Article IX.—LAGOMORPHA AND RODENTIA OTHER THAN SCIURIDAE, ANOMALURIDAE AND IDIURIDAE, COLLECTED BY THE AMERICAN MUSEUM CONGO EXPEDITION[1]

By Robert T. Hatt

Plates VII to XIX; Text Figures 1 to 39; 2 Maps

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[1] Scientific Results of the Congo Expedition. Mammalogy No. 18. Publication expenses were met in part by a contribution from The Cranbrook Institute of Science.

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INTRODUCTION

The American Museum Congo Expedition[1] of which Herbert Lang was leader, and James P. Chapin, assistant, was in the field from 1909–1915. During this period the Expedition obtained over 5200 specimens of mammals, of which about 1700 were rodents or hares. Some of these, the Sciuridae, Anomaluridae and Idiuridae, have already formed the basis of a report,[2] as have certain of the other groups of mammals.[3] The present paper deals with the remaining specimens of rodents and the lagomorphs and embraces representatives of the families Muscardinidae, Cricetidae, Muridae, Bathyergidae, Thryonomyidae, Hystricidae and Leporidae.

For a small part of the time that the Congo Expedition was in the field, another collector, Dr. Cuthbert Christy, was in much the same territory for the benefit of the British Museum. The fact that Christy's material was all promptly studied and new forms named is a testimonial to the industry of the late Oldfield Thomas and his associates. It explains in large part why there have been comparatively few new species and subspecies described from the American Museum collections from the northeastern Congo. But two species taken by Dr. Christy in the Uelle or Ituri were not secured by the American Museum Congo Expedition. One of these is the dwarf grass rat, *Lemniscomys m. akka*, the other, the protruding-toothed mouse, *Zelotomys instans*.

Since the period of the Congo Expedition, the American Museum has obtained a number of important collections of mammals from the Belgian Congo, some by expedition, one by purchase. These have come principally from the Ruwenzori, Kivu and Marungu Mountains, the Kasai and the Middle Congo. Though an account of them has not been incorporated in this Bulletin, the specimens have naturally been of great service to me for purposes of comparison with the Congo Expedition series. I also had the advantage of studying types and other specimens in the British Museum, the Congo Museum, the Paris Museum, the United States National Museum, the Field Museum and the Museum of Comparative Zoölogy.

In a report such as this it is inevitable that the help of many persons is enlisted and it would be ungrateful indeed to fail to acknowledge such assistance.

Doctor James P. Chapin more than any other person helped me with this report by answering innumerable questions about a territory, animals and people with which I have no first-hand acquaintance. To him I am indebted beyond the possibility of return favors.

To Doctor Harold E. Anthony I am thankful for the privilege of working with the Congo collection and for profound patience in awaiting the long-delayed manuscript.

To Doctor John Eric Hill I am grateful for much laborious checking of manuscript and proof.

Numerous persons in other museums have gone out of their way to help me when I worked with collections in their charge, or

[1] For general accounts of the Expedition and the country in which it collected, see especially the following:
1919. Osborn, Henry Fairfield. "The Congo Expedition of the American Museum of Natural History." Bull. Amer. Mus. Nat. Hist., XXXIX, pp. xv–xxvii.
1932. Chapin, James P. "Birds of the Belgian Congo, Part I." Bull. Amer. Mus. Nat. Hist., LXV, Section A, pp. 1–392.

[2] 1922. Allen, J. A. "Sciuridae, Anomaluridae and Idiuridae collected by the American Museum Congo Expedition." Bull. Amer. Mus. Nat. Hist., XLVII, pp. 39–71.

[3] Other synoptic reports of this series which have appeared to date, are the following:
1916. Hollister, N. "Shrews Collected by the Congo Expedition of the American Museum." Bull. Amer. Mus. Nat. Hist., XXXV, pp. 663–680.
1917. Allen, J. A., Lang, Herbert, and Chapin, James P. "The American Museum Congo Expedition Collection of Bats." Bull. Amer. Mus. Nat. Hist., XXXVII, pp. 405–563.
1922. Allen, J. A. "The American Museum Congo Expedition Collection of Insectivora." Bull. Amer. Mus. Nat. Hist., XLVII, pp. 1–38.
1924. Allen, J. A. "Carnivora Collected by the American Museum Congo Expedition." Bull. Amer. Mus. Nat. Hist., XLVII, pp. 73–281.
1925. Allen, J. A. "Primates Collected by the American Museum Congo Expedition." Bull. Amer. Mus. Nat. Hist., XLVII, pp. 283–499.
1934. Hatt, Robert T. "A Manatee Collected by the American Museum Congo Expedition, with Observations on the Recent Manatees." Bull. Amer. Mus. Nat. Hist., LXVI, pp. 533–566.
1934. Hatt, Robert T. "The Pangolins and Aard Varks Collected by the American Museum Congo Expedition." Bull. Amer. Mus. Nat. Hist., LXVI, pp. 643–672.
1936. Hatt, Robert T. "The Hyraxes Collected by the American Museum Congo Expedition." Bull. Amer. Mus. Nat. Hist., LXXII, pp. 117–141.

have looked up specimens and information. Among these have been Doctor Henri Schouteden of the Musée du Congo Belge; Dr. Paul Rode of the Muséum d'Histoire Naturelle, Paris; Mr. M. A. C. Hinton, Captain Guy Dollman and Mr. R. Hayman of the British Museum; Dr. Jean Roux, of the Naturhistorisches Museum, Basel; Dr. W. H. Osgood of the Field Museum; Dr. G. S. Miller of the United States National Museum; Dr. Glover M. Allen of the Museum of Comparative Zoölogy; Dr. Karl Jordan of the Tring Museum; and Dr. B. Rensch of the Berlin Museum.

The drawings used in this report, as will be obvious, are the work of two individuals, to each of whom I am deeply indebted for painstaking work. Miss Helen Z. Hunt drew figures 3, 8–13, 16, 20–28, 32–39, and Mrs. E. Rungius Fulda constructed figures 1, 2, 5–7, 14, 15, 17–19, 29–31.

All skulls are drawn without perspective and with the lighting from the anterior end. In certain instances the skulls are partially composite, since in any series the skulls best suited to illustration frequently lacked the pterygoids or lacrymals, which were then drawn in from another specimen matching the figured skull as nearly as possible.

Native or English names are given where I found record of such on labels, in field catalogues, or publications. In such instances the format used is as follows:

Native name: Tribe or locality (Authority)
or
Name (Authority)

Where no authority appears, the name is either one commonly used in the literature or one of my own invention.

Contrary to common practice, a comma is used between an author's and a scientific name when the citation does not involve a first usage.

Tables of collectors' measurements and skull measurements are grouped at the end of this report for the sake of convenience.

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Bloomfield Hills, Michigan
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SPECIES AND SUBSPECIES WITH THEIR LOCALITIES AND NUMBER OF SPECIMENS TAKEN AT EACH LOCALITY

SPECIES AND SUBSPECIES	LOCALITIES	SPECIMENS
1.—*Claviglis christyi*	Avakubi, 1; Medje, 29; Niangara, 1; Stanleyville, 1; Unknown, 1	33
2.—*Claviglis lorraineus*	Bafwabaka, 3; Faradje, 3; Medje, 3; Niangara, 7; Vankerckhovenville, 1	17
3.—*Otomys tropicalis faradjius*	Faradje, 11	11
4.—*Taterillus emini congicus*	Faradje, 34; Garamba, 2; Niangara, 18	54
5.—*Tatera dichrura*	Faradje, 8; Garamba, 3; Niangara, 38	49
6.—*Dendromus messorius*	Bafwabaka, 6; Gamangui, 2; Medje, 23; Nala, 1; Niangara, 6	38
7.—*Dendromus acraeus lineatus*	Faradje, 15; Garamba, 1	16
8.—*Deomys ferrugineus christyi*	Gamangui, 13; Medje, 2; Niapu, 1	16
9.—*Steatomys opimus gazellae*	Faradje, 10; Garamba, 2; Niangara, 14	26
10.—*Lophuromys sikapusi*	Bafwabaka, 3; Faradje, 1; Medje, 2; Niangara, 2; Stanleyville, 2	10
11.—*Lophuromys aquilus* subsp.	Faradje, 1	1

Species and Subspecies	Localities	Specimens
12.—*Lophuromys aquilus rita*	Avakubi, 3; Bafwabaka, 2; Bafwasende, 2; Batama, 1; Gamangui, 2; Leopoldville?, 1; Medje, 1; Ngayu, 13; Niangara, 1; Stanleyville, 22	48
13.—*Lophuromys luteogaster*	Medje, 2	2
14.—*Cricetomys gambianus langi*	Faradje, 12; Niangara, 3	15
15.—*Cricetomys dissimulus emini*	Akenge, 4; Bafwabaka, 1; Faradje, 1; Medje, 8; Niangara, 4; Niapu, 9; Unknown, 3	30
16.—*Malacomys longipes centralis*	Avakubi, 3; Gamangui, 30; Medje, 4; Niangara, 4; Niapu, 5	46
17.—*Colomys goslingi goslingi*	Gamangui, 1; Medje, 8; Niapu, 2	11
18.—*Arvicanthis testicularis centralis*	Aba, 1; Garamba, 1; Niangara, 4	6
19.—*Lemniscomys striatus striatus*	Avakubi, 15; Bafwabaka, 4; Bafwasende, 2; Boyulu, 1; Faradje, 3; Gamangui, 1; Medje, 2; Niangara, 8; Stanleyville, 18; Tshumbiri, 1	55
20.—*Lemniscomys barbarus zebra*	Faradje, 22; Garamba, 2; Niangara, 2	26
21.—*Lemniscomys dunni nubalis*	Faradje, 3	3
22.—*Lemniscomys oweni orientalis*	Faradje, 2	2
23.—*Hybomys univittatus univittatus*	Avakubi, 12; Bafwasende, 5; Gamangui, 1; Medje, 5; Ngayu, 1; Niangara, 4; Niapu, 3; Stanleyville, 1	32
24.—*Mylomys dybowskii alberti*	Faradje, 18; Garamba, 2; Niangara, 6; Unknown, 1	27
25.—*Stochomys longicaudatus ituricus*	Gamangui, 1; Medje, 12; Ngayu, 3; Niangara, 1; Stanleyville, 2	19
26.—*Dasymys bentleyae bentleyae*	Bafwabaka, 3; Faradje, 11; Garamba, 2; Medje, 16; Niangara, 3	35
27.—*Oenomys hypoxanthus hypoxanthus*	Akenge, 1; Avakubi, 10; Bafwabaka, 3; Faradje, 2; Gamangui, 1; Medje, 2; Ngayu, 7; Niangara, 1; Niapu, 1; Stanleyville, 20	47
28.—*Rattus rattus frugivorus*	Isangi, 1; Leopoldville, 7; Stanleyville, 5	13
29.—*Aethomys kaiseri medicatus*	Faradje, 2; Niangara, 13	15
30.—*Mastomys coucha ugandae*	Aba, 2; Avakubi, 18; Bafwabaka, 19; Faradje, 12; Gamangui, 1; Garamba, 6; Medje, 7; Niangara, 15	80
31.—*Praomys jacksoni jacksoni*	Avakubi, 6; Bafwabaka, 8; Bafwasende, 2; Gamangui, 5; Medje, 9; Ngayu, 4; Niangara, 10; Niapu, 2	46

Species and Subspecies	Localities	Specimens
32.—*Hylomyscus alleni stella*	Avakubi, 2; Gamangui, 12; Medje, 2; Ngayu, 1	17
33.—*Hylomyscus carillus schoutedeni*	Medje, 4; Niangara, 3; Niapu, 1	8
34.—*Thamnomys venustus schoutedeni*	Medje, 2	2
35.—*Thamnomys surdaster callithrix*	Faradje, 8; Garamba, 1; Niangara, 14	23
36.—*Thamnomys rutilans centralis*	Avakubi, 2; Gamangui, 2; Medje, 12; Niangara, 12; Niapu, 3; Stanleyville, 3	33
37.—*Leggada bella enclave*	Faradje, 14; Garamba, 9; Nala, 1; Niangara, 4	28
38.—*Leggada grata grata*	Bafwabaka, 6; Medje, 7; Ngayu, 9; Niangara, 4; Stanleyville, 1	27
39.—*Leggada pasha*	Bafwabaka, 1; Niangara, 6; Yakuluku, 1	8
40.—*Leggada emesi*	Niangara, 3	3
41.—*Leggada musculoides*	Malela, 1	1
42.—*Cryptomys lechei*	Faradje, 14; Garamba, 23	37
43.—*Choeromys harrisoni harrisoni*	Faradje, 16; Medje, 1; Niangara, 2; Vankerckhovenville, 1; Unknown, 1	21
44.—*Thryonomys swinderianus variegatus*	Faradje, 7; Unknown, 1	8
45.—*Atherurus africanus centralis*	Akenge, 10; Faradje, 1; Medje, 21; Niapu, 36	62
46.—*Hystrix galeata*	Akenge, 1; Faradje, 14; Unknown, 2	17
47.—*Poelagus m. marjorita*	Faradje, 31	31

LIST OF LOCALITIES WITH NAMES OF THE SPECIES AND SUBSPECIES AND NUMBER OF SPECIMENS TAKEN AT EACH LOCALITY

Localities	Species and Subspecies	No. of Specimens	Totals
Aba	*Arvicanthis testicularis centralis*	1	
"	*Mastomys coucha ugandae*	2	3
Akenge	*Cricetomys dissimulus emini*	4	
"	*Oenomys hypoxanthus hypoxanthus*	1	
"	*Atherurus africanus centralis*	10	
"	*Hystrix galeata*	1	16
Avakubi	*Claviglis christyi*	1	
"	*Lophuromys aquilus rita*	3	
"	*Malacomys longipes centralis*	3	
"	*Lemniscomys striatus striatus*	15	
"	*Hybomys univittatus univittatus*	12	
"	*Oenomys hypoxanthus hypoxanthus*	10	
"	*Mastomys coucha ugandae*	18	
"	*Praomys jacksoni jacksoni*	6	
"	*Hylomyscus alleni stella*	2	
"	*Thamnomys rutilans centralis*	2	72

Localities	Species and Subspecies	No. of Specimens	Totals
Bafwabaka	*Claviglis lorraineus*	3	
"	*Dendromus messorius*	6	
"	*Lophuromys sikapusi*	3	
"	*Lophuromys aquilus rita*	2	
"	*Cricetomys dissimulus emini*	1	
"	*Lemniscomys striatus striatus*	4	
"	*Dasymys bentleyae bentleyae*	3	
"	*Oenomys hypoxanthus hypoxanthus*	3	
"	*Mastomys coucha ugandae*	19	
"	*Praomys jacksoni jacksoni*	8	
"	*Leggada grata grata*	6	
"	*Leggada pasha*	1	59
Bafwasende	*Lophuromys aquilus rita*	2	
"	*Lemniscomys striatus striatus*	2	
"	*Hybomys univittatus univittatus*	5	
"	*Praomys jacksoni jacksoni*	2	11
Batama	*Lophuromys aquilus rita*	1	1
Boyulu	*Lemniscomys striatus striatus*	1	1
Faradje	*Claviglis lorraineus*	3	
"	*Otomys tropicalis faradjius*	11	
"	*Taterillus emini congicus*	34	
"	*Tatera dichrura*	8	
"	*Dendromus acraeus lineatus*	15	
"	*Steatomys opimus gazellae*	10	
"	*Lophuromys sikapusi*	1	
"	*Lophuromys aquilus* subsp.	1	
"	*Cricetomys gambianus langi*	12	
"	*Cricetomys dissimulus emini*	1	
"	*Lemniscomys striatus striatus*	3	
"	*Lemniscomys barbarus zebra*	22	
"	*Lemniscomys dunni nubalis*	3	
"	*Lemniscomys oweni orientalis*	2	
"	*Mylomys dybowskii alberti*	18	
"	*Dasymys bentleyae bentleyae*	11	
"	*Oenomys hypoxanthus hypoxanthus*	2	
"	*Aethomys kaiseri medicatus*	2	
"	*Mastomys coucha ugandae*	12	
"	*Thamnomys surdaster callithrix*	8	
"	*Leggada bella enclave*	14	
"	*Cryptomys lechei*	14	
"	*Choeromys harrisoni harrisoni*	16	
"	*Thryonomys swinderianus variegatus*	7	
"	*Atherurus africanus centralis*	1	
"	*Hystrix galeata*	14	
"	*Poelagus m. marjorita*	31	276
Gamangui	*Dendromus messorius*	2	
"	*Deomys ferrugineus christyi*	13	
"	*Lophuromys aquilus rita*	2	
"	*Malacomys longipes centralis*	30	
"	*Colomys goslingi goslingi*	1	

Localities	Species and Subspecies	No. of Specimens	Totals
Gamangui	*Lemniscomys striatus striatus*	1	
"	*Hybomys univittatus univittatus*	1	
"	*Stochomys longicaudatus ituricus*	1	
"	*Oenomys hypoxanthus hypoxanthus*	1	
"	*Mastomys coucha ugandae*	1	
"	*Praomys jacksoni jacksoni*	5	
"	*Hylomyscus alleni stella*	12	
"	*Thamnomys rutilans centralis*	2	72
Garamba	*Taterillus emini congicus*	2	
"	*Tatera dichrura*	3	
"	*Dendromus acraeus lineatus*	1	
"	*Steatomys opimus gazellae*	2	
"	*Arvicanthis testicularis centralis*	1	
"	*Lemniscomys barbarus zebra*	2	
"	*Mylomys dybowskii alberti*	2	
"	*Dasymys bentleyae bentleyae*	2	
"	*Mastomys coucha ugandae*	6	
"	*Thamnomys surdaster callithrix*	1	
"	*Leggada bella enclave*	9	
"	*Cryptomys lechei*	23	54
Isangi	*Rattus rattus frugivorus*	1	1
Leopoldville	*Lophuromys aquilus rita*	1	
"	*Rattus rattus frugivorus*	7	8
Malela	*Leggada musculoides*	1	1
Medje	*Claviglis christyi*	29	
"	*Claviglis lorraineus*	3	
"	*Dendromus messorius*	23	
"	*Deomys ferrugineus christyi*	2	
"	*Lophuromys sikapusi*	2	
"	*Lophuromys aquilus rita*	1	
"	*Lophuromys luteogaster*	2	
"	*Cricetomys dissimulus emini*	8	
"	*Malacomys longipes centralis*	4	
"	*Colomys goslingi goslingi*	8	
"	*Lemniscomys striatus striatus*	2	
"	*Hybomys univittatus univittatus*	5	
"	*Stochomys longicaudatus ituricus*	12	
"	*Dasymys bentleyae bentleyae*	16	
"	*Oenomys hypoxanthus hypoxanthus*	12	
"	*Mastomys coucha ugandae*	7	
"	*Praomys jacksoni jacksoni*	9	
"	*Hylomyscus alleni stella*	2	
"	*Hylomyscus carillus schoutedeni*	4	
"	*Thamnomys venustus schoutedeni*	2	
"	*Thamnomys rutilans centralis*	12	
"	*Leggada grata grata*	7	
"	*Choeromys harrisoni harrisoni*	1	
"	*Atherurus africanus centralis*	21	194
Nala	*Dendromus messorius*	1	

Localities	Species and Subspecies	No. of Specimens	Totals
Nala	*Leggada bella enclave*	1	2
Ngayu	*Lophuromys aquilus rita*	13	
"	*Hybomys univittatus univittatus*	1	
"	*Stochomys longicaudatus ituricus*	3	
"	*Oenomys hypoxanthus hypoxanthus*	7	
"	*Praomys jacksoni jacksoni*	4	
"	*Hylomyscus alleni stella*	1	
"	*Leggada grata grata*	9	38
Niangara	*Claviglis christyi*	1	
"	*Claviglis lorraineus*	7	
"	*Taterillus emini congicus*	18	
"	*Tatera dichrura*	38	
"	*Dendromus messorius*	6	
"	*Steatomys opimus gazellae*	14	
"	*Lophuromys sikapusi*	2	
"	*Lophuromys aquilus rita*	1	
"	*Cricetomys gambianus langi*	3	
"	*Cricetomys dissimulus emini*	4	
"	*Malacomys longipes centralis*	4	
"	*Arvicanthis testicularis centralis*	4	
"	*Lemniscomys striatus striatus*	8	
"	*Lemniscomys barbarus zebra*	2	
"	*Hybomys univittatus univittatus*	4	
"	*Mylomys dybowskii alberti*	6	
"	*Stochomys longicaudatus ituricus*	1	
"	*Dasymys bentleyae bentleyae*	3	
"	*Oenomys hypoxanthus hypoxanthus*	1	
"	*Aethomys kaiseri medicatus*	13	
"	*Mastomys coucha ugandae*	15	
"	*Praomys jacksoni jacksoni*	10	
"	*Hylomyscus carillus schoutedeni*	3	
"	*Thamnomys surdaster callithrix*	14	
"	*Thamnomys rutilans centralis*	12	
"	*Leggada bella enclave*	4	
"	*Leggada grata grata*	4	
"	*Leggada pasha*	6	
"	*Leggada emesi*	3	
"	*Choeromys harrisoni harrisoni*	2	213
Niapu	*Deomys ferrugineus christyi*	1	
"	*Cricetomys dissimulus emini*	9	
"	*Malacomys longipes centralis*	5	
"	*Colomys goslingi goslingi*	2	
"	*Hybomys univittatus univittatus*	3	
"	*Oenomys hypoxanthus hypoxanthus*	1	
"	*Praomys jacksoni jacksoni*	2	
"	*Hylomyscus carillus schoutedeni*	1	
"	*Thamnomys rutilans centralis*	3	
"	*Atherurus africanus centralis*	36	63
Stanleyville	*Claviglis christyi*	1	

Localities	Species and Subspecies	No. of Specimens	Totals
Stanleyville	*Lophuromys sikapusi*	2	
"	*Lophuromys aquilus rita*	22	
"	*Lemniscomys striatus striatus*	18	
"	*Hybomys univittatus univittatus*	1	
"	*Stochomys longicaudatus ituricus*	2	
"	*Oenomys hypoxanthus hypoxanthus*	20	
"	*Rattus rattus frugivorus*	5	
"	*Thamnomys rutilans centralis*	3	
"	*Leggada grata grata*	1	75
Tshumbiri	*Lemniscomys striatus striatus*	1	1
Unknown			9
Vankerckhovenville	*Claviglis lorraineus*	1	
"	*Choeromys harrisoni harrisoni*	1	2
Yakuluku	*Leggada pasha*	1	1

SPECIES AND SUBSPECIES DESCRIBED FROM THIS COLLECTION WITH THEIR TYPE LOCALITIES

Otomys tropicalis faradjius Hatt. Faradje

Lophuromys luteogaster Hatt. Medje

Cricetomys gambianus langi Hatt. Faradje

Lemniscomys oweni orientalis Hatt. Faradje

Thamnomys venustus schoutedeni Hatt. Medje

Thamnomys surdaster callithrix Hatt. Garamba

GENERAL SUMMARY[1]

Families	Genera	Species and Subspecies	Specimens	Localities
Sciuridae	6	14	315	23
Anomaluridae	3	3	125	8
Idiuridae	1	3	40	4
Muscardinidae	1	2	50	6
Cricetidae	6	7	210	8
Muridae	18	32	719	21
Bathyergidae	1	1	37	2
Thryonomyidae	2	2	29	4
Hystricidae	2	2	79	4
Leporidae	1	1	31	1

STANDARDS

Since measurements as taken by different investigators lack a certain amount of uniformity it is desirable to define the units I have employed, where they are not adequately covered by the Thomas definitions. All measurements of specimens are given in millimeters.

In dental homologies I have followed Hinton (1923, Ann. Mag. Nat. Hist., (9) XI, p. 162) rather than Kellogg (1922, Univ. Calif. Pub. Zool., XXI, p. 245) and consider the usual three cheek teeth of the Muridae all as molars.

[1] The Sciuridae, Anomaluridae and Idiuridae are summarized from the earlier report on these.

Collectors' Measurements

Total Length.—In common with other American collectors, Messrs. Lang and Chapin measured their specimens according to the more accurate method of taking the straight line measurement from tip of nose to tip of tail, rather than measuring the head and body as one unit, the tail as another. The greater part of descriptions and reports on African mammals having been written by Europeans, and based on collections made by Europeans, the "head plus body" unit has been almost universally employed. To harmonize this report with others, I have deducted the tail length from the total length to obtain the length of head and body, and given this measurement together with the original.

Head and Body.—In quotations of type descriptions or field labels where so given this measurement is a direct transcription. Where it refers to specimens in the Congo Expedition collection, or to certain other specimens collected or described by Americans, the measurement given has been obtained by deducting the tail length from the total length.

Tail.—Except where otherwise specified this refers to the length of the tail exclusive of the hairs on the tip. Messrs. Lang and Chapin obtained this by bending the tail at right angles to the body and taking a reading directly against a rule held against the tail.

Foot.—In all Congo Expedition specimens, and probably in all other specimens mentioned in this report when collected by Americans the measurement is the length of one of the hind feet held against a flat surface, and measured from the heel to the tip of the longest claw.

Ear.—The ear length of the Congo Expedition specimens was, I believe, always taken from the lowest point of the ear in front of the antitragus to the tip, instead of from the notch behind the antitragus, as this measurement is more commonly taken.

Cranial Measurements

Greatest Length.—Between verticals, with the alveolocondylar axis (Martin, Rudolph, 1928. "Lehrbuch der Anthropologie," 2d Ed., II, p. 585) horizontal. In most rodents measured this is the distance from opisthocranion (see Duerst, "Handb. der biolog. Arbeitsmethoden," Abth. VII, Heft 2, pp. 125–520, p. 237) to the rhinion (*op. cit.*, p. 240). There is, however, no general rule and each species has its own standard. For example, in *Cryptomys* the greatest length is the distance from the tips of the mastoid processes to the tips of the incisors. (Fig. 1A)

Zygomatic Breadth.—The greatest zygomatic breadth without regard to the constancy of the transverse plane.

Breadth Brain Case.—The greatest breadth obtainable above the zygomatic root. (Fig. 1B)

Interorbital Breadth.—The least breadth obtainable between the orbits as measured from above with parallel nosed calipers.

Skull Height.—The greatest height obtainable in the parietal region. In most rodents this is from the base of the bullae to the crown. (Fig. 1D)

Length Nasals.—Where not written length nasal suture, this is the greatest length of the nasals.

Breadth Nasals.—This is the greatest breadth of the combined nasals, usually near their distal ends, but in some genera (e.g., *Cryptomys*) in the posterior half.

Width Zygomatic Plate.—This is the greatest width of the lower arm of the zygomatic root. I have preferred the use of "zygomatic plate" to "infraorbital plate" for this surface, since the latter term is, in rodents a misnomer. (See Fig. 1C.) With some species I have used an alternative measurement, "Least width zygomatic plate."

Width Upper Arm of the Anterior Zygomatic Root.—This measurement is taken at the narrowest point.

Diastema.—Measured in the median plane.

Width Palate Inside M^1.—The least width at the alveolar level.

Crown Length Upper Tooth Row.—The greatest length in the long axis of the tooth row above the level of the gums.

Width M^1, M^2, Etc.—The first molariform tooth is considered M^1 in all genera

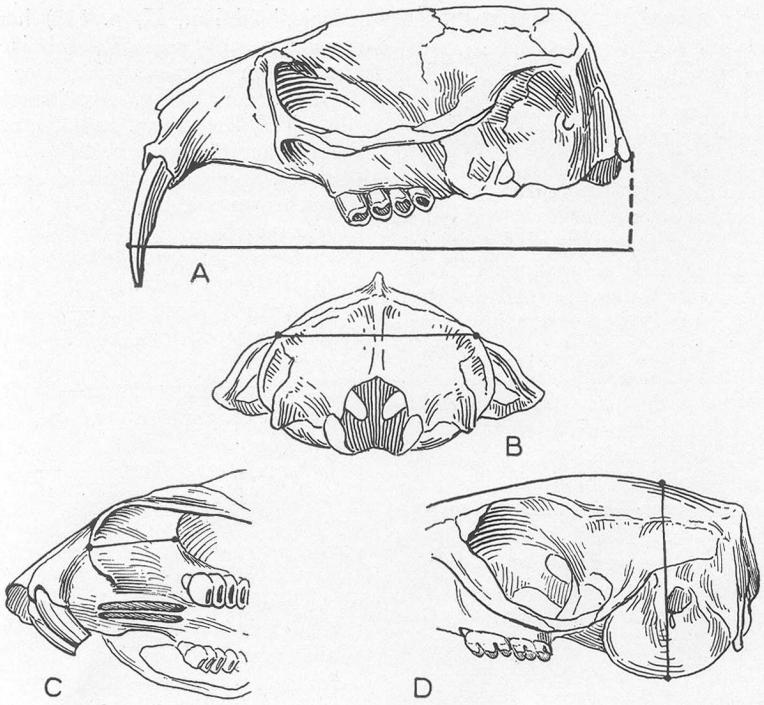


Fig. 1. Methods of measurement: A, Greatest length; B, Breadth of brain case; C, Width of zygomatic plate; D, Skull height.

with three cheek teeth in a row. In others the first is considered Pm^4. The width is taken as the greatest diameter in the transverse plane of the tooth measured.

CONDYLO-INCISIVE LENGTH MANDIBLE.—Taken in the long axis of one-half the mandible, with the molar crowns and the caliper beam horizontal.

COLOR

When color names are capitalized they refer to Ridgway's "Color Standards and Color Nomenclature."

ABBREVIATIONS EMPLOYED

(Other than Standard Bibliographic Citations)

A.M.N.H.	The American Museum of Natural History, New York
B.C.	Belgian Congo
B.M.	British Museum (Natural History), London
c.	Circa (approximately)
c.u.	Con unguis (foot length with claw)
F.M.	Field Museum of Natural History, Chicago, Illinois
H-B	Combined length head and body
M.C.B.	Musée du Congo Belge, Tervueren
M.C.Z.	Museum of Comparative Zoölogy, Cambridge
M.H.N.	Muséum d'Histoire Naturelle, Paris
N.M.B.	Naturhistorisches Museum, Basel
N.R.S.	Naturhistoriska Riksmuseum, Stockholm
s.u.	Sin unguis (foot length without claw)
U.S.N.M.	United States National Museum, Washington
Z.M.B.	Zoologisches Museum der Universität, Berlin

ANNOTATED LIST AND NOTES ON LOCALITIES MENTIONED IN THIS REPORT

A number of localities mentioned in the report do not appear on the more commonly available maps and the following notes will help in identifying them.

ABIMVA.—Near Aru and Watsa in Upper Uelle. See map by Dr. Schouteden in 1936, Ann. Mus. Congo, Zool., I, fasc. 2, p. 153.

ADRA.—Near Aru. See map cited above.

ATALIA.—Somewhere within 5 days of Lake Edward. Collections of Dott. Aurilio Rossi.

BAKWABULU (= BAKA MBULI).—Lies on the southern edge of a forest on the left bank of the Sankuru opposite the mouth of the Lubefu River, about 65 km. N.W. of Lusambo.

BAMBARA.—On the Uelle between Niangara and Dungu. Approximately 3° 35′ N.; 28° 20′ E.

BELIMA.—Between Niangara and Dungu, south of Uelle River. Visited by Emin.

BELLIMA (= BELIMA).

BENI, NEW (= BUNGULU).—The new post lies eight miles northwest of the old post, and at 3837 feet elevation. (0° 30′ N.; 29° 30′ E.)

BENI, OLD.—In the Semliki Valley at an elevation of 3050 feet.

BERITIO.—A forest village 3 days' journey south of Angu. Visited by Boyd Alexander.

BOLONGERA (= BOLONGENA).—Christy Coll. Rev. Zool. Afr., IV, p. 84.

BOPU.—A village at the edge of the forest 25 km. N. of Lesse in the Semliki Valley. (About 1° N.; 29° 50′ E.)

BOSOBANGI.—A rapid about eighteen miles below Avakubi on the Ituri River.

BOYULU.—A rest house between Stanleyville and Avakubi, near Bafwasende.

BUANASURA (= BWANASURA).—A village on the Irumu–Beni road about forty miles S.SW. of Irumu, and about thirty miles S.W. of Boga. Approximately 0° 35′ N.; 29° 40′ E. The nearest open country is about twenty-five miles east.

BUHAMBA (= BUAMBA).—A small district between the Semliki River and the N.W. base of Ruwenzori. Also a locality at 2000 meters in the Kivu region.

BUNGULU.—Native name for the new post of Beni, but no longer used.

BUNKEYA RIVER.—Affluent of the Lufira River in Katanga. The Mission of Bunkeya is at 10° 17′ S.; 27° E.

BUTAHU VALLEY.—West slope of Ruwenzori. The river flows into the Semliki. Also spelled Butagu.

BUTOPA.—South slope of Mt. Elgon, Southern Bugishu, Uganda.

CAMPI YA WAMBUTTI.—West of Irumu, Belgian Congo. (1° 40′ N.; 29° 30′ E.)

CAMPIA.—Marungu Mountains, southeastern Belgian Congo.

CARTOUSHI (= KARTOUSHI).

CHAHAFI, LAKE.—British Ruanda, at foot of the escarpment between Kabale and Mt. Muhavura. (1° 20′ S.; 29° 55′ E.)

DJALASINDA.—A village just west of Mahagi Post, with a small patch of forest. Altitude 5000 feet.

DJUGU.—2° N.; 30° 30′ E. Altitude about 5000 feet.

DUMA.—Just east of Ubangi River, between Bangui and Libenge.

ELISABETHA.—On left bank of Congo River, opposite Basoko.

ELOMBO.—Near Djugu, W. of Lake Albert.

FORT PORTAL.—At the northeastern base of Mt. Ruwenzori, Uganda.

FUNDI.—Near Mawambi, on road toward Beni. (1° N.; 29° E.)

GADDA RIVER.—Between Niangara and Rungu, Uelle District.

GAMBI (= KAMBI).—In forest S.E. of Angu on the Uelle. Gosling collector.

GAMBI RIVER.—3° 45′ N.; 26° 10′ E.

GANDA SUNDI.—In the Mayombe Forest, near the Cabinda border. (4° 50′ S.; 12° 45′ E.)

GONGO YEMBE.—Lokoro River, near Lake Leopold II.

GUDIMA.—On River Ira about twelve miles S.E. of Vankerckhovenville. Approximately 3° 10′ N.; 29° 30′ E.

GURRA COUNTRY.—Below Djabbir on the Uelle, approximately 4° N.; 24° E.

INKONGO.—Lies on the upper Sankuru River about midway between Lusambo and the mouth of the Lubefu River. (5° S.; 23° 10′ E.)

KABARA.—On the saddle between Mts. Mikeno and Karisimbi, Kivu volcanoes at 11,000 feet.

KABARE.—Southeastern shore of Lake Edward.

KABULA MULIRO.—On the road about midway between Kampala and Hoima, Uganda; between Albert Nyanza and Victoria Nyanza.

KALAMHOLE.—Near Blukwa, west of Lake Albert.

KALIMBO.—On lower Rutshuru Plain. A small village just south of Kabare.

KAMAIEMBI.—A small village in the Kasai. Approximately 5° 40′ S.; 20° 50′ E.

KAMBARINBI.—Near Luebo. Dr. Schouteden collected here.

KAMPALA.—Fort Kampala, or Mengo, just north of Entebbe, Uganda, and near the northwestern edge of Victoria Nyanza.

KANDASHOMWA MOUNTAIN.—One of the high points (about 9900 feet) on the high ridge just west of the lower Ruzizi Valley.

KANDO RIVER.—An affluent of the Lualaba. (10° 50′ S.; 26° 10′ E.)

KARISIMBI MOUNTAIN.—Kivu volcanoes. (1° 30′ S.; 29° 25′ E.)

KARTOUSHI.—About 20 kilometers north of Beni between the Semliki and Zuma Rivers.

KASSALA.—On the Uelle, 20 miles above Bima. Approximately 3° 30′ N.; 25° 30′ E.

KEMO RIVER.—French Congo. Affluent of Ubangi River.

KIBATI.—Southeastern base of Mt. Niragongo, Kivu volcanoes.

KIDADA.—Near Kitobola. (5° 20′ S.; 14′ 40′ E.)

KIKONDA.—About twenty-five miles southeast of Hoima, Unyoro, Uganda.

KIMARA.—A dried-up marsh on the Semliki flats, about 10 miles S.W. of southern end of Lake Albert. Approximately 1° N.; 30° 25′ E.

KINABO.—Semliki Valley.

KINEMBO.—A small village in the vicinity of Beni.

KIRONKE.—West of Beni.

KISENYI.—Northeastern shore Lake Kivu, on the Congo–Ruanda border.

KISINGO.—About midway between Kampala and Hoima, Uganda.

KITCHEMURO (= KITSUMURO).—Ten kilometers south of Irumu, on the road to Boga.

KODJA HILL.—Gaima Range, near Vankerckhovenville. Upper Uelle District.

KOLOKA (or KOLOKA's).—Two days' march S. of Angu, Uelle District. Schubotz collection.

KOMI.—About 3° 30′ S.; 23° 30′ E., in Sankuru District, near Lodja. Ghesquière collection.

KOTELI (= KOTILI).—Lower Uelle. (2° 50′ N.; 24° 35′ E.)

KUBBI.—On the headwaters of the Gadda, between the Bomokandi and the Kibali, about 50 miles S.E. of Niangara, approximately 3° 10′ N.; 28° 30′ E.

KUNUNGU.—A village east of Bolobo. (2° 10′ S.; 16° 30′ E.)

LAMBARENE.—French Congo. (0° 40′ S.; 10° 15′ E.)

LIKANDI RIVER.—Flows into the Uelle from the south, near Bambili. Boyd Alexander collection.

LOBI.—One day's journey S. of Angu.

LUFUPA RIVER.—A large river of the Katanga, rising near Sakabinda on frontier and flowing into Lualaba River on its left.

LULENGA.—Northwest foot of Mt. Mikeno, Kivu volcanoes, 6000 feet elevation.

LUNDU.—4° 50′ S.; 13° E. Upper Mayombe.

LUOFU.—Southwest of Lake Edward. (0° 50′ S.; 29° 5′ E.)

MACACO.—Near Luebo, Kasai District.

MACOGA (= MAKOGA).

MAGOMBO.—About five miles east of Vankerckhovenville on Nzoro River. (Another Magombo is below Vankerckhovenville.)

MAKAIA NTETE.—Mayombe.

MAKOGA.—A small village and large fan-palm grove on the Semliki flats, about five miles E. of Semliki and about fifteen miles S.W. of S. end of Lake Albert. Approximately 1° N.; 30° 20′ E.

MALEK.—Congo-Nile water shed. Shaw collection.

MALISAWA.—(0° 50′ N.; 29° 50′ E.), within the forest.

MAMBAKA.—South of Avakubi, B.C. (1° 15′ N.; 27° 45′ E.) Another Mambaka is on the road between Stanleyville and Mawambi. (0° 50′ N.; 26° 50′ E.)

MAMBO.—Ituri District.

MANGBETU.—Also spelled Mangbuttu, Mombuttu, Mombattu, Mongbuttu, etc. The tribal district just S. of Niangara, Uelle District. A locality used by Emin.

MASAMBI.—Near Avakubi.

MASISI.—1° 25′ S.; 28° 30′ E. (N.W. of Lake Kivu.) Lt. Bonnevie collection.

MASONGO.—In the Semliki Valley. It is not certain to which of two localities Gyldenstolpe referred. The expedition map (Kungl. Svenska Vet. Handl., Bd. I, N:o 3) shows Musango ten kilometers west of Boga and Masidongo forty kilometers south of Beni.

MAUDA.—A village in the Uelle District, about halfway between Niangara and Doruma. (See map in Schouteden, H., 1936, Annales du Musée du Congo Belge, Zool. I, fasc. 2, p. 153.)

MAWAMBI.—Ituri.

MAYOMBE (= MAYUMBE).—Forested district north of Boma. Dr. Daniel collected there.

MBOGA.—Boga.

MBOGU.—On the upper Ituri, between Boga and Irumu.

MBULA.—Near Tshopo Falls, near Stanleyville.

MIKENO MOUNTAIN.—Kivu volcanoes.

MOERA.—Ten miles north of New Beni, altitude 3500 feet.

MOKOLA (= MAKALA).—South of Avakubi.

MOLEGBWE.—South of Uelle River and west of Banzyville.

MOMBATTU.—See Mangbetu.

MOMBUTTU.—See Mangbetu.

MONGBUTTU.—See Mangbetu.

MUHAVURA MOUNTAIN.—The easternmost peak of the Kivu Mountains. (1° 25′ S.; 29° 45′ E.)

MUSANGO.—A few miles west of Boga.

MUTANDA LAKE.—Uganda. (1° 15′ S.; 29° 45′ E.).

NDOLA.—Northern Rhodesia. (13° S.; 28° 40′ E.) Shortridge collection.

NGOMA.—Adjacent to Kisenyi on Lake Kivu.

OKA.—Upper Uelle. (3° 10′ N.; 30° 40′ E.) Schouteden collection.

PILI PILI.—On the road from Makala to Avakubi.

POPOIE.—Near Banalia, Aruwimi River.

RHINO CAMP.—West bank of the Nile, extreme southern Lado Enclave, at 2° 55′ N. Heller collection.

RUNGWE MOUNTAIN.—In Tangangika Territory, near the north end of Lake Nyasa. Boulton collection.

SABINYO MOUNTAIN.—Kivu volcanoes, Ruanda. (1° 25′ S.; 29° 35′ E.)

SELEMANI.—In forest south of Boga. (1° N.; 29° 50′ E.)

SIMBO.—40 km. west of Irumu. (1° 40′ N.; 29° 25′ E.)

TABARO.—Between Boga and Irumu. In savanna near the forest margin. (1° 20′ N.; 29° 50′ E.)

TCHIMBANGU.—Sixty miles W. of Inkongo. Wilson collection.

TEMVO.—In Mayombe. 5° 30′ S.; 16° 5′ E. Schouteden collection.

TINGASI (= MUNZA).—S.W. of Niangara, Uelle District. Village of the chief of the Mangbetu. (3° 20′ N.; 28° E.)

TSHOPO FALLS.—On lower Tshopo River, close to Stanleyville. Christy collection.

TSHUMBIRI (= CHUMBIRI).—A mission on the Congo River, between Bolobo and Kwamouth. 2° 30′ S.; 16° 15′ E.

UMANGI.—Near Lisala, at 2° 06′ 43″ N.; 21° 26′ 52″ E.

VIADANA.—On the Poko River, about 30 miles S.E. of Poko, 35 miles N.NW. of Medje. Approximately 2° 50′ N.; 27° 10′ E.

WADELAI.—East bank of Bahr-el-Jebel. (2° 45′ N.; 31° 35′ E.)

WASA RIVER.—Flows from the escarpment north of Fort Portal through the Semliki Valley north to Lake Albert. Specimens referred to were collected by the deWalden Expedition at the foot of the eastern wall of the valley, about ten miles north of Fort Portal at approximately 0° 50′ N.; 30° 20′ E. Another river of the same name flows into the Semliki from the Congo hills on the west side of the valley.

WELLE (= UELLE.)

ZAMBO.—Between Beni and Mawambi. Christy collection.

MUSCARDINIDAE

CLAVIGLIS JENTINK

Tree Dormice

Claviglis JENTINK, 1888, Notes Leyden Museum, X, parts I–II, Note I, pp. 41–42, April 1, 1888. Type species: *Claviglis crassicaudatus* Jentink.

1936. *Claviglis*, ALLEN. Jour. Mammalogy, XVII, No. 3, p. 292.

Claviglis, the only genus of the Gliridae represented in the Belgian Congo, is in this territory known by at least six forms: *christyi*, *lorraineus*, *microtis*, *saturatus*, *soleatus* and *vulcanicus*. Of these, all but *soleatus* are represented in American Museum collections, but only the first two named were secured by the Congo Expedition.

Claviglis christyi (Dollman)

Christy's Dormouse

Figures 2, 3B

Graphiurus christyi DOLLMAN, 1914, Rev. Zool. Afric., IV, fasc. 1, p. 80. Type locality: Mambaka, Congo. Type specimen:[1] ♂, B.M. 14. 2. 11. 8.

1915. *Graphiurus christyi*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 474. Two from Medje, one from Poko, collected by Christy.

CONGO EXPEDITION SPECIMENS

The species is represented by 33 specimens, of which thirty are skins with skulls, and three specimens in alcohol. They were taken as follows:

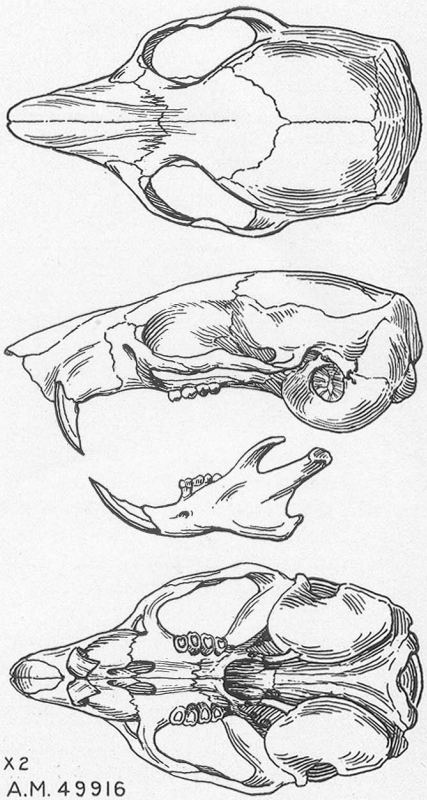


Fig. 2. *Claviglis christyi*. Adult male. Medje.

Avakubi, 1 (immature ♀), November 29.

Medje, 29 (11 adult ♂, 11 adult ♀, juvenile ♂, 5 juvenile ♀, adult sex?), January 21, 22, 23, 24, 25; April 10, 17; May 2; June 9, 14, 15, 22; September 4, 10.

[1] Eight specimens in the Congo Museum are labelled "Type," but should instead be marked Paratypes. In the original description no type was named but one of the series, original number 444, was considered "typical" and measurements of this specimen only were given. That specimen is No. 14. 2. 11. 8 in the British Museum collections where it is marked "Type" and should be so considered.

Niangara, 1 (adult ♀), December 7.
Stanleyville, 1 (adult), ♀ January.
No data, 1 (adult).

DISCUSSION.—In the original description *C. christyi* was compared with *C. spurreli* of the Gold Coast, which, in turn, in its original description had been compared with *C. lorraineus* of the Congo. An examination of the types and other material in the British Museum did not convince me that *spurreli* was genetically nearer one of the Congo species than the other. In fact, in almost all characters which I could discern, *spurreli* was intermediate between the two. I cannot, however, follow this to the seemingly logical conclusion of making *christyi* a subspecies of *lorraineus*, for the two nominal species are too strikingly different and sometimes occur together in the same locality, where I, without first-hand knowledge of these areas, would not expect ecological separation. For this reason I retain *christyi* as nominally a full species.

MEASUREMENTS.—The type skull, though complete, is damaged to the extent that the occipital and basal regions are broken free from the other parts. Hence the overall measurements which I took, and possibly those taken by the describer, may be slightly erroneous.

EAR.—The ear of *Claviglis christyi* is much nearer circular than in its smaller compatriot, *C. lorraineus*, in which species the ear is relatively long and narrow. The two, as drawn from alcoholics, contrast as shown in figure 3.

DISTRIBUTION IN THE CONGO.—Definitely known only from the forests of the northeastern and central eastern Congo. I have examined specimens from Avakubi, Mambaka, Medje, Niangara, Poko, Mambo, Beni-Cartoushi, Selemani and Masisi. One dormouse in the British Museum (13. 4. 7. 2), from Inkongo, a skin with a crushed skull, is possibly this, though the locality casts doubt on the association.

HABITS.—The specimen taken at Avakubi in November, a young female, was secured by cutting down a tree in the forest. A female and two young, with eyes unopened, were taken from a nest in a hollow tree, near Medje, January 22. On June 22, at Medje, five of these dormice were found in a hollow tree, in which there was no nest. One of these escaped. Of the four secured, two were adult males, two adult females.

The stomach contents of four *C. christyi* taken January 23 were noted by the collector as "a whitish or somewhat greenish paste-like vegetable matter."

BREEDING AND YOUNG.—Mr. Lang noted of one female that it had one pair of thoracic and two pairs of abdominal mammae. On two others he found two pairs of thoracic and two pairs of abdominal mammae.

Three embryos were observed in a female taken January 21. Two young, with eyes unopened (the measurements of one were: total length, 86 mm.; tail length, 38; foot, 14), were secured from one nest January 22. Two slightly larger young (measurements of one: total length, 104; tail length, 43; foot, 14), probably litter mates, were taken from a nest September 4. Two others (measurements of one: total length, 130; tail length, 63; foot, 17), which also are presumably litter mates, were taken September 10. It thus appears that there are normally two or three young. Probably breeding is not restricted to one time of the year.

In two young animals removed from a nest on January 22, at Medje, the belly hairs are completely white. These specimens measure 86 mm. in total length and the collector noted that their eyes were as yet unopened.

Claviglis lorraineus (Dollman)

Lorrain's Dormouse

Kashilukui: Kasai (Callewaert labels)

Plate VII, figure 1; Figure 3A

Graphiurus lorraineus DOLLMAN, 1910, Ann. Mag. Nat. Hist., (8) V, p. 285. Type locality: "Molegbwe, south of the Setema Rapids, Welle River, Congo." This is about 20 miles west of Banzyville. Type specimen: ♀, B.M. 7. 7. 8. 115.

1896. *Myoxus* (*Eliomys*) *murinus*, POUSARGUES. Ann. Sci. Nat., (8) III, p. 367. Reported from Ouadda and Kemo, on the Ubangi.

1915. *Graphiurus lorraineus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 474. Two specimens from Poko, in the Christy collection.

1920. *Graphiurus lorraineus*, SCHWARZ. Friedrich's "Ergebn. Zweit. Deutsch. Zentr. Afr. Exp. 1910–1911," I, Zool. Lief. 15, p. 1081. Specimens were obtained by Schubotz, at Koloka.

CONGO EXPEDITION SPECIMENS

There are fourteen skins with skulls and three specimens in alcohol, collected as follows:

Bafwabaka, 3 (2 adult ♂, adult ♀), January 3, 9; December 29.

Faradje, 3 (2 adult ♀, juvenile ♂), March 19; November 18.

Medje, 3 (adult ♂, 2 adult ♀), April 10; August 19; September 29.

Niangara, 7 (3 adult ♂, 4 adult ♀), January 2; November 25; December 1, 6.

Vankerckhovenville, 1 (adult ♀), April 17.

This is a small dormouse presenting a wide range of color variation, but usually brilliantly buff above. The eye ring is weak or absent, and the cheeks are not whitish as they are in "*microtis*." The tail is rather bushy, much more so than in *christyi* or *soleatus*, and does not have a white tip except in some cases of hairy overgrowth following loss of the original tail tip. The fur is shorter than in other dormice of the eastern Congo. The ear is comparatively narrow as shown in figure 3A. The skull of *C. lorraineus* is short and rather stoutly built. Adult *C. lorraineus* attain a maximum total length of about 160 mm., of which as much as 93 mm. is head and body. The average foot length in fully grown specimens is about 17 mm. The skull attains a maximum length of about 25 mm.

RELATIONSHIPS.—As most of the genera of African rodents, *Claviglis* is in need of a reviser, but this genus presents some of the greatest problems of all and I do not pretend that my present views of the interrelationships of various species would be sustained by a more comprehensive review of the genus than I have been able to make. *Claviglis lorraineus* bears striking resemblance to two other nominal species, *C. haedulus* of the Cameroon and *C. spurreli* of the Gold Coast, which I believe to be but subspecies of the earlier described Congo form.

GEOGRAPHIC VARIATION.—The Ituri representative of *Claviglis lorraineus* is not typical of the race, for it does not attain the size of the type. Specimens secured at Lukolela and now in the American Museum are large, in fact larger than the type in some dimensions. Others from the Kasai (Luluabourg) are also large, and probably average grayer, for I have seen but one reddish specimen from this district, numerous others being typically gray.

DISTRIBUTION.—Specimens which I believe to be correctly referred to *C. lorraineus* are known from various localities near the border of the Ituri Forest (Niangara, Medje, Bafwabaka); at Vankerckhovenville and Faradje, both well outside the Congo Forest, but in an area of scattered gallery forest; at Molegbwe (the type locality), which is also near the forest limits; Lukolela; along the Lukenie River, which parallels the southern forest border; and at Inkongo and Luluabourg, in which localities are represented both the savanna fauna and the forest fauna.

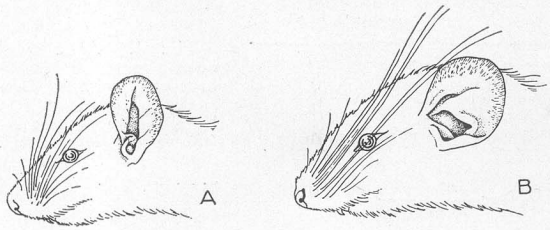


Fig. 3. Ear shapes of Congo dormice. Natural size. A, *Claviglis lorraineus*. A.M.N.H. No. 50373. B, *Claviglis christyi*. A.M.N.H. No. 50375.

The only information which I have on the habitat preferences of *Claviglis lorraineus* is that in the Ituri, Lang noted that the natives secured specimens in the banana plantations; at Vankerckhovenville the specimens secured were from a swallow's nest on a hill on which there was virtually no tree growth; at Inkongo, Wilson obtained a specimen from the thatch of a native hut, and at Luluabourg, Father Callewaert noted many specimens as "en

maison." One secured by Mr. Edson at Lukolela was taken on the doorstep of a house. At the other localities represented, gallery forest, second growth forest and clearings are present. In view of this known distribution and the few habitat records, one could postulate that this species favors the narrow tongues of forest and second growth, but it is equally possible that the absence of specimens from the central Congo Forest is due to the circumstance that all extensive collections of Congo mammals come from these peripheral zones where climatic conditions are less distressing to the collector. I favor the former view, however, because the notes on the habitats of this species and on *C. christyi* bolster the theory that the former avoids old forest and the latter favors it.

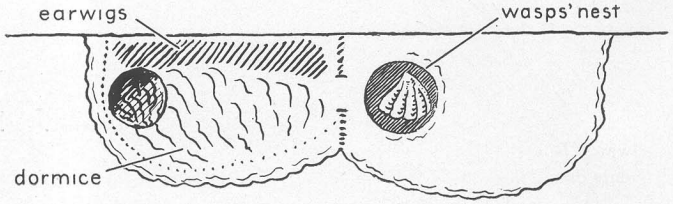


Fig. 4. Abandoned double nest of streak-breasted swallow (*Hirundo puella*) occupied by a family of dormice (*Claviglis lorraineus*). See text. Sketch by J. P. Chapin.

HABITS.—Mr. Lang wrote of an adult male (A.M.N.H. No. 49889, figured alive in Plate VII, fig. 1) which he had captive, that it was a very lively animal that characteristically moved its tail up and down with the hairs spread wide, and when excited made a loud chattering noise, a "gak—gak" repeated four or five times in succession. That these dormice are courageous animals is indicated by Lang's observation that they "bite furiously and do not loosen their grip when they get a bite on the finger."

Frugivorous diet is suggested by a note that at Bafwabaka the natives unanimously averred that the dormice are caught in banana plantations where these rodents went for the fruit.

Insectivorous diet is in part indicated by a note made by Dr. Chapin, April 13, at Vankerckhovenville, on one of our specimens (A.M.N.H. No. 49885). This skin has the lips, chin, mystaceal area and chest deeply stained a dark mahogany color, a soiling encountered in dormice from widespread areas[1] and in all months of the year. The nest from which this specimen was taken was overlain by a layer of several hundred earwigs, light brown in color, and which gave the alcohol in which specimens were preserved, a deep reddish color similar to that of the stained fur of the dormouse.

These dormice are ideally adapted to tree life. Lang recorded that they can adhere to or climb upward on a nearly smooth surface, and that "one has actually to tear them off." Chapin in writing of the nest described below, observed that the mice, to get to the ground below the nest or the rocks above, had to crawl for about two feet upside down on a nearly horizontal, and but slightly roughened stone surface.

The usual nesting site of this dormouse is probably a hollow tree, but Fitzsimons' record of a nest of *Claviglis murinus* in a bee-hive[2] finds a parallel in the Congo. Chapin recorded the instance in notes made at Vankerckhovenville, April 13, in the following words:

"One old double [swallow's] nest was especially interesting by reason of its strange occupants. It was attached to the undersurface of a rock, a little rough, it is true, but nearly horizontal. Both compartments [Fig. 4] were provided with round entrances but they were also connected within by a small aperture. A fe-

[1] I have seen similar staining on skins of various species of *Claviglis* as follows: *C.* sp., Kaffaria; Angoniland; *C. murinus*, Cape of Good Hope; *C. griselda*, Kuruman; *C. woosnami*, Stampriet, SW. A.; *C. microtis saturatus*, Rutshuru; Mt. Elgon; *C. orobinus*, Darfur; *C. lorraineus*, Inkongo, B.C.; *C. spurreli*, Sierra Leone; S. Nigeria, and also in *Graphiurus occularis*, Namaqualand.

[2] Fitzsimons, F. W., 1920, "Natural History of South Africa," IV, pp. 69–70.

male dormouse had taken possession of the left-hand nest and stuffed it with dry vegetable material, and was now living there with her three well-grown young. But the outer entrance of her side was closed by the nesting material, the dormice evidently passing in and out through the right-hand chamber, where their way was almost barred by a nest of a large species of paper-wasp. Still more remarkable, the space between the top of the dormouse nest and their stone ceiling was crammed with several hundred earwigs, light brown in color and bearing pincers—very long in some individuals—on their caudal extremities."

Heller found specimens of *C. p. dollmani* in mud nests of swallows on the underside of a large rock in the roof of a cave (Hollister, 1919, U. S. Nat. Mus. Bull. 99, Part 2, p. 154). Other instances of *Claviglis* nesting in the nests of weaver birds, hammer-headed stork, and even in the nests of social spiders, are compiled by Shortridge (1934, I, p. 221). He also relates that the South African species habitually live in outside nests, constructed by themselves or by birds among the branches of small trees and bushes.

There is no indication of an annual period of inactivity in these equatorial dormice, though at least one South African member of the genus undergoes hibernation.

A nest from the roof of a house at Lusambo was obtained by Rev. Wilson. The species in this instance was reported as *C. microtus* (Schouteden, 1934, Rev. Zool. Bot. Afric., XXIV, pp. 87–88).

BREEDING AND YOUNG.—One specimen was noted by Mr. Lang to have two pairs of pectoral and one pair of abdominal mammae. Young were in the nest in a swallow nest, April 13. Two half-grown young in the collection are dated January 2 and November 18.

CRICETIDAE

Otomyinae

OTOMYS F. CUVIER

Groove-toothed Rats; Swamp Rats

Otomys F. CUVIER, 1823, "Dents des Mammifères," pp. 168–169, 255, Pl. LX. Type species, by subsequent designation (W. L. Sclater, 1899, Ann. S. Afr. Mus., I, part 2, pp. 195–198): *Mus irroratus* Lichtenstein.

1906. *Otomys*, WROUGHTON. Ann. Mag. Nat. Hist., (7) XVIII, p. 264. Revision of the genus.

1915. *Otomys*, DOLLMAN. Ann. Mag. Nat. Hist., (8) XV, pp. 149–170. Key to species and subspecies.

1918. *Otomys*, THOMAS. Ann. Mag. Nat. Hist., (9) II, pp. 203–211. Revised classification of the subfamily.

Otomys occurs through East Africa from Cape Colony to Abyssinia and is found westward to the central Angolan plateau, the Katanga and the eastern Congo. The genus is not represented in the West African forest area except on Cameroon Mountain where a single species occurs. Within the Belgian Congo *Otomys* is represented by four species or six subspecies. Of these *O. denti* is confined to the bamboo and mountain forest zone of Mt. Ruwenzori (altitude 6000–10,000 feet). *O. kempi* is similarly restricted to the Kivu volcanoes (6000–11,000 feet).[1] *O. dartmouthi* in its typical form is confined to the senecio zone of Mt. Ruwenzori (12,000–14,000 feet) though it is apparently represented by what may be an undescribed subspecies at lower altitudes. I have referred to this name specimens from Luofu (near Lake Edward) (M.C.B.), Kasindi (M.C.B.), Kandashomwa Mountain, west of the Ruzizi River (A.M.N.H.) and the Marungu Mountains (A.M.N.H.). The wide-spread *O. tropicalis* is divisible within the Congo into three subspecies.[2] Of these three *O. tropicalis elgonis* occurs on Ruwenzori, where in the Butahu Valley (6930–7130 feet) Dr. Chapin found it abundant. It is also found at New Beni (A.M.N.H.), Tabaro (N.R.S.), Irumu (M.C.B.; N.R.S.), Djugu (M.C.B.) and at Kasindi Landing (A.M.N.H.) on Lake Edward. *O. t. vulcanicus* is found on the Kivu volcanoes (9600 feet). *O. t. faradjius*, the only *Otomys* secured by the Congo Expedition, is known only from Faradje, though pre-

[1] I might here note my conviction that *O. denti*, *O. kempi* and *O. anchietae lacustris* would certainly be considered one species by devotees of the formenkreise attitude.

[2] Six specimens from Kando, Katanga, in the collections of the Musée du Congo Belge are probably a race of *tropicalis*, but I hesitate to name them without further study.

sumably some form of *O. tropicalis* occurs in the intervening unforested fringe of the Congo between Faradje and Irumu.

The classification of the genus has been largely based on (1) the grooving of incisors, (2) arching of the skull, (3) notching of the nasals, (4) width of nasals and (5) number of laminae in the molars. I am not prepared to name less variable and more reliable characters but I do feel it important to observe that (1) the close similarity of *O. dartmouthi* and *O. thomasi*, except in the matter of the depth of the inner groove of the lower incisors, clearly indicates that the distinction of Dollman's groups B and C is strikingly artificial; (2) skulls of young *Otomys* are always more arched than are those of older individuals, and that young *tropicalis* skulls are not unlike older *thomasi* skulls in profile, and of many races it is difficult to say that the profile is flat or arched; (3) the notching of the nasals is a very useful character though subject to wide individual variation; (4) the width of nasals is usable only in very old individuals, for species characterized as broad nasaled are often represented by adult skulls with nasals measuring less than the arbitrary 8 mm. limit; (5) the number of laminae in M^3 varies in any large series of specimens by one unit. The last lamina characteristic of a species is small and frequently is altogether lacking.

Otomys tropicalis faradjius Hatt

Uelle Savanna Rat

Short Tailed Meadow Mouse (Lang)

Figure 5

Otomys tropicalis faradjius Hatt, 1934, Amer. Mus. Novitates, No. 708, p. 1. Type locality: "Faradje, Upper Uelle District, Belgian Congo." Type specimen: adult ♂, A.M.N.H. 50357.

Congo Expedition Specimens

There are ten skins with skulls and three specimens in alcohol as follows:

Faradje, 13 (6 adult ♂, 3 adult ♀, 3 juvenile ♂, 1 juvenile ♀), February 20, 21; March 5, 25, 26, 27, 30; April 1, 2, 15.

Breeding and Feeding.—Mr. Lang's sole note concerning this species, other than calling it a "meadow mouse," was that one female (taken March 5, A.M.N.H. 50354), had two pairs of abdominal mammae, contained two small embryos in the right uterus and had dark green vegetable matter in the stomach. Since there were only two other females in the series (taken March 26 and 27) one cannot do more than state that the usual number of young does not exceed four and that young may be born in March or April.

Gerbillinae

Taterillus Thomas

Band-footed Gerbils

Taterillus Thomas, 1910, Ann. Mag. Nat. Hist., (8) VI, p. 222. Type species: *Gerbillus emini* Thomas.

1906. *Tatera*, Wroughton (part), Ann. Mag. Nat. Hist., (7) XVII, pp. 474–499.

The genus occurs from Somaliland across the Sudan to northern Nigeria. Southward it is known in Kenya Colony, and the northern Congo. Everywhere it probably occurs in savanna or grassland. *Taterillus emini congicus* is the only form known to inhabit the Congo, and in that territory it is limited to the savanna of the northeast, though occasionally found in open areas (including the type locality) within the forest border.

Taterillus emini congicus Thomas

Uelle Gerbil

Sakade: Azande (Kershaw)

Plate VII, figure 2; Figure 6

Taterillus congicus Thomas, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 147. Type locality: "Poko," Upper Uelle, Congo. Type specimen: adult ♂, B.M. 19. 5. 8. 81.

1896. *Gerbillus emini*, Pousargues. Ann. Sci. Nat., III, p. 373. Four specimens collected by Dybowski at "Poste de la Mission sur la rivière Kemo" (French Congo) are probably of the subspecies *congicus*.

1915. *Taterillus congicus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 474. The above series relisted.

1924. *Taterillus congicus*, Kershaw. Ann. Mag. Nat. Hist., (9) XIII, p. 23. Specimens from Bafuka, Upper Uelle, collected by Shaw.

Congo Expedition Specimens

The collection contains fifty-four specimens of which nine are in alcohol. They were collected as follows:

Faradje, 34 (12 adult ♂, 17 adult ♀, 2 juvenile ♂, 3 juvenile ♀), February 17, 18, 19, 20, 22, 23, 24, 26, 28; March 1, 3, 11, 15, 16, 18, 23; April 1, 5, 8, 10.

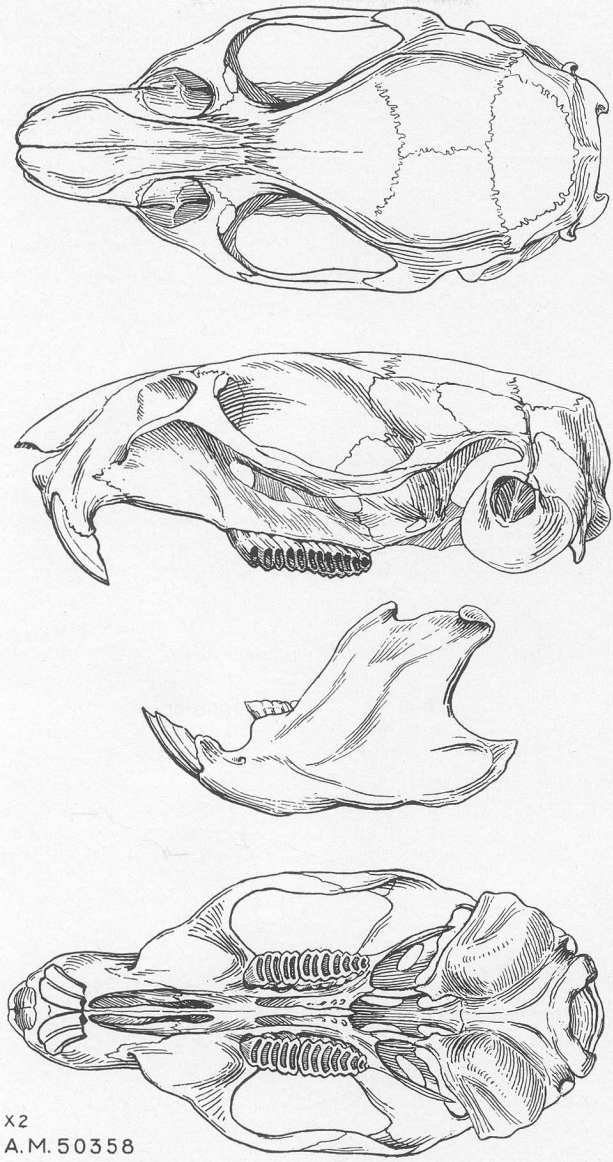


Fig. 5. *Otomys tropicalis faradjius.* Adult male. Faradje.

