Aspects of the biology of the Small grey mongoose *Galerella pulverulenta*

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Abstract

The small grey mongoose *Galerella pulverulenta* is a common, diurnal predator throughout much of its limited range. In the present study 34 individuals were marked and released within a 200 ha area, with the home ranges of four animals being between 5 ha and 36 ha in extent. The estimated density was 1 mongoose/12.5 ha and there was considerable range overlap. Ninety two percent of the 163 sightings were of solitary animals. Food consists mainly of small murids and insects. Comparative notes are presented on the Yellow mongoose *Cynictis penicillata*.

Introduction

The Small grey mongoose *Galerella pulverulenta* (Fig. 1) is a small, generally solitary, diurnal viverrid, restricted in its distribution to the Cape Province south of the Orange River, Orange Free State, and marginally in Natal, Lesotho and Namibia (Lynch, 1981; Stuart, 1981).

Despite its abundance, particularly in the south-western part of its range, little attention has been given to this mongoose by research workers. Lynch (1981) has discussed the taxonomic status of this species and limited aspects of its biology have been briefly examined by Crawford *et al.* (1983) and Stuart (1981). This paper reports the results of a home range, behaviour and diet study of the small grey mongoose on the Vrolijkheid Nature Conservation Station.

Fig. 1. Small grey mongoose (*Galerella pulverulenta*, also kown as *Herpestes pulverulentus)*

Study area

The study area was situated in the Vrolijkheid Nature Conservation Station in the extreme eastern portion of the Robertson Karoo, part of the Little Karoo system. Of the 200 ha study area some 40 ha consisted of cultivated and unused farmland. The southern boundary of the area was formed by the Keisers' River, behind which rises a steep and rocky hillside. A tarred road divides the study area and extensive vineyards and orchards bound the southern sector. The study area consisted of low karroid scrub and succulent vegetation on broken, rocky outcrops. The eastern and northern boundaries abutted on to steep, rocky hillslopes. The southern area consisted of open, eroded and overgrazed scrubland. Five small earth-walled dams were located in the western sector of the study area and one in the east. Only two of the dams held water throughout the year. The faunal and floral components of the area have been covered in some detail by Stuart (1974).

Methods

Between April 1978 and July 1980 a live-trapping programme was undertaken to determine the small carnivore population of the study area, with special emphasis on the small grey mongoose. Trapping was undertaken at regular intervals, with a total of 7260 trap days (20 traps for 363 days), with single-door live-traps (75x36x36 cm). Eight traplines were marked out and each line consisted of 20 equally spaced markers (50 m between markers). Trapping was undertaken in each line for three days every 65 days. Six traplines ran from east to west and two from north to south (Fig. 2). Traps were baited with a blood-based scent lure and raw meat. In order to reduce disturbance traps were fixed in the open position between trapping periods.

All animals trapped were sexed, aged (juvenile, sub-adult or adult), measured, weighed, marked and released. Each mongoose was marked with numbered aluminium poultry wing-tags placed close to the base of each ear. Direct observations of free-ranging animals were made on an irregular basis. Scats of the small grey mongoose were collected and prey fragments identified in the laboratory as described by Stuart (1981).

Results

Home range and movement

A total of 34 individual small grey mongooses were trapped (Fig. 2), marked and released, of which 18 were male and 16 female. Thirteen (38%) of the animals were caught in the first two months of trapping and a total of 20 (59%) had been taken by the end of the seventh month. Only 16 animals were recaptured after marking, with one of the males being trapped 22 times and a female 12 times. Sufficient recaptures for estimating home range were only available for two males and two females (Fig. 3).

The established home range sizes were calculated using the "minimum home range" method (Mohr, 1947). These ranged from 5 ha (female B) to 36 ha (male C). From the limited information obtained it would seem that there is considerable overlap in home ranges within the study area.

