

Agonistic behaviour patterns of the slender mongoose, *Herpestes sanguineus*

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The slender mongoose is a small, diurnal, solitary viverrid which generally occurs in savannah and semi-arid zones (Coetzee 1971). Males are slightly larger than females: mass 553 g and 430 g respectively, and head and body lengths of 319 mm and 284 mm (Rowe-Rowe 1978). Because of its solitary mode of life, small size and extreme shyness, little detailed data have been collected on this species (Hinton & Dunn 1967; Taylor 1975; Vaughan 1976). Social interactions are almost entirely confined to the breeding season, thus agonistic displays are neither as frequent nor as complex as has been reported for some sociable viverrids (Rasa 1972). In the present study (348 h of observation), the specific agonistic behaviour studied included the continuum of behaviour patterns extending from threat through attack, submission, avoidance (and displacement activities) to flight.

Six pairs of mongooses were maintained in adjoining outdoor enclosures for periods of up to 20 months. Two pairs were housed in cages 3 × 2 × 9 m, two pairs in cages 4 × 1,6 × 2 m and one pair in a cage 3 × 1,6 × 2 m. The floors of the cages were covered with a 150-mm layer of river sand. Tree stumps, rocky mounds and a waterproofed, wooden nestbox (300 × 570 × 300 mm) were present in each cage. Temporary openings between adjacent enclosures allowed mongooses to pass from the familiar territory of their own cage to unfamiliar territory in the neighbouring cage. Two males were housed in a small indoor enclosure (1 × 0,5 × 0,5 m) for two weeks, so that fighting methods could be observed in detail. In the outdoor enclosures two males were also housed together for three months.

Using an 8-mm cine camera, continuous photography at one frame per minute provided 24-h coverage of their behaviour. Observations on the mongooses housed outdoors were made from wooden hides situated outside the cages. Following Altmann (1947), '... all occurrences of some behaviours' were recorded.

In many sociable animals a hierarchy is established in which one or two animals are dominant and the remainder of the group form a rank order of subordinates. In the normally solitary slender mongooses, each captive pair established a dominant-submissive relationship. The dominant mongoose initiated attacks, and was the primary aggressor. In most pairs the female appeared to be dominant, resembling the matriarchal structure of dwarf mongooses, *Helogale undulata rufula* (Rasa 1972).

Fighting was not recorded between the two males housed indoors. Agonistic interactions were observed only between animals held outdoors. Each sequence of behaviour consisted of one or more of the following components: (a) Threat; (b) Attack; (c) Submission; (d) Avoidance; (e) Defence; (f) Displacement.

(a) Threat. Agonistic interactions were usually initiated by a threat display. These were of three types, namely vocalizations, neck- and shoulder-orientated threat-gapes and mutual open-mouth threat displays (Table 1). All displays were evenly distributed through the year and no seasonal variation was observed. Similarly, sequences were scattered throughout the day without being restricted to any particular time, although approximately 70% occurred during periods of intense activity (06h45 to 09h00 and 15h00 to 17h15).

Table 1 Occurrence of threat types in 37 threat interactions

Threat type	Occurrence	
	No. of interactions	% of interactions
Vocalization	24	64,8
Neck- and shoulder-orientated threat-gape	21	56,7
Mutual open-mouth display	7	18,9

(i) Vocalizations. Only six vocalizations were produced, four being associated with agonistic behaviour. Growling, spitting and snarling occurred when two animals were initially introduced to each other. When the ownership of food was in question, growling was usually elicited. The presence of dogs, cats and people outside the enclosures often resulted in the production of one of these three threat vocalizations. When threatening allo-specifics, mongooses adopted a crouched position, remaining motionless while vocalizing continuously until the danger had passed. Buzzing was produced by a male on two occasions when he attempted to intercept his cage-mate during peak activity periods, perhaps functioning as a soft warning growl.

(ii) Neck- and shoulder-orientated threat-gape. This usually occurred when one mongoose attempted to intercept its mate while they were both running about the cage. The protagonist approached the shoulder or neck region of the other animal with its head held low and twisted towards the other (Figure 1). The mouth was usually held slightly open with vertically retracted lips. This threat-gape resembled a snarl and gave the snout a wrinkled appearance. The antagonist maintained a crouched position.