Garamba, 2 (adult ♂, juvenile ♂), March 15; May 12.

Niangara, 18 (8 adult ♂, 2 adult ♀, 6 juvenile ♂, 2 juvenile ♀), November 9, 18, 20, 26, 29; December 2, 5, 6, 7, 31.

Distribution in the Congo.—This gerbil is known from the following localities, all in the northeastern section of the colony: Poko (B.M.; M.C.B.); Niangara (A.M.-N.H.); Bafuka (B.M.); Faradje (A.M.-N.H.; M.C.B.); Garamba (A.M.N.H.).

A specimen (skin only) from Kabalo,

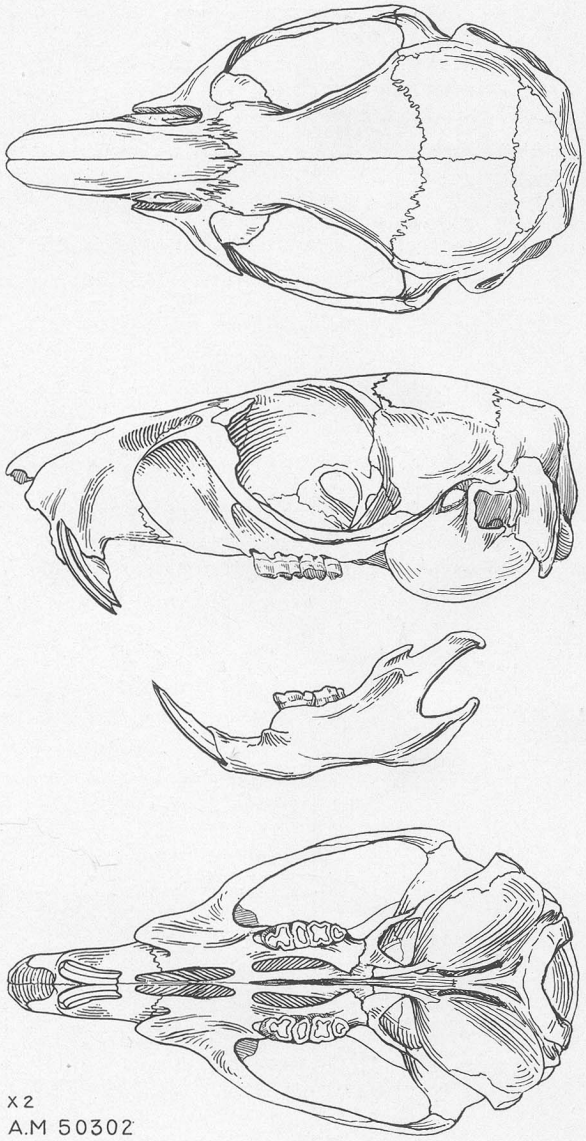


Fig. 6. *Taterillus emini congicus*. Adult female. Faradje.

Lualaba R., collected by Dr. Schouteden, and now in the Congo Museum, bears striking resemblance to this gerbil and I am unable to associate it with any other known form.

The Nile appears to be the boundary separating *T. e. emini* and *T. e. congicus* for the first is described from Wadelai, and the other occurs as far east as Garamba. It may be predicted that it will some time be proved that there is complete intergradation between *T. e. congicus* and *T. e. butleri* of the Bahr-el-Ghazal, the line of separation perhaps lying along the line of the Congo-Nile watershed. One may also associate in this group, as subspecies of *T.*

emini, the large dark race *clivosis* of Jebel Marra, Darfur, and the small pallid form of the Lake Chad District, *lacustris*, and *anthonyi* of the Anglo-Egyptian Sudan.

BREEDING.—Two females were noted as possessing 2 pairs of pectoral mammae, and 2 pairs of abdominal. At Niangara, November 18, three young were taken together and under date of December 2, is the note concerning a female, "There were four young, all still blind." These were preserved, and one of them measures: total length, 126; tail length, 60; hind foot, 25; ear, 10.

FEEDING.—February 19, the stomach of a male was noted as containing green and gray vegetable matter. The stomach of a female accompanied by four young, collected December 2, contained a few ants and well-ground-up vegetable matter.

LOCOMOTION.—Mr. Lang in his field catalogue, called this species "jumping rat." It is not known whether these animals are capable of ricochetal progression but it is thought that they are probably not so adapted.

TATERA LATASTE

Tatera LATASTE, 1882, Le Naturaliste, IV, p. 126. Type species: *Gerbillus indicus* Hardwicke.

1906. *Tatera*, WROUGHTON (part). Ann. Mag. Nat. Hist., (7) XVII, pp. 474–499.

1936. *Tatera*, OSGOOD. Field Museum Natural History, Zool. Ser., XX, No. 21, p. 231.

I am completely in accord with Hollister in considering the African gerbils for which Wroughton erected the genus *Taterona* congeneric with the Asiatic gerbils of the genus *Tatera*.

The genus *Tatera* within the Congo is limited in its distribution to the unforested area. The species known from the Congo are:

T. valida (Bocage). Occurring in the Kasai and Katanga, thence southward into Angola.

T. liodon Thomas. Found in the basins of the Lufira and Luapula Rivers, Katanga.

T. ndolae (Kershaw). Its range overlapping that of *T. liodon*, though not known so far to the north and also collected farther to the south than that species.

T. böhmi böhmi (Noack). Congo records are in the Marungu Mountains, and on the southwestern shore of Lake Tanganyika.

T. ruwenzorii Thomas and Wroughton. Known only from the plains around the south end of Ruwenzori.

T. nigrita beniensis Hatt. Occurrences are known at Beni and Boga.

T. benvenuta lucia (Hinton and Kershaw). Distributed along the lower Semliki Valley to Lake Edward, and at Kodja Hill in the Gaima Range, near Vankerckhovenville.

T. dichrura Thomas, whose distribution as known is more specifically stated below, inhabits the grassland of the Upper Uelle, where its known range coincides rather closely with that of another gerbil, *Taterillus congicus*.

T. neavei Wroughton is known only from Ndola, Northern Rhodesia, but in all probability crosses the nearby Congo border.

T. nyasae Wroughton is reported along the Bunkeya and Lufupa Rivers of the Katanga (Dollman, 1909, Ann. Mag. Nat. Hist., (8) III, p. 352).

Tatera dichrura Thomas

Fota: Tingasi (Emin label)

Plate VIII, figures 1 and 2; Figure 7

Tatera dichrura THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 147. Type locality: "Poko," Upper Uelle District, Congo. Type specimen: ♂, B.M. 19. 5. 8. 77.

1915. *Tatera dichrura*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 474. A series including the type, relisted.

CONGO EXPEDITION SPECIMENS

There are forty-eight skins with skulls and one specimen in alcohol, collected as follows:

Faradje, 8 (2 adult ♂, 4 adult ♀, juvenile ♂, juvenile ♀), February 21, 22; March 19, 29, 31.

Garamba, 3 (2 adult ♂, adult ♀), May 13.

Niangara, 38 (10 adult ♂, 10 adult ♀, 5 juvenile ♂, 13 juvenile ♀), November 14, 15, 16, 23, 26, 29, 30; December 2, 5, 6, 7, 11, 12, 15, 17, 18, 26.

The nearest relatives of *T. dichrura* are *T. ruwenzorii* and *T. liodon*. It is possible that the ranges of the first two will sometimes be found contiguous.

The range of *T. benvenuta lucia* abuts or overlaps that of *T. dichrura*, for the former has been taken (by the Gosling Expedition, specimen in B.M.) at Kodja Hill, Gaima Range. *T. b. lucia* need not however be confused with *T. dichrura*, for in the latter the flanks are much redder, and the outer-hairing of the ears and the dorsum of the tail, brownish instead of blackish. Cra-

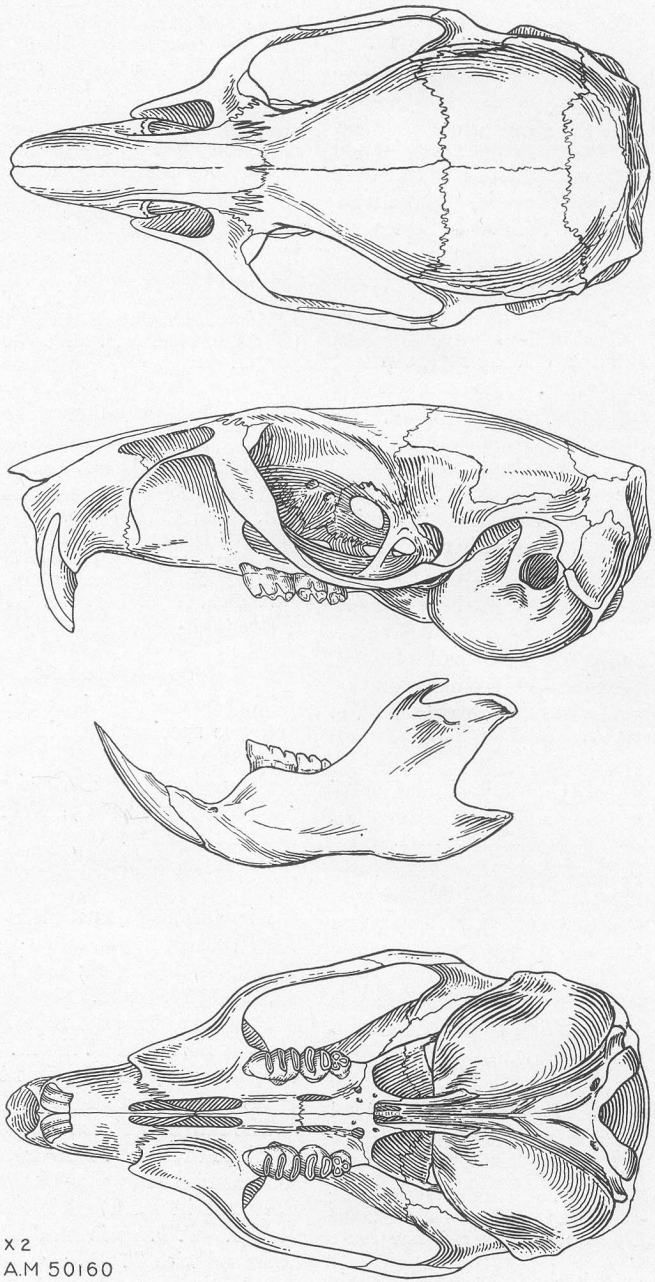


Fig. 7. *Tatera dichrura.* Adult male. Niangara.

nially they are very distinct. The anterior palatal foramina in *T. dichrura* extend between the roots of M^1, whereas in the other gerbil they do not. The posterior palatal foramina, to the contrary, are shorter in *T. dichrura*, 1.3–2.8 mm., longer in *T. b. lucia*, 2.4–2.6. The grooves of the incisors of *T. dichrura* are very faint, those of *T. b. lucia* fairly well marked.

DISTRIBUTION IN THE CONGO.—Described from Poko, where Christy obtained a large series, it was found by the Congo Expedition at three points in the savanna, Niangara, Faradje and Garamba. Emin obtained specimens at Gadda and Tingasi (B.M.). In the Congo Museum are specimens collected by Dr. Schouteden at Adra, Faradje, Koteli, Mahagi-Post and Mauda.

APPEARANCE.—The external appearance of the animal in the flesh may be judged by the photographs here reproduced (Plate VIII, figs. 1 and 2) and Mr. Lang's description of a subadult male: "Iris dark brown, nose grayish, mouth whitish, outersides and edge of the innersides of ear, dark gray, rest of innerside pinkish. Feet white. Pad of fore limbs pinkish; pad of hind limbs darkish excepting the pinkish underside of toes. Claws dark, excepting the grayish base and tips. Tail above dark gray, below grayish white."

LOCOMOTION.—Mr. Lang, in his field catalogue, occasionally referred to these animals as "jumping mice." There is no indication, however, that he ever observed them in the process of leaping. Their proportions are not those of a saltatorial animal and I can scarcely credit them with being such.

FOOD.—The stomach of a subadult secured at Niangara, December 19, contained, in the words of the collector, "remains of insects and, mostly, whitish vegetable matter well chewed up."

BREEDING.—The mammary formula for this species, as attested by Mr. Lang's notes on four specimens, is pectoral 2 pairs, abdominal 2 pairs = 8. With one female four young were taken, with another, six.

The length of the breeding season—if there is any period of the year showing reduction of the breeding activity—cannot be estimated on the basis of the Congo collection, for all specimens received were taken in five months: February, March, May, November and December. Young specimens were secured in March, November and December. Collectors' measurements of the juvenile animals secured show that, from the middle of November to the end of December, young in almost any stage of growth may be found.

The smallest juvenile secured (December 26) measured: head and body, 68; tail, 51; foot, 21; ear, 8. This animal is fully haired, though the hairs are very short, and shows the adult pattern and coloration. To judge from the study skin, the eyes were not yet open. The mammae (it is a female) are clearly discernible. Other young, up to 80 mm. head and body length, also seem to have the eyes closed.

This species, when about two-thirds grown, shows a slaty gray suffusion over the dorsal area quite lost in adults.

Six young, with eyes unopened, obtained at Faradje, March 31, were taken from a nest which, according to the natives, was in the ground. Mr. Lang observed that, "the young would still cling to the mother though it was well decomposed, each young holding a mamma in its mouth."

Dendromurinae

DENDROMUS A. SMITH

Banana Mice

Dendromus A. SMITH, 1829, Zool. Journal, IV, pp. 438–439. Type, by monotypy: *Dendromus typus* Smith (= *Mus mesomelas* Brants).

1916. *Dendromus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 237. Subgenera defined.

The Congo harbors a number of forms of banana mice, of which I have examined specimens of the following:

Dendromus acraeus lineatus Heller. Type locality: Rhino Camp, Lado Enclave.

Dendromus ruddi Wroughton. Type locality: Malikisi, Mt. Elgon, 5000 feet.

Dendromus haymani Hatt. Type locality: Mboga, eastern Belgian Congo.

Dendromus messorius Thomas. Type locality: Efulan, Bulu Country, Cameroons.

Dendromus whytei Wroughton. Type locality: Fort Hill, Nyasa.

Dendromus pecilei Milne-Edwards. Type locality: Lower Congo to Ogowe River.

Dendromus spectabilis Heller. Type locality: Rhino Camp, Lado Enclave.

Dendromus insignis insignis Thomas. Type locality: Nandi, Kenya Colony, 2000 meters.

Dendromus insignis kivu Thomas. Type locality: Buhamba, 2000 meters, Kivu Region.

But two of these were secured by the Congo Expedition: the widespread forest form *D. messorius* (of which *D. whytei* appears to be a southern representative), and *D. a. lineatus*, the range of which extends from the Lado Enclave down to the border of the Congo Forest in the Kibali River district, and in the narrow strip of similar country lying between the Semliki River and the eastern border of the Ituri Forest.

At several localities two species of these small tree mice are known, and at one, Mboga, if my diagnosis is correct, three occur in close proximity, if not in fact sharing the same banana plantations. These three are *D. a. lineatus*, *D. ruddi* and *D. haymani*. In the original account of *D. haymani* (1934, Amer. Museum Novitates, No. 708, p. 13) I hazarded the guess that although the type locality was in grass country it was also near the forest, and that possibly there was distinct ecological assortment of these species. Since the appearance of that publication, however, Mr. R. W. Hayman, collector of the six *D. a. lineatus*, two *D. ruddi* and single *D. haymani* noted in my report, has informed me that: "Although Mboga is only a few miles from the meeting place of savanna and rain forest, there is little possibility of any of the *Dendromus* collected at that locality having been taken in different environments. All were brought in to the village on one day at short intervals, having been taken by native children in the banana shambas immediately surrounding the village. They all came in quite fresh and warm and had obviously not come from far away."

Dendromus messorius Thomas

Banana Mouse (Christy)

Plate VIII, figure 1; Plate IX, figure 1

Dendromus messorius Thomas, 1903, Ann. Mag. Nat. Hist., (7) XII, p. 340. Type locality: "Efulan, Bulu Country, Cameroons, altitude 500 m." Type: adult ♀, B.M. 3. 2. 4. 24.

1909. *Dendromus messorius*, Wroughton. Ann. Mag. Nat. Hist., (8) III, p. 248.

1915. *Dendromus messorius*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 474. Specimens in the Christy collection are listed from Medje, Viadana and Poko.

1920. *Dendromus messorius*, Schwarz. Friedrich's "Ergebn. Zweit. Deutsch. Zentr. Afr. Exp. 1910–1911," I, Zool. Lief. 15, pp. 1083–1084. A specimen was obtained by Schubotz at Duma.

Congo Expedition Specimens

Represented by thirty-eight specimens of which thirty are skins with skulls, two skins only, one skull only and five in alcohol. They were taken as follows:

Bafwabaka, 6 (3 adult ♂, 2 adult ♀, juvenile ♀), December 29, 31; January 2, 21.

Gamangui, 2 (adult ♂, adult ♀), February 28.

Medje, 23 (9 adult ♂, 11 adult ♀, 2 juvenile ♂, juvenile ♀), January 16, 17, 18, 20, 21, 22, 24; April 4; August 4, 5, 23, 31; September 4, 15.

Nala, 1 (adult, sex ?), July.

Niangara, 6 (2 adult ♂, 4 adult ♀), November 21, 22, 30; December 2, 6, 12.

Feet.—The fore feet are not only notable for the reduction of digits, but also for the palmar pad against which the three toes close. It is doubtless of great assistance in climbing tall grasses and creepers.

The fifth toe of the pes can be abducted to a right angle to the axis of the foot and can also be adducted to a line parallel with the long axis.

Habitat.—These mice in the Congo are usually secured in native gardens (shambas) and as their nests are commonly in banana plants, it is fitting to call them "banana mice."

At Medje, Mr. Lang noted that they were rather common near the ground in plantations, among sweet potatoes, and further described nests found in bananas. At Niangara it was noted that their nests were usually placed in bananas.

Nests.—Several nests were observed by Mr. Lang, in plantations at Medje. Of one of these he noted that "the nest was inserted between the bases of banana leaves, close to the stem, about eight feet from the ground. The nest was hardly visible being well concealed between the large bases of the closely growing banana leaves. Sliced up dry banana leaves were

the only material used outside. On the underside larger pieces were utilized, but inside the leaves were so finely split that the material looked like fine grass." This was the nest of a female with three young. "Another nest was found in exactly the same position, its only inhabitant, a male, was in its nest at about 10:00 A.M. The nest of the female was somewhat larger than a man's fist, the nest of the male considerably smaller. Both were built of the same material, somewhat roundish in general form, only slightly flattened, covered above. There was but one entrance placed toward the stem of the banana plant." A third nest, occupied by a male, was opened the following day. It was described as being "the same, but smaller, just room enough inside for its inhabitant."

Food.—Vegetable matter was recorded as present in two stomachs.

Reproduction.—The mammary formula as determined on three specimens is 2–2 = 8. Of the thoracic group one pair is somewhat in front of the fore limbs, one slightly in back of them.

Three fetuses were noted in a female taken at Medje, April 4. Four were in another taken at this locality August 4, and three blind young were found in a nest on this date. Older young were taken August 31. A specimen with three young was taken at Niangara, December 6.

Dendromus acraeus lineatus Heller

Figure 8

Dendromus lineatus Heller, 1911, Smithsonian Misc. Coll., LVI, No. 17, p. 4. Type locality: Rhino Camp, Lado Enclave. Type: adult ♂, U.S. National Museum, 164816.

1919. *Dendromus lineatus* Hollister. U.S. Nat. Mus. Bull. 99, part 2, pp. 50 and 54.

1934. *Dendromus lineatus* Hatt. Amer. Mus. Novitates, No. 708, p. 14. Compared to *D. ruddi* and *D. haymani*, all from Mboga, Congo.

Congo Expedition Specimens

Represented by sixteen specimens of which nine are skins with skulls, and seven alcoholics. They were collected as follows:

Faradje, 15 (9 adult ♂, 6 adult ♀), February 15; April 7, 8, 9, 15, 18, 19.

Garamba, 1 (adult ♀), July.

The mammary formula is the same in this species as it is in *D. messorius*.

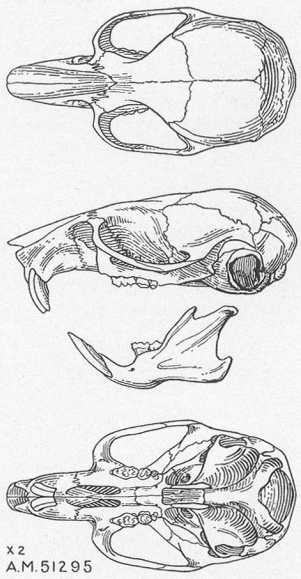


Fig. 8. *Dendromus acraeus lineatus*. Male. Faradje.

Deomys Thomas

Deomys Thomas, 1888, Proc. Zool. Soc. London, 1888, p. 130. Type, by monotypy: *Deomys ferrugineus* Thomas.

Deomys ferrugineus christyi Thomas

Water Rat

Nepiewea: Mangbetu (Lang)

Plate IX, figure 2; Figure 9

Deomys christyi Thomas. 1915. Ann. Mag. Nat. Hist., (8) XVI, p. 150. Type locality: "Poko," Upper Uelle. Type: B.M. 19. 5. 8. 69.

1915. *Deomys christyi*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 474. Eight specimens listed from Poko.

1910. *Deomys ferrugineus* Thomas and Wroughton, Trans. Zool. Soc. London, XIX, part 5, p. 503. A specimen from between Mawambi and Avakubi is noted.

Congo Expedition Specimens

Sixteen specimens were obtained by the Expedition, eight of which are skins with skulls, two skins only, two skulls only and four alcoholics. They are as follows:

Gamangui, 13 (2 adult ♂, 10 adult ♀, adult, sex ?), February 5, 6, 7, 8, 9, 10, 11.

Medje, 2 (adult ♂), January 24; June 25.

Niapu, 1 (adult ♀), January 27.

The upper Congo *Deomys* can scarcely be

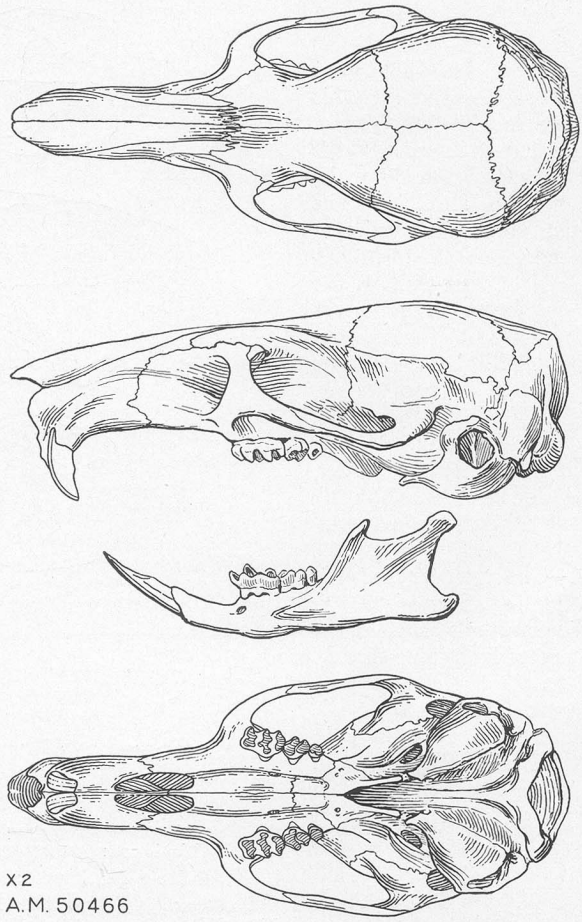


Fig. 9. *Deomys ferrugineus christyi*. Male. Gamangui.

considered more than subspecifically distinct from that of the lower Congo, if one can judge the character of the latter completely by reference to the type (B.M. 19. 10. 5. 1) and possibly only topotypical specimen of *D. ferrugineus*. The character of the white tail tip ascribed to the Uelle form by Thomas appears to be a fortuitous and greatly variable character; the palatal notching and shape of the posterior nares in this instance, a matter of no classificatory value.

The western form is represented in the British Museum by the type and specimens from Efulan, Bitye and the Benito River, Cameroon. The eastern form is represented by the type and topotypes and other specimens from the "Ituri Forest"; the Ituri Forest, 50 miles southwest of Irumu, and the Ituri River. Specimens in the Congo Museum represent only *D. f. christyi* and come from Poko, Penge and Mambaka.

HABITAT.—One specimen from Gamangui was secured in high grass between the bushes of a deserted plantation. At this locality natives caught the animals in sling pole traps set on cleared ground at the edge of the forest or in the middle of a shamba. The traps are not baited, but depend on the animals crossing the space set with traps. In such manner are also secured guinea-

fowl, partridge, francolins, pigeons and smaller birds. One of the rats taken was caught about 9:00 A.M.; the others, in the late afternoon or evening, since the specimens were brought in in the morning.

Food.—The collector's notes on stomach contents of eight specimens taken at Gamangui, February 5 to 11, all refer only to animal food. Concerning five stomachs, the notes merely state that the remains of insects were the only contents. In one, grasshoppers and ants were identified; in another, ants and termites; in a third, ants and some meat, resembling that of a rat.

Reproduction.—Four females had two pairs of abdominal mammae. A fifth had three abdominal mammae on the right side, two on the left.

Two specimens secured at Gamangui, February 10, each contained two small embryos in the left horn of the uterus.

Parasites.—The stomach of one specimen taken at Gamangui, February 6, contained twenty-five nematodes. Another of these rats examined the same day contained but two. These parasites have not been identified.

Steatomys Peters

Fat Mice

Steatomys Peters, 1846, Bericht über Verhandl. K. Preuss. Akad. Wiss., Berlin, pp. 258–259. Type, by monotypy: *Steatomys pratensis* Peters.

Within the borders of the Belgian Congo there appear to be but three forms of the fat mouse: *S. opimus gazellae* northeast of the forest, *S. pratensis pratensis* in the Katanga and *S. p. kasaicus* in the Kasai.

Steatomys opimus gazellae

Thomas and Hinton

Figure 10

Steatomys gazellae Thomas and Hinton, 1923, Proc. Zool. Soc. London, 1923, p. 265. Type locality: Tamburas, Bahr-el-Ghazal, Africa. Type: immature ♂, B.M. 5. 10. 7. 4.

Congo Expedition Specimens

Represented by twenty-six specimens. There are twenty-two skins, all but one of which are accompanied by skulls, and four alcoholics. The specimens are distributed as follows:

Faradje, 10 (7 adult ♂, 3 adult ♀), January 10, 12; February 7, 22; March 4, 9; May 20; December 25.

Garamba, 2 (adults, sex ?), March 15.

Niangara, 14 (4 adult ♂, 7 adult ♀, 2 juvenile ♂, juvenile ♀), November 7, 10; December 6, 7, 11.

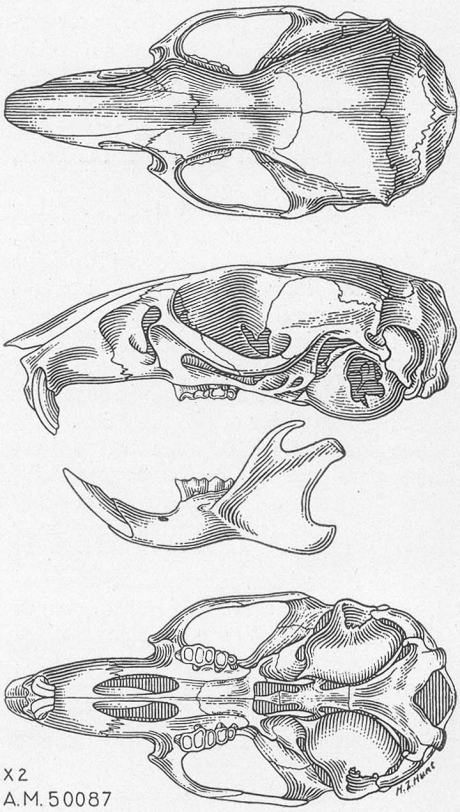


Fig. 10. *Steatomys opimus gazellae.* Female. Niangara.

The Niangara specimens are from very near the type locality of *S. o. gazellae* (heretofore known only by the young type) and appear to be typical. Inasmuch as the original description was not particularly complete, I here describe a large and adult female from Niangara. This specimen (A.M.N.H. 50085) was secured on December 6. Its molars are well worn.

The color of the mid-line of the back is blackish Mars Brown which on the sides pales to Wood Brown. The hairs of the

underside are white to their bases. The cheeks and a broad band above and to the rear of the dark eye ring are Sayal Brown. The short hairs of the mystaceal region and the tips of the hairs in a band passing to and around the eyes are blackish brown as are also the hairs of the outer surface of the ear conch. The lips are white. The color of the flanks extends down the upper surfaces of the fore and hind legs on to the metacarpal and metatarsal region; otherwise the hairs of the limbs are white. The tail is thinly haired, the hairs above, the shade of the darkest portion of the back, those below white.

The skull differs from that of other *Steatomys* in its larger size, swollen bullae, widely open palatal foramina, its relative narrowness, long muzzle and straight (though not parallel) zygomata.

The coloration of younger individuals is sometimes considerably lighter than that of older animals, and they may in fact lack any dorsal intensity of pigmentation.

The distinction between *S. opimus* Pousargues and *S. gazellae* Thomas and Hinton appears to be based on a possibly larger size of the former, a relatively shorter tail and larger number of mammae. I have considered the more recently named form, *S. gazellae*, a subspecies of *S. opimus* on the grounds that both are characterized by large size (the greater measurements of Pousargues are possibly based on stretched prepared skins), and that the number of mammae in *S. gazellae* tends to vary toward the higher number reported for the female cotype of *S. opimus*.

VALUE AS FOOD.—These mice are blanketed by a layer of fat from two to six mm. in thickness, which has furnished the basis for their appropriate name, *Steatomys*. It has also served to make them popular food animals in many parts of their range. Doctor Chapin informs me that Okondo, at the time of the Congo Expedition an important chief of the Mangbetu, was particularly fond of these and had them secured for his meals by the basketful. These mice were usually trapped in fields of "Malu" (Eleusine).

Although there appears to be no evidence of a period of dormancy in the Congo it is reported that members of the genus aestivate in northern Nigeria and in the northeast Transvaal cannot be found in the summer.

REPRODUCTION.—That the mammary formula is subject to variation is indicated by the collector's count of mammae of three individuals, one of which bore six pairs of mammae, the others, seven. These extend from pectoral to inguinal regions. Peters found but five pairs of mammae in *S. edulus* and Bocage (1890, Jour. Sci. Math. Phys. Nat. Lisboa, (2) II, p. 5) noted but four pairs in specimens from Angola which were identified as *S. edulis*. Pousargues, however, found eight pairs in a female of *S. opimus* of the French Congo.

A specimen taken at Niangara, November 10, contained five fetuses.

MURIDAE

LOPHUROMYS PETERS

Brush-furred Mice

Lophuromys PETERS, 1874, Monatsber. k. Preuss. Akad. Wiss., Berlin, 1874, p. 234. Replacing *Lasiomys* Peters, 1866 (preoccupied). Type species: *Lasiomys afer* Peters (= *tullbergi* Matschie).

Three species—groups (or super-species)—of *Lophuromys* occur within the Belgian Congo. In the present state of our knowledge, these must be subdivided into several species and races. The most widespread and abundant group, typified by *aquilus*, is known from all parts of the Congo except the extreme west. The fur on the backs of these species is usually strongly flecked, due to the presence of a light subapical hair band. A second group, of which *L. sikapusi* is the earliest named species, combines the characters of a generally smooth, evenly colored fur and short tail. This group is distributed over all of the Congo. The third group, characterized by *L. woosnami*, is at present known only from Mt. Ruwenzori, the Kivu region and from Medje, in the Ituri Forest. The presence of a related species in the Cameroon suggests that the distribution may eventually be found to extend completely across the Congo Basin.

Another species, *L. naso* Thomas, of the Gaboon, may be expected in the Congo.

Loss of the Tail.—Specimens of *Lophuromys* frequently exhibit loss, or shortening, of the tail as a result of some accident to that appendage occurring between birth and capture. The percentage of injured individuals in nature is probably far higher than that in Museum series, for it is natural for a collector to reject some specimens of a common species because of imperfections.

The skin of *Lophuromys* is notably tender and easily torn. The tail skin is no exception and this slips from the tail with very little effort. The caudal vertebrae, muscles and tendons, deprived of their cover, would be expected to dry up and soon break off. Similar results are known in several other rodents (Hatt, 1932, Bull. Amer. Mus. Nat. Hist., LXIII, Art. 6, pp. 613 and 700).

Of *Lophuromys* at Stanleyville, Mr. Lang noted that: "The tails of these rats (at least the dead specimens) break as easily as, for instance, those of lizards. Among those that came into our hands were specimens that were entirely deprived of tail, and specimens that showed any length of tail. The perfect ones are much more scarce, as may be seen from the collected specimens. The ears are frequently mutilated."

To this Mr. Chapin added: "Not only is the skin of the tail as well as that of the whole body very tender, but the attachments of the caudal vertebrae are very weak, so that the tail, in a dead specimen at least, breaks to pieces very easily." One specimen was described as having the skin of the tail broken in a complete circle, but the distal part of the skin still adhering to the vertebrae.

More than a year later at Niangara, Mr. Lang found no injury to the tails of *Lophuromys* and wrote as follows: "They are very common. Within a month we received over 25, but not one specimen lacked its tail. This is probably due to the fact that army ants are rather scarce here, whereas in Stanleyville they are very common."

As I had observed fracture lines across the caudal vertebrae of a species of an American pocket mouse (*Perognathus fallax*), which was known to have a very fragile tail, I searched for a similar plane of structural weakness in the caudal vertebrae of *Lophuromys*. The tail of an adult *Lophuromys a. rita* twenty-four years in alcohol proved very resistant to injury, and excessive pulling, twisting and bending stresses did not occasion a break. With scissors and scalpel I cut off the tail sheath, and then found ready and easy fracture along the weak connective tissue lines between the rings of scales. Still the vertebrae failed to separate or break under moderate stress. Cleaning up a few of the caudal vertebrae, however (four in the area of transition), showed a plane of weakness marked by notching of ridges, and grooving of the centra on each of the vertebrae. This (Fig. 11) is markedly similar to notching of the vertebrae of *Perognathus*.

Fig. 11. Planes of supposed structural weakness traversing caudal vertebrae of *Lophuromys aquilus rita*.

A specimen of *L. sikapusi* was also found to have a tail strongly resistant to injury, but in this case excessive twisting of the tail produced fracture of the vertebrae, not directly across the centra but in a diagonal plane.

There is no evidence at this time that the planes of weakness found in the caudal vertebrae of *Lophuromys* contribute to the ease of caudal injury, though trial injury to living or freshly killed animals may yet show that the vertebrae are easily broken at this level.

Laboratory Use.—In the Congo, members of the genus have been employed as laboratory animals, a use to which they are well suited because of their "indolent" manner. (Rodhain, 1934. Bull. Cercl. Zool. Congolais, XI, p. 8.) It is suggested that they might prove excellent material

for genetic study because of some of the striking color variants encountered.

Lophuromys aquilus (True) subspecies

[*Mus aquilus* True, 1892, Proc. U.S. Nat. Mus., XV, p. 460, October 26. Type locality: Mount Kilimanjaro, Tanganyika Territory. Type: U.S.N.M. 18997.]

Congo Expedition Specimen

Faradje, 1 (adult ♀), March 22.

There is a second specimen of speckled *Lophuromys* from Faradje, in the Musée du Congo Belge, which agrees in essential characters with the specimen in the American Museum.

The specimen at hand is not typical of any described race of *Lophuromys aquilus* but is rather closely approached by specimens from the Semliki Valley and western Uganda (Kampala, Kikonda and Kisingo, U.S.N.M.) which on geographical grounds could be considered *L. a. rubecula*, but which as a matter of fact are not so dark as the type of that subspecies, which appears in its typical form only in the highlands.

With a series of specimens from Faradje, all closely similar to the specimen at hand, I would not hesitate to establish a new name for the Faradje animals, but based on a single specimen such action is not advisable.

The general dorsal coloration of the Faradje specimen is near Saccardo's Umber, though somewhat darker than this shade. The undersurface is Warm Buff, this color extending the full length of the hairs. The flanks are slightly paler than the mid-dorsal area, but are rather sharply marked off from the paler underside. Above the eye is a pale spot, not more conspicuous than that observable in many skins of *L. a. rita*. Laterally the fore feet are a dark Bister, medially the color of the belly. The hair of the dorsum of the hind feet is uniformly Ivory Yellow, much the palest shade I have noticed as a monotone on the feet in this group of mice. The tail is more sharply bicolor than in *L. a. rubecula* or *L. a. zena*, the hairs of its upper-surface being a dark brown, those of the undersurface white.

Lophuromys aquilus rita Dollman

Plate VII, figure 2; Plate X, figure 1

Lophuromys aquilus rita Dollman, 1910, Ann. Mag. Nat. Hist., (8) V, p. 179. Type locality: Lufupa River, Katanga, Congo. Altitude 4000 ft. Type, by original designation, adult ♂, B.M. 9. 1. 3. 36.

1915. *Lophuromys aquilus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 475. Thomas did not feel justified in naming subspecifically the specimens from Medje and Poko secured by Christy.

Congo Expedition Specimens

Forty-five skins with skulls and three in alcohol were collected as follows:

Avakubi, 3 (adult ♂), October 2, 4, 7.

Bafwabaka, 2 (adult ♂, adult ♀), December 29.

Bafwasende, 2 (adult ♀, juvenile ♀), September 25.

Batama, 1 (adult ♂), September 18.

Gamangui, 2 (adult ♂, adult ♀), January 27, February 1.

Leopoldville, 1 (adult, sex?), August 13.

Medje, 1 (juvenile ♀), March 24.

Ngayu, 13 (9 adult ♂, 4 adult ♀), December 13, 14, 18, 21, 22, 23, 24.

Niangara, 1 (adult ♀), December 2.

Stanleyville, 21 (13 adult ♂, 7 adult ♀, 1, sex?), August 12, 13, 14, 17, 19, 26.

No more than one form of speckled *Lophuromys* is known to inhabit any one place within the Congo, and any *Lophuromys* so marked may be assigned to *L. aquilus*. The limitations of subspecies are at present almost arbitrarily set. The greater part of the range of the species within the Congo, including all but one of the localities represented by specimens from the Congo Expedition, is occupied by a population of reddish individuals that I for the present assign to the race described from the Katanga, *L. a. rita*.

Specimens from Lukolela in skin characters, agree well, except for the fluctuating character of belly color, with the type of *L. major*, which is from a region not far removed from Lukolela. On the other hand, it may also be said that these specimens from Lukolela are not distinguishable on external characters from many specimens of *L. a. zena*, taken at and near the type locality in the Abadares of Kenya Colony,

except that the latter present a greater contrast between dorsal and ventral coloration than do the Congo specimens.

A greater contrast exists between the skulls of *L. major* and the Lukolela animal, *L. major* having much the larger, more elongate skull and broader teeth.

I consider it possible, however, that *L. major* may not represent a distinct species or subspecies but merely the confusion of a *Lophuromys sikapusi* skull with the skin of a *Lophuromys aquilus*. *L. major* is known only by the type.

The Lukolela specimens while lumped with *L. a. rita* are by no means typical of that race, but much lighter in color. Two skins, accompanied by a single imperfect skull, from Lake Leopold II and now in the British Museum are also unlike *L. a. rita* in that they completely lack the reddish tint characteristic of that race.

COLOR.—An indication of the danger of using color, particularly that of the ventral surface, in allocating single or small series of specimens to any given race, is the extent of variation occurring in the forty-five skins from the Ituri, obtained by the Congo Expedition. Here the greatest contrasts are not between adults, as might be expected, but between individuals about half grown. Of three individuals presenting color types, one (49637, ♀, head and body length 98) may be considered typical; another (49634, ♀, head and body length 122) is exceptionally dark, almost melanistic; the third (49646, ♀, head and body length 92) is very red, above and below, and might even represent an erythristic mutation. The colors as nearly as they may be matched with Ridgway's Standards, are as follows:

	General Color Above	General Color Below
49637	Cinnamon-Brown	Clay Color
49634	blackish Mummy Brown	blackish Mummy Brown
49646	Chestnut Brown	Ferruginous

Comparison of adults from the Ituri reveals color tendencies sufficiently striking to cause confusion as to relationships, some individuals resembling *L. sikapusi* sufficiently to require reference to skulls to verify the opinion based on skin alone. Some of those approaching *L. sikapusi* have the annulations of the hairs, diagnostic of *L. aquilus*, apparent only on the sides of the head. Even further approaching the appearance of the other group, some of these (e.g., 49706) have a few scattered blonde hairs intermixed with the dark hairs of the back. Were it not that the skulls bore no resemblance to those of *L. sikapusi* I would be inclined to suspect hybridization. The belly colors of the adult Ituri specimens vary from a yellowish Cinnamon to a deep orange, the younger individuals in general showing the more orange color, which may or may not be an indication that the species and races with greatest amount of red or orange below have deviated least from the ancestral stock.

DISTRIBUTION.—The distribution within the Belgian Congo and neighboring territory of the various subspecies of *Lophuromys aquilus*, as I at this time consider their limits, is indicated on the accompanying map (Map 1). Here localities from which I have examined specimens are assigned a dot, type localities a star.

I may divide the areas from which I have named specimens as *L. a. rita* into certain districts which show divergent tendencies, as noted below. Specimens examined have been from:

KATANGA

Elizabethville (M.C.B.); Lufupa River (B.M.), (type).

MANYEMA

Kabambare (M.C.B.); Kongolo (M.C.B.).

ITURI–UELLE–STANLEYVILLE

Aruwimi–Panga (M.C.B.); Avakubi (A.M.N.H.); Avakubi–Masambi (B.M.); Bafwabaka (A.M.N.H.); Bafwasende (A.M.N.H.); Batama (A.M.N.H.); Buta (M.C.B.); Djugu (M.C.B.); Gamangui (A.M.N.H.); Koteli, Bas Uelle (M.C.B.); Medje (A.M.N.H.; B.M.; M.C.B.); Ngayu (A.M.N.H.); Niangara (A.M.N.H.); Pili Pili (M.C.B.); Poko (B.M.; M.C.B.); Stanleyville (A.M.N.H.; M.C.B.).

EQUATOR

Upper Tshuapa River (M.C.B.).

MIDDLE CONGO–LAKE LEOPOLD

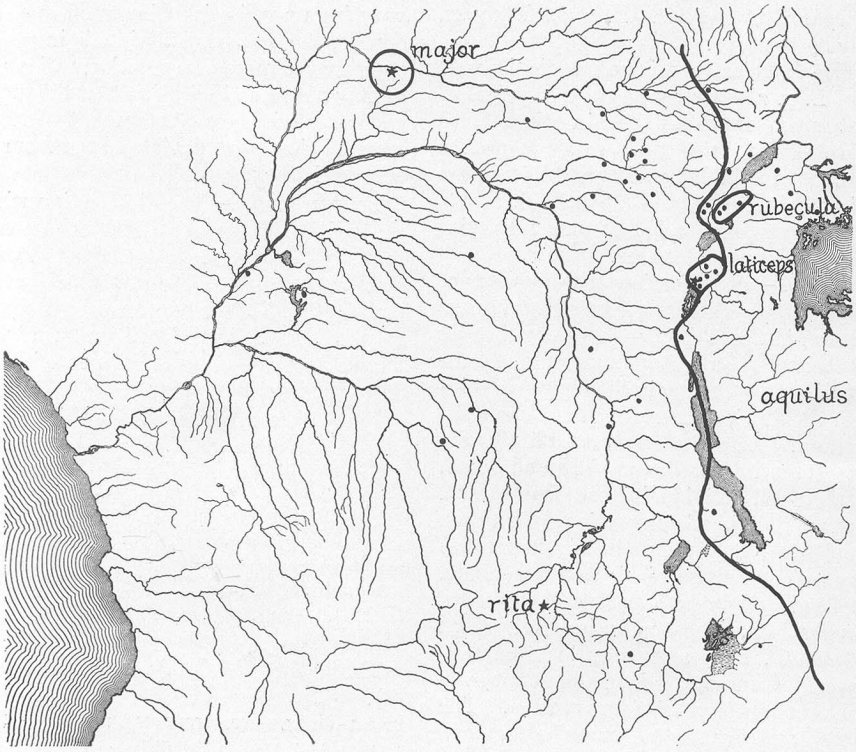
Lake Leopold II (B.M.); Lukolela (A.M.-N.H.).

KASAI–SANKURU

Komi, Sankuru (M.C.B.); Luluabourg (A.M.N.H.; M.C.B.).

The mountain race of the Kivu, *L. a. laticeps*, is clearly differentiated, and series of these mice are strikingly uniform in their colors and proportions. The subspecies (M.C.B.; N.R.S.); Mt. Karisimbi, 12,000 (A.M.N.H.; M.C.B.; N.R.S.); Mt. Mikeno, 7900–13,000 (A.M.N.H.; N.R.S.); Mt. Muhavura (N.R.S.); Mt. Sabino, Ruanda (M.C.B.; N.R.S.); Ngoma (M.C.B.; N.R.S.).

HABITAT.—Three specimens taken August 12 in a coffee plantation at Stanleyville were caught under grass and roots in an



Map 1. Distribution of subspecies of *Lophuromys aquilus* within the Belgian Congo.

while closely associated with the highlands is not restricted to the mountains, specimens demonstrating a broad altitudinal range.

Specimens are known from the following localities:

Djalasinda (M.C.B.); Kabara 11,000 (A.M.N.H.); Kibati (N.R.S.); Kisenyi (M.C.B.); Lake Chahafi (N.R.S.); Lake Kivu, 4900 ft. [type loc.] (B.M.); Lake Mutanda (M.C.B.; N.R.S.); Lulenga area that had been cut down about three weeks before. Another specimen from Batama dated September 18 was obtained in the forest where, it was noted, "several were caught." At Ngayu these mice were secured in grassy places, plantation and forest.

NUMBERS.—Mr. Lang noted that *Lophuromys* (*L. a. rita* and/or *L. sikapusi*) were common or abundant at Stanleyville, Niangara, Avakubi and Ngayu; at Stan-

leyville, the "most common." At Niangara, "over 25" were received from the natives in one month.

ACTIVITY.—At Stanleyville, August 12, Mr. Lang wrote of *Lophuromys* that "They seem to be rather diurnal in habits as none were caught in traps left out during the night, but almost all were caught during the daytime."

FOOD.—The stomachs of these mice contain a high percentage of insects as well as of vegetable matter. At Stanleyville, August 14, Mr. Lang summarized his observations on specimens secured in the first half of August as follows: They "feed...on vegetable matter, principally the kernel of the oil palm, which appears in the stomach as a whitish or grayish mass, also on insects, earthworms and myriapods." Notes on five individuals secured August 12, 13 and 19 at Stanleyville, all recorded insects and vegetable matter. One noted the presence of an earthworm.

BREEDING.—The mammary formula of this mouse was not recorded by the collector.

Embryos were found August 12, 13 and 19 at Stanleyville, December 18 and 23 at Ngayu, and January 27 at Gamangui. This, however, is no more than an indication of the period in which specimens were taken. Of the gravid females recorded, two contained two embryos each, two others three each and three held four apiece.

Mr. Lang failed to distinguish the presence of two species of *Lophuromys* in his collections made at Stanleyville, but he writes of the mice of this genus that "they are extraordinarily prolific, as the uterus of nearly all females contains 3 or 4 fetuses." At that date he had saved as specimens only four females of this species, three of which were noted as with gravid uteri.

Lophuromys sikapusi (Temminck)

Mus sikapusi TEMMINCK, 1853, "Esquisses Zool. sur la Côte de Guiné," p. 160. Type locality: "Dabocrom" [District of Fanti, Gold Coast]. Type in the Leiden Museum. (Matschie, 1911, Sitzber. Gesell. Naturf. Freunde, p. 336.)

1888. *Lophuromys sikapusi*, THOMAS. Proc. Zool. Soc. London, 1888, p. 13. Emin secured a specimen at Gadda.

1896. *Lophuromys sikapusi*, POUSARGUES. Ann. Sci. Nat. Zool. Paleon., III, p. 397.

1915. *Lophuromys ansorgei*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 475. A specimen from Medje and eight from Poko, in the Christy Coll. were noted as "reddish below as in Heller's '*L. pyrrhus*' but this is also the case in specimens from Mt. Elgon near the type locality of *L. ansorgei*."

1920. *Lophuromys major*, SCHWARZ (part). Friedrich's "Ergebn. Zweit. Deutsch. Zentr. Afr. Exp. 1910–1911," I, Zool. Lief. 15, p. 1086.

CONGO EXPEDITION SPECIMENS

Six skins with skulls, 1 skull only and three in alcohol were collected as follows:

Bafwabaka, 3 (adult ♂, adult ♀, juvenile ♀), December 29.

Faradje, 1 (adult ♂), February 20.

Medje, 2 (adult ♀), January 20, 23.

Niangara, 2 (adult ♀), November 15, 18.

Stanleyville, 2 (adult ♂), August 14, 17.

Other known specimens of *L. sikapusi* from the northeastern Congo are from Gadda (Emin Coll., B.M.), Medje (Christy Coll., M.C.B.) and Poko (Christy Coll., B.M.).

COLOR.—Color variation among the six skins is not extensive. One of the specimens is that of a very young individual, whose head and body measured but 110 mm. The pelage of this juvenile is much more pallid than that of the adults but essentially similar as to color. Dorsal coloration among the adults is almost completely uniform, but the belly color, as is usually true in the genus is subject to fortuitous variation. The lightest belly color occurring among the six adults is Apricot Buff, the darkest Cinnamon Rufous. The two skins from Luluabourg, in American Museum collections, have bellies this latter color.

In skulls, this collection of the Ituri representatives of *L. sikapusi* present a nicely graded series from a skull with practically unworn teeth to an individual with the molar crowns worn down to flat pavements. They do not, however, present much individuality. One skull (A.M.N.H. 51037) contrasts with the others in its narrow parallel-sided palatal foramina. The others have broad flaring foramina.

In other respects, however, this skull is typical of the series.

Lophuromys sikapusi of the Ituri Forest is certainly but subspecifically removed from *L. ansorgei*, the separation between the two lying, I believe, along the eastern margin of the Ituri Forest, as specimens from Boga, Beni and the Wasa River, a small affluent of the Semliki near Boga, are all referable to *L. ansorgei*. These Semliki Valley specimens differ not only in their lighter color, but in having a slightly broader brain case, shorter nasals and larger bullae. *L. pyrrhus* appears to be a slightly distinct geographical representative of the same species and may be relegated to subspecific rank. The line of separation between the Lado and Ituri races is assumed to correspond to the low divide between the Congo and the Nile drainage systems, along which a marked vegetational change is said to occur. The great distance between the Ituri and the Gold Coast, type locality of *L. sikapusi*, suggests that the eastern group is not typical, but I have not been able to establish differentiation due to the absence of a suitable series of topotypes. The status of the Kasai and Angolan representatives should repay study which I have not been able to give the matter, though even a superficial survey of specimens from these areas shows them to be longer tailed, lighter faced mice with shorter skulls, more bowed in the zygomata than those of the Ituri. *L. muansae*, of which form I have seen no specimens, is, I judge, also a subspecies of *L. sikapusi*. The small size of the skull figured by Tullberg is accounted for by its youth, if one assumes that the little-worn molars shown in a larger scale on the same plate as the skull were drawn from the same specimen.

Two other members of the unticked group of *Lophuromys* are supportable as full species, *L. naso* and *L. nudicaudus*. The former is known only by the type and a specimen in the United States National Museum (220764, ♂) collected in the Gaboon. *L. nudicaudus* approaches *L. woosnami* of the eastern Congo in some respects and may eventually be nomenclatorially related with that animal. It is my opinion, necessarily based on published information alone, that *L. nudicaudus* is the same animal described and figured by Tullberg as *L. afer* and subsequently named by Matschie, *L. tullbergi*, which would then be a synonym of *L. nudicaudus* Heller, since the latter preceded Matschie's name by several months.

Skulls of adult *L. sikapusi* are easily distinguished from those of *L. aquilus rita* of the same region by their large size, more slender proportions. In the instance of some young individuals, particularly when the skull is not accompanied by a skin, definite identification is not feasible without reference to the pattern and size of the molars. Here the most conspicuous difference relates to the third upper molars. In *L. sikapusi* the lingual margin of the tooth is marked by well-developed cusps, whereas in *L. a. rita* the two cusps are united to form a smooth or but slightly incised ridge. The cusps on the lingual side of the second molar are better developed in *L. sikapusi* than in *L. a. rita*. The molars of *L. sikapusi* are the wider, M^1 having a width of 1.85 mm. or more, whereas in *L. a. rita*, only fully adult specimens attain a molar diameter this great.

Mandibular and lower molar characters are not marked, and hence of little use. The cusps of the lower molars of *L. a. rita* are, however, thinner, less triangular (in norma lateralis) than in *L. sikapusi*.

Lophuromys luteogaster Hatt

Figure 12

Lophuromys luteogaster Hatt, 1934, Amer. Mus. Novitates, No. 708, p. 4. Type locality: Medje, Belgian Congo. Type: adult ♀, A.-M.N.H. 49647.

Congo Expedition Specimens

Skins with skulls were secured as follows: Medje, 2 (adult ♀, juvenile ♀), April 10.

This species, one of the few novelties obtained by the Congo Expedition that were not secured by and previously described from the Christy Expedition, in all probability occupies a different ecologic niche than the two other members of the genus occurring in the Ituri. While unquestionably related to the Ruwenzori species, *L. woosnami* and its subspecies *L. w. prittiei*

of the Kivu, the distinctive features of *L. luteogaster* are of greater magnitude than those occurring between any currently recognized subspecies of any single species of *Lophuromys*, and so it is retained as proposed, a full species.

The pale coloration, great extension of the light belly color, unicolored small scaled tail, small hands and feet, the short broad outline of the skull, broad zygomatic

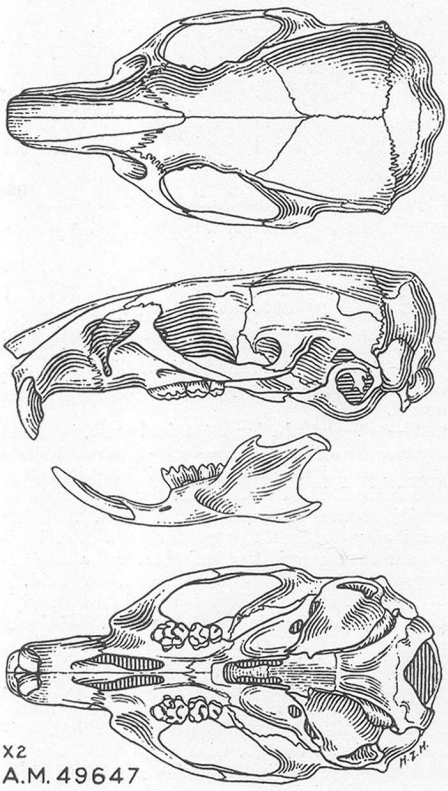


Fig. 12. *Lophuromys luteogaster*. Type. Female. Medje.

plate and the presence of post-orbital processes, all contrast with conditions observed in the mountain species of the same group.[1]

The animal in the flesh was described by Mr. Lang in the following words: "Much like the short tailed rat [*L. a. rita* and *L. sikapusi*] but has a longer tail, is dark gray above (the bases of the hairs yellowish) and creamy yellow below. The forelimbs are pale yellowish above. The hair reaches down along them to the toes except for a naked strip over the lower half of the ulna. The toes are pinkish, the nails whitish, showing a dark tip below. There are five tubercles on the hind foot. The ears are dark gray and pinkish on their base. About the mouth it is pale pinkish brown."

There is no note concerning the habitat or the natural history of this mouse.

CRICETOMYS WATERHOUSE

Giant Pouched Rats

Cricetomys WATERHOUSE, 1840, Proc. Zool. Soc. London, 1840, p. 2. Type, by monotypy: *C. gambianus* Waterhouse, from the "river Gambia."

Cricetomys presents a most interesting problem in the interpretation of geographical differentiation within one genus. In every major area, from Gambia to Kenya and southward through Angola and Mozambique, it is represented. In certain localities, instances of which are recorded below, two well-marked types occur, but I am not aware that it has been proved that in any particular habitat two species occur; the points from which I am satisfied that two forms do occur always having two marked biotic associations adjoining each other. Thus at Faradje and Niangara in the Congo, forest and savanna meet and from these collecting localities two distinct types of *Cricetomys* occur without demonstrable intergradation. In other areas the problem is not simple and from several localities along the eastern border of the Congo it is a question as to whether the evidence is best interpreted as a case of marked speciation and subspeciation, one of fortuitous variation far beyond that usually encountered in the genus or of hybridization. Certainly the group is prone to show well-marked local types over broad areas comparatively uniform in environment. The occurrence of regions in which, contrary to uniformity, there is diversity renders difficult the determination

[1] Osgood (1936, Field Museum, Zool. Ser., XX, pp. 244–245) has recently cast doubt on the proper association of skin and skull of the type; and suggests that the skull is that of *L. rubeculus*. He found characters in the damaged skull of the immature cotype suggesting affinities with the little known genus, *Uranomys*.

of the taxonomic status of many specimens. If at one time the genus spread out over central Africa, differentiating into many local types, broad enough in some instances to be called full species yet retaining interfertility, and if some of these new forms migrated into areas where other local types had already become established, a condition of great variation might come about through the course of hybridization and reassortment of characters. Specimens at hand are inadequate to establish this as the probable history but I find it a convenient working hypothesis in the interpretation of the observed great admixture of characters in restricted areas, which elsewhere are reasonably constant in their associations.

The problem of speciation in *Cricetomys* comes to a focus along the Albertine rift: at Djugu, Beni and Masisi. Though conditions may be equally critical elsewhere, at these collector's points a short horizontal distance, not evidenced on the label, may involve a considerable vertical, and hence environmental, change, and from these points a fair number of specimens are known. Unfortunately there are not enough in any one museum to serve as adequate background for the study.

A collection made at or near Masisi, by Arrhenius, contained ten *Cricetomys*. Here, the forest is continuous with and much the same as that of the Ituri, but between Masisi and Lake Kivu are several ridges, covered with mountain forest and grassland, which might harbor species different from those of the Congo forest. Lönnberg studying the ten specimens concluded that there were here four forms represented: one small-toothed and white-bellied which he named *C. g. kivuensis;* one large-toothed and white-bellied doubtfully referred to the Ituri form *C. g. emini;* one medium-toothed and dark-bellied described as a full species, *C. microtis;* and one large-toothed, with no sharp line of demarcation of the lighter belly color, which he abstained from naming since it was represented by but a single specimen.

Ten specimens from Beni are in the collections of the Congo Museum. One in the Riksmuseum was considered *C. g. proprator* by Lönnberg. The British Museum has a specimen from Kironke, west of Beni. Here conditions would seem ideal for analysis of the variation produced, for there are ample named specimens from east and west, and the physiographic and vegetational background is well known, though since it may be presumed that all or most of the specimens secured were obtained from natives who may have carried them a considerable distance from any direction, the exact habitat of all specimens must be open to doubt.

It would be possible, though highly unlikely, that near Masisi, four subspecies of one species might occur in four habitats: mountain forest, mountain grassland, tropical rain forest and tropical grassland. At Beni not more than three forms should be represented, on the assumption of one subspecies to each major vegetational association.

Judging the Masisi specimens described by Lönnberg against the background of specimens now before me, I conclude that:

1.—*C. microtis* Lönnberg is a distinct form, probably related subspecifically to *C. ansorgei* and *C. viator.*

2.—"*C.* sp.," the large-toothed male, is of the same subspecies as the large-toothed female ("*C. g. emini*"), differing from it only in sexual and in individual characters. Male characters exhibited are the narrower rostrum and the vertically directed temporal ridges. An individual character is the indistinct color line between dorsal and ventral surfaces of the skin.

3.—*C. g. kivuensis* Lönnberg is identical with or at most a slight deviant from *C. d. emini* and may be placed in synonomy with that form.

4.—"*C. emini,*" the large-toothed female from Masisi, is far beyond the limits, as concerns dentition, of the race *emini* as typically represented by the Congo Collection. Lacking similar material, I cannot, without personal examination of the specimen, decide whether it is a variant of *emini*, an undescribed form, or a hybrid between the *emini-proprator* and the *ansorgei-viator-microtis* stock.

Of specimens from the region of Beni, which I have seen, one (B.M. 30. 11. 11. 363) secured by the deWalden Expedition at Kironke, west of Beni (altitude 3000 feet), I consider intermediate between *emini* and *proprator*, having the foot pattern and belly color of the former, and the tail color-ratio and the dark dorsal fur of the latter. Eight specimens in the Congo Museum, all from Beni, are to be referred to

proprator, though they too approach the *emini* type. Two others (M.C.B. 3217; 3218) are clearly of a different group, and should be, in all probability, referred to *C. microtis* Lönnberg, which they resemble in their combination of characters.

C. a. microtis is distinguished from the neighboring *emini-proprator* group by its harsh, dense and long dorsal hair; darker, grayer color; dark hands and feet; small ears; greater restriction of white on the tail (average about 1/4 white); dark thinly-haired undersurface. Cranially *microtis* is separable from the *proprator* types of the Beni district by its smaller fossa for the reception of the anterior portion of the masseter medialis (on the sides of the rostrum anterior to the infraorbital foramen), larger palatal foramina and broader molars.

Djugu specimens in the Musée du Congo Belge number thirteen. Some of these skins are heavily pigmented with black. The oldest and youngest of the series, however, are lightly colored. In the short time I had for the examination of the skulls I was unable to discern any characters indicating that more than a single species or subspecies was represented. These specimens, however, did not closely match any of the nearby forms: *C. g. langi; C. g. grahami; C. d. emini; C. d. proprator;* nor *C. a. microtis*. The sleek character of the pelage, the relatively large teeth and numerous minor characters suggest that their affinities lie with the forest living *C. dissimulus* group, but I could not consistently call these *C. d. emini* nor *C. d. proprator* as in color and in skulls they do not fit in with other series of these animals. Ultimate appraisal of such localized types must await a reviewer of the genus.

A large number of specimens of *Cricetomys* from Luluabourg, in several museums (21 in A.M.N.H.), are all unquestionably referable to *C. d. sanctus*. Without consideration of certain abnormal and shedding specimens, there is in the series a wide range in intensity of pigmentation. None, however, in the American Museum series, and none that I noted in other museums, approach the type in lightness of color, though Inkongo, the type locality, is very near Luluabourg (150 km.) and supposedly identical in environment. The type is then (topotypes are unknown) presumably atypical. The dorsal color of the type of *sanctus* is near Ridgway's Cinnamon, whereas Luluabourg specimens range only from Sepia to Sayal Brown.

Summarizing, the Congo *Cricetomys*, as far as I have examined them, appear to fall into three species. *Cricetomys gambianus* I consider to be represented only by *C. g. langi* of the northeastern savanna. *C. dissimulus*[1] probably occupies the entire Congo forest; its subspecies *C. d. emini* and *C. d. sanctus* occurring respectively in the northeastern and southcentral sections. *C. proprator* of Ruwenzori is also, in my estimate, a race of *C. dissimulus* and not closely related to *C. elgonis* which is completely unlike any Congo species. The third species I consider to be *C. ansorgei* which appears to occur up the Rift as far at least as Beni in the Semliki, breaking up into several local forms (i.e., *C. a. microtis*), possibly hybridizing with its neighbors to the north, east and west.

The few specimens from the Katanga which I have seen cannot be allocated at this time. Clearly, two forms are present and may represent *C. ansorgei*, but both are far from typical of this species.

MOULT.—Four specimens of *Cricetomys* in the American Museum, representing three races, show evidence of moulting. Two of these are about half grown and have well-marked lines of demarcation between new and old fur. Aligning the four specimens in what appears to be a natural sequential arrangement, it seems that the course of moult is as follows:

The hair of the area between the ears becomes thinned and this area spreads at first to a sharply marked line slightly behind the eyes, then extends anteriorly along the sides, surrounding the eyes. At about this time it has progressed caudally to the shoulder region. This area increases dorsally to the tip of the nose and base of tail, blending on the sides into an area of older hair. About the time that the denudation and bleaching has reached the tail a strong

[1] A specimen in the Musée du Congo Belge from Ganda Sundi is from sufficiently near the type locality of *C. dissimulus* Rochbrune (Landana) that I base my estimate of that form on the specimen.

new growth of replacing hair appears in the area first affected, and presumably follows a similar course of extension. No specimens show a replacement pattern on the undersurface.

Observations Concerning Variations in *Cricetomys* Available for the Characterization of Specific and Subspecific Units

The giant rats show such remarkable local differentiation that it is only by weighing the degree of differentiation between specimens that one may arrive at a usable nomenclature. Some of the characters remain stable or subject to broad individual variation over a wide range and then in some small area appear to become fixed in the nature of unit character variation. Certain other characters, as, for example, "size of teeth" or coat color, though open to a fairly broad range of variation in any one area, are of great usefulness when considered in their local mean. Some of the more obvious or useful features noted in specimens from the Belgian Congo, Uganda and Angola, which deserve comment, are the following:

Coarseness of Pelage.— It is generally true that *Cricetomys* inhabiting savanna or arid country have coarse, stiff hair, and those inhabiting forest have short, sleek hair. This may be merely a reflection of habitat, but it appears to follow genetic lines inasmuch as, in my view, the savanna animals and the forest animals of west Africa belong in different species groups or rassenkreis.

Length of Hair.—Though used by several taxonomists working in this group, length of hair is not a very useful character since age and the stage of moult affect it so widely and so subtly that it is difficult without large series of each of two compared forms to ascertain when one is comparing animals in similar pelage.

White Belly Hair.—This is a constant feature of every specimen of *C. d. emini* and *C. d. sanctus* which I have examined, just as gray bellies have characterized all of good series of specimens of *C. g. langi*, *C. g. elgonis* and *C. g. kenyensis* which I have noted. The one apparent exception to uniformity in a single population which has come to my notice has been a series from northern Angola, at the present considered as representing only *C. ansorgei*, in which both white- and gray-bellied skins occur. The evidence in this case is, however, too fragmentary, since few skins are matched by skulls, to justify an unequivocal assertion that both types of belly color are found in one species in one locality.

Sharp Demarcation of the Belly Color.—This is very nearly an invariable accompaniment of white belly color. Occasional specimens are encountered in which the line is blurred, but this is, I believe, an individual variation, almost certainly not a stage of moult, since lines of demarcation between old and new pelage are usually or always abrupt.

Proportion of White to Black on the Tail.—This is a feature of peculiar usefulness. It seems to be fairly constant among members of any one subspecies in any one locality, yet varies more than any other single character observed from one locality to another.

Shade of Light Section of the Tail.—This is more constant than the color of the back. In some groups such as *langi*, *microtis*, *ansorgei* and *elgonis* the light area is chalky white; whereas in *emini* and *sanctus*, though this same clear shade is occasionally encountered, a dull cream color is the more frequent.

Ear Size.—In *emini*, *proprator* and in *ansorgei*, as in fact most *Cricetomys*, the ear is large, measuring in the fresh specimens from 40 to 45 mm. In *microtis*, *langi*, *viator* and one of the Angolan forms, the ear is considerably smaller. Few collectors have troubled to record ear measurements, but Mr. Lang's field labels of *langi* show a maximum of 40 mm., and Mr. Boulton measured the ear of a specimen of *viator* from Mt. Rungwe as 40. The ears of prepared skins of the other forms mentioned, as well as the observations of Lönnberg, clearly show that the ears of some of the forms are smaller.