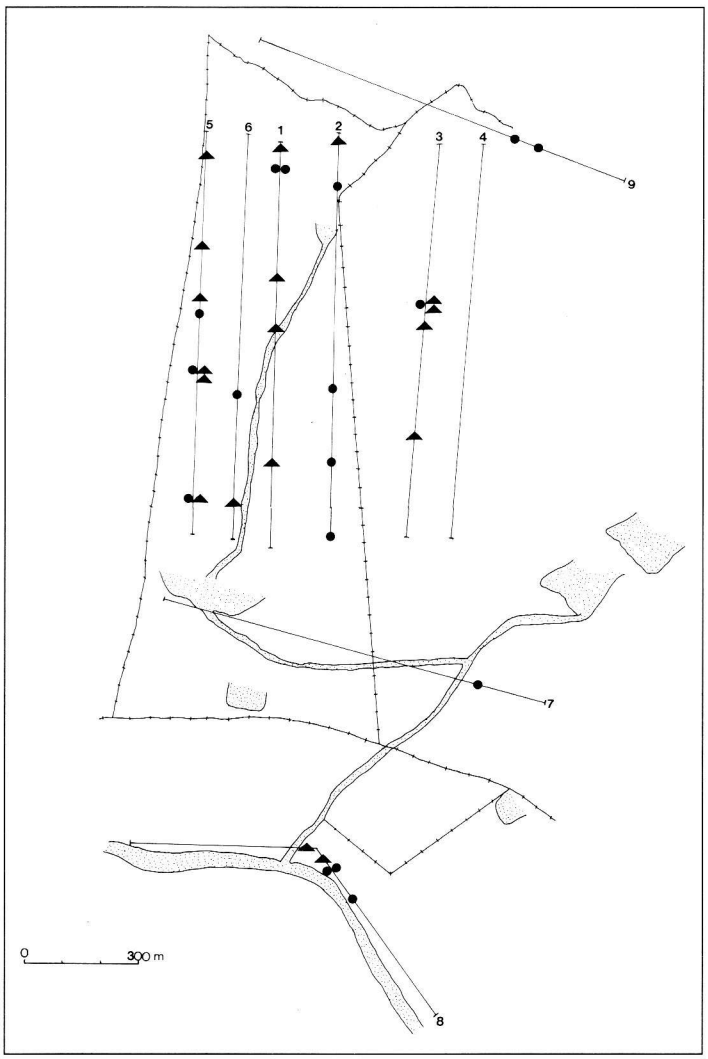

Fig. 2. Spatial distribution of first captures of Small grey mongoose within the study area. Triangles: males; circles: females. The nine traplines and topographical features are also indicated. Dams and water courses are indicated by stippled overlay.

The longest linear movement recorded between captures was by male C, of 1800 m. Most other recorded movements between captures were, however, considerably less than this, with a mean of 350 m.

Social organisation and behaviour

A total of 163 sightings were made during this study, of which 151 were of solitary animals, seven were of pairs and five were of groups of three individuals. Three of the pairs and four of the groups of three consisted of an adult accompanied by one, or two sub-adults.

Food searching appears to be of an opportunistic nature and this is borne out by the diet analysis. Both sight and smell appear to play a significant role in food searching (Pers. obs.). Most attention is concentrated on searching the area at the bases of bushes and rocks.

Only on one occasion was an aggressive encounter observed. Two adult mongooses were observed walking towards each other on the same path. Both animals (A & B) were involved in food searching, each unaware of the presence of the other. Animal A stopped, defecated and was about to continue when B came within sight of A. Animal A raised the hair on its tail, holding the tail low to the ground and ran at B, with B turning and A chasing it for approx. 10 m.

Density

With 34 individual mongooses having been marked within the study area, the density was approximately one mongoose per 6 ha. Eighteen animals were trapped once only and may have been non-resident within the study area, or they learned to avoid the traps. If these animals are excluded from the calculations the resident population would have been 16 animals and therefore a possible density of one mongoose per 12.5 ha. If one takes into account that 40 ha of the area consisted of marginally utilised habitat, the actual density would have been greater.

