

## MODERN RODENT FAUNA OF THE LOWER OMO VALLEY, ETHIOPIA

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### ABSTRACT

One hundred and seventy rodents, comprising 15 species of nine genera and five families (Sciuridae, Gerbillidae, Cricetomyidae, Muridae, and Gliridae), have been captured in the lower Omo Valley. These represent a good sampling of the modern

rodent population of the several biotopes of the areas—Sahelian savanna, arid zones (paleontological beds), and forested blocks comprising a continuous stratum of large trees and associated bushes and shrubs.

### INTRODUCTION

One hundred and seventy rodents, comprising 15 species of nine genera and five families, were captured in the lower Omo Valley in the summer of 1973 during the paleontological expedition organized by Yves Coppens. These represent a good sampling of the modern rodent population of the several biotopes of the areas.

The specific designation of certain species mentioned here cannot always be regarded as definitive, because systematic revisions may be required.

However, their ecological characteristics are well-defined. A future study, based on karyotypes, will permit the systematics of species to be more firmly established.

Animals have been captured in various ways—through excavation of their burrows; by hand at night with the aid of a light; by traps set at burrows or in lines and baited with peanut butter; or by large metal cans sunk half to three-quarters of a m into the ground.

### RESULTS

#### Species List

##### Sciuridae

*Heliosciurus gambianus omensis* (Thomas, 1909)\*  
*Xerus rutilus* (Cretzschmar, 1826)

##### Gerbillidae

*Tatera nigrauda* (Peters, 1878)  
*Tatera minuscula* Osgood, 1936  
*Taterillus harringtoni* (Thomas, 1906)  
*Gerbillus pulvinatus* Rhoads, 1896  
*Gerbillus pusillus* Peters, 1878

##### Cricetomyidae

*Saccostomus mearnsi* Heller, 1910

##### Muridae

*Mastomys erythroleucus* (Temminck, 1853)  
*Arvicanthis niloticus* (Desmarest, 1822)  
*Arvicanthis somalicus* Thomas, 1902  
*Acomys percevali* Dollman, 1911  
*Acomys wilsoni* Thomas, 1892  
*Thamnomys dolichurus* (Thomas and Wroughton, 1908)\*\*

##### Gliridae

*Graphiurus murinus* Desmarest, 1822

\*Captured by A. Duff-Mackay (National Museum, Nairobi, in 1967).

\*\*Captured by F. Rhodain and R. Houin.

The presence of at least two other species is indirectly documented. An immense network of burrows, 3 to 5 cm in diameter, situated at a depth of about a meter, occurs on the surface of the Kibish Formation sediments, and may well testify to the presence of a bathyergid mole-rat. Some nests, filled with dry leaves, and unlike those of *Graphiurus* or of *Thamnomys*, were found situated either in hollow limbs or in the empty trunks of certain trees in the gallery forest and could well belong to a species of *Thallomys*, a genus already documented elsewhere in Ethiopia (Petter, 1973).

### DISCUSSION

#### Geographic Distribution

Some species are widely distributed throughout sub-Saharan Africa (*Arvicanthis niloticus*, *Masto-*

*mys erythroleucus*, *Thamnomys dolichurus*, *Graphiurus murinus*). Others are restricted to eastern Africa (*Xerus rutilus*, *Tatera nigrauda*, *Taterillus*

Table 1.—Number of rodents collected in the five ecological zones of the trapped area in the Omo Valley, Ethiopia. The number of trap-nights is indicated for each zone, but is not significant because some species were collected by digging their burrows or by sunken can-traps.

