

The Banded Mongoose (*Mungos mungo*)

excerpt from

Gilchrist, J.S. 2001. Reproduction and pup care in the communal breeding banded mongoose. PhD thesis. University of Cambridge.



Photos: left - a group of mongooses 'hanging out'; mid - a pair of mongooses investing in the next generation; right - resting after a hard morning foraging. Left & mid by Gavin Gilchrist; all others JG.

The banded mongoose, *Mungos mungo* (Gmelin 1788) is classified in the cat-like lineage (Feloidea, or Ailuroidea) within the Order Carnivora, Family Herpestidae (Wozencraft 1982), although more traditionally classed in the Family Viverridae (Rood 1986). There are 36 species of mongoose, the majority of which are solitary. The banded mongoose is one of probably only eight social species, the most intensively studied of which include the meerkat, dwarf mongoose and yellow mongoose. Little is known of the other potentially social species (Rood 1986). The banded mongoose is widely distributed in East and Central Africa (Skinner & Smithers 1990) (see Fig. 2.1). They have a broad habitat tolerance from woodland to open savannah and den in termitaria, hollow trees and crevices (Kingdon 1997). Cant (1998) found that 8 groups used 388 dens over a one year period, changing den on average every two nights. They live in groups of 6 to 40 individuals, which forage and den together. They are diurnal and forage independently whilst travelling as a group, feeding mainly on invertebrates but take vertebrate prey opportunistically (Rood 1975; Hiscocks & Perrin 1991). Groups are territorial, generally with overlapping boundaries (Rood 1975; Cant et al. in press). In the Serengeti litters are restricted to the wet season. Banded mongooses are not endangered (source: IUCN).

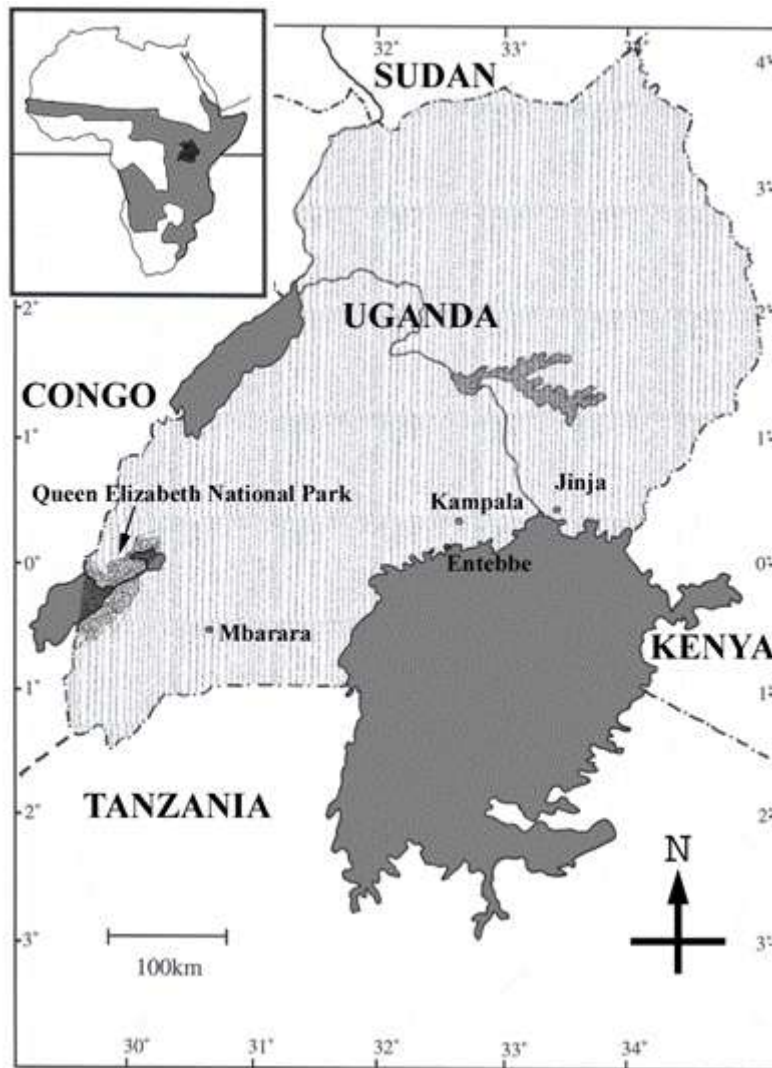


Figure 2.1 Inset (top left) is a map of Africa showing the position of Uganda (black) and distribution of the banded mongoose (grey). The main map of Uganda shows Queen Elizabeth National Park, my study site (dark, south-west).