Food

Small grey mongoose scats were deposited singly, or in small, scattered accumulations along pathways and on dam walls. The content of 316 scats is summarised in Table 1. Rodent remains occurred in all ten monthly samples, ranging from 65% to 100% of the content. Of the 43 individual rodents identified to species level only two, *Rhabdomys pumilio* and *Otomys unisulcatus* occurred in significant numbers. The remaining four rodent species identified were much more limited in their distribution within the study area.

Discussion

There are few data with which to compare the findings of this study, with only one previous estimate of home range size for this mongoose having been made (Crawford *et al.*, 1983). This was based on casual observations of a single animal believed to range over 75 ha.

The only other comparable solitary and diurnal viverrid that has been studied, the slender mongoose, *Galerella sanguinea*, which had estimated home range sizes of 100 ha in the Serengeti National Park in Tanzania (Rood & Waser, 1978). Kingdon (1977) is, however, of the opinion that in some areas home ranges of the slender mongoose are considerably smaller.

Gorman (1979) working on the closely related Small Indian mongoose *Herpestes auropunctatus* in Fiji found that males had a mean home range of approximately 39 ha and females 22 ha. In a similar study in Puerto Rico Pimentel (1955) found that the same mongoose had home ranges of 0.5 ha and 1.2 ha resp., whereas Tomich (1969) found that the small Indian mongoose in Hawaii had home ranges of between 50 ha and 200 ha. These studies serve to demonstrate the variability of home range size within the same species in different areas.

In the current study the small grey mongoose home ranges were estimated from between 5 ha and 36 ha and with a density probably greater than one mongoose per 12.5 ha.

Solitary viverrids have two advantages: exploitation of small rodents as a food source requires hunting by stealth and is best accomplished when the individual hunts alone.

Approximately 70%, by mass, of the prey taken by small grey mongoose in the study area were vertebrates. In addition, the individual gains an intimate knowledge of its foraging range and this is particularly important in a species which exploits invertebrates as a food source. Although invertebrates are abundant they generally have an aggregated and local distribution (Gorman, 1979). Insects were by far the most important invertebrate group represented in the present study, followed by myriapods and arachnids.