Two distinct reactions to this threat-gape were recorded. In the first type, a threat situation initiated in the enclosure often ended in an attack followed by a short struggle within the nestbox. In the second type of reaction, snapping and a spitting vocalization often accompanied the protagonist's threat. Duration of the neck- and shoulder-orientated threat was usually a few seconds, and

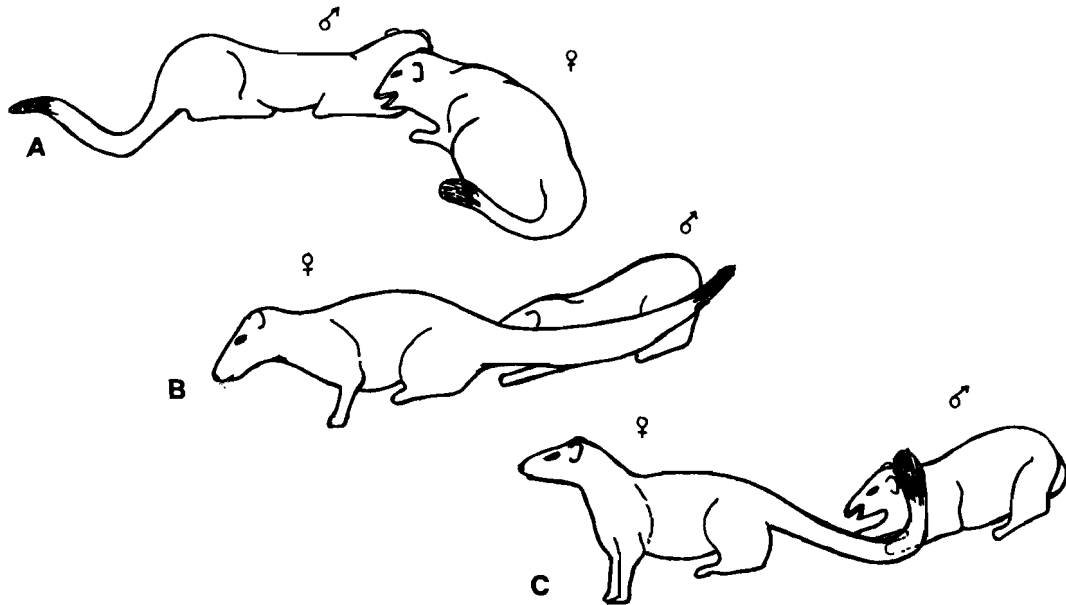


Figure 1 Sequence of agonistic behaviour of slender mongooses (drawn from cine film). (A) Neck- and shoulder-orientated threat-gape of female directed at male in a submissive neck-exposure posture. Note accentuation of mouth by pink lip colouration. (B) Female moves away and male assumes low slung submissive posture. Note piloerection on tail of female. (C) Male exhibits a submissive grin.

never exceeded six seconds. During this time both animals remained in a tense crouched position. The sequence was terminated when the subordinate animal ran off.

(iii) Mutual open-mouth threat display. These displays also occurred during periods of high activity, and were observed seven times. The animals were positioned face-to-face in an 'S-shape' so that each faced towards the shoulder of the other (Figure 2). One animal held its head in the horizontal position with the mouth opened vertically, while the other's head was twisted sideways with the mouth held horizontally. The only vocalizations that accompanied this threat were a spit and a growl, which were produced on two occasions. The entire sequence lasted approximately one second.

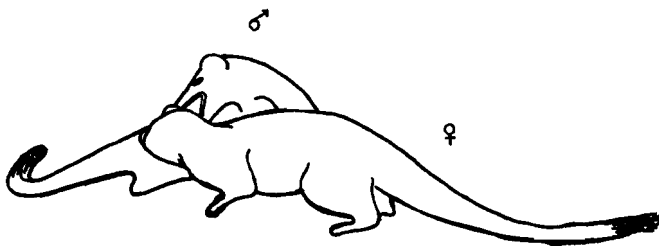


Figure 2 Mutual open-mouth threat display of two slender mongooses.

(b) Attack. No complete attack sequences were seen as the mongooses moved into, and out of, the nestboxes while fighting. Following one of the initiating threat behaviour patterns, the protagonist held the other mongoose by the 'scruff' of the neck, in an attempt to pin it to the ground. A struggle ensued in which they pulled in opposite directions, until the antagonist was released.

(c) Submission. Submission was the usual response to threat. After a dominant-submissive relationship had been established between some pairs, it was noted that the subordinate mongoose always approached its cagemate in the submissive posture, especially if the dominant partner was resting or occupying a favourite sleeping place.