Bicolored Ears.—In a skin of *C. d. proprator* from Ruwenzori, and some Ituri skins of *C. d. emini*, the ears are lightly pig-

mented on the basal half of their outer surface and heavily pigmented on the terminal half. In the greater number of the *emini* skins this is not discernible, but in such skins the ears have invariably been poorly prepared, through removal of the cartilage and the insertion of a cotton plug. Bicolored ears are probably characteristic of *C. d. emini* and *C. d. proprator*.

Pattern of the Fore Feet.—Though the fore feet of the giant rats of one subspecies in one region usually present a common pattern, this, as any other feature, may vary. In *C. g. langi* of the Uelle savannas the older specimens have a limited development of white on the underparts, usually most prominent on the throat, and in such specimens the toes of the fore feet are invariably white, as are also the margins of the feet. In both young and subadult pelages, the hairs of the fore feet are gray-brown. The substitution of the white-margined pattern appears to be a matter of gradual replacement. Sixteen specimens of *C. d. sanctus* from Luluabourg, ranging from adults to young of about one-quarter adult size, all have the hands completely white up to the wrists. One new-born *C. d. sanctus* from Lukolela has the hands similarly white, but three adults from the same locality have a sharply defined brown stripe down the mid-line of the dorsum of the hand, extending to the base of the middle toes. In *C. d. emini* of the Uelle-Ituri District, of which I have studied an excellent series, from an area that is neither great nor significantly diverse, no rule of age change is applicable. Among fully adult specimens with well-worn molars, one encounters specimens with the hands completely white, some with a sharply defined dorsal stripe, others with a diffuse dorsal stripe, others with no white hairs except on the toes. Thus it is clear that, lacking large series of animals from the locality which one is considering, it is inadvisable to use the pattern of the fore feet as a diagnostic character.

Pattern of the Hind Feet.—On the basis of the observations concerning the fore feet, one could predict a similar situation concerning the hind feet, and this in fact proves a fairly good parallel. In *C. g. langi* the hind feet change with age, starting with white, then to gray and later to a gray central area with white toes and margins. In *C. d. sanctus* from Luluabourg and Lukolela, there is, however, no age change in pattern and little individual variation, a broad brown, well-defined dorsal area bordered with white being an apparently invariable pattern. Among *C. d. emini* a great range in pattern again occurs, irrespective of age, sex or exact locality. In none, however, is the hind foot completely white, nor is there ever a dorsal stripe as narrow as that found in *C. d. dissimulus* or *C. dolichops*.

Length of Hind Foot.—The foot length of the giant rat shrinks very greatly in the drying subsequent to preparation, shortening usually from four to six mm., a truly remarkable change which needs consideration when comparisons are made with various published measurements.

Skull Proportions.—The general skull proportions are doubtless of significance and if material were abundant enough to justify statistical procedure, some useful ends might be attained from further study of the question. Skulls are, however, so poorly represented in any one race-locality-age class that analysis of the significance of general skull shape must remain a matter for observational analysis. In a series of twenty-four *emini* skulls of known sex, it is apparent that the male skulls are longer and relatively narrower. The male skulls also are slightly more sculptured than the female, this being particularly well marked in the temporal crests which are more or less vertical in the males and horizontal in the females, a condition apparently not obtaining in other Congo *Cricetomys*.

Postorbital Points.—Small projections, too short to be termed processes, but homologous with such features, are discernible along the course of the temporal-supraorbital ridges of some *Cricetomys*. These are characteristic of old males in *C. d. emini*, *C. d. sanctus* and *C. ansorgei*, and have also been observed in *C. g. olivae*. They do not occur in *C. g. langi*.

Length of the Anterior Palatal Foramina.—Short foramina characterize *C. g. langi*, long foramina the races of *C.*

dissimulus: emini, sanctus and *proprator*. Occasional specimens are encountered which reverse the normal proportions, but the average difference is well marked. *C. ansorgei, viator* and *microtis* have palatal foramina which may be described as intermediate since they do not average as long as those of *emini*, nor as short as those of *langi*.

NOTCHING OF THE PALATE.—The notching of the free edge of the palate proves characteristic of the *gambianus* group, but other palatal characters, such as the shape of the posterior edge, have no significance in the groups which I have reviewed with greatest care.

THE INTERPARIETAL.—Shape and complexity of the suture of the interparietal seems to be without significance as regards any age, sex or taxonomic subgroup of *Cricetomys* (see Fig. 13), but the surface area of this bone is correlated with the systematic position of the animal. Large interparietals typify *dissimulus, sanctus, emini, proprator* and *ansorgei*. Small interparietals are the rule in *langi* and *elgonis*.

MEASUREMENTS OF THE MOLARS.—It seems apparent that with excessive wear the molar row might decrease in length and width, but I find that this cannot be established as a fact by means of measuring series of young and old animals. The range of individual variation is such that in the young and old skulls one encounters similar extremes of shortness and length.

ROOTS OF M^1.—In *C. g. langi* there is constantly a minute supplementary root midway between the two main roots of the first molar. This root is so small that it but rarely has a socket in the maxillary. I have not encountered a similar structure in any other *Cricetomys*.

ACCESSORY CUSPS ON M^1.—Within the genus one finds a considerable diversity of pattern as regards the smaller molar cusps, but these can only be satisfactorily studied in skulls with unworn or little worn teeth. Thus one or two minute conules may occur on the anterior face of the first molar, but these occurrences are of no value to the systematist as they have been noted as sporadic in *C. d. emini, C. d. sanctus, C. kenyensis* and *C. ansorgei*. Minute conules may, however, characterize a race, as appears to be the case in *C. elgonis*, in which all of four specimens available to me at the present writing show the supplementary conules illustrated in figure 14.

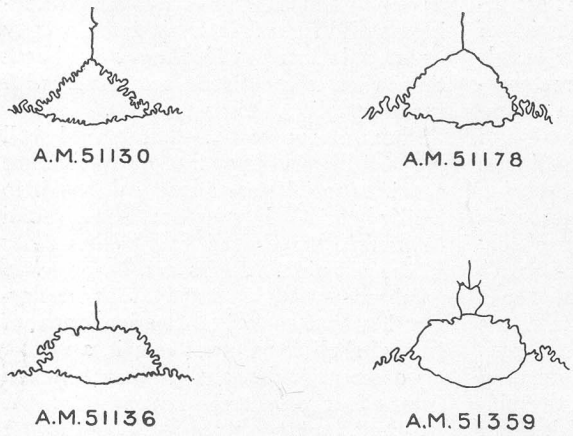


Fig. 13. Fortuitous variation in shape of the interparietal of *Cricetomys d. emini*. Numbers 51130, 51136, 51178 are females from Niapu; number 51359 a male from Medje.

CUSPS OF M^2.—The two prominent lingual cusps of M^2 may be narrow and separated by a broad U-shaped valley, as typically in the races of *C. ansorgei*, or broadly triangular and very little apart, as in *C. d. sanctus* and commonly though not invariably in *C. d. emini*. *C. g. langi* and *C. a. microtis* are intermediate between these extreme types.

The posterior buccal conule of M^2 in the course of wear becomes connected by a ridge either with the loph anterior to it, or

that medial to it. The first pattern is encountered in *C. g. langi*, the second in *C. d. emini*, *C. d. sanctus*, and other forms including *C. ansorgei* and *C. elgonis*. Whether or not the type of union encountered in *C. g. langi* is typical of the entire *gambianus* group, I am not prepared to say.

Conule of M^3.—A small conule blocks the valley of M^3 at its lingual end, in *C. g. langi*. I have also found this in *C. d. sanctus*, but in no other *Cricetomys*.

Fig. 14. Genetic variation in the left M^1 of *Cricetomys*. A, *C. g. langi*; B, *C. a. microtis*; C, *C. elgonis*.

Cricetomys gambianus langi Hatt

Assumba: Monbuttu (Emin label)

Plate XI, figures 1 and 2; Figures 14 and 15

Cricetomys gambianus langi Hatt, 1934, American Mus. Novitates, No. 708, p. 5. Type locality: Faradje, Belgian Congo. Type specimen, by original designation: adult ♂, A.M.-N.H. 51153.

1888. *Cricetomys gambianus*, Thomas (part). Proc. Zool. Soc. London, 1888, p. 10. Emin secured twelve giant rats, certain of which I refer to *C. g. langi*, others to *C. d. emini*. Thomas recognized that those from Belima differed from the rest in "grayer colour, gray instead of pure white bellies, and the less sleek character of the fur, differences which are neither sexual nor seasonal." He suggested that they were ecological, a point with which I am partly in accord.

1910. *Cricetomys gambianus dichrurus*, Osgood. Ann. Mag. Nat. Hist., (8) V, p. 281. Osgood remarked that "It seems quite possible that it [*dichrurus*] ranges well into the interior, since two specimens from Mombattu, Northern Congo (B.M. 87. 12. 1. 52–53), appear to be very closely allied to, if not identical with it. These being from the same region as *P.* [sic] *g. emini*, which is a large-toothed form, suggests the possibility that the small-toothed forms of West Africa are different from the large-toothed ones of East and South Africa."

1915. *Cricetomys gambianus dichrurus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 475. Here a specimen from Panga, in the Christy collection, is referred to this name with the remark that it was possibly a race of *ansorgei*.

1919. *C*[*ricetomys*] *gambianus grahami* Hinton (part). Ann. Mag. Nat. Hist., (9) IV, p. 284. In the description of *C. g. grahami* it was noted that "The specimens obtained by Emin Pasha in the Monbuttu are lighter colored and have thinner hair." I assume that Hinton considered these specimens as representatives of *C. g. grahami*.

Congo Expedition Specimens

Represented by fifteen skins with skulls as follows:

Faradje, 12 (4 adult ♂, 2 adult ♀, 4 juvenile ♂, 2 juvenile ♀), January 12; February 23, 26, 28; March 1, 3, 15, 28, 29; December 5.

Niangara, 3 (adult ♂), May 12; November 16; December 13.

Range.—Specimens have been examined as follows: Bellima (B.M.); Faradje (A.-M.N.H.); Kubbi (B.M.); Niangara (A.-M.N.H.).

From the above it would appear that this rat is restricted to the savannas or clearings, in contrast to *C. d. emini* which is a forest inhabiting race. In the Congo Museum is a specimen from Panga, well inside the Congo Forest, which, when I saw it, I referred to *C. g. langi*. If this identification is correct, then it would indicate that this subspecies is not limited to savanna, or that the form may occur in cleared areas well outside a normal range.

Appearance.—Color notes were made concerning an adult male taken at Faradje, December 5. The iris was described as dark brown, nearly black; the nose dark pinkish; the ears grayish inside, pinkish on the lower portion. The claws were whitish with a darker core. The distal plantar tubercles were pinkish, the proximal pair grayish.

Cricetomys dissimulus emini Wroughton

Assumbe: Monbuttu (Emin)

Figure 13

Cricetomys gambianus emini Wroughton, 1910, Ann. Mag. Nat. Hist., (8) V, p. 106.

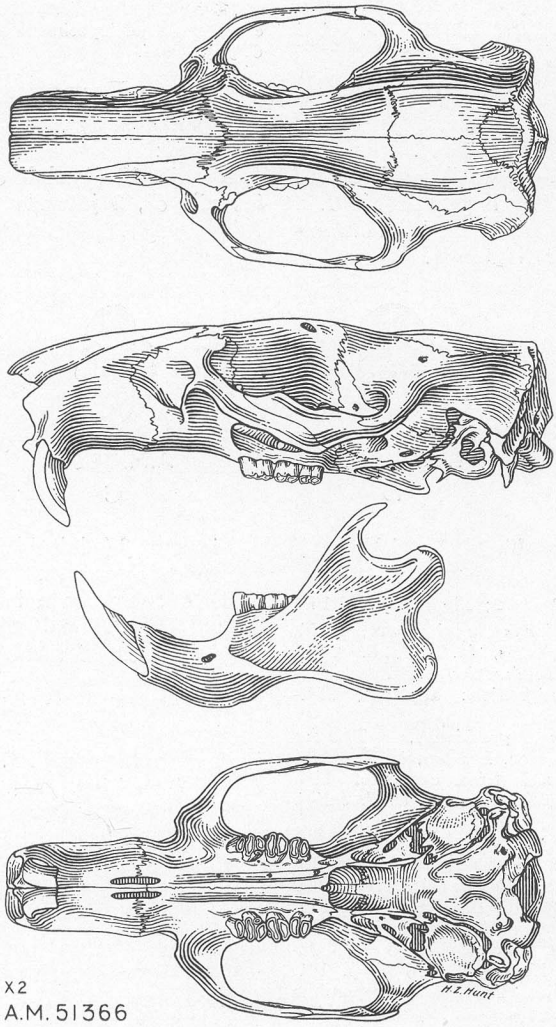


Fig. 15. *Cricetomys gambianus langi.* Male. Faradje.

Type locality: "Gadda, Mombuttu." Type specimen, by original designation: adult ♂, B.M. 87. 12. 1. 55.

1888. *Cricetomys gambianus*, THOMAS (part). Proc. Zool. Soc. London, 1888, p. 10.

1914. *Cricetomys gambianus emini*, DOLLMAN, Rev. Zool. Afric., IV, fasc. 1, p. 84, Pili Pili.

1915. *Cricetomys gambianus emini*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 475. Eighteen specimens from Medje and Poko, in the Christy collection, listed.

1917. *Cricetomys gambianus kivuensis* LÖNNBERG. Kungl. Svenska Vet. Akademiens Handl., Bd. 58, N:o 2, p. 75. The variation presented in the tooth rows of *C. d. emini* from the Ituri leads me to regard this nominal race as a synonym of the earlier named form.

1919. *C.* [*ricetomys emini*] *emini*, HINTON. Ann. Mag. Nat. Hist., (9) IV, p. 286.

1920. *Cricetomys emini emini*, SCHWARZ. Friedrich's "Ergebn. Zweit. Deutsch. Zentr. Afr. Exp. 1910–1911," I, Zool. Lief. 15, pp. 1086–1087. Five specimens from Angu.

CONGO EXPEDITION SPECIMENS[1]

Twenty-seven skins, twenty-six skulls and one skeleton were collected as follows:

Akenge, 4 (adult ♂, 3 adult ♀), September 9, 26; October 21, 30.

Bafwabaka, 1 (adult ♂), December 29.

Faradje, 1 (adult ♀), March 3.

Medje, 8 (4 adult ♂, 4 adult ♀), January 20, 21, 22; March 14; August 10, 20; September 11.

Niangara, 4 (adult ♂, 3 adult ♀), November 10, 23; December 8, 9.

Niapu, 8 (3 adult ♂, 5 adult ♀), November 9, 10, 11, 12, 15, 17, 22, 26.

Data lost: 2 skins, 1 skull.

RANGE.—I have examined specimens of *C. d. emini* as follows: Akenge (A.M.N.H.); Angu (B.M.); Arebi (M.C.B.); Bafwabaka (A.M.N.H.); Bambili (M.C.B.); Bondo (M.C.B.); Faradje (A.M.N.H.); Gadda (B.M.); Likandi River (B.M.); Mambaka (M.C.B.); Masisi (M.C.B.); Medje (A.M.N.H.; M.C.B.); Niangara (A.M.N.H.); Niapu (A.M.N.H.); Panga (M.C.B.); Pili Pili (M.C.B.); Poko (B.M.; M.C.B.); Popoie (M.C.B.); Tingasi (A.M.N.H.; B.M.).

LOCOMOTION.—Christy (1924, "Big Game and Pygmies," p. 244) believed these animals do not climb. His observance that the tip of the tail is permanently bent downward needs confirmation or possibly correction, as does the record by Allen and Coolidge (1930, "Mammals of Liberia," p. 597) that *Cricetomys* in Liberia sometimes leap forward on the hind feet alone.

DIGESTIVE TRACT.—Measurements of the intestinal tract of a freshly killed male 750 mm. in total length, secured at Medje, are:

	LENGTH	DIAMETER (FLAT)
Small intestine	1470	
Large intestine	1100	10–15
Caecum	230	32

The intestine from 40 to 80 mm. below the caecum is enlarged to a diameter (when flattened) of 25 mm. Slight constrictions in the tract occur at either end of this enlargement.

FOOD.—Stomachs of specimens taken at Medje, March 14 and August 20, contained manioc. One secured at Niangara, December 8, was noted as having vegetable matter. Termites in indeterminable number were observed in a stomach examined at Faradje, March 3.

VALUED AS FOOD.—*Cricetomys* is prized throughout its range as a source of food. Field notes of the Congo Expedition record that the Azande at Akenge utilized these rats and at Medje the rats were smoked and considered desirable storage food. The Medje obtained the rats by placing spring nooses in the burrows. Some attempt has been made in the Congo to raise these rats on a commercial scale for food purposes but the present status of the project is not known to me.

MASTOLOGY.—The mammary formula of but two specimens of *C. d. emini* was recorded by Mr. Lang. Both were mature females, both were secured at Medje. On one the mammae were given as 2–2 = 8, the other, 1–2 = 6.

Determination of the total number of mammae from the dried skins of *Cricetomys* is rarely practical, the inguinal mammae particularly being subject to obliteration in the process of preparation or drying. It has proved possible, however, to find the number of pectoral mammae in a good series of Congo Expedition skins, and in seven of these skins from the Ituri there were two pectoral pairs, in five but a single pair. In some of those in which two pairs were counted both were of equal size, sometimes both functional. In others it was obvious that only the anterior pair were functioning at the time of preparation, the pair to the rear being more or less vestigial.

Two pairs of pectoral mammae appear to be the rule in *Cricetomys*, as I have encountered this number in most of the forms examined (*ansorgei, buchanani, cosensi, elgonis, emini, kenyensis, langi, liberiae, osgoodi, poensis, sanctus, viator*). A single pair is occasionally found on some of the specimens of the forms named above (*emini, langi*). In certain forms I have not seen more than a single pair of pectoral mam-

[1] The American Museum has in its collections one of Emin's specimens (original number 2139) taken August 21, 1883, at Tingasi, which is within a few days' walk of the type locality. It is a skin in good condition although quaintly prepared with the tail curled in a loop, a string through the nose by which it was hung and dried, the arms hanging down the sides and, of course, with skull, leg bones and caudal vertebrae in their original sites.

mae, though the number of specimens examined in these cases has been small (*adventor*, *cuncator*, *proprator*).

I have no record of the number of any embryos or young from any *Cricetomys*.

MALACOMYS MILNE–EDWARDS

Big-eared Rats

Figure 16

Malacomys MILNE–EDWARDS, 1877, Bull. Soc. Philomathique, Paris, (6) XII (for 1876), part 2, p. 10. Type, by monotypy: *Malacomys longipes* Milne-Edwards.

Moult and wear of the pelage tend to alter the color and color pattern of *Malacomys* more than in most other mammals. As many as six sharply limited zones of color may occur on the dorsal surface of a moulting specimen (see Fig. 16, M.C.B. 7501, an immature male). The gray facial patch attributed to *M. l. wilsoni* appears to be nothing but such a character of wear, and is found on comparatively few specimens. A similar gray frontal patch is discernible, though never so strongly marked, in *M. l. centralis* and *Colomys goslingi*. Color in fact seems to be of no value in distinguishing races of *Malacomys*, though it is true that the deep red colors found in some skins of *M. l. longipes* cannot be matched in *M. l. wilsoni*.

Of the four nominal species of *Malacomys* it is certain that three at least are but racially differentiated. I do not hesitate to assign *centralis* and *wilsoni* as subspecies of *longipes*. As to *edwardsi* I am less certain, since I have not examined satisfactory material of this form.

As others have noted, specimens from one area show a wide range of size that indicates size alone to be valueless in diagnosing subspecies of *Malacomys longipes*. Tail color also is apt to be misleading in that, though specimens of *M. l. longipes* from the Gaboon and Cameroon usually have completely dark tails, thus contrasting with *M. l. centralis* and *M. l. wilsoni*, some specimens of the typical race also show a bicolored pattern. The chief points of distinction between the typical coastal form and *centralis* of the Ituri involve the broader molars and larger bullae of the latter, whereas *wilsoni* of the southern Congo is distinguished by its broader

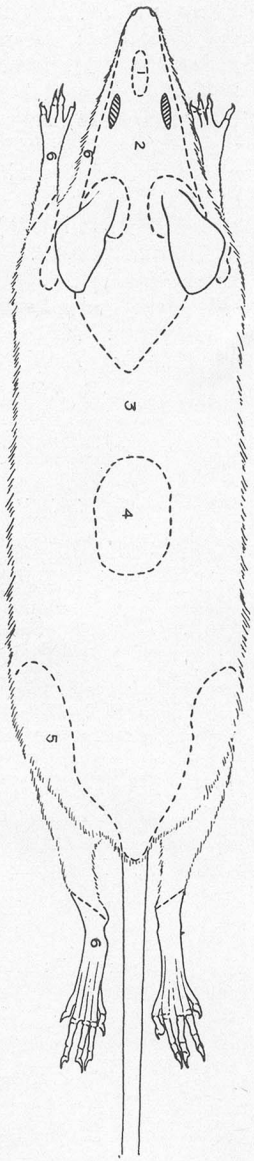


Fig. 16. Moult pattern in an immature male *Malacomys longipes wilsoni* (M.C.B. 7501) taken July 4 at Luluabourg. The areas are colored as follows: 1, gray; 2, dark brown; 3, reddish brown; 4, blackish brown (new pelage); 5, grayish brown (new pelage); 6, white.

interorbital roof, shorter palatal foramina and slightly longer feet.

Malacomys appears to be found in suitable habitats over the entire forested section of the Congo. Within the area three subspecies are represented: *M. l. longipes*, at present known only from Lake Leopold II and Kunungu; *M. l. centralis*, the range of which includes the forest from the Uelle basin and the Lualaba to western Uganda, and *M. l. wilsoni*, in the Kasai.

Malacomys longipes centralis de Winton

Maguere:Medje. Nasande:Makere. Nango: Azande (Lang). Nesanda:Tingasi (Emin)

Plate XII, figure 1; Figure 17

Malacomys centralis DE WINTON, 1897, Ann. Mag. Nat. Hist., (6) XIX, p. 465. Type locality: "Tingassi Mombuttu." Type specimen: adult ♂, B.M. 87. 12. 1. 60. Emin Pasha, collector.

1888. *Malacomys longipes*, THOMAS. Proc. Zool. Soc. London, 1888, p. 11. Emin secured two specimens at Tingasi. This genus was previously known only by a specimen from Gaboon.

1910. *Malacomys centralis*, THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, pt. 5, p. 511. Specimens from the Mpanga Forest, Fort Portal, Uganda, are recorded.

1914. *Malacomys centralis*, DOLLMAN. Rev. Zool. Afric., IV, fasc. 1, p. 85. Specimens collected by Christy are recorded from Fundi, Mambaka and Pili Pili.

1915. *Malacomys centralis*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 476. Five specimens from Medje, and twenty-one from Poko, in the Christy collection are recorded.

1928. *Malacomys centralis centralis*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 74. Two specimens recorded from Kartoushi.

CONGO EXPEDITION SPECIMENS

Forty-four skins, forty-five skulls and two specimens in alcohol were secured as follows:

Avakubi, 3 (2 adult ♂, adult ♀), June 27, 30.

Gamangui, 32 (17 adult ♂, 14 adult ♀, juvenile ♀), January 28, 29, 31; February 2, 4, 5, 6, 9, 10, 11, 18, 20.

Medje, 4 (adult ♂, 3 adult ♀), January 20; May 22; June 4.

Niangara, 4 (adult ♂, 3 adult ♀), November 24; December 1.

Niapu, 5 (2 adult ♂, 2 adult ♀, juvenile ♀), November 24, 30; December 1.

RANGE.—I have referred specimens of *Malacomys longipes* to the race *centralis* from the following Congo localities: Avakubi (A.M.N.H.); Bambara (B.M.); Buanasura (B.M.); Fundi (B.M.; M.C.B.); Gamangui (A.M.N.H.); Listmu (M.C.B.); Mambaka (M.C.B.); Medje (A.M.N.H.; B.M.; M.C.B.); Niangara (A.M.N.H.); Niapu (A.M.N.H.); Pili Pili (M.C.B.); Poko (B.M.; M.C.B.); Tingasi (B.M.).

HABITAT.—The maguere is predominantly a rat of small watercourses in the forest, though it is problematical that Mr. Lang was accurate in describing it as a water rat. The natives of the Ituri (Azande and Makere) trap these rodents by placing manioc near or in the water, and setting traps about the bait. Natives also aver that the animals occur in plantations, and indeed two were secured at Gamangui, January 29, in such a location, but in this instance the plantation was abandoned and only a few banana plants remained to indicate its former use. The area was overgrown with grass, bushes and creepers. It may be observed that the type of *M. l. wilsoni* was trapped on creepers overhanging a stream. Woosnam (1910, Trans. Zool. Soc. London, XIX, p. 511) observed that in Western Uganda, *Malacomys* appeared to inhabit only the damp and dark forests.

FOOD.—Eleven stomachs of this species were examined by the collector. All were noted as containing grayish vegetable matter, six of them exclusively this. Other matter identified was: remains of insects (4 stomachs); caterpillar (1 stomach); slug (1 stomach); medium sized toad (1 stomach).

REPRODUCTION.—Mammae, as recorded for five individuals are: 1–0–2 = 6. One other specimen was noted as with 2–0–2 = 8.

Embryos were recovered from but one individual. In that instance there were three. The examination was made January 29.

COLOMYS THOMAS AND WROUGHTON

White-bellied Wood Rat

Colomys THOMAS AND WROUGHTON, 1907, Ann. Mag. Nat. Hist., (7) XIX, p. 379. Type

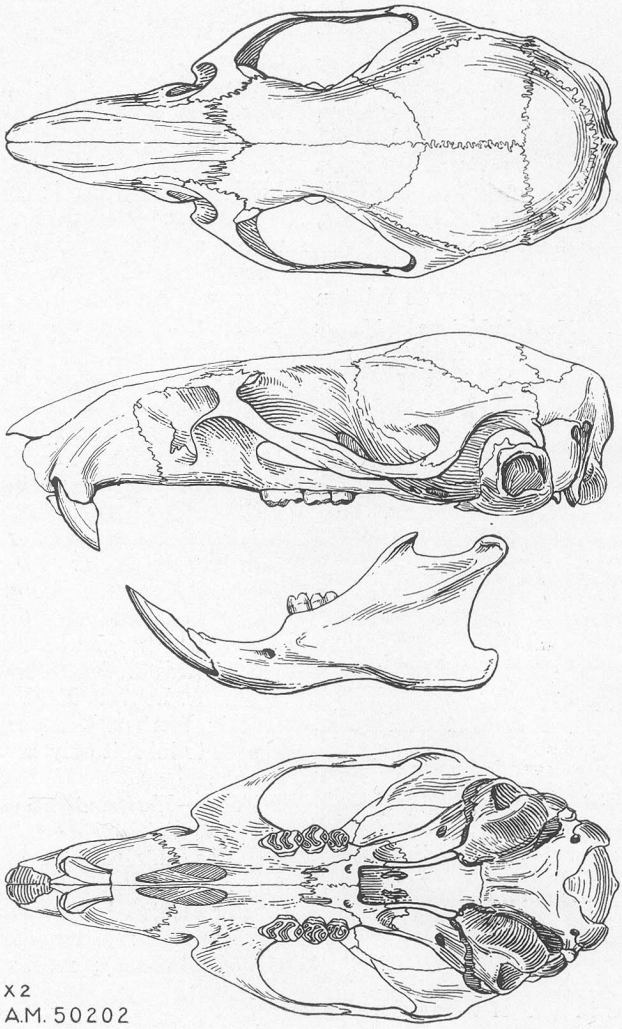


Fig. 17. *Malacomys longipes centralis.* Male. Gamangui.

by designation: *Colomys goslingi* Thomas and Wroughton.

But one of the three races of this monotypic genus occurs within the Belgian Congo. The characters distinguishing the subspecies *goslingi, bicolor* and *denti,* have recently been reviewed by Miss St. Leger (1930, Ann. Mag. Nat. Hist., (10) VI, pp. 527–528).

Colomys goslingi goslingi
Thomas and Wroughton

Congo White-bellied Wood Rat

Nsabukamsulu (Callewaert). Monbongolo (Gosling)

Plate XII, figure 2; Figure 18

Colomys goslingi Thomas and Wroughton, 1907, Ann. Mag. Nat. Hist., (7) XIX, p. 380. Type locality: "Gambi, Welle River." Type: adult ♂, B.M. 7. 7. 8. 172.

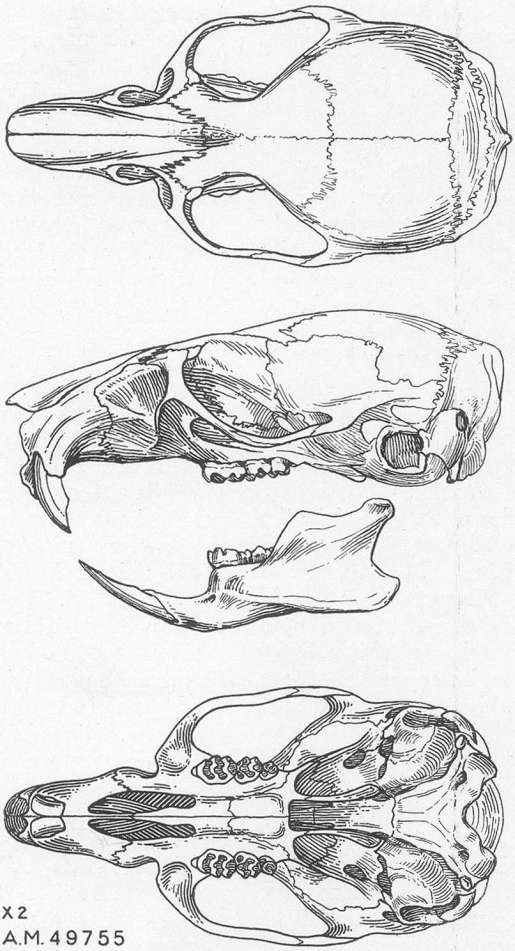


Fig. 18. *Colomys goslingi*. Male. Niapu.

1915. *Colomys goslingi*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 475. Specimens collected by Christy at Poko and Medje are listed.

1923. *Colomys bicolor*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 367. I have examined the specimen from Luebo, which Kershaw here assigned to *C. bicolor* Thomas and am convinced that it should be referred instead to *C. g. goslingi*.

1926. *Colomys goslingi*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 599. Record of twenty specimens from Luluabourg. I cannot subscribe to these authors' suggestion that the variation in color may be correlated with environmental differences.

CONGO EXPEDITION SPECIMENS

Eleven skins with skulls taken as follows:

Gamangui, 1 (adult ♀), February 18.

Medje, 8 (4 adult ♂, 2 adult ♀, juvenile ♂, juvenile ♀), March 18; April 21; May 7, 14, 28; July 18.

Niapu, 2 (adult ♂, adult ♀), January 18.

Within the Congo this subspecies is identified on generic characters. The subspecies *bicolor* of the eastern Cameroons is distinguished from the typical race by its

long, oval brain case, which is high and rounded above. *C. g. denti* of Kenya is immediately recognized by its pale-colored tail.

RANGE.—Though *Colomys* is known in the Congo only from the northeastern forests and the Kasai, it is probable that its range will eventually be found to include all the area of tropical rain forest. Where it has been found it has been comparatively rare, and has been taken only where relatively thorough collecting has been done.

I have examined sixty-six specimens representing the following localities:

Gamangui (A.M.N.H.); Gambi (B.M.); Inkongo (B.M.; M.C.B.); Luebo (M.C.-B.); Luluabourg (A.M.N.H.; B.M.; M.-C.B.); Mboga (M.C.B.); Medje (A.M.-N.H.; B.M.; M.C.B.); Niapu (A.M.N.-H.); Poko (B.M.; M.C.B.).

COLOR.—The color of an animal in the flesh (A.M.N.H. 49756 adult ♂) was noted by Mr. Lang, at Medje, May 28, in the following words: "Dark brown back, grayish brown sides, densely furred pure white lower side; fore and hind limbs above, silvery white, lower surface of fore limbs pale pinkish white. Lower surface of rear limbs pinkish brown with the exception of toes which are whitish. Claws pale brownish with white tip. The ears are dark gray with pale pinkish base. The upper vibrissae black and the lower white, but tips of some in the middle are also white; the base about the vibrissae dark blue gray, the hairy part of the nose light blue gray; septum dark pinkish. The tail above is dark gray, with a few dark hairs on tip, below lighter as there are many short white hairs."

The dorsal coloration in the Congo Expedition series shows a much broader range of variation than is found in the dozen specimens obtained by Christy. This is, in part, attributable to age. Two adult specimens from Medje contrast particularly, one matching Fuscous of Ridgeway, the other Orange-Cinnamon. The first of these individuals is a male taken March 18, the second a female secured April 21, but the remainder of the series makes it obvious that neither sex nor season is responsible for this immense difference, but age. The fuscous male had a head-body length of 115 mm. and its molars are little worn. The light female measured 130 mm. in head-body length, and has well-worn molars. Two half-grown individuals are almost identical in color with the male. The older individual has the frontal gray patch strongly marked, whereas the younger animal does not exhibit this feature at all.

Specimens from the Kasai do not differ from those of the Ituri. An adult and two young in the British Museum, secured by R. W. Hayman, at Mboga, are uniformly darker above, and less rufous than the Medje and Poko specimens in the same institution. In this respect they resemble the type and paratype of *C. g. denti*, but the similarity may be due to similar freshness of pelage more than to genetic tendencies. The tails of these specimens from the eastern Ituri resemble those of *C. g. goslingi*, not those of the Kenya representative.

The palatal foramina are occasionally (e.g., A.M.N.H. 51303) transversely divided by a bridge from the median septum.

HABITAT.—Mr. Lang's only observation on the habitat of this animal (which it is barely possible that he confused with *Malacomys* since it would be strange to call an animal common when one had secured but eight specimens in four years) is that at Medje they were "common about the brooks but found everywhere in the forest, not in the villages." Christy (Thomas, 1915, Ann. Mag. Nat. Hist. (8) XVI, p. 475) observed that *Colomys* "lives constantly at the water's edge where its elongated feet enable it to wade about on the stones and . . . it feeds on small water crustaceans and insects, not on vegetable matter." At Luluabourg, Callewaert recorded habitats of particular specimens as, water's edge; in the water; in a brook; and in the forest. It was noted of the type of *C. g. denti* that it "lives in thick forest; climbs trees."

It appears probable that both *Colomys* and *Malacomys* are inhabitants of the rain forest, that they climb, and also frequent the borders of small streams in search of food. That they swim may be inferred from the notes of various collectors and the nature of their feet. This presents a range

of locomotor habits uncommon among rodents.

The foot of *Colomys*, as noted above, spreads broadly outward. Lang noted that the toes of the hind limb turn strongly inward (medially?), so much so that the fifth toe is hidden from view.

BREEDING.—There are in two specimens, two thoracic and two abdominal mammae. A female taken April 21, at Medje, contained two embryos. The two half-grown young of the collection were taken July 18.

FOOD.—An adult ♀ secured at Medje, April 21, had some grayish vegetable matter and some insects in the stomach. (See also under "Habitat.")

ARVICANTHIS LESSON

Arvicanthis LESSON, 1842, Nouv. Tableau Règne Animal, Mamm., p. 147. Type: *Lemmus niloticus* E. Geoffroy from "Africa."

1911. *Arvicanthis*, DOLLMAN. Ann. Mag. Nat. Hist., (8) VIII, pp. 334–353. (Revision of *A. abyssinicus* group.)

1916. *Arvicanthis*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 68. Restricted.

Two species of *Arvicanthis* are known from the Belgian Congo, the short tailed *A. abyssinicus* and the longer tailed *A. testicularis*. (Braestrup, 1935, Vidensk. Medd. fra Dansk Naturh. Foren., p. 118, considers this a race of *niloticus*.)

The first of these has been divided so that within the Congo three subspecies may be recognized: *A. a. rubescens* Wroughton, typical on the east shore of Lake Albert; *A. a. centrosus* Heller of the Lado Enclave; and *A. a. rossii* de Beaux, from the upper Semliki Valley. The latter is in some respects intermediate between the other two, and my own observations suggest the Albertine rift as an area of intergradation. Thus from Beni, near to Atalia, type locality of *rossii*, come specimens (in the M.C.B.) some of which resemble *rubescens*, others *centrosus*. Specimens from the western side of the Nile drainage system, which has been supposed *centrosus* territory, are often of *rubescens* type. Such is one from Mahagi (B.M.) on the west shore of Lake Albert. Specimens referable to *centrosus* have come from Irumu and Musango (Gyldenstolpe, 1928, Arkiv för Zoologi, Bd. 20A, N:o 4, p. 74), from Adra (M.C.B. 8996 and others), Djalasinda (M.C.B. 9016 and others) and Oka (M.C.B. 9000 and others), Makoga and Kimara in the Semliki Valley (2450–2500 ft.). In American Museum collections there are seven specimens from the new post of Beni (3900 feet) which I cannot distinguish from one taken at Lulenga (6000 feet), and two from Rutshuru (4400 feet) and which could also be referred to *centrosus* or to *rosii*.

A. testicularis occurs in the northeastern Congo, in an area about midway between the type localities of two of the subspecies, *A. t. jebelae* Heller and *A. t. centralis* Dollman, to both of which Congo specimens have been assigned from time to time. It is this form which is represented in the Congo collection and which will be discussed below.

Arvicanthis testicularis centralis Dollman

Unstriped Grass Rat

Gua: Azande (Kershaw)

Figure 19

Arvicanthis testicularis centralis DOLLMAN, 1911, Ann. Mag. Nat. Hist., (8) VIII, p. 338. Type locality: "Between Chak-Chak and Dem Zubeir, West Bahr-el-Ghazal." Type: adult ♂, B.M. 8. 4. 2. 45.

1924. *Arvicanthis abyssinicus centralis*, KERSHAW. Ann. Mag. Nat. Hist., (9) XIII, p. 25. Specimens from the Yambio District, Bahr-el-Ghazal.

1925. *Arvicanthis testicularis centralis*, DE BEAUX. Atti della Soc. Ital. Sci. Nat. e del Mus. Civico Storia Nat. Milano, LXIV, p. 89. Two specimens from the upper Uelle in the Rossi collection.

CONGO EXPEDITION SPECIMENS

Five skins with skulls and one in alcohol as follows:

Aba, 1 (juvenile ♀), December 12.

Garamba, 1 (adult ♀), May 15.

Niangara, 4 (adult ♂, 2 adult ♀, juvenile ♂), November 26, 30; December 7, 17.

The Niangara specimens are uniform in color and typical of *centralis*. The Aba specimen, the smallest of the four, is considerably lighter but this is presumably an age or individual difference.

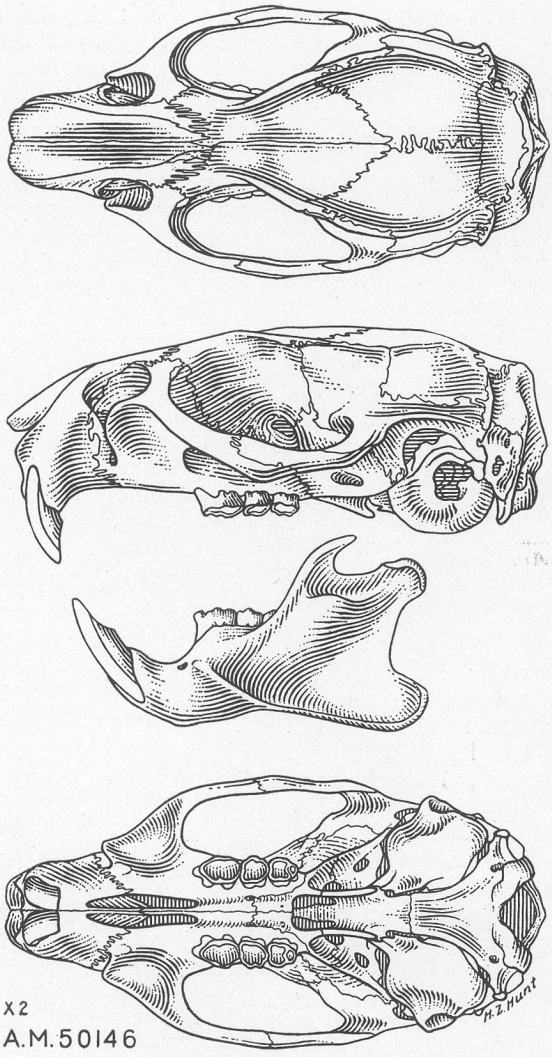


Fig. 19. *Arvicanthis testicularis centralis*. Male. Niangara.

Two specimens in the British Museum, collected at Malek along the "Congo-Nile Watershed," by Shaw, and a third from the "Sudan Congo, Prov. Congo," may also be assigned to this race.

A specimen from Rungu in the Congo Museum (M.C.B. 9068) is of this subspecies as are six from Mauda.

There is a considerable superficial resemblance between these grass rats and those of the genus *Mylomys* of the same area. These latter, however, are less finely grizzled, less orange, more yellow colored, and have considerably longer hair.

LEMNISCOMYS TROUESSART

Lemniscomys TROUESSART, 1881, "Catalogue des Mammifères Vivants et Fossiles. Roden-

tia." Bull. Soc. d'Études Scientifiques d'Angers, X, 2e fasc., p. 124. Type species, by subsequent designation (Thomas, 1916, Ann. Mag. Nat. Hist., (8) XVIII, p. 68): *Mus barbarus* Linnaeus.

Within the Congo occur three groups of *Lemniscomys:* the many-lined *L. barbarus;* the striped and spotted *L. striatus;* and *L. griselda,* which bears a single median line but is otherwise self-colored, or but obscurely spotted. The latter occurs only in the southern Congo and is, in consequence, not represented in the collection of the Congo Expedition.

Lemniscomys striatus striatus
(Linnaeus)

Punctated Grass Mouse

Batéké: Tshumbiri (Lang notes)

Schibakala or Nshunbautande: Luluabourg (Callewaert labels)

Plate VIII, figure 2

Mus striatus LINNAEUS, 1758, "Systema Naturae," 10th Ed., I, p. 62. Type locality (as restricted by Thomas, 1911. Proc. Zool. Soc. London, p. 148): Sierra Leone. Type: unknown.

1915. *Arvicanthis striatus,* THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 479.

1915. *Arvicanthis micropus,* THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 479. See other notes.

1923. *Lemniscomys striatus,* KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 368.

1926. *Lemniscomys luluae,* MATSCHIE. Zeitschrift für Säugetierkunde, Bd. I, p. 112. Type locality: "Schibakala,[1] near Luluabourg," Kasai District, Belgian Congo. Cotypes[2] N.M.B. 3960 and 3961.

CONGO EXPEDITION SPECIMENS

Represented by 48 skins with skulls and 7 in alcohol as follows:

Avakubi, 15 (6 adult ♂, 9 adult ♀), October 1, 2, 5, 6, 7, 9, 10.

Bafwabaka, 4 (2 adult ♂, juvenile ♂, juvenile ♀), January 3; December 29, 31.

Bafwasende, 2 (adult ♀), September 25.

Boyulu, 1 (juvenile ♀), September 22.

Faradje, 3 (adult ♂, 2 adult ♀), February 20, 22; April 2.

Gamangui, 1 (adult ♀), February 10.

Medje, 2 (adult ♂, adult ♀), January 16; July 2.

Niangara, 8 (5 adult ♂, 2 adult ♀, juvenile ♀), November 10, 17, 18, 26; December 2.

Stanleyville, 18 (2 adult ♂, 8 adult ♀, 3 juvenile ♂, 5 juvenile ♀), August 12, 13, 14, 17, 18, 19, 20, 25, 26, 27, 28.

Tshumbiri, 1 (juvenile ♂), July 15.

The punctated grass mice of the northeastern Congo present a problem in the evaluation of size differences that must remain for the time completely unsolved. In such good series as those obtained by Christy and by the Congo Expedition the greater number of specimens are of comparatively large size and have long feet. A few specimens, however, are encountered which though adult and with well-worn teeth, are distinctly smaller than the average of the collection.

Through a broad section of Central Africa two species of these mice occur in the same region, possibly in the same habitats. These are the larger *L. striatus* and the smaller *L. macculus.* Thomas recognized a Uelle representative of this latter and named it *L. m. akka.* Heller recorded the presence of two forms of this group in the Lado and, whereas he obviously intended to name the smaller one as new, he erroneously selected as type a specimen of the larger form. Hollister (1919, Bull. U.S.N.M., No. 99, p. 138) noted this and identified the smaller specimens as typical *macculus.* Thomas (1915, Ann. Mag. Nat. Hist., (8) XVI, p. 479) had, however, recognized in the Christy collection not only a specimen of *L. m. akka* and twenty of *L. striatus* but also two from Poko, intermediate in size, which he referred to *L. micropus* (Heller). I have examined the same specimens that were studied by Thomas and agree as to the apparent distinctness of these groups, as seen in his series. In the Lang–Chapin series there are no specimens that can be referred to *L. m. akka,* but there is one skin with skull of an old adult which is identifiable with those two specimens from Poko which Thomas assigned to *L. micropus* (Heller). A consideration of all specimens in the Congo collection does not, however, give me great confidence in the genetic purity of line of these odd specimens and for the present I prefer to assign them to the common species.

[1] Matschie appears to have mistaken a native name of the rat, for a locality.

[2] I am indebted to Doctor Jean Roux of Basel for this information.

The series of specimens collected at Rhino Camp by Loring, on part of which Heller founded the unrecognized race *micropus* and which Hollister (U.S. Nat. Mus. Bull. 99, part 2, pp. 138–142) in turn divided into representatives of the smaller *L. macculus* and the larger, more abundantly represented *L. striatus massaicus*, was loaned to me for comparison with the Congo Expedition series. It is evident to me that the larger specimens of the two (U.S.N.M. and A.M.N.H.) collections represent respectively *Lemniscomys s. striatus* in the Uelle and *L. s. massaicus* in the Lado. It is also clear that the two Lado specimens assigned by Hollister to *L. m. macculus* are, in foot character, similar to the odd Congo Expedition specimen referred to above. In characters other than foot length, however, the gap between the medium-sized form (*macculus* Hollister) and the larger forms (*striatus* Hatt; *massaicus* Hollister) tends to become bridged. In coloration particularly, the medium-sized specimens tend to match the larger from their same localities better than they do those of equal size from the other locality. This might be construed as the best of evidence that but a single race is involved in any one locality, and probably this is the case.

As to *L. m. akka* (Thomas), it may be observed that it is known by but few specimens, none of which, at the time of writing, are in this country. The type was collected by Emin at Tingasi; Christy secured a specimen at Poko. In the Musée du Congo Belge are several specimens which are tentatively identified as *L. m. akka*. Of these six are from Mauda, two from Rungu and one from Abimva. Gyldenstolpe (Arkiv för Zoologi, Bd. 20A, N:o 4, p. 74) reports two secured at Kasindi. It is my present belief that *L. m. akka* is a valid race, separable not alone on size characters but also on that of coloration.

Admittedly the evidence is too fragmentary for one to give more than a preliminary review and statement of conclusions, but the tentative recognition of two forms will do more to stimulate collecting of new specimens than will the relegation of all the nominal small races into the synonomy of the earlier described animal, when complete intergradation remains to be demonstrated.

The two "size species" and the intermediate sized specimen from the Congo Expedition as represented at one locality, contrast as follows:

	akka	49597	*striatus*
Head and body	c.100	102	c.110
Tail	c. 95	110	c.134
Foot	c. 21 s.u.	24 c.u.	c. 28 c.u.
Condylo-incisive length skull	c. 24.5	24.6	c. 28.0
Crown length upper molar row	c. 4.5	4.5	c. 5.0
Width M^1	1.5	1.6	1.7
Color	more cinnamon	—alike—	

Size species such as these in *Lemniscomys* and *Thamnomys kuru* when known by few specimens and when an ecological and geographical separation between them remains to be demonstrated are, justly, apt to be discounted by those not familiar with the material; yet one must not lose sight of similar instances, as, for example, those among birds where no one could deny the complete distinction of the greater and lesser scaup ducks (*Marila marila* and *M. affinis*) and the yellow-legs (*Totanus flavipes*) and greater yellow-legs (*Totanus melanoleucus*). I know of no authentic instance of THREE animals, closely similar, except as to size occurring together, but in Leelanau County, Michigan, occur three forms of *Peromyscus* which are not always easily separated. Further material might lead me to recognize the intermediate *Lemniscomys* as a valid form but I have not as yet encountered sufficient numbers of specimens which could not be clearly referred to one of the two forms.

A similar problem presented by the *L. barbarus* group is discussed below.

Possible explanations of the presence of such "intermediate" specimens are: (a) hybridization between *akka* and *striatus;* (b) gigantism in *akka;* (c) dwarfism in *striatus;* (d) ecological subspeciation from *striatus*, or, less logically, *akka*.

In the Congo collection series there are about seven post-juvenile specimens which have relatively small feet and small skull,

but with the exception of the odd specimen discussed above, these all have little-worn teeth. Several quarter-grown young in the lot are assigned to *striatus* strictly on the ground of numerical probability.

A good series of topotypes of *L. luluae* Matschie,[1] present in the American Museum collections, are no different so far as I can determine, from *L. striatus* as it occurs in the Uelle, and I have in consequence considered Matschie's name invalid.

RANGE.—An extremely wide range in the Belgian Congo is indicated by specimens which I have examined from the following localities: Aruwimi (M.C.B.); Avakubi (A.M.N.H.; B.M.; M.C.B.); Bafwabaka (M.C.B.); Bafwasende (A.M.N.H.); Basongo (A.M.N.H.; M.C.B.); Boyulu (A.M.N.H.); Beni (M.C.B.); Berilio (or Beritio) (B.M.); Bosabangi (M.C.B.); Bulembo (M.C.B.); Buta (M.C.B.); Eala (M.C.B.); Elisabetha (M.C.B.); Elombo (M.C.B.); Faradje (A.M.N.H.); Gadoa (B.M.); Gamangui (A.M.N.H.); Ganda Sundi (M.C.B.); Inkongo (B.M.); Irumu (M.C.B.); Kalamhobe (M.C.B.); Kassala (B.M.); Kinembo (B.M.); Kisambi (M.C.B.); Kodja Hill (B.M.); Koteli (M.C.B.); Kunungu (M.C.B.); Kwamouth (M.C.B.); Luebo (M.C.B.); Luluabourg (A.M.N.H.; B.M.; M.C.B.); Lunda (M.C.B.); Lusambo (M.C.B.).

Macaco (M.C.B.); Makala (B.M.); Maksia (M.C.B.); Mboga (B.M.; M.C.B.); Mbula (M.C.B.); Medje (A.M.-N.H.; M.C.B.); Moera-Beni (M.C.B.); Ndongo (B.M.); Ngombi (M.C.B.); Niangara (A.M.N.H.).

Pili Pili (M.C.B.); Poko (B.M.; M.C.B.); Rondu (M.C.B.); Stanleyville (A.M.N.H.); Tingasi (B.M.); Tshopo Falls (M.C.B.); Upper Tshuapa (M.C.B.); Tshumbiri (A.M.N.H.); Yambuya (M.C.-B.); Zambi (B. M.); Zambo (M.C.B.).

REPRODUCTION.—Breeding notes made by the collectors included but three consecutive months, August, September and October, in each of which embryos were recorded; four embryos in three instances, three embryos in two other records. The mammary formula of 2–2 = 8 is indicative that four young are about the normal number.

The following table records each case noted in the field catalogue in which reproduction was referred to.

DATE	LOCALITY	H-B LENGTH OF MOTHER	NUMBER OF EMBRYOS
August 18	Stanleyville	107	4
August 19	Stanleyville	108	4
August 20	Stanleyville	109	3
September 25	Bafwasende	122	3
September 25	Bafwasende	122	4
October 2	Avakubi	115	0
October 2	Avakubi	113	4
October 10	Avakubi	126	0

Five equal-aged young, probably of the same litter, were brought in August 25, at Stanleyville. The average head-body length of three was 54 mm. The young of the collection whose dates and head-body measurements are given below indicate continuous breeding activity from at least June to December.

DATE	LOCALITY	H-B LENGTH
July 15	Tshumbiri	82
August 13	Stanleyville	91
August 25	Stanleyville	52
August 25	Stanleyville	53
August 25	Stanleyville	58
November 10	Niangara	57
December 29	Bafwasende	84
December 29	Bafwasende	85

HABITAT.—At Tshumbiri, July 15, one of these mice was caught during the burning of some bush grass. Mr. Lang observed at Avakubi, October 1, that the punctated grass mice were common near the road and in patches of grass, not in the forest.

FOOD.—A stomach examined August 19, at Stanleyville, contained vegetable matter and insects. This was a gravid adult female.

Lemniscomys barbarus zebra (Heuglin)

Sika: Azande (Kershaw)

Figure 20

Mus zebra HEUGLIN, 1864, Nov. Act. Acad. Caesareae Leopoldino-Carolinae Germ. Nat.

[1] It is appropriate to observe that *Pelomys luluae* Matschie, which I (1935, Amer. Mus. Novitates, No. 790, p. 4) once considered distinct, is obviously a synonym of *P. frater* Thomas.

Curiosorum, XXXI, Abhandl. No. 7, p. 10. Type locality: "Lande der Req-Neger, Djur und Bongo," Bahr-el Ghazal.

1888. *Mus (Isomys) barbarus*, THOMAS (part). Proc. Zool. Soc. London, 1888, p. 11.

1924. *Lemniscomys zebra*, KERSHAW. Ann. Mag. Nat. Hist., (9) XIII, p. 25. Specimens from Malek and the Congo-Nile watershed.

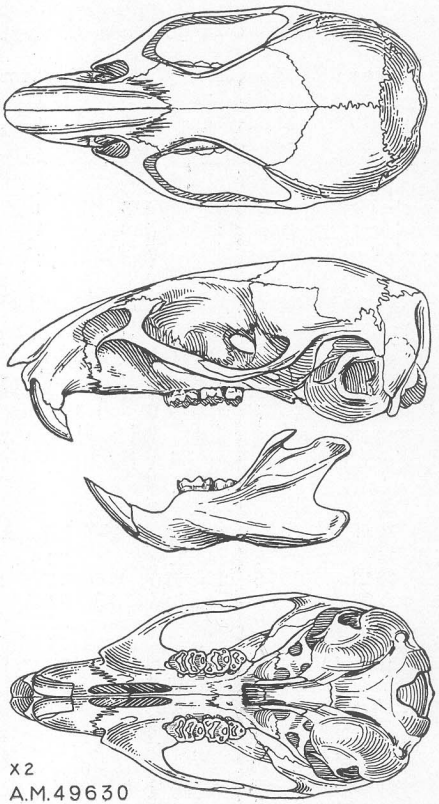


Fig. 20. *Lemniscomys barbarus zebra*. Male. Faradje.

CONGO EXPEDITION SPECIMENS

Represented by 20 skins with skulls and five in alcohol (the juveniles here identified largely arbitrarily), as follows:

Faradje, 21 (7 adult ♂, 11 adult ♀, juvenile ♂, 3 juvenile ♀), February 19, 20, 21; March 1, 14, 15, 16; April 7, 11, 19; December 19.

Garamba, 2 (adult ♂), May 14.

Niangara, 2 (juvenile ♀), November 14; December 7.

Congo Expedition specimens of the *Lemniscomys barbarus* group may be sorted into what appears to me to be three natural groups whose principal diagnostic features compare as follows:

	A	B	C
Head-body length (approximate)	90.0	100.0	80.0
Tail length (approximate)	130.0	130.0	115.0
Foot length	25.0	25.0	23.0
Greatest skull length	27.5	27.2	26.6
Length upper molar row	4.8	5.1	4.6
Width M^1	1.6	1.8	1.6
General color	dark	pallid	dark
Facial stripes	present	absent	present
Pelage	hispid	very hispid	hispid

Of group "A" there are fifteen adult specimens, two each of the others.

The smallest of these three ("C") corresponds rather closely in its status as a distinct taxonomic unit to the smallest form of the *striatus* group occurring in the nearby forest. The palid form ("B") I probably would consider a pelage phase of group "A" were it not that I found it corresponding very closely to the type of *L. dunni nubalis*, to which it was directly compared. I thus prefer to recognize three forms of the *barbarus* group from the savannas at Faradje. That a more conservative individual or one with a greater series of specimens than have been available to me might lump all three together as fortuitous variations of a single subspecies, I readily admit, but such a procedure would, I believe, with the present evidence, but mask the simple assortment of characters as they have presented themselves and tend to smother rather than encourage further investigation of the problem of speciation, or it may be ecologic segregation in this region.

Specimens of each of these three groups were compared with types and other material in the British Museum. At that time I made the nominal assignments used in this paper, from which arrangement I have not had reason to diverge.

For the commonest form I have adopted *zebra* as the name on the single basis that it corresponds to the majority of specimens

from the region so labelled in other museums. Heuglin's original description is inadequate for identification and I do not know of the existence of the type. The groups may then be identified as follows:

"A"—*Lemniscomys barbarus zebra* Heuglin
"B"—*Lemniscomys dunni nubalis* Thomas and Hinton
"C"—*Lemniscomys oweni orientalis* Hatt

RANGE.—The subspecies within the Congo is apparently restricted to the savannas as is indicated by the following locality records: Congo-Nile watershed (B.M.); Faradje (A.M.N.H.; M.C.B.); Garamba (A.M.N.H.); Luebo (M.C.B.); Lusambo (M.C.B.); Niangara (A.M.N.H.).

REPRODUCTION.—The mammary formula of *L. b. zebra* is 2–2 = 8. Young were taken as follows:

November 14, Niangara. H-B length 51 mm.
December 7, Niangara. H-B length 66 mm.
February 19, Niangara. H-B length 75 mm.

This is, of course, not to be construed as indicative of the rate of growth but merely that these mice breed at least throughout November to January.

FOOD.—In the stomach of an adult female taken February 21, at Faradje, was manioc and green vegetable matter.

Lemniscomys dunni nubalis Thomas and Hinton

Lemniscomys dunni nubalis THOMAS AND HINTON, 1923, Proc. Zool. Soc. London, 1923, p. 267. Type locality: Talodi, Nuba Country, Southern Kordofan. Type: adult ♂, B.M. 18. 7. 2. 14.

CONGO EXPEDITION SPECIMENS

Represented by three skins with skulls (the juvenile questionably so assigned) as follows:

Faradje, 3 (2 adult ♀, juvenile ♀), January 8; March 16; April 5.

These specimens, if my viewpoint is correct, demonstrate an unusually extensive southward distribution for a rodent of Kordofan.

A discussion of the relation of these specimens to *L. b. zebra* is given above.

Lemniscomys oweni orientalis Hatt

Nage or Nadje (Emin label)

Lemniscomys oweni orientalis HATT, 1934, Amer. Mus. Novitates, No. 790, p. 2. Type locality: Faradje, Belgian Congo. Type: adult ♂, A.M.N.H. 49626.

1888. *Mus (Isomys) barbarus*, THOMAS (part). Proc. Zool. Soc. London 1888, p. 11.

CONGO EXPEDITION SPECIMENS

Represented by two skins with skulls, as follows:

Faradje, 2 (adult ♂), February 20; March 16.

Another specimen (A.M.N.H. 2150) was secured by Emin Pasha at Tingasi, July 15, 1883. A specimen (B.M. 87. 12. 1. 68) taken by the same collector at Wadelai may be this species. Emin noted that at Tingasi this mouse was found on the edge of the forest.

For a discussion of the small form of striped *Lemniscomys*, see under *L. b. zebra*.

HYBOMYS THOMAS

Back-striped Mice

Hybomys THOMAS, 1910, Ann. Mag. Nat. Hist., (8) V, p. 85. Type, by monotypy: *Mus univittatus* Peters.

Within the Congo, the common west African forest *Hybomys univittatus* remains uniform except in the eastern highlands, where a subspecies, *H. u. lunaris* (Thomas), is differentiated. Specimens occurring on the Kivu are darker and larger skulled than those from Ruwenzori, the type locality of *H. u. lunaris*, and should probably be named as another subspecies.

Hybomys univittatus univittatus (Peters)

Ediapu: Niapu (Lang label). Tibo: Monbuttu (Emin)

Plate X, figure 2; Figure 21

Mus univittatus PETERS, 1876, Sitzber. der physikalisch-mathematischen Klasse. M. B. Akad. Berlin, p. 479. Type locality: "Dongila (Gaboon)."

1888. *Mus univittatus*, THOMAS. Proc. Zool. Soc. London, 1888, p. 12. Emin obtained two specimens at Tingasi, one at Gadda.

1893. *Mus (Isomys) univittatus*, TULLBERG. Nova Acta Reg. Soc. Upsala, (3) XVI, p. 20.

1897. *Mus univittatus*, PUCHERAN. Ann. Sci. Nat., (8) IV, p. 4. A specimen from

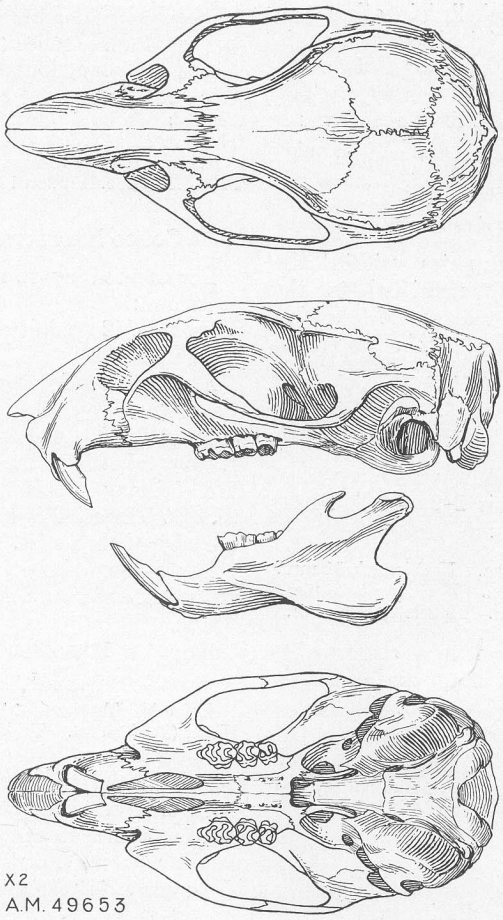


Fig. 21. *Hybomys univittatus*. Male. Medje.

Samkitta, Ogôoué, French Congo, secured by M. Marche.

1910. *Mus univittatus*, Thomas and Wroughton. Trans. Zool. Soc. London, XIX, part 5, p. 505. Two specimens taken on the lower north slope of Ruwenzori were referred to the typical subspecies, as was another from the Mpanga Forest, Fort Portal (5000 feet) and one from the Ituri Forest (2500 feet).

1914. *Hybomys univittatus*, Dollman. Rev. Zool. Afric., IV, fasc. 1, p. 84. Here are recorded thirteen specimens secured by Dr. Christy at Fundi, Mambaka, Pili Pili and Bafwasende. The variation in coloration and definity of the dorsal stripe are attributed to bleaching.

1915. *Hybomys univittatus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 479. Ten specimens collected by Christy at Avakubi, Medje and Poko, are recorded.

1916. *Hybomys univittatus*, Thomas. Ann. Mag. Nat. Hist., (8) XVIII, p. 239. A single specimen was secured by Wilson at Inkongo. It is singular that in the large series of rodents known from Luluabourg, no *Hybomys* have been reported.

1923. *Hybomys univittatus*, Kershaw. Rev. Zool. Afric., XI, fasc. 4, p. 368. A specimen collected by Dr. Schouteden at Ganda Sundi is mentioned.

Congo Expedition Specimens

Represented by 32 skins with skulls as follows:

Avakubi, 12 (3 adult ♂, 6 adult ♀,

juvenile ♂, 2 juvenile ♀), October 2, 3, 8, 9, 11, 12, 23.

Bafwasende, 5 (2 adult ♂, 3 adult ♀), September 25.

Gamangui, 1 (adult ♀), January 22.

Medje, 5 (4 adult ♂, adult ♀), January 19, 21; June 17, 24.

Ngayu, 1 (adult ♀), December 14.

Niangara, 4 (2 adult ♂, 2 adult ♀), November 21, 24, 26; December 17.

Niapu, 3 (adult ♀), January 17; November 30; December 1.

Stanleyville, 1 (adult ♀), August 19.

Also in the American Museum collection are nine specimens from Lukolela which were secured by Messrs. Chapin and Edson.

RANGE.—The range of *Hybomys univittatus* extends southward and eastward from the type locality through all of the rain forest. In the Ruwenzori range and the Kivu volcanoes, the species is represented by a mountain subspecies. Throughout its range *Hybomys* appears to be a common animal, for it is well represented in the larger mammal collections. I have personally examined specimens from the following Congo localities.

Avakubi (A.M.N.H.; M.C.B.); Bafwasende (M.C.B.); Baka Mbulu (M.C.B.); Bambara (B.M.); Campi ya Wambutti (M.C.B.); Fundi (M.C.B.); Gadda (B.M.); Ganda Sundi (M.C.B.); Gurra country (B.M.); Inkongo (B.M.); Ituri Forest, 2500′–3700′ (B.M.); Koteli (M.C.B.); Lac Leopold II (B.M.); Lobi (B.M.); Lukenie River (B.M.); Mambaka (B.M.; M.C.B.); Medje (M.C.B.); Mussaka (B.M.); Pili Pili (B.M.; M.C.B.); Poko (B.M.; M.C.B.); Stanleyville (M.C.B.); Tchimbangu (B.M.); Tingasi (B.M.).

FOOD.—At Medje, Mr. Lang observed that these rats which were found everywhere in the forest, far from the village, fed, among other things, on "the red fruit of a lily-like plant of which chimpanzees are so fond." Bates (1905, P.Z.S., I, p. 83) wrote of this species in the Cameroons that "it is reputed to be the most destructive of all [Muridae] to cassava-roots. It is the animal proverbial for greediness as the pig is among us."

REPRODUCTION.—There are two pairs of abdominal mammae, as noted on 13 females of this collection, and four from Lukolela. Lang found embryos as follows:

January 21, Medje. H-B length of mother 114; 1 large embryo.

January 27, Gamangui. H-B length of mother 126; 2 large embryos.

September 25, Bafwasende. H-B length of mother 127; 2 embryos.

October 2, Avakubi. H-B length of mother 129; 3 embryos.

HABITS.—These mice live in and by water and swim with facility, according to Emin (Thomas, 1888, p. 12).

MYLOMYS THOMAS

Swamp Rats

Mylomys THOMAS, 1906, Ann. Mag. Nat. Hist., (7) XVIII, p. 224. Type, by original designation: *Mylomys cuninghamei* Thomas.

In the Congo, *Mylomys* is known only in the Uelle District, and only by the species *alberti*. *Mylomys dybowskii* (Pousargues) has its type locality near the border of the Belgian Congo, and is probably a northern representative of the Congo species.

The genus, as noted by Hollister (U.S. Nat. Mus. Bull. 99, part 2, p. 125) is not strongly founded, inasmuch as some members of the genus *Pelomys* (e.g., *frater*) approach the dental pattern of typical *Mylomys*.

Mylomys dybowskii alberti Thomas

Bristly-haired Rat (Lang note)

Figure 22

Mylomys alberti THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 148. Type locality: "Poko, Upper Welle," Congo. Type: 19. 5. 8. 146.

1915. *Mylomys alberti*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 479. Two specimens, including the type, from Poko are listed. Collector's measurements of the type are given.

1928. *Mylomys alberti*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 74. A specimen from Irumu is recorded.