Species captured	Riverine areas		Arid zones		
	With trees & shrubs	Without trees, with grass & thickets	Slopes	Bottom	Plateau
<i>Xerus rutilus</i>				1	5
<i>Tatera nigricauda</i>	4	11		2	8
<i>Tatera minuscula</i>				2	1
<i>Taterillus harringtoni</i>		1		2	3
<i>Gerbillus pulvinatus</i>					27
<i>Gerbillus pusillus</i>				3	6
<i>Saccostomus mearnsi</i>		9			
<i>Mastomys erythroleucus</i>	2	3			
<i>Arvicanthis niloticus</i>	11	2			
<i>Arvicanthis somalicus</i>		7		5	
<i>Acomys percevali</i>		4	3	16	3
<i>Acomys wilsoni</i>	2	16			9
Total specimens	19	53	3	31	62
Number of trap-nights	640	1,880	290	630	1,711

*harringtoni*, *Saccostomus mearnsi*, *Arvicanthis somalicus*, *Acomys wilsoni*). Others appear to be more or less endemic and limited in distribution to southern Ethiopia and northern Kenya (*Heliosciurus gambianus omensis*, *Tatera minuscula*, *Gerbillus pulvinatus*, *Gerbillus pusillus*, *Acomys percevali*).

#### Ecological Aspects

These taxa differ in their biology. Certain species dig burrows and are active nocturnally (*Mastomys erythroleucus*) or diurnally (*Xerus rutilus*). Others are active both day and night and construct nests of dry vegetation at the foot of bushes or in high grasses (*Arvicanthis* spp.). Still others are arboreal and active during the day (*Heliosciurus gambianus omensis*) or the night, and construct nests of dry leaves in hollow limbs (*Graphiurus murinus*) or attach them to bushes or lianas (*Thamnomys dolichurus*). Their nests do not seem to be occupied throughout the year.

Three major habitats may be usefully distinguished (see Table 1). The riverine area has two aspects—with trees and shrubs (including *Trichilia roka*, *Tapura fischeri*, *Ficus sycomorus*, *Celtis integrifolia*, *Ziziphus rubescens*, *Cordia gharuf*) forming a continuous canopy, and with lianas (*Sissus*, *Sabia*) present. This zone appears to have a poor rodent fauna; only *Heliosciurus gambianus omensis*, *Graphiurus murinus*, and *Thamnomys*

*dolichurus* have been captured. Native villages situated here harbor *Arvicanthis niloticus* and *Mastomys erythroleucus*. There is also the riverine zone, largely without trees, but with grasses and very dense thicket. Here *Mastomys erythroleucus*, *Saccostomus mearnsi*, *Acomys wilsoni*, and *Tatera nigricauda* occur. The soils of this zone are heavy and clay-like and often appear as vertisols. The latter zone is flooded at more or less regular intervals in keeping with the Omo flood regime.

The Shungura Formation exposures may be considered separately and to have three aspects. The slopes of the exposures are comprised of detritus and eroded Plio-Pleistocene sediments. This very arid facies, practically without vegetation, harbors *Acomys percevali*. The cuestas of these exposures, which are covered with tuffs, and the bottoms, which separate them and contain recently eroded sediments, still have a very arid vegetation comprised of open shrubs (*Euphorbias*, *Adenium obesum*, *Cissus rotundifolia*, *Dasyphiera prostrata*, *Commiphora africana*, *Adenia venenata*, *Caralluma russelliana*, *Sesamothamnus brisseanu*, and *Maerua crassifolia*) and rare herbaceous plants (*Indigofera* sp., some *Cyperaceae*). In these situations *Gerbillus pusillus*, *Taterillus harringtoni*, *Tatera minuscula*, *Arvicanthis somalicus*, and *Xerus rutilus* occur.

Finally, the plateau has several soil types, more or less rich in clay, and these have a considerable

influence on the local composition of the vegetation, generally that of a more or less open shrub or bush savanna (*Acacia paolii*, *A. reficiens*, *A. horrida*, *Grewia tenas*, *Cadaba glandulosa*, *C. gilletti*, *Sciatula hortacantha*, *Serricomopsis pallida*) with herbs (*Blepharis persica*, *Polygala eriopelta*, *Ipomea belpharosepala*) as well as numerous grasses (*Aristida*, *Cenchrus*, *Chloris*, *Dactyloctenium*, and others). The plateau rodents are *Xerus rutilus*, *Acomys wilsoni*, and *Arvicanthis somalicus*, which occur everywhere, and *Gerbillus pusillus* and *G. pulvinatus* which occupy areas of lighter, more sandy soil than those where *Taterillus harringtoni* and *Tatera nigricauda* are found.

