

REVISION OF THE GENUS *SACCOSTOMUS* (RODENTIA,
CRICETOMYINAE), WITH NEW MORPHOLOGICAL AND
CHROMOSOMAL DATA FROM SPECIMENS FROM
THE LOWER OMO VALLEY, ETHIOPIA

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ABSTRACT

Based upon new records of *Saccostomus* from southwestern Ethiopia, a revision of the genus is considered. Morphometric and karyological evidence indicate two species should be rec-

ognized—*S. campestris* from southern Africa and *S. mearnsi* from eastern Africa.

INTRODUCTION

Seven rodents of the genus *Saccostomus* were collected during the summer of 1973 in the Lower Omo Valley, Ethiopia, during a paleontological expedition directed by Y. Coppens. These individuals are noteworthy because of their shaggy fur, uniformly brownish-gray in color, and consisting of

long, soft, and silky hairs. The belly of these specimens is paler than the back, but still definitely grayish, unlike the forms from southern Africa with their pure white belly and their sleek but less shaggy fur.

RESULTS AND DISCUSSION

Table 1 presents the main external and cranial measurements for the specimens collected in the Lower Omo Valley, Ethiopia; three specimens from the British Museum, one from Ethiopia (reported by Yalden et al., 1976) and two from Uganda; three specimens from the Museum National d'Histoire Naturelle (MNHN) de Paris with southern African origin, one of which is the specimen studied by Matthey (1958). The measurements published by Roche (1976) for a specimen from Somalia are also reported here. External measurements are given to the nearest millimeter; cranial measurements were taken with a dial caliper and reported to the nearest tenth of a millimeter.

The specimens from northeast Africa (Uganda, Ethiopia, and Somalia) have a gray belly, a long ear (more than 20 mm), a long tail (more than 50 mm), and a long maxillary toothrow (more than 5.0 mm). The three southern specimens from the MNHN have a white belly, a short ear (less than 20 mm), a short tail (40 mm), and a short maxillary toothrow (less than 5.0 mm). The same characters are present on all the specimens from southern Africa that I studied in the British Museum, particularly the cotypes of *Saccostomus campestris* Peters.

The karyotypes were observed for two individuals in 1973 by the "squash" method as described

by Matthey (1958), and for two others in 1976–1977 by the "air-drying" method. The slides are not very easily interpreted, but the chromosome number was always between 40 and 42, never exceeding this last number, in more than 20 metaphases observed (Fig. 1). Ford and Hamerton (1956) published a karyotype of $2N = 44$ for an individual of unknown origin, but Matthey (1958) considers that it is difficult material to interpret and that the number of chromosomes for *Saccostomus campestris* is $2N = 46$, as he personally observed on a specimen collected in the Cape Province, South Africa.

Ellerman (1941) thought that there was only one species of *Saccostomus*—*S. campestris* Peters. Misonne (1968) agreed with him, but Roche (1976) thought that his specimen from Somalia was closely related to the other specimens from the "north," and different from the southern African *Saccostomus campestris*. I think that Ethiopian specimens, which are different by their morphological characters, by their measurements, and by their karyotype, represent a distinct species together with all the *Saccostomus* from the north of this area in Africa (Ethiopia, Uganda, Somalia, and Kenya). Prior to the revision of Ellerman (1941), different species had been described from these countries as follows: *Saccostomus umbriventer*, Miller, 1910; *Saccosto-*

Table 1.—Selected external and cranial measurements of *Saccostomus* examined from the *Museum National d'Histoire Naturelle, Paris*, and the *British Museum (Natural History), London*.

Number	Sex	Origin	Head and body	Tail	Hind foot	Ear	Oc-cipito-nasal length	Zygo-matic breadth	Inter-orbital con- stric- tion	Upper molar row	Bulla	Obser- vations
1974—54	♂	Omo, Ethiopia	140	50	24	20	32.0	17.2	4.6	5.6	6.2	Gray belly
1974—55	♀	Omo, Ethiopia	144	56	22	23	35.1	19.1	4.4	5.6	7.3	Gray belly
1974—56	♀	Omo, Ethiopia	149	70	25	25	34.0	18.8	4.5	5.9	7.0	Gray belly
814	♂	Omo, Ethiopia	150	81	23	22	36.7	19.6	4.9	5.9	6.9	Gray belly
1977—1	♀	Omo, Ethiopia	137	58	22	20	36.2	19.5	4.5	7.0	7.0	Gray belly
1977—2	♀	Omo, Ethiopia	141	58	23	23	34.9	19.4	4.5	6.3	6.9	Gray belly
1977—3	♀	Omo, Ethiopia	153	67	24	24	36.2	19.5	4.4	6.2	6.2	Gray belly
BM 46.740	♀	Karamoja, Uganda	140	50	22	20	32.2	17.0	4.4	5.9	6.5	Gray belly
BM 71.450	♂	Karamoja, Uganda	—	—	—	—	34.5	18.0	4.7	5.8	5.9	Gray belly
BM 71.451	♂	Karamoja, Uganda	117	69	19.4	20.2	31.2	17.4	4.3	5.6	7.2	Gray belly
BM 73.490	♀	Maji, Ethiopia	116	64	22	21	—	—	—	—	—	Gray belly
3047—MF	♀	Giohar, Somalia	144	72	23	20	35.3	17.3	4.1	6.2	—	Gray belly
1958—226	♂	Transvaal, R.S.A.	125	40	22	17	35.7	17.8	4.7	4.5	8.0	White belly
1964—56	♂	Rhodesia	118	40	19	16	30.8	—	4.3	4.6	6.0	White belly
1969—57	♀	Rhodesia	122	40	19	17	32.4	—	4.5	4.3	6.4	White belly

Table 2.—Means, standard errors, and standard deviation of the lengths of the tail, the ear, and the upper molar row from different populations from the American museum collections. The measurements of the upper molar row were made by the author and permit statistical tests on the homogeneity of the different populations. The two groups are homogeneous and each different from the other. The specimens from Tanzania are different from the two groups, but their characters are reported to the second.