CONGO EXPEDITION SPECIMENS

Represented by 21 skins with skulls, and five in alcohol as follows:

Faradje, 18 (8 adult ♂, 8 adult ♀, 2 juvenile ♂), February 9, 18, 19, 20, 21, 22, 24; April 15.

Garamba, 2 (adult ♂), March 15.

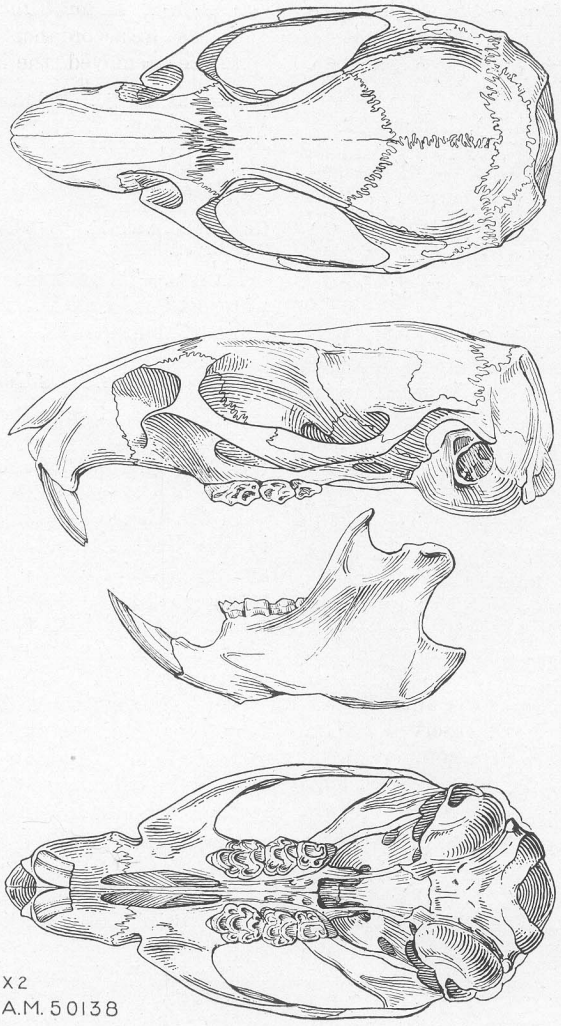


Fig. 22. *Mylomys dybowskii alberti.* Male. Faradje.

Niangara, 6 (2 adult ♂, 3 adult ♀, juvenile ♂), November 23; December 7, 11, 12, 21, 30.

Locality (?), adult in alcohol.

Specimens in the Congo Expedition series differ from the type in lacking a prominent yellow eye ring, but are otherwise typical.

In the Congo Museum are the cotype and topotype and three specimens collected at Mauda. Gyldenstolpe reports a specimen from Irumu.

Though I have not personally examined the cotypes of *Golunda dybowskii* Pousargues, I have, through the courtesy of Dr. Rode, an excellent photograph of one of these (1892-1591, which I here designate the lectotype)[1] seen in palatal view. As seemed evident from Pousargues' good description, it is clearly a member of the

[1] The lectotype, a female, is preserved in the Paris Museum as a study skin and skull. The skin is in poor condition. Another of the original cotypes, No. 1892-1054, sex unknown, is a mounted specimen, and a poor skull with greatly worn teeth.

genus *Mylomys* and is not to be distinguished on dental grounds from *M. alberti*. For this reason I have considered the relationship between the two as subspecific.

APPEARANCE.—An adult male (No. 50451) secured December 30, at Niangara was described by Mr. Lang as follows: "Nose pinkish, eyes rather small. The ears are broad and rounded, their innerside the color of the hair that densely covers them with the exception of the deeper situated portions which are dark gray. The outside of the ears dark brownish. The pads of the forelimb pinkish, the underside of fingers slightly grayish. The pads of the hindlimbs dark brownish throughout. The claws are darkish."

ANOMALY.—One specimen in the Congo Expedition collection (No. 50130) is more or less symmetrically piebald, the normal color on both shoulders and flanks, and a spot in the middle of the back, being replaced by Cinnamon-Buff. The regular distribution of the pattern suggests a mutation rather than a condition analogous to leucoderma or a regenerative anomaly.

HABITAT.—Mr. Lang observed that at Niangara these rats were common in the high grass. It may be observed that *Mylomys dybowskii* was referred to by the describer, probably quoting the collector, as "rat du marais."

REPRODUCTION.—Two specimens have two pairs of pectoral, two pairs of abdominal mammae.

STOCHOMYS THOMAS

Water Rats (Lang)

Stochomys THOMAS, 1926, Ann. Mag. Nat. Hist., (9) XVII, pp. 174 and 176. Type species: *Dasymys longicaudatus* Tullberg.

The genus is monotypic, the species divisible into but two subspecies, the typical form of which is from the Cameroons, and *S. longicaudatus ituricus* from Medje, Belgian Congo.

DeWinton was in error in redescribing and renaming *Dasymys longicaudatus* Tullberg under the name of *Mus sebastianus* on the grounds that the species in question was not a *Dasymys* but a *Mus*, and Tullberg's name hence a homonym of *Mus* [*Oryzomys*] *longicaudatus* Bennett. Thomas, in accordance with more recent practice, removed the species from the genus *Mus* to *Epimys*, later erected the genus *Stochomys* for the species, and reinstated Tullberg's name. Though Article 36 of the International Rules states that a rejected homonym cannot be used again, Thomas was justified in reëstablishing Tullberg's name since de Winton was not correct in his generic assignation of the species.

Stochomys longicaudatus ituricus (Thomas)

Ditapa (Wilson label). Nkosamalebe (Callewaert label). Water Rat (Lang)

Plate XIII, figure 1; Figure 23

Epimys longicaudatus ituricus THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 149. Type locality: "Medje, Upper Ituri." Type: B.M. 19. 5. 8. 120.

1914. *Epimys sebastianus*, DOLLMAN. Rev. Zool. Afric., IV, fasc. 1, p. 81. Specimens from Fundi, Pili Pili and Mambaka are noted.

1915. *Epimys* (*Aethomys*) *longicaudatus ituricus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 477. Specimens were taken by Dr. Christy at Medje and Poko.

1916. *Rattus* (*Aethomys*) *longicaudatus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 238. A specimen from Inkongo.

1923. *Rattus* (*Aethomys*) *longicaudatus*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 366. A specimen from Luebo is recorded.

1926. *Stochomys longicaudatus*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 591. Specimens from Luluabourg.

CONGO EXPEDITION SPECIMENS

Represented by 19 skins with skulls, as follows:

Gamangui, 1 (adult ♀), February 21.

Medje, 12 (5 adult ♂, 6 adult ♀, juvenile ♀), January 20, 21, 22, 23; March 13, 18; May 26; June 4; August 14.

Ngayu, 3 (adult ♂, 2 adult ♀), December 12, 23, 24.

Niangara, 1 (adult ♀), December 11.

Stanleyville, 2 (adult ♂, adult ♀), August 12, 13.

Specimens from Luluabourg more closely approach the Ituri subspecies than that of the Cameroon and I have referred Kasai specimens to the Ituri form. It will be noted from measurements published here that larger specimens are found among the

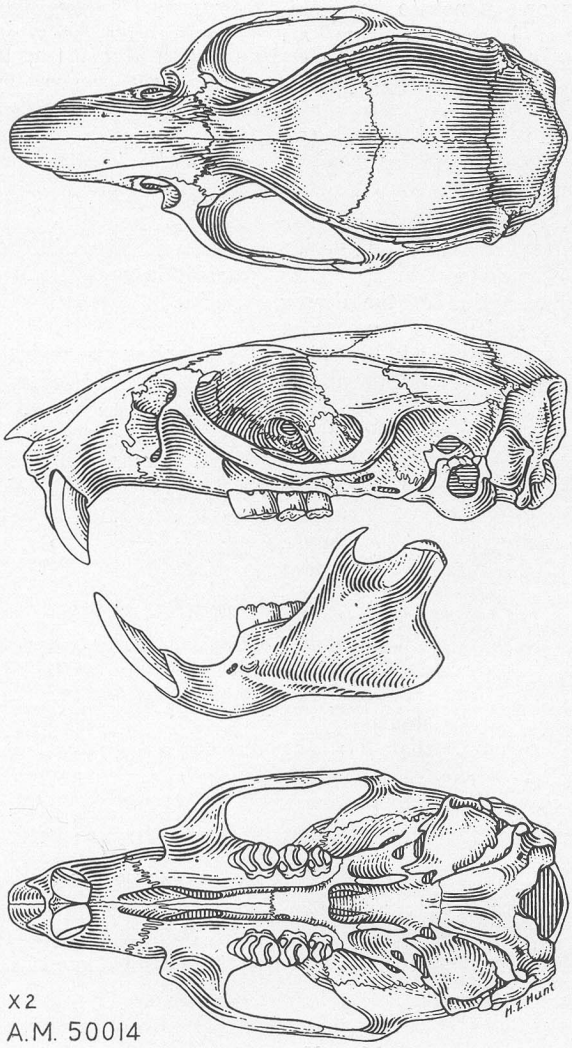


Fig. 23. *Stochomys longicaudatus ituricus.* Male Medje.

Luluabourg series than among those secured in the eastern Congo. Luluabourg would in fact have been a better locality from which to describe a Congo subspecies than was Medje, for Kasai specimens are more greatly differentiated from the Cameroon animals than are those of the Ituri. The larger size and paler coloration which Thomas credited to *S. l. ituricus* are well founded but his observation that it differed from the typical form in having a white undersurface to the terminal half of the tail was due to inadequate material. Specimens from southern Cameroons are commonly similarly marked, and in a series from the type locality of *S. l. ituricus* there is great variation in the degree of lightening.

RANGE.—I have examined specimens from the following Congo localities: Baka

Mbuli (M.C.B.); Bwanasura (B.M.); Gamangui (A.M.N.H.); Inkongo (B.M.); Ituri River, 3500 feet (B.M.); Irumu, 50 miles S.W. of (B.M.); Lac Leopold II (B.M.); Luebo (M.C.B.); Luluabourg (A.M.N.H.; B.M.; M.C.B.); Medje (A.M.N.H.; B.M.; M.C.B.); Ngayu (A.M.N.H.); Niangara (A.M.N.H.); Pili Pili (B.M.; M.C.B.); Poko (B.M.; M.C.B.); Stanleyville (A.M.N.H.); Titule (B.M.; M.C.B.).

REPRODUCTION.—Of eleven adult females secured by the expedition, but one contained embryos. This was secured August 12, at Stanleyville. There were two embryos both in the left horn of the uterus. The female was a large individual, measuring 164 mm. in head-body length.

A female taken at Ngayu, December 24, had swollen mammary glands, which indicated that she was nursing, and a two-thirds grown young was secured at Medje, January 21.

The mammary formula, as observed on three specimens, is: 1–2 = 6, which indicates that more than two young are customarily born in a litter.

FOOD.—Examination of stomachs of three specimens revealed that besides vegetable matter, *Stochomys* eats insects. These three stomachs were from the animals secured in December at Ngayu, and in January at Medje.

HABITAT.—The collector observed that two specimens secured at Ngayu in late December were taken along a brook in the forest. One specimen, at least, was caught at night, at Medje. Mr. Lang noted that the species was found in swampy places, near brooks or rivers, within the forest. It probably shares the habitat with *Malacomys*, possibly with *Otomys* and *Dasymys*.

Callewaert, it is noted on specimen labels, secured specimens in "forest" and "brush."

PELAGE.—The appearance of a small adult female (A.M.N.H. 50016) in slightly worn pelage secured May 26, at Medje, was described by Mr. Lang as follows:

"A dark brownish streak on back from between the ears to shoulders; dark blue gray on sides of back, brownish gray on sides. On the back there are a number of elongate black hairs, on the sides long hairs with whitish tip; the ventral surface whitish gray; the ears and tail dark gray, the claws grayish surrounded above by some rather long hair. The lower surface of forelimbs pinkish below, the lower surface of hind limbs dark, except the phalanges."

This description does not apply well to the series as a whole, in which great variation in color and color pattern, attributable to condition of pelage, is evident. This same female, for example, has a bright brown median stripe extending from the base of the tail to the center of the back, flanked by an iridescent grayish-brown area. An older male (50011) secured at the same locality, January 23, has the color pattern exactly reversed, the center line being there covered with the fresh dark pelage, flanked in turn by the bleached and worn lighter pelage.

Specimens in full new pelage (50010, an adult male taken at Medje, January 22, is typical) do not have these harlequin markings but are uniformly dark over the head and shoulders, the color fading gradually toward the rear, and on the flanks to the relatively sharp line of demarcation at the borders of the belly. In such a specimen the scattered large black guard hairs which gave the name to the genus, show off to best advantage.

DASYMYS PETERS

Shaggy Swamp Rats

Dasymys PETERS, 1875, Monatsber. k. Preuss Akad. Wiss., Berlin, 1875, p. 12. Type species, by monotypy: *D. gueinzii* Peters (= *Mus incomtus* Sundevall).

The swamp rats of the genus *Dasymys* are widespread in the Belgian Congo, being represented in every province, political and biotic, from sea-level to 14,000 feet on the mountains. Over part of this area two species are represented: *D. bentleyae*, with a subspecies (*D. b. medius*) in the highlands of the east (Ruwenzori to the Marungu) and *D. nudipes* which is somewhat atypically represented in the Kasai and differentiated into the subspecies *D. n. edsoni* along the middle section of the Congo

River. At high altitudes on Ruwenzori is found another species, *D. montanus*, distinguished by short tail and long hair. It has not yet been identified from the other highlands of the eastern Congo.

Dasymys bentleyae bentleyae Thomas

Lifutu or Chifumfutu: Katanga (Neave in Dollman 1909)

Tshibasu: Luluabourg, Kasai (Callewaert labels)

Suhr: Monbuttu (Emin)

Figure 24

Mus (Dasymys) bentleyae THOMAS, 1892, Ann. Nat. Hist., (6) X, p. 179. Type locality: "Ngombi (also called "Wathen") Lower Congo." Type: B.M. 91. 2. 11. 2.

1888. *Mus gueinzii*, THOMAS. Proc. Zool. Soc. London, 1888, p. 12. Emin secured two specimens at Gadda.

1896. *Dasymys niloticus*, POUSARGUES. Ann. Sci. Nat., (8) III, p. 377. Specimens from Bangui, Kemo, and the upper Ubangi are probably subspecifically the same as those of the Ituri.

1910. *Dasymys bentleyae*, DOLLMAN. Ann. Mag. Nat. Hist., (8) V, p. 180. A specimen from Luwingu, northeast of Lake Bangweolo, identified as this, indicates the exceptional southeastern spread of this species.

1915. *Dasymys bentleyae*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 480. Sixteen specimens secured by Christy at Poko and Medje, are mentioned.

1923. *Dasymys bentleyae*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 368. Two specimens from Luebo are listed.

1926. *Dasymys bentleyae*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 601. A single specimen from Luluabourg recorded.

1928. *Dasymys bentleyae*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, pp. 57 and 74. Comparison is made with the subspecies *D. b. medius* and specimens from Irumu are listed.

CONGO EXPEDITION SPECIMENS

Represented by 35 skins with skulls as follows:

Bafwabaka, 3 (juvenile ♀), January 3; December 29.

Faradje, 11 (7 adult ♂, 2 adult ♀, juvenile ♂, juvenile ♀), February 18, 19, 25; April 2.

Garamba, 2 (adult ♀, juvenile ♀), March 14.

Medje, 16 (9 adult ♂, 5 adult ♀, 2 juvenile ♂), January 16, 17, 18, 19, 21, 22; July 30.

Niangara, 3 (adult ♂, adult ♀, juvenile ♂), November 19; December 1, 18.

The Ituri representatives of *D. bentleyae* are, in the opinion of Thomas (1915, Ann. Mag. Nat. Hist., (8) XVI, p. 480), intermediate between those of the Lower Congo and the subspecies of Ruwenzori. I have not studied sufficient material from the Lower Congo to judge of the variation at the type locality, but the whole lot obtained by the Congo Expedition is distinct from any true *D. b. medius*, of which the American Museum has a rich series from Ruwenzori, the Kivu and the Marungu Mountains.

In the matter of coloration it is true that the Ituri series is intermediate between the dark, somber mountain representatives and a single bright hazel specimen from Lukolela, on the middle Congo, but with Kasai specimens they are almost identical.

In cranial characters I find the specimens from the Congo basin very homogeneous, but sharply set off by size and, to a lesser extent, proportional characters from that population extending outward from Ruwenzori, westward at least to Beni (Bungulu). Specimens from the Kivu agree well with those from Ruwenzori in all characters except that of skull size, in which they approach more closely, typical *D. bentleyae*. A single specimen in the American Museum collections from the Marungu Mountains is referred to *D. b. medius* though it is atypical in the great breadth of its nasals, and long tail.

Dasymys shawi, of the Bahr-el-Ghazal, is clearly related to *D. bentleyae* of which it may be considered a subspecies.

HABITAT.—These rats were secured in numbers at Medje, where Mr. Lang found them "common in the grass and bushes on the slopes of the valley. At Bafwabaka they were also caught on the slope on the right side of the Nepoko, under similar conditions; a very steep incline grown over with grass and bushes and a few trees." The natives said that "the rats build their nests nearly on the surface of the ground with practically no excavation. The nest is said to consist of nothing but a heap of fine dry grass, carefully concealed and covered on the top." At Bafwabaka a

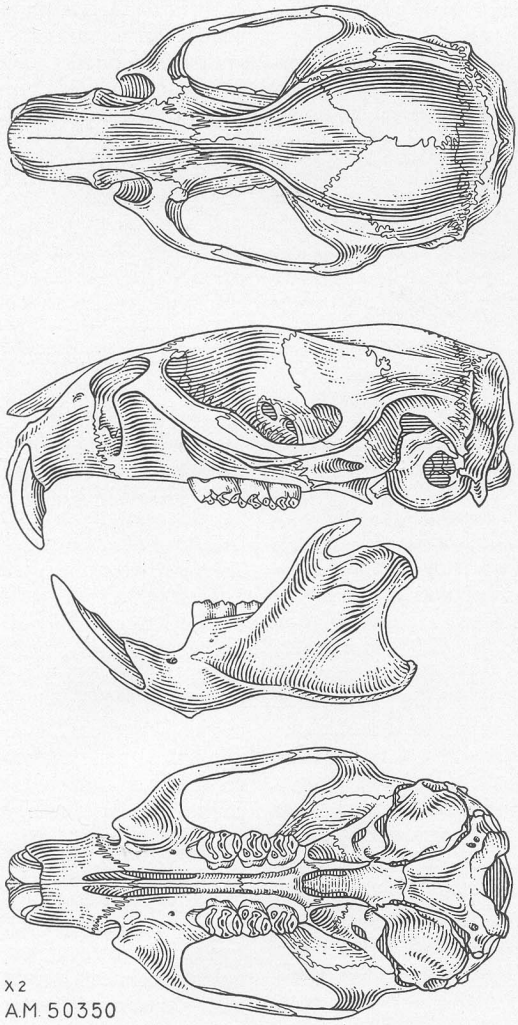


Fig. 24. *Dasymys bentleyae bentleyae.* Male. Faradje.

specimen was "caught in high grass in the forest, in a trap baited with manioc."

In the Katanga, Neave (Dollman, 1909, Ann. Mag. Nat. Hist., (8) III, p. 353), observed that *D. bentleyae* "frequents long grass and somewhat swampy ground." On Mt. Ruwenzori, at altitudes from 6000 to 9000 feet, Woosnam (Thomas and Wroughton, 1910, Trans. Zool. Soc. London, XIX, p. 515) found that the mountain subspecies, *D. b. medius*, "inhabited chiefly the bottoms of the valleys, near streams, but were also caught occasionally on the drier ridges."

Reproduction.—The mammary formula, as observed on four specimens, is 1–2 = 6.

An adult female taken at Medje, January 16, had no embryos, but another secured January 21, had three embryos, and another examined the same day, two. At Bafwabaka, January 3, a female trapped had no embryos but did have an enlarged uterus which suggests recent parturition.

Small young were secured at Bafwabaka in December and at Faradje in April.

Food.—The only direct information concerning the food of *Dasymys bentleyae* is the observation of Mr. Lang that the stomach of one adult contained the usual rodent stomach content—"whitish and greenish vegetable matter." In some localities they live alongside their shorter-tailed counterparts, *Otomys*, and it is probable that both fill much the same role as do the microtines of the holarctic world.

Oenomys Thomas

Red-nosed Rats[1]

Oenomys Thomas, 1904, Ann. Mag. Nat. Hist., (7) XIII, p. 416. Type: *Mus hypoxanthus* Pucheran.

Oenomys and *Thamnomys* bear much resemblance to each other, and I am inclined to believe that they represent respectively semi-arboreal and arboreal descendants of a common stock. Their molars bear many features of resemblance, each being cuspidate and with the cusps in distinct rows, those on the lingual side of the uppers set off at a peculiar and characteristic angle. In each the first molar is or may be five rooted, in both the incisors are ungrooved. The two genera also share large, expanded anterior palatal foramina, large interparietals, long tails, similar pelage. *Thamnomys* has progressed further in the arboreal line with shortened feet, slightly longer and much heavier tail. Its smaller auditory bullae and narrower molars may also be attendant specializations to life and feeding in the trees.

A key to the species and races of *Oenomys* then described was published in 1910, by Thomas (Trans. Zool. Soc. London, XIX, part 5, p. 510). Since that publication, many specimens have been secured which indicate that *bacchante* does not merit specific distinction, and that the genus is monotypic.

The red-nosed rats are probably present in all sections of the Congo in which forest is found, excepting at altitudes over 6000 feet on the eastern mountains. I have seen specimens from forty or more localities which I do not list only because I am unable to give them a satisfactory assortment among the nominal species and subspecies. It appears to me that the Gaboon type of *Oenomys* (*hypoxanthus*), occurs with little change as far eastward as Pili Pili, Beni and other nearby localities, where series of specimens show a greater spread of variation than encountered to the west. Individual specimens could be assigned to *editus* or *unyori* or *hypoxanthus*, but others are distinctly intermediate or present combinations of characters that lead me to suspect that in the neighborhood of the Albertine Rift an eastern narrow-toothed species and a western broad-toothed species have united ranges and hybridized. From the Marungu Mountains comes a specimen intermediate between *hypoxanthus* and the Angolan *anchietae*, yet distinct in certain characters of pelage, as, for example, the restriction of the red pigments, and its entire suppression on the hands, ears and orbital ring. Here too, the tooth row is short, the molars wider, the diastema long, the palatal foramina large. From nearby Mweru comes another specimen, narrow-toothed and otherwise resembling *editus* of Ruwenzori and the Kivu District.

Specimens from the Kasai tend to be intermediate between *hypoxanthus* and *anchietae*, but are in general color and tail length nearer the Gaboon race. Their eye rings, however, are usually, as in Angolan specimens, brightly colored. Luluabourg specimens, as may be seen by reference to the skull measurements here published, have much larger skulls and broader molars than do those of Ituri.

A revision of the genus, obviously a necessity before specific nomenclature can be widely applied, scarcely falls within the scope of this paper, since the most critical areas lie outside the territorial limits covered by the Congo Expedition. Material is, however, fairly adequate and a review of the central African representatives of the genus is now one of the most practical and needed studies in the taxonomy of African rodents.

[1] Dr. Emin tells us (1921, "Tagebücher," VI, p. 27) that the Mangbetu say that this rat obtained its red nose as punishment for its always sampling palm oil!

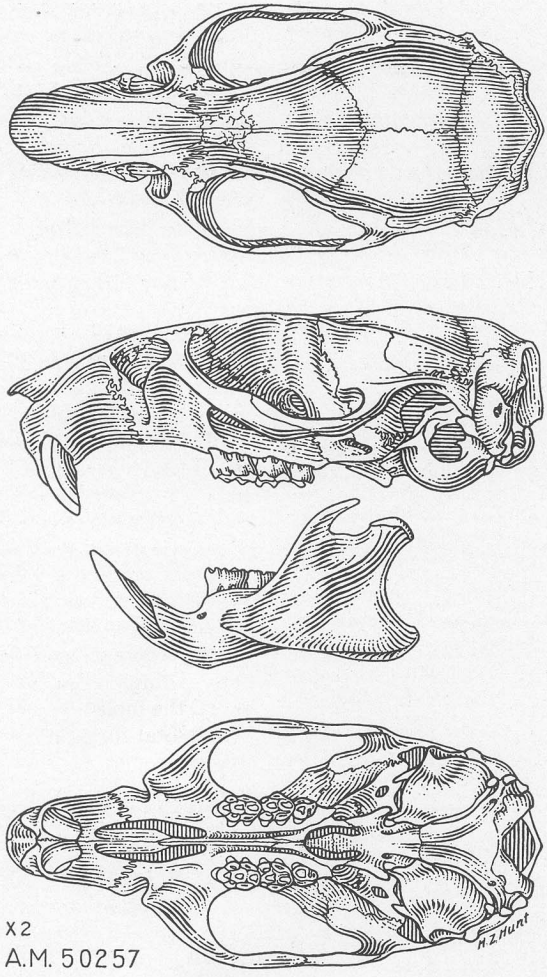


Fig. 25. *Oenomys hypoxanthus hypoxanthus*. Male. Stanleyville.

Oenomys hypoxanthus hypoxanthus (Pucheran)

Mbàla or Npala: Mangbuttu (Emin)

Dimunu: Luluabourg (Callewaert labels)

Plate XIII, figure 2; Figure 25

Mus hypoxanthus Pucheran, 1855, Revue et Magasin de Zoologie, (2) VII, p. 206. Type locality: "Gabon." Type: Probably in Paris Museum.

1858 (?). *Mus hypoxanthus*, Pucheran. Arch. Mus. d'Hist. Nat., Paris, X, pp. 129–130.

1893. *Mus hypoxanthus*, Tullberg. Nova acta Reg. Soc. Upsala, (3) XVI, p. 26.

1897. *Mus hypoxanthus*, Pousargues. Ann. Sci. Nat., (8) IV, p. 19. Specimens listed from Bangui and the Kemo, French Congo.

1903. *Mus hypoxanthus*, Thomas. Ann. Mag. Nat. Hist., (7) XII, p. 342. Key to the subspecies.

1914. *Aenomys hypoxanthus*, Dollman. Rev. Zool. Afric., IV, fasc. 1, p. 84. Specimens from Avakubi, Bafwasende, Bolongena and Pili Pili are listed.

1915. *Oenomys hypoxanthus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 476. Five specimens from Medje and nine from Poko were secured by Christy. Thomas noted that though the majority of specimens agreed absolutely with Gaboon specimens, a few had smaller teeth and could not then be satisfactorily identified.

1916. *Oenomys hypoxanthus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 239. Notes a specimen secured by Wilson at Inkongo.

1920. *Oenomys hypoxanthus hypoxanthus*, SCHWARZ. Friedrich's "Ergebn. Zweit. Deutsch. Zentr.-Afr. Exp. 1910–1911," I, Zool. Lief 15, pp. 1085–1086. Two skins collected by Schubotz at Libenge and Koloka.

1921. *Mus* (rotnasig) EMIN (part). "Tagebücher," VI, p. 27.

1923. *Aenomys hypoxanthus*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 365. Recorded from Luebo.

1926. *Aenomys* [sic] *hypoxanthus hypoxanthus*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 599. Twenty-one specimens from Luluabourg "agree very well with specimens from the Cameroons and Gaboon, and not with *A. h. anchietae* from Angola."

1928. *Oenomys hypoxanthus* subsp., GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 50. Two specimens from Lulenga resembled *O. b. editus* in some respects. Idem, pp. 73–74. Specimens are listed from the following Congo localities: Campi ya Wambutti, Simbo, Kartoushi, Lesse, Kinabo and Malisawa.

CONGO EXPEDITION SPECIMENS

Represented by 43 skins, 44 skulls and three in alcohol, collected as follows:

Akenge, 1 (adult ♂), September 30.

Avakubi, 10 (3 adult ♂, 6 adult ♀, juvenile ♀), October 2, 5, 9, 11, 12, 14.

Bafwabaka, 3 (2 adult ♀, juvenile ♂), January 4; December 29.

Faradje, 2 (adult ♂), April 3; November 5.

Gamangui, 1 (adult ♀), February 2.

Medje, 2 (adult ♂, adult ♀), January 15; June 30.

Ngayu, 7 (2 adult ♂, 3 adult ♀, adult ?, juvenile ♂), December 11, 12, 14, 21, 23.

Niangara, 1 (adult ♀), November 17.

Niapu, 1 (adult ♀), January 26.

Stanleyville, 20 (4 adult ♂, 10 adult ♀, 4 juvenile ♂, 2 juvenile ♀), August 12, 13, 14, 16, 17, 19.

In the American Museum collections there is also a series of twenty-two specimens from Luluabourg, and one from Lukolela.

HABITAT.—Specimens secured by the expedition were labelled forest rat or field rat. One of these taken at Faradje, "was shot from a tree about twelve feet from the ground, out of the finer twigs." Two others were caught by natives working in an old coffee plantation at Stanleyville, where *Lophuromys a. rita* were also taken. Another was taken in the same locality "in the grass." Emin (1921, VI, pp. 27–28) also records these as arboreal and (another subspecies) as nesting in the branches of a low tree.

FOOD.—Other than that three stomachs contained greenish vegetable matter, there are no notes on food.

ENEMIES.—A specimen taken at Lukolela by Mr. Edson contained the larva of a bot fly.

REPRODUCTION.—The mammary formulae of 2–1 = 6 was recorded for five females, that of 2–2 = 8 for two others, both of which I have verified. These two latter records were both from Bafwabaka. Gyldenstolpe (Arkiv för Zoologi, Bd. 20A, N:o 4, p. 74) states of specimens from farther east in the Congo, that the mammary formula is 1–1 = 4.

Embryos were taken from females with head-body lengths of from 136 to 166 mm., and in the months of August, October, December and January. In one instance there was one embryo; in five, two embryos; in six, three embryos; in one, four embryos; in one, five embryos.

RATTUS FISCHER

Ruttus (misprint for *Rattus*) FISCHER, 1803, Nationalmus. Naturg., Paris, II, p. 128. Type, by monotypy (see Hollister, 1916, Proc. Biol. Soc. Wash., XXIX, pp. 206–207): *Mus decumanus* Pallas (= *M. norvegicus* Erxleben).

1758. *Mus*, LINNAEUS. "Systema Naturae," 10th Ed., p. 61 (part).

1814. *Musculus*, RAFINESQUE. "Précis des Découvertes et Travaux Somiologiques," Palermo, p. 13. Included species: *Musculus frugivorus* Rafinesque, and *M. dichrurus* Rafinesque.

1827. *Rattus*, DONOVAN. Nat. Repos., III, text to plate 73. (1834) Type by tautonomy: *Mus rattus* Linnaeus (see Hollister, 1916, Proc. Biol. Soc. Wash., XXIX, p. 126) (part).

1867. *Rattus*, FITZINGER. Sitzungsber. Math.-Naturwiss. Cl. k. Akad. Wiss., Wien, LVI, part 2, p. 63. Type, by tautonomy: *Rattus domesticus* Fitzinger (= *Mus rattus* Linnaeus).

1881. *Epimys*, TROUESSART. Bull. Soc. Angers, X, p. 117. Type, by subsequent designation (Miller, 1910, Proc. Biol. Soc. Wash., XXIII, p. 58): *Mus rattus* Linnaeus.

1910. *Mus* (*Epimys*), LYDEKKER. Proc. Biol. Soc. Wash., XXIII, p. 124.

1910. *Mus*, BONHOTE (part). Proc. Zool. Soc. London, 1910, p. 651–665.

1916. *Rattus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 240, August.
1918. *Rattus*, HINTON. Jour. Bombay Soc. Nat. Hist., p. 63.
1919. *Rattus*, HOLLISTER. U.S. Nat. Mus. Bull. 99, part 2, p. 66 (part). Hollister's conservatism in assigning many genera to subgeneric position is not in accord with the present practice of most mammalogists and although I consider his attitude laudable, I have not seen fit to follow his practice.
1932. *Rattus*, AHARONI. Zeitschr. für Säugetierkunde, VII, p. 177.

REFERENCES TO *Rattus* FROM THE CONGO

1874. *Mus decumanus* and *Mus alexandrinus*, SCHWEINFURTH. "The Heart of Africa," II, p. 505. Specimens recorded from the Niam Niam and Bongo country, bordering the present Belgian Congo.
1910. *Mus rattus*, THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, part 5, p. 503. Specimens from Mokia, S.E. Ruwenzori, and Beni.
1914. *Epimys rattus*, DOLLMAN. Rev. Zoolog. Afric., IV, fasc. 1, p. 81. Specimens are recorded from Leopoldville, Avakubi, Makala and Tshopo Falls.
1916. *Rattus rattus*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 238. A specimen from Inkongo.
1923. *Rattus rattus*, KERSHAW. Rev. Zoolog. Afric., XI, fasc. 4, p. 365. Reported from the coastal town, Banana.
1923. *Rattus rattus alexandrinus*, KERSHAW. *Loc. cit.* Listed from Boma and Moanda.
1923. *Rattus rattus frugivorus*, KERSHAW. *Loc. cit.* Specimens reported from Moanda, Kidada, Kwamouth, Eala and Luebo.
1925. *Rattus rattus kijabius*, DE BEAUX. Atti della Soc. Ital. Sci. Nat. e del Mus. Civico Storia Nat. Milano, LXIV, p. 89. Specimens from Atalia, Beni and Kabale.
1926. *Rattus rattus*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 598. The authors concluded it hazardous to use a subspecific name for a series of fifteen from Luluabourg, which they considered similar to but not identical with, *alexandrinus* of Egypt.
1933. *Rattus rattus*, *R. r. alexandrinus* and *R. r. frugivorus*, SCHOUTEDEN. Bull. Cercle Zool. Congolaise, IX, fasc. 4, pp. 113–118, and X, fasc. 1, pp. 9–10. Notes on the biology of the rats of the Congo.

That the black rat and the white-bellied rat (*frugivorus* Rafinesque = *alexandrinus* L'Isle) are conspecific was fairly satisfactorily demonstrated by L'Isle (1866, Ann. Sci. Nat. (Zool.), IV, p. 173) whose studies led him to cross these two forms. Some of the resultant hybrids were apparently similar to the animals now called *R. r. alexandrinus* (Geoffroy). L'Isle's conclusion that the white-bellied type represented the original wild form, and that the black rat is merely a color phase of the same species brought about by the indoor life adopted in its colonization of Europe, is now generally accepted. That the change is effected by colder climate seems belied by the dusky coloration of many of the equatorial African representatives.

In Africa all three European types appear to have become established, with some modification of the *alexandrinus* stock, or the development of a similar one into *R. r. kijabius* Allen. Schwarz (1934, Nature, CXXXIII, No. 3363, p. 573) recently stated that in East Africa two other subspecies, *R. r. wroughtoni* Hinton, and *R. r. rufescens* Gray, have been identified, and has hypothesized the routes by which these "mutant" races have been introduced.

The majority of the East African representatives of the *Rattus rattus* group are not typical of *rattus, alexandrinus, frugivorus, wroughtoni* or *rufescens*, but possess a pelage to some degree intermediate between *rattus* and *alexandrinus*, with, in a high percentage of cases, a white chest star[1] that in some individuals extends caudally to the pubis. The first name applied directly to this group of rats was *Mus kijabius* J. A. Allen (1909, Bull. Amer. Mus. Nat. Hist., XXVI, p. 109) which name Hollister (1919, U.S. Nat. Mus. Bull. 99, part 2, p. 68) and G. M. Allen (1933, Bull. M.C.Z., LXXV, No. 2, p. 104) have used for the entire East African house rat population. Within certain limits this is permissible, though I would admit the presence of *R. r. wroughtoni* as a distinct element in the population, and recognize that for other specimens there is no justification for not applying one of the earlier and more commonly applied names.

[1] Ventral spotting in mice, doubtless the same genetically as in the rats, has recently been studied by Murray and Green (1933, Genetics, XVIII, pp. 481–486). They concluded that though it certainly has an hereditary basis, it is not dependent on a single dominant or recessive gene. It was found that the white patches were of more frequent occurrence and larger as well among males.

The nomenclatorial treatment of these many stocks, without the employment of quadrinomials, is bound to prove inadequate. As Hinton (1918, *supra* p. 66) following his brilliant work on the house rats of India, Burma and Ceylon, observed, "Like other murines, this species shows, within certain limits, an almost startling plasticity. Its structure responds readily to the demands of purely local requirements. If necessary, color or the quality of the coat is modified; a change in diet induces modifications in the development or the 'set' of the muscles of mastication; and these in turn mould the skull or lead to the lengthening or shortening of the tooth-rows. Considerations such as those mentioned . . . lead us to realize the hopelessness of attempting to disentangle the history of the rats in large towns or ports. . . . In such places the rat population is a motley horde, representing the progeny of truly native [this in Asia] rats crossed with the descendants of old wanderers and with new comers . . . from all parts of the world. It is therefore only in the more remote parts of the country that we can reasonably expect some measure of success to crown such efforts."

Within the Belgian Congo the greater number of house rats may be sorted rather simply between a brown type with white or creamy belly, usually with the hair of the underside soft and about as long as that above, and with a mammary formula of 3–3 = 12 (*R. r. frugivorus*) and another brown type with shorter thin gray hairs below and a mammary formula of 2–3 = 10, to which either the name *alexandrinus* or *kijabius* could be applied. A few all-black specimens (*R. r. rattus*) are encountered. In the region of the Albertine Rift the house rats resemble the *alexandrinus-kijabius* type most closely, but diverge in that they attain greater size and a coarser pelage than I have observed on other African rats of this stock. White pectoral patches are characteristic of this lot, however, and I prefer to assign the name *kijabius* to such specimens, as de Beaux (1925, Atti della Soc. Italiana di Sci. Nat. Milano, LXIV, p. 89) has before me.

Distribution of the Races of *Rattus* in the Congo

Rattus rattus rattus, that is truly black rats, are represented in the Congo Museum by specimens from Banana, at the mouth of the Congo, Basongo in the Kasai and Elisabethville in the Katanga. Whether these represent modified individuals of an otherwise more homogeneous *"kijabius"* stock, or the presence of colonies of black rats, it is not possible to say.

Rattus rattus kijabius is apt to occur at any settlement in the Congo. I have examined over ninety specimens in various museums that represent widely scattered localities in the colony. As examples, there are specimens from Boma, Leopoldville, Beni, Rutshuru, Albertville and Elisabethville; examples chosen for their familiarity, rather than that these rats typically come from large European settlements. To some extent this is, however, probably true, for these rats are not known from many smaller villages from which the next form listed is well represented.

Rattus rattus frugivorus is also widespread in the Congo and known from practically all localities in which the gray-bellied rat is represented. My notes concern seventy individuals from the Congo. Sample localities would extend along the River from the mouth to Stanleyville, over to Albertville, Elisabethville and in the Kasai. Good series are at hand from several localities from which I have seen no specimens of *R. r. kijabius*. Such are Lukolela, Stanleyville, Luebo and Luluabourg. Whether these series represent colonies "climatically adapted," genetically isolated, or merely collectors' selection, remains to be determined. There is the possibility that some collectors would discard gray-bellied house rats at the same time as conserving white-bellied house rats on the assumption that the latter were an indigenous species, the former, otherwise.

Rattus rattus frugivorus (Rafinesque)

White-bellied House Rat
Figure 26

Nsangonio: Luluabourg (Callewaert labels)

Musculus frugivorus Rafinesque, 1814, Précis des Découvertes et Travaux Somiologique, Palermo, p. 13. Type locality: Sicily.

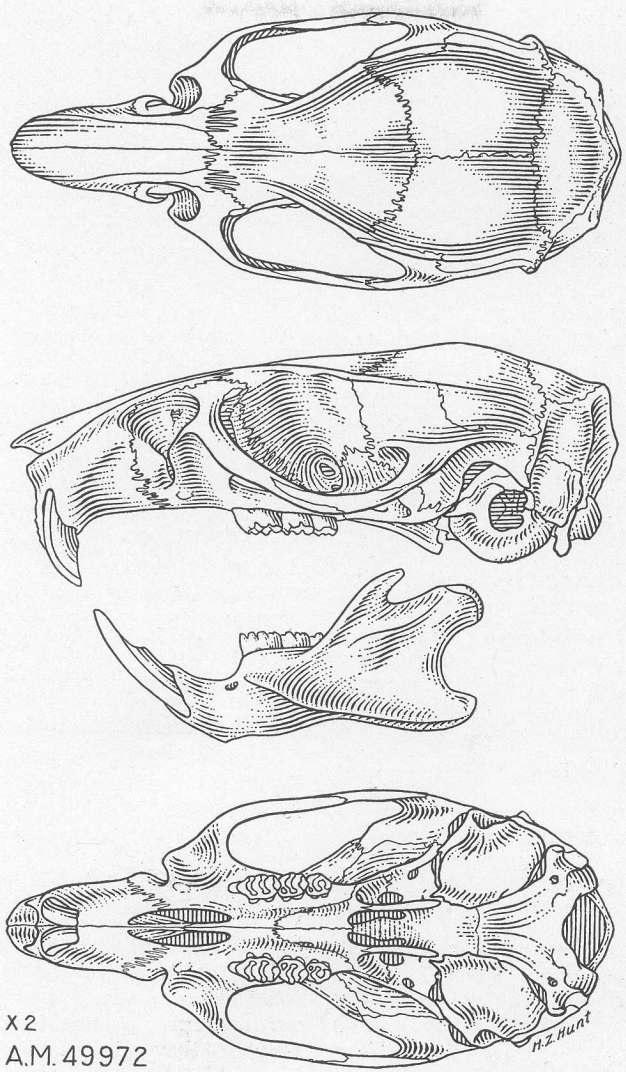


Fig. 26. *Rattus rattus frugivorus*. Female. Leopoldville.

CONGO EXPEDITION SPECIMENS

Represented by twelve skins with skulls and one in alcohol, collected as follows:

Isangi, 1 (adult ♀), August 1.

Leopoldville, 7 (3 adult ♂, 3 adult ♀, juvenile ♀), July 7, 8.

Stanleyville, 5 (4 adult ♀, juvenile ♂), August 14, 16, 18, 26, 28.

House rats from Luluabourg were noted by Cabrera and Ruxton (1926, Ann. Mag. Nat. Hist., (9) XVII, p. 598) as approaching *alexandrinus* but yet not exactly like *alexandrinus* from Egypt. It is true that among the eleven specimens the American Museum has from the Callewaert collections, a few are somewhat intermediate between white-bellied *frugivorus* and gray-bellied *alexandrinus* but all are clearly distinct from the animals I elsewhere identify as *R. r. kijabius*, and none of the females

have the lower number of mammae characteristic of that subspecies.

HABITAT.—Mr. Lang's notes refer to specimens obtained as "house rats," and at least two of the specimens secured by another expedition at Lukolela were caught in houses. Another was secured on a river steamer, near Isangi. Callewaert noted on the labels of six specimens in American Museum collections that they were taken "en maison."

It is probably significant that the Congo Expedition obtained specimens of this rat only along the river. At that time it is likely that the Asiatic house rats had not become established in the more remote villages in which the Expedition collected.

REPRODUCTION.—The mammary formula on all suitable specimens examined from the Congo is 3-3 = 12. The collector wrote of one specimen (A.M.N.H. 49964) that there were "four pairs of mammae, two abdominal, two pectoral; of the latter, one pair is in front of the forelegs, the other behind." On the dry skin of this specimen it is, however, easy to discern the usual three, evenly spaced inguinal-abdominal pairs, the two closely spaced thoracic pairs and the single pair at the level of the fore limbs.

AETHOMYS THOMAS

Aethomys THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 477. Type species: *Mus hindei* Thomas. Proposed as a subgenus of *Epimys*.

1926. *Aethomys*, THOMAS. Ann. Mag. Nat. Hist., (9) XVII, p. 177. Restricted.

Four species of *Aethomys* apparently range within the Congo: *A. kaiseri* and its subspecies *medicatus; A. chrysophilus*, represented in the Katanga by the subspecies *dollmani; A. walambae* as a subspecies, *hintoni;* and *A. bocagei* in the western Congo. *A. w. pedester* and *A. k. helleri* may also occur in the Congo.

The interrelationships of these forms are at this time very imperfectly understood, particularly in that the chief characters used for the diagnosis of the "species" vary so greatly from one locality to the next. The three dozen named forms of the genus can be combined into several different patterns of apparent relationship, but until a great deal of work has been done on the group, specific assignments of the subspecies will remain arbitrary. There is much need for collecting in the Congo at the type locality of *A. kaiseri* and in the same parallel to the westward.[1]

Aethomys kaiseri medicatus
(Wroughton)

Ring-tailed Rat (Lang notes)

Bomu or Sinsi (Emin)

Figure 27

Mus medicatus WROUGHTON, 1909, Ann. Mag. Nat. Hist., (8) IV, p. 540. Type: adult ♀, B.M. 10. 4. 2. 14. Type locality: "Mumias, B. E. A., from 4500′."

1888. *Mus Kaiseri*, THOMAS. Proc. Zool. Soc. London, 1888, p. 12. Two specimens were secured by Emin at Gadda.

1912. *Epimys medicatus*, LÖNNBERG. Kungl. Sv. Vet. Akademiens Handl., Bd. 48, N:o 5, p. 91.

1915. *Epimys* (*Aethomys*) *kaiseri*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 477. Forty-one specimens from Poko, were collected by Christy.

1928. *Aethomys k. medicatus*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73. A specimen recorded from Kirripi, N.W. Uganda.

CONGO EXPEDITION SPECIMENS

Represented by fourteen skins with skulls and one in alcohol, collected as follows:

Faradje, 2 (adult ♂, adult ♀), March 1, 28.

Niangara, 13 (7 adult ♂, 6 adult ♀), November 15, 20, 21, 26; December 3, 5, 6, 10, 15, 19, 20.

For the present it seems advisable to refer all specimens of the genus from the northeastern Congo to this subspecies, although they are not all typical of that form. The chief characters of divergence exhibited by the series listed above are, slightly smaller size, shorter palatal foramina and more flaring pterygoids. Some

[1] It might here be noted that in the description of *Epimys walambae amalae* Dollman that the type was designated B.M. 13. 10. 18. 111, from the Lemek Valley, B.E.A. This is a subadult female. The specimen marked type in the British Museum (in 1932) was No. 13. 10. 18. 105, an old male from Narossura, B.E.A. The published field measurements are those of the younger specimen. Those of the skull appear to have been taken from the older specimen, though I have been unable to obtain identical measurements on that skull. It is necessary, I believe, to consider B.M. 13. 10. 18. 111 the type, since the description so designated it, and this specimen is from the designated type locality.

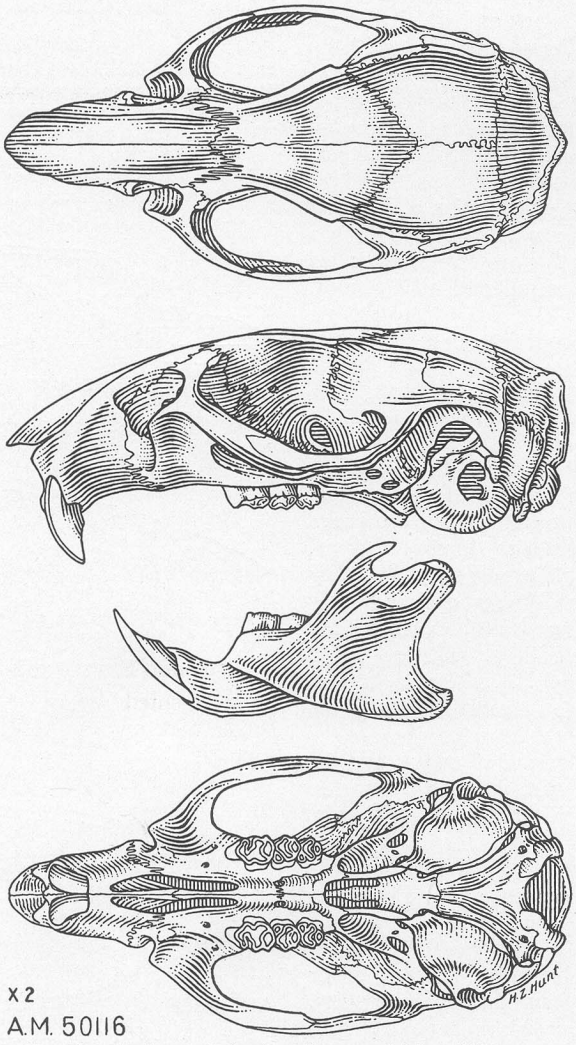


Fig. 27. *Aethomys kaiseri medicatus*. Male. Niangara.

collections from this area do not match specimens obtained by Lang and Chapin, to the expected degree, but I must assign such apparent differences to season represented or to differences in method of preparation. Thus, specimens collected by Christy at Poko, have longer softer fur, lighter colored tails. Skins made by Emin at Gadda are smaller and redder than Poko or Congo Expedition series and differ somewhat in their markings. Without direct comparison of these and topotypes of *A. helleri* it seems inadvisable to attempt to separate them from the stock of the other nearby localities. It appears probable that the Congo-Nile watershed is a satisfactory line of separation between the Lado and Uelle populations.

A fresh specimen was described by Lang as follows:

"Fur soft and silky, 12–15 mm. long on back, ground color near Salmon Buff, much mixed with black on back, less so on sides, passing rather abruptly but without any definite line into the white of the belly, this last looking almost gray owing to the long slaty bases of individual hairs. Hands and feet are white, tail unicolored, sparsely haired, dark."

REPRODUCTION.—Two pairs of inguinal mammae are observable on several of the females. Three embryos were noted in one female secured, December 10, at Niangara.

MASTOMYS THOMAS
Multimammate Rats

Mastomys THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 477. Type species: *Mus coucha* A. Smith.

The essential character of the genus is a continuous row of mammae along the milk line, from the pectoral region to the groin. There may be from 9 to 12 pairs of these. The fur is usually fine and silky, the belly hairs gray based. The feet are commonly white-haired. Supraorbital crests of the skull are weak, or lacking. The first upper molar is three-rooted. There is no infallible criterion for separating this genus from *Myomys*, except the mammary formula, and this can of course not be determined on males, nor on all females. The fifth digit of the hind foot in *Mastomys* is usually short and barely reaches the base of the fourth digit. In *Myomys* the fifth digit reaches about to the middle of the fourth digit. *Myomys*, however, appears to be unknown in the Belgian Congo.

Mastomys should be an ideal animal for laboratory use in genetic and other studies. Its tendency to vary within one local population; its numerous subspecies; ready availability; its hardihood in captivity and high birth rate, all combine to make it a good subject for this type of domestication.

Mastomys coucha ugandae (de Winton)
Uganda Multimammate Rat
Babili: Azande (Kershaw)
Figure 28

Mus ugandae DE WINTON, 1897, Ann. Mag. Nat. Hist., (6) XX, p. 317. Type locality: Entebbe, Uganda. Type: adult ♂, B.M. 99. 8. 4. 69.

1888. *Mus*. sp., THOMAS. Proc. Zool. Soc. London, 1888, p. 13.

1910. *Mus ugandae*, THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, part 5, p. 503. Twenty-nine specimens were reported from eastern and southeastern Ruwenzori. Woosnan, in an accompanying note, observed that no specimens were caught above 7000 feet.

1910. *Mus* sp. (multimammate), THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, part 5, p. 503. Two specimens from between Mawambi and Avakubi, preserved in spirits, were not assigned to the same group as those of Ruwenzori (*vide supra*).

1915. *Epimys* (*Mastomys*) *coucha*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 478. Thomas passed the problems presented by the Congo *Mastomys* by assigning, without comment, thirty-four specimens from Poko and one each from Bosabangi, Medje, Panga, to the earliest named species of the subgenus: a Bechuanaland rat to which they bear little resemblance.

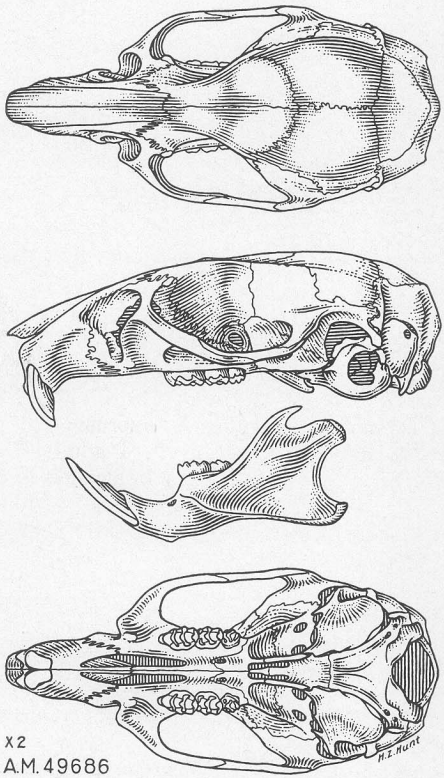


Fig. 28. *Mastomys coucha ugandae*. Male. Garamba.

1924. *Rattus* (*Mastomys*) *coucha ugandae*, KERSHAW. Ann. Mag. Nat. Hist., (9) XIII, p. 24. Specimens from the Congo-Nile watershed and the Lado, the Shaw collection.

1928. *Mastomys c. ugandae*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73. Specimens from S.W. Ankole and eastern Belgian Congo are mentioned.

1928. *Mastomys tinctus*, GYLDENSTOLPE. *Loc. cit.* Sixteen specimens from Masongo, Irumu, Simbo, Kitchemuro, Bopu and Kartoushi, eastern Belgian Congo, were assigned to this species.

CONGO EXPEDITION SPECIMENS

There are seventy-seven skins with skulls and three specimens in alcohol, collected as follows:

Aba, 2 (adult ♂, adult ♀), December 12.

Avakubi, 18 (5 adult ♂, 8 adult ♀, 3 juvenile ♂, 2 juvenile ♀), March 3; October 7, 8, 9, 10, 13.

Bafwabaka, 19 (4 adult ♂, 2 juvenile ♂, 10 adult ♀, 3 juvenile ♀), January 2, 4, 5, 7; December 29, 30, 31.

Faradje, 12 (5 adult ♂, juvenile ♂, 5 adult ♀, juvenile ♀), February 18, 20, 21, 26; April 3; November 14, 17, 27.

Gamangui, 1 (adult ♂), February 2.

Garamba, 6 (2 adult ♂, 4 adult ♀), May 4, 12, 15. Includes 3 in alcohol.

Medje, 7 (4 adult ♂, juvenile ♂, 2 adult ♀), January 21, 25; June 30; July 2, 3.

Niangara, 15 (5 adult ♂, 3 juvenile ♂, 5 adult ♀, 2 juvenile ♀), November 7, 30; December 1, 2, 6, 10, 12, 26, 27, 30.

The indigenous African house rats of the genus *Mastomys* in certain regions present the same peculiar diversity as is found among the "parasitic" Asiatic species. Such an area is that in which the Congo Expedition operated. Two principal types appear in the series obtained by the expedition, but I have not been able to separate them completely, nor consistently, and so refer them tentatively to a single race. One of these types is characterized by brownish pelage, short (25 mm.) feet and smoothly rounded frontals. The other typically has grayish pelage, long (30 mm.) feet and strongly beaded supraorbital margins of the frontals. Each of these characters is one that in other series of *Mastomys* appears as a diagnostic character, but here there is no correlation with general body size, suture closure or dental wear. Neither is a sex or geographical correlation possible. For reference I may cite the differences between specimens A.M.N.H. 49961 and 49990.

It is presumed that Gyldenstolpe (1928, Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73) had specimens similar to the long-footed specimens above mentioned when he reported *M. tinctus* in the Congo and that those which he identified as *M. c. ugandae* were the specimens here recorded as short-footed.

Of the three specimens saved as alcoholics, one chances to be a long-footed male, one a short-footed female and the other a subadult male. In the two adults the proportionate size of the foot pads differs somewhat but unfortunately, it is impossible to correlate these differences with those observable on the dried skins since in all but a few instances the relative size of the pads cannot be judged.

Color variation within some areas is often extreme. In the American Museum are six specimens of *M. c. ugandae* taken near the base of Mt. Elgon. Three of these are normal "agouti" type individuals; one appears to be a "chocolate" mutant; one a melano, and the other an "extended black." Melanos are not uncommon in the Kavirondo, as the British Museum has a good series from that district. To what extent the dark color of *Mastomys tinctus* may be attributed to melanistic tendencies within this area I am not prepared to say. Individual variation, as Hollister (1919, U.S. Nat. Mus. Bull. 99, part 2, p. 87) noted, is far more conspicuous than the characters marking valid geographic races. Age changes in pelage are also profound, and not always harmonious. The pelage of many specimens of *Mastomys* is so precisely similar to that of *Myomys* in the same area that identification is difficult. Others, young specimens, in coat color, bear striking resemblance to gerbils of the genus *Tatera*. Such are a few immature specimens of *Mastomys c. ugandae* in the Congo collection. They are almost identical (they differ in having slaty bases to the ventral hairs) with the type of *Rattus* (? *Myomys*) *somereni* Kershaw.

Despite the enormous diversity observed in specimens from one locality, there are certain subtle average differences in series of specimens from different regions. Thus the *Mastomys* from the northeastern forest and savanna region (Stanleyville to Aba) more commonly resemble the topotypes of *M. c. ugandae*. Specimens from 7000 feet on the western slope of Ruwenzori, attain larger size than do those from lower altitudes to the westward and appear a bit brighter in color, but are not sufficiently differentiated to merit a special name being used for them. Certain specimens from the same mountain resemble *M. c. effectus* Dollman, but at present I judge them to be no more than one of the types of variants of the local multimammate rat population. In the Kasai, the rats of this group differ but slightly from the Uganda race but average redder in color, so that one may be justified in adopting the name *fuscus*, the first of three names (the other two were *rufa* and *albina*) proposed by Bocage for color varieties of Angolan multimammate rats. *Mastomys* from the Katanga resemble those from Zambesia (*microdon*) in their small size, yellower coloration, longer, softer hair and smoother skull.

HABITAT.—*Mastomys* over much of its range is an inhabitant of native huts and villages, except where it has been replaced by the Asiatic house rat. It is not, however, exclusively a parasite on man, for as is equally true of the so-called house rats it commonly lives an independent existence in areas well removed from human habitations.

The Congo Expedition found these rats common in and about native huts at Bafwabaka, Medje and Niangara. None were found at Ngayu. Specimens were also obtained at Niangara "in the field." Four specimens from Avakubi were taken in the forest, near the Ituri River, one and one-half miles from any village.

REPRODUCTION.—The mammary formula appears to present a certain amount of variation. The collector noted specimens with from eight to twelve mammae in a row, many of which had different numbers on opposite sides. The various combinations were as follows: 8–9 (1 specimen); 9–9 (3); 9–11 (1); 10–10 (2); 10–11 (1); 10–12 (1); 11–11 (4); 11–12 (2).

Embryos were recovered as follows:

DATE	LOCALITY	BODY LENGTH OF MOTHER	EMBRYOS
October 10	Avakubi	135	3
December 29	Bafwabaka	127	7
December 31	Bafwabaka	147	9
December 31	Bafwabaka	141	11
January 4	Bafwabaka	138	16

PRAOMYS THOMAS

Soft-furred Mice

Praomys THOMAS, 1915, Ann. Mag. Nat. Hist., (8) XVI, p. 477. Type species: *Mus tullbergi* Thomas.

1926. *Praomys*, THOMAS. Ann. Mag. Nat. Hist., (9) XVII, p. 178. Restricted.

The assortment of diagnostic characters within the genus is not yet sufficiently well known to permit a satisfactory analysis of its Congo representatives. Whereas it has been common practice to consider most named forms as geographical representatives of *P. tullbergi*, this has not been universally done. G. M. Allen (Bull. M.C.Z., LXXV, p. 107) suggested that the east African forms were specifically distinct from the west African, differing in having smaller ears, smaller bullae and in having a distinct buccal cusp on the first lamina of the first upper molar, a feature reputed lacking in *P. tullbergi*. To this I would add the notation that in the Congo representatives of *P. jacksoni* (including *montis*) this outer cusp is obsolescent. At Lukolela, where both species are represented, *P. tullbergi lukolelae* has no trace of the cusp, *P. jacksoni minor* has a small, poorly developed one. To judge from Tullberg's good figures of his *maurus* this was also the condition in the specimens he described. *Praomys tullbergi* may be further characterized, in distinction to *P. jacksoni*, as an animal with a narrow tooth-row, supraorbital ridges and slightly amphoral supraorbital pattern. In these respects the middle Congo animal which I have named *P. t. lukolelae* is distinctly a representative of *P. tullbergi*. In length of foot, however, it is set well apart from *P. tullbergi*, which has a foot about a quarter shorter than the

Congo animal, a difference partly bridged by an intermediate form. Thus, passing from west to east, one encounters the following foot lengths (on types): *rostratus*, 28.9 mm.; *tullbergi*, 22 mm. (*s.u.*); *morio*, 27; *lukolelae*, 30.

It has proved difficult to find any reason for authors to refer members of this genus to the rank of subspecies of *P. tullbergi* (Thomas), when *P. morio* (Trouessart) apparently subspecifically related to the former is available as a well-known earlier name.[1] Neither is it clear why so many authors have considered specimens from the Cameroons as typical of *P. tullbergi* or so commonly written "*P. tullbergi* of the Cameroons," when the species type locality, as originally defined, is Ashanti, back of the Gold Coast.

The first-named west African species of the genus is *Mus maurus* described by Gray in 1862, from Cameroon Mountain, but as the name was preoccupied, it was replaced in 1880, by *Mus morio* Trouessart. Thomas in 1892 named a *Mus burtoni* from Ashanti, which, since it proved to be preoccupied, he replaced in 1894 with *Mus tullbergi*. Tullberg's description and figures of specimens from Bonge and Ekundu, a little north of Cameroon Mountain, were published in 1893. Now it has been considered (Trouessart, 1897, Cat. Mamm., p. 483) that *Mus maurus* Gray is not identical with *Mus maurus* Tullberg, but I find little evidence to support this view. The type, a subadult, B.M. 62. 5. 9. 5, of *Mus maurus* Gray was obtained at 7000 feet altitude, and is one of the dusky colored highland representatives of the group. Tullberg's specimens were from lower altitudes, a few miles to the north, but appear to have been of the same species as Gray's type. Although I admit that specimens from Ashanti, the Cameroons and other areas have not been collected in sufficient numbers to permit more than a tentative decision being reached at this time, it seems best for the present to consider *tullbergi* and *morio* conspecific.

Praomys jacksoni jacksoni (de Winton)

Mulando, Nsamba (or Nsambo), Tshikoja and Nsokoba: Luluabourg (Callewaert labels)

Plate VII, figure 2, and Plate XIV, figure 1; Figure 29

Mus 'acksoni DE WINTON, 1897, Ann. Mag. Nat. Hist., (6) XX, p. 318. Type locality: "Ntebbi" (= Entebbe), Uganda. Type: B.M. 99. 8. 4. 68.

1915. *Epimys* (*Praomys*) *tullbergi*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 478. Thirty-two specimens secured by Christy at Mawambi, Medje and Poko are listed.

1916. *Rattus* (*Praomys*) *tullbergi*, THOMAS. Ann. Mag. Nat. Hist., (8) XVIII, p. 238. A specimen from Inkongo.

1926. *Praomys tullbergi*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 599. Twenty-nine specimens recorded from Luluabourg.

1928. *Praomys tullbergi jacksoni*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73. "105 specimens from numerous localities in the eastern Belgian Congo."

1934. *Praomys jacksoni jacksoni*, HATT. Amer. Mus. Novitates, No. 708, pp. 12–13.

CONGO EXPEDITION SPECIMENS

Represented by 46 skins with skulls, collected as follows:

Avakubi, 6 (5 adult ♂, adult ♀), October 2, 7, 12.

Bafwabaka, 8 (5 adult ♂, adult ♀, 2 juvenile ♂), January 3, 4; December 29, 31.

Bafwasende, 2 (adult ♂, juvenile ♂), September 24.

Gamangui, 5 (2 adult ♂, 2 adult ♀, juvenile ♀), January 31; February 5, 7, 12.

Medje, 9 (4 adult ♂, 2 adult ♀, juvenile ♂, 2 juvenile ♀), January 18; June 28; July 1; August 5, 23; September 6.

Ngayu, 4 (2 adult ♂, 2 adult ♀), December 10, 16, 20, 22.

Niangara, 10 (7 adult ♂, 3 adult ♀), November 10, 14, 15, 17, 26, 30; December 2, 3, 11.

Niapu, 2 (adult ♂), January 18; November 30.

The American Museum also possesses eighteen specimens from Luluabourg, Kasai, and two specimens from Bugishu, Uganda. The closely related form, *P. j. minor*, is represented by the type and six

[1] I am not certain as to the generic relations of *Mus lehocla* Smith. It is usually associated with *Gerbillus namaquensis* Smith, which is an undoubted *Aethomys* although Roberts has considered it, for reasons that are not obvious, a *Praomys*. *Mus lehocla*, if it proves a *Praomys*, will be the earliest available name in the group.

topotypes. The mountain subspecies, *P. j. montis*, by eighteen from Mt. Ruwenzori and one from Mt. Mikeno. The Ruwenzori subspecies is represented at altitudes from 6900 to 7130 feet. That from Mt. Mikeno was taken at 7900 feet. One skin with skull from Nganzi's, at 3900 feet elevation on the western base of Ruwenzori, is perhaps better considered a *P. j. jacksoni*, on the basis of its smaller size.

have been from the following settlements: Baka Mbuli, Beni, Bwanasura, Inkongo, Kalamhole, Luebo, Lusambo, Makala, Mawambi, Mboga, Medje, Poko, Selemani, Waso River.

This mouse appears not to have differentiated sufficiently in the Ituri to justify the assignation of a name different from that of its Uganda representative. On Ruwenzori the same stock has gained some-

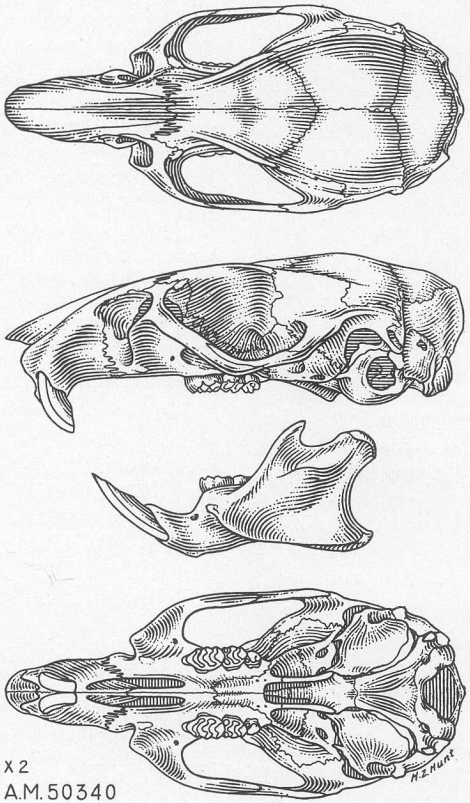


Fig. 29. *Praomys jacksoni jacksoni*. Male. Niapu.

The species is widespread in the forested sections of the Congo. To what extent the limits of *P. jacksoni* extend to the north and west, it is not, I believe, possible to say, although it is to be remembered that *P. viator* Thomas, of northern Nigeria, was described as a subspecies of *jacksoni*.

Distribution.—Specimens from the Congo referred to *P. jacksoni jacksoni* which I have examined in other museums, what larger teeth and darker color, but specimens from the base appear better referred to the lowland *P. j. jacksoni* than to the mountain *P. j. montis*.

