L.angolensis* (Kikwit), *L.sikapusi* (Franceville-Odzala) and *L.ansorgei* (Cratertrack) are compared by one way analysis of variance and an a posteriori Student Newman Keuls test.
Both tables show *L.angolensis* to differ considerably from both other species, *L.angolensis* being the smaller one. Compared with *L.ansorgei* the Kikwit sample is for most measurements significantly smaller, except for M8 (INTE), M21 (DINC) and M18 (CHOB), which are not significantly different among the three species. Compared to *L.sikapusi* the Kikwit sample differs very significantly for nearly all length measures, except for M5 (length of palatal foramen) and M19 (bulla length), whereas most of the breadth measurements are not different (K=F), except the width measurements referring to the zygomatic arch (M9 - ZYGO and M14 - ZYPL) and the braincase (M20 - BRCA).
Table 6 shows the small Kinshasa sample to be close to *L.ansorgei* (Cratertrack).

	W	Tol	HB	Tl	HF	El
L. angolensis	54,9	210,5	134,8	75,5	22,8	16,6
Kikwit	43 - 71	190 - 235	115 - 154	51 - 88	20-24	15 - 18
	44	39	43	39	45	46
L. sikapusi	68.5	206	136,8	69,5	23,9	16,2
Mopoyem	50 - 95	189 - 231	122 - 152	60 - 82	22 - 25	15 - 18
	165	116	167	116	132	112
L. sikapusi	68.7	198,7	130,1	68,1	22,1	15,8
Odzala	49 - 92	179 - 222	112 - 145	59 - 80	20,4 - 24,3	14,4 - 17,5
	24	20	24	20	24	20

Table 3.
External measurements of *Lophuromys angolensis* sp.n. compared with populations of adult (cl. 2-3-4) *Lophuromys sikapusi* captured in Mopoyem (Ivory Coast) and Odzala (Congo). (W: weight; Tol: total length; HB: head + body length; Tl: taillength; HF: hindfootlength; El: earlength) (Mean; min - max ; n)

Lophuromys angolensis sp.n. (Kikwit, Congo)						
	N	MEAN	MIN	MAX	STD	CV %
M1	41	30,49	28,75	32,45	0,88	2,9
M2	46	28,53	26,70	30,50	0,83	2,9
M3	46	24,18	22,50	26,05	0,77	3,2
M4	46	12,22	11,20	12,85	0,38	3,2
M5	46	6,62	5,80	7,10	0,30	4,5
M6	46	7,82	7,10	8,30	0,31	4,0
M7	46	9,44	8,25	10,20	0,41	4,3
M8	46	6,36	5,85	6,75	0,21	3,3
M9	45	15,21	14,05	16,25	0,55	3,6
M10	46	3,66	3,20	4,05	0,21	5,9
M11	46	4,68	4,30	5,20	0,19	4,1
M12	46	7,37	6,80	7,80	0,25	3,3
M13	46	1,81	1,60	2,00	0,08	4,6
M14	46	2,81	2,45	3,25	0,18	6,4
M15	46	2,99	2,70	3,40	0,15	5,0
M16	41	12,49	11,05	13,60	0,54	4,3
M17	46	4,41	3,90	4,80	0,21	4,7
M18	46	1,65	1,05	2,10	0,24	14,7
M19	46	5,12	4,85	5,60	0,17	3,3
M20	46	12,79	12,05	13,55	0,34	2,7
M21	46	1,30	1,05	1,50	0,10	7,9
M22	46	6,21	5,80	6,70	0,23	3,7
M23	46	5,43	4,70	5,90	0,23	4,3
M24	45	8,13	7,25	8,95	0,37	4,5

Lophuromys sikapusi (Franceville-Odzala)						
	N	MEAN	MIN	MAX	STD	CV %
M1	44	31,17	28,80	33,35	0,97	3,1
M2	45	29,98	27,55	31,75	1,06	3,5
M3	45	25,41	14,35	27,15	1,96	7,7
M4	45	12,74	11,50	13,50	0,49	3,8
M5	45	6,61	5,95	7,30	0,30	4,6
M6	45	8,18	7,35	9,00	0,44	5,4
M7	45	10,04	9,10	10,80	0,50	5,0
M8	45	6,37	5,95	6,80	0,21	3,2
M9	45	15,62	14,50	16,75	0,55	3,5
M10	45	3,66	3,15	4,25	0,26	7,1
M11	45	4,89	4,55	5,20	0,16	3,3
M12	45	7,38	6,15	7,90	0,33	4,5
M13	45	1,78	1,70	2,00	0,07	3,7
M14	45	2,98	2,55	3,45	0,22	7,5
M15	45	3,02	2,70	3,40	0,14	4,7
M16	44	12,85	11,45	14,00	0,63	4,9
M17	45	4,51	4,25	4,90	0,14	3,2
M18	45	1,48	1,15	1,80	0,16	10,8
M19	45	5,12	4,75	5,50	0,18	3,6
M20	45	13,11	12,50	13,65	0,29	2,2
M21	45	1,28	1,10	1,45	0,08	6,0
M22	45	6,61	6,05	7,35	0,31	4,6
M23	45	5,43	5,00	6,00	0,22	4,0
M24	43	8,65	7,75	9,35	0,40	4,6

Lophuromys ansorgei (Cratertrack, Uganda)						
	N	MEAN	MIN	MAX	STD	CV %
M1	39	32,95	30,50	34,40	1,02	3,1
M2	46	31,61	28,75	34,35	1,13	3,6
M3	46	27,07	24,50	29,60	1,07	3,9
M4	49	13,63	12,50	14,85	0,51	3,8
M5	49	7,30	6,40	8,25	0,30	4,1
M6	49	8,76	7,80	9,80	0,40	4,6
M7	48	10,74	9,55	11,75	0,48	4,5
M8	50	6,40	5,95	6,80	0,22	3,4
M9	47	16,11	14,50	17,45	0,62	3,8
M10	50	3,92	3,35	4,50	0,23	5,8
M11	50	5,34	5,00	5,75	0,15	2,9
M12	48	7,99	7,35	8,55	0,29	3,6
M13	50	1,96	1,80	2,15	0,07	3,7
M14	50	2,93	2,40	3,65	0,27	9,1
M15	49	3,15	2,90	3,40	0,15	4,6
M16	45	13,85	12,15	15,25	0,71	5,1
M17	49	4,96	4,65	5,20	0,14	2,8
M18	49	1,71	1,15	2,50	0,22	13,0
M19	50	5,34	4,90	5,80	0,17	3,2
M20	46	13,53	12,75	14,15	0,32	2,4
M21	49	1,32	1,05	1,50	0,10	7,3
M22	49	7,04	6,45	7,80	0,30	4,3
M23	49	6,16	5,45	6,90	0,32	5,2
M24	47	9,25	8,10	10,05	0,46	4,9