The banded mongoose is a communal breeding species (Rood 1975; Cant 2000) that exhibits amongst the lowest reproductive skew within any cooperative breeding mammal. It shares many characteristics and behaviour patterns with the high skew social mongoose species, the meerkat and dwarf mongoose, where normally only a single ‘dominant’ pair breed (Rood 1986). These species have been the focus of intensive long-term studies in the Kalahari (meerkat: Doolan & Macdonald 1996a, 1999; Clutton-Brock et al. 1999a, 2001b), Taru and Serengeti (dwarf mongoose: Rasa 1987b, 1989a, 1994; Rood 1978, 1983a, 1990; Creel et al. 1992; Creel & Waser 1997), thus providing a basis for comparison within a high taxonomic level (Harvey & Mace 1982). The banded mongoose is therefore an ideal species in which to tackle the relationship between reproduction and care.

The dispersal system of the banded mongoose involves single sex subgroups leaving their group either voluntarily, through forced eviction or by usurpation. Individual mongooses do not

disperse alone, and group members only disperse voluntarily when there is an available subgroup of opposite sexed individuals. Dispersal appears to be linked to reproductive competition, rather than competition for food. Evictions commonly result in injury and the high rate of aggression toward newly formed groups can lead to injury and death (unpublished data; Cant et al. 2001). Emlen (1991) asked why helpers do not disperse and breed independently; this question is appropriate for high skew cooperative breeders where offspring remain in their natal group and almost never breed. In the banded mongoose, this question is inappropriate because individuals *do* breed in their natal group. Therefore, subordinates do not necessarily sacrifice their personal reproductive potential by staying at home.

The mating system of the banded mongoose is polygynandrous. Females within a group come into behavioural oestrus synchronously (over a few days) and the dominant males mate guard the older females first before moving on to younger females (Cant 2000). In spite of mate guarding, most females and males mate with more than one partner. The majority of females conceive and carry to full term. Parturition occurs in a communal den approximately two months later, and females within the group often give birth on the same day (Rood 1975; Cant 2000). Rood (1975) suggested that reproductive skew in the banded mongoose was negatively correlated with group size. He observed that skew was low in small and medium groups but that fewer females bred in large groups. Subsequent studies have found little or no effect of either group size or maternal characteristics (age (Cant 2000) and dominance (De Luca & Ginsberg 2001)), on the probability of a female becoming pregnant. I consider the factors that affect conception and fecundity of females, evaluating whether maternal, environmental or social factors determine a female's reproductive success. I also evaluate whether there is any evidence that females ever suppress other females, either pre-or post-parturition.

Although the banded mongoose is generally regarded as a cooperative breeder, other than anecdotal recording of females allowing indiscriminate suckling by pups from the communal litter (Neal 1970), it has not been shown unequivocally that group members care for offspring that are not their own. Although nursing was observed rarely, I did see non-offspring nursing where pups moved between and suckled from different females. Nonetheless, I have not considered it in this thesis because any further analysis requires genetic data to test whether females show any preference for suckling their own or their closest relatives pups (see Pusey & Packer 1994) and whether allonursing is adaptive. Members of banded mongoose groups have been observed to babysit and provision pups, tasks that are principally undertaken by non-breeders in the dwarf mongoose and meerkat. Group members babysit the communal litter (Rood 1974), and there is indirect evidence that non-breeders take on the costliest babysitting role (Cant in press). When the young emerge from the den they are then 'escorted' by group members who carry, provision and 'shelter' pups (Cant 1998). I directly evaluate the contributions made by breeders and non-breeders whilst considering the inherent difficulties of assigning parentage in a communal breeder, and determine whether care is costly to the donor and benefits the pups.

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Photos: show escorting and association in banded mongoose, where an individual pup maintains a consistent stable association with a particular adult group member.