The broad range of color observable in any good series of these animals, appears to be due to the one factor of freshness of pelage. There is no sex nor seasonal correlation. No juvenile specimens exhibit the fulvous tint common in adults, but this

seemingly is accounted for by the more rapid replacement of juvenile pelage. Specimens are encountered (*vide* A.M.N.H. 50339) which show the old, long, rough, reddish hair being replaced by the new darker, and more sleek coat.

A dental peculiarity of about half the specimens of *P. j. montis* that have been examined, is the presence of a more or less well-developed conule (*vide* A.M.N.H. 82471) between the lingual cusps of the first and second laminae of both M^1 and M^2. This I have seen duplicated in but one other skull of a large series of *Praomys*, a paratype of *P. t. lukolelae*.

Individuals are commonly marked by areas of various extent of completely white hair. Such a spot is shown in Plate XIV, fig. 1. Another individual from Luluabourg (A.M.N.H. 55335) has a patch about an inch square on the left flank, another smaller, on the right flank. There is, of course, no way of determining whether these areas are occasioned by injury or mutation, but the occasional great extent of these areas makes it appear that injury is not an adequate explanation.

HABITAT.—That these mice are largely nocturnal and hut-dwelling, is attested by several of Mr. Lang's records. To what extent they are in conflict with *Mastomys* and *Rattus* is not known. Specimens were recorded as obtained in native dwellings at Avakubi and Ngayu. Callewaert too has noted specimens as from houses, some from forests (field labels). Other Lang specimens were caught on banana plants. Five such, secured at Medje, were in nests hidden between the bases of the large leaf stalks, about eight feet above the ground. The nest of one was composed of "sliced banana leaves or their fibres," and was described as similar to that of *Dendromus messoricus*, which builds in identical situations (see page 482), but larger and not covered at the top.

REPRODUCTION.—The typical generic pattern of one pair of thoracic, and two pairs of inguinal mammae was noted by the collector on seven females, and is discernible on many skins. I have seen no exception to it.

Embryos were recovered as follows:

Dec. 16 Ngayu	♀'s head-body (6 embryos), 117 mm.
Dec. 31 Bafwabaka	♀'s head-body (3 embryos), 104 mm.
Jan. 31 Gamangui	♀'s head-body (3 embryos), 102 mm.

Young, in the nest, accompanied by the mother were found at Medje, on two occasions, as follows:

Aug. 5	2 half-grown young
Sept. 6	3 large young

FOOD.—One adult male, taken October 7, was caught in a trap baited with meat. The stomach of a female, secured February 5, contained vegetable matter and remains of a few insects. Other stomachs contained vegetable matter only.

HYLOMYSCUS THOMAS

Bush Mice

Hylomyscus THOMAS, 1926, Ann. Mag. Nat. Hist., (9) XVII, p. 178. Type species: *Epimys aeta* Thomas.

The two bush mice of the collection represent two distinct species which contrast in the following characters:

H. a. schoutedeni	*H. c. stella*
Size larger	Size smaller
Ears smaller	Ears larger
Fore feet larger	Fore feet smaller
Hind feet broad	Hind feet narrow
Tail tip hairs longer	Tail tip hairs normal
White tips belly hairs long	White tips belly hairs short
Dark tarsal spot	No tarsal spot
Mammae 1–2 = 6	Mammae 2–2 = 8
Orbital ridges cuneate	Orbital ridges amphoral
Bead on anterior half of frontal strong	Bead on anterior half of frontal absent
Tooth row longer	Tooth row short

In the Kivu District are two representatives of the genus, one *H. weileri* (Lönnberg and Gyldenstolpe) described from a single specimen taken at 2400 meters (8000 feet) on the western foothills of Mt. Mikeno and *H. denniae vulcanorum* (Lönnberg and Gyldenstolpe) from 3800 meters on Mt. Karissimbi. A specimen[1] referred to the latter, in the American Museum collections, was taken at or near the type locality of *H. weileri* (at 7900 feet), so that this form appears to have a broad altitudinal range, embracing, as it does, the mountain forest, bamboo and hagenia zones.

The relationships of these forms are not yet completely known. *H. schoutedeni* is obviously only subspecifically distinct from *H. aeta* of the Cameroon, and *H. weileri* of the Kivu. *H. stella* is related to *H. kaimosa* of East Africa and *H. simus* of Liberia. The Angolan *H. carillus*, on the basis of its mammary formula, appears to be a relative of *H. schoutedeni*, but the only Angolan specimen at hand, from Hanha, far to the south of the type locality, has eight instead of six mammae and is otherwise closely similar to the *stella* group. It is possible, however, that this specimen is not *H. carillus* but an undescribed form of *H. stella*. I am similarly in doubt about the relationships of *H. alleni* of Fernando Po, the earliest described member of the genus, the type of which is a new-born in which only the first molar has erupted, and of which the skin is in alcohol. Thomas has stated that the hind feet are not completely white, which would indicate relationship with *H. aeta* and *H. schoutedeni*. The brain case is, however, said to be of the *stella* type, and with this species it is probable that the affinities of *H. alleni* lie.

The highland forms, *denniae*, *vulcanorum* and *endorobae*, are all closely related, and differ from the other forms sufficiently to merit specific distinction, under the name of *H. denniae*.

[1] The collector's measurement of the tail is 138 mm. which is in the normal range of variation of *H. d. denniae*. It may be noted, however, that in the dried skin the scaled section of the tail (of course quite a different measurement from the length of caudal vertebrae as measured by the collector) is but 104 mm., which approximates the tail measurement recorded for the type.

The eastern representative of *H. denniae* which Heller named *endorobae* was considered by Hollister a synonym of the Ruwenzori race but on newly observed differences, I would recognize Heller's subspecies as a valid one. In the skull of *H. d. endorobae* the palatal foramina are shorter than in the typical subspecies, and reach only to the anterior end of M^1 instead of its middle. The pterygoid fossa is narrower as well. In these two matters, *endorobae* resembles *H. d. vulcanorum*. The width of the palate across the first molar is less in *H. d. endorobae* than in *H. d. denniae*.

Whereas in this paper I have, for nomenclatorial purposes, used *alleni* as the earliest described form in the *stella* group, and *carillus* as the earliest described of the *aeta-schoutedeni* group, I recognize that any conclusions regarding the relationships of *alleni* and *carillus* are on weak ground and are no better than tentative assignments. Should *carillus* be proved closely related to *stella*, *aeta* would be the earliest described of its group. Should *alleni* be proved a near relative of *aeta*, *stella* would have priority over others in the narrow-footed group.

Hylomyscus alleni stella (Thomas)

Epimys stella Thomas, 1911, Ann. Mag. Nat Hist., (8) VII, p. 590. Type locality: "Ituri Forest between Mawambi and Avakubi," eastern Congo. Type: subadult ♀, B.M. 7. 1. 2. 23.

1910. *Mus alleni*, Thomas and Wroughton. Trans. Zool. Soc. London, XIX, part 5, p. 505 Two spirit specimens from the type locality of *H. a. stella*.

1914. *Epimys stella*, Dollman. Rev. Zool. Afric., IV, fasc. 1, p. 82. Compared to *H. schoutedeni*.

1915. *Epimys* (*Praomys*) *stella*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 478. Eight specimens from Medje and one from Poko reported in the Christy collection.

1923. *Rattus* (*Praomys*) *stella*, Kershaw. Rev. Zool. Afric., XI, fasc. 4, p. 366. A specimen collected by Dr. Schouteden at Lundu, Upper Mayumbe, is noted.

1928. *Hylomyscus stella stella*, Gyldenstolpe. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73. "Five specimens from Kartoushi, Simbo and Campi ya Wambutti, eastern Belgian Congo."

Congo Expedition Specimens

Fifteen skins with skulls and two in alcohol, collected as follows:

Avakubi, 2 (juvenile ♂), October 2.

Gamangui, 12 (8 adult ♂, 4 adult ♀), January 31; February 1, 3, 5, 6, 9, 13, 16, 17, 18.

Medje, 2 (adult ♂), March 13; June 23.

Ngayu, 1 (adult ♀), December 12.

Other specimens of this subspecies in American Museum collections are from Lukolela, Belgian Congo and Kribi–Efulan, Cameroon.

I have examined specimens referable to this subspecies from the eastern border of the Ituri Forest (Arebi, Zambo); along the middle Congo (Kunungu, Lukolela); and in the Kasai (Inkongo, Luebo). Specimens from the various points in the Ituri are fairly common.

HABITAT.—Lang wrote at Gamangui as follows: "These four mice (including the 3 preceding) have been caught in traps put on the ground. I believe that this mouse lives chiefly upon the trees as its claws would indicate. The ground where they have been caught is a large swamp with practically no open water where one sinks in to the knees and the traps have been set between the roots of trees. The stomach of No. 641 and the female that has not been prepared contain a paste-like oily, yellowish (some nuts) and a whitish paste-like (manioc from neighboring plantations) vegetable matter."

REPRODUCTION.—One specimen contained three medium-sized embryos.

Hylomyscus carillus schoutedeni (Dollman)

Plate XIV, figure 2; Figure 30

Epimys schoutedeni DOLLMAN, 1914, Rev. Zool. Afric., IV, fasc. 1, p. 82. Type locality: "Mambaka," Belgian Congo. Type: B.M. 14. 2. 11. 16. Paratypes: M.C.B. 1706A and 1706B, erroneously labelled "Type."

1923. *Rattus* (*Praomys*) *aeta*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 59.

1926. *Praomys stella*, CABRERA AND RUXTON. Ann. Mag. Nat. Hist., (9) XVII, p. 599. A single specimen, in the British Museum, erroneously referred to *stella* Thomas.

CONGO EXPEDITION SPECIMENS

Seven skins with skulls and one in alcohol, collected as follows:

Medje, 4 (2 adult ♂, 2 adult ♀), April 1, 10; May 1, 16; June 2.

Niangara, 3 (adult ♂, adult ♀, juvenile ♂), November 9, 16.

Niapu, 1 (adult ♀), January 2.

Specimens from the western half of the Congo (specimens seen from Lukolela, Lusambo, Luluabourg, Baka Mbuli and Temvo) are probably best referred to *H. c aeta*, although in some respects they are intermediate between *aeta* and *schoutedeni*, and Angolan representatives of the group.

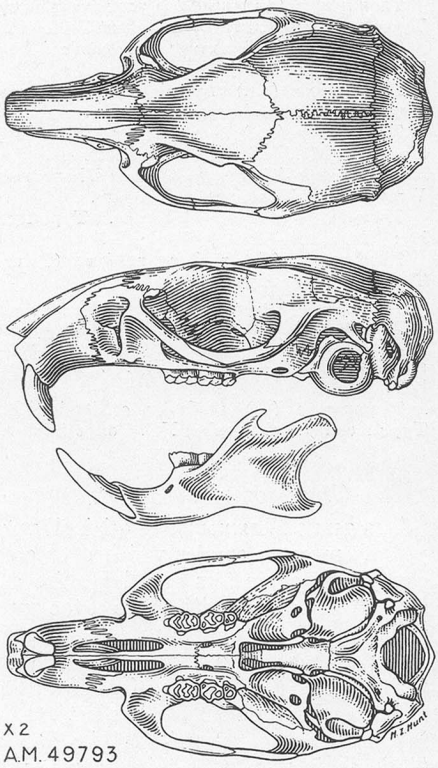


Fig. 30. *Hylomyscus carillus schoutedeni*. Male. Medje.

THAMNOMYS THOMAS

Tree Rats

Thamnomys THOMAS, 1907, Ann. Mag. Nat. Hist., (7) XIX, pp. 121–122. Type species: *Thamnomys venustus* Thomas.

1915. *Grammomys*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 150. Type species: *Mus dolichurus* Smuts.

Although the characters separating *Grammomys* from its parent genus do not seem to warrant recognition of the later named group as of full generic rank, I believe it

convenient to retain the name in subgeneric status.

Within the boundaries of the Belgian Congo ten forms of *Thamnomys* occur, six of which are of the subgenus *Grammomys*. Six of the total have their type localities in the Congo. The species and subspecies now recognized in this area are the following:

Thamnomys (*s.s.*) *venustus venustus* Thomas. Type locality: Ruwenzori East, at 7000 feet.
Thamnomys (*s.s.*) *venustus schoutedeni* Hatt. Type locality: Medje.
Thamnomys (*s.s.*) *kempi kempi* Dollman. Type locality: Buhamba, 6000 feet.
Thamnomys (*s.s.*) *kempi major* Hatt. Type locality: Mt. Karisimbi, 12,000 feet.
Thamnomys (*Grammomys*) *kuru* Thomas and Wroughton. Type locality: Angu.
Thamnomys (*G.*) *dryas* Thomas. Type locality: Ruwenzori East, at 7000 feet.
Thamnomys (*G.*) *rutilans rutilans* (Peters). Type locality: Lambarene, Gaboon.
Thamnomys (*G.*) *rutilans centralis* Dollman. Type locality: Fundi, Ituri District.
Thamnomys (*G.*) *surdaster surdaster* Thomas and Wroughton. Type locality: Zomba, Zambesi.
Thamnomys (*G.*) *surdaster callithrix* Hatt. Type locality: Garamba, NE. Congo border.

Grammomys as a Genus

The genus *Thamnomys* as originally proposed, embraces species which offer great contrast in characters of pelage, size and teeth. The striking difference of the upper molar cusps of some of these (contrasting forms such as *T. venustus*, in which the third cusp on the lingual surface of the first and second molars is almost as large as the first and second cusps, with species, such as *T. dryas*, in which the third cusp is very small) led Thomas to propose the name *Grammomys*, for the reception of the species with the small cusps. Thomas retained *T. rutilans* (Peters) in *Thamnomys*. Although I have not had opportunity to examine the type of *T. rutilans*, I have seen specimens from the Gaboon, the Cameroon and the Lower Congo which I believe to be correctly referred to *T. rutilans* and yet which do have the third lingual cusp small, as in typical *Grammomys*. The same applies to *T. rutilans centralis* of which I have examined the type and numerous other specimens. *T. rutilans* also resembles typical *Grammomys* in the diagnostic characters of cuneate temporal crests (amphoral in *Thamnomys, s.s.*). I consider then that this species is related to the group referred to *Grammomys* more than those assigned to the restricted group of *Thamnomys*.

A clean cut difference between *Thamnomys, s.s.*, and *Grammomys*, however, does not exist since some species show atypical combinations of characters, or are intermediate in development of the critical "x" cusp, and in consequence, I do not recognize the more recently proposed genus.

Thamnomys venustus schoutedeni Hatt

Ituri Soft-haired Tree Rat

Thamnomys venustus schoutedeni Hatt, 1934, Amer. Mus. Novitates, No. 708, p. 9. Type locality: "Medje, Ituri District, Belgian Congo." Type specimen: adult ♀, A.M.N.H. No. 50066.

1915. *Thamnomys venustus*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 476.

Congo Expedition Specimens

Two as follows:
Medje, 1 (adult ♂), March 13.
Medje, 1 (adult ♀), June 14.

This rat is at present known only from the type locality, Medje. A specimen in the Musée du Congo Belge (No. 4559) collected by Dr. Christy, at Medje is probably of this species, though at the time I saw it I did not compare it directly with the specimen which eventually became the type of this subspecies.

This rat is either much rarer than the other *Thamnomys* secured at Medje, by the American Museum Congo Expedition, or else it has habits or habitat much different from *T. rutilans centralis*, for thirty-three specimens of the latter were secured by Messrs. Lang and Chapin, thirty by Dr. Christy and only three of *T. v. schoutedeni* taken by the three collectors combined.

Nothing is known of the habits of this animal. The type of *T. v. venustus* was shot "as it left its hole among the roots of a tree and had one of its young hanging to a teat."

Thamnomys (Grammomys) surdaster callithrix Hatt

Uelle Tree Rat

Kuru: Azande (Kershaw, Lang)

Figure 31

Thamnomys (Grammomys) surdaster callithrix Hatt, 1934, Amer. Mus. Novitates, No. 708, p. 11. Type locality: "Garamba, Haut Uelle District, Belgian Congo." Type specimen: adult ♂, A.M.N.H. No. 49789.

1915. *Grammomys macmillani*, Thomas. Ann. Mag. Nat. Hist., XVI, p. 476. One specimen listed from Poko, where collected by Christy. Though I have not examined this specimen, I consider it probable that this may be the animal I have named *callithrix*.

1924. *Grammomys surdaster*, Kershaw. Ann. Mag. Nat. Hist., (9) XIII, p. 24.

Congo Expedition Specimens

Twenty-two skins with skulls and one in alcohol, taken as follows:

Faradje, 8 (2 adult ♂, 5 adult ♀, juvenile ♀), February 25; March 1, 15; April 8; May 16; December 5.

Garamba, 1 (adult ♂), March 14.

Niangara, 14 (4 adult ♂, 6 adult ♀, 2 juvenile ♂, 2 juvenile ♀), November 9, 10, 13, 15, 17, 18, 23, 24, 26; December 8.

Distribution.—*Thamnomys s. callithrix* is known by the good series secured by Messrs. Lang and Chapin, by a specimen in the British Museum (21. 1. 8. 22) from the Congo-Nile watershed were collected by A. Shaw and by one of Emin Pasha's specimens taken near Dungu (B.M. 87. 12. 1. 80).

This species, though perhaps as another subspecies, also occurs in the Kasai, at Inkongo, where Wilson secured a male and a female (B.M. 16. 5. 15. 19 and 16. 5. 15. 29, also specimens in M.C.B.) and in the Katanga where two were taken by Neave (B.M. 7. 12. 13. 40 and 7. 12. 13. 42), one along the Dikulwe River. The British Museum also has a specimen (7. 6. 14. 42) from an island in Lake Kivu (4900 feet), collected by Carruthers, that in color, skull size and proportions is somewhat intermediate between *surdaster* and *dryas*, and may possibly represent intergradation between these nominal species.

Reproduction.—Three adults each had the mammary quota of 1–0–2 = 6.

Two young accompanied a female obtained at Niangara, November 13. The collector's measurements of the mother are: head-body, 285; tail, 175; foot, 25; ear, 17; those of one of her young, a male: head-body, 188; tail, 116; foot, 20; ear, 13. Two young were also with a smaller female taken at Niangara on November 24. The adult in this instance measured head-body, 270; tail, 167; foot, 24; ear, 16. One of

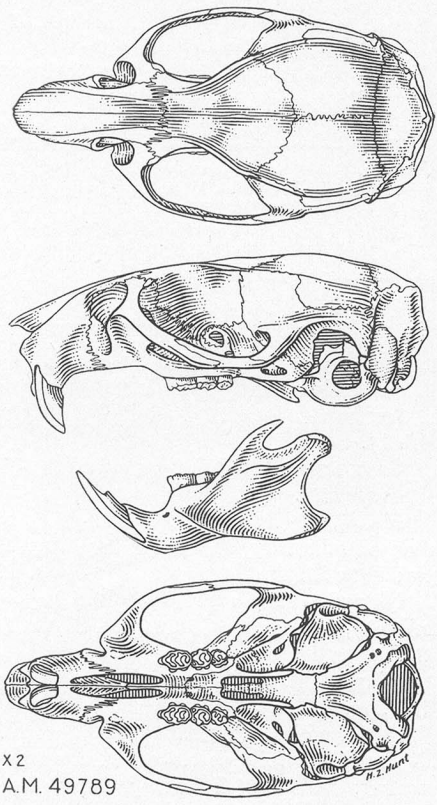


Fig. 31. *Thamnomys surdaster callithrix*. Type. Male. Garamba.

the young, a female, measured head-body, 128; tail, 74; foot, 16; ear, 6. This individual, kept alive for a day, had its eyes open.

Food.—The stomach of an adult female, obtained at Faradje on March 15, contained green vegetable matter.

Mice and Elephants.—At Garamba, the Azande told Mr. Lang the story that these mice run into the trunks of elephants

when the latter are feeding on branches and leaves near the mice. The elephants, under such circumstances, were said to beat their trunks against trees, which action was not always effectual in driving out the invader, and in consequence the elephants would perish.

Thamnomys (Grammomys) rutilans centralis Dollman

Forest Rat, Hairy-tailed Rat, Arboreal Rat (Lang notes)

Nsamba or Mulanda: Luluabourg (Callewaert labels)

Plate XV, figure 1

Thamnomys rutilans centralis Dollman, 1914, Rev. Zool. Afric., IV, fasc. 1, p. 83. Type locality: Fundi, Congo. Type specimen: adult ♂, B.M. 14. 2. 11. 24.

1915. *Thamnomys rutilans centralis*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 476. A good series was secured by Christy at Medje and Poko.

Congo Expedition Specimens

Thirty-two skins with skulls and one specimen in alcohol were secured as follows:

Avakubi, 2 (adult ♂, adult ♀), October 10, 14.

Gamangui, 2 (adult ♂, subadult ♂), February 21.

Medje, 12 (7 adult ♂, 4 adult ♀, juvenile ♂), January 20, 21, 22, 24; May 26, 28; June 22, 24, 29.

Niangara, 12 (8 adult ♂, 3 adult ♀, juvenile ♀), November 9, 13, 16, 18, 23, 26, 28, 29.

Niapu, 3 (2 adult ♂, adult ♀), November 26, 28.

Stanleyville, 2 (2 adult ♂), August 20.

Thus, the following months are represented: January, February, May, June, August, October, November.

Distribution.—Specimens of *T. rutilans* definitely referable to the race *centralis* have come from the following localities: Arebi (M.C.B.); Avakubi (M.C.B.); Fundi (B.M.; M.C.B.); Mambaka (B.M.; M.C.B.); Mambo (M.C.B.); Medje (B.M.; M.C.B.); Pili Pili (M.C.B.); Poko (B.M.; M.C.B.).

Specimens taken at Lukolela by Chapin and Edson (A.M.N.H.), and Kunungu (near Bolobo) by Dr. Schouteden, and Gongo Yembe, Lokoro River, near Lake Leopold II, by Fraser, are nearly typical of *T. r. rutilans* as represented by specimens from Gaboon.

Specimens taken at Inkongo by Wilson (B.M.; M.C.B.); and Luluabourg by Callewaert (A.M.N.H.; B.M.; M.C.B.) are rather intermediate between *T. r. rutilans* and *T. r. centralis* but are perhaps nearer the latter. Other localities in the Kasai from which I have examined specimens (all in the M.C.B.) are:

Baka Mbuli; Kamaiembi; Kambarinbi; Luebo; Lusambo; Macaco.

The Status of *Thamnomys kuru*

The Congo Expedition specimens of *Thamnomys* do not bridge the gap between *T. r. centralis* and *T. kuru*. The relatively short distance (c. 300 kilometers) and general uniformity of conditions between the type locality of *T. kuru*, and Niapu, from which come typical specimens of *T. r. centralis*, as well as the striking similarity between the two species, combined with the fragmentary nature of *T. kuru* material[1] lead me to believe that *T. kuru* may be a dwarf of *T. r. centralis*. If this should eventually be proved, *T. r. centralis* will, of course, become a synonym of *T. kuru*, and *T. kuru* will need to be recognized as a subspecies of *T. rutilans*.

Variation of size and color in a series of *T. r. centralis* is extreme, as noted by Thomas (Ann. Mag. Nat. Hist., (8) XVI, p. 476) in his report on the Christy collection. One example bearing on the status of *T. kuru* is the contrast between two specimens from Niangara, one an adult male (50071) of large skull size but with little worn teeth; the other, a female (50078) practically identical in body size, considerably smaller in skull, but with teeth excessively worn. The difference in size between this individual, a senescent female, and the type of *kuru*, is not great except in the matter of tail length and skull length. Certain selected measurements compare as follows:

[1] *T. kuru* is apparently known only from the type skin and skull, and a topotype skin (which resembles *T. r. centralis* more than *T. kuru*) in the British Museum and three specimens from Koloka in the Berlin Museum, which are said by Schwarz (1920, p. 1086) to be identical with the type.

	♂ 50071	♀ 50078	♀ Type *kuru*
Head and body	127.0	129.0	135.0*
Tail	189.0	185.0	160.0*
Foot	27.0	25.0	24.0*
Greatest skull length	343.0	329.0	290.0
Basilar length	28.1	25.1	23.0
Greatest breadth	15.5	15.2	15.0
Interorbital breadth	6.0	5.7	5.6
Length nasals	12.1	11.6	10.0
Breadth brain case	13.5	12.8	12.7
Palatilar length	13.9	12.2	12.5
Upper molar series	5.3	5.0	5.5

* Dry skin measurements.

While admitting the possibility of synonymy of *T. r. centralis* and *T. kuru*, or intergradation between the two, I prefer to await better evidence, in the form of more specimens from the region of Angu, before merging the two.

It may be noted that though twenty-three males were obtained by the Congo Expedition, only ten females are in the collection.

One individual, an adult female, is marked on the back by a tuft of white hairs which, I assume, mark the site of an old injury.

Five females were recorded as with two pairs of abdominal mammae. October 10 at Avakubi, a female had no embryos. There are no positive records of gravid individuals.

Specimens taken February 16, August 20 and October 10 had "green vegetable matter" in their stomachs.

LEGGADA GRAY

Pigmy Mice

Leggada GRAY, 1837, Charlesworth's "Mag. Nat. Hist.," I, p. 586. Included species: *Leggada booduga* Gray and *Mus platythrix* Bennett.

1881. *Leggada*, THOMAS. Proc. Zool. Soc. London, 1881, p. 552. *Leggada booduga* fixed as genotype.

1910. *Mus*, MILLER. Proc. Biol. Soc. Washington, XXIII, p. 57. *Leggada* considered a synonym of *Mus*.

1913. *Leggada*, WROUGHTON AND RYLEY. Jour. Bombay Nat. Hist. Soc., XXII, p. 16. *Mus platythrix* taken as genotype.

1914. *Mus*, THOMAS. Jour. Bombay Nat. Hist. Soc., XXII, p. 682. *L. booduga* upheld as genotype of *Leggada*, which is considered a synonym of *Mus*.

1919. *Leggada*, THOMAS. Jour. Bombay Nat. Hist. Soc., XXVI, p. 419. *L. booduga* and its allies defined as generically distinct from *Mus*, and the genus *Leggada* thus reinstated.

Within the Belgian Congo there occur, or have been reported, a large number of forms of pigmy mice, representing several different groups. These are:

Leggada bella bella Thomas. Type locality: Machako's, Kenya Colony, 5000 feet.

Leggada bella kasaica Cabrera. Type locality: Luluabourg, Kasai.

Leggada bella enclave (Heller). Type locality: Rhino Camp, Lado Enclave.

Leggada bella gondokorae (Heller). Type locality: Gondokoro, Uganda.

Leggada grata grata Thomas. Type locality: Mubuku Valley, Ruwenzori East, Uganda.

Leggada pasha Thomas. Type locality: Tingasi, Monbuttu, Belgian Congo.

Leggada neavi Thomas. Type locality: Petauke, East Loangwa District, N.E. Rhodesia, 2400 feet.

Leggada emesi (Heller). Type locality: Kabula Muliro, Uganda.

Leggada musculoides (Temminck). Type locality: Côte de Guiné.

Leggada triton triton Thomas. Type locality: Kirui, Mt. Elgon, 6000 feet.

Leggada triton murilla Thomas. Type locality: Machako's, Kenya Colony, 5400 feet.

Leggada triton fors Thomas. Type locality: Butagu Valley, W. Ruwenzori, 7000 feet, Belgian Congo.

Leggada tenellus acholi (Heller). Type locality: Rhino Camp, Lado Enclave.

Leggada birungensis (Lönnberg and Gyldenstolpe). Type locality: Mt. Mikeno, Birunga volcanoes.

Leggada bufo bufo Thomas. Type locality: Ruwenzori East, Uganda, 6000 feet.

Leggada bufo wambutti (Lönnberg and Gyldenstolpe). Type locality: Campi ya Wambutti, Ituri Forest, Belgian Congo.

To this perhaps should be added the mouse which Thomas named *Hylenomys callewaerti*, as *Leggada triton callewaerti* (Thomas). The genus *Hylenomys* was established almost wholly on the character of the proodont incisors of the type and only specimen, which was otherwise indistinguishable from the specimens referred to *Leggada triton* occurring at the type locality. The American Museum has six skins from Luluabourg referable to *L. triton* or *H. callewaerti*, but by an unfortunate circumstance, only two of these are accompanied by skulls. It is highly interesting to note, however, that in skins and skulls these two specimens (86265 and 86269) cannot be told apart except for the one feature of the angle of the incisors. In one of these the incisors

are normal, orthodont, in the other somewhat proodont—but little less so than in the type of *Hylenomys callewaerti*. It appears to me that *Leggada triton* in the Luluabourg District is subject to an unusual variation in angle of its incisors.

KEY TO THE *Leggadas* OF THE CONGO EXPEDITION COLLECTION

A.—Size large (H-B c. 88 mm.); foot broad. No sub-auricular white spot, eye ring not prominent; mammae 3–2 = 10. *L. pasha.*

B.—Size smaller (H-B 77 mm. or less); foot narrow

a.—Color darker than *L. pasha;* eye ring and sub-auricular white spot obsolete; masseteric knob small; mammae 2–2 = 8.....*L. emesi.*

b.—Color about as in *L. pasha* but eye ring and sub-auricular spot prominent; size smallest; masseteric knob strong; mammae 3–2 = 10.....*L. b. enclave.*

c.—Color darker than *L. pasha;* prominent bright buffy side stripe; eye ring and sub-auricular spot obsolescent; masseteric knob strong; mammae 3–2 = 10.....*L. g. grata.*

d.—Color light; eye ring prominent; masseteric knob strong; ear very small, rounded, almost naked; mammae 3–2 = 10.....*L. musculoides.*

Leggada bella enclave (Heller)

Figure 32

Mus bellus enclave HELLER, 1911, Smithsonian Misc. Coll., LVI, No. 17, p. 8. Type locality: Rhino Camp, Lado Enclave. Type specimen: adult ♂, U.S.N.M. 164818.

1919. *Mus bellus enclave*, HOLLISTER. U.S. Nat. Mus. Bull. 99, part 2, p. 97.

1921. *Mus*, EMIN. "Die Tagebücher von Dr. Emin Pascha," VI, p. 27.

1928. *Mus bellus enclave*, GYLDENSTOLPE. Arkiv för Zoologi, Bd. 20A, N:o 4, p. 73. A specimen listed from Kartoushi.

CONGO EXPEDITION SPECIMENS

Represented by twenty-eight specimens half of which are skins with skulls, half specimens in alcohol. All of the Garamba specimens, the Nala specimen, two from Faradje and two from Niangara are in alcohol.

Faradje, 14 (7 adult ♂, 6 adult ♀, juvenile ♀), February 17, 18; March 1, 23; April 4, 11, 24.

Garamba, 9 (7 adult ♂, 2 adult ♀), March 15; May 14, 15.

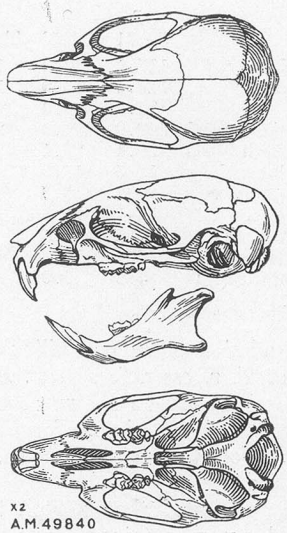


Fig. 32. *Leggada bella enclave.* Male. Faradje.

Nala, 1 (adult ♂), July.

Niangara, 4 (adult ♂, juvenile ♂, juvenile ♀), November 9, 16; December 5.

REPRODUCTION.—The mammae, as noted on three specimens, are 3–2 = 10. A specimen taken March 1, at Faradje, had three young.

FOOD.—The stomach contents of an adult female taken March 23, at Faradje, was predominantly of insects. It was noted by Mr. Lang that "these mice decay rapidly as do shrews, and for this reason are difficult to prepare."

HABITAT.—At Faradje, Mr. Lang observed that these mice were very common in the village which was surrounded by a sort of reed fence that was partly decayed and fallen down.

Leggada grata grata Thomas

Plate VIII, figure 2; Plate XV, figure 2

L. [*eggada*] *grata* THOMAS, 1909, Ann. Mag. Nat. Hist., (8) IV, p. 549. Type locality: Mubuku Valley, east Ruwenzori, Uganda. Type specimen: old ♀, B.M. 6. 7. 1. 155. The species was here inadvertently defined in advance of the publication of its formal description.

1910. *Leggada grata*, THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, p. 507. A formal description delayed in publication.

1915. *Mus bellus*, THOMAS. Ann. Mag. Nat.

Hist., (8) XVI, p. 478. Specimens from Medje and Poko.

1919. *Mus gratus gratus*, HOLLISTER. U.S. Nat. Mus. Bull. 99, part 2, p. 102. Specimens are listed from Uganda and Kenya Colony.

1936. *Leggada grata grata*, ALLEN AND LAWRENCE. Bull Mus. Comp. Zoöl., LXXIX, No. 3, p. 97.

CONGO EXPEDITION SPECIMENS

There are twenty-seven specimens, seventeen of which are skins with skulls, one skin only, three skulls only and six in alcohol, collected as follows:

Bafwabaka, 6 (3 adult ♂, 3 adult ♀), December 20, 29; January 4, 5.

Medje, 7 (2 adult ♂, 5 adult ♀), March 24; June 14; July 27; August 23, 26; September 16, 24.

Ngayu, 9 (4 adult ♂, adult ♀, 2 adult [sex ?], juvenile ♂), July 29; December 14, 19, 20, 21, 22.

Niangara, 4 (2 adult ♂, 2 adult ♀), November 19, 26.

Stanleyville, 1 (adult [sex ?]), January.

HABITAT.—The ecological source of several specimens was noted by Mr. Lang. One, a juvenile, was secured in a native hut (Ngayu); another, adult, in the grass near native huts (Ngayu); one in high grass near the forest (Bafwabaka); another under a heap of wood (Stanleyville).

ACTIVITY.—One specimen was found in the trap in the early morning and evidently caught in the night as the epidermis slipped from the abdomen. Another specimen was trapped at 7 P.M. Yet another was taken in the daytime.

FOOD.—Specimens were taken in traps baited with manioc. One stomach contained "whitish vegetable matter."

REPRODUCTION.—The mammae, as determined by the collector and by myself, on several specimens, are: 3-2 = 10.

Four medium-sized embryos were found in a specimen taken December 19, at Ngayu. Five young were found on a verandah in a box containing a small bale of dry grass and a few chicken feathers by Dr. Chapin at New Beni.

Leggada pasha Thomas

Leggada pasha THOMAS, 1910, Ann. Mag. Nat. Hist., (8) V, p. 89. Type locality: Tingasi, Monbuttu. Type specimen: B.M. 87. 12. 1. 93.

1915. *Mus pasha*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 478. Christy secured a specimen at Panga and nine others at Poko.

1936. *Mus proconodon pasha*, OSGOOD. Field Museum Nat. Hist., Zool. Ser., XX, No. 21, p. 247.

CONGO EXPEDITION SPECIMENS

Represented by three skins with skulls and five in alcohol as follows:

Bafwabaka, 1 (adult ♂), January 5.

Niangara, 6 (2 adult ♂, 2 adult ♀, juvenile ♂, juvenile ♀), November 30; December 6, 17, 27.

Yakuluku, 1 (adult ♀), November 4.

Leggada emesi (Heller)

Mus musculoides emesi HELLER, 1911, Smithsonian Misc. Coll., LVI, No. 17, p. 5. Type locality: Kabula Muliro, Uganda. Type specimen: adult ♂, U.S.N.M. 164819.

1919. *Mus emesi*, HOLLISTER. U.S. Nat. Mus. Bull. 99, part 2, p. 96.

CONGO EXPEDITION SPECIMENS

Three skins with skulls as follows:

Niangara, 3 (2 adult ♀, juvenile ♀), November 9.

REPRODUCTION.—There are two pairs of pectoral and two pairs of abdominal mammae. In this respect *L. emesi* is unique among the pigmy mice of the eastern Congo. A female taken at Niangara, November 9, had four young.

Leggada musculoides (Temminck)

Harvest Mouse (Allen and Coolidge)

Mus musculoides TEMMINCK, 1853, "Esquisses Zool. sur la Côte de Guiné," p. 161. Type locality: Dabocrom, interior Fanti country 'Côte de Guiné" [= Gold Coast].

1923. *Leggada musculoides*, KERSHAW. Rev. Zool. Afric., XI, fasc. 4, p. 367. Records from Luebo and Kisantu.

CONGO EXPEDITION SPECIMEN

One, in alcohol, as follows:

Malela, 1 (subadult ♂), July 8.

This *Leggada*, of which *L. bella* and the forms currently allied with it may be but subspecies, is at present known only from the western section of the forest, between Lukolela and the coast. Material at hand is inadequate for the purposes of determining the extent of difference between Congo representatives and the stock as it occurs westward to Liberia.

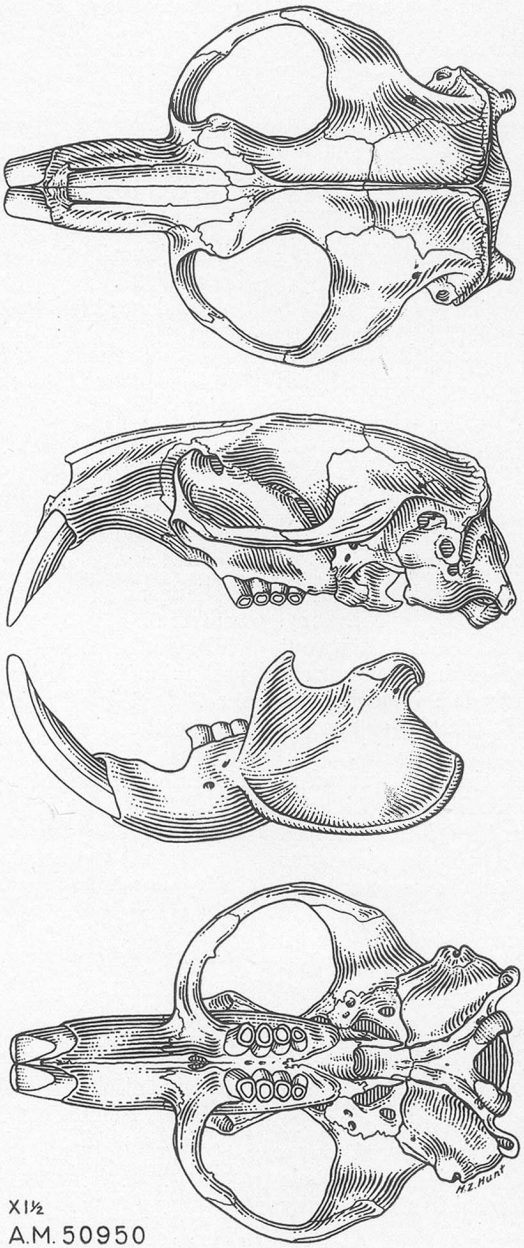


Fig. 33. *Cryptomys lechei*. Male. Garamba.

BATHYERGIDAE

CRYPTOMYS GRAY

Blesmols: Mole-rats

Cryptomys GRAY, 1864, Proc. Zool. Soc. London, 1864, p. 124. Type: *Georychus holosericeus* Wagner.

The blesmols, because they are inhabitants of steppe country, are limited in their Congo distribution to the fringes of the Congo, and as most other steppe dwellers are represented by different species in the Uelle, the Katanga and the Kasai. *C. mellandi* (Thomas) and *C. amatus* (Wroughton) have been identified from the Katanga. It is possible that *C. ansorgei* (Thomas and Wroughton) of Angola, *C. molyneuxi* (Chubb) of northwestern Rhodesia and *C. meckleni* (Chubb) of the same region, will be found within the borders of the Belgian territory.

Cryptomys lechei (Thomas)

Tuyu: Garamba (Lang). Túndua: Mangbettu (Emin)

Plate XVI, figures 1, 2, 3; Figure 33

Georhychus Lechei THOMAS, 1895, Ann. Mag. Nat. Hist., (6) XVI, p. 241. Type locality: "Bellima, Monbuttu." Type: ♂, B.M. 87. 12. 1. 96.

1885. *Georychus ochraceo-cinereus*, THOMAS. Proc. Zool. Soc. London, 1888, p. 14. Original reference to the type of *C. lechei*.

1887. *Georhychus damarensis*, LECHE. Zool. Jahrb., III, p. 120. (See above references.)

1921. *Georhychus (argenteo-cinereus)*, EMIN (part). "Tagebücher," VI, p. 31.

CONGO EXPEDITION SPECIMENS

Represented by thirty-seven specimens, thirty-three of which are skins with skulls, one a skin without skull and three in alcohol. They were collected as follows:

Faradje, 14 (adult ♂, 11 adult ♀, adult, sex [?], juvenile ♂), January 2; April 25; May 15, 25, 27, 30; June 17, 19, 29; November 5; December 16.

Garamba, 23 (11 adult ♂, 11 adult ♀, juvenile ♀), May 6, 12, 13; June 17, 21, 22, 24, 29; July 7, 9, 18, 19, 21, 23.

The species is represented in the British Museum by specimens from Gudima on the Ira River, and Magambo. In the Congo Museum are specimens from Djugu.

HABITS.—The hillocks thrown up by these blesmols, as observed by Mr. Lang in a field of Eleusine at Faradje, were three to four inches high in the center and eight to ten inches in diameter at their base. Four such hillocks were spaced two and one-half to four feet from each other. Their character is well shown in Plate XVI, figure 1. The animal shown in this figure I judge to be a dead animal posed in the flesh; an art at which Mr. Lang excelled.

REPRODUCTION.—There are two pairs of pectoral and one pair of abdominal mammae.

THRYONOMYIDAE

CHOEROMYS THOMAS

Short-tailed Cane Rats

Choeromys THOMAS, 1922, Ann. Mag. Nat. Hist., (9) IX, p. 390. Type species, by original designation: *Thryonomys gregorianus* Thomas.

Choeromys harrisoni harrisoni (Thomas and Wroughton)

Cane Rat

Bendi: Niangara (Lang)

Plate XVII, figure 1; Figures 34, 35

Thryonomys Harrisoni THOMAS AND WROUGHTON, 1907, Ann. Mag. Nat. Hist., (7) XIX, p. 384. Type locality: "Loka, 60 miles S.W. of Fort Berkeley, Lado District." [The locality given on the label of the type is "Lockor," west of Nile, 4° N.] Type: B.M. 4. 9. 28. 2, a skull accompanied by an imperfect skin of head, shoulders and fore feet.

1910. *Thryonomys harrisoni*, THOMAS AND WROUGHTON. Trans. Zool. Soc. London, XIX, part 5, p. 516. A specimen is recorded from Beni.

1915. *Thryonomys harrisoni*, THOMAS. Ann. Mag. Nat. Hist., (8) XVI, p. 481. Christy obtained three specimens at Poko.

1922. *Choeromys harrisoni congicus*, THOMAS. Ann. Mag. Nat. Hist., (9) IX, p. 390. Type locality: "Lower Welle River, Congo." Type: adult ♂, B.M. 7. 7. 8. 192.

CONGO EXPEDITION SPECIMENS

There are twenty-one specimens of which eighteen are skins with skulls, one a skin without skull and two skulls without skin. They were collected as follows:

Faradje, 16 (3 adult ♂, 3 adult ♀, 3 adult, sex [?], 4 juvenile ♂, 3 juvenile ♀),

February 17, 18, 21, 25, 26, 28; March 4, 5, 24, 28; June 9; December 8.

Medje, 1 (adult ♂), May 4.

Niangara, 2(adult ♂, juvenile ♀), December 4, 26.

Vankerckhovenville, 1 (adult ♀), April 1.

Locality ?, 1 adult skull only; no data.

But one of the Congo Expedition series has the coloration of the type of *Choeromys harrisoni congicus* Thomas. This is the Medje specimen, which is perhaps from nearer the type locality than any of the others. It chances, however, also to be the oldest individual in the lot, and I am inclined to believe that the lighter coloration may be attributed solely to age.

Concerning the taxonomic status of *Choeromys rutshuricus* (Lönnberg), I am somewhat in doubt. The two specimens on which the species was founded are considerably larger than any of those from the Faradje region, yet may only be considerably older specimens. There appears to be no significant difference in other characters, and I am inclined to recognize it as a valid race of *C. harrisoni* until proved otherwise. In Faradje specimens, as in *C. rutshuricus*, the postorbital process is sometimes well developed, and the relative distance of the first groove from the outer margin of the tooth subject to some variation.

RANGE.—*Choeromys harrisoni* appears to occupy not only the Lado, but the savannas of the Semliki, and the Butahu Valley at 6500 feet on the west slopes of Ruwenzori, and at 8000 feet on the east, and the Uelle. Specimens of this genus are represented in the Congo Museum from Banzyville, Kwamouth and the Bas Congo; and in a cursory examination of the material I was not able to distinguish these specimens from those of the upper Uelle. The spread of one subspecies of rodent from the upper Nile to the Lower Congo is almost without parallel.

The occurrence of cane rats at from 6500 to 8000 feet on Ruwenzori, and at Poko and Medje, within the limits of the Congo Forest is doubtless explainable on the occurrence of native plantations in these areas.

BEHAVIOR.—An adult male was held captive for a time. It was observed that he never attempted to bite or make any use of his teeth.

The Medje specimen was shot at close range at midday, in a native plantation near a native village.

FOOD.—The stomach of an adult male (Niangara, December 4) contained manioc and green vegetable matter. Another, adult male (Medje, May 4), had eaten coarse grass.

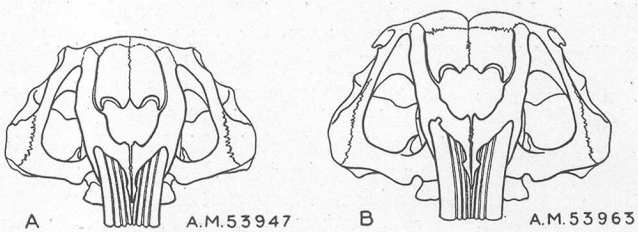


Fig. 34. Contrast in frontal and incisor characters of *Choeromys* (A) and *Thryonomys* (B). Both are adult females from Faradje.

REPRODUCTION.—There are but two pairs of laterally placed mammae. Two of the specimens contained gravid uteri, there being three embryos in each instance; one specimen secured February 28, the other March 24, at Faradje. The head–body lengths of the mothers were both 465 mm.

ANATOMICAL NOTES.—Of the appearance of an adult male secured May 4, Mr. Lang noted that: "The edge and back of ear are dark grayish, nostrils whitish pink. The ears are pressed to the head, the eyes rather small and not protruding. The incisors are invisible, being covered by the heavy lips. There is a large amount of soft tissue and skin upon and in front of the nasal cartilage. It gives the idea of a small hood as it is protruding 15 mm. beyond the nostrils and 22 mm. in front of the upper incisors, near the alveolus. Tail and pads of

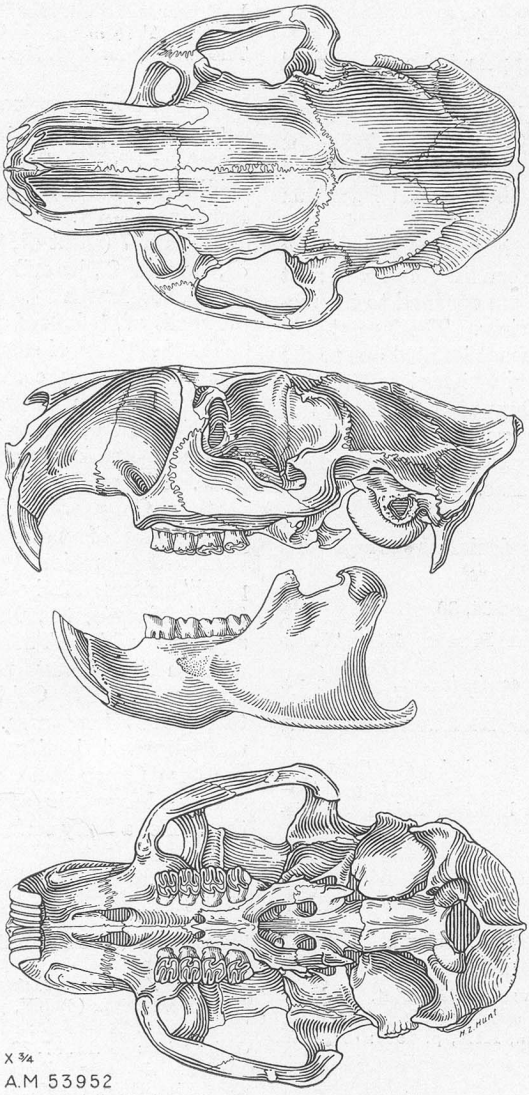


Fig. 35. *Choeromys harrisoni harrisoni.* Male. Faradje.

the hind limbs dark brownish, pads of fore limbs lighter."

A note on the digestive tract of an adult whose head-body length was 329 mm., follows: "Small intestine, 1320 mm.; large intestine, 980 mm.; caecum, 160 mm. The width of the caecum is 40 to 60 mm."

THRYONOMYS FITZINGER

Long-tailed Cane Rats

Thryonomys FITZINGER, 1867, Sitzungsber. Math.-Naturwiss. Cl. k. Akad. Wiss., Wien, LVI, p. 141. Type species: *Aulacodus semipalmatus* Heuglin (= *A. variegatus* Peters).

1922. *Thryonomys*, THOMAS. Ann. Mag. Nat. Hist., (9) IX, pp. 389–391. Restricted.

One species (*swinderianus*) and four subspecies (*swinderianus*, *variegatus*, *raptorum* and *angolae*) are recognized and defined.

Two subspecies appear to be represented in the Belgian Congo: *T. s. variegatus*, occupying the Uelle; the other, *T. s. angolae*, the Lower Congo (the region of the Cataracts and Mukimbungu), the Kasai (Inkongo and Luluabourg) and Pweto on Lake Mwero.

The grooves of the incisors of *Thryonomys* as contrasted to the condition found in next genus (see Fig. 34) are confined to the median half of each incisor. The frontal area of the skull is somewhat inflated due to the large frontal sinuses, which also effect the shape of the cribriform plate, which in this genus is roughly pyramidal. The tail is about double the foot length and there are three pairs of mammae.

Thryonomys swinderianus variegatus (Peters)

Figures 34, 36

Aulacodus variegatus PETERS, 1852, "Reise Mossamb." p. 138.

1864. *Aulacodus semipalmatus*, HEUGLIN. Nov. Act. Acad. Caesareae Leopoldino-Carolinae Germ. Nat. Curiosorum, XXXI, Abhandl. No. 7, p. 5.

1874. *Aulacodus swinderianus*, SCHWEINFURTH. "The Heart of Africa," II, pp. 446–450, 506. Notes on hunting, habits and distribution.

1897. *Aulacodus calamophagus* DE BEERST. In Pousargues, Bull. Mus. Paris, p. 160.

1922. *Thryonomys swinderianus variegatus*, THOMAS. Ann. Mag. Nat. Hist., (9) IX, p. 391.

CONGO EXPEDITION SPECIMENS

There are eight specimens, of which two are skins with skeletons, one a skin with skull and five skulls only. They were collected as follows:

Faradje, 7 (adult ♂, 3 adult ♀, juvenile ♂, juvenile ♀, juvenile, sex [?]), February 21, 25, 26; March 20.

Locality ?, 1 skull of adult; no data.

The definition of subspecies of *Thryonomys swinderianus* contained in Thomas' paper of 1922, was based on inadequate material, and a later reviewer of the subject will most certainly reach different conclusions. All mature specimens from the northern Congo which I have examined, as is true also of specimens from Bozoum, Ubangi-Shari region, have the "intertemporal" gutters sharply defined, as is characteristic of *variegatus*, and supposedly not of *raptorum* which Thomas states ranges through the forest region from lower Nigeria and the Gold Coast, eastward through the Congo area. No other characters observed justify the separation of northern Congo stock as racially distinct from the Mozambique form, except perhaps the lack of a buffy suffusion over the rump.

HYSTRICIDAE

ATHERURUS F. CUVIER

Brush-tailed Porcupines

Atherurus G. F. CUVIER,[1] 1829, Dict. Sci. Nat., LIX, p. 483. Type species (*vide* Lyon, 1906, Proc. Biol. Soc. Wash., XIX, p. 199): *Hystrix macroura* Linnaeus.

LIST OF THE NOMINAL SPECIES OF AFRICAN *Atherurus*

1842. *Atherura Africana* GRAY. Ann. Mag. Nat. Hist., (1) X, p. 261. Type locality: "West Africa, Sierra Leone." Type specimen, by subsequent designation (*vide supra*) in the British Museum.

1854. *Atherura armata* GERVAIS. Hist. Nat. Mammifères, I, p. 334. Type locality, by original designation, "Gambie." It was stated by Pucheran (1855–1860) that the type was from the "Gabon."

1895. *Atherura centralis* THOMAS. Ann. Mag. Nat. Hist., (6) XV, p. 89. Type locality: "Monbuttu, Central Africa." Type, by original designation: B.M. 87. 12. 1. 98.

1902. *Atherura Burrowsi* THOMAS. Ann. Mag. Nat. Hist., (7) IX, p. 270. Type locality: "Lower Aruwimi River, close to its junction with the Congo." Type specimen: B.M. 2. 2. 28. 1.

1932. *Atherura turneri* ST. LEGER. Ann. Mag. Nat. Hist., (10) X, p. 231. Type locality: "Kakamega Forest, near Kaimosi, North Kavirondo, Kenya." Type: B.M. 32. 8. 6. 1.

In comparing skulls it is desirable to have some criterion for defining relative age. Fortunately, in porcupines, this is quite practical to do, and I will employ here eight categories in the manner that Thomas

[1] Commonly falsely attributed to G. L. Cuvier, 1829, Règne Anim., 2d Ed., I, p. 215, in which "Les Atherures" only appears.

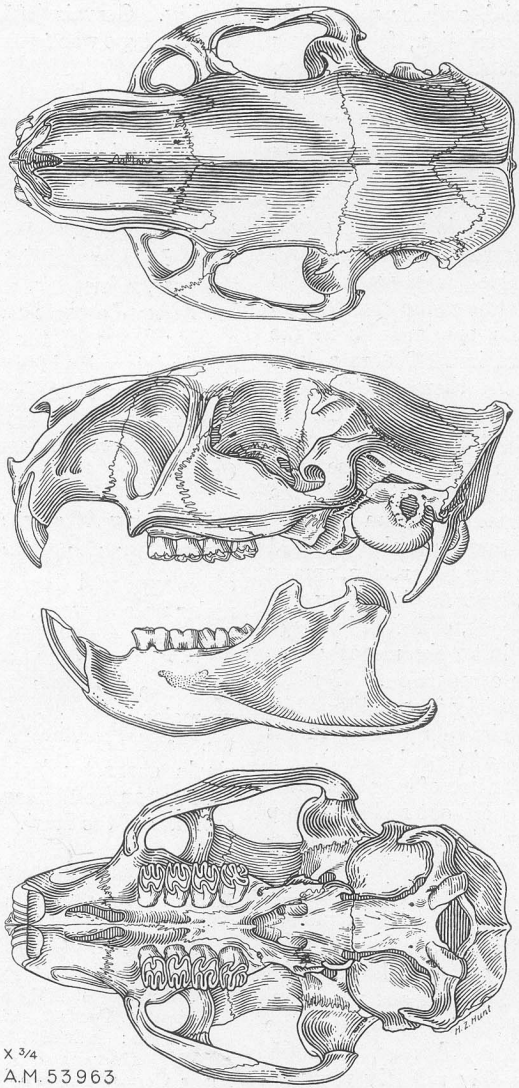


Fig. 36. *Thryonomys swinderianus variegatus.* Female. Faradje.

defined age classes of hyraxes. Those which I propose are limited, as follows:

Stage I.—M^1 unerupted
II.—M^2 unerupted
III.—d Pm worn, M^3 unerupted
IV.—d Pm much worn, M^3 just erupted
V.—d Pm much worn, M^3 lightly worn
VI.—p Pm erupted, M^3 worn
VII.—p PM slightly worn, M^3 worn
VIII.—All permanent teeth well worn

Within any of the age groups there is a considerable range of variation, but on the whole this is a workable arrangement.

What Is the Type of *Atherurus africana* Gray?

In Gray's description (1842) of *A. africana* reference was first made, without comment, to *A. fasciculata* Bennett (1830).

Then followed a brief, and for subspecific purposes, useless description, followed by the line "Hab. West Africa, Sierra Leone, Whitfield. Brit. Mus." Mention was also made of a living specimen in the menagerie of the Earl of Derby, and a dead one in the British Museum.

Bennett's account was a general one concerning chiefly the Asiatic representatives of the genus, but referred to a specimen presented to the Zoological Society about 1828 by Lt. Vidal who obtained the specimen on Fernando Po. This specimen is in the British Museum and in 1933 bore a type label, possibly placed there by Thomas. Thomas in 1895, as a matter of fact, did not consider the Whitfield Sierra Leone specimen as type, for he wrote: "Since then (1887) the skulls have been extracted from the type and other specimens from the West Coast, and the Museum has also received additional material from that region, among which the most noteworthy is a very fine skull from Sierra Leone, collected long ago by Mr. Whitfield but only recently rendered available for comparison." By this latter is almost certainly meant the Whitfield specimen mentioned by Gray in his definition of "Habitat" (type locality).

The question of fixation of type has never been specifically pointed out and the group has had no reviser. Thomas has, it appears, selected the type in an informal manner, as the Fernando Po specimen of Lt. Vidal, but it is obvious that the specimen to which Gray principally referred, even though he obviously knew of the Vidal specimen, was the Sierra Leone specimen. Gray (1842) noted that this was in the British Museum but Thomas, in 1895, stated that it was only recently rendered available for comparison.

Because it appears advisable, I hereby designate the Sierra Leone specimen of Whitfield as the type of *Atherura africana* Gray, on the basis that although the describer was aware of the existence of the Fernando Po specimen, and others, he specifically selected the Whitfield specimen as definitive of "Habitat," which was stated to be Sierre Leone. It may be noted that Pucheran, Glover Allen and Schwarz have Accepted this as type, or the locality as type locality. Gervais (1854), it is true, stated that the type was from Fernando Po.

The Type Locality of *Atherurus armata* Gervais

In the original description of *Atherurus armata* Gervais, the specimen on which the species was based was said to have come from "Gambie." Pucheran (1858–1860, Arch. Museum d'Hist. Nat., X, p. 132), however, referred to the same specimen of M. Aubry-Lecomte as "reçu du Gabon." Doctor Rode of the Paris Museum has kindly determined for me that all specimens received from M. Aubry-Lecomte were from Gaboon and it is thus shown that Gervais made an error in assigning his type to Gambia.

Regarding *Atherurus burrowsi* Thomas

In the original description Thomas spoke of the type of *A. burrowsi* as having the last molar up and worn, but an examination of the skull marked type (there is no skin or other skull) in the British Museum showed this to be an animal of stage III (deciduous premolar in use; molar^3 unerupted) with the basal suture widely open. I find no single character by which this nominal species can be defined, or separated, from *centralis* of the Ituri.

Atherurus africanus centralis Thomas

Kolia: Monbuttu (Emin). Mbessi: Niapu (Lang)

Plate XVIII, figures 1 and 2; Figure 37

Atherura centralis Thomas, 1895, Ann. Mag. Nat. Hist., (6) XV, p. 89. Type locality: "Monbuttu, Central Africa." Type by original designation: B.M. 87. 12. 1. 98.

1884. *Atherura armata*, Johnston. "The River Congo," p. 386. Sir Harry noted that this porcupine was found at Bolobo and in the Upper Congo.

1884. *Athenusa africana*, Johnston. "The River Congo," 3rd Ed., p. 390.

1888. *Atherura africana*, Thomas. Proc. Zool. Soc. London, 1888, p. 15. Three adults and a young specimen were secured by Emin in the Monbuttu country, where he noted that it was common and eaten by the natives.

1902. *Atherura burrowsi*, Thomas. Ann. Mag. Nat. Hist., (7) IX, p. 270. Type locality: "Lower Aruwimi River close to its junction with the Congo." Type specimen: B.M. 2. 2. 28. 1.

1913. *Atherura*, Schubotz. "From the Congo to the Niger and the Nile," II, Chap. XIV, p.

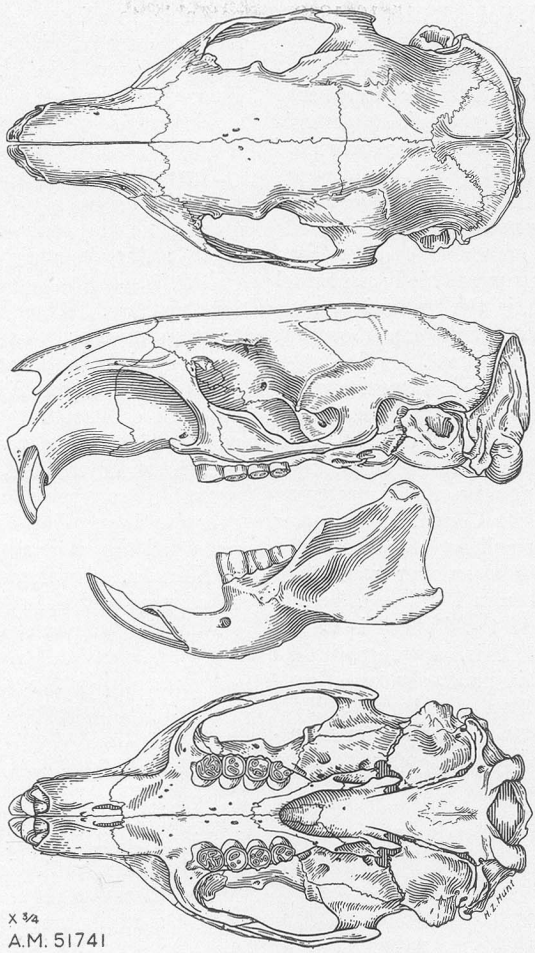


Fig. 37. *Atherurus africanus centralis.* Male. Medje.

30. Specimens obtained at Koloka's, two days' march south of Angu.

1915. *Atherurus centralis*, Thomas. Ann. Mag. Nat. Hist., (8) XVI, p. 481. Christy secured eleven specimens at Poko.

1920. *Atherurus africanus centralis*, Schwarz. Friedrich's "Ergebn. Zweit. Deutsch. Zentr. Afric. Exp. 1910–1911," I, Zool. Lief. 15, p. 1088. Four skins and two skulls from Koloka were taken by Schubotz.

1921. *Atherura* (*africana*?), Emin. "Tagebücher," VI, p. 32. The Mangbetu consider the meat a delicacy. Emin obtained three specimens alive from their country.

Congo Expedition Specimens

The brush-tailed porcupine is represented in the collections of the Expedition by sixty-two skins with skulls, one skin with skull and body skeleton, two complete skeletons, two skulls only and one foetus in alcohol. They were collected as follows:

Akenge, 10 (7 adult ♂, 3 adult ♀), September 12, 18, 29, 30; October 9, 24, 26, 29.

Faradje, 1 (adult ♀), March 14.

Medje, 21 (9 adult ♂; 7 adult ♀, 2 juvenile ♂, 3 juvenile ♀), March 3, 6; April 11, 13; May 3, 4, 6, 10, 11; June 5, 28; July 20, 30; August 7, 8; September 9, 10.

Niapu, 36 (18 adult ♂, 8 adult ♀, adult, sex ?; 4 juvenile ♂; 4 juvenile ♀; foetus), November 16, 17, 18, 21, 22, 25, 28, 29, 30;

December 1, 2, 4, 7, 9, 11, 13, 15, 16, 18, 22, 25.

DISTRIBUTION.—At Faradje, in the savannas where gallery forest occurred, Mr. Lang observed, after a considerable residence, that these porcupines were evidently very scarce, because they were able to secure but one individual. At Medje, in the forest, the collector noted that these animals were relatively common but difficult to secure because they were chiefly nocturnal in habits. At Medje the porcupines were most abundant near native plantations but were also found in the forest.

The Congo Museum has specimens of *Atherurus* from a number of localities in the Uelle: Umangi, Panga, Popoie, Arebi, Buta, Koteli and Poko. Another specimen comes from Luluabourg, Kasai, and one from Bolobo, middle Congo. This latter has a particularly small skull for its age and represents perhaps a smaller race than *centralis*. A skull from Mayombe (on the lower fifty miles of the Congo) is in the British Museum. This, however, unlike the Bolobo skull, is unusually large, considerably larger than the type skull of *africanus*. A few comparative measurements of these specimens may here be given:

	Type *africanus*	Mayombe Specimen	Type *centralis*
Greatest length	92.0	102.5	94.3
Condylo-incisive length	88.0	95.0	c88.0
Greatest width	49.5	49.0	44.5
Alveolar length tooth row	19.5	18.0	16.0
Width M^1	4.6	4.3	4.1

THE MODE OF LIFE.—During the day, according to Mr. Lang, these porcupines took refuge in rotten tree trunks that lay on the ground, in large hollow trees or burrows. Only at night could they be trapped.

Four specimens were taken on one occasion from a hiding place and, another time, a female with three more than half-grown young were obtained together. Natives averred that as many as ten would occasionally be found together.

These porcupines were found to be capable of running up slanting trees but were not able to climb. An astonishing performance was their leaping three or four feet horizontally at a jump. Set free on level ground in a village, uninjured specimens would not run off rapidly, but in the forest they disappeared quickly.

DEFENSE.—The tails of the old-world porcupines serve a "warning" in the same manner as the tails of rattlesnakes. In *Hystrix* the mechanism consists of thin-walled, cup-shaped quills which have delicate pedicels. When the tail is vibrated these produce a loud noise. In *Atherurus* the caudal hairs are transformed into a series of as many as six flattened enlarged air cells connected by thin strands, the whole tuft making a very efficient rattle. Mr. Lang noted that a living specimen responded to approach by curling its tail over its back, vibrating it rapidly, and remarked the similarity to the sound of a rattlesnake. Another individual it was noted produced the sounds by rapid sideway movements on or close to the ground.

Other defensive behavior of this species was described by Mr. Lang in the following words: "If irritated, they raise their spines on the posterior half of their body but chiefly on their back. Lowered on their haunches, they rapidly hit one or the other hind foot on the ground in so rapid a fashion that it is really impossible to see it exactly, thus producing a loud tapping noise. When touched on the back one makes a rapid movement backward, but when touched, for instance, on the sides of its neck it actually throws forward and sideways its posterior portion of the body. This doubling up must be a formidable defense, but in spite of this, I have twice found remains of them in stomachs of leopards, for which they must be an easy prey.

"The natives believe firmly that these porcupines can shoot their spines after or in the direction of their enemies. The reason for this is quite easy to comprehend when one sees the animal attacked, darting about so rapidly that one is unable to follow its movements and there might be some truth in this belief. The fact is that the living animal can certainly loosen its spines at which time they will drop out in these

fights with surprising ease. After death, however, they stick rather firmly in their deep-set cells. The skin is extremely tender and it is very difficult to prepare specimens of this species."

ALIMENTATION.—Manioc was identified in two stomachs. Also noted was "the same reddish bean-like fruit which is eaten by the larger squirrels and flying squirrels"; ripe plantains, and large crickets. Palm-nuts, at Akenge, where the palms were fairly abundant in the forest, formed the chief item of food.

The digestive tract measurements of an adult male whose head-body length was 460 mm., were: small intestine, 6800 mm.; large intestine, 1250; caecum, 260.

REPRODUCTION.—There are two pairs of laterally placed mammae, situated somewhat behind the fore limbs (three specimens). A small embryo was found in a specimen taken at Niapu, December 22. The mother had a head–body length of 435 mm. A large embryo was obtained at the same locality, December 2. The mother's head–body length was 462.

The head-body measurements of young specimens, as obtained from field data are, for various months, as follows: December, 196, 215, 324, 340, 370; April, 346; May, 335; July, 250; August, 318; November, 295. There is nothing here that indicates a seasonal breeding period.

