

Short Communication

First records in Tanzania of the Vulnerable Jackson's mongoose *Bdeogale jacksoni* (Herpestidae)

Daniela W. De Luca and Francesco Rovero

Abstract New records in Tanzania of the Vulnerable Jackson's mongoose *Bdeogale jacksoni* expand its distribution by over 900 km to the south. During two independent camera-trap surveys over 3 years *B. jacksoni*, one of Africa's most cryptic small carnivores and previously thought to be endemic to Kenya, was recorded in forests of the Udzungwa Mountains. All records were highly localized within Matundu forest, at a maximum of 2.65 km apart. Most of the records (73%) were between 19.00

and 00.00, confirming that the species is primarily nocturnal. Conservation recommendations include further ecological research, genetic analyses, surveys in other Eastern Arc and ground-water dependent forests, and greater protection for Matundu.

Keywords *Bdeogale jacksoni*, conservation status, distribution, Jackson's mongoose, Herpestidae, Kenya, Tanzania.

Jackson's mongoose *Bdeogale jacksoni* (Thomas, 1894) is one of three species of dog (or four-toed) mongooses of the genus *Bdeogale* occurring in East Africa. It is categorized as Vulnerable on the Red List (IUCN, 2006) because it appears to be severely fragmented and has subpopulations probably not containing more than 1,000 mature individuals. *Bdeogale omnivora*, the Sokoke dog mongoose, is also rare and localized on the Kenyan coast and Tanzania's Usambara Mountains (Allen & Loveridge, 1942; Engel, 1996). *Bdeogale crassicauda*, the bushy-tailed mongoose, although uncommon is more widespread across south-eastern Africa (Kingdon, 1997; De Luca & Mpunga, 2005b).

Jackson's mongoose is the largest species of *Bdeogale* and is distinguished by the round, broad and hirsute ears (smaller than those of *B. crassicauda*), the intense yellow on the side of the neck and throat, and the white bushy tail (Kingdon, 1997; H. Van Rompaey & J. Kingdon, unpubl. data). *B. jacksoni* is highly localized and previously known only from montane and bamboo forest on Mt Kenya and in Aberdares, Elgeyo forest, Naivasha, Yala River, and lowland forest near Mt Elgon (Kingdon, 1997; H. Van Rompaey & J. Kingdon, unpubl.

data). Initially ascribed its own genus, *B. jacksoni* was considered a subspecies of *B. crassicauda* (Allen, 1914) and a montane isolate of the central African black-legged mongoose *B. nigripes* (Sanderson, 1940; Kingdon, 1977). Most authors however, recognize it as a valid species (Hollister, 1918; Allen, 1939; Wozencraft, 1993; Kingdon, 1997). There are 14 museum specimens from Kenya: Aberdares, Elgeyo forest, Mt Kenya, Naivasha and Yala River (H. Van Rompaey & J. Kingdon, unpubl. data), but no records for Uganda, despite ambiguity in the literature and the likelihood of *B. jacksoni* occurring there. Records of the species are few, probably because of its nocturnal nature and fragmented distribution (Boitani *et al.*, 1999).

Information on the ecology of Jackson's mongoose is also limited (Schreiber *et al.*, 1989), with knowledge based on only a few observations (Kingdon, 1977). The species is omnivorous, and analysis of *c.* 40 scats of adults and juveniles from the Aberdares revealed the adult diet was >50% rodents (Kingdon, 1977), 40% insects, mainly workers of army ants (*Anona* sp.), and some remains of beetles, lizards and birds. The juvenile diet consisted mainly of rodents (*Otomys*, *Lophuromys*, *Mus*, *Praomys*) with some invertebrates, birds' eggs and carrion. The more insectivorous adult diet suggests that coping with columns of army ants is a learned behaviour (Kingdon, 1997; H. Van Rompaey & J. Kingdon, unpubl. data).