Lophuromys cf. ansorgei (Kinshasa, Congo)						
	N	MEAN	MIN	MAX	STD	CV %
M1	7	34,36	33,75	35,25	0,52	1,5
M2	7	32,74	32,20	33,50	0,53	1,6
M3	7	27,88	27,30	28,70	0,53	1,9
M4	7	14,10	13,60	14,65	0,39	2,8
M5	7	7,52	7,15	7,90	0,24	3,3
M6	7	9,31	8,95	9,65	0,24	2,6
M7	7	11,23	10,40	11,55	0,40	3,6
M8	7	6,38	5,85	6,75	0,35	5,4
M9	6	15,94	15,60	16,45	0,32	2,0
M10	7	4,09	3,60	4,35	0,27	6,7
M11	7	5,26	5,15	5,50	0,15	2,8
M12	7	8,01	7,55	8,45	0,29	3,6
M13	7	2,06	1,95	2,25	0,11	5,1
M14	7	2,96	2,70	3,25	0,21	7,1
M15	7	3,04	2,85	3,25	0,14	4,5
M16	7	14,42	13,75	15,10	0,47	3,2
M17	7	4,97	4,60	5,20	0,19	3,8
M18	7	1,86	1,60	2,20	0,18	9,5
M19	7	5,17	4,70	5,60	0,33	6,3
M20	7	13,71	13,25	14,40	0,40	2,9
M21	7	1,36	1,20	1,50	0,09	6,6
M22	7	7,42	6,80	8,15	0,42	5,6
M23	7	6,60	5,45	7,15	0,55	8,3
M24	6	9,01	8,45	9,65	0,42	4,6

Table 4.
Basic statistics of *Lophuromys angolensis* sp.n. compared with the basic statistics of *L. ansorgei* (UGANDA), *L.sikapusi* (GAB-CON = Franceville-Odzala) and *L.cf. ansorgei* (Congo; Kinshasa). Only specimens from age classes 2-3-4 were retained. For the complete set of metrical data of *L.angolensis* sp.n. we refer to App.2.1 and 2.2. The composition of the craniological series of the other species can be consulted in App. 3.1 and 3.2; the entire craniometrical data set can be obtained through e-mail.

ANOVA one way – Kikwit – Franceville – Cratertrack							
Measur.	**MS effect**	**df**	**MS error**	**df**	**F**	**P**	**SNK test**
M1	645,30	2	9,21	121	70,09	0,000	K/F/C
M2	1.090,91	2	10,28	134	106,07	0,000	K/F/C
M3	968,28	2	18,43	134	52,54	0,000	K/F/C
M4	243,07	2	2,18	137	111,55	0,000	K/F/C
M5	74,97	2	0,91	137	82,33	0,000	K=F/C
M6	105,98	2	1,51	137	70,20	0,000	K/F/C
M7	196,24	2	2,16	136	90,78	0,000	K/F/C
M8	0,28	2	0,45	138	0,62	0,540	ns
M9	93,32	2	3,29	134	28,33	0,000	K/F/C
M10	10,67	2	0,55	138	19,42	0,000	K=F/C
M11	55,70	2	0,29	138	194,30	0,000	K/F/C
M12	60,46	2	0,84	136	71,95	0,000	K=F/C
M13	4,44	2	0,05	138	81,67	0,000	K=F/C
M14	3,74	2	0,52	138	7,21	0,001	K/F/C
M15	3,37	2	0,21	137	15,96	0,000	K=F/C
M16	216,12	2	4,02	127	53,82	0,000	K/F/C
M17	41,02	2	0,27	137	150,90	0,000	K/F/C
M18	6,56	2	0,45	137	14,66	0,000	K=C/F
M19	8,06	2	0,31	138	26,08	0,000	K=F/C
M20	64,42	2	1,03	134	62,76	0,000	K/F/C
M21	0,21	2	0,09	137	2,46	0,089	ns
M22	81,46	2	0,79	137	103,32	0,000	K/F/C
M23	84,77	2	0,69	137	123,40	0,000	K=F/C
M24	145,92	2	1,69	132	86,52	0,000	K/F/C

K = Kikwit = not different
F = Franceville-Odzala / different
C = Cratertrack ns = not significant

Table 5.
Results of ANOVA (one way) analyses performed on 24 craniodental measurements of age classes (2-3-4) of *Lophuromys angolensis* sp.n. (Congo: Kikwit), *Lophuromys sikapusi* (Franceville-Odzala), *Lophuromys ansorgei* (Cratertrack).
A posteriori test (Student-Newman-Keuls) are used to evaluate the differences between OTU's (SOKAL & ROHLF, 1969).(Statsoft, 1998).