The distribution of these various rodent species, which utilize the part of the environment which best agrees with their ecological preferences, is further affected by another limiting factor—dryness—which is more or less strongly pronounced according to the year and the season. Except for the gallery forest species, the rodent fauna is rather characteristic of dry, and even arid zones. The low incidence of species in the gallery forest is a result of recurrent dry periods that prevent the occurrence of species that are linked to a permanently moist environment and in addition the occasional flooding of the entire area, thereby restricting immigration by burrowing or purely terrestrial species.

#### Reproduction

Observations made during the summer of 1973 broadly confirm the conclusions of previous workers (Dieterlen, 1967; Happold, 1966; Poulet, 1972; Hubert, 1977) on the reproduction of tropical rodents in sub-Saharan Africa. Reproduction occurs some weeks after onset of the rainy season. The onset of rains in early July 1973, in the north Shungura area, saw active reproduction of the principal rodent species represented there. In August, 80% of the trapped females were sexually active—either in estrous, gestating, or lactating. Farther south, on

the other hand, in the Kalam area, where rain was lacking, there was no evidence of reproductive activity among those rodent populations.

#### Taxonomic Comments

The modern rodent fauna of the Lower Omo Valley is typical for this area in Africa, where different types of habitat are represented—Sahelian savanna, arid zones, and forested blocks comprising a continuous stratum of large trees and associated bush and shrubs.

There are two squirrels, one arboreal (*H. g. omensis*, described from this place) and one fossorial (*X. rutilus*). Two species of *Tatera* are present, one widely distributed in eastern Africa (*T. nigricauda*), and a very small one, endemic to this area, *T. minuscula* (which was described by Osgood in 1936 from specimens collected in a nearby area, the Webbi Shebelli in southeastern Ethiopia, and was never officially collected since that time). *Taterillus harringtoni* occurs in all this part of eastern Africa (Robbins, 1975) where it lives together in the Sahelian savanna with two species of gerbils, a medium-sized hairy-footed species, *G. pulvinatus* (Hubert, 1978; Schlitter, personal communication) and a small one with naked sole, subgenus *Hendecapleura*, *Gerbillus pusillus* (Roche, 1976). *Saccostomus mearnsi* is the northern form of this genus, occurring in Ethiopia, Uganda, Kenya, and Tanzania (Hubert, 1978). The *Mastomys* seems to be referable to *Mastomys erythroleucus*, a large species characterized by a light gray belly, a brown-yellowish back, and a karyotype of 38 chromosomes, occurring in western and central Africa (Petter, 1957 and 1978). Two species of *Arvicanthis* are represented—*A. niloticus*, a large species, which is found in wet areas in the savannas over all Africa, and *A. somalicus*, a smaller one with a paler fur, from the arid zones of eastern Africa. The two species of *Acomys* were reported from this area by Matthey (1968).

#### CONCLUSIONS

It is worth noting that four of the nine rodent genera present in the lower Omo basin are represented each by two species adapted to slightly different habitats. Here is an adaptative evolutionary process of some plasticity frequently found in various animal species. It permits maximum utilization

of the heterogeneity of the environment, in space and in time. This strategy, reflected in more or less marked specialization of different species, adapted to particular conditions, contrasts with that of species substantially less strict in their ecological requirements. However, those latter species are ca-

pable of very rapid occupation of various habitats given some favorable change of a seasonal or other unusual nature.

Thus, the modern rodent fauna of the Lower

Omo basin is rich, reflecting the different habitats present, which is characteristic of the African tropical zones, even the dry zones.

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