



# Record of Burmese Ferret Badger (*Melogale personata*, I. Geoffroy Saint-Hilaire, 1831) in Kathmandu, Nepal

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## Abstract

Burmese ferret badger (*Melogale personata*) was recorded by camera trapping for the first time in Nagarjun forest of Shivapuri Nagarjun National Park, Nepal. It was expected to inhabit only the eastern part of Nepal but recently the species has been recorded from central and western parts of the country. A globally rarely studied species was only observed during daylight in Nepal but this time it is photographed during the night. A Burmese ferret badger was captured for one event with three photographs with a photo capture rate index (PCRI) of 0.085 in the dense mixed forest of *Schima wallichii* and *Castanopsis indica*. A more comprehensive study of its ecology is necessary to implement suitable conservation measures.

**Keywords:** Camera trap, photo capture rate index, Nagarjun forest, protected area

## Introduction

Burmese or large-toothed ferret badger *Melogale personata* is one of the seven species of family Mustelidae reported from Nepal (Baral & Shah, 2008; Jnawali et al., 2011). It is an omnivorous small mammal that feeds on birds, small mammals, insects, and fruits (Nowak & Paradiso, 1984). It is one of the rarely recorded and studied mammalian species. Its occurrence has been documented from northeast India, Bangladesh, Nepal, southeast China, Myanmar, Cambodia, Thailand, Laos, and Vietnam (Pocock, 1941; Van Peenen et al., 1971; Islam et al., 2008; Schank et al., 2009; Robichaud, 2010; Kakati et al., 2014; Duckworth et al., 2016; Li et al., 2019; Bhatta et al., 2021). It is an elusive mammal identified by a dorsal streak that runs to its tail and a white stripe across the eyes and face, black around the nose, and black spots on cheeks (Baral & Shah, 2008; Jnawali et al., 2011; Duckworth et al., 2016; Bhatta et al., 2021). The population size and trend of Burmese ferret badger are unknown (Duckworth et al., 2016) but it has been recorded from the lowlands at 15 m (Schank et al., 2009) up to 1,520 m (Pocock, 1941).

Eventhough Kakati et al. (2014) suggested that need be confirmed only by identification based on the large P4 has an outer concave edge and is one-third in length to the upper cheek teeth similarly the upper P1 is excessively small in comparison to upper P2 This diagnosis is important for confirmation between Large-toothed Ferret Badger and Smalltoothed Ferret Badger *Melogale moschata* only because of their gross external similarity. But In Nepal presence of *M. personata* Its was indicated by Suwal and Verheugt (1995) in far eastern Nepal: Ilam and Jhapa, Okhaldhunga (Duckworth et al., 2016) and Syangja by Bhatta et al. (2021). The species in Nepal was first time described for science by Hodgson (1836) from

Rapti River bank probably near Hetauda, Makawanpur district as *M. nepalensis* (Hinton & Fry, 1923), but this taxon is now considered a valid subspecies of *M. personata* (Srinivasulu & Srinivasulu, 2012; Srinivasulu, 2018). According to Jnawali et al. (2011), there are no reports of this species in any protected area of Nepal. About a decade ago, Madhu Chetri of Manaslu Conservation Area Project had taken a photograph of this species from Filim Vilage inside the Manaslu Conservation Area (MCA) based on which Duckworth et al. (2016) confirmed its occurrence in Nepal (Dr. Madhu Chetri, previous Chief of MCA, pers. comm. 2022). We observed an individual at Central Zoo Jawalakhel which was rescued from Tatopani area of Gaurishankar Conservation Area on 26 January 2021 (Rachana Shah, Chief of Central Zoo pers comm. 2022). Recently Bhatta et al. (2021) recorded the species in the Syangja district as its westernmost distribution for Nepal. Here, we present camera trapped photographic record of the Burmese ferret badger from Nagarjun Forest of Shivapuri Nagarjun National Park, central Nepal.

## Materials and Methods

A camera trapping survey was carried out in the Nagarjun Forest of the Shivapuri-Nagarjun National Park (SNNP) to explore the diversity of mammalian fauna. The Nagarjun Forest covers an area of about 15 km<sup>2</sup> of Shivapuri-Nagarjun National Park between the elevations of 1350 m and 2100 m. The Nagarjun Forest area was annexed to the Shivapuri National Park in 2009 and the protected area was renamed as Shivapuri-Nagarjun National Park (Fig. 1). The Nagarjun forest supports a mid-hill forest ecosystem and has a sub-tropical climate grading to temperate climate (SNNP, 2017).

Our study in Nagarjun forest lasted from September 2017 to May 2018 at an elevation between 1350 m and 2100 m with a total survey effort of 1176.54 camera trap days. The study area was divided into 15 grid of 1 km \* 1 km grid. Among the 15 grids, 10 grids were selected randomly for camera trap installation. 10 infrared cameras (Bushnell Trophy Camera Model #119537C, Model #119405C) were installed in selected grid at the trail with sign and track of wildlife. The cameras traps were set in hybrid mode to take both still photographs and

videos simultaneously that were operated for 24-hours to capture night images. The camera traps were employed at 30–40 cm height above the ground. Photo capture rate index (PCR) was calculated following Carbone et al. (2001) and Koju et al. (2020). Slope and aspect and near the camera trap location was measured using android app clinometer-bubble, GPS Garmin Etrex 30 respectively, and canopy cover was estimated by visual estimation following Dhital et al. (2020).