Measur.	**Mean Cratertrack**	**Mean Kinshasa**	**t-value**	**Df**	**P**	**Sign.**
M1	32,95	34,36	-3,539	44	0,001	***
M2	31,61	32,74	-2,594	51	0,012	**
M3	27,07	27,88	-1,966	51	0,055	n.s.
M4	13,63	14,10	-2,314	54	0,025	*
M5	7,30	7,52	-1,828	54	0,073	n.s.
M6	8,76	9,31	-3,590	54	0,001	***
M7	10,74	11,23	-2,577	53	0,013	**
M8	6,40	6,38	0,258	55	0,798	n.s.
M9	16,11	15,94	0,643	51	0,523	n.s.
M10	3,92	4,09	-1,869	55	0,067	n.s.
M11	5,34	5,26	1,269	55	0,210	n.s.
M12	7,99	8,01	-0,195	53	0,846	n.s.
M13	1,96	2,06	-3,145	55	0,003	***
M14	2,93	2,96	-0,229	55	0,820	n.s.
M15	3,15	3,04	1,835	54	0,072	n.s.
M16	13,85	14,42	-2,061	50	0,045	*
M17	4,96	4,97	-0,210	54	0,834	n.s.
M18	1,71	1,86	-1,719	54	0,091	n.s.
M19	5,34	5,17	2,133	55	0,037	*
M20	13,53	13,71	-1,273	51	0,209	n.s.
M21	1,32	1,36	-1,083	54	0,284	n.s.
M22	7,04	7,42	-3,015	54	0,004	***
M23	6,16	6,60	-3,102	54	0,003	***
M24	9,25	9,01	1,239	51	0,221	n.s.

Table 6.
t-Students test on *Lophuromys ansorgei* (Cratertrack) and the Kinshasa sample.
n.s. = not significant * > 0,05 ** > 0,01 *** > 0,001

MULTIVARIATE ANALYSIS (FIG.2 AND TABLE 7)

A forward stepwise discriminant analysis was performed on a set of 14 variables, M4, M7, M10 and M15 being excluded by the analysis, while M1, M3, M9, M16, M18 and M24 were not included in order to maximise the number of specimens.
Wilks' Lambda = 0.03 (df 28, 232) indicates a very good discriminating power.
Root 1, which expresses 80% of the total variation, discriminates *L.ansorgei* from the other samples. Since all correlations of the original variables with root 1 are positive and since *L.ansorgei* has the biggest skull, this is considered to be a size effect. The Kinshasa and Boma specimens, plotted on this graph, fall well within the range of *L.ansorgei.*
Root 2 discriminates between *L.sikapusi* and *L.angolensis*, though there is a small overlap. The Huambo specimens plotted on this graph fall mostly within the Kikwit range; most of the Luhanda specimens however fall apart, indicating that maybe there is some differentiation to be discovered in the Angolan region. (also see conclusion)
The Mahalanobis squared distances give highly significant differences among all groups, *L.ansorgei* being the most distant.

Wilks' Lambda: ,0301 approx. F (28, 232) = 39,39826 p <0,00000

Squared Mahalanobis Distances (upper triangle)
F-values (lower triangle) df = 14; 116

	angolensis	*sikapusi*	*ansorgei*
angolensis	0,000	17,123	55,198
sikapusi	24,468	0,000	33,004
ansorgei	75,078	44,416	0,000

↑→

Table 7.
Summary of the main results of the discriminant function analyses on a selected craniometrical data set of *Lophuromys angolensis* sp.n. (Kikwit), *L.ansorgei* (Uganda) and *L.sikapusi* (Gab-Con).