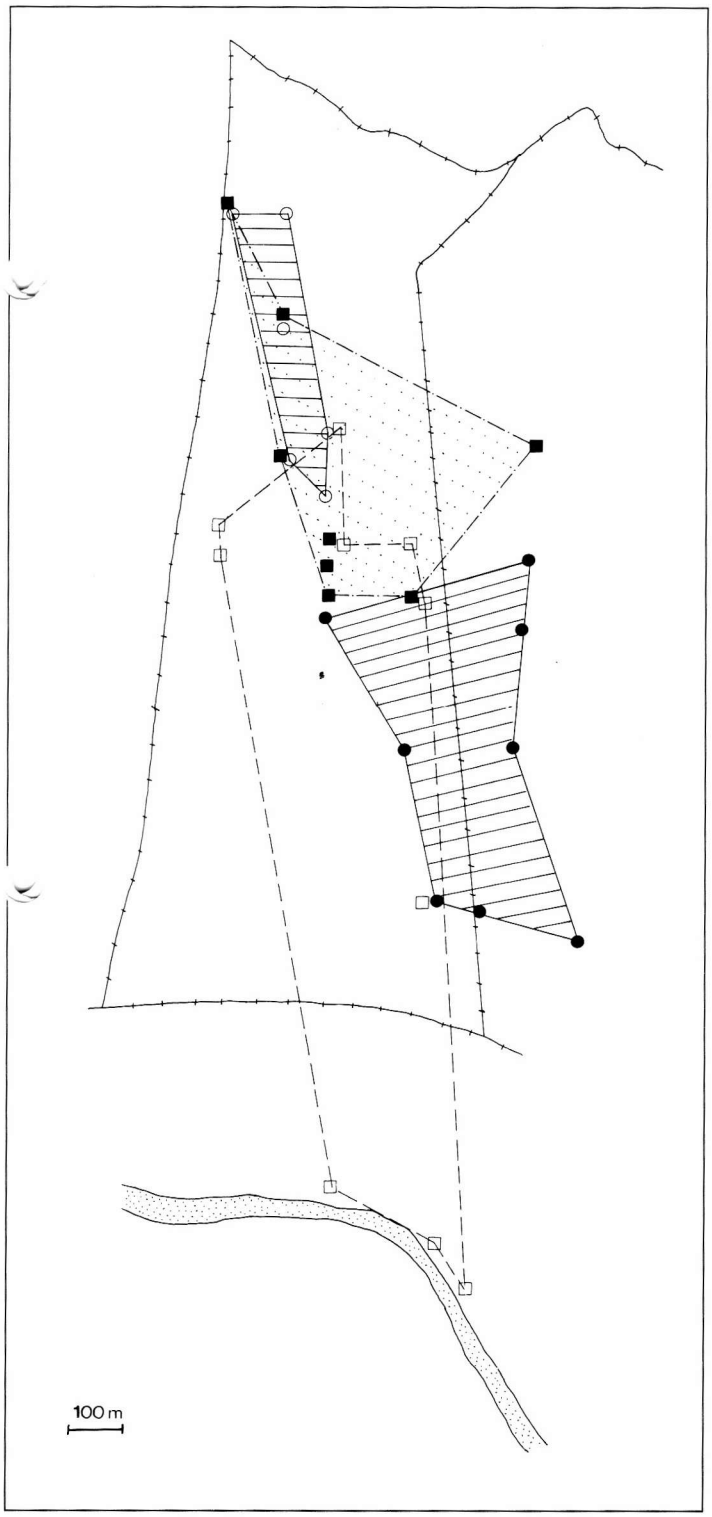

Fig. 3. Estimated home ranges of two male (solid and closed squares) and two females (solid and open circles) Small grey mongoose within the study area.

Table 1. Percentage occurrence of different food categories from Small grey mongoose scats through the months of the year.

	J	F	M	A	M	J	J	A	S	O	N	D
No. of scats	22	10	96	20	12	-	4	-	48	34	46	24
Rodents	100	100	73	70	83	-	(4)	-	92	88	65	92
Amphibians	-	-	4	10	-	-	-	-	-	-	-	-
Birds	9	-	6	20	-	-	-	-	6	12	26	8
Reptiles	9	-	2	10	-	-	-	-	-	6	17	8
Insects	73	80	94	100	67	-	(4)	-	100	94	22	67
Arachnids	-	-	2	10	-	-	(2)	-	-	6	13	-
Myriapods	18	20	-	40	-	-	(2)	-	-	6	13	-
Molluscs	18	-	-	40	-	-	-	-	-	-	9	-
Plants	45	20	17	10	-	-	-	-	-	6	4	42

Note: No percentages were calculated for the small July sample.

Small grey mongooses were rarely observed in the cultivated areas, or fallow land, but these were heavily utilised by the diurnal Yellow mongoose, *Cynictis penicillata*. Of the eight species of carnivores occurring within the study area only the small grey mongoose and the yellow mongoose are diurnal, solitary foragers. Two colonies of yellow mongoose, with an estimated total of 12 individuals, were located within the study area. There were no observed interactions between the two mongoose species during the present study. The yellow mongoose is an open area feeder but usually forages in fairly close proximity to its burrow systems, whereas the small grey mongoose shows a marked preference for feeding amongst, or close to, bush and scrub cover. In the present study it was found that the diet of the small grey mongoose was dominated by small murids and insects but that the diet of the yellow mongoose consisted mainly of insects and other invertebrates (Table 2). It is suggested, therefore, that the small grey mongoose and the yellow mongoose avoid competition by utilising largely different habitats and feeding niches.

Table 2. Yellow mongoose scat contents from Vrolijkheid Nature Conservation station. A=abundant; P=present.

