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Expanding the geographical distribution of the Egyptian Mongoose, *Herpestes ichneumon* (Linnaeus, 1758), in South Africa

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Abstract

The current geographical distribution of the Egyptian Mongoose or Large Grey Mongoose, *Herpestes ichneumon* (Linnaeus, 1758), in South Africa is limited to the south-eastern coastal and eastern sections of the country. One recent sighting in the central part of the country suggested a wider geographical distribution. In this study, we report on confirmed sightings of the Egyptian Mongoose on consecutive years in the central part (at Sasol's Synfuels Plant in Secunda) of the country. Our sightings thus expand the distribution of the Egyptian Mongoose in South Africa to include some sections of the central to eastern part of the country.

Key words

Mpumalanga; range expansion; Grassland biome.

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Introduction

The Egyptian Mongoose, or Large Grey Mongoose, *Herpestes ichneumon* (Linnaeus, 1758), occupies a vast range in Africa, with the exception of deserts (Fig. 1A). The known distribution of the Egyptian Mongoose in South Africa is restricted to the south-eastern to eastern coastline and eastern sections of the country (Fig. 1A, C) (Palomares 2013). The Egyptian Mongoose is a terrestrial, predominantly solitary species, occurring in habitats with well-developed understory in coastal, lacustrine, and riparian environments (Palomares 2013). Although it is an opportunistic omnivore, it preys on small mammals (Stuart 1983), including vlei rats, *Otomys* spp. and multimammate mice, *Mastomys* spp. (Smithers and Wilson 1979, Angelici 2000). Throughout its African range, the Egyptian Mongoose is classified as Least Concern by the International Union for Conservation of Nature (IUCN) (Do Linh San et al. 2016a) and the South African Red List assessment (Do Linh San et al. 2016b).

Methods

The study was done under permit issued by the Mpumalanga Tourism and Parks Agency (permit no. 5467). Photographs for this study were collected during a study on the population ecology of Serval, *Leptailurus serval* (Schreber, 1776), at the Sasol Synfuels Plant in Secunda

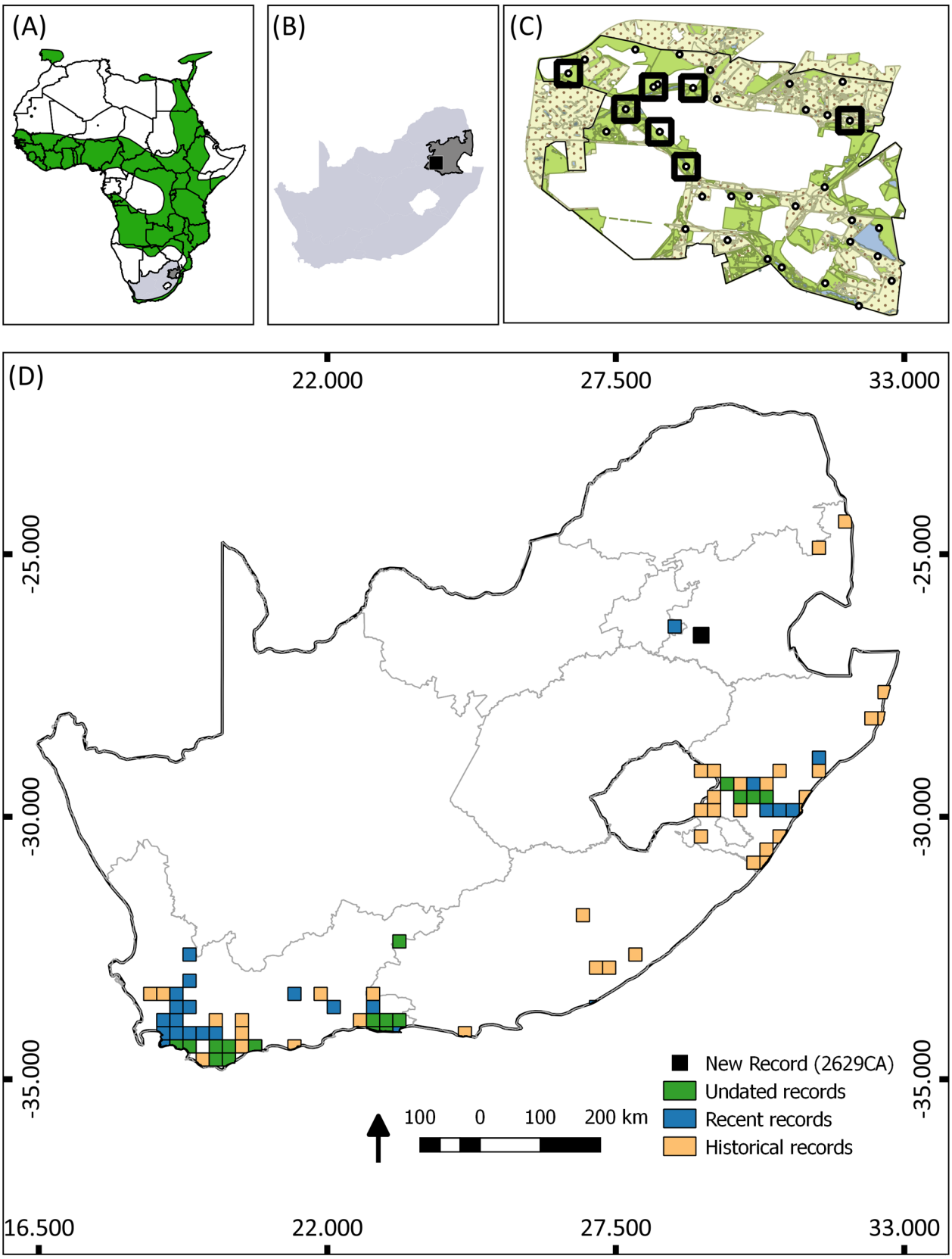

Figure 1. Range of Egyptian Mongoose, *Herpestes ichneumon* (Linnaeus, 1758). **A.** African range (grey represents South Africa). **B.** Study site (black square) in relation to Mpumalanga Province (dark grey), South Africa. **C.** Camera trapping layout and study area; white circles represent camera trap locations and black squares indicate sites were Egyptian Mongoose were photographed. **D.** Historic, recent, and undated Egyptian Mongoose observations in South Africa, the black square represents the new confirmed observations from this study.