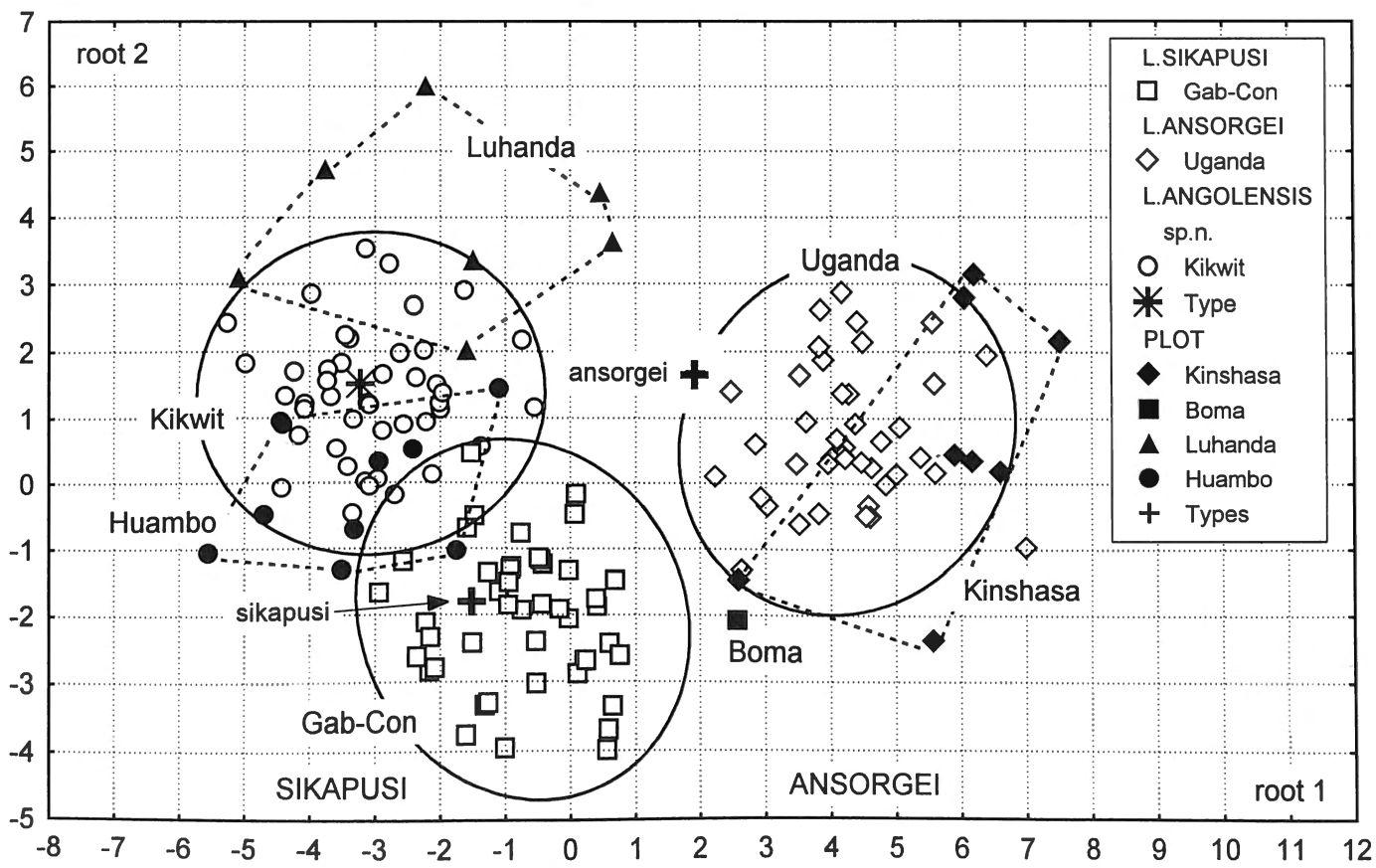

Fig.2. Canonical analysis on a selected data set of *Lophuromys sikapusi* (OTU = Gab-Con), *L.ansorgei* (OTU = Uganda) and *L.angolensis* n.sp. (OTU = Kikwit). This analysis was performed to characterise our new species and plot a number of critical skulls of "non-speckled" Lophuromys, such as OTU's Luhanda, Huambo and Kinshasa and some type-specimens (*L.sikapusi* and *L.ansorgei*).

Raw coefficients for Canonical Variables		
Variable	**Root 1**	**Root 2**
M11	0.0358	-0.0157
M23	0.0186	0.02332
M22	0.0156	-0.01984
M8	-0.0334	0.01087
M5	-0.0031	0.02788
M2	0.0029	-0.01598
M12	0.0171	0.01930
M17	0.0188	0.00535
M21	-0.0509	-0.00047
M13	0.0280	0.05186
M14	-0.0124	-0.01093
M6	0.0108	0.01696
M20	0.0058	-0.01008
M19	0.0020	0.01638
Constant	-32.1956	-2.97620
Eigenval	9.2827	2.22091
Cum.prop.	0.8069	1.00000

Factor Structure Matrix Correlations variables / Canonical roots		
Variable	**Root 1**	**Root 2**
M11	0.52261	0.00154
M23	0.40028	0.28443
M22	0.38511	-0.14469
M8	0.02040	-0.01058
M5	0.31635	0.22241
M2	0.39344	-0.14546
M12	0.30524	0.19920
M17	0.45144	0.12145
M21	0.02106	0.08964
M13	0.30483	0.29426
M14	0.05001	-0.19747
M6	0.30908	-0.05708
M20	0.31683	-0.07425
M19	0.18353	0.12679

Conclusion

The univariate as well as the multivariate analysis supports in our opinion the conclusion that the *Lophuromys* population of Kikwit is morphometrically sufficiently different from both *L.sikapusi* (Gabon, Congo-Brazzaville) and *L.ansorgei* (Uganda) to belong to the newly described species *Lophuromys angolensis*. However in view of the absence of clear-cut craniological and other morphological diagnostical characters new caryological and (or) genetical data will be required to evaluate the exact taxonomical status of our taxon vis à vis the *Lophuromys sikapusi* populations on the northern bank of the Congo river.

As already mentioned, undamaged skulls of representatives of Angola and southern Congo of the *Lophuromys sikapusi* species complex are rather rare in museum collections, which resulted in the impossibility to group these specimens into statistically workable OTU's. As a consequence we had to plot the few available specimens on our multivariate analysis (fig. 2); all these specimens were collected by G.Heinrich in 1954 and make part of the Field Museum of Natural History (Chicago) collection.

This plotting revealed in the first place that the specimens to the south of the river Cuanza (OTU: Huambo) fall well within the range of the Kikwit-specimens, while the specimens to the north of this river group as a somewhat different OTU (Luhanda).

When we summarise the collector's biotope descriptions, it appears that the 'Huambo' specimens are restricted to mountain forests (alt. 1500m-2600m) isolated by surrounding miombo- woodland (Brachystegia/Julbernardia) and savannahs, whereas the 'Luhanda' specimens were captured in primary and secondary tropical forest patches (alt. 1000m-1500m), also isolated by miombo woodland and savannahs. (HALL, 1959; STUART ET AL., 1990).

We find thus that the observed craniometrical differences between the Huambo- and Luhanda-series seem to be linked to differences in altitude and in biotope (montane versus tropical forest). Since all these specimens were collected as skins and skulls we are able to verify the pelage characteristics as well. This reveals that the "Luhanda" specimens have all outspoken bright orange-reddish ventral sides, whereas all the skins from "Huambo" show a dull brown-yellowish ventral pelage. We can thus safely anticipate that a closer examination by caryotyping and DNA-sequencing techniques will probably reveal the existence of another *Lophuromys* taxon in the tropical forest patches occuring to the north of the Cuanza-river.

We finally draw attention to the specimens collected in the region just south of the lower reaches of the Congo stream (Kinshasa - Boma - Chinxoxo) which, when plotted on fig. 2, fall well within the range of *L.ansorgei* (OTU Uganda). This is rather unexpected considering that the nearest representatives of *L.ansorgei* were captured in Mwanza (Tanzania - type locality of *L.manteufeli*, MATSCHIE, 1911) near lake Victoria. In this respect, we recall our observation (VERHEYEN et al 1996) that the *Lophuromys* of our OTU Cameroon south of the Sanaga (CAM.S.) are craniometrically sufficiently different from the N.Sanaga and GAB-CON-RCA OTU's as to be considered incertae sedis; we added, that it is even possible that they will prove to be related to *L.ansorgei*, the eastern representative of the *L.sikapusi* species complex. This observation, linked to what we find for the *Lophuromys* of the south bank of the Congo river (Kinshasa - Boma - Chinxoxo), leads us to suggest that either more collecting will actually prove that the accepted distribution of *Lophuromys ansorgei* has to be extended far to the west and this along the northern and southern rim of the Congolese central forest block, or that the above mentioned Cameroon and lower Congo populations are remnants of a once much more widely distributed *L.ansorgei*.