	Jan.	Feb.	Apr.	May	Jul.	Sep.	Nov.
Sample size	38	42	15	22	25	19	2
Coleoptera	A	P	A	A	A	A	A
Orthoptera	A	A	A	A	A	-	P
Isoptera	P	-	-	P	P	-	P
Myriapoda	-	-	A	A	P	P	-
Scorpiones	P	P	-	-	P	-	-
Aves	-	-	P	-	-	P	-
Rodentia	-	-	-	-	-	P	-

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Footnote

There are indications that *Galerella pulverulenta* is extending its distribution range, particularly in the eastern sector of South Africa. Bronner (1990) has recorded the capture of a female near Wakkerstroom, Transvaal, some 200 km north-east of records in Natal and Lesotho. This area was extensively surveyed by Roberts (1951) but no trace of this mongoose was found at the time. Local farmers were not familiar with *Galerella*. There are also uncorfirmed sightings of this species in areas north of the Orange River (Cape Province) where they would overlap with *Galerella sanguinea*, another small diurnal predator with similar dietary patterns. We will, hopefully, be able to investigate these apparent range extensions as part of the African Carnivore Survey.

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Abstracts

Small Indian mongoose in Yugoslavia.

Seven mongooses from three Adriatic islands (Mljet, Korcula, and Hvar) off the coast of Yugoslavia were examined. Comparison with material of *Herpestes auropunctatus, H. edwardsi, H. sanguineus, H. javanicus,* and *H. pulverulentus* showed that they belong to *H. auropunctatus*. The history of their introduction since 1910, present distribution, and biological remarks are given. No recent data on their presence are available on Brac Island, but they are frequent on the three above mentioned islands and on the Peninsula of Peljesac. The Adriatic population of *H. auropunctatus* is the only one of its kind in Europe.

Tvrtkovic, N. & Krystufek, B. 1990. Small Indian mongoose *Herpestes auropunctatus* (Hodgson, 1836) on the Adriatic Islands of Yugoslavia. *Bonn. Zool. Beitr.*, 41(1):3-8.

The mongooses of the genus *Galerella* in southern Africa.

Galerella sanguinea (Rüppel, 1836), also known as *Herpestes sanguineus*, was investigated for intra-population and geographical variation in southern Africa by means of univariate and multivariate methods. The analyses of intra-population variation indicated the presence of sexual dimorphism in skull size, with males being larger than females. No evidence was found to justify the recognition of subspecies in *G. sanguinea* from southern Africa. It is proposed that all of the 16 subspecies described for southern Africa be regarded as synonyms of *G. sanguinea cauui*, except for *G. swalius* which is regarded as a monotypic species, occurring sympatrically with *G. sanguinea* in the central and southern parts of Namibia.

In the genus *Galerella* following species are now recognized: *G. pulverulenta, G. sanguinea, G. nigrata,* and *G. swalius*, while the status of *G. swinnyi* is still considered uncertain on morphometric grounds.

The results of geographic variation analyses showed that:

1) Pelage colour is very variable geographically and correlates with substrate colour and humidity
2) An east-west decrease in skull size is present in *G. sanguinea*.

Watson, J. P. 1990. The taxonomic status of the Slender mongoose, *Galerella sanguinea* (Rüppel, 1836), in southern Africa. *Navors. Nas. Mus. Bloemfontein* 6(10):351-492.

Siberian ferrets used as surrogate Black-footed ferrets in release study

Black-footed ferrets (*Mustela nigripes*) are an endangered mustelid that once spread across the Great Plains of North America. The last known population was decimated by canine distemper in 1985. Captive breeding has been successful and the next step in recovery of the species is the reintroduction of captive-raised, black-footed ferrets in the fall of 1991. Using a congeneric surrogate, the Siberian ferret (*Mustela eversmanni*), development of predator avoidance abilities, hunting effectiveness, and release techniques were tested. Even though the captive-raised Siberian ferrets often exhibited the correct behavioral responses, they did not always perform them as efficiently as wild-raised animals. Mortality will probably be heavy with any release of captive-raised animals. For a captive-raised carnivore the size of a black-footed ferret, it will be no easy task to locate and kill a prey as large as a Prairie dog and not be killed by a larger predator in the process.

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