

A JUNE-JULY CENSUS OF SMALL MAMMALS ON THE ATHI PLAINS, KENYA

By

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INTRODUCTION

Ecological studies of small mammals in East Africa are scarce. What little intensive work that has been undertaken centres on observations of habitat distribution and breeding cycles. Southern and Hook collected data on the distribution of Soricids and Murids in Uganda high forest (1963a) and later studied the reproductive condition of some insectivores and rodents of Uganda and Kenya (1963b). Delany (1964) summarized all quantitative work on small mammals in Africa south of the Sahara and added his own results from trappings in Uganda. The following superficial observations, the first on the Athi Plains, are presented merely as a guidepost for further investigations.

Briefly, the study area falls within the semi-arid "scattered tree" or *Acacia-Themeda* grassland biome (Edwards & Bogdan, 1951). The area is characterized by an abundance of red oat grass, *Themeda triandra* Forsk., whose dominance is ensured by periodic fires and impeded soil drainage, both of which factors retard the advance of tree and bush constituents (*Ibid*). Where conditions are favourable, stunted whistling thorn, *Acacia drepanolobium* Harms ex Sjöstedt, is found in association with *Themeda*. On the plains trees and shrubs are otherwise found only in riparian depressions. (For a fuller description of floral constituents see Heriz-Smith, 1962.)

Mean annual rainfall on the plains varies between 20 and 30 inches. Years with less than 20 inches are not uncommon. Drought is a feature of the habitat. Rain, when present, is characteristically sporadic, localized, torrential, and short-lived. Run-off is rapid; evapo-transpiration loss, high.

Possibly more important with regard to the ecologic distribution of small mammals is the prevalence of a heavy black clay—the infamous "black cotton" soil of East Africa. This clay becomes glutenous and waterlogged during the rains, concretionary and impenetrable during drought, subjecting the homogeneous surface horizon to its annual kneading and mixing and perhaps making conditions for burrowing and life in the subsoil intolerable for shrews and rodents.

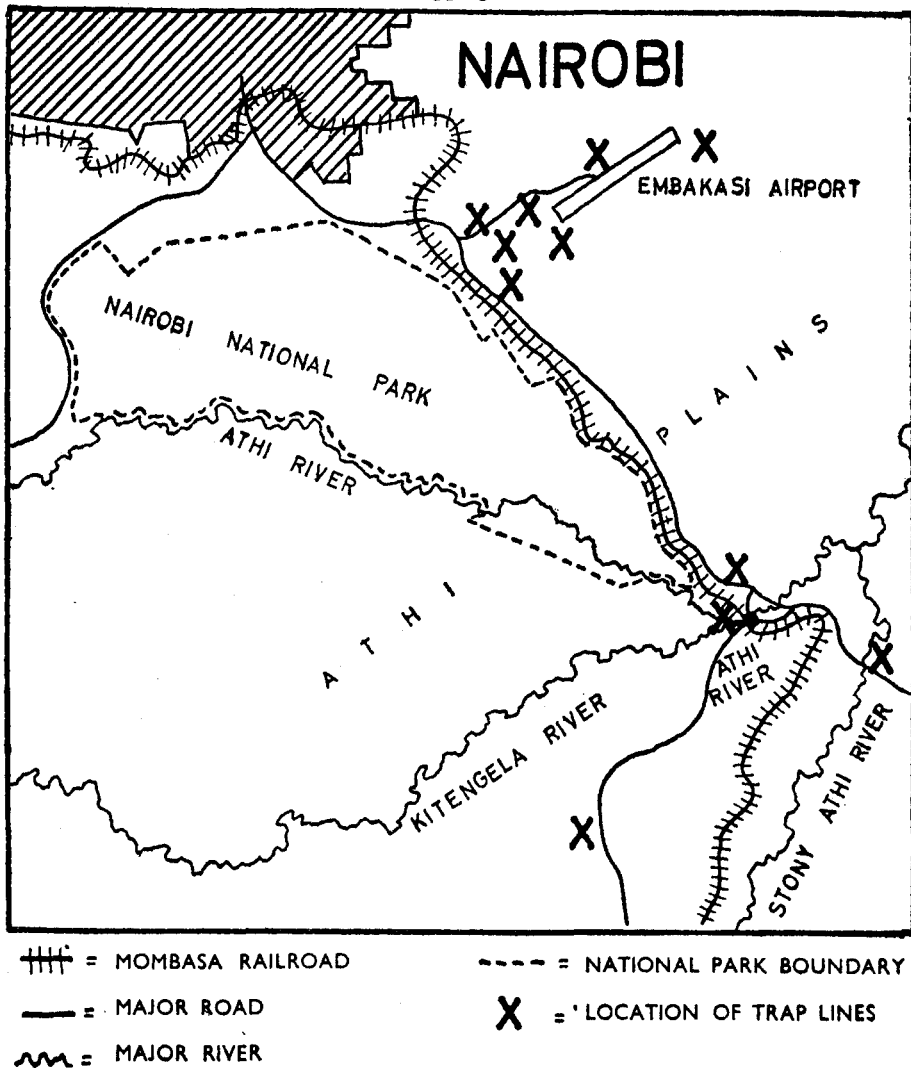
The purpose of the sampling programme was primarily to determine the species composition and relative numbers of the small mammals of the plains habitat. The two months devoted to the study coincided with the onset of the long dry season during which period the vegetation was either overgrazed, mowed, burned, or simply drying up—in all cases depleting food and cover sources. It was hoped a significant correlation between environmental pressures and population density would be evident. Secondly, ancillary observations were to be made on reproductive condition, niche diversity, and habitat preference.