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LOCALITY	MUSEUM	NUMBER	SEX	AGE	CR	P	AL	DATE	REMARKS
OTU : KIKWIT									
KAKOI	KMMA	97-021-M-27	M	3	X	-	X	15 jul 95	
	RUCA	2114	M	2	X	-	X	24 jul 95	
	RUCA	2406	M	3	X	-	X	28 jul 95	
KIKWIT	RUCA	1955	M	2	X	-	X	20 jul 95	
	RUCA	1970	M	3	X	-	X	20 jul 95	
KUWANGA	RUCA	2044	M	2	X	-	X	23 jul 95	
	RUCA	2531	F	2	X	-	X	30 jul 95	
MBALAKA	RUCA	2728	M	2	X	-	X	01 aug 95	
MBWAMBALA	KMMA	97-021-M-1	F	3	X	-	X	05 jul 95	TYPE
	KMMA	97-021-M-2	F	2	X	-	X	15 jun 95	
	KMMA	97-021-M-3	F	2	X	-	X	16 jun 95	
	KMMA	97-021-M-4	M	2	X	-	X	19 jun 95	
	KMMA	97-021-M-5	M	2	X	-	X	19 jun 95	
	KMMA	97-021-M-6	F	3	X	-	X	20 jun95	
	KMMA	97-021-M-7	M	2	X	-	X	20 jun 95	
	KMMA	97-021-M-8	F	2	X	-	X	21 jun 95	
	KMMA	97-021-M-9	F	3	X	-	X	21 jun 95	
	KMMA	97-021-M-10	M	2	X	-	X	23 jun 95	
	KMMA	97-021-M-11	M	2	X	-	X	24 jun 95	
	KMMA	97-021-M-12	M	3	X	-	X	01 jul 95	
	KMMA	97-021-M-13	F	4	X	-	X	01 jul 95	
	KMMA	97-021-M-14	M	2	X	-	X	01 jul 95	
	KMMA	97-021-M-15	F	3	X	-	X	02 jul 95	
	KMMA	97-021-M-16	M	3	X	-	X	03 jul 95	
	KMMA	97-021-M-17	M	2	X	-	X	03 jul 95	
	KMMA	97-021-M-18	F	3	X	-	X	04 jul 95	
	KMMA	97-021-M-19	M	3	X	-	X	05 jul 95	
	KMMA	97-021-M-20	M	3	X	-	X	05 jul 95	
	KMMA	97-021-M-21	M	2	X	-	X	05 jul 95	
	KMMA	97-021-M-22	M	3	X	-	X	05 jul 95	
	RUCA	1189	F	2	X	-	X	06 jul 95	
	RUCA	1240	F	3	X	-	X	07 jul 95	
	RUCA	1244	M	2	X	-	X	07 jul 95	
	RUCA	1349	F	3	X	-	X	11 jul 95	
	RUCA	1492	F	3	X	-	X	12 jul 95	
	RUCA	1495	M	2	X	-	X	12 jul 95	
	RUCA	1991	M	3	X	-	X	21 jun 95	
	RUCA	2265	F	3	X	-	X	27 jul 95	
	RUCA	2267	M	3	X	-	X	27 jul 95	
	RUCA	2372	M	2	X	-	X	28 jul 95	
	RUCA	2528	M	2	X	-	X	30 jul 95	
	RUCA	2709	F	3	X	-	X	31 jul 95	
	RUCA	2711	M	3	X	-	X	01 jun 95	
	RUCA	2712	F	2	X	-	X	01 aug 95	
MENGA	RUCA	1844	F	3	X	-	X	18 jul 95	
	RUCA	1845	M	2	X	-	X	18 jul 95	
OTU : LUHANDA									
DUQUE DE BRAGANÇA	FMNH	81934	M	2	X	X	-	05 jun 54	
	FMNH	81937	M	3	X	X	-	06 jun 54	
LUHANDA	FMNH	81942	M	2	X	X	-	18 jun 54	
	FMNH	81943	F	2	X	X	-	19 jun 54	
	FMNH	81947	M	2	X	X	-	22 jun 54	
	FMNH	81948	M	2	X	X	-		
OTU : HUAMBO									
CHIPEPE	HZMB	403.4	?	3	X	?	?	06 jul 24	
CHITAU	AMNH	85741	M	?	X	X	-	05 aug 25	
	AMNH	85742	F	3	X	X	-	04 aug 25	
MOCO	FMNH	83833	M	2	X	X	-	18 sep 54	
	FMNH	83836	M	4	X	X	-	24 sep 54	
	FMNH	83837	F	3	X	X	-	09 oct 54	
	FMNH	83838	M	3	X	X	-	09 oct 54	
	FMNH	83839	M	4	X	X	-	10 oct 54	
SOQUE	FMNH	83832	M	3	X	X	-	04 sep 54	

Appendix 1.1. Listing of the specimens of *Lophuromys angolensis* sp.n. that have been included in this study. For the definition of the acronyms of the institutions and museums, and the age-classes we refer to VERHEYEN & AL. (1996).
(cr = cranium; p = skin; al = in spirit; F = female; M = male)