Origin	Number of specimens	Length of the tail		Length of the ear		Length of the upper molar row		Significance
		Mean \pm standard error	Standard deviation	Mean \pm standard error	Standard deviation	Mean \pm standard error	Standard deviation	
Northern Rhodesia (AMNH)	63	47.5 \pm 0.7	5.39	18.2 \pm 0.1	0.76	4.68 \pm 0.03	0.27	F = 0.92 < 1 homogeneous population
Angola (AMNH)	5	46.4 \pm 2.5	5.68	16.0 \pm 1.0	1.40	4.44 \pm 0.07	0.16	
Bechuanaland (AMNH)	17	42.8 \pm 0.8	3.51	17.2 \pm 0.4	1.63	4.57 \pm 0.06	0.23	
Nyasaland (AMNH)	23	39.3 \pm 1.1	5.13	16.4 \pm 0.2	0.86	4.57 \pm 0.03	0.14	
Southern Rhodesia (AMNH)	13	45.3 \pm 2.3	8.0	16.0 \pm 0.6	1.87	4.61 \pm 0.04	0.15	
South West Africa (AMNH)	5	48.1 \pm 3.1	6.97	18.5 \pm 0.8	1.70	4.69 \pm 0.28	0.63	
Transvaal (USNM)	13	46.2 \pm 2.2	8.12	17.7 \pm 0.4	1.42	4.68 \pm 0.07	0.25	
Bechuanaland (USNM)	14	44.1 \pm 1.1	5.13	16.9 \pm 0.3	1.21	4.71 \pm 0.05	0.21	
Mozambique (Gaza) (USNM)	13	44.0 \pm 1.4	4.59	17.3 \pm 0.3	0.90	4.49 \pm 0.05	0.18	
Mozambique (Tete) (USNM)	14	43.1 \pm 0.9	3.16	16.9 \pm 0.2	0.90	4.48 \pm 0.05	0.20	
Nyasaland (MCZ)	5	34.5 \pm 1.9	3.87	17.7 \pm 0.4	0.95	4.17 \pm 0.08	0.18	
								t = 16.66 t > 1.96 significant difference
Uganda (AMNH)	3	77.7 \pm 10.7	18.40	—	—	6.08 \pm 0.07	0.14	F = 0.67 < 1 homogeneous population
Kenya (USNM)	25	61.4 \pm 1.13	5.54	19.4 \pm 0.3	1.70	5.94 \pm 0.05	0.27	
Kenya (MCZ)	4	56.7 \pm 4.8	9.71	22.0 \pm 0.0	0.00	5.86 \pm 0.06	0.11	
Omo (MNHN)	7	62.9 \pm 3.9	10.46	22.4 \pm 0.7	1.90	6.07 \pm 0.18	0.49	
Tanganyika (AMNH)	29	48.8 \pm 1.2	7.2	—	—	5.38 \pm 0.04	0.21	
								significant difference



Fig. 1.—Karyotype of *Saccostomus mearnsi* from Omo Valley, Ethiopia.

mus mearnsi, Heller, 1910; *Saccostomus isiolae*, Heller, 1912; *Saccostomus cricetulus*, Allen and Lawrence, 1936. The holotypes of these species are deposited in the Smithsonian Institution, Washington, D.C., and at the Museum of Comparative Zoology, Harvard University.

The four species are closely related. The first described is *S. mearnsi*, the holotype of which is an adult male in good condition (better condition than *S. isiolae*, but younger than *S. umbriventer*, which is a very old female). *S. cricetulus* is not very different and when described by G. M. Allen and B. Lawrence they thought that the four species might be the same (Allen and Lawrence, 1936). I think that *Saccostomus mearnsi* is the available name for the northeastern species of *Saccostomus* characterized by a gray belly, a long tail (more than 49.0 mm), a large ear (more than 19.0 mm), a long maxillary toothrow (more than 5.0 mm), and a karyotype of $2N = 40-42$ chromosomes.

Table 2 shows the means of the length of the tail, the ear, and the upper molar row for a group of

specimens from the American Museum of Natural History, New York, from the United States National Museum, Washington, D. C., and from the Museum of Comparative Zoology, Harvard, collected in different countries of eastern and southern Africa. It shows the difference between the specimens from Zambia (Northern Rhodesia), Angola, Botswana (Bechuanaland), Malawi (Nyasaland), Zimbabwe (Southern Rhodesia), Transvaal, and Mozambique on one hand and from Tanzania, Uganda, Kenya, and Ethiopia on the other hand. The specimens from Kijungu, Tanzania, are referred to *S. mearnsi*, but they are a bit smaller than the individuals from the other northeastern countries, and statistically significantly different. Their karyotype is unknown.

An hypothesis to test is whether the division between the two species is the Rift Valley. Furthermore, it would be very interesting to collect some specimens in southern Tanzania or in northern Mozambique to test the possibility of speciation according to the latitude in this region.

SUMMARY

Two different species of *Saccostomus* are recognized—*S. campestris* from southern Africa, char-

acterized by a white belly, a short ear (less than 19 mm), a small tail (less than 49 mm), a short upper

molar row (less than 5.0 mm) and a karyotype of $2N = 46$ chromosomes; *S. mearnsi* from eastern Africa, characterized by a gray belly, a large ear,

a long tail, a long upper molar row and a karyotype of $2N = 40-42$ chromosomes.

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