At one time a female and three more than half-grown young were found in a hiding place. Natives claimed that the young were usually kept in hollow logs

Foetal specimens reminded the collector, in some ways, of foetal pangolins as the spines grow in prominent half circles in the pattern of scales. The free distance between each set of quills is about the same as that between scale borders in pangolins of similar size.

HYSTRIX LINNAEUS

Crested Porcupines

Hystrix LINNAEUS, 1758, "Systema Naturae," 10th Ed., I, pp. 56–57. Type species, by subsequent fixation[1]: *Hystrix cristata* Linnaeus.

[1] W. L. Sclater, 1901, "Mammals of South Africa," II, pp. 89–92, Figs. 111–112; or by tautonymy (see Thomas, 1911, Proc. Zool. Soc. London, 1911, p. 144).

Hystrix galeata Thomas

Nzingeneh: Niam-niam. Kehoa: Bongo (Schweinfurth). N'kaka (Johnston). Ikiniokote: Kinyaruanda (Gyldenstolpe)

Plate XVII, figure 2; Figure 38

Hystrix galeata THOMAS, 1893, Ann. Mag. Nat. Hist., (6) XI, p. 229. Type locality: "Beach at Lamu, East Africa." Type specimen: B.M. 93. 2. 3. 48. Sex (?). Skull only. Stage IV.

1874. *Hystrix cristata*, SCHWEINFURTH. "The Heart of Africa," II, p. 506.

1884. *Hystrix cristata*, JOHNSTON. "The River Congo," 3rd Ed., p. 386.

1912. *Hystrix galeata*, LÖNNBERG. Kungl. Svenska Vet. Akademiens Handl., Bd. 48, N:o 5, pp. 105–108.

CONGO EXPEDITION SPECIMENS

The species is represented by seventeen specimens, eleven of which are skins with skulls, two skins with complete skeletons, one a complete skeleton, one a skull only and two skins only with data lost.

Akenge, 1 (adult ♀), October 8.

Faradje, 14 (6 adult ♂, 2 adult ♀, adult sex ?, 4 juvenile ♂, juvenile ♀), March 10, 15, 16, 20, 26, 29; April 3, 6; June 9; July 2, 8.

Locality (?), 2, data lost.

Although the series from Faradje is an unusually good one, embracing a fair range of ages in both sexes, I do not find it adequate either for establishing a geographical constant or for disqualifying the several nominal forms of porcupines from central Africa. The Faradje animals are clearly related to the East African *H. galeata* more than the species typical of north or south Africa. Their locality is nearest the type locality of *H. stegmanni*, but particularly in the matters of nasal length and shape they differ from the type and paratype of that species.

COMMUNAL.—The collector, writing at Faradje, noted that as many as ten were sometimes found in one burrow.

REPRODUCTION.—There are three pairs of laterally placed mammae. As may be seen in Plate XVII, figure 2, the spines about the mammae are evidently chewed off so that the young may have access to them.

PORCUPINES AND MAN.—The natives around Faradje catch the porcupines by trapping them in the fields or spear them

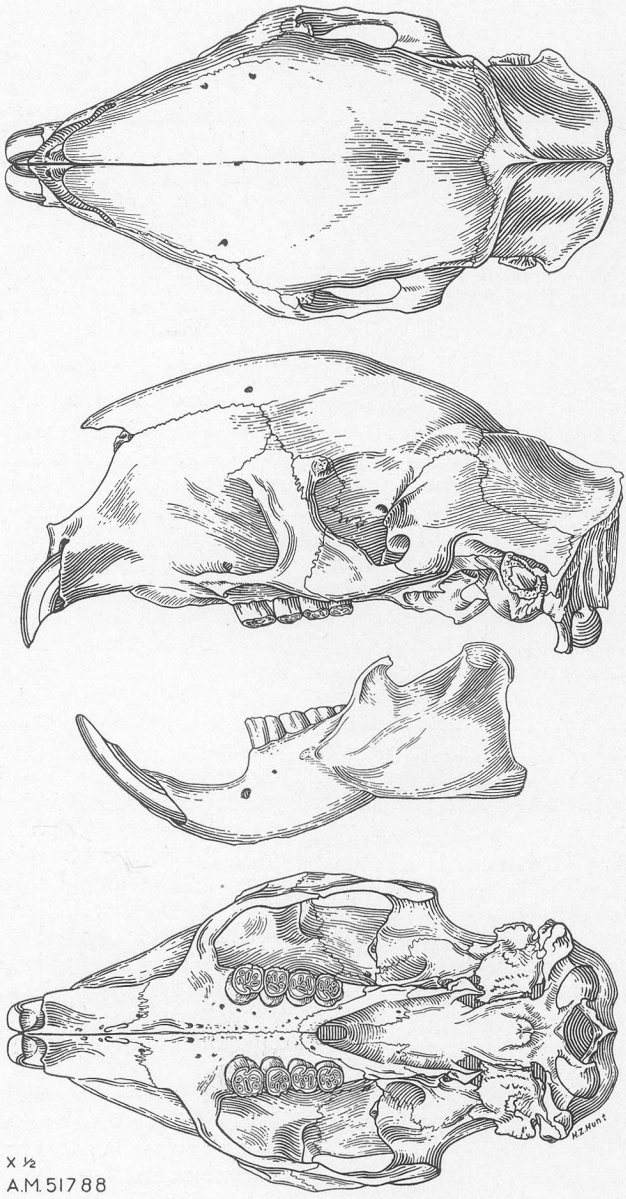


Fig. 38. *Hystrix galeata*. Male. Faradje.

during moonlight nights when these animals devastate the fields of manioc and sweet potatoes. The natives also hunt out the den after a rain when the footprints are easily followed; then they stop up all holes and dig the animals out. Several natives take part in the feat. The meat is highly appreciated as it is very tender. The women stick the spines in their hair and the men use the spines as hat pins.

LEPORIDAE

The Belgian Congo harbors at least three species of hares, but none of these are found in the central forest area. One, *Lepus ansorgei zairensis* Hatt, is known only from the savannas of the west. This is an outlying representative of an Angolan species. The East African *Lepus crawshayi* extends into Ruanda, to the region of the Kivu volcanoes and the Semliki. The same or a closely related species occurs in the Katanga. In the northeastern savannas, in the vicinity of Faradje, is found the recently described genus and species *Poelagus marjorita* St. Leger, the type of which was from Bunyoro, Uganda.

The Identity of *Lepus microtis* Heuglin

The hare described as *Lepus microtis* by Heuglin in 1865 came from an area (6°–8° N., 29°–31° E.) not far removed from the source of the Congo Expedition series of *Poelagus*. From the wording of Heuglin's description there is no basis for believing the two to be different. In proportion also there is basis for considering them identical, but when it comes to transcribing Heuglin's measurements I am forced to conclude that his "pariser Maass" is either a measurement with which I am unacquainted or that his animal was of another sort. Taking his measurement to be POUCES and LIGNES I obtain not the measurements of a fully grown *Poelagus* but one less than half grown. Thus in millimeters his measurements are:

Total length	8″	=	217.0 mm.
Skull	1″ 5 1/2‴	=	39.5 mm.
Head with body	2″ 2‴	=	59.7 mm.
Ear length	1″ 2 1/2‴	=	32.7 mm.
Width ear	circa 8‴	=	18.0 mm.
Tail, including hair	1″ 2‴	=	31.6 mm.
Brachium	10 1/2‴	=	23.8 mm.
Antibrachium and manus	1″ 9‴	=	47.3 mm.
Tarsus	1″ 4‴	=	36.1 mm.
Hand [? pes]	circa 18‴	=	40.5 mm.

If one doubled all of these measurements one would have approximately the dimensions of an adult *Poelagus*. No known African lagomorph, when adult, has dimensions that would agree with those of Heuglin.

Specimens in the British Museum identified as *Lepus microtis* Heuglin and also that in the U.S. National Museum (Hollister, 1919, U.S.N.M. Bull. 99, part 2, p. 169) are, however, true *Lepus*, and they more probably represent Heuglin's hare.

POELAGUS St. Leger

Poelagus St. Leger, 1932, Proc. Zool. Soc. London, part I, pp. 119–123, text figures 1–3. Type species: *Lepus marjorita* St. Leger.

Poelagus marjorita marjorita (St. Leger)

Plate XIX, figures 1 and 2; Figure 39

Lepus marjorita St. Leger, 1929, Ann. Mag. Nat. Hist., (10) IV, p. 292. Type locality: "Near Masindi, Bunyoro, Uganda, 4000′." Type: B M. 29. 5. 14. 30.

1932. *Poelagus marjorita*, St. Leger. Proc. Zool. Soc. London, part 1, p. 120.

1935. *Poelagus marjorita*, St. Leger. Ann. Mag. Nat. Hist., (8) XVI, p. 598. Description of *P. m. larkeni* from the Bahr-el-Ghazal.

Congo Expedition Specimens

There are twenty-six skins with skulls, one skin only, one complete skeleton and three skulls without skins, represented as follows:

Faradje, 31 (8 adult ♂, 9 adult ♀, 4 juvenile ♂, 10 juvenile ♀), January 2, 15; February 25, 28; March 6, 8, 17, 29; April 8, 18; August 12, 14, 22; September 6, 24, 30; October 5; November 16; December 20, 26, 27.

Skeletal features characterizing *Poelagus m. marjorita* were treated by Miss St. Leger and in some respects the single skeleton from our series, that of an adult male, agrees with her account. I do not know how many skeletons were available to Miss St. Leger but in some important points, such as the shape of the scapula, there is strong divergence from that treated by her. The scapula of the American Museum *Poelagus*, except for size, is far more similar in shape and proportions to that of the *Lepus timidus* which she figured than that of her *Poelagus*. As in the former, there is greater flare from neck to blade (a character which she has associated with her *P. m. larkeni* of the Bahr-el-Ghazal), the coracovertebral angle is more rounded than angular, the gleno-vertebral angle produced

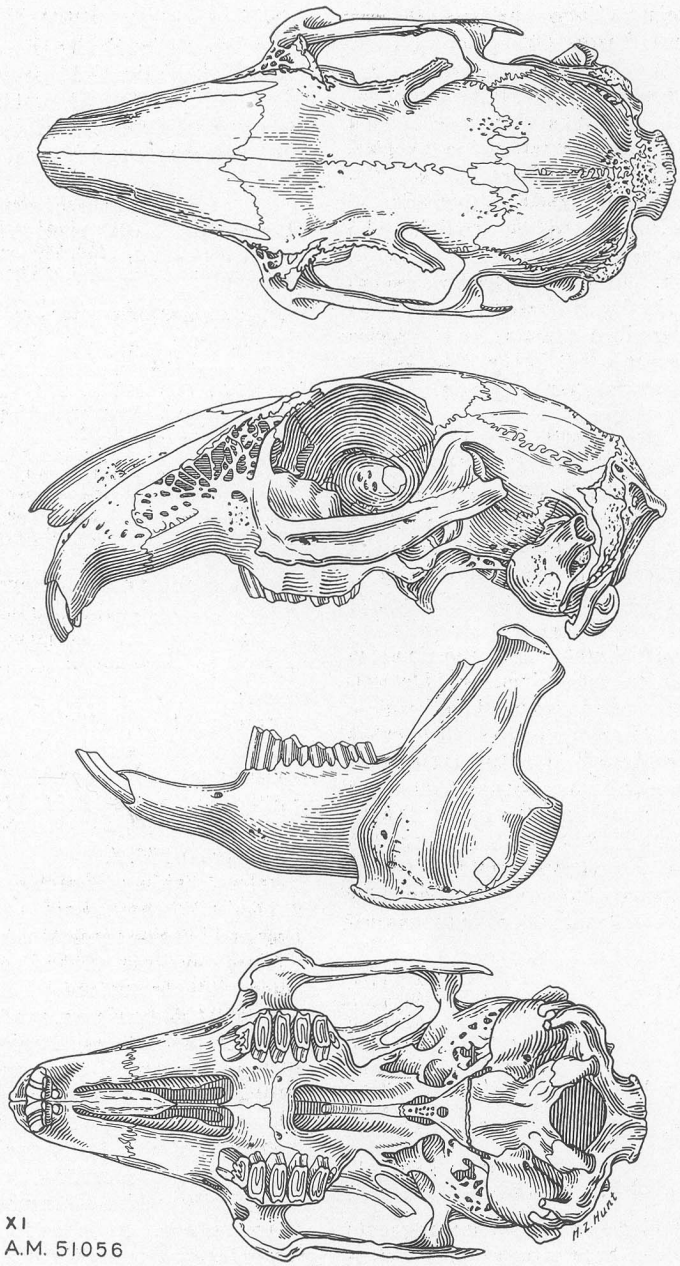


Fig. 39. *Poelagus marjorita.* Male. Faradje.

backward into a moderately sharp point and the coracoid process is deflected strongly downward and inward. The diapophyses ("transverse processes," St. Leger) of the lumbar vertebrae in the American Museum specimen do show distinct broadening and flaring at the tips. These processes are somewhat more delicate than in *Lepus victoriae*, but there is not generic significance in the differences presented. As would be expected in a lagomorph of lesser leaping powers, the spinous processes of the sacral and pseudo-sacral vertebrae are lower and more robust in *Poelagus* than in *Lepus*, for in the former the dorsal extensors are of lessened importance and do not develop high spines. The anterior three ribs appear to be as fully expanded, terminally, in the American Museum *Poelagus* as in any African *Lepus* at hand, but caudad to the third they are more cylindrical than is the case in *Lepus*. The proportions of the ilium are subject to marked age change and I find it impossible with a single skeleton of *Poelagus* to compare the relative width of this bone with that of *Lepus*.

ANOMALY.—An interesting anomaly occurs in an adult male. Here, instead of the front upper incisors bearing each a single deep groove, the left has two grooves, the right four.[1] In each case the supernumerary grooves are lateral to the main furrow and smaller than it. In this same specimen the lower incisors, instead of being completely smooth, bear one symmetrically placed furrow near the outer border of the enamel.

NOTES.—In the vicinity of Faradje, *Poelagus* was found near stony places and hills where short grass grew.

A large embryo was found in the uterus of a hare taken on August 14.

[1] For record of a similar anomaly among hyraxes see Hatt, 1934, Amer. Mus. Novitates, No. 594, page 5.

COLLECTORS' MEASUREMENTS OF ADULTS

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Claviglis christyi								
Medje	Minimum	11	♂	167	89	75	16	14
"	Maximum	11	♂	181	101	84	19	15
"	**Average**	**11**	♂	**173**	**96**	**77**	**17**	**14**
"	Minimum	10	♀	159	86	73	16	12
"	Maximum	10	♀	183	102	90	20	15
"	**Average**	**10**	♀	**174**	**94**	**80**	**18**	**14**
"	**Average**	**21**	♂ ♀	**173**	**95**	**78**	**18**	**14**
Niangara		1	♀	173	98	75	17	14
C. lorraineus								
Bafwabaka	Minimum	2	♂	148	81	63	17	13
"	Maximum	2	♂	156	93	67	19	14
Faradje		1	♀	133	88	45	15	14
Medje		1	♂	129	72	57	15	12
"	Minimum	2	♀	143	77	62	15	12
"	Maximum	2	♀	146	84	66	17	13
Niangara	Minimum	2	♂	133	64	54	16	12
"	Maximum	2	♂	140	86	69	17	14
"	Minimum	3	♀	138	73	65	15	9
"	Maximum	3	♀	159	86	77	17	13
"	**Average**	**3**	♀	**150**	**80**	**70**	**16**	**11**
"	**Average**	**5**	♂ ♀	**145**	**78**	**67**	**16**	**10**
Vankerckhovenville		1	♀	147	80	67	15	11

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Otomys t. faradjius								
Faradje	Minimum	4	♂	224	145	79	29	18
"	Maximum	4	♂	277	185	97	32	22
"	**Average**	**4**	♂	**258**	**168**	**90**	**31**	**20**
"	Minimum	2	♀	231	149	82	30	21
"	Maximum	2	♀	255	171	84	30	23
"	**Average**	**6**	♂ ♀	**253**	**168**	**88**	**30**	**21**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Taterillus e. congicus								
Faradje	Minimum	11	♂	260	109	151	32	19
"	Maximum	11	♂	295	131	181	35	22
"	**Average**	**11**	♂	**279**	**118**	**161**	**33**	**20**
"	Minimum	13	♀	247	100	134	31	19
"	Maximum	13	♀	293	144	166	35	22
"	**Average**	**13**	♀	**277**	**122**	**155**	**33**	**20**
"	**Average**	**24**	♂ ♀	**278**	**120**	**158**	**33**	**20**
Niangara	Minimum	4	♂	232	102	130	31	18
"	Maximum	4	♂	277	122	157	35	20
"	**Average**	**4**	♂	**263**	**116**	**142**	**33**	**20**
"	Minimum	2	♀	282	126	156	32	18
"	Maximum	2	♀	292	127	165	32	20
"	**Average**	**6**	♂ ♀	**271**	**119**	**142**	**33**	**20**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Dendromus messorius								
Bafwabaka	Minimum	2	♂	168	70	98	20	13
"	Maximum	2	♂	174	73	101	20	13
"	Minimum	2	♀	159	67	93	19	13
"	Maximum	2	♀	171	70	101	20	13
"	**Average**	**4**	♂♀	**168**	**70**	**98**	**20**	**13**
Gamangui		1	♂	165	73	92	17	13
Medje	Minimum	7	♂	155	63	90	17	13
"	Maximum	7	♂	172	75	98	20	13
"	**Average**	**7**	♂	**163**	**70**	**93**	**19**	**12**
"	Minimum	9	♀	155	61	87	16	10
"	Maximum	9	♀	163	75	98	19	13
"	**Average**	**9**	♀	**159**	**68**	**93**	**18**	**12**
"	**Average**	**16**	♂♀	**161**	**69**	**93**	**18**	**12**
Niangara		1	♂	157	68	89	17	14
"	Minimum	3	♀	152	62	82	16	12
"	Maximum	3	♀	156	70	92	19	13
"	**Average**	**3**	♀	**154**	**65**	**88**	**17**	**12**
"	**Average**	**4**	♂♀	**155**	**66**	**89**	**17**	**13**
D. a. lineatus								
Faradje	Minimum	5	♂	130	50	75	16	11
"	Maximum	5	♂	143	58	86	17	13
"	**Average**	**5**	♂	**137**	**56**	**81**	**17**	**12**
"	Minimum	4	♀	137	53	81	14	11
"	Maximum	4	♀	147	64	85	17	13
"	**Average**	**4**	♀	**142**	**59**	**83**	**16**	**12**
"	**Average**	**9**	♂♀	**139**	**57**	**82**	**16**	**12**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Deomys f. christyi								
Gamangui	Minimum	2	♂	314	127	187	36	25
"	Maximum	2	♂	317	129	188	37	26
"	Minimum	8	♀	323	130	189	36	25
"	Maximum	8	♀	351	139	215	38	27
"	**Average**	**8**	♀	**337**	**135**	**202**	**37**	**26**
"	**Average**	**10**	♂♀	**327**	**132**	**197**	**37**	**26**
Medje		1	♂	308	118	190	39	25

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Steatomys o. gazellae								
Faradje	Minimum	2	♂	168	100	68	20	17
"	Maximum	2	♂	211	140	71	20	18
"	Minimum	2	♀	166	105	56	19	16
"	Maximum	2	♀	168	112	61	19	18
"	**Average**	**4**	♂♀	**178**	**114**	**64**	**20**	**17**
Niangara	Minimum	2	♂	177	119	58	19	17
"	Maximum	2	♂	184	123	61	20	18
"	Minimum	3	♀	168	115	52	18	18
"	Maximum	3	♀	189	125	65	20	20
"	**Average**	**3**	♀	**179**	**119**	**60**	**19**	**19**
"	**Average**	**5**	♂♀	**168**	**120**	**60**	**19**	**18**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Tatera dichrura								
Faradje	Minimum	2	♂	314	138	172	35	21
"	Maximum	2	♂	322	142	184	37	22
"	Minimum	3	♀	267	131	136	34	20
"	Maximum	3	♀	323	150	173	39	23
"	**Average**	**5**	♂♀	**308**	**142**	**165**	**36**	**22**
Garamba	Minimum	2	♂	310	151	159	35	21
"	Maximum	2	♂	346	171	175	36	23
"		1	♀	280	138	142	34	21
"	**Average**	**3**	♂♀	**312**	**153**	**159**	**35**	**22**
Niangara	Minimum	10	♂	266	132	134	36	19
"	Maximum	10	♂	341	176	176	38	22
"	**Average**	**10**	♂	**316**	**156**	**160**	**37**	**21**
"	Minimum	10	♀	271	130	141	35	20
"	Maximum	10	♀	359	167	193	40	23
"	**Average**	**10**	♀	**323**	**156**	**167**	**37**	**22**
"	**Average**	**20**	♂♀	**319**	**156**	**164**	**37**	**22**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Lophuromys a. rita								
Avakubi	Minimum	3	♂	179	114	64	21	16
"	Maximum	3	♂	184	120	67	22	17
"	**Average**	**3**	♂	**181**	**116**	**65**	**22**	**17**
Bafwabaka		1	♂	188	122	65	23	17
"		1	♀	169	106	63	21	16
Bafwasende		1	♀	192	127	65	23	15
Batama		1	♂	[143]	119	[24]	21	16
Gamangui		1	♂	176	120	56	19	16
"		1	♀	181	122	59	21	18
Ngayu	Minimum	5	♂	168	111	57	21	16
"	Maximum	5	♂	196	130	66	23	17
"	**Average**	**5**	♂	**177**	**117**	**61**	**22**	**16**
"	Minimum	3	♀	173	112	61	22	17
"	Maximum	3	♀	201	128	75	22	17
"	**Average**	**3**	♀	**190**	**122**	**68**	**22**	**17**
"	**Average**	**8**	♂♀	**182**	**119**	**63**	**22**	**17**
Niangara		1	♀	175	115	60	20	16[2]
Stanleyville	Minimum	12	♂	166[1]	105	52[1]	20	14.5[2]
"	Maximum	12	♂	197[1]	132	75[1]	23	17
"	**Average**	**12**	♂	**185**[1]	**119**	**66**[1]	**21**	**16**[2]
"	Minimum	7	♀	185	114	65	21	16
"	Maximum	7	♀	195	127	73	22	16
"	**Average**	**7**	♀	**191**[3]	**120**	**70**[3]	**22**	**16**[4]
"	**Average**	**19**	♂♀	**186**[5]	**119**	**67**[5]	**21**	**16**[6]
L. aquilus subsp.								
Faradje		1	♀	179	112	67	20	17
L. luteogaster								
Medje		1	♀	212	110	102	22	18
L. sikapusi								
Bafwabaka		1	♂	212	146	66	26	18
"		1	♀	215	146	69	25	17
Medje		1	♀	221	148	73	24	18
Niangara	Minimum	2	♀	179	119	60	22	16
"	Maximum	2	♀	203	144	69	22	18

[1] Series of 7. [2] Series of 9. [3] Series of 3. [4] Series of 4. [5] Series of 10. [6] Series of 13.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Cricetomys g. langi								
Faradje	Minimum	4	♂	515	295	320	62	34
"	Maximum	4	♂	690	335	380	67	38
"	**Average**	**4**	♂	**634**	**315**	**346**	**64**	**36**
"	Minimum	2	♀	615	303	312	60	36
"	Maximum	2	♀	660	315	345	65	39
"	**Average**	**6**	♂ ♀	**635**	**313**	**340**	**63**	**37**
C. d. emini								
Akenge		1	♂	753	348	405	71	43
"	Minimum	3	♀	655	288	367	70	39
"	Maximum	3	♀	785	380	420	72	41
"	**Average**	**3**	♀	**730**	**333**	**397**	**71**	**40**
Faradje		1	♀	665	300	365	70	40
Medje	Minimum	4	♂	685	320	365	73[2]	41[1]
"	Maximum	4	♂	940	490	450	74[2]	41[1]
"	**Average**	**4**	♂	**799**	**382**	**416**	**74**[2]	**41**[1]
"	Minimum	4	♀	687	317	370	69	42[2]
"	Maximum	4	♀	790	373	445	73	46[2]
"	**Average**	**4**	♀	**754**	**346**	**408**	**71**	**44**[2]
"	**Average**	**8**	♂ ♀	**776**	**364**	**412**	**72**[4]	**43**[3]
Niangara		1	♂	825	375	450	75	40[1]
"	Minimum	3	♀	630	338	290	63	39[1]
"	Maximum	3	♀	750	365	385	70	40[1]
"	**Average**	**3**	♀	**698**	**448**	**351**	**67**	**40**[1]
Niapu	Minimum	3	♂	760	340	393	71	42
"	Maximum	3	♂	787	387	420	80	47
"	**Average**	**3**	♂	**769**	**465**	**404**	**75**	**44**
"	Minimum		♀	685	313	370	67	41
"	Maximum		♀	801	357	447	77	43
"	**Average**		♀	**737**	**341**	**396**	**71**	**42**
"	**Average**		♂ ♀	**749**	**387**	**399**	**72**	**43**

[1] Two specimens only. [2] Three specimens. [3] Five specimens. [4] Seven specimens.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Malacomys l. centralis								
Avakubi	Minimum	2	♂	334	158	176	40	25
"	Maximum	2	♂	350	161	189	40	25
"		1	♀	324	151	173	40	26
"	**Average**	**3**	♂ ♀	**339**	**157**	**179**	**40**	**25**
Gamangui	Minimum	15	♂	308	131	169	38	28
"	Maximum	15	♂	371	172	208	42	30
"	**Average**	**15**	♂	**343**	**158**	**185**	**41**	**29**
"	Minimum	11	♀	303	137	166	40	28
"	Maximum	11	♀	372	170	203	42	30
"	**Average**	**11**	♀	**343**	**157**	**185**	**41**	**29**
"	**Average**	**26**	♂ ♀	**343**	**157**	**185**	**41**	**29**
Medje		1	♂	342	178	164	40	28
"	Minimum	2	♀	346	171	175	42	26
"	Maximum	2	♀	375	177	198	42	29
"	**Average**	**3**	♂ ♀	**354**	**175**	**179**	**41**	**28**
Niangara		1	♂	336	159	177	41	24
"	Minimum	3	♀	300	144	156	41	26
"	Maximum	3	♀	341	160	185	41	28
"	**Average**	**4**	♂ ♀	**329**	**170**	**175**	**41**	**26**
Niapu	Minimum	2	♂	353	168	185	41	28
"	Maximum	2	♂	369	169	200	44	28
"	Minimum	2	♀	356	150	189	41	27
"	Maximum	2	♀	367	178	206	42	29
"	**Average**	**4**	♂ ♀	**369**	**166**	**195**	**42**	**28**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Colomys g. goslingi								
Gamangui		1	♀	293	128	165	38	21
Medje	Minimum	4	♂	274	115	155	36	18
"	Maximum	4	♂	295	131	164	39	21
"	**Average**	**4**	♂	**282**	**120**	**159**	**37**	**20**
"	Minimum	2	♀	285	126	159	38	20
"	Maximum	2	♀	297	130	167	39	21
"	**Average**	**6**	♂ ♀	**285**	**123**	**161**	**38**	**20**

Species and Locality		Sex	Total	H-B	Tail	Foot	Ear
Arvicanthis t. centralis							
Niangara		♂	324	162	162	34	20
"		♀	278	137	141	33	19

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Lemniscomys s. striatus								
Avakubi	Minimum	6	♂	229	109	120	26	15
"	Maximum	6	♂	264	126	138	30	22
"	**Average**	**6**	♂	**249**	**120**	**130**	**29**	**17**
"	Minimum	9	♀	225	112	112	27	15
"	Maximum	9	♀	264	126	138	31	18
"	**Average**	**9**	♀	**245**	**116**	**129**	**29**	**17**
"	**Average**	**15**	♂ ♀	**247**	**118**	**129**	**29**	**17**
Bafwabaka	Minimum	2	♂	251	119	132	27	17
"	Maximum	2	♂	271	138	133	29	17
Bafwasende	Minimum	2	♀	246	122	124	28	17
"	Maximum	2	♀	250	122	128	29	17
Faradje		1	♂	246	114	132	26	17
"	Minimum	2	♀	231	99	132	26	17
"	Maximum	2	♀	232	98	134	27	17
"	**Average**	**3**	♂ ♀	**235**	**104**	**133**	**26**	**17**
Gamangui		1	♀	248	116	132	27	17
Medje		1	♂	243	119	124	28	18
"		1	♀	250	116	134	29	16
Niangara	Minimum	5	♂	213	99	114	25	15
"	Maximum	5	♂	253	121	132	28	17
"	**Average**	**5**	♂	**229**	**107**	**122**	**27**	**16**
"	Minimum	2	♀	233	110	121	27	16
"	Maximum	2	♀	244	112	134	27	16
"	**Average**	**7**	♂ ♀	**234**	**109**	**125**	**27**	**16**
Stanleyville	Minimum	2	♂	229	110	119	28	14
"	Maximum	2	♂	253	131	122	28	15.5
"	Minimum	6	♀	216	104	109	26	13
"	Maximum	6	♀	239	120	126	28	16
"	**Average**	**6**	♀	**230**	**111**	**119**	**28**	**15**
"	**Average**	**8**	♂ ♀	**235**	**116**	**120**	**28**	**15**
L. b. zebra								
Faradje	Minimum	5	♂	210	86	122	25	15
"	Maximum	5	♂	249	104	145	26	16
"	**Average**	**5**	♂	**226**	**95**	**128**	**26**	**15**
"	Minimum	11	♀	211	82	113	25	14
"	Maximum	11	♀	247	117	140	27	17
"	**Average**	**11**	♀	**224**	**98**	**126**	**25**	**15**
"	**Average**	**16**	♂ ♀	**224**	**97**	**127**	**26**	**15**
L. d. nubalis								
Faradje	Minimum	2	♀	216	93	123	25	15
"	Maximum	2	♀	220	96	124	25	15
L. o. orientalis								
Faradje	Minimum	2	♂	196	82	114	23	14
"	Maximum	2	♂	219	100	119	24	15

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Hybomys u. univittatus								
Avakubi	Minimum	3	♂	249	125	104	29	17
"	Maximum	3	♂	257	153	124	31	17
"	**Average**	**3**	♂	**253.7**	**134.7**	**117.3**	**30.3**	**17.0**
"	Minimum	6	♀	207	106	101	29	15
"	Maximum	6	♀	253	129	125	30	18
"	**Average**	**6**	♀	**231.2**	**119.7**	**111.5**	**29.5**	**16.5**
"	**Average**	**9**	♂ ♀	**242.4**	**127.2**	**114.4**	**29.9**	**16.8**
Bafwasende	Minimum	2	♂	213	110	103	27	16
"	Maximum	2	♂	243	130	113	31	19
"	Minimum	3	♀	218	110	108	29	16
"	Maximum	3	♀	244	127	117	30	18
"	**Average**	**3**	♀	**228.7**	**115.7**	**113.0**	**29.3**	**17.0**
"	**Average**	**5**	♂ ♀	**228.4**	**117.9**	**110.5**	**29.2**	**17.3**
Gamangui		1	♀	244	106	118	28	16
Medje	Minimum	4	♂	227	118	109	28	16
"	Maximum	4	♂	260	138	122	31	28
"	**Average**	**4**	♂	**241.7**	**125.5**	**116.0**	**28.8**	**19.5**
		1	♀	235	114	121	30	17
Ngayu		1	♀	229	116	113	31	17
Niangara	Minimum	2	♂	215	112	103	29	16
"	Maximum	2	♂	232	116	116	31	18
"	Minimum	2	♀	220	112	107	28	15
"	Maximum	2	♀	222	115	108	28	17
"	**Average**	**4**	♂ ♀	**222.3**	**113.8**	**108.5**	**29.0**	**16.5**
Niapu	Minimum	3	♀	220	110	110	29	17
"	Maximum	3	♀	351	160	191	41	29
"	**Average**	**3**	♀	**267.7**	**129.3**	**138.3**	**33.3**	**21.0**
Stanleyville		1	♀	249	116	133	29	15

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Mylomys d. alberti								
Faradje	Minimum	6	♂	296	133	163	36	20
"	Maximum	6	♂	345	160	189	40	21
"	**Average**	**6**	♂	**321**	**148**	**173**	**38**	**20**
"	Minimum	7	♀	275	125	150	34	18
"	Maximum	7	♀	317	150	171	39	20
"	**Average**	**7**	♀	**296**	**138**	**158**	**36**	**19**
"	**Average**	**13**	♂ ♀	**308**	**143**	**165**	**37**	**20**
Garamba		1	♂	263	122	141	34	18
Niangara	Minimum	2	♂	292	?	?	36	20
"	Maximum	2	♂	350	184	166	37	21
"	Minimum	3	♀	269	129	140	36	20
"	Maximum	3	♀	333	167	166	37	21
"	**Average**	**3**	♀	**306**	**151**	**155**	**36**	**20**
"	**Average**	**5**	♂ ♀	**312**	**152**	**158**	**36**	**20**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Stochomys l. ituricus								
Gamangui		1	♀	351	138	213	31	20
Medje	Minimum	5	♂	334	139	192	32	20
"	Maximum	5	♂	384	160	227	34	27
"	**Average**	**5**	♂	**362**	**147**	**215**	**33**	**22**
"	Minimum	6	♀	303	121	182	30	19
"	Maximum	6	♀	372	154	218	33	21
"	**Average**	**6**	♀	**352**	**145**	**207**	**32**	**21**
"	**Average**	**11**	♂ ♀	**357**	**146**	**211**	**32**	**21**
Ngayu		1	♂	365	143	222	27	20
"	Minimum	2	♀	364	149	215	33	20
"	Maximum	2	♀	365	150	215	33	22
"	**Average**	**3**	♂ ♀	**365**	**147**	**217**	**31**	**21**
Niangara		1	♀	355	139	216	31	19
Stanleyville		1	♂	372	147	225	32	..
"		1	♀	393	164	229	33	20
Luluabourg	Minimum	12	♂	331	139	185	27 s.u.	18
"	Maximum	12	♂	397	165	242	31 s.u.	23
"	**Average**	**12**	♂	**362**	**151**	**211**	**29 s.u.**	**19**
"	Minimum	7	♀	337	138	199	25 s.u.	16
"	Maximum	7	♀	398	172	250	31 s.u.	23
"	**Average**	**7**	♀	**366**	**151**	**215**	**29 s.u.**	**20**
"	**Average**	**19**	♂ ♀	**364**	**151**	**213**	**29 s.u.**	**20**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Dasymys b. bentleyae								
Faradje	Minimum	6	♂	268	125	135	30	19
"	Maximum	6	♂	302	155	148	34	20
"	**Average**	**6**	♂	**277**	**139**	**143**	**32**	**19**
"	Minimum	2	♀	259	128	131	30	20
"	Maximum	2	♀	270	139	131	31	20
"	**Average**	**8**	♂ ♀	**271**	**136**	**137**	**31**	**20**
Medje	Minimum	7	♂	261	129	132	32	18
"	Maximum	7	♂	313	160	153	35	21
"	**Average**	**7**	♂	**292**	**149**	**143**	**33**	**20**
"	Minimum	4	♀	277	139	123	31	18
"	Maximum	4	♀	294	158	144	32	20
"	**Average**	**4**	♀	**283**	**147**	**136**	**32**	**19**
"	**Average**	**11**	♂ ♀	**288**	**148**	**140**	**33**	**20**
Niangara		1	♀	261	135	126	30	18

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Oenomys h. hypoxanthus								
Avakubi	Minimum	3	♂	316	141	175	33	18
"	Maximum	3	♂	335	152	184	34	20
"	**Average**	**3**	♂	**328**	**148**	**180**	**34**	**19**
"	Minimum	6	♀	303	138	165	31	14
"	Maximum	6	♀	361	161	200	33	19
"	**Average**	**6**	♀	**331**	**149**	**182**	**32**	**18**
"	**Average**	**9**	♂ ♀	**333**	**149**	**181**	**33**	**18**
Bafwabaka	Minimum	2	♀	316	136	180	32	20
"	Maximum	2	♀	331	143	188	33	20
Faradje	Minimum	2	♂	362	162	192	35	17
"	Maximum	2	♂	367	170	205	36	20
Gamangui		1	♀	369	161	208	31	22
Medje		1	♂	312	146	166	33	18
"		1	♀	357	156	201	34	21
Ngayu	Minimum	2	♂	355	168	179	33	20
"	Maximum	2	♂	372	176	204	35	21
"	Minimum	3	♀	338	145	187	33	18
"	Maximum	3	♀	353	166	194	34	20
"	**Average**	**3**	♀	**344**	**152**	**191**	**34**	**19**
"	**Average**	**5**	♂ ♀	**353**	**162**	**191**	**34**	**20**
Niapu		1	♀	327	137	190	33	20
Stanleyville	Minimum	2	♂	351	164	186	33	..
"	Maximum	2	♂	355	165	191	34.5	..
"	Minimum	9	♀	317	137	180	32	18
"	Maximum	9	♀	370	166	210	34.5	20
"	**Average**	**9**	♀	**347**	**155**	**192**	**33**	**19**
"	**Average**	**11**	♂ ♀	**350**	**160**	**191**	**34**	**19**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Rattus r. frugivorus								
Leopoldville		1	♂	358	158	200	34	..
"	Minimum	3	♀	381	155	226	38	24
"	Maximum	3	♀	445	189	256	39	25
"	**Average**	**3**	♀	**409**	**172**	**238**	**38**	..
Lukolela	Minimum	4	♂	321	146	155	32	19
"	Maximum	4	♂	373	180	196	37	25
"	**Average**	**4**	♂	**341**	**166**	**175**	**35**	**22**
"		1	♀	407	183	224	35	27
Luluabourg	Minimum	2	♂	329	156	165	26	21
"	Maximum	2	♂	346	164	190	31	21
"	Minimum	5	♀	320	150	165	28	18
"	Maximum	5	♀	350	165	188	32	24
"	**Average**	**5**	♀	**334**	**158**[1]	**176**[1]	**30**	**22**
"	**Average**	**7**	♂ ♀	**335**	**159**[2]	**176**[2]	**29**	**21**
Stanleyville	Minimum	3	♀	339	142	197	32	21
"	Maximum	3	♀	379	170	211	35	21
"	**Average**	**3**	♀	**361**	**156**	**206**	**34**	..
R. r. kijabius								
Kalongi	Minimum	4	♂	363	154	187	35	..
"	Maximum	4	♂	400	187	213	35[3]	..
"	**Average**	**4**	♂	**377**	**175**	**201**	**35**[3]	..
Lulenga		1	♀	391	177	214	33	

[1] Series of 4. [2] Series of 6. [3] Two specimens.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Aethomys k. medicatus								
Faradje		1	♂	329	132	197	29	21
Niangara	Minimum	3	♂	320	157	142	30	19
"	Maximum	3	♂	333	188	173	32	23
"	**Average**	**3**	♂	**325**	**168**	**160**	**31**	**21**
"	Minimum	2	♀	294	148	146	31	20
"	Maximum	2	♀	323	163	160	31	21
"	**Average**	**5**	♂♀	**318**	**163**	**157**	**31**	**21**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Mastomys c. ugandae								
Aba		1	♂	249	129	120	28	18
"		1	♀	264	138	126	26	19
Avakubi	Minimum	4	♂	230	99	111	25	16
"	Maximum	4	♂	242	122	139	33	18
"	**Average**	**4**	♂	**237**	**115**	**122**	**28**	**17**
"	Minimum	7	♀	254	135	119	27	18
"	Maximum	7	♀	279	147	132	30	20
"	**Average**	**7**	♀	**265**	**140**	**124**	**28**	**19**
"	**Average**	**11**	♂♀	**254**	**131**	**123**	**28**	**18**
Bafwabaka	Minimum	4	♂	233	109	122	26	18
"	Maximum	4	♂	289	150	139	29	20
"	**Average**	**4**	♂	**259**	**131**	**128**	**28**	**19**
"	Minimum	9	♀	247	125	118	25	18
"	Maximum	9	♀	314	161	153	29	20
"	**Average**	**9**	♀	**269**	**171**	**128**	**26**	**19**[1]
"	**Average**	**13**	♂♀	**263**	**138**	**128**	**27**	**19**[2]
Faradje	Minimum	6	♂	217	103	114	24	16
"	Maximum	6	♂	300	158	142	29	20
"	**Average**	**6**	♂	**259**	**132**	**127**	**26**	**18**[3]
"	Minimum	5	♀	253	126	125	25	18
"	Maximum	5	♀	276	149	131	28	21
"	**Average**	**5**	♀	**263**	**136**[3]	**128**[3]	**26**	**19**
"	**Average**	**11**	♂♀	**261**	**127**[4]	**133**[4]	**26**	**19**
Gamangui		1	♂	258	142	116	27	19
Garamba	Minimum	2	♂	246	121	125	26	19
"	Maximum	2	♂	267	133	134	28	19
"		1	♀	233	111	122	26	18
Medje	Minimum	4	♂	220	118	102	26	17
"	Maximum	4	♂	279	157	125	29	19
"	**Average**	**4**	♂	**255**	**138**	**117**	**28**	**18**
"	Minimum	2	♀	262	136	119	27	18
"	Maximum	2	♀	267	143	131	27	19
"	**Average**	**6**	♂♀	**258**	**138**	**120**	**28**	**18**
Niangara	Minimum	7	♂	217	111	103	21	19
"	Maximum	7	♂	242	121	126	27	20
"	**Average**	**7**	♂	**229**	**116**[5]	**115**[5]	**25**	**19**
"	Minimum	5	♀	230	97	115	23	17
"	Maximum	5	♀	265	133	142	25	19
"	**Average**	**5**	♀	**249**	**129**	**129**	**24**[3]	**18**[3]
"	**Average**	**12**	♂♀	**237**	**122**[6]	**122**[6]	**25**[6]	**19**[6]

[1] Series of 8. [2] Series of 12. [3] Series of 4. [4] Series of 10. [5] Taken from series of 6. [6] Taken from series of 11.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Praomys j. jacksoni								
Avakubi	Minimum	4	♂	241	110	131	24	18
"	Maximum	4	♂	263	118	147	25	19
"	**Average**	**4**	♂	**257**	**115**	**142**	**25**[1]	**19**
"		1	♀	257	107	150	25	18
Bafwabaka	Minimum	5	♂	234	101	130	20	18
"	Maximum	5	♂	276	122	154	25	20
"	**Average**	**5**	♂	**254**	**110**	**144**	**23**	**19**
"		1	♀	254	104	150	24	18
Bafwasende		1	♂	251	107	144	24	18
Gamangui	Minimum	2	♂	240	106	134	23	18
"	Maximum	2	♂	255	113	142	25	20
"	Minimum	2	♀	250	102	148	24	19
"	Maximum	2	♀	271	118	153	24	20
"	**Average**	**4**	♂ ♀	**254**	**110**	**144**	**24**	**19**
Medje	Minimum	3	♂	242	109	133	25	17
"	Maximum	3	♂	268	117	151	27	19
"	**Average**	**3**	♂	**254**	**114**	**140**	**26**	**18**
"		1	♀	251	110	141	24	19
Ngayu	Minimum	2	♂	251	111	140	25	19
"	Maximum	2	♂	263	113	150	25	20
"		1	♀	266	117	149	26	19
Niangara	Minimum	5	♂	245	105	122	23	18
"	Maximum	5	♂	281	135	158	26	20
"	**Average**	**5**	♂	**262**	**119**	**143**	**25**	**19**
"	Minimum	2	♀	255	110	145	23	18
"	Maximum	2	♀	266	121	145	24	19
"	**Average**	**7**	♂ ♀	**261**	**118**	**143**	**24**	**17**
Niapu	Minimum	2	♂	235	103	132	23	17
"	Maximum	2	♂	252	106	146	24	18

[1] Taken from a series of 3.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Hylomyscus a. stella								
Gamangui	Minimum	5	♂	215	84	131	18	14
"	Maximum	5	♂	240	94	150	20	16
"	**Average**	**5**	♂	**229**	**88**	**141**	**19**	**15**
"	Minimum	4	♀	212	79	129	19	15
"	Maximum	4	♀	225	96	139	19	16
"	**Average**	**4**	♀	**220**	**87**	**134**	**19**	**16**
"	**Average**	**9**	♂ ♀	**225**	**87**	**138**	**19**	**16**
Medje	Minimum	2	♂	228	86	135	17	15
"	Maximum	2	♂	228	93	142	19	16
Ngayu		1	♀	218	82	136	20	20
H. c. schoutedeni								
Medje	Minimum	2	♂	246	104	139	20	16
"	Maximum	2	♂	250	107	146	21	16
"	Minimum	2	♀	228	94	134	18	15
"	Maximum	2	♀	239	99	140	19	16
"	**Average**	**4**	♂ ♀	**241**	**101**	**140**	**20**	**16**
Niangara			♂	221	92	129	19	14
"			♀	210	84	126	18	15

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Thamnomys r. centralis								
Avakubi		1	♂	328	133	195	27	18
"		1	♀	328	129	199	29	17
Medje	Minimum	5	♂	307	128	178	25	15
"	Maximum	5	♂	326	129	197	27	17
"	**Average**	**5**	♂	**320**	**129**	**191**	**26**	**16**
"	Minimum	4	♀	312	125	183	24	16
"	Maximum	4	♀	332	136	196	28	18
"	**Average**	**4**	♀	**318**	**129**	**189**	**26**	**17**
"	**Average**	**9**	♂ ♀	**320**	**129**	**190**	**26**	**16**
Niangara	Minimum	6	♂	316	127	182	24	15
"	Maximum	6	♂	322	135	190	27	18
"	**Average**	**6**	♂	**318**	**132**	**186**	**26**	**17**
"	Minimum	2	♀	314	129	185	25	17
"	Maximum	2	♀	327	132	195	27	17
"	**Average**	**8**	♂ ♀	**318**	**131**	**187**	**26**	**17**
Niapu	Minimum	2	♂	324	. . .	. . .	25	17
"	Maximum	2	♂	325	136	189	. .	18
T. v. schoutedeni								
Medje		1	♂	301	118	183	26	19
"	Type	1	♀	325	122	203	24	20
T. s. callithrix								
Faradje	Minimum	2	♂	267	103	156	23	16
"	Maximum	2	♂	273	111	170	23	17
"	Minimum	4	♀	251	88	153	23	15
"	Maximum	4	♀	263	101	173	24	16
"	**Average**	**4**	♀	**259**	**96**	**163**	**24**	**16**
"	**Average**	**6**	♂ ♀	**263**	**100**	**163**	**23**	**16**
Garamba	TYPE	1	♂	270	110	160	25	18
Niangara	Minimum	4	♂	220	84	146	22	14
"	Maximum	4	♂	245	95	168	24	16
"	**Average**	**4**	♂	**235**	**87**	**148**	**23**	**15**
"	Minimum	6	♀	234	74	139	23	15
"	Maximum	6	♀	285	110	175	25	17
"	**Average**	**6**	♀	**258**	**93**	**162**	**24**	**16**
"	**Average**	**10**	♂ ♀	**249**	**93**	**156**	**24**	**16**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Leggada b. grata								
Bafwabaka	Minimum	3	♂	109	61	46	14	10
"	Maximum	3	♂	115	63	54	14	11
"	**Average**	**3**	♂	**113**	**62**	**50**	**14**	**10**
"		1	♀	113	59	54	15	11
Medje	Minimum	2	♂	112	59	51	14	10
"	Maximum	2	♂	115	64	53	15	10
"	Minimum	4	♀	107	62	43	14	8
"	Maximum	4	♀	118	67	53	15	10
"	**Average**	**4**	♀	**114**	**65**	**49**	**15**	**9**
"	**Average**	**6**	♂ ♀	**114**	**64**	**50**	**15**	**10**
Niangara	Minimum	2	♂	118	67	51	15	11
"	Maximum	2	♂	118	67	51	15	12
"	Minimum	2	♀	119	64	49	13	9
"	Maximum	2	♀	121	72	55	14	11
"	**Average**	**4**	♂ ♀	**119**	**68**	**52**	**14**	**11**
Ngayu	Minimum	2	♂	110	58	52	15	10
"	Maximum	2	♂	120	66	54	15	11
L. b. enclave								
Faradje	Minimum	6	♂	105	56	46	12	9
"	Maximum	6	♂	111	64	52	14	10
"	**Average**	**6**	♂	**107**	**60**	**49**	**13**	**10**
"	Minimum	5	♀	103	49	46	13	9
"	Maximum	5	♀	117	66	55	14	10
"	**Average**	**5**	♀	**109**	**59**	**49**	**13**	**10**
"	**Average**	**11**	♂ ♀	**108**	**60**	**49**	**13**	**10**
Niangara	Minimum	2	♂	106	60	45	12	9
"	Maximum	2	♂	108	61	48	13	10
L. pasha								
Bafwabaka		1	♂	127	75	52	16	12
Niangara		1	♂	134	65	59	16	11
"		1	♀	145	88	57	16	13
L. emesi								
Niangara	Minimum	2	♀	114	68	44	14	12
"	Maximum	2	♀	121	70	54	16	14

Species and Locality		No.	Sex	Total	H-B	Tail	Foot
Cryptomys lechei							
Faradje	Minimum	7	♀	185	161	17	29
"	Maximum	7	♀	220	200	27	32
"	**Average**	**7**	♀	**199**	**178**	**21**	**31**
Garamba	Minimum	9	♂	178	157	14	27
"	Maximum	9	♂	192	177	22	35
"	**Average**	**9**	♂	**183**	**164**	**19**	**31**
"	Minimum	5	♀	176	161	14	29
"	Maximum	5	♀	207	182	25	32
"	**Average**	**5**	♀	**191**	**174**	**18**	**31**
"	**Average**	**14**	♂ ♀	**187**	**169**	**18**	**31**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Choeromys h. harrisoni								
Faradje	Minimum	3	♂	490	425	65	80	32
"	Maximum	3	♂	580	470	110	88	32
"	**Average**	**3**	♂	**543**	**455**	**88**	**85**	**32**
"	Minimum	2	♀	550	465	85	82	27
"	Maximum	2	♀	570	465	105	87	30
"	**Average**	**5**	♂ ♀	**550**	**459**	**91**	**85**	**31**
Medje		1	♂	550	462	88	92	30
Vankerckhovenville		1	♀	520	435	85	80	28

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Thryonomys s. variegatus								
Faradje	Minimum	2	♀	671	482	189	85	30
"	Maximum	2	♀	710	485	235	85	38

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Atherura a. centralis								
Akenge	Minimum	4	♂	610	435	175	72	35
"	Maximum	4	♂	675	448	227	75	40
"	**Average**	**4**	♂	**643**	**441**	**201**	**74**	**38**
"	Minimum	3	♀	540	365	175	72	31
"	Maximum	3	♀	645	440	205	78	40
"	**Average**	**3**	♀	**602**	**412**	**190**	**75**	**36**
"	**Average**	**7**	♂ ♀	**625**	**429**	**196**	**75**	**37**
Faradje		1	♀	570	415	155	72	37
Medje	Minimum	7	♂	588	388	160	68	35
"	Maximum	7	♂	704	479	225	75	41
"	**Average**	**7**	♂	**637**	**441**	**201**	**73**[2]	**38**[1]
"	Minimum	5	♀	610	400	155	65	36
"	Maximum	5	♀	665	460	225	73	38
"	**Average**	**5**	♀	**631**	**438**	**185**	**70**	**37**[1]
"	**Average**	**12**	♂ ♀	**637**	**440**	**198**	**72**[3]	**37**[4]
Niapu	Minimum	17	♂	600	400	180	67	36
"	Maximum	17	♂	705	515	210	78	40
"	**Average**	**17**	♂	**663**	**469**	**195**	**73**	**38**
"	Minimum	8	♀	575	375	170	68	32
"	Maximum	8	♀	683	478	210	77	38
"	**Average**	**8**	♀	**625**	**434**	**191**	**72**	**36**
"	**Average**	**25**	♂ ♀	**651**	**467**	**194**	**69**	**37**

[1] Series of 3. [2] Series of 6. [3] Series of 11. [4] Series of 6.

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Hystrix galeata								
Akenge		1	♀	920	810	110	110	47
Faradje	Minimum	5	♂	800	685	80	105	43
"	Maximum	5	♂	940	865	170	115	49
"	**Average**	**5**	♂	**875**	**772**	**123**	**109**	**47**
"	Minimum	2	♀	850	740	110	102	34
"	Maximum	2	♀	860	745	115	103	38
"	**Average**	**7**	♂ ♀	**869**	**764**	**120**	**107**	**44**

Species and Locality		No.	Sex	Total	H-B	Tail	Foot	Ear
Poelagus m. marjorita								
Faradje	Minimum	6	♂	450	400	45	65	62
"	Maximum	6	♂	650	605	60	100	70
"	**Average**	**6**	♂	**500**	**449**	**58**	**90**	**66**[1]
"	Minimum	6	♀	465	405	45	94	60
"	Maximum	6	♀	595	535	70	100	68
"	**Average**	**6**	♀	**498**	**439**	**58**	**97**	**64**[1]
"	**Average**	**12**	♂ ♀	**499**	**444**	**55**	**96**	**65**[2]

[1] Series of 5. [2] Series of 10.

CRANIAL MEASUREMENTS

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Breadth brain case	Length nasals	Breadth nasals	Palatilar length	Length palatal foramina	Crown length upper tooth row	Width M^2	Condylo-incisive length mandible
Claviglis christyi														
Mambaka	Type	♂	27.5	24.0	15.0	4.9	12.6	10.4[1]	3.6	8.1	2.6	3.3	1.2[1]	...
Medje	49891	♂	26.8	23.4	14.8	4.8	12.8	10.2	3.6	7.9	2.9	3.2	1.1	15.9
"	49900	♂	28.0	24.1	14.6	4.9	12.5	11.2	3.6	8.2	3.4	...	...	16.6
"	49913	♂	27.6	23.8	15.1	5.0	12.9	11.4	3.6	7.9	3.4	...	...	16.4
"	49916	♂	27.5	23.7	14.8	5.0	12.6	10.7	3.6	8.0	3.2	3.2	1.0	15.7
"	49920	♂	27.2	23.3	14.8	4.8	12.2	10.5	3.5	8.2	2.6	3.3	1.0	15.7
"	**Average**	♂	**27.4**	**23.6**	**14.8**	**4.9**	**12.6**	**10.8**	**3.7**	**8.0**	**3.1**	**3.2**	**3.0**	**16.0**
"	49892	♀	27.0	23.2	14.6	5.0	12.6	10.6	3.5	7.9	2.7	3.1	1.0	16.1
"	49897	♀	27.8	23.7	15.1	5.0	12.2	10.7	3.5	8.1	2.9	...	...	16.2
"	49915	♀	26.8	23.3	14.2	4.8	12.1	10.1	3.6	8.1	2.7	3.2	1.1	16.0
"	49917	♀	27.0	23.3	14.0	5.0	12.5	10.4	3.5	8.2	2.8	3.2	1.1	15.8
"	49919	♀	28.0	24.2	14.4	5.0	12.8	10.8	3.7	8.6	3.1	3.3	1.0	16.4
"	**Average**	♀	**27.3**	**23.5**	**14.4**	**4.9**	**12.4**	**10.5**	**3.5**	**8.1**	**2.8**	**3.2**	**4.0**	**16.1**
"	**Average**	♂ ♀	**27.3**	**23.6**	**14.6**	**4.9**	**12.5**	**10.6**	**3.6**	**8.1**	**2.9**	**3.2**	**1.0**	**16.0**
Niangara	49882	♀	26.6	23.2	14.1	4.5	12.2	10.1	3.4	...	3.2	3.3	1.0	16.0
C. lorraineus														
Molegbwe	Type	♀	?	?	14.5	5.0	12.2	9.5	3.4	7.9[1]	2.8	3.4	?	?
Bafwabaka	49888	♂	23.6	20.8	13.2	4.7	12.0	8.5	3.0	7.1	2.4	3.3	1.2	14.4
"	49889	♂	?	21.8	14.0	4.4	11.8	?	?	7.2	2.5	?	?	14.8
"	**Average**	♂	...	**21.3**	**13.6**	**4.5**	**11.9**	...	...	**7.1**	**2.4**	...	...	**14.6**
Faradje	49886	♀	23.9	21.6	13.7	4.0	11.2	9.0	2.9	7.6	2.7	?	1.1	14.3
Medje	49911	♂	?	?	?	4.4	11.9	7.7	2.6	?	2.7	3.1	1.2	13.0
"	49904	♀	22.4	19.5	12.1	4.2	11.0	7.4	2.4	6.8	2.4	2.9	1.1	13.0
"	49906	♀	?	?	?	4.5	?	8.3	2.7	7.6	2.6	3.3	1.2	14.0
"	**Average**	♂ ♀	...	...	...	**4.3**	**11.4**	**7.8**	**2.6**	**7.2**	**2.6**	**3.1**	**1.2**	**13.3**
Niangara	49878	♂	?	21.6	13.9	4.3	?	?	2.5	7.5	2.3	3.3	1.1	14.8
"	49881	♂	21.2	19.1	?	4.3	?	7.6	2.7	6.1	2.1	3.1	1.2	12.2
"	**Average**	♂	...	**20.3**	...	**4.3**	...	...	**2.6**	**6.8**	**2.2**	**3.2**	**1.1**	**13.6**
"	49879	♀	24.6	22.2	13.8	4.7	12.2	8.7	3.3	7.7	2.9	3.2	1.3	15.0
"	49880	♀	24.3	22.0	13.5	4.5	11.4	9.2	3.4	7.4	2.3	3.3	1.2	14.4
"	**Average**	♀	**24.4**	**22.1**	**13.6**	**4.6**	**11.8**	**8.9**	**3.3**	**7.5**	**2.6**	**3.2**	**1.2**	**14.7**
"	**Average**	♂ ♀	**23.4**	**21.2**	**13.7**	**4.4**	...	**8.5**	**3.0**	**7.2**	**2.4**	**3.2**	**1.2**	**14.1**
Vankerckhovenville	49885	♀	23.6	21.2	12.9	3.8	11.0	9.1	2.6	7.5	2.7	?	?	13.7
Lukolela	86893	♂	?	?	14.8	4.8	?	10.2	3.3	8.1	2.1	3.2	1.3	15.2
"	86894	♀	23.7	21.0	13.9	4.3	12.2	8.1	3.0	7.3	2.2	3.2	1.2	14.3
"	86896	♀	24.2	22.2	14.9	4.6	12.2	8.8	3.1	7.1	2.4	?	1.1	14.1
"	**Average**	♂ ♀	**23.9**	**21.6**	**14.5**	**4.6**	**12.2**	**9.0**	**3.1**	**7.5**	**2.2**	**3.2**	**1.2**	**14.5**
Luluabourg	86311	♀	25.1	22.2	13.3	4.2	12.2	9.0	3.1	7.7	2.3	3.2	1.1	13.9
"	86316	♀	22.8	20.2	12.2	4.2	11.2	8.6	2.7	7.6	2.5	3.0	1.1	13.2
"	**Average**	♀	**23.9**	**21.2**	**12.7**	**4.2**	**11.7**	**8.8**	**2.9**	**7.6**	**2.4**	**3.1**	**1.1**	**13.5**

[1] Measurements of type by R. T. Hatt.

Species and locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Breadth brain case	Skull height	Length nasals	Breadth nasals	Palatilar length	Length palatal foramina	Width palate inside M^1	Crown length upper tooth row	Width M^2	Condylo-incisive length mandible
Otomys t. faradjius																
Faradje	Type	♂	39.7	38.1	19.9	4.6	15.5	12.8	16.7	7.5	17.8	7.2	1.8	8.5	2.7	25.7
"	50356	♂	39.8	37.6	19.7	4.3	14.5	12.2	16.9	7.5	17.9	7.6	1.5	8.1	2.4	25.9
"	50358	♂	38.8	36.6	18.5	4.8	15.0	12.5	15.6	7.2	17.7	7.0	1.7	8.6	2.6	24.6
"	50361	♂	36.0	33.0	16.6	4.5	13.6	11.9	16.4	6.7	15.6	6.6	1.2	7.2	2.4	22.9
"	**Average**	♂	**38.6**	**36.3**	**18.7**	**4.5**	**14.6**	**12.3**	**16.4**	**7.2**	**17.2**	**7.1**	**1.5**	**8.1**	**2.5**	**24.8**
"	Minimum	♂	36.0	33.0	16.6	4.3	13.6	11.9	15.6	6.7	15.6	6.6	1.2	7.2	2.4	22.9
"	Maximum	♂	39.8	38.1	19.9	4.8	15.5	12.8	16.9	7.5	17.9	7.6	1.8	8.6	2.7	25.9
"	50354	♀	38.3	36.2	...	4.4	14.8	12.3	16.6	7.0	17.3	7.4	1.6	8.2	2.6	24.6
"	50360	♀	39.1	36.9	19.2	4.5	14.9	12.1	16.7	6.7	17.3	6.5	1.8	8.5	2.5	24.5
"	**Average**	♀	**38.7**	**36.55**	...	**4.4**	**14.8**	**12.2**	**16.6**	**6.85**	**17.3**	**6.9**	**1.7**	**8.3**	**2.5**	**24.5**

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Breadth brain case	Skull height	Length nasals	Palatilar[1] length	Width palate inside M[1]	Length post. palatal foramina	Length bullae	Crown length upper tooth row	Alveolar length upper tooth row	Width M[1]	Condylo-incisive length mandible
Taterillus e. congicus																	
Poko	Type	♂	36.5	31.2	...	6.6	...	...	...	...	...	4.1	...	5.0	...	...	...
Faradje	50281	♂	37.1	32.5	19.5	6.9	15.5	14.5	15.5	16.7	4.0	4.2	9.4	5.3	5.9	2.0	22.4
"	50286	♂	37.2	31.7	17.9	7.0	14.7	13.8	15.2	16.1	3.6	4.6	9.5	5.0	5.7	2.0	22.3
"	50287	♂	37.6	31.9	18.9	6.5	14.9	14.4	15.3	17.1	4.1	4.4	10.2	5.0	5.7	2.0	22.1
"	50301	♂	36.1	30.2	...	6.4	15.7	13.9	14.5	15.5	3.4	4.1	9.7	5.1	6.0	2.0	21.0
"	50307	♂	37.2	31.4	18.6	6.3	15.3	14.3	15.6	17.2	3.5	4.1	10.0	5.5	5.9	2.1	20.9
"	**Average**	♂	**37.0**	**31.5**	**18.7**	**6.6**	**15.2**	**14.2**	**15.2**	**16.5**	**3.5**	**4.3**	**9.8**	**5.2**	**5.8**	**2.0**	**21.5**
"	50284	♀	36.6	31.6	18.5	6.5	15.3	14.1	14.8	16.1	4.1	4.1	9.2	...	6.2	...	22.3
"	50288	♀	36.6	31.4	18.1	6.9	16.0	14.6	15.0	15.6	4.0	4.5	9.2	5.1	6.4	1.9	21.7
"	50291	♀	36.0	30.9	18.4	6.3	14.8	14.1	15.0	15.9	3.9	4.2	9.5	5.0	5.6	2.0	21.5
"	50292	♀	36.8	31.6	18.2	6.6	14.8	13.7	15.0	15.8	3.7	3.5	10.0	5.3	5.9	1.9	21.9
"	50302	♀	38.5	32.9	20.0	6.9	15.4	14.4	16.6	16.9	4.1	4.3	9.7	5.2	5.8	1.9	22.5
"	**Average**	♀	**36.9**	**31.7**	**18.6**	**6.6**	**15.3**	**14.2**	**15.3**	**16.1**	**4.0**	**4.1**	**9.5**	**5.1**	**6.0**	**1.9**	**22.0**
"	**Average**	♂ ♀	**37.0**	**31.6**	**18.7**	**6.6**	**15.2**	**14.2**	**15.2**	**16.3**	**3.8**	**4.2**	**9.6**	**5.2**	**5.9**	**2.0**	**21.9**
Niangara	50224	♂	?	?	19.6	6.5	15.6	?	15.1	?	3.8	4.1	10.5	5.0	5.8	2.0	21.2
"	50222	♀	36.6	31.4	?	6.3	14.5	13.7	12.0	?	4.1	4.4	9.5	4.7	5.4	1.9	21.5

[1] The posterior edge of the palate of *Taterillus* is frequently difficult to define. In these measurements I have arbitrarily selected for the posterior point, the plane of the anterior roots of the pterygoid.