LOCALITY	MUSEUM	NUMBER	W	TOL	HB	TL	HF	EL	REMARKS
OTU : KIKWIT									
KAKOI	KMMA	97-021-M-27	65	225	154	79	230	170	
	RUCA	2114	49	190	124	66	230	170	
	RUCA	2406	54				210	150	
KIKWIT	RUCA	1955	57	210	133	77	230	160	
	RUCA	1970	54	210	137	73	240	170	
KUWANGA	RUCA	2044	57	210	136	74	230	160	
	RUCA	2531	56	190	139	51	240	160	
MBALAKA	RUCA	2728	47	200	135	65	200	160	
MBWAMBALA	KMMA	97-021-M-1	61	215	140	75	240	170	TYPE
	KMMA	97-021-M-2	52	211	130	81	240	180	
	KMMA	97-021-M-3	53	217	135	82	220	170	
	KMMA	97-021-M-4	58	220	136	84	230	160	
	KMMA	97-021-M-5	56	193	133	60	230	160	
	KMMA	97-021-M-6	46	205	128	77	230	180	
	KMMA	97-021-M-7	57	210	137	73	230	160	
	KMMA	97-021-M-8	52	210	128	82	240	170	
	KMMA	97-021-M-9	62	212	152	60	230	170	
	KMMA	97-021-M-10		194	119	75		150	
	KMMA	97-021-M-11	55	205	132	73	220	160	
	KMMA	97-021-M-12	66	223	144	79	210	170	
	KMMA	97-021-M-13	52	221	142	79	210	170	
	KMMA	97-021-M-14	48	207	128	79	230	170	
	KMMA	97-021-M-15	63				230	180	
	KMMA	97-021-M-16	62	226	142	84	230	170	
	KMMA	97-021-M-17	58	210	136	74	230	160	
	KMMA	97-021-M-18	58		148		230	180	
	KMMA	97-021-M-19	52		129		220	170	
	KMMA	97-021-M-20	63	212	136	76	220	170	
	KMMA	97-021-M-21	60	202	127	75	220	170	
	KMMA	97-021-M-22	54	224	136	88	230	180	
	RUCA	1189	46	201	128	73	230	170	
	RUCA	1240	54	210	138	72	220	160	
	RUCA	1244	54	194	134	60	230	150	
	RUCA	1349	55		115		240	150	
	RUCA	1492	48		130		230	170	
	RUCA	1495	43	196	120	76	230	160	
	RUCA	1991	55	223	140	83	240	170	
	RUCA	2265	49	210	139	71	210	160	
	RUCA	2267	71	235	147	88	230	160	
	RUCA	2372	49	200	127	73	230	170	
	RUCA	2528		220	138	82	220	170	
	RUCA	2709	46				230	150	
	RUCA	2711	56	224	137	87	230	170	
	RUCA	2712	58	215	138	77	230	170	
MENGA	RUCA	1844	55	215	139	76	230	170	
	RUCA	1845	48	216	131	85	230	170	
OTU : LUHANDA									
DUQUE DE BRANGANÇA	FMNH	81934		178		66	220	170	
	FMNH	81937		195	117	78	220	170	
LUHANDA	FMNH	81942		210		80	230	180	
	FMNH	81943		205		70	220	170	
	FMNH	81945		185		73	235	170	
	FMNH	81947		207		81	230	150	
	FMNH	81948		210		87	250	170	
OTU : HUAMBO									
CHIPEPE	HZMB	403.3							
CHITAU	AMNH	85741		170	110	60	190	160	
	AMNH	85742		205	129	76	230	170	
MOCO	FMNH	83833		199	119	80	240	180	
	FMNH	83836		213	130	83	230	180	
	FMNH	83837			125		230	170	
	FMNH	83838		197	113	84	230	170	
	FMNH	83839			130		230	170	
SOQUE	FMNH	83832		205	125	80	235	170	

Appendix 1.2. Additional data on the specimens of *Lophuromys angolensis* sp.n. that have been included in this study. (W: weight; Tol: total length; HB: head + body length; Tl: taillength; HF: hindfootlength-nail)