Three submissive postures were observed in response to threat:

(i) Neck exposure. The subordinate animal often turned its head away from the source of threat, thus exposing the neck region in a submissive posture.

(ii) Submissive grin. The submissive grin as described by Fox (1970) in some canids was occasionally observed. The subordinate animal lowered the head when threatened and opened the mouth slightly, by retracting the lips horizontally (Figure 1). This caused both lip and tooth exposure. The pinkness of the lips and interior of the mouth probably served to accentuate the submissiveness of the animal. Tooth exposure is often associated with threat, but postero-horizontal lip retraction allows only a small portion of the teeth to be uncovered, unlike vertical lip retraction which uncovers the whole expanse of the canines and incisors.

(iii) Submissive approach to a dominant animal. The submissive animal approached its dominant partner with its body and head held low. Occasionally the belly was dragged on the ground. The approach was always slow and cautious.

(d) Avoidance. Some mongooses tended to avoid their cagemates when threatened by them. This often occurred during periods of intense activity, when two animals in one enclosure were running on their habitual pathways (Figure 3). If they unexpectedly confronted one another, or if one animal actually threatened the other

which had trespassed on its pathway, the two animals immediately turned away from each other and continued their running. Occasionally, however, an altercation did occur (neck- and shoulder-orientated threat-gape).

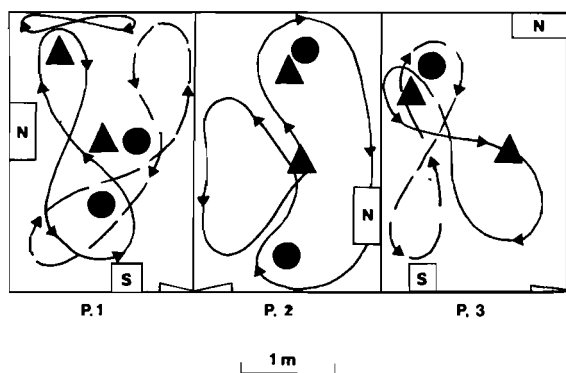


Figure 3 Activity pathways used by pairs 1, 2 and 3. — female path; - - male path; ▲ rock; ● tree; N nestbox; S shelter.

(e) Defence. Defence usually occurs in most animals in response to attack or threat. No generalized defence posture, as has been described in some mustelids (Rowe-Rowe 1975), was ever seen in the slender mongoose. Whenever the animals were in a situation when threat might have been expected, for example when the observer was in the cage, the body hairs were raised. Piloerection was particularly pronounced in the tail and shoulder region, giving an impression of increased body size. Squirting of scent from anal glands, as recorded in *Ictonyx striatus* (Rowe-Rowe 1975) and *Atilax paludinosus*, was not observed in slender mongooses.

(f) Displacement behaviour. No displacement behaviour was seen in agonistic encounters. Territorial displays were not observed when mongooses had access to neighbouring cages.

The establishment of dominant-submissive relationships is important for the reduction of agonistic encounters. In the slender mongoose, this relationship seemed unstable and uncertain in some cases perhaps explainable by the fact that normally any two animals remain together long enough only to mate and perhaps rear a family, necessitating the maintenance of a dominant-submissive relationship for only a short period. It may also be suggested that the enforced sociality in captivity required a more stable dominant-submissive relationship to be formed, but due to the nature of the normally solitary animals, this relationship fluctuated throughout the year.

The results indicate that slender mongooses avoid each other in most instances, which results in limiting the number of agonistic encounters. Whenever a confrontation did occur, however, the captive animals seemed to rely most heavily on threat and submissive displays, indicated by the fact that these two displays were slightly more elaborate than the other agonistic behaviour observed. Neck exposure, which seems characteristic of canids (Fox 1969), was commonly recorded for slender mongooses.

However, because this is a solitary species, little use would be made of agonistic behaviour in comparison with the sociable dwarf mongooses where continual interactions occur to maintain the hierarchical structure of the group (Rasa 1972). This limited need for agonistic displays in slender mongooses may explain the relatively poor variety and degree of development of both agonistic displays and displacement behaviour.

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The responses of a captive bontebok ram to faecal pellets from conspecific rams

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Faeces or urine often function in mammalian olfactory communication, and many species tend to defaecate at particular locations to form conspicuous dung piles (Ralls 1971). In the bontebok *Damaliscus dorcas dorcas* there is reason to suspect that dung plays a role in olfactory communication. Bontebok males exhibit territorial behaviour, and territorial males (unlike females and juveniles) frequently use dung patches. Also mutual anus