(central coordinates 26°31′46″ S, 29°10′32″ E, 3000 ha; Fig. 1B, C) between August 2014 and November 2016. The Sasol Synfuels Plant consists of a primary area (the petrochemical plant itself) and a secondary area (surrounding natural and disturbed vegetation). Camera trapping was done in the secondary area where the vegetation is classified at Soweto Highveld Grassland (Mucina et al. 2006), which falls in the Grassveld Biome (Mucina et al. 2006). The secondary area is dominated by natural grasslands interspersed with both natural and man-made wetlands. Approximately 38% of the secondary area is classified as untransformed while the remaining 62% is classified as disturbed vegetation.

During survey periods we deployed an array of 34 Reconyx™ Hyperfire™ HC600 camera traps. Survey duration varied between years (2014: August to December; 2015: January to September; 2016: October to November). Traps were placed at least 1.2 km apart, raised about 50 cm off the ground on wooden stakes, and generally placed on vehicle roads or animal paths. Trap deployment and placement were done to maximize detection of Serval, and therefore the majority of traps were deployed in areas close to wetlands.

Results

During10,160 camera trapping days (2014–2016) we detected the Egyptian Mongoose at 8 camera trap sites (Table 1; Fig. 1C). Egyptian Mongooses were detected at 1 camera station in 2014, 2 camera stations in 2015, and 4 camera stations in 2016 (Table 1). The majority of detections (7 out of 8) were made in wetland or wetland-related habitat types (Table 1; Fig. 1C). Besides the Egyptian Mongoose, another 10 species of carnivores were recorded.

Identification. Egyptian Mongoose were identified by their characteristic long guard hairs, longer hair at the base of tail compared to the tip (Fig. 2A), and a black tail-tip (Fig. 2B) (Palomares 2013). Interestingly, on some of the camera trap photographs, the black tail-tip was not apparent (4 out of 8 photographs: Fig. 2A), which seems related to the camera trap angle.

Discussion

The Egyptian Mongoose appears to prefer riparian, lacustrine, and coastal habitats (Palomares and Delibes 1993, Angelici 2000). These habitat associations are concordant with our results where the majority of photo-detections occurred in wetland vegetation. Egyptian Mongooses have also been observed in grazed vegetation, as well as cultivated and irrigation fields, suggesting that they are not deterred by human presence (Palomares 2013). Our results concur with this as we detected Egyptian Mongooses in areas frequented by humans.

Our detections ranged from 265 to 288 km west (Fig. 1D) of the previously known westernmost occurrence record of the Egyptian Mongoose in South Africa. However, our detections were only 60 km to the east of a 2016 sighting in the 2628BC quarter degree grid. The 2016 sighting, combined with our detections, suggest that the geographical distribution of the species is larger than currently estimated. While these "extralimital" detections might be interpreted as being indicative of range expansion, it may be merely a result of this species being underdetected due to its cryptic habits (Do Linh San et al. 2016b). Furthermore, Egyptian Mongoose populations might be constrained by the presence of larger predators like Black-backed Jackals, *Canis mesomelas* Schreber, 1775, and Caracals, *Caracal caracal* (Schreber, 1776) (Do Linh San et al. 2016b).

Our detections of Egyptian Mongooses, over an extended period, outside their known range is attributable to either range expansion or underdetection of the species. We, therefore, suggest that future studies are needed to validate our observations and to determine whether this species is present in other wetland and riparian areas where it has not previously been detected. Investigations into the use of Egyptian Mongooses as bioindicators for monitoring wetland habitats should be pursued.

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Authors' Contributions

KWE and DL collected and catalogued the data, WM assisted in project design and management, LHS wrote the first draft, validated the data, and subsequent editorial work.

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Table 1. Photo-detections of the Egyptian Mongoose, *Herpestes ichneumon* (Linnaeus, 1758) at the Sasol Synfuels Plant in Secunda, Mpumalanga, South Africa during 2014–2016.

Date	Time	Longitude	Latitude	Vegetation type
8 October 2014	09:14:48 AM	29.13217	–26.53426	Wetland and grassland
5 November 2014	09:13:53 AM	29.13217	–26.53426	Wetland and grassland
19 February 2015	10:46:33 AM	29.13410	–26.54812	Wetland
12 March 2015	01:15:23 PM	29.12358	–26.54114	Wetland and grassland
27 October 2016	08:38:35 PM	29.19299	–26.54466	Wetland and grassland
29 October 2016	07:54:48 AM	29.14438	–26.53457	Wetland
5 November 2016	06:34:11 AM	29.10582	–26.53008	Grassland
5 November 2016	12:41:58 PM	29.14225	–26.55894	Wetland

Figure 2. Camera trap photographs of Egyptian Mongoose, *Herpestes ichneumon* (Linnaeus, 1758). **A.** Detail of the characteristic long guard hair, long hair at base of tail, but here black tail-tip is not apparent. **B.** Detail of the characteristic black tail-tip.

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