LOCAL	MUS	NUMB	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
OTU : KIKWIT														
KAKOI	KMMA	97-021-M-27	3170	2970	2540	1240	705	810	970	640	1530	385	475	765
	RUCA	2114	2875	2670	2260	1160	580	710	825	600	1405	350	475	705
	RUCA	2406	3070	2885	2440	1210	675	755	910	620	1565	390	495	755
KIKWIT	RUCA	1955	2985	2815	2385	1180	625	795	945	640	1445	365	485	725
	RUCA	1970	3095	2895	2425	1265	680	815	995	590	1580	390	445	755
KUWANGA	RUCA	2044	2895	2720	2260	1120	640	710	870	650	1430	355	470	740
	RUCA	2531	3085	2885	2440	1230	650	805	945	650	1565	350	475	740
MBALAKA	RUCA	2728	2905	2745	2340	1165	650	740	895	595	1520	340	435	720
MBWAMBALA	KMMA	97-021-M-1	3150	2925	2480	1280	695	805	985	640	1625	400	465	760
	KMMA	97-021-M-2	3050	2835	2390	1240	675	780	920	640	1590	375	490	775
	KMMA	97-021-M-3	2960	2800	2400	1240	660	810	930	640	1565	385	470	750
	KMMA	97-021-M-4	3080	2885	2425	1225	660	800	940	630	1530	360	465	735
	KMMA	97-021-M-5	3050	2875	2450	1225	700	780	950	610	1495	350	450	735
	KMMA	97-021-M-6	3105	2870	2425	1250	700	780	960	620		345	485	730
	KMMA	97-021-M-7	3090	2905	2475	1235	660	770	945	640	1545	355	470	730
	KMMA	97-021-M-8	2935	2755	2345	1140	585	740	880	655	1530	390	455	740
	KMMA	97-021-M-9	3245	3050	2605	1275	710	825	980	660	1570	400	490	780
	KMMA	97-021-M-10	2895	2685	2250	1180	620	730	865	625	1415	350	465	705
	KMMA	97-021-M-11	3080	2865	2450	1210	660	800	950	650	1545	380	455	745
	KMMA	97-021-M-12	3070	2895	2455	1250	690	820	990	640	1575	400	465	775
	KMMA	97-021-M-13	3125	2975	2525	1250	670	830	980	645	1565	350	430	745
	KMMA	97-021-M-14		2735	2300	1205	620	750	900	625	1470	340	450	700
	KMMA	97-021-M-15		2910	2465	1250	660	805	980	670	1575	360	450	735
	KMMA	97-021-M-16	3205	3000	2535	1280	685	825	995	640	1520	355	480	755
	KMMA	97-021-M-17	3120	2955	2505	1260	665	820	1020	635	1570	360	450	745
	KMMA	97-021-M-18	3075	2900	2470	1230	670	810	975	670	1570	390	470	735
	KMMA	97-021-M-19	3110	2905	2460	1230	660	795	925	655	1485	360	450	730
	KMMA	97-021-M-20	3085	2930	2500	1260	680	815	995	655	1555	390	455	765
	KMMA	97-021-M-21		2815	2400	1220	650	755	930	630	1440	330	490	700
	KMMA	97-021-M-22	3100	2870	2425	1230	650	775	965	660	1515	380	500	750
	RUCA	1189	3030	2820	2390	1215	635	780	950	615	1515	375	450	720
	RUCA	1240		2885	2480	1240	680	775	950	665	1565	360	500	725
	RUCA	1244	2975	2785	2365	1195	660	770	950	585	1510	370	470	710
	RUCA	1349	3015	2780	2340	1175	685	770	900	625	1615	405	475	755
	RUCA	1492	3055	2860	2420	1215	710	800	975	620	1505	370	450	705
	RUCA	1495	2910	2750	2305	1225	635	770	920	610	1405	320	450	680
	RUCA	1991	3035	2875	2440	1245	665	800	960	640	1515	380	460	760
	RUCA	2265		2775	2385	1180	670	745	910	615	1515	370	450	735
	RUCA	2267	3195	2945	2475	1250	710	820	1005	675	1545	390	485	760
	RUCA	2372	3010	2775	2320	1175	650	770	930	640	1460	345	440	700
	RUCA	2528	2950	2780	2345	1170	610	740	910	630	1490	340	465	715
	RUCA	2709	3075	2905	2435	1280	660	785	960	665	1540	370	520	780
	RUCA	2711	3055	2860	2400	1215	655	770	945	625	1555	380	470	765
	RUCA	2712	3070	2830	2395	1195	640	770	950	630	1475	330	455	695
MENGA	RUCA	1844	3065	2910	2495	1285	675	805	1000	645	1480	335	490	720
	RUCA	1845	2945	2795	2390	1215	670	740	915	630	1455	360	485	730
OTU : LUHANDA														
DUQUE DE BRAGANÇA	FMNH	81934	2995	2800	2355	1215	625	735	870	615	1520	360	500	750
	FMNH	81937	2980	2705	2365	1185	680	750	855	615	1520	380	485	720
LUHANDA	FMNH	81942	3185	2950	2540	1305	735	820	980	650	1575	400	515	770
	FMNH	81943	3125	2880	2485	1295	690	815	960	635	1535	390	500	775
	FMNH	81945	2980	2750	2355	1240	685	760	885	600	1530	360	500	740
	FMNH	81947	3135	2905	2530	1285	750	920	965	650	1555	365	490	770
	FMNH	81948	3055	2845	2425	1265	655	750	865	630	1520	340	540	795
OTU : HUAMBO														
CHIPEPE	HZMB	403.3	2915	2670	2245	1155	615	715	825	615	1415	325	480	680
CHITAU	AMNH	85741	3095	2820	2410	1230	645	770	900	660	1465	350	490	720
	AMNH	85742	3100	2830	2455	1300	635	785	875	670	1555	360	530	740
MOCO	FMNH	83833	2980	2770	2380	1215	630	745	865	635	1460	370	490	725
	FMNH	83836	3025	2790	2410	1215	660	760	870	635	1425	350	460	700
	FMNH	83837	3005	2825	2450	1225	650	770	905	645	1495	350	495	730
	FMNH	83838	3060	2775	2380	1185	625	735	875	625	1450	345	470	690
	FMNH	83839	3015	2825	2435	1245	615	770	895	680	1415	370	475	725
SOQUE	FMNH	83832	2930	2760	2385	1235	645	735	875	615	1415	345	490	695

Appendix 2.1. Craniometrical data set (M1 to M12) of *Lophuromys angolensis* sp.n. specimens and types. For details on the origin of individual specimens see App.1.1. and 1.2. For the description of the measurements see table 1 and VERHEYEN ET AL. (1996).