The Udzungwa Mountains form the largest massif of the Eastern Arc. They are an important area for biodiversity and a number of species have been discovered or rediscovered there in recent years: the

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Sanje mangabey *Cercocebus sanjei* (Rodgers & Homewood, 1982), the Udzungwa forest partridge *Xenoperdix udzungwensi* (Dinesen *et al.*, 1994), Lowe's servaline genet *Genetta servalina lowei* (Brink *et al.*, 2002; De Luca & Mpunga, 2002) and the kipunji *Rungwecebus kipunji* (Jones *et al.*, 2005; Davenport *et al.*, 2006). The observations presented here were made during two independent surveys in the Udzungwa Mountains (Fig. 1) including Matundu, one of East Africa's largest lowland forests (522 km²).

Matundu Forest Reserve is situated within both West Kilombero Forest Reserve and Udzungwa Mountains National Park. Steep valley bottoms are dominated by groundwater-dependent mixed evergreen and deciduous forest trees (*Khaya nyasica*, *Erythrophloeum suaveolens*, *Funtumia africana* and *Milicia excelsa*) and *Anthocleista*-dominant swamp forest. Despite extensive logging in the 1970s primary forest still exists, especially

west of the Ruipa river. Matundu Forest Reserve has been ranked as the third most important Udzungwa forest based on its primates, duikers and birds (Dinesen *et al.*, 2001) and the richest in terms of carnivores (De Luca & Mpunga, 2005a,b).

The first survey targeted carnivores and involved 10,608 camera trap hours (884 trap nights) at 35 trap sites during November 2001–November 2002 throughout the National Park (De Luca & Mpunga, 2005a,b). Jackson's mongoose was photographed three times in July 2002: on the 22nd at 19.50, 23rd at 19.52 and the 29th at 00.35. All records were at the same site at an altitude of 368 m in an area of lowland semi-deciduous forest within Matundu Forest Reserve (Fig. 1). The second survey consisted of >57,600 camera trap hours (2,400 trap nights) at 41 sites during July 2002–August 2005 in the National Park and neighbouring Forest Reserves as part of a long-term project on forest antelopes. Jackson's