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Skull height	Interorbital breadth	Breadth brain case	Length nasals	Breadth nasals	Width zygomatic plate	Palatilar length	Length anterior palatal foramina	Length posterior palatal foramina	Width palate inside M^1	Length bullae	Width bullae	Crown l. upper cheek teeth	Width M^1	Condylo-incisive length mandible
Tatera dichrura																				
Poko	Type	♂	43.0	38.1	22.0	...	7.2	...	...	...	...	...	7.8	1.7	...	...	...	6.6	...	...
Faradje	50104	♂	39.1	35.2	19.5	15.2	7.0	16.2	16.6	4.0	7.7	18.4	7.5	1.8	3.4	11.3	6.4	6.7	2.6	25.8
"	50105	♂	39.3	36.6	?	15.2	6.5	16.7	16.1	4.1	7.7	19.0	7.2	2.3	3.1	11.6	6.9	6.7	2.8	25.5
"	50101	♀	34.7	32.6	18.8	14.8	6.3	16.0	14.2	4.2	6.4	16.7	6.3	1.6	3.1	10.2	6.4	6.8	2.5	22.6
"	50102	♀	41.2	38.8	21.3	16.5	7.5	17.0	16.6	4.2	8.6	20.0	7.6	1.8	4.1	11.6	7.2	7.0	2.6	27.5
"	50103	♀	39.2	36.5	21.0	15.8	6.6	16.6	15.9	4.3	7.9	18.5	7.9	1.9	4.1	11.4	6.5	6.8	2.5	25.9
"	**Average**	♀	**38.4**	**36.0**	**20.4**	**15.7**	**6.8**	**16.5**	**15.6**	**4.2**	**7.6**	**18.4**	**7.3**	**1.8**	**3.8**	**11.1**	**6.7**	**6.9**	**2.5**	**25.3**
"	**Average**	♂ ♀	**38.7**	**35.9**	**20.2**	**15.5**	**6.8**	**16.5**	**15.9**	**4.2**	**7.7**	**18.5**	**7.3**	**1.9**	**3.6**	**11.2**	**6.7**	**6.8**	**2.6**	**25.5**
Garamba	50109	♂	39.7	36.5	20.0	15.5	6.9	17.0	16.9	4.1	7.6	19.0	7.2	2.5	3.1	11.3	7.0	6.8	2.9	26.1
"	50110	♂	42.3	39.1	20.9	16.5	6.8	16.8	17.9	4.3	7.9	21.0	8.4	2.8	3.6	11.6	7.3	6.6	2.7	27.1
"	50108	♀	36.9	33.8	18.5	14.9	6.5	15.7	14.5	4.0	6.5	17.5	6.6	2.3	3.3	10.4	6.7	6.5	2.4	23.5
"	**Average**	♂ ♀	**39.6**	**36.5**	**19.8**	**15.6**	**6.7**	**16.5**	**16.4**	**4.1**	**7.3**	**19.2**	**7.4**	**2.5**	**3.3**	**11.1**	**7.0**	**6.6**	**2.7**	**25.6**
Niangara	50159	♂	40.0	36.9	22.0	15.6	7.6	17.0	15.5	4.7	7.8	19.0	7.5	1.3	4.3	10.9	6.6	6.3	2.3	26.3
"	50160	♂	41.7	37.8	21.3	15.6	7.8	17.2	17.3	4.2	7.7	19.0	7.6	2.4	3.6	11.4	7.0	6.6	2.5	26.0
"	50162	♂	41.9	38.1	21.1	15.4	7.0	16.2	16.7	4.0	8.3	19.3	7.8	1.5	3.6	11.4	6.4	6.5	2.4	26.5
"	50163	♂	41.1	38.1	21.5	16.4	7.0	17.0	17.1	4.5	8.2	19.9	7.6	2.0	4.0	11.4	6.6	6.3	2.4	26.7
"	50178	♂	41.8	38.3	20.9	16.0	7.5	17.7	16.6	4.3	8.3	20.3	7.7	1.7	3.7	11.8	6.7	6.3	2.3	27.6
"	**Average**	♂	**41.3**	**37.8**	**21.3**	**15.8**	**7.4**	**17.0**	**16.6**	**4.3**	**8.1**	**19.5**	**7.6**	**1.8**	**3.8**	**11.5**	**6.7**	**6.4**	**2.4**	**26.6**
"	50164	♀	42.0	38.8	21.9	16.5	7.3	17.2	16.3	4.6	8.6	19.8	8.2	2.5	4.2	11.5	6.5	6.2	2.3	26.7
"	50175	♀	41.5	37.9	20.4	16.3	7.4	16.3	17.2	4.3	8.2	19.2	8.2	2.1	3.7	12.0	7.1	6.9	2.5	26.6
"	50179	♀	39.1	36.5	19.9	15.6	7.0	16.7	15.5	4.3	7.4	18.3	7.7	1.8	3.8	11.3	7.1	6.3	2.5	24.6
"	50182	♀	41.0	37.9	21.0	16.2	7.8	16.4	16.6	4.8	8.2	19.5	8.1	1.7	3.9	11.6	6.9	6.4	2.5	26.7
"	50185	♀	40.9	37.8	21.5	15.3	7.1	17.0	16.4	3.9	7.9	19.2	8.2	1.6	3.6	11.2	6.3	6.6	2.3	26.8
"	**Average**	♀	**40.9**	**37.8**	**20.9**	**16.0**	**7.3**	**16.7**	**16.4**	**4.4**	**8.1**	**19.2**	**8.1**	**1.9**	**3.8**	**11.5**	**6.8**	**6.5**	**2.4**	**26.3**
"	**Average**	♂ ♀	**41.1**	**37.8**	**21.2**	**15.9**	**7.4**	**16.9**	**16.5**	**4.4**	**8.1**	**19.4**	**7.9**	**1.9**	**3.8**	**11.5**	**6.7**	**6.4**	**2.4**	**26.5**

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Palatilar length	Length palatal foramina	Breadth of palate across M^1	Alveolar length upper tooth row	Width of M^1	Wear of molars
Dendromus a. lineatus													
Faradje	51289	♂	18.7	16.5	9.6	2.8	6.8	7.7	3.8	4.0	2.9	0.9	Great
"	51295	♂	?	16.7	?	2.9	?	8.0	3.8	3.9	3.0	0.9	Great
"	51296	♂	18.3	15.9	8.9	2.8	6.9	7.6	3.9	3.9	2.9	0.9	Moderate
"	**Average**	♂	**18.5**	**16.4**	**9.3**	**2.8**	**6.9**	**7.8**	**3.8**	**3.9**	**2.9**	**0.9**	
"	51290	♀	19.1	17.2	9.8	3.0	7.2	8.3	3.8	4.1	3.0	1.0	Great
"	51291	♀	19.7	16.6	9.4	2.9	6.9	7.9	3.9	4.0	3.0	0.9	Great
"	51292	♀	18.4	16.5	9.6	2.7	6.5	7.4	3.7	4.1	3.0	1.0	Moderate
"	**Average**	♀	**19.1**	**16.8**	**9.6**	**2.9**	**6.9**	**7.9**	**3.8**	**4.1**	**3.0**	**1.0**	
"	**Average**	♂ ♀	**18.8**	**16.6**	**9.5**	**2.9**	**6.9**	**7.8**	**3.8**	**4.0**	**3.0**	**0.9**	
D. messorius													
Bafwabaka	49873	♂	20.6	18.0	9.9	3.1	7.6	8.4	4.1	4.3	3.4	0.9	Moderate
"	49874	♂	21.5	18.7	10.3	3.3	8.0	8.5	4.5	4.3	3.2	1.0	Great
"	49872	♀	?	?	10.2	3.2	6.4	8.0	3.6	4.1	3.1	1.0	Moderate
"	49876	♀	20.7	18.2	10.5	3.3	8.6	8.6	4.6	4.6	3.4	1.0	Great
"	**Average**	♂ ♀	**20.9**	**18.3**	**10.2**	**3.2**	**7.7**	**8.4**	**4.2**	**4.3**	**3.3**	**1.0**	
Medje	49853	♂	21.3	18.3	9.9	3.2	8.2	8.3	4.0	4.6	3.2	1.0	Great
"	49854	♂	20.8	18.0	9.8	3.1	8.0	8.5	4.3	4.3	3.2	0.9	Great
"	49856	♂	20.4	17.9	10.0	3.3	7.7	7.9	3.9	4.1	3.1	1.0	Slight
"	49859	♂	20.7	18.0	10.6	3.2	8.0	8.3	4.2	4.6	3.4	1.0	Moderate
"	49862	♂	21.5	18.4	10.9	3.2	8.5	8.7	4.2	4.3	3.2	1.0	Moderate
"	49869	♂	20.6	18.0	10.4	3.2	8.1	8.3	4.3	4.4	3.2	1.0	Great
"	49870	♂	?	18.8	10.7	3.3	?	8.6	4.5	4.4	3.1	1.0	Moderate
"	**Average**	♂	**20.9**	**18.2**	**10.3**	**3.2**	**8.1**	**8.4**	**4.2**	**4.4**	**3.2**	**1.0**	
"	49858	♀	21.1	18.5	10.3	3.4	8.6	8.6	3.8	4.1	3.2	1.0	Moderate
"	49860	♀	?	?	10.2	3.1	8.2	8.1	4.2	4.4	3.2	0.9	Moderate
"	49863	♀	20.5	18.1	10.2	3.1	7.6	8.6	4.2	4.2	3.2	0.9	Moderate
"	49864	♀	20.2	17.6	10.4	3.2	7.5	8.2	4.1	4.3	3.1	0.9	Moderate
"	51399	♀	19.8	17.2	?	3.3	7.4	8.3	4.1	4.2	3.1	1.0	Slight
"	**Average**	♀	**20.4**	**17.9**	**10.3**	**3.2**	**7.9**	**8.4**	**4.1**	**4.2**	**3.2**	**0.9**	
"	**Average**	♂ ♀	**20.7**	**18.1**	**10.3**	**3.2**	**8.0**	**8.4**	**4.2**	**4.3**	**3.2**	**1.0**	
Niangara	51286	♂	?	18.3	10.3	3.3	8.0	8.8	4.3	4.3	3.3	1.0	Moderate
"	49877	♀	?	18.7	10.7	3.1	?	9.0	4.8	4.4	3.3	1.1	Moderate
"	51282	♀	19.8	16.8	10.0	3.1	7.6	7.9	3.8	4.2	3.2	1.0	Moderate

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Breadth brain case	Interorbital breadth	Length nasals	Palatilar length	Length palatal foramina	Combined width palatal foramina	Width palate across M^1	Crown length upper tooth row	Wear of molars
Deomys f. christyi														
Gamangui	49732	♂	35.5	31.0	15.1	13.8	6.1	14.3	15.9	5.2	2.9	8.3	4.9	Slight
"	49735	♂	36.1	31.8	14.7	13.9	6.1	14.3	16.4	5.1	2.5	8.3	5.6	Moderate
"	49736	♀	35.5	31.7	15.7	14.1	6.3	13.7	17.0	5.4	2.6	9.0	5.5	Great
"	49738	♀	36.7	32.2	16.3	14.2	5.9	14.8	16.0	5.8	2.7	8.9	5.5	Great
"	51306	♀	37.0	35.0	16.2	14.5	6.4	14.5	17.4	5.3	2.7	8.8	5.7	Great
"	**Average**	♀	**36.4**	**33.0**	**16.1**	**14.3**	**6.2**	**14.3**	**16.8**	**5.5**	**2.7**	**8.9**	**5.6**	
"	**Average**	♂ ♀	**36.2**	**32.3**	**15.6**	**14.1**	**6.2**	**14.3**	**16.5**	**5.4**	**2.7**	**8.7**	**5.5**	
Medje	49729	♂	35.8	31.5	?	13.7	6.2	14.6	16.4	5.6	2.5	9.5	5.5	Slight

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Length nasals	Palatilar length	Length palatal foramina	Least width zygomatic plate	Breadth palate across M^1	Length bullae	Alveolar length upper tooth row	Width M^1	Wear of molars
Steatomys o. gazellae														
Faradje	50092	♂	30.2	27.1	?	14.2	14.3	6.3	2.0	6.9	6.4	4.7	1.7	Great
"	50095	♂	27.9	25.5	12.9	12.0	12.5	5.6	1.9	6.2	6.5	4.3	1.6	Moderate
"	50097	♂	25.0	23.2	12.8	10.4	11.7	5.4	1.8	6.2	6.1	4.4	1.6	Moderate
"	50098	♂	25.1	22.6	?	10.5	11.5	5.0	1.7	6.2	6.1	4.3	1.6	Moderate
"	50099	♂	25.1	23.4	12.9	10.1	11.8	5.2	1.6	6.2	6.2	4.5	1.6	Moderate
"	50100	♂	24.8	23.1	12.9	10.6	11.5	5.1	1.6	6.2	6.5	4.4	1.6	Moderate
"	**Average**	♂	**26.4**	**24.2**	**12.9**	**11.3**	**12.2**	**5.4**	**1.8**	**6.3**	**6.3**	**4.4**	**1.6**	
"	50093	♀	28.7	26.7	14.5	12.5	13.3	6.0	2.0	6.9	6.9	4.5	1.6	Great
"	50094	♀	28.0	25.8	13.5	12.5	12.9	6.0	1.9	6.4	6.5	4.4	1.5	Great
"	**Average**	♂ ♀	**26.9**	**24.6**	**13.3**	**11.5**	**12.4**	**5.6**	**1.8**	**6.4**	**6.4**	**4.4**	**1.6**	
Niangara	50081	♂	28.0	26.0	13.0	12.3	12.6	5.8	2.0	6.4	6.4	4.6	1.5	Great
"	50086	♀	28.0	26.0	12.7	12.1	12.5	5.7	2.0	6.7	6.6	4.8	1.6	Moderate
"	50087	♀	30.1	27.6	14.2	13.4	13.6	6.0	2.0	6.9	6.8	4.3	1.5	Great

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Height brain case	Interorbital breadth	Breadth brain case	Length nasals	Least width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M¹	Crown length upper tooth row	Width M¹	Condylo-incisive length of mandible	Wear of molars
Lophuromys sikapusi																	
Bafwabaka	49715	♂	32.8	31.4	15.0	9.8	6.5	12.8	13.7	2.2	13.9	8.1	7.7	5.2	1.9	22.5	Moderate
"	49717	♀	32.5	31.4	15.4	9.8	6.5	13.0	13.6	2.2	13.2	7.4	7.9	5.3	1.9	22.1	Great
Medje	49636	♀	33.1	31.3	?	9.7	6.2	12.8	13.0	2.2	?	7.7	7.6	5.3	1.9	22.2	Great
Niangara	49639	♀	31.3	29.6	15.1	9.1	6.4	12.5	13.2	2.1	13.0	6.8	7.1	5.2	1.8	21.3	Great
Luluabourg[1]	86208	♀	29.8	28.1	15.1	8.2	6.6	12.7	11.8	2.1	11.7	6.5	7.5	4.9	1.8	19.3	Slight
L. luteogaster																	
Medje	Type	♀	29.2	27.8	14.5	8.5	6.0	12.5	12.1	2.8	11.7	6.0	6.9	4.8	1.8	18.2	Moderate
L. a. rita																	
Avakubi	49642	♂	28.5	27.3	13.3	8.3	5.6	11.6	11.4	2.0	11.8	6.6	6.6	4.3	1.9	19.6	Great
"	49643	♂	29.1	25.9	?	8.3	6.1	?	12.6	1.6	11.4	5.8	6.8	4.6	1.8	19.1	Moderate
"	49644	♂	27.5	25.5	12.8	8.2	6.0	11.8	11.7	2.0	11.4	5.7	6.8	4.6	1.9	17.9	Moderate
"	**Average**	♂	**28.4**	**25.7**	**13.0**	**8.3**	**5.9**	**11.7**	**11.9**	**1.9**	**11.5**	**6.0**	**6.7**	**4.5**	**1.9**	**18.8**	
Bafwabaka	49713	♂	28.3	27.1	13.4	8.4	5.7	11.3	11.9	2.1	12.1	6.5	6.4	4.4	1.7	19.2	Great
"	49714	♀	27.0	26.0	?	8.1	5.5	11.5	10.4	1.6	12.0	6.8	6.4	4.6	1.7	17.7	Slight
Bafwasende	49712	♀	28.5	26.9	?	8.7	5.9	?	12.0	2.1	11.5	6.2	6.4	?	1.8	19.4	Moderate
Batama	49645	♂	27.4	26.4	?	8.9	5.8	12.0	11.5	2.1	12.0	5.9	6.8	4.0	1.6	18.9	Great
Gamangui	49634	♀	27.3	?	13.5	8.2	6.2	12.1	10.0	2.2	12.0	6.4	6.6	?	1.7	17.9	Moderate
Ngayu	49720	♂	26.8	25.0	?	8.4	5.5	11.7	10.8	1.6	11.4	6.0	6.4	4.9	1.7	17.5	Slight
"	49725	♂	27.4	25.5	13.3	8.4	5.7	11.8	10.8	2.1	11.8	6.2	6.4	4.7	1.7	17.5	Moderate

"	49726	♂	26.9	25.2	?	8.2	5.5	12.2	10.9	1.7	12.2	5.9	6.0	4.5	1.6	17.4	Slight
"	49727	♂	26.9	25.6	12.6	8.0	5.5	11.8	10.1	2.0	11.8	5.8	6.0	4.9	1.7	18.1	Slight
"	51280	♂	28.3	27.0	13.4	8.1	5.9	12.0	10.8	1.9	11.5	5.9	6.3	4.7	1.8	18.8	Moderate
"	**Average**	♂	**27.3**	**25.7**	**13.1**	**8.2**	**5.6**	**11.9**	**10.7**	**1.8**	**11.7**	**6.0**	**6.2**	**4.7**	**1.7**	**17.9**	
"	49721	♀	29.5	28.3	14.5	9.0	5.8	12.3	12.2	2.0	13.0	6.2	6.5	4.5	1.6	20.2	Great
"	49722	♀	28.6	26.3	13.2	8.7	5.7	11.7	?	1.9	12.3	6.2	6.4	5.0	1.6	18.6	Moderate
"	49728	♀	28.9	27.4	13.7	8.4	5.5	11.6	12.1	2.5	11.6	6.5	6.8	4.8	1.8	19.5	Great
"	51281	♀	29.6	28.0	14.4	8.3	5.8	12.1	12.2	2.4	12.6	6.9	7.2	4.6	1.8	19.9	Great
"	**Average**	♀	**29.1**	**27.5**	**13.9**	**8.6**	**5.7**	**11.9**	**12.2**	**2.2**	**12.4**	**6.4**	**6.7**	**4.7**	**1.7**	**19.5**	
"	**Average**	♂ ♀	**28.1**	**26.5**	**13.6**	**8.4**	**5.7**	**11.9**	**11.2**	**2.0**	**12.0**	**6.2**	**6.4**	**4.7**	**1.7**	**18.6**	
Stanleyville	49695	♂	29.3	28.0	14.0	8.6	6.3	12.4	12.3	2.2	12.7	6.5	6.6	4.6	1.9	19.8	Moderate
"	49698	♂	29.0	28.0	13.8	9.2	6.0	12.6	11.5	2.2	12.1	6.0	6.8	4.5	1.8	19.7	Moderate
"	49704	♂	28.0	26.8	13.8	8.4	5.8	12.3	11.0	1.8	11.8	6.0	6.8	4.4	1.7	18.5	Great
"	49706	♂	28.7	28.0	?	8.7	5.8	12.5	11.6	2.2	12.2	6.2	6.6	4.4	1.7	18.8	Great
"	49710	♂	29.6	28.3	14.5	8.7	5.9	12.7	12.3	2.3	12.3	5.8	7.0	4.7	1.9	19.6	Great
"	**Average**	♂	**28.9**	**27.8**	**14.0**	**8.7**	**5.9**	**12.5**	**11.7**	**2.1**	**12.2**	**6.1**	**6.8**	**4.5**	**1.8**	**19.3**	
"	49692	♀	28.6	27.5	14.0	9.0	6.2	12.5	12.0	2.0	12.0	6.1	6.8	4.5	1.7	19.1	Great
"	49694	♀	28.9	28.1	?	?	5.8	?	11.6	2.0	12.1	6.1	6.9	4.6	1.9	19.6	Moderate
"	49700	♀	29.0	28.2	14.3	8.4	6.0	12.5	11.6	2.2	12.4	6.0	7.2	4.8	1.7	19.8	Great
"	49702	♀	26.9	25.8	12.2	7.7	6.0	11.8	10.5	2.0	11.2	5.9	6.5	4.6	1.8	17.6	Slight
"	49705	♀	28.7	?	?	?	6.0	?	11.7	2.2	11.9	5.8	?	?	1.8	19.7	Great
"	**Average**	♀	**28.5**	**27.4**	**13.5**	**8.4**	**6.0**	**12.3**	**11.5**	**2.1**	**11.9**	**6.0**	**6.9**	**4.6**	**1.8**	**19.2**	
"	**Average**	♂ ♀	**28.7**	**27.6**	**13.8**	**8.6**	**6.0**	**12.4**	**11.6**	**2.1**	**12.1**	**6.0**	**6.8**	**4.6**	**1.8**	**19.2**	
L. a. subsp. Faradje	49641	♀	28.7	27.3	?	8.4	5.7	12.2	11.5	?	?	6.0	?	4.9	1.7	18.9	Moderate

[1] Not a Congo Expedition specimen.

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Skull height	Interorbital breadth	Breadth brain case	Length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Width palate across M^1	Crown length upper tooth row	Width M^1	Condylo-incisive length of mandible	Wear of molars
Cricetomys g. langi																	
Faradje	Type	♂	67.3	63.0	32.0	22.0	10.8	23.0	27.5	5.9	32.7	6.3	13.1	10.7	3.2	48.0	Moderate
"	51141	♂	69.2	64.0	32.0	20.2	10.5	23.5	27.8	6.0	33.8	6.8	12.0	10.7	3.4	48.0	Moderate
"	51152	♂	68.0	63.6	33.0	21.3	10.7	22.9	27.1	6.4	31.1	5.7	13.2	10.3	3.2	46.4	Moderate
"	51362	♂	68.6	64.8	30.5	20.6	10.0	22.2	28.0	6.1	33.0	6.1	13.1	10.3	3.1	47.8	Moderate
"	51366	♂	73.0	69.1	35.2	22.6	10.7	24.6	30.2	6.5	35.4	6.7	13.6	10.8	3.2	48.5	Great
"	**Average**	♂	**69.2**	**64.9**	**32.5**	**21.3**	**10.5**	**23.0**	**28.1**	**6.2**	**33.2**	**6.3**	**13.0**	**10.6**	**3.2**	**47.9**	
"	51146	♀	63.4	59.3	30.9	19.6	10.0	22.4	26.0	5.6	30.4	5.3	12.6	10.3	3.0	45.5	Slight
"	51151	♀	68.0	64.1	32.1	21.1	10.0	23.1	27.6	6.2	32.0	6.7	13.0	10.8	3.2	47.5	Great
"	**Average**	♂ ♀	**68.2**	**64.0**	**32.3**	**21.1**	**10.4**	**23.0**	**27.7**	**6.1**	**32.6**	**6.1**	**12.9**	**10.5**	**3.2**	**47.4**	
C. d. emini																	
Akenge	51139	♂	71.7	67.0	32.3	22.3	10.5	24.0	30.4	6.5	34.0	7.5	13.6	11.3	3.3	49.2	Moderate
"	51137	♀	73.2	68.5	32.0	?	10.6	24.1	29.8	6.3	35.2	9.6	13.6	10.5	3.2	48.2	Great
"	51138	♀	67.1	62.5	29.0	?	10.3	22.5	26.5	5.7	32.1	7.6	13.1	10.8	3.2	43.9	Slight
"	51140	♀	71.7	66.9	31.8	21.4	10.7	23.7	29.5	7.5	34.0	8.5	13.4	11.2	3.7	47.8	Moderate
"	**Average**	♂ ♀	**70.9**	**66.2**	**31.3**	**22.9**	**10.5**	**23.6**	**29.1**	**6.5**	**33.8**	**8.3**	**13.4**	**11.0**	**3.4**	**47.3**	
Bafwabaka	53977	♂	70.6	66.7	32.0	22.8	10.8	24.0	28.8	6.2	35.7	8.4	13.5	11.7	3.5	46.6	Moderate
Medje	51353	♂	72.2	66.2	32.5	20.1	10.4	24.5	29.1	6.6	34.2	7.5	13.1	10.5	3.2	47.9	Slight
"	51354	♂	78.5	73.5	34.6	24.5	11.6	23.9	32.1	6.5	37.1	9.5	13.7	11.0	3.3	53.5	Great
"	51359	♂	69.2	64.7	30.6	20.9	10.5	24.3	28.1	5.8	32.1	7.9	13.2	11.0	3.2	47.8	Slight

"	51360	♂	67.0	61.5	29.8	21.1	10.7	23.2	27.7	6.1	31.7	7.2	11.8	10.5	3.2	45.2	Slight
"	**Average**	♂	**71.7**	**66.5**	**31.9**	**21.7**	**10.8**	**24.0**	**29.2**	**6.2**	**33.7**	**8.0**	**13.0**	**10.8**	**3.2**	**48.6**	
"	51355	♀	68.0	64.1	31.6	22.4	10.7	23.4	27.6	7.0	31.6	7.2	13.1	10.8	3.3	45.8	Moderate
"	51356	♀	74.3	68.6	31.6	23.5	10.8	23.7	30.4	7.2	34.6	8.3	12.8	10.9	3.3	50.5	Moderate
"	51357	♀	76.3	71.1	32.2	23.8	11.0	24.0	31.0	6.9	37.2	8.0	13.7	11.3	3.2	49.5	Moderate
"	**Average**	♀	**72.9**	**67.9**	**31.8**	**23.2**	**10.8**	**23.7**	**29.7**	**7.0**	**34.5**	**7.8**	**13.2**	**11.0**	**3.3**	**48.6**	
"	**Average**	♂ ♀	**72.2**	**67.1**	**31.8**	**22.3**	**10.8**	**23.8**	**29.4**	**6.6**	**34.1**	**7.9**	**13.1**	**10.9**	**3.2**	**48.6**	
Niangara	51365	♂	77.4	71.4	33.3	23.9	11.2	23.3	31.0	7.1	36.4	8.0	13.6	11.2	3.2	51.0	Great
"	51364	♀	70.3	65.4	30.4	22.4	10.1	23.0	27.5	6.7	32.8	9.1	12.6	10.6	3.1	47.8	Great
Niapu	51131	♂	79.5	74.5	33.4	?	11.1	24.6	33.2	7.5	38.9	9.6	13.8	11.3	3.2	54.4	Great
"	51132	♂	74.3	69.8	32.8	22.0	11.5	24.8	29.6	6.6	35.0	6.6	14.1	11.0	3.4	49.7	Moderate
"	51135	♂	74.6	70.1	34.8	?	11.8	23.6	31.4	6.1	36.1	8.2	14.2	10.9	3.6	51.3	Moderate
"	**Average**	♂	**76.1**	**71.5**	**33.7**	...	**11.5**	**24.3**	**31.4**	**6.7**	**36.6**	**8.1**	**14.0**	**11.0**	**3.4**	**51.8**	
"	51130	♀	76.0	71.5	33.6	?	11.6	25.1	30.8	7.1	36.5	7.5	13.3	10.9	3.2	51.8	Great
"	51136	♀	71.0	65.4	30.5	20.0	10.5	23.6	29.7	7.0	34.4	8.2	13.5	11.8	3.4	47.2	Moderate
"	51178	♀	72.1	67.1	31.6	?	11.4	25.1	29.1	7.5	33.7	7.6	14.3	11.0	3.6	48.7	Moderate
"	**Average**	♀	**73.0**	**68.0**	**31.9**	...	**11.2**	**24.9**	**29.9**	**7.2**	**34.9**	**7.8**	**13.7**	**11.2**	**3.4**	**49.2**	
"	**Average**	♂ ♀	**74.6**	**69.7**	**32.8**	...	**11.3**	**24.5**	**30.6**	**7.0**	**35.4**	**8.0**	**13.9**	**11.1**	**3.4**	**50.5**	
C. d. proprator																	
W. Ruwenzori 7000 ft.	82447	♂	71.3	65.5	32.7	?	10.0	23.9	30.0	6.4	32.4	8.3	13.3	10.3	3.2	47.9	Great
C. d. sanctus																	
Lukolela	86831	♂	73.4	68.5	33.1	22.0	9.9	23.3	29.1	5.9	35.5	8.0	13.5	10.2	2.9	50.0	Great
"	86832	♂	68.5	63.7	30.1	22.1	10.0	22.8	28.1	5.8	32.4	6.6	12.6	10.0	3.0	45.4	Moderate
"	86833	♀	70.5	65.5	30.6	21.6	8.5	22.9	28.1	7.0	34.6	7.4	12.1	9.8	3.0	47.3	Moderate
Luluabourg	55079	♂	75.9	70.5	33.0	?	11.0	23.6	31.0	7.0	36.2	8.3	13.1	10.7	3.1	50.5	Great
"	55085	♀	71.0	65.5	31.5	?	10.5	23.9	28.2	6.1	35.0	6.7	13.3	10.4	3.0	47.7	Moderate
"	55075	?	74.8	69.1	32.0	22.0	10.3	23.6	31.5	6.7	35.8	7.6	13.0	10.5	3.0	50.5	Great

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Height brain case	Interorbital breadth	Breadth brain case	Length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Length bullae	Crown length upper tooth row	Width M^1	Condylo-incisive length mandible	Wear of molars
Malacomys l. longipes																	
Benito River	U.S.N.M. 84527	♂	37.5	33.6	16.0	9.7	6.5	15.0	14.7	3.7	...	5.5	4.5	5.6	1.6	23.2	Moderate
" "	" 84526	♀	37.7	33.6	15.3	10.0	6.3	14.0	15.1	4.1	...	6.1	4.5	5.5	1.7	23.6	Moderate
Fernan Vaz	" 218914	♀	39.6	36.9	18.2	10.5	7.6	15.4	16.4	4.1	...	5.8	4.8	5.5	1.6	25.9	Great
M. l. centralis																	
Avakubi	50051	♂	41.8	38.2	17.6	10.2	6.8	14.4	16.1	4.3	18.2	6.3	5.6	6.2	1.8	26.5	Great
"	50053	♂	40.8	36.9	17.6	9.9	7.1	14.8	16.2	4.4	18.2	6.5	?	6.4	1.7	25.4	Moderate
"	50052	♀	42.5	37.7	?	10.4	7.1	?	17.5	4.5	18.7	6.4	5.0	5.9	1.9	26.5	Moderate
"	**Average**	♂♀	**41.7**	**37.6**	**17.6**	**10.2**	**7.0**	**14.6**	**16.6**	**4.4**	**18.4**	**6.4**	**5.3**	**6.2**	**1.8**	**26.1**	
Gamangui	50193	♂	43.2	40.0	17.2	11.1	6.9	14.8	17.2	4.5	19.7	6.5	5.4	6.2	1.8	27.8	Great
"	50201	♂	43.4	40.0	18.5	10.7	7.1	14.6	17.6	4.2	19.5	6.5	5.4	6.2	1.8	27.7	Moderate
"	50208	♂	43.2	38.6	18.1	10.3	7.2	14.8	16.7	4.5	18.5	6.6	5.1	6.0	1.7	26.7	Moderate
"	50210	♂	44.8	40.5	18.5	11.1	6.9	15.1	18.3	4.8	20.4	6.5	?	6.1	1.7	28.9	Great
"	50212	♂	41.2	37.6	17.8	11.1	7.5	14.8	16.1	4.5	19.0	6.1	5.3	5.8	1.8	26.4	Great
"	**Average**	♂	**43.2**	**39.3**	**18.0**	**10.9**	**7.1**	**14.8**	**17.2**	**4.5**	**19.4**	**6.4**	**5.3**	**6.1**	**1.7**	**27.5**	
"	50191	♀	43.1	38.7	18.6	11.1	7.1	15.3	17.8	4.7	19.6	6.1	5.1	5.4	1.6	27.5	Great
"	50194	♀	42.0	37.8	18.3	11.0	7.3	15.1	16.1	4.6	18.7	6.9	5.2	5.8	1.7	26.8	Great
"	50206	♀	42.0	38.2	17.9	10.9	6.4	14.4	16.7	4.3	19.1	6.5	5.2	5.9	1.7	27.0	Moderate
"	50209	♀	42.6	38.6	18.0	11.2	7.3	15.1	16.7	4.3	19.1	6.0	5.5	5.8	1.7	27.1	Moderate
"	50215	♀	42.2	38.0	18.0	11.3	6.9	14.8	16.2	4.3	18.2	5.9	5.2	5.8	1.7	26.6	Moderate

"	**Average**	♀	**42.4**	**38.3**	**18.1**	**11.1**	**7.0**	**14.9**	**16.7**	**4.4**	**18.9**	**6.3**	**5.2**	**5.7**	**1.7**	**27.0**	
"	**Average**	♂♀	**42.7**	**38.8**	**18.1**	**11.0**	**7.0**	**14.9**	**17.0**	**4.5**	**19.1**	**6.2**	**5.2**	**5.9**	**1.7**	**27.3**	
Medje	50048	♂	42.4	?	17.4	?	6.5	14.8	16.7	4.4	19.3	6.3	?	6.1	1.8	26.8	Moderate
"	50049	♀	42.3	39.2	18.4	10.8	7.1	15.1	17.3	4.4	19.2	6.1	5.3	6.0	1.8	28.0	Moderate
"	50050	♀	43.7	39.5	18.4	11.0	6.7	15.0	17.9	4.8	19.7	7.1	5.1	5.8	1.8	28.0	Moderate
"	**Average**	♂♀	**42.8**	**39.3**	**18.1**	**10.9**	**6.8**	**15.0**	**17.3**	**4.5**	**19.4**	**6.5**	**5.2**	**6.0**	**1.8**	**27.6**	
Niangara	50039	♂	?	?	18.1	10.7	7.6	15.6	16.5	4.4	18.2	6.2	?	5.9	1.7	26.3	Moderate
"	50040	♀	40.4	36.8	?	10.8	7.2	14.5	15.9	4.2	18.2	5.5	5.2	5.8	1.8	25.9	Slight
"	50041	♀	41.0	37.6	17.4	10.5	6.5	14.4	16.4	4.1	18.5	6.4	4.9	5.8	1.7	26.1	Slight
"	**Average**	♂♀	**40.7**	**37.2**	**17.7**	**10.7**	**7.3**	**14.8**	**16.3**	**4.2**	**18.3**	**6.0**	**5.1**	**5.8**	**1.7**	**26.1**	
Niapu	50043	♂	43.3	39.1	18.9	11.3	6.4	15.2	18.0	4.3	19.5	6.4	5.7	6.0	1.9	27.9	Great
"	50046	♂	44.0	40.4	19.1	11.3	7.3	15.1	17.9	4.2	19.7	7.2	5.3	6.0	1.7	28.0	Great
"	50044	♀	43.3	39.5	18.6	10.5	6.5	14.6	17.2	4.4	19.4	6.7	5.4	5.9	1.8	28.3	Great
"	50045	♀	40.2	36.5	?	10.8	7.1	14.8	16.3	3.8	17.7	6.0	4.9	5.7	1.7	26.0	Slight
"	50047	♀	42.7	39.2	?	10.8	7.5	15.4	16.3	4.9	18.7	6.2	5.4	6.1	1.8	27.6	Moderate
"	**Average**	♀	**42.1**	**38.4**	...	**10.7**	**7.0**	**14.9**	**16.6**	**4.4**	**18.9**	**6.3**	**5.2**	**5.9**	**1.8**	**27.3**	
"	**Average**	♂♀	**42.7**	**38.9**	**18.9**	**10.9**	**7.0**	**15.0**	**17.1**	**4.3**	**19.0**	**6.5**	**5.3**	**5.9**	**1.8**	**27.6**	
M. l. wilsoni																	
Luluabourg	55223	♂	42.9	38.0	18.8	11.4	7.3	15.6	17.4	4.1	18.6	5.9	5.7	6.0	1.8	26.3	Great
"	55313	♂	42.6	39.0	17.7	10.2	6.7	14.5	17.1	4.3	18.5	6.9	5.8	5.6	1.7	26.2	Great
"	55322	♂	42.9	39.0	18.6	10.7	7.0	15.2	17.6	4.5	19.4	5.1	5.7	6.0	1.8	27.0	Great
"	55326	♂	41.7	38.5	18.0	11.1	6.9	15.3	16.9	4.1	18.5	6.1	5.6	6.1	1.8	26.1	Great
"	55328	♂	42.1	37.2	18.0	10.8	6.9	15.2	15.6	4.3	19.5	5.6	5.5	6.0	1.8	26.4	Great
"	**Average**	♂	**42.4**	**38.3**	**18.2**	**10.8**	**6.9**	**15.2**	**16.9**	**4.3**	**18.9**	**5.9**	**5.6**	**5.9**	**1.8**	**26.4**	
"	55314	♀	44.4	39.6	18.0	10.0	6.5	14.3	17.8	4.6	19.7	6.2	5.6	6.0	1.8	28.2	Great
"	55318	♀	41.0	36.2	17.6	11.0	6.9	15.1	15.6	3.8	17.5	5.8	5.8	6.1	1.7	24.1	Slight
"	**Average**	♂♀	**42.5**	**38.2**	**18.0**	**10.7**	**6.9**	**15.0**	**16.8**	**4.2**	**18.8**	**6.0**	**5.7**	**6.0**	**1.8**	**26.3**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Height brain case	Interorbital breadth	Breadth brain case	Length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Length bullae	Crown length upper tooth row	Width M^1	Condylo-incisive length mandible	Wear of molars
Colomys goslingi																	
Gamangui	49749	♀	34.4	31.5	16.7	10.1	5.2	14.8	14.2	2.4	15.2	7.5	4.7	5.3	2.0	21.9	Moderate
Medje	49750	♂	33.5	31.0	16.5	10.3	5.1	15.1	11.9	2.6	14.9	7.9	4.9	?	?	21.4	Moderate
"	49752	♂	32.6	30.1	15.6	10.0	4.9	14.2	12.4	2.3	15.4	6.8	4.5	5.3	1.8	20.0	Slight
"	49756	♀	33.2	30.6	15.8	10.1	5.1	14.6	13.0	2.4	14.8	6.9	4.5	5.3	1.9	21.2	Moderate
"	51303	♀	33.6	31.0	16.2	9.9	4.8	14.2	13.1	2.4	15.2	7.4	4.5	5.7	2.0	21.3	Moderate
"	**Average**	♂♀	**33.2**	**30.6**	**16.0**	**10.1**	**5.0**	**14.5**	**12.6**	**2.4**	**15.1**	**7.2**	**4.6**	**5.4**	**1.9**	**21.0**	
Niapu	49755	♂	33.5	30.9	16.6	10.0	5.0	14.8	13.1	2.5	14.8	7.1	4.3	5.4	1.9	21.3	Moderate
"	49754	♀	32.2	29.7	15.8	9.9	5.3	14.6	12.4	2.3	14.7	6.7	4.8	5.5	2.0	20.5	Slight
Luluabourg	55209	♂	34.4	31.3	16.2	9.6	4.5	14.0	13.5	2.6	15.1	7.3	4.9	5.6	1.9	21.2	Great
"	55212	♂	34.3	31.3	16.5	9.9	4.7	14.0	13.6	2.6	15.1	6.8	4.6	4.8	1.8	22.0	Great
"	55215	♂	34.6	?	16.2	9.9	4.4	14.3	14.1	2.5	15.3	6.9	4.6	5.2	1.8	21.8	Great
"	55216	♂	35.7	32.5	16.5	10.2	4.9	14.6	13.7	2.6	17.8	6.9	4.9	5.1	1.9	22.4	Great
"	55218	♂	32.6	30.1	16.0	10.1	5.0	15.0	12.9	2.7	14.4	7.0	4.8	5.2	2.0	21.0	Moderate
"	**Average**	♂	**34.3**	**31.3**	**16.3**	**9.9**	**4.7**	**14.4**	**13.6**	**2.6**	**15.5**	**6.8**	**4.9**	**5.2**	**1.9**	**21.7**	
"	55210	♀	34.9	?	16.0	10.3	4.8	14.6	13.8	2.8	15.3	6.6	5.0	5.2	1.9	22.0	Great
"	55211	♀	34.2	31.3	16.7	9.7	5.1	14.5	13.3	2.6	15.0	6.8	5.1	5.1	2.0	21.3	Moderate
"	55213	♀	34.5	30.9	15.9	10.3	5.0	?	12.9	2.8	15.2	6.7	5.0	5.3	1.9	21.5	Moderate
"	55219	♀	34.5	31.5	16.1	9.8	4.9	15.1	13.1	2.9	15.4	6.8	4.9	5.5	1.9	20.9	Slight
"	55220	♀	35.3	32.3	17.1	10.4	4.8	14.7	14.0	3.1	15.6	7.4	4.5	5.3	2.0	22.5	Great
"	**Average**	♀	**34.3**	**31.6**	**16.4**	**10.1**	**4.9**	**14.7**	**13.4**	**2.9**	**15.3**	**6.9**	**4.9**	**5.3**	**1.9**	**21.6**	
"	**Average**	♂♀	**34.3**	**31.4**	**16.3**	**10.0**	**4.8**	**14.5**	**13.5**	**2.7**	**15.4**	**6.9**	**4.9**	**5.2**	**1.9**	**21.6**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Height brain case	Interorbital breadth	Breadth brain case	Length nasals	Breadth nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Length bullae	Crown length upper tooth row	Width M^1	Condylo-incisive length mandible	Wear of molars
Arvicanthis t. centralis																		
Niangara	50146	♂	36.6	34.3	18.1	11.5	5.9	14.7	13.6	5.2	6.0	15.6	7.6	7.3	6.7	2.1	23.4	Great
"	50151	♀	32.6	30.3	16.3	10.4	5.0	13.1	11.1	3.7	5.2	14.2	6.5	6.7	6.7	2.3	21.5	Slight

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Height brain case	Interorbital breadth	Breadth brain case	Length nasals	Least width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Crown length upper cheek teeth	Width M^1	Condylo-incisive length of mandible	Wear of molars
Lemniscomys s. striatus																	
Avakubi	49592	♂	31.4	28.0	?	9.4	5.3	?	11.7	4.0	13.2	6.0	6.2	5.0	1.8	18.8	Very great
"	49596	♂	31.0	?	...	9.2	5.9	12.7	12.4	3.8	13.0	6.1	6.8	4.9	1.7	18.3	Very great
"	49598	♂	29.1	26.1	13.2	9.1	4.9	12.4	11.2	3.9	11.5	6.0	6.0	4.6	1.6	17.8	Very great
"	49599	♂	31.0	28.2	14.5	9.3	4.8	?	12.7	4.1	12.7	6.3	6.4	4.9	1.7	19.1	Very great
"	49602	♂	31.3	28.3	14.6	9.4	5.2	12.5	12.4	4.1	13.0	5.7	6.7	5.1	1.8	18.7	Great
"	**Average**	♂	**30.8**	**27.7**	**14.1**	**9.2**	**5.2**	**12.5**	**12.8**	**4.0**	**12.7**	**6.0**	**6.4**	**4.9**	**1.7**	**18.5**	
"	49591	♀	31.0	27.9	14.2	9.2	4.8	12.2	12.4	4.0	13.4	6.0	6.5	4.7	1.7	19.2	Very great
"	49593	♀	30.7	28.0	14.5	9.2	5.1	12.7	12.2	4.0	12.8	6.5	6.5	4.8	1.7	18.9	Very great
"	49594	♀	30.0	27.1	14.2	9.0	5.0	12.3	12.1	4.2	12.9	6.0	6.2	4.7	1.7	18.3	Very great
"	49597[1]	♀	27.5	24.6	12.5	9.0	4.7	11.7	11.2	3.6	11.2	5.5	5.7	4.5	1.5	16.8	Great
"	49600	♀	30.1	27.5	14.7	8.9	5.0	12.8	12.1	3.4	13.1	6.1	6.6	4.5	1.7	19.3	Very great
"	49601	♀	30.4	27.2	13.9	8.5	5.2	12.3	12.2	4.1	12.7	5.9	6.1	5.0	1.8	18.9	Great
"	**Average**[1]	♀	**30.4**	**27.5**	**14.3**	**8.9**	**5.0**	**12.5**	**12.2**	**3.9**	**12.9**	**6.1**	**6.2**	**4.7**	**1.7**	**18.9**	
"	**Average**[1]	♂ ♀	**30.6**	**27.6**	**14.2**	**9.1**	**5.1**	**12.5**	**12.5**	**3.9**	**12.8**	**6.0**	**6.3**	**4.8**	**1.7**	**18.7**	
Bafwabaka	49576	♂	29.9	27.2	?	8.8	5.2	12.4	11.2	3.6	12.4	5.8	6.0	4.7	1.7	18.7	Great
"	49577	♂	31.0	27.8	?	8.8	5.1	12.6	12.1	3.7	12.9	6.2	6.3	5.1	1.8	18.8	Moderate
Bafwasende	49607	♀	30.4	27.9	14.8	9.1	4.8	12.7	12.1	4.1	13.0	6.1	6.6	5.2	1.8	19.3	Very great
Faradje	49588	♂	30.3	27.8	13.8	9.2	5.2	12.3	11.7	3.9	12.0	5.5	6.0	5.2	1.8	18.7	Moderate
"	49587	♀	28.3	25.2	13.3	8.7	4.8	12.1	11.0	3.7	11.4	5.6	?	?	?	16.9	Slight
"	49789	♀	29.2	26.6	14.0	9.1	4.8	12.0	11.5	4.0	11.7	5.6	5.7	4.9	1.7	18.0	Slight
"	**Average**	♂ ♀	**29.3**	**26.5**	**13.7**	**9.0**	**4.9**	**12.1**	**11.9**	**3.9**	**11.7**	**5.6**	**5.8**	**5.0**	**1.8**	**17.9**	
Medje	49572	♂	30.0	27.1	14.2	9.5	5.4	12.2	11.9	4.1	12.3	5.6	5.8	4.8	1.7	18.2	Very great
"	50608	♀	30.4	27.7	15.0	9.2	5.4	12.6	12.0	3.9	13.1	6.4	6.7	4.9	1.8	?	...

Niangara	49580	♂	28.8	26.5	?	8.8	4.6	?	10.6	3.6	11.5	5.6	5.9	5.2	1.7	17.7	Slight
"	49581	♂	27.9	25.1	12.2	8.9	4.8	11.3	10.5	3.3	?	5.7	5.8	5.1	1.8	17.4	Slight
"	49582	♂	28.2	24.6	12.6	8.8	4.8	11.4	10.8	3.5	11.0	5.1	5.7	4.9	1.8	17.1	Slight
"	49583	♂	27.7	24.7	13.3	8.8	5.0	11.8	10.1	3.4	11.3	5.3	5.7	4.8	1.7	16.0	Slight
"	49585	♂	31.2	27.2	14.2	8.8	5.3	11.7	11.9	3.6	12.2	6.1	5.8	4.7	1.6	18.0	Great
"	**Average**	♂	**29.0**	**25.6**	**13.8**	**8.8**	**4.9**	**11.5**	**10.9**	**3.5**	**11.5**	**5.6**	**5.8**	**4.9**	**1.7**	**17.2**	
"	49586	♀	28.4	26.0	13.2	8.9	4.8	11.6	11.8	3.6	11.9	5.5	5.7	5.0	1.7	17.8	Slight
Stanleyville	49565	♂	29.6	26.8	13.0	8.7	5.0	10.9	12.0	3.8	12.1	5.7	5.9	4.9	1.7	17.7	Great
"	49563	♀	31.0	28.3	14.9	9.1	5.2	11.9	12.4	4.0	13.4	6.4	6.7	5.0	1.7	19.6	Very great
"	49564	♀	28.6	26.3	14.2	9.3	4.9	12.2	11.5	3.5	11.6	5.7	6.3	5.1	1.8	18.3	Moderate
"	49566	♀	29.6	26.7	14.6	9.2	5.0	12.1	11.2	3.7	12.2	5.8	5.6	5.0	1.8	18.7	Very great
"	49567	♀	28.9	26.7	?	8.7	5.0	11.5	11.7	?	11.6	5.6	6.0	4.9	1.7	18.1	Moderate
"	49571	♀	27.3	24.9	12.8	9.0	5.0	11.8	10.6	3.5	11.0	5.0	5.9	5.0	1.7	16.8	Slight
"	**Average**	♀	**29.1**	**26.6**	**14.1**	**9.1**	**5.0**	**11.9**	**11.5**	**3.4**	**11.9**	**5.7**	**6.1**	**5.0**	**1.7**	**16.3**	
L. b. zebra																	
Faradje	49616	♂	27.1	24.5	12.5	8.5	4.5	11.6	9.5	3.6	10.6	5.3	5.7	4.8	1.6	16.5	Slight
"	49627	♂	?	?	12.1	?	4.3	11.6	9.9	3.2	10.6	4.8	5.5	4.7	1.7	15.1	Slight
"	49612	♀	?	26.7	13.6	9.2	4.4	12.5	?	4.4	12.4	5.7	5.7	4.8	1.7	18.5	Great
"	49614	♀	27.4	24.4	12.2	8.4	4.2	11.8	10.5	3.8	11.3	5.0	5.2	4.8	1.6	16.2	Slight
"	49629	♀	?	?	12.2	?	4.2	11.2	10.5	3.3	10.2	5.0	5.5	4.5	1.6	15.5	Slight
"	49631	♀	27.2	24.6	12.9	8.6	4.2	11.8	10.0	3.5	11.4	5.2	?	?	?	16.8	Slight
"	49632	♀	26.5	24.1	12.5	8.6	4.4	11.4	10.0	3.5	11.2	5.0	5.5	5.0	1.6	16.4	Moderate
"	**Average**	♀	**27.0**	**24.4**	**12.6**	**8.7**	**4.3**	**11.5**	**10.2**	**3.7**	**11.3**	**5.2**	**5.5**	**4.8**	**1.6**	**16.7**	
"	**Average**	♂♀	**27.1**	**24.4**	**12.5**	**8.7**	**4.3**	**11.6**	**10.1**	**3.6**	**11.1**	**5.1**	**5.5**	**4.8**	**1.6**	**16.4**	
L. o. orientalis																	
Faradje	49611	♂	26.7	24.1	12.5	8.4	4.5	11.4	10.2	3.3	10.5	5.0	5.6	4.8	1.6	16.2	Great
"	49626	♂	26.6	24.3	12.6	8.3	4.3	11.5	10.0	3.3	10.8	5.7	5.7	4.8	1.7	16.2	Very great
L. d. nubalis																	
Faradje	49628	♀	27.1	24.1	12.0	8.6	4.4	11.3	10.2	3.4	10.5	5.1	?	?	?	16.0	Moderate
"	49633	♀	25.0	23.0	11.5	8.3	3.9	10.9	8.3	3.1	10.5	5.0	5.4	4.9	1.7	15.2	Slight

[1] No. 49597 not included in averages. See text.

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital constriction	Greatest length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Hybomys u. univittatus														
Avakubi	49671	♂	32.7	28.9	15.7	6.3	13.0	3.9	14.6	7.1	6.9	5.5	1.9	Great
"	49672	♂	33.0	29.3	15.1	6.0	12.7	4.0	14.1	6.9	6.5	5.2	1.9	Great
"	49663	♀	33.5	29.5	16.0	5.9	14.4	4.1	14.2	6.9	6.9	5.5	1.9	Great
"	49664	♀	33.0	29.0	?	5.7	13.1	4.0	14.2	6.8	6.6	5.4	1.9	Moderate
"	49665	♂	32.5	27.4	15.0	5.5	12.3	3.8	13.6	6.7	6.7	5.4	1.8	Moderate
"	49666	♀	32.5	28.6	?	5.6	12.9	4.0	14.1	5.6	6.7	5.4	1.8	Moderate
"	49669	♀	32.0	28.5	?	5.5	13.5	4.1	14.1	6.7	6.7	5.5	1.9	Great
"	**Average**	♀	**32.7**	**28.6**	**15.5**	**5.6**	**13.2**	**4.0**	**14.0**	**6.5**	**6.7**	**5.4**	**1.9**	
"	**Average**	♂ ♀	**32.6**	**28.7**	**15.5**	**5.8**	**13.1**	**4.0**	**14.1**	**6.7**	**6.7**	**5.4**	**1.9**	
Bafwasende	49662	♂	34.4	30.1	15.3	5.9	14.0	4.1	14.9	7.0	6.4	5.3	1.9	Moderate
Gamangui	49656	♀	31.9	28.2	14.9	5.8	12.7	3.9	13.6	6.3	6.0	5.3	1.8	Moderate
Medje	49651	♂	31.8	27.9	14.8	5.7	12.2	3.9	13.8	6.3	6.2	5.5	1.9	Moderate
"	49653	♂	33.1	29.1	15.7	6.1	13.9	4.4	14.4	7.1	6.6	5.1	1.8	Slight
"	49654	♂	32.6	28.3	?	5.9	13.7	3.9	13.9	6.5	?	5.5	?	Moderate
"	49655	♂	33.0	28.3	15.1	6.3	13.3	4.0	14.2	6.8	6.9	5.6	1.9	Great
"	**Average**	♂	**32.6**	**28.4**	**15.2**	**6.0**	**13.3**	**4.1**	**14.1**	**6.7**	**6.6**	**5.4**	**1.9**	
"	49652	♀	32.6	28.7	14.9	5.6	13.1	3.7	13.4	7.5	6.4	5.3	1.9	Slight
Niangara	49678	♂	31.6	27.2	15.2	5.7	13.0	3.7	13.5	7.0	6.2	5.1	1.7	Moderate
"	49677	♀	30.6	26.8	14.1	5.5	12.1	4.0	13.1	6.8	6.0	5.1	1.7	Slight
Niapu	49649	♀	33.6	29.7	16.1	6.3	11.9	3.2	13.2	6.6	6.0	5.7	1.7	Moderate
"	49680	♀	34.2	30.1	15.8	6.1	14.4	4.2	14.6	7.0	6.7	5.6	1.8	Great
Stanleyville	49657	♀	32.5	28.8	14.9	5.5	13.1	4.1	13.8	6.5	6.7	5.5	1.8	Moderate
Lukolela	86795	♂	33.5	28.4	15.2	6.0	?	3.8	14.1	7.0	6.5	5.4	1.9	Moderate
"	86796	♂	32.9	28.9	15.2	5.7	13.6	4.1	13.9	6.3	7.0	5.8	2.0	Great
"	86797	♂	30.7	27.1	15.1	6.0	12.9	3.6	13.1	6.3	6.4	4.9	1.8	Moderate
"	86804	♂	31.0	26.7	?	5.5	12.6	4.0	13.2	6.1	6.6	5.3	1.9	Great
"	**Average**	♂	**32.0**	**27.8**	**15.2**	**5.8**	**13.0**	**3.9**	**13.6**	**6.4**	**6.6**	**5.4**	**1.9**	
"	86798	♀	33.5	29.6	?	6.1	13.8	4.2	14.3	6.6	7.3	5.5	2.0	Great
"	86799	♀	31.9	27.5	15.4	6.1	13.1	3.6	13.9	6.6	6.7	5.6	1.9	Slight
"	86803	♀	31.5	27.6	15.3	5.7	12.5	3.9	13.2	6.6	6.6	5.3	1.9	Moderate
"	**Average**	♀	**32.3**	**28.2**	?	**6.0**	**13.1**	**3.9**	**13.8**	**6.6**	**6.9**	**5.5**	**1.9**	
"	**Average**	♂ ♀	**32.1**	**28.0**	**15.2**	**5.9**	**13.1**	**3.9**	**13.7**	**6.5**	**6.9**	**5.4**	**1.9**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Length nasals	Breadth nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Mylomys d. alberti															
Faradje	50131	♂	35.9	33.3	16.2	4.6	14.3	4.6	5.5	16.3	7.4	6.6	7.4	2.5	Slight
"	50133	♂	35.1	32.0	16.1	4.6	14.1	4.7	5.4	15.6	7.3	6.8	7.6	2.6	Slight
"	50138	♂	35.9	33.4	17.1	5.0	13.5	5.0	5.4	16.2	7.6	6.6	7.8	2.5	Great
"	50141	♂	38.3	35.2	18.0	5.0	16.4	4.8	5.9	17.4	8.1	7.7	7.7	2.6	Great
"	50142	♂	35.6	32.7	16.0	4.6	15.4	5.1	5.7	16.2	7.4	6.8	7.9	2.5	Moderate
"	**Average**	♂	**36.2**	**33.3**	**16.7**	**4.8**	**14.7**	**4.8**	**5.6**	**16.3**	**7.6**	**6.9**	**7.7**	**2.5**	
"	50129	♀	32.6	29.8	15.5	4.5	12.8	4.4	4.9	14.9	6.2	6.8	8.0	2.7	Moderate
"	50130	♀	37.2	34.1	17.0	4.7	14.6	4.2	6.0	17.2	8.0	7.5	8.0	2.7	Great
"	50136	♀	35.0	32.0	16.0	4.3	14.0	4.2	4.9	15.6	7.0	7.0	7.9	2.6	Moderate
"	50137	♀	36.5	33.4	16.3	4.8	14.4	4.9	5.6	16.2	7.5	7.1	7.9	2.5	Great
"	**Average**	♀	**35.3**	**32.3**	**16.2**	**4.6**	**14.0**	**4.4**	**5.4**	**16.0**	**7.1**	**7.1**	**7.9**	**2.6**	
"	**Average**	♂ ♀	**35.8**	**32.9**	**16.5**	**4.7**	**14.4**	**4.6**	**5.5**	**16.2**	**7.4**	**7.0**	**7.8**	**2.6**	
Garamba	50143	♂	32.2	29.3	15.2	4.7	12.6	4.2	4.8	14.5	6.1	6.9	7.6	2.5	Great
Niangara	50148	♂	33.3	30.6	13.9	4.1	12.8	4.1	5.0	15.2	6.8	6.3	7.6	2.5	Slight
"	50144	♀	36.1	32.9	?	4.8	15.3	4.5	6.1	16.5	7.5	7.4	7.8	2.5	Great
"	50150	♀	36.1	33.8	?	5.1	14.4	4.5	5.5	16.8	6.8	6.9	7.2	2.4	Great
"	**Average**	♂ ♀	**35.1**	**32.4**	?	**4.7**	**14.2**	**4.4**	**5.5**	**16.2**	**7.0**	**6.9**	**7.5**	**2.5**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Breadth brain case	Length nasals	Palatilar length	Length palatal foramina	Breadth palate across M^1	Crown length upper tooth row	Width M^1	Wear on molars
Stochomys l. ituricus														
Gamangui	50005	♀	38.0	34.4	18.2	6.3	14.5	14.6	16.9	7.2	7.5	6.7	2.2	Great
Medje	50009	♂	38.2	?	18.9	5.8	15.0	14.5	17.0	7.2	8.1	6.7	2.3	Moderate
"	50010	♂	37.1	33.1	17.5	5.8	14.4	13.0	15.7	6.8	7.8	6.8	2.3	Moderate
"	50011	♂	38.5	35.1	19.1	5.8	15.6	15.2	17.1	7.1	8.3	6.8	2.3	Great
"	50013	♂	39.4	35.4	18.4	5.6	14.6	15.7	17.2	8.0	7.9	6.7	2.1	Great
"	50014	♂	37.9	34.0	18.0	5.8	14.5	14.4	16.4	7.2	8.1	7.0	2.4	Great
"	**Average**	♂	**38.2**	**34.4**	**18.4**	**5.8**	**14.8**	**14.6**	**17.1**	**7.3**	**8.1**	**6.8**	**2.3**	
"	50006	♀	?	34.3	18.7	5.7	14.9	14.8	16.8	7.7	8.2	6.4	2.3	Great
"	50012	♀	40.0	36.7	19.1	6.5	14.7	15.3	17.5	7.6	8.5	6.9	2.2	Great
"	50015	♀	37.7	34.1	18.3	5.8	14.7	15.0	16.9	7.0	7.9	6.5	2.2	Great
"	50016	♀	37.2	33.0	18.0	5.9	14.2	13.8	16.2	7.0	8.0	6.8	2.2	Moderate
"	50017	♀	38.1	34.2	19.0	6.0	14.8	14.7	16.7	7.4	8.1	6.6	2.3	Great
"	**Average**	♀	**38.2**	**34.5**	**18.6**	**6.0**	**14.7**	**14.7**	**16.8**	**7.3**	**8.1**	**6.6**	**2.2**	
"	**Average**	♂ ♀	**38.2**	**34.5**	**18.5**	**5.9**	**14.7**	**14.7**	**16.9**	**7.3**	**8.1**	**6.7**	**2.3**	
Ngayu	50002	♂	39.4	35.4	19.5	5.5	15.2	15.7	17.0	7.7	8.4	6.7	2.2	Very great
"	50003	♀	39.0	34.7	18.4	5.7	14.5	15.4	16.6	7.7	8.0	6.7	2.2	Very great
Stanleyville	49999	♀	39.1	35.3	18.6	5.9	14.7	15.9	16.7	7.2	8.2	6.5	2.3	Great
Luluabourg	55160	♂	40.1	36.8	19.5	6.5	14.2	15.9	17.0	7.3	8.3	6.7	2.4	Very great
"	55165	♂	39.1	35.6	18.5	5.8	14.4	15.6	16.9	7.3	8.3	6.4	2.2	Moderate
"	55168	♂	40.4	37.1	19.8	6.6	15.2	15.6	17.4	7.4	8.5	7.1	2.5	Moderate
"	55172	♂	39.5	36.1	18.9	6.4	14.5	14.6	17.4	6.6	8.1	6.9	2.4	Moderate
"	55173	♂	41.1	37.6	19.7	6.8	14.9	16.3	17.2	7.1	8.3	7.0	2.4	Moderate
"	**Average**	♂	**40.1**	**36.6**	**19.3**	**6.4**	**14.6**	**15.6**	**17.2**	**7.1**	**8.3**	**6.8**	**2.4**	
"	55162	♀	40.0	35.9	19.6	6.7	15.1	15.9	17.4	7.6	8.0	6.6	2.3	Great
"	55163	♀	36.8	33.3	18.2	6.1	14.7	14.2	15.8	6.8	8.1	7.3	2.4	Slight
"	55174	♀	36.5	33.4	18.7	5.9	15.1	14.1	15.6	6.4	8.0	6.9	2.4	Slight
"	**Average**	♀	**37.8**	**34.2**	**18.8**	**6.2**	**15.0**	**14.7**	**16.3**	**6.9**	**8.0**	**6.9**	**2.4**	
"	**Average**	♂ ♀	**39.2**	**35.7**	**19.1**	**6.3**	**14.7**	**15.3**	**16.8**	**7.1**	**8.2**	**6.9**	**2.4**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Dasymys b. bentleyae													
Faradje	50341	♂	32.6	32.1	16.6	4.1	13.4	15.7	7.0	6.7	7.0	2.4	Slight
"	50343	♂	30.4	30.2	16.1	4.4	12.5	15.3	6.8	6.6	7.0	2.5	Slight
"	50344	♂	32.9	31.7	17.2	5.0	12.6	16.2	7.8	6.7	7.3	2.5	Slight
"	50349	♂	34.2	33.7	17.0	4.4	13.4	17.0	8.6	6.7	7.2	2.3	Moderate
"	50350	♂	33.8	33.2	17.6	4.3	12.9	17.5	7.7	7.0	7.6	2.5	Moderate
"	**Average**	♂	**32.8**	**32.2**	**16.9**	**4.4**	**12.9**	**16.3**	**7.6**	**6.7**	**7.2**	**2.4**	
"	50345	♀	33.8	33.6	18.1	4.7	12.9	16.8	7.7	7.1	7.4	2.6	Moderate
Garamba	50352	♀	32.5	31.9	17.2	4.6	12.3	16.7	7.5	6.8	7.3	2.4	Moderate
Medje	50024	♂	?	33.9	17.4	4.7	12.5	17.1	8.8	7.2	7.4	2.7	Great
"	50027	♂	36.1	?	?	4.4	13.5	18.2	8.4	7.2	7.0	2.5	Great
"	50031	♂	34.8	34.1	17.2	4.6	12.8	17.3	8.0	6.9	6.9	2.4	Great
"	50032	♂	34.2	33.6	17.3	4.3	12.5	17.2	8.4	6.7	6.6	2.3	Moderate
"	**Average**	♂	**35.0**	**33.5**	**17.3**	**4.5**	**12.8**	**17.5**	**8.4**	**7.0**	**6.9**	**2.5**	
"	50021	♀	33.8	33.1	?	4.5	12.6	16.9	8.4	7.1	7.0	2.4	Moderate
"	50029	♀	33.8	33.4	17.3	4.3	12.4	17.0	8.3	7.3	6.6	2.5	Great
"	50030	♀	34.2	33.7	17.4	4.7	13.0	17.1	8.1	7.5	7.2	2.4	Great
"	**Average**	♀	**33.9**	**33.4**	**17.3**	**4.5**	**12.6**	**17.0**	**8.2**	**7.3**	**6.9**	**2.4**	
"	**Average**	♂♀	**34.5**	**33.6**	**17.3**	**4.5**	**12.7**	**17.3**	**8.3**	**7.1**	**6.9**	**2.4**	
Niangara	50036	♀	31.1	30.6	15.3	4.4	12.2	16.2	8.0	6.2	6.7	2.3	Slight

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Length nasals	Breadth nasals	Least width zygomatic plate	Palatilar length	Diastema	Length palatal foramina	Breadth palate across M^1	Crown length upper cheek teeth	Width M^1	Temporal crests	Anterior edge zygomatic plate	Wear of molars
Oenomys h. hypoxanthus																		
Avakubi	50269	♂	35.5	32.2	16.5	5.4	13.0	4.0	4.1	14.9	9.4	7.0	6.1	6.6	2.1	Cuneate	Sigmoid	Slight
"	50271	♂	34.2	31.1	14.9	4.7	12.4	3.4	3.8	14.3	8.8	6.9	6.0	6.7	2.2	Cuneate	Sigmoid	Slight
"	50273	♂	35.5	32.0	15.8	5.2	13.2	4.4	4.4	15.3	9.5	7.2	6.3	7.0	2.1	Cuneate	Vertical	Silght
"	**Average**	♂	**35.1**	**31.8**	**15.7**	**5.1**	**12.9**	**3.9**	**4.1**	**14.8**	**9.2**	**7.0**	**6.1**	**6.8**	**2.1**			
"	50270	♀	37.3	34.2	16.4	5.5	14.6	4.3	4.0	16.4	10.3	7.5	6.4	6.8	2.1	Cuneate	Vertical	Moderate
"	50272	♀	35.4	32.0	16.6	4.8	14.5	3.5	4.0	15.7	8.9	7.0	6.6	7.1	2.2	Cuneate	Vertical	Moderate
"	50274	♀	35.0	31.3	16.1	5.4	13.3	3.9	3.9	15.3	8.9	7.0	6.4	6.9	2.3	Cuneate	Vertical	Light
"	50275	♀	37.5	34.0	16.7	5.3	14.4	4.7	4.0	15.9	10.0	6.7	6.8	7.0	2.1	Cuneate	Vertical	Moderate
"	50276	♀	35.5	32.1	16.1	6.1	13.5	4.2	3.6	15.0	9.1	6.3	6.3	6.5	2.1	Cuneate	Sigmoid	Slight
"	**Average**	♀	**36.1**	**32.7**	**16.4**	**5.4**	**14.1**	**4.1**	**3.9**	**15.7**	**9.4**	**6.9**	**6.5**	**6.9**	**2.2**			
"	**Average**	♂ ♀	**35.8**	**32.4**	**16.2**	**5.3**	**13.8**	**4.0**	**4.0**	**15.3**	**9.3**	**7.0**	**6.4**	**6.8**	**2.2**			
Bafwabaka	50246	♀	35.5	32.1	16.5	5.6	14.3	4.6	4.0	15.9	9.5	7.0	6.4	6.8	2.4	Parallel	Sigmoid	Great
Faradje	50236	♂	38.7	35.7	17.7	6.0	15.5	4.9	4.3	17.4	10.5	8.2	6.5	7.4	2.4	Parallel	Vertical	Great
Gamangui	50247	♀	38.4	35.2	17.6	5.5	15.6	4.4	3.9	17.0	10.4	7.6	6.6	6.9	2.3	Parallel	Sigmoid	Great
Medje	50248	♀	37.3	32.9	16.8	4.8	13.8	4.3	4.4	15.0	9.5	7.6	6.5	7.3	2.3	Cuneate	Vertical	Moderate
Ngayu	50238	♂	38.4	35.5	18.1	5.8	13.7	4.2	4.1	16.9	10.2	7.5	6.6	7.0	2.3	Cuneate	Vertical	Great
"	50241	♂	38.5	35.2	18.3	5.4	15.1	4.9	4.1	16.3	10.3	7.6	7.0	7.2	2.4	Parallel	Sigmoid	Great
"	50240	♀	37.7	34.2	17.6	5.8	15.3	4.7	4.2	17.1	10.2	7.1	6.8	7.1	2.4	Cuneate	Sigmoid	Great

"	50242	♀	36.7	33.2	17.4	5.1	12.4	4.8	4.0	15.5	10.0	6.6	6.5	7.1	2.3	Cuneate	Sigmoid	Great
"	50243	♀	35.5	31.9	17.2	5.2	13.9	3.9	3.7	15.3	9.5	6.7	6.9	7.4	2.2	Cuneate	Vertical	Great
"	**Average**	♀	**36.6**	**33.1**	**17.4**	**5.4**	**13.9**	**4.5**	**4.0**	**16.0**	**9.9**	**6.8**	**6.7**	**7.2**	**2.3**			
"	**Average**	♂♀	**37.4**	**34.0**	**17.7**	**5.5**	**14.1**	**4.5**	**4.0**	**16.0**	**10.0**	**7.1**	**6.7**	**7.2**	**2.3**			
Niangara	50235	♀	36.5	33.2	16.9	5.3	14.3	4.4	4.4	16.0	9.6	7.2	7.0	6.9	2.3	Parallel	Sigmoid	Very great
Niapu	50234	♀	36.7	32.8	16.5	5.5	14.0	4.7	4.0	15.8	9.1	7.8	6.7	7.3	2.4	Cuneate	Sigmoid	Moderate
Stanleyville	50261	♂	37.8	34.1	18.2	6.1	15.4	4.9	4.3	17.0	9.2	6.4	6.9	7.8	2.4	Parallel	Vertical	Great
"	50252	♀	37.7	34.0	17.4	6.0	14.5	4.6	4.5	16.1	10.3	6.8	6.2	7.1	2.1	Parallel	Vertical	Moderate
"	50256	♀	37.0	33.0	17.2	6.0	14.1	5.0	4.1	15.4	9.4	7.4	7.1	6.8	2.2	Cuneate	Vertical	Great
"	50258	♀	38.3	35.1	17.7	6.5	14.3	5.0	4.5	16.3	10.8	7.4	6.8	7.1	2.2	Cuneate	Vertical	Very great
"	50262	♀	37.7	34.3	17.2	6.3	14.5	4.9	4.3	16.8	9.7	7.2	6.6	7.5	2.1	Parallel	Sigmoid	Great
"	**Average**	♀	**37.7**	**34.1**	**17.4**	**6.2**	**14.4**	**4.8**	**4.4**	**16.3**	**10.0**	**7.2**	**6.7**	**7.1**	**2.2**			
Luluabourg[1]	55088	♂	40.0	37.2	19.7	6.3	15.6	4.7	4.3	17.4	11.4	8.2	7.5	7.3	2.3	Parallel	Vertical	Great
"	55099	♂	36.1	33.2	17.3	5.7	13.1	4.2	4.0	15.4	9.4	7.3	6.7	7.4	2.3	Cuneate	Vertical	Moderate
"	55108	♂	36.8	33.7	18.1	5.8	14.2	4.5	4.0	16.2	9.7	7.3	6.5	7.5	2.3	Cuneate	Vertical	Moderate
"	55110	♂	37.5	35.5	19.2	5.8	14.3	5.0	4.2	16.2	9.6	7.2	7.7	7.5	2.5	Parallel	Sigmoid	Great
"	**Average**	♂	**37.6**	**34.9**	**18.6**	**5.9**	**14.3**	**4.6**	**4.1**	**16.3**	**10.0**	**7.5**	**7.1**	**7.4**	**2.4**			
"	55096	♀	40.2	36.4	18.0	5.6	15.1	4.2	4.7	17.7	10.3	8.1	7.0	7.8	2.4	Parallel	Sigmoid	Great
"	55105	♀	39.5	36.1	18.5	5.9	15.6	4.2	4.3	16.8	10.0	7.2	7.1	7.5	2.4	Cuneate	Sigmoid	Great
"	55107	♀	40.5	37.2	18.9	6.0	16.8	4.7	4.3	18.2	11.3	8.1	6.8	7.5	2.4	Cuneate	Vertical	Great
"	**Average**	♀	**40.1**	**36.6**	**18.5**	**5.8**	**15.8**	**4.4**	**4.4**	**17.9**	**10.5**	**7.8**	**7.0**	**7.6**	**2.4**			
"	**Average**	♂♀	**38.7**	**35.6**	**18.5**	**5.9**	**15.0**	**4.5**	**4.3**	**16.8**	**10.2**	**7.6**	**7.0**	**7.5**	**2.4**			
Marungu Mts.[1]	55733	♂	39.8	37.3	19.1	5.5	16.1	5.1	4.5	18.0	10.7	8.7	7.2	7.2	2.4	Parallel	Sigmoid	Great

[1] Not Congo Expedition specimens.