LOCAL	MUS	NUMB	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
OTU : KIKWIT														
KAKOI	KMMA	97-021-M-27	185	275	295	1285	445	150	525	1320	130	625	540	865
	RUCA	2114	175	275	280	1160	415	165	520	1205	115	585	515	725
	RUCA	2406	185	290	295	1220	425	200	525	1265	130	630	560	840
KIKWIT	RUCA	1955	170	300	295	1240	430	175	505	1215	120	595	525	820
	RUCA	1970	170	295	310	1335	440	150	495	1265	135	625	585	840
KUWANGA	RUCA	2044	185	285	285	1150	450	145	500	1240	120	580	515	830
	RUCA	2531	190	300	300	1320	445	165	535	1270	140	615	540	840
MBALAKA	RUCA	2728	180	270	285	1210	405	140	485	1225	125	635	545	785
MBWAMBALA	KMMA	97-021-M-1	175	280	290	1350	440	165	530	1320	130	625	540	880
	KMMA	97-021-M-2	200	290	310	1220	460	130	525	1345	140	650	565	815
	KMMA	97-021-M-3	175	260	290	1200	400	170	490	1295	110	630	545	840
	KMMA	97-021-M-4	175	280	290	1310	470	200	510	1270	135	615	530	815
	KMMA	97-021-M-5	190	270	270	1235	435	105	500	1220	135	600	520	835
	KMMA	97-021-M-6	190	250	300	1200	455	175	500	1305	130	620	550	760
	KMMA	97-021-M-7	195	270	290	1225	450	140	515	1265	140	640	570	840
	KMMA	97-021-M-8	170	260	300	1215	440	175	500	1320	135	625	560	765
	KMMA	97-021-M-9	180	300	320	1360	390	160	555	1290	150	635	565	810
	KMMA	97-021-M-10	175	270	285	1105	450	115	495	1260	105	615	470	750
	KMMA	97-021-M-11	190	285	320	1305	440	200	510	1275	130	670	535	855
	KMMA	97-021-M-12	180	315	305	1255	450	210	490	1265	135	650	560	895
	KMMA	97-021-M-13	180	295	305	1290	435	170	500	1275	125	615	550	785
	KMMA	97-021-M-14	180	275	295		415	165	500	1290	140	590	565	
	KMMA	97-021-M-15	175	325	325		425	195	515	1280	120	640	565	825
	KMMA	97-021-M-16	195	285	320	1310	450	180	520	1300	145	670	555	820
	KMMA	97-021-M-17	185	280	295	1230	430	150	520	1305	130	610	535	810
	KMMA	97-021-M-18	175	295	300	1265	420	150	520	1350	145	625	575	810
	KMMA	97-021-M-19	190	290	320	1200	430	165	560	1315	135	625	565	805
	KMMA	97-021-M-20	180	300	310	1290	440	165	505	1265	150	640	555	865
	KMMA	97-021-M-21	175	260	275		440	180	515	1255	125	585	540	800
	KMMA	97-021-M-22	180	325	295	1250	480	185	525	1260	130	635	525	805
	RUCA	1189	165	285	325	1235	425	190	485	1260	115	605	545	845
	RUCA	1240	185	290	310		480	120	515	1295	135	620	550	835
	RUCA	1244	175	245	300	1235	410	145	490	1265	135	595	525	775
	RUCA	1349	175	280	305	1275	435	185	520	1310	130	600	565	830
	RUCA	1492	160	280	300	1230	440	175	505	1260	130	610	530	850
	RUCA	1495	175	245	290	1200	465	170	510	1265	120	590	520	740
	RUCA	1991	190	295	320	1240	455	175	540	1300	130	615	565	820
	RUCA	2265	175	270	285		425	175	495	1225	110	620	520	755
	RUCA	2267	175	290	340	1300	460	185	535	1300	140	670	555	810
	RUCA	2372	175	275	300	1230	425	185	500	1250	120	625	515	780
	RUCA	2528	180	265	300	1205	445	190	525	1300	125	620	530	775
	RUCA	2709	190	280	300	1260	480	190	490	1305	140	665	590	825
	RUCA	2711	190	275	280	1230	440	130	510	1355	135	635	510	800
	RUCA	2712	180	275	290	1305	450	130	510	1270	140	600	560	805
MENGA	RUCA	1844	180	260	280	1300	470	165	500	1290	135	610	510	770
	RUCA	1845	185	260	285	1215	465	145	515	1250	120	585	530	825
OTU : LUHANDA														
DUQUE DE BRAGANÇA	FMNH	81934	195	205	275	1140	505		525	1255	150	595	510	830
	FMNH	81937	180	230	265	1250	445		510	1215	145	570	460	795
LUHANDA	FMNH	81942	205	245	310	1290	490		580	1310	130	645	525	855
	FMNH	81943	200	210	275	1210	470		555	1295	145	640	490	810
	FMNH	81945	200	205	285	1220	485		545	1265	130	620	465	820
	FMNH	81947	205	290	280	1335	455		550	1280	140	640	490	805
	FMNH	81948	225	235	295	1240	515		555	1275	130	615	495	845
OTU : HUAMBO														
CHIPEPE	HZMB	403.3	180	280	245	1220	435	125	510	1210	135	570	500	805
CHITAU	AMNH	85741	180	260	330	1260	480		525	1305	145	630	515	815
	AMNH	85742	185	300	275	1270	460		575	1310	145	695	505	875
MOCO	FMNH	83833	185	255	255	1180	465		535	1285	120	605	485	830
	FMNH	83836	175	300	280	1250	435		550	1235	135	660	475	885
	FMNH	83837	190	265	275	1200	475			1255	150	590	455	785
	FMNH	83838	180	245	275	1240	435		520	1230	135	635	495	865
	FMNH	83839	185	285	365	1230	435		525	1290	140	635	480	825
SOQUE	FMNH	83832	170	275	255	1155	475		535	1225	140	625	455	790

Appendix 2.2. Craniometrical data set (M13 to M24) of *Lophuromys angolensis* sp.n. specimens and types. For details on the origin of individual specimens see App. 1.1. and 1.2. For the description of the measurements see table 1 and VERHEYEN ET AL. (1996).

Lophuromys ansorgei **De Winton, 1896**

OTU UGANDA (Cratertrack) 50 ex. ; 17M ; 32F ; 1? ; cl2=33 ; cl3=13 ; cl4=4

BMNH 65.1374; 65.1377; 65.1378; 65.1385; 65.1386; 65.1388; 77.1812; 77.1813; 77.1816; 77.1817; 77.1819; 77.1822; 77.1827; 77.1828; 77.1829; 77.1832; 77.1833; 77.1836; 77.1837; 77.1842; 77.1843 ; 77.1847 ; 77.1849; 77.1850; 77.1852; 77.1856; 77.1857; 77.1861; 77.1862; 77.1863; 77.1878; 77.1880; 77.1884; 77.1889; 77.1892; 77.1893; 77.1897; 77.1900; 77.1903; 77.1906; 77.1908; 77.1911; 77.1912; 77.1918; 77.1919; 77.1923; 77.1924; 77.1926; 77.1928; 77.1932

Lophuromys cf. ansorgei **De Winton, 1896**

OTU KINSHASA : 9 ex. ; 1M ; 4F ; 4? ; cl2=4 ; cl3=4 ; cl4=1

BOMA : KMMA 19611;
CHINXOXO : HZMB 70011;
KINSHASA : KMMA 14034; 14036; 14037; 14731; 18782; 18783;
LEO-KALINA : KMMA 19393

Appendix 3.1.

Listing of the specimens of *Lophuromys ansorgei* (OTU = Uganda) and *Lophuromys cf. ansorgei* (Kinshasa) that were used in the process of describing the new taxon.

OTU GAB-CON 46 ex. ; 26 M ; 20 F ; cl2=21 ; cl3=22 ; cl4=3

FRANCEVILLE :
RUCA G10050; G10051; G10056; G10057; G10058; G10073; G10080; G10081; G10082; G10083; G10085; G10107; G10108; G10128; G10129; G10130

ODZALA :
RUCA R22214; R22215; R22244; R22270; R22271; R22272; R22327; R22328; R22338; R22339; R22340; R22341; R22342; R22343; R22366; R22370; R22371; R22380; R22411; R22412; R22461; R22462; R22463; R22464; R22465; R22467; R22467; R22468; R22469; R22471; R22502 ;

MOUILA :
MHNP 1949.520

Appendix 3.2.

Listing of the specimens of *Lophuromys sikapusi* used in this article.