METHODS AND MATERIALS

The species composition and relative density of small mammals were obtained by line-trapping. A slight modification of the NACSM B-type line (Calhoun, 1951) was adopted.

Two parallel lines, 60 snap traps to a line, were set over 400 yards apart but in the same vegetative faciation. Each line was divided at 50 ft. intervals into 20 stations. At every station two standard 7×3" rat traps and one 4×2" mouse trap were set within two yards of the centre of the station in spots most likely to capture animals. Various baits were separately experimented with, including cheese, raisins, and aniseed oil, none of which yielded any greater trapping success than the ultimately chosen mixture of peanut butter and rolled oats. Traps remained set for three consecutive days after which the transects were relocated in a new area. The distribution of trapping locations is presented in Figure 1. Typically, two locations were sampled in a week. Vegetative faciatiions sampled included: riverine forest (6 days); over-grazed, mown or burned grassland and bush (9 days); and undisturbed *Acacia-Themeda* (21 days).

FIGURE 1. Distribution of trapping locations on the Athi Plains.



Trapping was conducted from May 30th through July 28th, 1966. While operative, the trap lines were checked daily at 6:30 a.m. and 6:30 p.m. Collected animals were subjected to routine necropsy procedures in the laboratory with especial emphasis on reproductive condition. Study skins were sent to the Cornell University Museum.

RESULTS

In the course of 4,320 trap-nights a total of only 12 mammals of but two species was collected (Table 1). All captures were made at night. The categorization of the faciations in which the trap line pairs were set is not included as trapping success showed no bias toward a particular vegetative type. The results are therefore lumped under the plains habitat as a whole.

TABLE 1
SPECIES NUMBERS, COMPOSITION, AGE AND SEX DISTRIBUTION,
AND REPRODUCTIVE CONDITION

No.	Species	Age	Sex	Reprod. Cond.	Date
	Insectivora:				
1	<i>Crocidura fumosa</i> Thomas	A	F	breeding	28-6-66
2	" "	A	M	non-breeding	7-7-66
3	" "	A	M	non-breeding	8-7-66
4	" "	A	F	breeding	12-7-66
5	" "	A	F	breeding	28-7-66
6	" "	A	F	breeding	28-7-66
	Rodentia:				
1	<i>Mastomys coucha</i> A. Smith	J	M	non-breeding	8-7-66
2	" "	A	M	breeding	12-7-66
3	" "	A	M	breeding	12-7-66
4	" "	A	M	breeding	14-7-66
5	" "	A	F	breeding	14-7-66
6	" "	J	M	non-breeding	14-7-66

In addition, mole-rats, *Tachyoryctes splendens* (Rueppel), were observed tunneling on several occasions, usually in the loosened black soil around aardvark diggings.

Though only a single animal was captured in the month of June as opposed to the remaining 11 in July, signs of presence (faeces, runways, middens, and cuttings) were much in evidence in early June but rare by late July. Correspondingly, insects, seeds, and green shoots were abundant at the beginning of the study and showed a progressive decline into the dry season.

DISCUSSION

Any inference from such scant results must be made with care. The fact that 80% of the adults captured (100% of the females) were reproductively viable stands in opposition to the assumption that a breeding peak should coincide with the end of the rains when environmental pressure would be minimal, when the replacement of vegetation would provide optimal conditions of cover and food. Approaching the end of the sampling period, reproducing individuals showed no trend toward declining reproductive stages. Otherwise, the numbers trapped are simply too small either to statistically analyze or to gauge cause and effect factors.

Small mammal populations have been shown to be cyclic, to fluctuate regularly in numbers, where unstable environmental circumstances prevail, notably on the arctic tundra. The reason or reasons for their predictable fluctuations are still a matter of dispute. It is doubtful that the populations of the Athi Plains cycle as such but probable that they fluctuate irregularly dependent upon climatic and affiliated changes. From personal inquiries I gather that there have been eruptions of small mammals on the study area. No one can recall, however, the duration of these periods or the seasons in which they occurred. The two month sample provides little insight into the question other than a presumed ebb in numbers if indeed a fluctuation is present.

Equally undiscovered are the adaptations the animals have evolved to tide them through the annual droughts on the grasslands. The results give no indication of mass death, aestivation or emigration to more favourable areas (water catchment basins, for example). The data gives only an index of the density and reproductive status of small mammals over a two month interval and professes to be no more than a framework for a future study which would demand at least four years.

SUMMARY

Coinciding with the advent of the "long dry season" in Kenya, a two month sampling of the small mammal population of the Athi Plains was carried out determining (1) the species composition and numbers and (2) the reproductive status of the animals collected. The results of over 4,300 trap nights indicated a dearth of small mammals, yielding only 12 individuals of two species, 8 of which were in breeding condition. Environmental factors influencing the paucity of animals are discussed. The possibility of a fluctuation in numbers is inferred.

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