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Palatilar length	Length palatal foramina	Breadth palate across M^1	Length bullae	Alveolar length upper tooth row	Width M^1	Wear of molars
Rattus rattus frugivorus														
Leopoldville	49973	♂	38.7	35.0	17.8	5.7	13.8	17.8	7.0	7.2	6.8	6.2	2.0	Slight
"	49969	♀	39.5	35.0	16.6	?	13.8	17.6	7.0	7.4	7.1	6.6	2.1	Moderate
"	49971	♀	43.9	40.5	?	6.6	16.7	20.3	8.0	8.4	7.6	6.7	2.5	Great
"	49972	♀	40.7	37.0	18.2	5.9	14.2	18.4	7.1	7.4	7.2	6.9	2.0	Moderate
"	**Average**	♀	**40.7**	**36.9**	**17.5**	**6.1**	**14.6**	**18.5**	**7.3**	**7.6**	**7.2**	**6.6**	**2.2**	
Stanleyville	49963	♀	37.8	34.3	17.0	5.5	13.2	17.3	7.2	7.3	6.7	6.1	1.9	Moderate
"	49965	♀	38.4	35.1	17.4	5.8	14.0	17.5	7.0	7.3	6.9	6.7	2.0	Moderate
"	49966	♀	40.5	36.5	18.0	6.3	15.0	18.4	6.9	7.7	7.1	6.6	2.0	Great
"	**Average**	♀	**38.9**	**35.3**	**17.4**	**5.9**	**14.1**	**17.7**	**7.0**	**7.4**	**6.9**	**6.5**	**2.0**	
Lukolela	86813	♂	35.3	31.6	16.2	5.1	12.2	15.9	6.5	7.0	6.7	6.4	1.9	Moderate
"	86826	♂	43.0	39.8	19.1	6.0	15.6	19.7	7.9	7.9	7.8	6.3	1.9	Great
"	86827	♂	?	35.7	?	5.3	?	17.8	6.9	7.2	6.9	6.5	2.0	Moderate
"	86830	♂	43.5	39.6	?	5.9	15.8	19.5	7.9	7.9	7.9	6.7	2.0	Great
"	**Average**	♂	**40.6**	**36.7**	**17.7**	**5.6**	**14.5**	**18.2**	**7.3**	**7.5**	**7.3**	**6.5**	**2.0**	
"	86828	♀	43.6	40.3	20.5	6.0	16.0	20.0	7.8	8.5	8.3	6.7	2.1	Great
Luluabourg	55341	♂	38.4	34.8	17.4	5.3	15.0	17.9	6.9	7.4	6.7	6.2	1.9	Moderate
"	55182	♀	39.6	36.6	17.9	5.6	15.1	18.6	7.6	7.9	7.2	6.4	1.9	Great
"	55185	♀	37.0	34.4	17.1	5.3	14.2	17.5	6.7	7.3	6.6	6.4	1.9	Moderate
"	55340	♀	37.9	34.8	17.4	5.4	14.5	17.5	6.7	7.4	6.7	6.5	1.9	Moderate
"	**Average**	♀	**38.2**	**35.3**	**17.5**	**5.4**	**14.6**	**17.9**	**7.0**	**7.5**	**6.8**	**6.4**	**1.9**	
R. r. kijabius														
Kalongi	82669	♂	44.0	41.5	21.3	6.4	16.6	21.1	8.4	8.5	7.6	7.4	2.0	Great
"	82670	♂	43.9	41.2	21.9	6.4	16.8	20.7	7.5	8.3	7.3	7.0	2.0	Great
"	82671	♂	41.6	39.2	19.7	6.2	15.9	19.9	8.1	8.1	7.2	6.9	2.0	Great
"	**Average**	♂	**43.2**	**40.6**	**21.0**	**6.3**	**16.4**	**20.6**	**8.0**	**8.3**	**7.4**	**7.1**	**2.0**	
Lulenga	82658	♀	41.1	38.4	20.9	6.0	16.0	19.2	7.9	8.0	7.0	7.1	2.1	Moderate
Kijabe	27881	♂	33.3	30.3	?	5.5	11.3	?	6.8	7.2	6.5	6.5	1.9	Moderate

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Aethomys k. medicatus														
Faradje	50114	♀	36.1	32.9	17.5	5.5	14.5	4.7	15.6	8.1	7.2	6.4	2.0	Moderate
Niangara	50116	♂	37.6	34.1	18.4	6.2	15.9	5.0	16.2	8.5	7.7	6.4	2.1	Great
"	50115	♀	36.5	33.2	16.7	5.5	14.9	5.1	16.3	8.5	7.3	6.5	2.1	Moderate
"	50124	♀	33.7	31.4	16.6	5.6	13.0	4.5	15.1	8.3	6.7	6.0	2.0	Moderate
"	50126	♀	35.2	31.9	15.9	5.2	14.2	4.9	15.5	7.8	6.7	6.4	2.0	Moderate
"	**Average**	♀	**35.1**	**32.2**	**16.4**	**5.4**	**14.0**	**4.8**	**15.6**	**8.2**	**6.9**	**6.3**	**2.0**	
"	**Average**	♂♀	**35.8**	**32.7**	**16.9**	**5.6**	**14.5**	**4.9**	**15.8**	**8.3**	**7.1**	**6.3**	**2.1**	

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Palatilar length	Length palatal foramina	Breadth palate across M¹	Length bullae	Alveolar length upper tooth row	Width M¹	Wear of molars
Mastomys c. ugandae														
Aba	49947	♀	34.0	32.7	16.7	4.3	14.0	16.2	7.6	7.0	4.8	5.1	1.5	Great
Avakubi	49929	♂	29.3	27.1	13.5	4.8	12.1	13.1	6.7	5.9	4.5	5.0	1.5	Slight
"	49930	♂	28.4	26.1	?	4.7	11.2	12.4	6.3	5.9	4.6	4.9	1.5	Slight
"	49932	♀	31.9	30.5	15.1	4.6	12.9	14.7	7.3	6.5	4.8	5.1	1.5	Moderate
"	49936	♀	31.1	29.2	?	4.8	12.1	14.2	6.9	6.4	4.5	5.4	1.7	Moderate
"	49938	♀	33.2	31.6	16.2	5.0	14.2	15.4	7.4	6.9	4.7	5.4	1.6	Moderate
"	49940	♀	31.3	29.8	15.6	4.8	12.9	14.5	7.5	6.7	4.6	5.2	1.7	Moderate
"	**Average**	♀	**31.9**	**30.3**	**15.6**	**4.8**	**13.0**	**14.7**	**7.3**	**6.6**	**4.7**	**5.3**	**1.6**	
"	**Average**	♂ ♀	**30.9**	**29.1**	**15.1**	**4.8**	**12.6**	**14.1**	**7.0**	**6.4**	**4.6**	**5.2**	**1.6**	
Bafwabaka	49991	♂	33.1	31.9	16.3	4.8	13.8	15.2	7.7	6.7	4.9	5.5	1.8	Great
"	49983	♀	33.2	32.4	17.2	4.7	14.4	15.8	8.5	6.4	5.3	5.1	1.7	Great
"	49986	♀	31.7	30.4	15.1	4.5	13.1	14.4	7.8	6.8	5.1	5.3	1.7	Moderate
"	49988	♀	32.1	30.7	15.1	4.5	13.0	14.9	7.4	6.2	4.7	5.3	1.6	Moderate
"	49989	♀	34.7	32.7	17.1	4.6	14.7	16.2	8.1	6.6	5.1	5.3	1.6	Great
"	49990	♀	32.5	31.4	15.8	4.6	13.8	15.5	7.8	6.4	4.7	5.6	1.7	Great
"	**Average**	♀	**32.8**	**31.5**	**16.1**	**4.6**	**13.8**	**15.4**	**7.9**	**6.5**	**5.0**	**5.3**	**1.7**	
Faradje	49953	♂	31.2	29.8	14.4	4.5	12.9	14.2	7.2	6.2	5.1	5.5	1.8	Moderate
"	49954	♂	29.9	27.9	14.0	4.2	12.7	13.2	7.1	5.7	4.9	5.3	1.6	Moderate
"	49959	♂	32.6	30.3	16.4	4.7	13.2	14.9	7.9	6.5	4.9	5.0	1.6	Great
"	49961	♂	32.4	31.4	16.4	4.9	12.8	15.5	8.3	7.0	4.8	5.5	1.7	Moderate
"	**Average**	♂	**31.5**	**29.9**	**15.3**	**4.6**	**12.9**	**14.5**	**7.6**	**6.4**	**4.9**	**5.3**	**1.7**	
"	49952	♀	32.0	31.1	15.8	4.8	13.2	14.7	7.8	6.4	4.8	5.4	1.7	Great
"	49955	♀	33.6	31.7	15.8	4.6	13.4	15.3	8.0	6.7	5.4	5.3	1.7	Great
"	49956	♀	31.3	29.9	15.3	4.7	12.7	14.6	7.3	6.7	4.9	5.2	1.6	Moderate
"	**Average**	♀	**32.3**	**30.9**	**15.6**	**4.7**	**13.1**	**14.9**	**7.7**	**6.6**	**5.0**	**5.3**	**1.7**	
"	**Average**	♂ ♀	**31.9**	**30.3**	**15.4**	**4.6**	**13.0**	**14.6**	**7.7**	**6.5**	**5.0**	**5.3**	**1.7**	
Garamba	49949	♂	31.3	29.1	13.8	4.5	12.7	14.1	7.7	5.9	4.6	4.8	1.6	Moderate
"	49951	♂	32.1	30.1	?	4.7	13.2	14.2	7.7	6.1	5.0	5.3	1.6	Moderate
Medje	49921	♂	28.5	27.0	13.8	4.1	11.9	13.0	6.7	6.1	4.5	5.1	1.7	Moderate
"	49923	♂	33.9	32.4	16.2	4.5	13.8	15.5	8.0	6.2	4.7	5.6	1.7	Great
"	49926	♂	34.7	32.6	17.2	4.3	14.6	15.4	8.1	6.7	4.8	5.9	1.7	Great
"	**Average**	♂	**32.4**	**30.7**	**15.7**	**4.3**	**13.4**	**14.6**	**7.6**	**6.3**	**4.7**	**5.5**	**1.7**	
"	49924	♀	32.5	30.8	16.0	4.6	13.3	14.7	7.4	?	4.6	5.8	1.6	Great
"	49925	♀	30.4	28.6	14.2	4.0	12.8	13.9	7.2	6.1	4.2	5.1	1.7	Slight
"	**Average**	♂ ♀	**32.0**	**30.3**	**15.5**	**4.3**	**13.3**	**14.5**	**7.5**	**6.3**	**4.6**	**5.5**	**1.7**	
Niangara	49983	♂	30.3	27.8	14.6	4.4	12.2	14.0	7.5	5.9	4.7	5.2	1.7	Slight
"	49995	♂	28.6	27.2	14.4	4.0	11.3	13.3	7.1	6.0	4.4	5.4	1.7	Moderate
"	49994	♀	31.1	29.7	15.3	4.4	13.2	14.7	7.5	6.4	4.5	5.3	1.6	Great

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Least width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Praomys j. jacksoni														
Avakubi	50311	♂	30.4	28.8	14.1	4.8	12.3	3.2	13.2	6.2	5.8	4.9	1.5	Moderate
"	50312	♂	30.7	28.0	?	5.0	11.9	3.4	13.7	6.6	6.1	4.8	1.5	Great
"	49796	♀	29.9	27.2	13.7	4.8	11.5	3.3	13.2	6.5	5.6	5.0	1.6	Moderate
Bafwabaka	50317	♂	30.8	28.3	13.8	4.7	12.7	3.2	14.2	7.5	5.9	5.1	1.6	Moderate
"	50318	♂	28.8	25.7	?	4.7	10.6	2.9	12.5	6.2	5.4	4.7	1.6	Slight
"	50322	♂	32.5	29.5	13.9	5.0	12.9	3.4	14.7	7.7	6.2	5.1	1.5	Great
"	50323	♂	30.1	26.9	14.2	4.8	11.7	3.2	13.6	7.4	?	4.7	1.4	Moderate
"	50324	♂	30.2	27.3	?	4.7	11.1	3.1	13.7	7.2	5.5	4.6	1.5	Moderate
"	**Average**	♂	**30.5**	**27.5**	**14.0**	**4.8**	**11.8**	**3.2**	**13.7**	**7.2**	**5.8**	**4.8**	**1.5**	
"	50320	♀	30.0	26.9	14.4	4.8	11.4	3.3	13.6	6.4	6.1	4.4	1.6	Moderate
Gamangui	50327	♂	31.1	27.4	14.0	4.9	12.2	3.5	13.8	6.9	5.9	4.8	1.4	Moderate
"	50329	♂	28.1	25.9	13.1	4.6	10.6	3.1	12.4	6.5	5.5	5.0	1.6	Slight
"	50326	♀	30.4	28.0	14.1	4.8	11.5	3.4	13.8	7.3	5.7	4.7	1.5	Great
Medje	50330	♂	30.1	27.5	13.8	4.8	11.7	3.2	13.8	6.8	5.9	4.9	1.6	Moderate
"	50331	♂	32.0	29.1	15.0	4.7	12.7	3.3	14.4	7.0	5.8	5.0	1.6	Moderate
"	50333	♀	30.0	27.4	14.5	4.9	11.6	3.0	13.8	6.7	5.9	5.4	1.6	Moderate
Ngayu	50315	♂	29.4	26.2	?	4.7	11.4	3.1	12.8	6.4	4.9	5.0	1.5	Moderate
"	51268	♂	30.9	28.1	13.9	5.0	12.2	3.3	14.0	7.2	5.7	4.8	1.5	Moderate
"	50316	♀	30.9	28.0	14.7	4.8	12.2	3.1	13.6	5.9	6.1	4.8	1.5	Moderate
Niangara	49763	♂	29.5	26.2	13.4	4.9	11.3	2.8	12.7	6.1	5.7	4.6	1.6	Slight
"	49765	♂	31.4	29.2	14.3	5.0	13.1	3.2	14.2	7.1	5.9	4.7	1.4	Great
"	49767	♂	30.5	27.8	13.8	4.9	11.6	3.2	13.9	6.9	5.7	4.7	1.5	Moderate
"	**Average**	♂	**30.5**	**27.7**	**13.8**	**4.9**	**12.0**	**3.1**	**13.6**	**6.7**	**5.8**	**4.7**	**1.5**	
"	49762	♀	28.1	25.5	13.1	4.5	10.8	2.8	13.0	6.3	5.7	4.7	1.5	Moderate
"	49764	♀	29.4	26.4	13.6	4.8	12.0	3.1	13.2	6.6	5.8	4.8	1.5	Great
"	**Average**	♂ ♀	**29.8**	**27.0**	**13.6**	**4.8**	**11.8**	**3.0**	**13.4**	**6.6**	**5.8**	**4.7**	**1.5**	
Niapu	49795	♂	30.3	26.6	13.8	4.6	12.0	3.0	13.4	6.5	5.7	4.9	1.5	Moderate
"	50340	♂	30.5	27.5	13.8	4.7	11.8	3.3	13.6	7.3	6.1	5.1	1.6	Slight

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Length nasals	Least width zygomatic plate	Palatilar length	Length palatal foramina	Breadth palate across M^1	Alveolar length upper tooth row	Width M^1	Wear of molars
Hylomyscus a. stella														
Gamangui	49811	♂	23.8	21.8	?	4.5	8.0	2.2	10.5	5.0	?	4.2	1.3	Moderate
"	49810	♀	?	?	?	4.4	8.3	2.1	10.9	4.8	?	4.0	1.2	Moderate
"	49812	♀	24.5	22.8	12.1	4.5	8.9	2.5	10.8	4.6	4.4	3.7	1.2	Great
Medje	49790	♂	25.5	23.4	12.3	4.3	9.3	2.4	11.1	4.8	4.6	4.0	1.2	Moderate
Ngayu	49802	♀	24.6	22.3	12.1	4.5	9.0	2.2	10.6	4.5	4.6	4.0	1.2	Great
H. c. schoutedeni														
Medje	49793	♂	28.2	25.8	13.8	5.1	9.6	2.7	13.0	6.3	5.5	4.7	1.3	Moderate
"	49794	♂	27.2	25.2	13.9	4.6	9.4	2.6	12.6	5.6	5.6	4.3	1.3	Moderate
"	49791	♀	26.4	24.3	13.5	4.5	9.7	2.5	12.0	5.7	5.2	4.7	1.3	Moderate
"	49792	♀	27.0	25.0	13.5	4.7	9.6	2.5	12.4	5.6	5.4	4.5	1.3	Great
"	**Average**	♂♀	**27.2**	**25.1**	**13.7**	**4.7**	**9.6**	**2.6**	**12.5**	**5.8**	**5.4**	**4.6**	**1.3**	
Niangara	49801	♂	24.5	23.0	13.0	4.7	8.1	2.4	11.2	4.9	4.9	4.3	1.3	Great
"	49799	♀	24.8	25.0	?	4.4	9.2	2.4	11.3	4.8	5.0	4.4	1.3	Moderate

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Skull height	Interorbital breadth	Breadth brain case	Length nasals	Width zygomatic plate	Palatilar length	Length palatal foramina	Width palate across M^1	Crown length upper tooth row	Width M^1	Condylo-incisive length mandible
Thamnomys v. schoutedeni																
Medje	49747	♂	?	?	14.2	10.3	4.8	13.0	10.9	2.7	13.1	6.7	5.4	5.7	1.8	17.9
"	Type	♀	34.1	30.0	15.8	10.2	5.0	13.6	14.0	2.5	13.8	7.3	5.7	5.7	1.7	20.8
T. s. callithrix																
Faradje	49786	♂	28.8	25.5	13.3	10.5	4.5	12.2	10.4	2.5	10.8	6.5	5.2	4.1	1.3	16.8
"	49788	♂	29.4	25.7	13.4	9.9	4.5	12.0	11.0	2.7	10.8	6.7	5.3	4.1	1.4	17.0
"	49782	♀	27.5	24.2	13.6	9.7	4.4	11.9	10.4	2.7	10.5	6.2	5.4	4.3	1.4	16.5
"	49784	♀	26.7	23.9	13.2	9.8	4.4	11.9	10.0	2.5	10.8	6.0	?	?	?	15.9
"	49785	♀	27.7	25.4	13.1	9.2	4.2	11.9	10.5	2.7	11.2	6.0	5.0	4.2	1.2	16.4
"	49787	♀	27.7	24.8	13.1	9.7	4.4	11.9	10.5	2.5	10.5	6.0	5.1	4.1	1.3	16.7
"	**Average**	♀	**27.4**	**24.6**	**13.2**	**9.6**	**4.4**	**11.9**	**10.3**	**2.6**	**10.7**	**6.0**	**5.2**	**4.2**	**1.3**	**16.4**
"	**Average**	♂♀	**27.9**	**24.9**	**13.3**	**9.6**	**4.4**	**11.9**	**10.4**	**2.6**	**10.8**	**6.2**	**5.2**	**4.1**	**1.3**	**16.6**
Garamba	Type	♂	28.1	25.3	14.1	10.2	4.4	12.1	10.9	2.6	10.6	6.4	5.0	4.3	1.3	17.0
Niangara	49776	♂	26.1	23.2	12.7	9.4	4.0	11.6	10.8	2.3	9.8	5.2	4.9	4.0	1.3	15.5
"	49778	♂	26.2	23.5	13.0	...	4.5	11.8	10.0	2.4	10.0	5.4	5.0	4.2	1.3	15.2
"	49771	♀	27.8	25.3	13.2	9.6	4.3	12.3	10.1	2.7	10.1	6.0	5.2	4.0	1.3	16.9
"	49775	♀	27.0	23.5	12.6	9.3	4.1	11.8	10.6	2.6	10.0	6.0	5.1	4.1	1.3	16.0
"	49777	♀	29.1	26.0	13.5	9.8	4.8	12.0	10.8	2.6	11.3	5.7	5.1	4.0	1.3	18.2
"	49781	♀	26.3	23.1	12.6	9.4	4.2	11.1	10.0	2.5	10.3	5.3	5.2	4.1	1.3	15.1
"	**Average**	♀	**27.5**	**24.0**	**13.0**	**9.5**	**4.3**	**11.7**	**10.4**	**2.6**	**10.4**	**5.7**	**5.1**	**4.1**	**1.3**	**16.3**
"	**Average**	♂♀	**27.1**	**24.1**	**12.9**	**9.5**	**4.3**	**11.7**	**10.4**	**2.5**	**10.3**	**5.6**	**5.1**	**4.1**	**1.3**	**16.2**

T. r. centralis																
Avakubi	50057	♂	33.6	29.4	15.9	10.6	6.0	13.6	12.6	2.9	13.6	6.5	6.3	5.2	1.7	20.2
"	50056	♀	32.6	29.2	15.5	9.8	5.9	13.6	11.8	2.9	13.1	6.2	6.2	5.2	1.7	19.8
Gamangui	49739	♂	30.2	26.8	14.3	10.5	5.7	12.7	10.3	2.6	12.3	5.9	5.7	5.3	1.6	18.0
Medje	50063	♂	32.8	29.3	16.0	10.6	6.0	13.2	12.5	2.8	13.0	6.5	6.3	5.6	1.8	20.0
"	50064	♂	33.0	29.0	15.2	10.4	5.6	13.1	11.6	2.8	13.1	6.8	6.0	5.6	1.8	20.1
"	50067	♂	31.7	28.6	15.0	10.8	5.8	13.0	11.0	2.9	12.8	6.4	6.5	5.5	1.7	19.7
"	**Average**	♂	**32.5**	**29.0**	**15.4**	**10.6**	**5.8**	**13.1**	**11.7**	**2.8**	**13.0**	**6.6**	**6.3**	**5.6**	**1.8**	**19.9**
"	49746	♀	32.0	28.1	15.7	10.3	5.5	12.8	11.7	2.6	12.5	6.2	6.2	5.4	1.8	19.7
"	50060	♀	33.0	28.8	15.2	10.2	6.0	13.3	12.8	2.7	13.0	6.5	6.2	5.6	1.8	19.9
"	50062	♀	32.8	29.9	16.2	10.6	5.8	13.7	12.1	2.5	13.2	7.0	6.5	5.2	1.7	20.3
"	50069	♀	32.2	28.6	15.4	10.1	5.4	13.0	11.8	2.8	12.8	6.2	6.0	5.7	1.7	19.6
"	**Average**	♀	**32.5**	**28.8**	**15.4**	**10.3**	**5.7**	**13.2**	**12.1**	**2.7**	**12.9**	**6.5**	**6.2**	**5.5**	**1.8**	**19.8**
"	**Average**	♂♀	**32.5**	**28.9**	**15.4**	**10.4**	**5.7**	**13.2**	**11.9**	**2.7**	**12.9**	**6.5**	**6.2**	**5.5**	**1.8**	**19.9**
Niangara	50070	♂	34.2	30.9	16.0	11.0	6.1	13.4	12.0	2.7	13.5	6.7	6.2	5.4	1.7	21.0
"	50071	♂	34.3	30.7	15.5	11.0	6.0	13.5	12.1	2.7	13.9	6.6	5.8	5.3	1.6	20.1
"	50072	♂	33.1	29.9	16.3	10.4	5.4	13.5	12.2	2.8	12.8	6.7	6.3	5.3	1.7	20.2
"	50073	♂	32.2	28.6	14.6	10.6	5.4	13.0	11.9	2.6	12.3	5.6	6.0	5.3	1.6	19.2
"	50076	♂	33.7	29.7	15.6	10.5	6.1	13.1	12.4	2.8	13.0	6.0	6.2	5.1	1.7	20.0
"	**Average**	♂	**35.8**	**30.0**	**15.6**	**10.7**	**5.8**	**13.3**	**12.1**	**2.7**	**13.1**	**6.3**	**6.1**	**5.3**	**1.7**	**20.1**
"	50077	♀	34.0	30.5	16.0	10.3	6.0	13.6	12.0	2.8	13.1	6.4	6.3	5.5	1.7	20.5
"	50078	♀	32.9	29.0	15.2	10.5	5.7	12.8	11.6	2.6	12.2	6.7	5.9	5.0	1.6	18.9
"	**Average**	♂♀	**33.7**	**29.9**	**15.6**	**10.6**	**5.8**	**13.3**	**12.0**	**2.7**	**13.0**	**6.4**	**6.1**	**5.3**	**1.6**	**20.0**
Niapu	50058	♂	34.5	30.8	16.4	10.6	5.8	13.9	12.0	2.5	13.3	6.4	6.4	5.6	1.7	20.9
"	50059	♂	35.4	31.6	17.1	10.5	5.9	13.6	12.3	3.1	14.4	7.2	6.3	5.5	1.7	21.5
Stanleyville	50054	♂	32.4	28.8	15.6	9.9	6.0	13.2	11.6	2.7	13.7	6.3	6.1	5.6	1.8	20.4
"	50055	♂	31.1	27.9	14.5	9.6	5.5	13.2	11.0	2.3	12.6	5.6	5.6	5.1	1.7	18.7

Species and Locality	No.	Sex	Greatest length	Condylo-incisive length	Zygomatic breadth	Interorbital breadth	Greatest length nasals	Palatilar length	Length palatal foramina	Breadth of palate across M^1	Alveolar length upper tooth row	Width of M^1	Wear of molars
Leggada b. enclave													
Faradje	49840	♂	17.3	16.6	8.7	3.5	?	8.0	4.1	4.1	3.2	1.1	Moderate
"	49845	♂	17.7	16.0	8.8	3.6	6.7	7.6	4.0	4.2	3.1	1.1	Moderate
"	49846	♂	18.2	16.9	?	3.4	?	8.4	4.1	4.1	2.9	1.1	Great
"	49849	♂	16.3	15.1	8.3	3.3	6.2	7.4	3.8	4.0	2.9	1.1	Moderate
"	49850	♂	17.8	15.9	8.7	3.4	7.1	8.3	3.8	3.9	3.0	1.1	Moderate
"	**Average**	♂	**17.5**	**16.1**	**8.6**	**3.4**	**6.7**	**7.9**	**4.0**	**4.1**	**3.0**	**1.1**	
"	49841	♀	19.6	18.3	9.6	3.5	7.8	9.2	4.5	4.2	3.3	1.1	Great
"	49842	♀	18.6	16.8	9.0	3.3	7.1	8.3	4.6	4.2	3.2	1.1	Great
"	49844	♀	?	?	?	?	6.8	?	?	?	3.0	1.1	Slight
"	49851	♀	17.9	16.0	8.8	3.4	6.6	8.1	4.0	4.0	3.1	1.1	Slight
"	**Average**	♀	**18.7**	**17.0**	**9.1**	**3.4**	**7.1**	**8.5**	**4.4**	**4.1**	**3.2**	**1.1**	
"	**Average**	♂♀	**17.9**	**16.5**	**8.8**	**3.4**	**6.9**	**8.2**	**4.1**	**4.1**	**3.1**	**1.1**	
Niangara	49836	♂	17.6	15.7	?	3.3	6.9	7.6	4.3	3.8	3.0	1.0	Slight
L. b. grata													
Bafwabaka	49819	♂	17.6	16.0	8.5	3.2	6.9	8.0	4.3	4.1	3.1	1.1	Moderate
"	49822	♂	17.9	16.6	8.5	?	7.6	8.3	3.9	4.1	3.1	1.1	Moderate
"	49820	♀	18.0	16.5	8.7	3.5	7.2	8.3	4.3	3.8	2.9	1.1	Moderate
Medje	49826	♂	17.7	15.8	8.7	3.3	6.8	7.8	3.9	4.1	3.0	1.1	Moderate
"	49827	♀	17.4	16.2	?	3.7	?	8.1	3.8	4.2	3.0	1.1	Moderate
"	49828	♀	18.4	16.5	9.1	3.6	7.0	7.9	3.9	4.2	3.0	1.1	Moderate
Ngayu	49816	♂	18.4	16.4	8.9	3.5	7.3	8.0	4.3	4.0	3.2	1.1	Moderate
"	49817	♂	18.2	16.5	8.4	3.4	7.1	8.2	4.3	?	3.0	1.0	Moderate
"	51397	♂	?	16.5	8.6	3.3	?	8.2	4.1	4.0	2.9	1.1	Moderate
"	**Average**	♂	**18.3**	**16.5**	**8.6**	**3.4**	**7.2**	**8.1**	**4.2**	**4.0**	**3.0**	**1.1**	
"	49815	♀	18.2	16.4	8.2	3.4	7.4	8.0	4.4	4.0	2.9	1.1	Moderate
Niangara	49833	♂	19.1	17.6	8.8	3.6	7.2	9.2	4.6	4.5	3.6	1.2	Slight
"	49832	♀	?	18.2	?	3.8	?	9.2	4.7	4.6	3.6	1.2	Moderate
L. pasha													
Bafwabaka	49821	♂	20.1	18.6	9.8	3.7	8.3	9.6	4.7	4.6	3.3	1.2	Great
Niangara	49837	♂	21.6	19.6	?	3.7	8.6	?	4.9	?	3.6	1.3	Moderate
L. emesi													
Niangara	49829	♀	21.0	20.3	10.2	3.7	8.7	10.8	5.5	4.6	3.4	1.2	Great
"	49830	♀	18.6	16.7	8.9	3.5	7.8	8.0	4.2	4.0	2.9	1.0	Moderate

Species and Locality	No.	Sex	Greatest length	Zygomatic breadth	Interorbital breadth	Mastoid breadth	Length nasals	Breadth nasals	Palatiliar length	Alveolar length upper tooth row	Greatest diameter bullae	Greatest depth mandible	Wear of molars
Cryptomys lechei													
Faradje	50928	♂	43.0	28.5	8.8	21.4	14.6	3.7	25.5	7.8	11.2	14.7	Great
"	50923	♀	45.3	31.3	8.8	20.8	17.3	3.4	26.7	8.8	12.1	15.9	Great
"	50925	♀	44.1	30.7	9.0	20.8	13.9	3.3	26.5	8.0	11.6	15.9	Great
"	50926	♀	43.1	30.4	9.3	21.0	14.0	3.5	25.2	7.8	11.2	15.2	Great
"	50927	♀	45.5	31.3	9.0	22.7	14.6	3.4	26.5	7.8	12.7	16.1	Great
"	50929	♀	48.2	32.9	8.9	22.2	16.1	3.8	28.7	8.4	12.5	17.6	Great (diseased zygomatic arch)
"	**Average**	♀	**45.2**	**31.3**	**9.0**	**21.5**	**15.2**	**3.5**	**26.7**	**8.2**	**12.0**	**16.1**	
Garamba	50935	♂	47.1	32.5	8.5	21.5	17.9	3.6	27.1	7.0	12.8	17.3	Great
"	50937	♂	43.1	29.3	8.2	20.4	14.2	3.1	24.6	7.2	12.0	14.8	Moderate
"	50949	♂	45.9	30.4	8.6	20.7	15.4	3.5	26.6	7.5	11.5	15.6	Great
"	50950	♂	46.0	31.5	8.1	21.2	14.9	3.4	26.2	7.3	11.8	15.6	Great
"	50955	♂	44.3	31.5	8.5	21.5	15.7	3.1	26.0	6.9	10.5	16.1	Great
"	**Average**	♂	**45.3**	**31.0**	**8.4**	**21.1**	**15.6**	**3.3**	**26.1**	**7.2**	**11.7**	**15.9**	
"	50934	♀	44.1	?	8.7	21.3	14.7	3.3	25.6	7.3	11.0	16.2	Great
"	50938	♀	39.7	26.6	8.2	18.5	12.9	2.9	22.9	7.3	10.7	13.6	Great
"	50945	♀	40.0	27.1	8.4	29.8	12.8	3.3	23.2	7.4	10.7	13.3	Great
"	50948	♀	42.1	28.8	9.0	20.3	15.6	3.6	25.1	7.4	10.7	14.4	Great
"	50951	♀	39.7	27.0	8.4	20.3	15.0	3.6	23.1	7.2	10.5	13.9	Great
"	**Average**	♀	**41.1**	**27.4**	**8.5**	**22.0**	**14.2**	**3.3**	**24.0**	**7.3**	**10.7**	**14.3**	
"	**Average**	♂ ♀	**43.2**	**29.4**	**8.5**	**21.6**	**14.9**	**3.3**	**25.0**	**7.2**	**11.2**	**15.1**	

Species and Locality	No.	Sex	Greatest length	Zygomatic breadth	Interorbital breadth	Mastoid breadth	Occipital height	Length nasals	Breadth across M^3	Alveolar length upper tooth row	Breadth from outer edge to first furrow of incisors	Breadth M^1	Wear of molars
Choeromys h. harrisoni													
Faradje	53952	♂	92.2	57.4	28.9	38.5	28.8	29.9	20.4	16.9	2.2	5.6	Moderate
"	53953	♂	89.1	59.1	28.4	38.8	28.5	31.2	19.9	17.0	2.2	6.1	Moderate
"	50463	♀	85.2	50.6	26.7	34.0	24.4	28.4	20.4	15.5	2.2	5.7	Moderate
"	53947	♀	81.9	49.9	25.1	33.7	25.9	28.1	19.6	16.6	2.0	6.4	Great
"	53961	♀	82.0	49.6	23.4	32.8	23.8	28.2	19.5	15.8	1.9	5.6	Slight
"	**Average**	♀	**83.0**	**50.0**	**25.1**	**33.5**	**24.7**	**28.2**	**19.8**	**16.0**	**2.0**	**5.9**	
"	**Average**	♂ ♀	**86.1**	**53.3**	**26.5**	**35.6**	**26.2**	**29.2**	**20.0**	**16.4**	**2.1**	**5.9**	
Medje	53969	♂	88.0	56.1	27.0	39.2	29.8	30.5	20.3	15.4	2.0	5.6	Moderate
Thryonomys s. variegatus													
Faradje	53951	♂	93.5	55.3	26.5	37.9	28.5	32.9	21.7	18.6	2.9	6.7	Moderate
"	53956	♀	89.2	54.6	27.7	37.8	29.6	31.9	22.2	18.5	2.9	6.7	Moderate
"	53963	♀	89.9	56.2	29.3	36.7	28.4	32.3	22.3	19.0	3.0	7.1	Moderate

Species and Locality	No.	Sex	Greatest length	Greatest breadth	Breadth across orbital processes	Mastoid breadth	Occipital height	Length nasals	Mesial length frontals	Palatilar length	Alveolar length upper tooth row	Stage of wear
Atherurus a. centralis												
Akenge	51722	♂	89.9	44.7	25.6	35.7	24.6	24.5	34.2	37.4	16.7	IV
"	51724	♂	90.5	42.8	26.1	34.4	24.2	26.4	34.3	39.3	18.6	VII
"	51725	♀	91.3	45.0	25.7	34.3	24.9	24.7	35.8	38.3	18.7	VII
"	**Average**	♂ ♀	**90.6**	**44.2**	**25.8**	**34.8**	**24.6**	**25.2**	**34.8**	**38.3**	**18.0**	
Medje	51740	♂	92.7	48.0	29.8	36.4	25.9	24.0	38.3	41.2	17.6	VI
"	51751	♂	95.3	45.8	28.3	36.3	26.0	26.6	39.8	41.2	17.8	V
"	52123	♂	87.8	43.5	26.0	34.7	24.4	23.6	33.6	37.1	16.0	V
"	52127	♂	90.9	45.0	?	35.3	24.5	24.4	35.8	38.7	16.0	VIII
"	**Average**	♂	**91.7**	**45.6**	**28.0**	**35.7**	**25.2**	**24.7**	**36.9**	**39.6**	**16.9**	
"	50989	♀	93.1	44.1	25.4	34.4	23.7	25.3	33.8	38.0	18.3	VII
"	51742	♀	88.3	?	26.9	36.3	24.9	24.3	35.4	36.7	17.7	VI
"	51750	♀	90.4	45.2	27.2	36.2	24.1	26.9	35.1	37.6	16.7	VII
"	**Average**	♀	**90.6**	**44.7**	**26.5**	**35.6**	**24.2**	**25.5**	**34.8**	**37.4**	**17.6**	
"	**Average**	♂ ♀	**91.2**	**45.3**	**27.3**	**35.7**	**24.8**	**25.0**	**36.0**	**38.6**	**17.2**	
Niapu	51755	♂	92.3	45.0	27.1	35.8	24.9	24.7	38.7	37.8	18.0	VIII
"	51767	♂	89.5	44.3	26.4	35.3	26.0	25.6	31.6	39.2	17.9	VIII
"	51769	♂	93.0	?	27.8	35.9	25.5	26.8	40.4	40.4	17.6	V
"	51770	♂	93.8	48.0	28.5	36.7	27.5	27.0	34.7	41.7	18.9	VII
"	52130	♂	94.6	46.5	28.1	36.7	25.6	25.0	35.4	41.0	19.1	VIII
"	**Average**	♂	**92.6**	**45.8**	**27.6**	**36.1**	**25.9**	**25.8**	**36.2**	**40.0**	**18.3**	
"	51774	♀	85.4	43.4	25.9	34.5	24.1	22.7	35.2	36.7	17.2	V
"	51777	♀	92.1	?	?	35.5	25.2	25.4	34.0	39.4	16.7	VII
"	51779	♀	90.5	44.2	28.8	35.9	26.7	25.0	35.1	38.2	17.5	IV
"	51781	♀		45.0	26.6	35.2	24.2	23.6	36.7	39.7	17.0	VIII
"	52131	♀	83.9	41.8	26.3	33.0	23.1	21.9	34.1	36.0	16.8	V
"	**Average**	♀	**88.0**	**43.6**	**26.9**	**34.8**	**24.7**	**23.7**	**35.0**	**38.0**	**17.0**	
"	**Average**	♂ ♀	**90.6**	**44.8**	**27.3**	**35.5**	**25.3**	**24.8**	**35.6**	**39.0**	**17.7**	

Species and Locality	No.	Sex	Condylo-basal length	Greatest breadth	Mastoid breadth	Occipital height	Greatest palato-nasal height	Length nasals	Breadth nasals—front naso-pnx suture	Breadth nasals—posterior naso-pnx suture	Median length frontals	Width dorsal root of zygoma	Distance between lachrymal and molar	Alveolar length upper tooth row	Crown length M^1	Dental stage
Hystrix galeata																
Faradje	51734	♂	150.1	83.3	55.6	44.1	64.2	83.0	39.7	58.6	31.6	11.9	5.4	36.8	7.5	VIII
"	51735	♂	151.2	84.8	56.7	42.6	70.9	?	34.3	54.2	36.2	10.0	12.8	28.8	4.6	VIII
"	51736	♂	158.3	81.0	57.8	44.3	68.1	96.1	37.4	58.8	37.8	16.0	11.4	33.2	7.7	VI
"	51786	♂	149.5	83.2	54.0	44.5	69.8	92.2	39.3	60.1	33.1	14.9	7.1	33.5	8.2	VII
"	51788	♂	150.0	83.6	59.5	45.9	66.0	86.1	31.6	52.8	31.0	15.0	8.6	30.9	6.4	VIII
"	**Average**	♂	**151.8**	**83.2**	**56.7**	**44.3**	**67.8**	**88.4**	**36.5**	**56.9**	**33.9**	**13.6**	**9.1**	**32.6**	**6.9**	
"	51732	♀	139.5	74.8	55.1	38.8	59.1	82.1	37.0	48.3	26.6	10.3	2.5	30.8	6.7	VIII
"	51787	♀	139.3	79.9	51.0	41.5	66.1	82.3	35.4	55.0	28.0	14.0	11.3	32.6	8.1	VII
"	**Average**	♂ ♀	**148.3**	**81.5**	**55.7**	**43.1**	**66.7**	**86.9**	**36.4**	**55.4**	**31.2**	**13.2**	**8.4**	**32.4**	**7.1**	

Species and Locality	No.	Sex	Greatest length	Cond lo-incisive length	Anterior zygomatic width	Length nasal suture	Breadth nasals	Post-orbital constriction	Length palatal foramina	Combined width palatal foramina	Least length palate	Width palate inside M^1	Width choanae opp. M^3	Greatest length mandible
Poelagus m. marjorita														
Faradje	51031	♂	82.5	72.9	40.2	27.6	16.8	16.0	20.6	8.3	29.3	12.1	6.2	62.1
"	51036	♂	80.6	71.1	39.6	28.9	16.0	15.3	20.4	9.2	29.3	11.2	7.0	62.7
"	51046	♂	81.2	71.7	39.1	26.9	16.0	14.2	18.9	8.1	30.1	10.7	5.6	62.1
"	51050	♂	86.1	74.4	38.9	25.8	17.8	14.7	20.9	8.5	30.4	11.8	6.7	64.5
"	51056	♂	84.5	75.6	41.2	28.8	18.9	16.1	21.8	8.5	31.8	11.8	5.8	66.3
"	**Average**	♂	**83.0**	**73.1**	**39.8**	**27.6**	**17.1**	**15.3**	**20.5**	**8.5**	**30.2**	**11.5**	**6.3**	**63.5**
"	51037	♀	78.0	69.0	39.1	27.2	15.9	14.0	20.4	8.3	28.4	11.2	6.3	60.0
"	51048	♀	84.2	75.9	42.2	27.9	18.7	17.0	20.1	9.4	30.4	11.7	7.1	66.2
"	51049	♀	78.8	70.5	40.0	23.4	16.2	15.9	19.7	8.9	29.2	11.9	6.7	63.2
"	51051	♀	86.6	75.7	41.4	29.0	20.5	17.5	19.7	8.2	31.3	12.9	6.5	66.8
"	52134	♀	87.3	77.0	40.8	29.6	19.3	15.6	22.3	8.4	32.9	12.3	6.7	68.1
"	**Average**	♀	**83.0**	**73.6**	**40.7**	**27.4**	**18.1**	**16.0**	**20.4**	**8.6**	**30.4**	**12.0**	**6.7**	**64.9**
"	**Average**	♂ ♀	**83.0**	**73.4**	**40.2**	**27.5**	**17.6**	**15.6**	**20.5**	**8.6**	**30.3**	**11.8**	**6.5**	**64.2**

PLATES VII TO XIX

PLATE VII

Fig. 1. *Claviglis lorraineus*. Live adult male. Bafwabaka, Belgian Congo. A.M.N.H. No. 49889.

Fig. 2. Upper: *Praomys jacksoni*. Male. A.M.N.H. No. 49766. Middle: *Lophuromys aquilus rita*. Female. A.M.N.H. No. 49640. Lower: *Taterillus emini congicus*. Female. All in flesh. Niangara.

1

2

PLATE VIII

Fig. 1. Upper: *Tatera dichrura*. A.M.N.H. No. 50169. Lower: *Dendromus messorius*. A.M.N.H. No. 51286.

Fig. 2. Upper: *Lemniscomys striatus striatus*. Female. A.M.N.H. No. 49586. Middle: *Taterona dichrura*. Male. A.M.N.H. No. 50167. Lower: *Leggada grata grata*. Female. A.M.N.H. No. 49835. All in flesh. Niangara.

1

2

PLATE IX

Fig. 1. *Dendromus messorius*. Female. A.M.N.H. No. 49871. In flesh. Medje.
Fig. 2. *Deomys ferrugineus christyi*. Female. A.M.N.H. No. 50474. In flesh. Niapu.

1

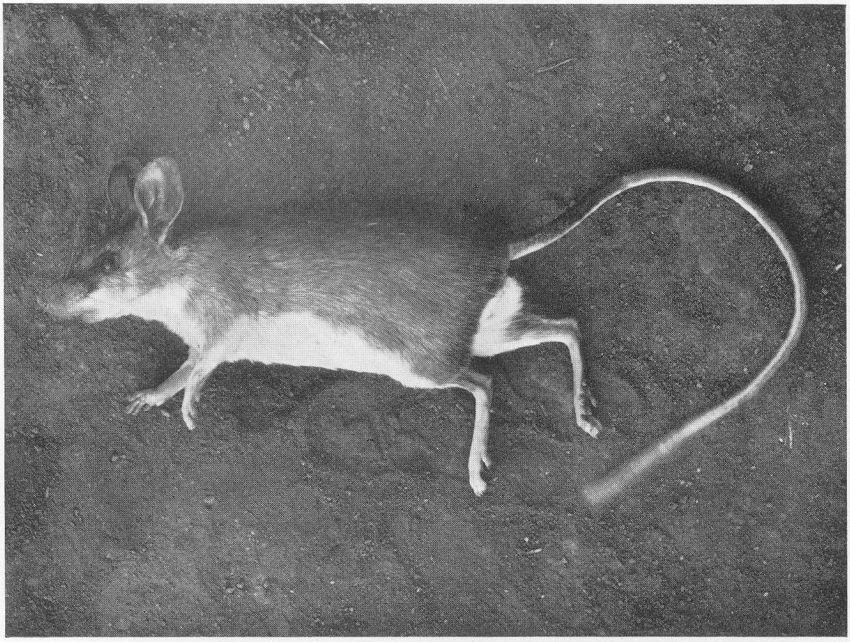


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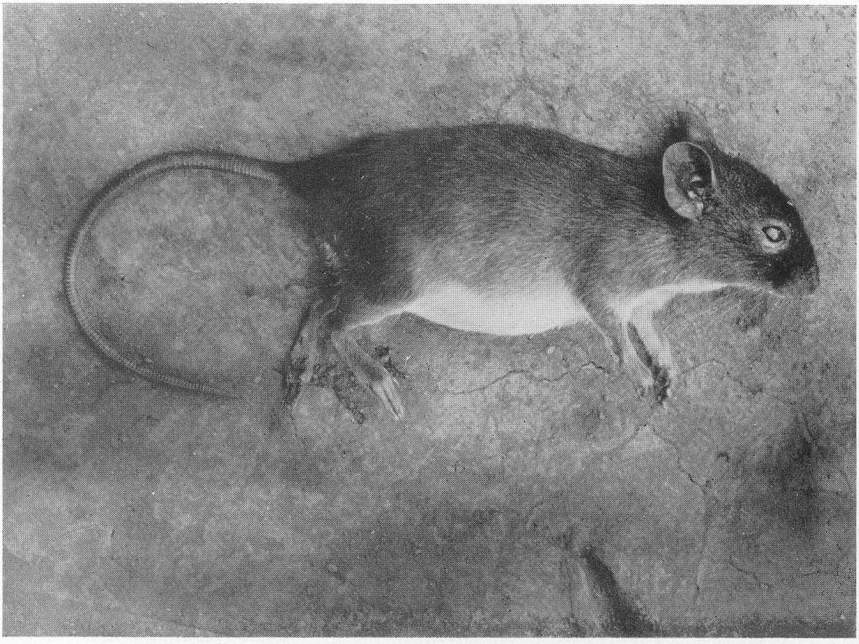
PLATE X

Fig. 1. *Lophuromys aquilus rita.* Female. A.M.N.H. No. 49637. In flesh. Medje.
Fig. 2. *Hybomys univittatus univittatus.* Female. A.M.N.H. No. 49650. In flesh. Niapu.

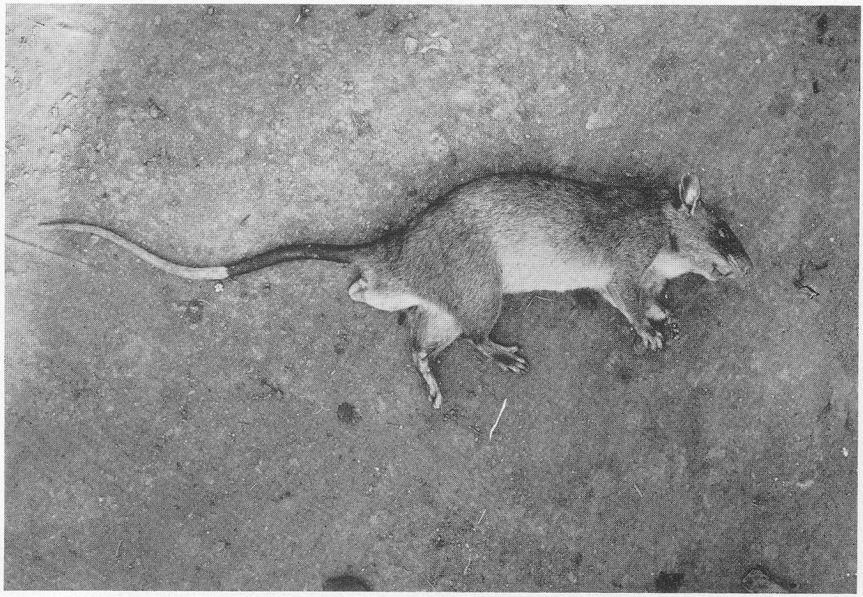
1



2

PLATE XI

Fig. 1. *Cricetomys gambianus langi*. Male. A.M.N.H. No. 51362. In flesh. Niangara.
Fig. 2. *Cricetomys gambianus langi*. Male. Type. A.M.N.H. No. 51153. In flesh. Faradje.



1

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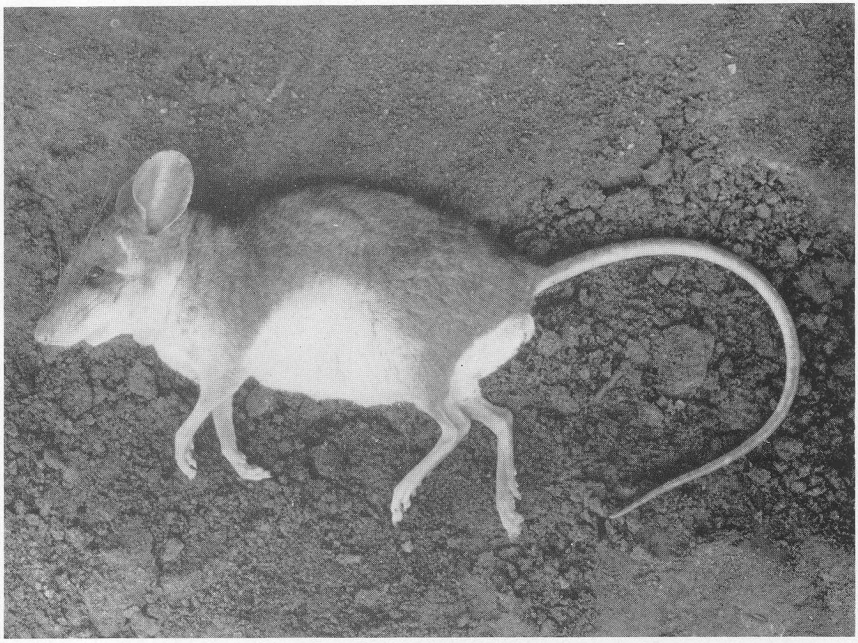
PLATE XII

Fig. 1. *Malacomys longipes centralis*. Male. A.M.N.H. No. 50043 (?). In flesh. Niapu.
Fig. 2. *Colomys goslingi*. Female. A.M.N.H. No. 49756. In flesh. Medje.



1

2

PLATE XIII

Fig. 1. *Stochomys longicaudatus ituricus*. Female. A.M.N.H. No. 50016. In flesh. Medje.
Fig. 2. *Oenomys hypoxanthus hypoxanthus*. Female. A.M.N.H. No. 50234. In flesh. Niapu.

1

2

PLATE XIV

Fig. 1. *Praomys jacksoni jacksoni*. Male. A.M.N.H. No. 49795. In flesh. Niapu.
Fig. 2. *Hylomyscus carillus schoutedeni*. Female. A.M.N.H. No. 49792. In flesh. Medje.

1

2

PLATE XV

Fig. 1. *Thamnomys rutilans centralis*. Male. A.M.N.H. No. 50064. In flesh. Medje.
Fig. 2. *Leggada bella grata*. Female. A.M.N.H. No. 50391. In flesh. Medje.

1

2

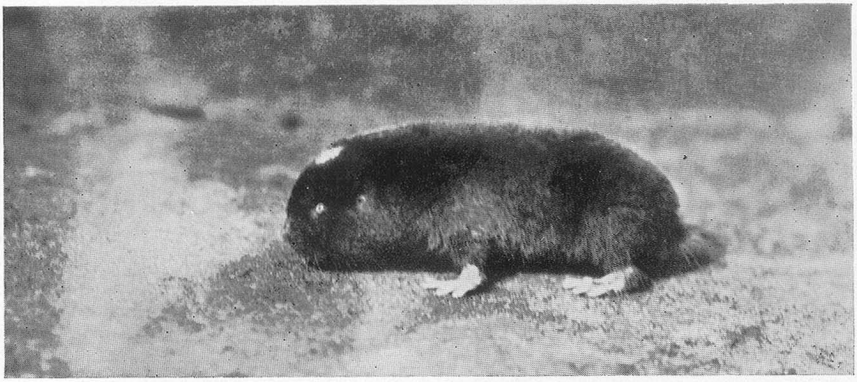
Plate XVI

Cryptomys lechei.

Fig. 1. Animal in the flesh, posed on a mound made by one of its species. Garamba.
Fig. 2. Living animal. Faradje.
Fig. 3. Living animal. Faradje.

1

2



3

PLATE XVII

Fig. 1. *Choeromys harrisoni harrisoni.* Living animal. Niangara.
Fig. 2. *Hystrix galeata.* Female. A.M.N.H. No. 50534. In flesh. Faradje. Note the manner in which the spines are broken or chewed off around the mammae.

1

2

PLATE XVIII

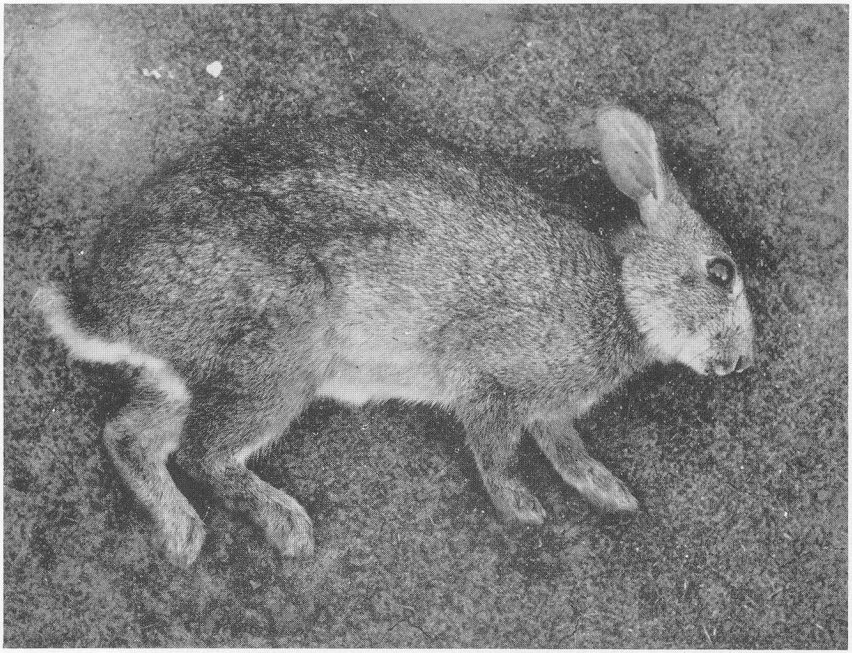
Fig. 1. *Atherurus africanus centralis*. Male. A.M.N.H. No. 51719. In flesh. Akenge.
Fig. 2. *Atherurus africanus centralis*. Male. A.M.N.H. No. 51719. In flesh. Akenge.

1

2

PLATE XIX

Figs. 1 and 2. *Poelagus marjorita*. Female. A.N.M.H. No. 51048. In flesh. Faradje.



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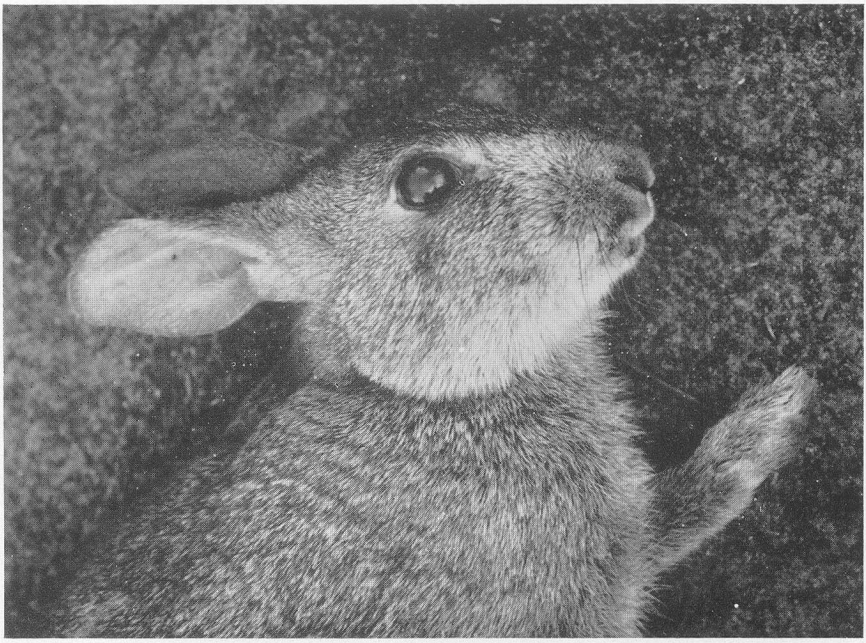

2

Aba Kb
Abercorn Kh
Abu Mumbazi Fb
Aka R. Ja
Akenge Ib
Albert L. Kc
Albert-Edward L. Jd
Albert Nile Kb
Albertville Jg
Alima R. CDd
Aluta Id
Amadi Ib
Ambaca Ch
Ambriz Bg
Ambrizette Bg
Angu Hb
Ankoro Ig
Api Hb
Arebi Jb
Aruwimi R. Hc
Avakubi Ic

Babeyru Ic
Bafuka Ia
Bafwabaka Ib
Bafwaboli Ic
Bafwasende Ic
Bagboro Ja
Bahr el Ghebel Ka
Bali R. Ga
Bambili Ib
Banalia Hc
Banana Bg
Bangweolo L. JKi
Banzyville Fa
Baraka Jf
Baringa Fc
Barumbu Gc
Basali Hc
Basankusu Ec
Basoko Gc
Basongo Ff
Batama Ic
Bekombe Fc
Belo Gd
Bena-Dibele Gf
Bengamisa Hc
Benguela Bj
Beni Jc
Bianga Fd
Bikoro Ed
Bili Ha
Bili R. Ga
Bima Hb
Biondo Hd
Boende Fd
Boga Kc
Bokakata Ec
Bokatola Ed
Bokote Fd
Bokula Fb
Bokungu Gd
Bolengi Ed
Bolobo De
Boma Bf
Bombai Gf
Bombimba Ec
Bomili Ic
Bomokandi R. Ib
Bomu R. GIa
Bondo (Djabir) Gb
Brazzaville Cf
Bukama Hh
Bukoba Kd
Bumba Gb
Bumbuli Fe
Bushimai R. Gg
Busira R. EFd
Buta Hb
Bwado Eb

Cabinda Bf
Chambezi R. Ki
Chinchoxo Bf
Choga L. Lc
Coquilhatbille Ec
Cuanza R. Di

Dekese Fe
Difuma He
Dilemba Eg
Dilolo Gf
Gigoma Jf
Dikolo L. Fi
Dima De
(Djabir) Gb
Djamba Hb
Dongo Eb
Doruma Ia
Dungu Jb
Dungu R. Jb
Duque de Bragança Dh
Duru Jb
Duru R. Jab

Eala Ed
Ekwayolo Ee
Elila R. Ie
Elipa Hd
Elisabethville Ii
Entebbe Lc
Epulu R. Jc
Etshutshu Gc

Faradje Jb
Fini R. De
Fort de Possel Ea
Fort Ferreira Di
Fort Portal Kc
Fort Silva Porto Dj

Gaima Mt. Jb
Gali Fb
Gamangui Ib
Gangura Jb
Garamba Ja
Golungo Alto Ch
Goma Jd
Gombari Jb
Gondokoro Ka

Huambo Cj

Ibembo Gb
Iboko Ed
Ireba Dd
Irumu Jc
Isangi Hc
Isiro Ib
Iteko Gc
Itimbiri R. Gb
Itoko Gd
Ituri R. Jc

Kabalo Ig
Kabamba L. Ig
Kabambare If
Kabele L. Hh
Kabinda Hg
Kabompo R. Hj
Kabonge Hg
Kafakumba Gh
Kafue R. Ij
Kagera R. Kd
Kalamba Fg
Kalembe-Lembe Jf
Kalonga Jj
Kama Ie
Kambove Ii
Kampala Lc
Kanda-Kanda Gg
Kasai R. D-Fe-h
Kasenga Ji
Kasindi Jd
Kasongo If
Kasuku R. He
Katako Kombe He
Katola Gh
Kayoyo Hi
Kiambi Ig
Kibali R. Jb
Kibombo Jf
Kibanga He
Kigoma Jf
Kikondja Ih
Kikwit Ef
Kilo Kc
Kilwa Jh
Kinda Hb
Kindu Hc
Kinshasa Cf
Kiri Ed
Kirundu Hd
Kisale L. Ih
Kisantu Cf
Kisengwa Hf
Kitobola Cf
Kivu L. Jde
Kole Ge
Komami R. He-g
Lomela Ge
Lomela R. Gd
Lopori R. Fe
Lowa R. Fg
Lua R. Hd
Lualaba R. Id
Luali Bf
Luama R. If
Luapula R. Ji
Lubefu R. Hf
Lubi R. GHf
Lubila R. Gf
Lubile Ic
Lubudi R. Ig
Lubudi R. FGf
Lubue R. Hh
Lubutu Ef
Ludima Id
Luebo R. Bf
Luele R. Ff
Lufira R. Ffg
Luilaka R. Ggh
Lukafu Ih
Lukenie R. Fd

Luki Bf
Lukolela Dd
Lukonzolwa Jh
Lukuga R. IJf
Lukula Bf
Lukulu R. IJe
Lulonga R. Ec
Lulua Hi
Lulua R. Gfi
Luluabourg Gf
Lusambo Gf
Lusana Hf
Lushika R. Fg
Luvua R. Ig
Luvungi Je

Madondo Ha
Mahagi Kb
Makala Ic
Makoua Dd
Malagarazi R. JKf
Malange Dh
Malela Bg
Malimba Ae
Mandungu Gb
Mangi Ef
Manyanga Cf
Maringa R. Fc
Masisi Jd
Matadi Bf
Mawambi Jc
Medje Ib
Meridi Ja
Micici Ie
Mingi Fc
Moanda Bf
Mobeka Ec
Moero L. Jh
Mokata Hf
Mokoange Ea
Moliro Kh
Molundu Eg
Momboyo R. EFd
Mompono Fc
Monbongo Gb
Mondjuku Fd
Mondombe Gd
Monga Ga
Mongala R. EFb
Monkero Ec
Monveda Fb
Muanza Le
Mulungu Je
Mundjumbuli Fb
Mushie De
Musofi Ii
Mutombo-Mukulu Hgh

Nala Ib
Nepoko R. Jb
Ngayu Ic
Ngombe Dd
Niangara Ib
Niapu Ib
Niembo Jf
Nimule Lb
Noki Bf
Nouvelle Anvers Ec
Novo Redondo Bi
Nya Lukemba Je
Nyangwe If
Nzoro R. Jb

Opala Hd
Oshwe Ee
Oso R. Id

Panga Ic
Pania-Mutombo Gf
Pawa Ib
Penge Jc
Poko Ib
Poko R. Ib
Ponthierville Hd
Popokabaka Df
Pungo Andongo Ch
Pusu Fc
Pweto Jh

Rafai Ga
Redjaf Ka
Rikwa L. Lh
Romée Hc
Rubi R. Hb
Ruiki R. Kc
Rungu Ed
Ruzizi R. Jd

Sakania Ji
Salonga R. Fd
Samba Fc
Sampwe Ih
San Salvador Cg
Sanga R. Dc
Sankuru-Lubilash R. Ggh
Sankuru R. Ff
Semio Ha
Semliki R. JKc
Shabunda Ie
Shiloango R. Bf
Shuka He
Sili Ia
Simba Gc
Soueh R. Ja
St. Antonio Bg
St. Paul de Loanda Bh
Stanley Pool Cf
Stanleyville Hc
Surunga Ib

Tabora Lf
Tanganyika L. JKe-h
Thysville Cf
Titule Hb
Toa Jf
Tonji R. Ja
Tshela Bf
Tshicapa R. Fgh
Tshitombe Ff
Tshofa Hf
Tshopo R. Ic
Tshuapa R. Fd
Tumba L. E–d

Ubangi R. D–Ga–d
Uele R. GHb
Uere Ha
Uere R. Ia
Ujiji Jf
Ukaturaka Fc
Ulindi R. Ie
Upemba L. Ih
Uvira Je

Vankerckhovenville Jb
Victoria L. Ld
Victoria Nile KLb

Wamasa Ke
Waka Fd
Walikale Id
Wazimba If
Wissmann Pool De

Yahila Gc
Yakoma Ga
Yakuluku Ja
Yambata Gb
Yambuya Hc
Yanonge Hc
Yei Ka
Yei R. Ka
Yokokara R. Fc
Yongama Hd
Yumbi Dd

Zambesi R. Gij
Zambi Bf
Zobia Hb