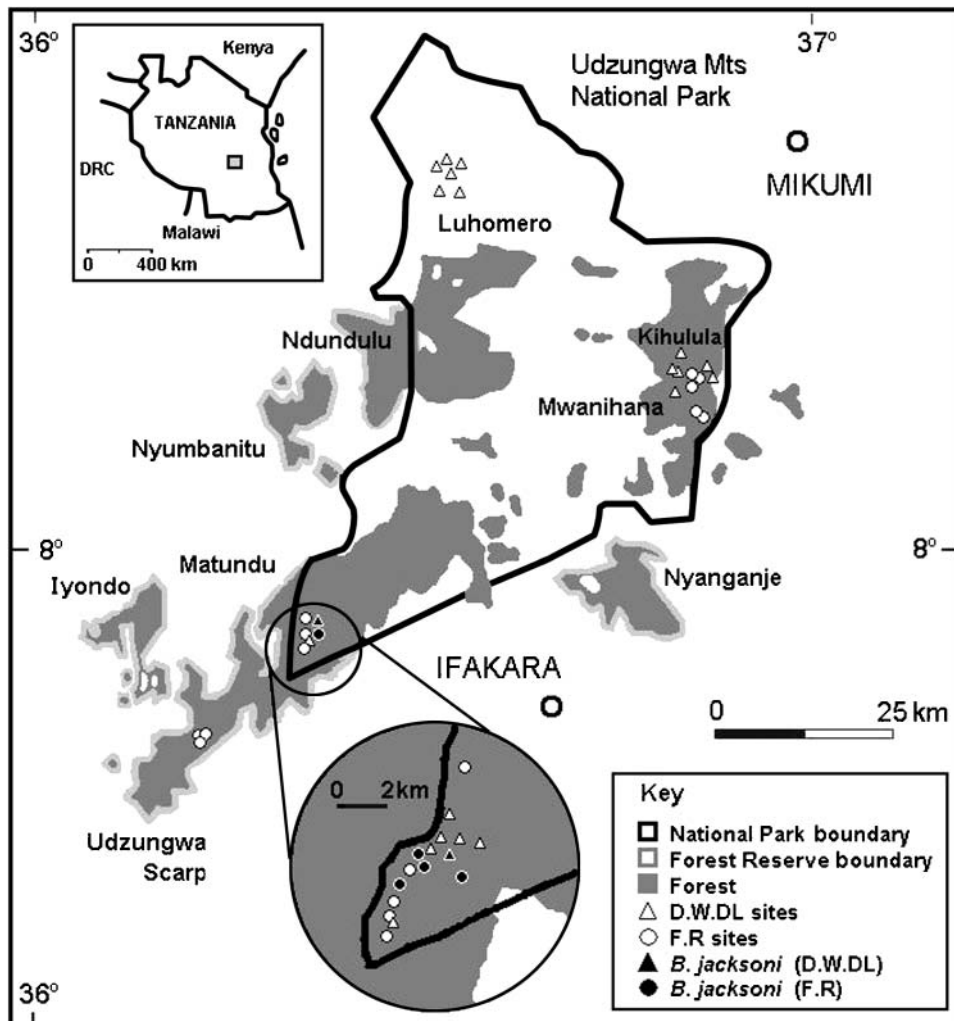


Fig. 1 The Udzungwa Mountains, showing positions of the camera-trap sites, and where *B. jacksoni* was photo-trapped (D.W.DL = D. De Luca; F.R = F. Rovero). The shaded square in the inset indicates the location of the main map in Tanzania.



Plate 1 Jackson's mongoose photo-trapped in Matundu Forest, Udzungwa Mountains, Tanzania, on 16th July 2004 at 22.29 (photo by F. Rovero).

mongoose was photographed 22 times from July to September 2004 at four sites, also within Matundu Forest Reserve, along a 2 km transect at 300–375 m altitude, at distances of 0.918–2.65 km from the 2002 records (Fig. 1; Plate 1). Times of all captures ranged from 19.20 to 06.07 and all individuals appeared to be adults.

All trap sites were, on average, 18 km from the nearest human settlement. The camera traps were operating 24 hours per day and 73% of the mongoose photographs were taken between 19.00 and 00.00. This seems to confirm that the species is primarily nocturnal with a tendency to be more active in the first part of the night (H. Van Rompaey & J. Kingdon, unpubl. data). Of a total of 76 camera-trap sites investigated in the Udzungwa Mountains over a period of 3 years (Fig. 1), only 5 sites (6.5%) recorded Jackson's mongoose, all within Matundu forest (Fig. 1), and it therefore seems this Tanzanian population is highly localized.

During 128 village interviews in four villages around the National Park (De Luca & Mpunga, 2005a), the presence of a mongoose corresponding to the description of *B. jacksoni* was reported at the edge of bamboo forest at 1,700 m in Kihulula, Mwanihana forest. This is significantly higher than Matundu and if this record is confirmed, it would be in habitat more similar to the montane forest and bamboo reported for the Kenyan records of the species in Aberdares and Mt Kenya.

All records in Tanzania were made in the dry season in wet lowland forest. Kingdon (1997) suggested that *Bdeogale* mongooses originated in the drier forests and woodlands of East Africa, associated with valley bottoms and soft soils where moisture lasts longer in the dry season. However, Jackson's mongoose is now known from a wide range of conditions, from lowland

forest in Tanzania at 300 m at the foot of geologically old mountains, to montane forest and bamboo at 1,700 m in relatively young volcanic mountains in Kenya. In Tanzania, but not in Kenya, it co-exists with *B. crassicauda* (De Luca & Mpunga, 2005a,b).

All the confirmed Tanzanian records of *B. jacksoni* are within protected areas. However, given the fragmentation and small size of the forest patches in which the species was camera-trapped, full protection of adjacent forests (Iyondo and Udzungwa Scarp Forest Reserves) could provide improved conservation of this rare species. Other East African groundwater-dependant forests (including those near Matundu and Nambiga Forest Reserves) need to be surveyed for the presence of Jackson's mongoose. The record for Kihulula needs verification to ascertain altitudinal range within Tanzania. Further ecological and morphological studies and an analysis of genetic distance would clarify the taxonomic relationship between the Kenyan and Tanzanian populations and facilitate appropriate conservation planning across the species' range.

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Biographical Sketches

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