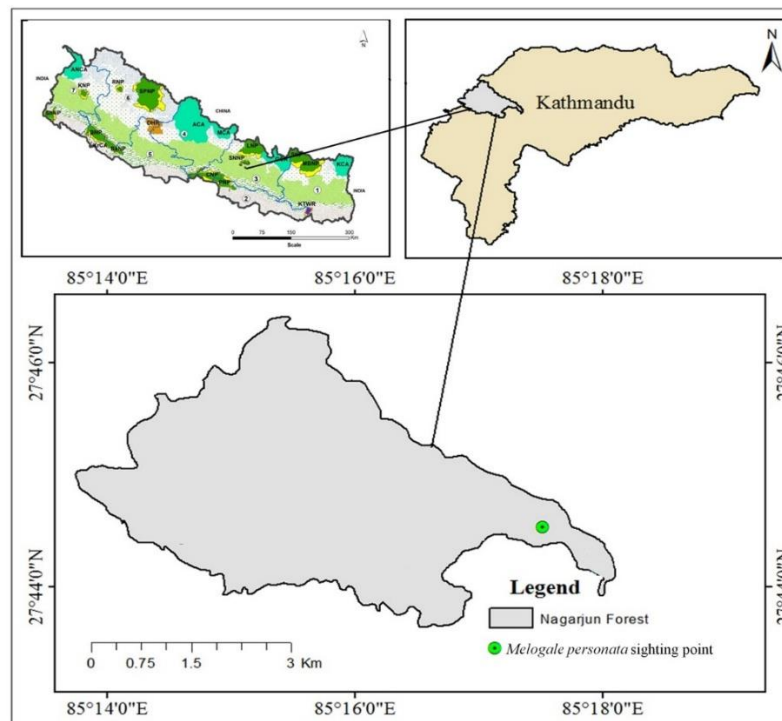


Figure 1 Map of the study area showing Burmese ferret badger photographed site

## Results and Discussion

The Burmese ferret-badger was photographed on 2017 November 22 at 01:22 AM (Fig. 2) at a single camera trap station at 27°44'30.53"N 85°16'53.40" E at an elevation 1400 m. There was a single independent event (PCR = 0.085), consisting of three photographs. This captured photo identified as Burmese ferret-badger with presence of a dorsal streak which runs to its tail, white stripe across the eyes and face, black around the nose and black spots on cheeks (Jnawali et al., 2011; Duckworth et al., 2016; Bhatta et al., 2021). The habitat of the camera trap site was the mixed forest of *Schima wallichii*, *Castanopsis indica*, and other associated plants. The location had canopy cover higher than 75%, slope 45°, and northeast aspect. Burmese ferret badger was captured by the camera while coming down from the hill on a wildlife trail which was also frequented by Assam macaque *Macaca assamensis*, Sambar deer *Rusa unicolor*, Barking deer *Muntiacus vaginalis*, leopard *Panthera pardus*, leopard cat *Prionailurus bengalensis*, and large Indian civet *Viverra zibetha*. Other mammalian species photographed at

Nagarjun forests in the cameratraps during the survey period include Chinese pangolin (*Manis pentadactyla*), Himalayan porcupine (*Hystrix brachyuran*) masked palm civet (*Paguma larvata*), yellow-throated marten (*Martes flavigula*), orange-bellied Himalayan squirrel (*Dremomys lokerial*), jungle cat (*Felis chaus*), and wild boar (*Sus sp.*).

We report an additional record of the species in Nepal inside a protected area within Kathmandu Valley. Previously the species was recorded from the habitats with grasses and bushes in Nepal (Bhatta et al., 2021) and Vietnam (Van Peenen et al., 1971), the tea garden of Maulvi Bazar district, northeastern Bangladesh Islam et al. (2008), and watermelon field adjacent to the house of a local family outside Botum Sakor National Park in Koh Kong province, Cambodia (Schank et al., 2009). These records are different from ours as the individual was recorded within the dense forest. Furthermore, in all the above-mentioned cases, the animals were observed during daylight while the present individual was captured by camera trap at

night. This might be the first camera trap record among the published research article so there may not be reporting of its

nocturnal activities. Therefore, it can be said that Burmese ferret badger is resilient to different habitat types.



**Figure 2** The photographed Burmese ferret badger in Nagarjun forest of Shivapuri Nagarjun National Park on 22 November 2017

The IUCN Red List of Threatened Species listed this species as Least Concern (LC) in 1998, Data Deficient (DD) in 2008, and then again LC in 2015 (Duckworth et al., 2016). India maintained *M. personata* in Schedule II (I) of the Wildlife (Protection) Act, 1972 (Kakati et al., 2014) and DD category (Sharma et al., 2015). Its ecological information is also lacking in Nepal, therefore the national status of this species is DD too (Jnawali et al., 2011; Amin et al., 2018).

Two species of ferret badger *Melogale* species the Large-toothed or Burmese ferret badger *M. personata* and the small-toothed or Chinese ferret badger *M. moschata* are difficult, perhaps impossible, to differentiate using pelage coloration and facial patterns (Kakati et al., 2014). But they have a combined, extensively overlapping, range on the Asian mainland (Pocock, 1941; Schank et al., 2009; Robichaud, 2010). In Nepal, no study specifically targeting Burmese ferret badger exists. Thus far, the records of the species in Nepal come in the form of anecdotal data from camera trap studies focused on other species or subjectively recorded. Kakati et al. (2014) suggested that species-level identification between *M. personata* and *M. moschata* is not possible from wild sightings or camera-trapping. Therefore, specimen collection and examination of the skull or phylogenetic analysis is important for species validity in the coming days. Moreover, since true geographic distribution and conservation status remain poorly known (Schank et al., 2009), a comprehensive study on its distribution, and ecology is

necessary for upcoming days to implement suitable conservation measures and assess its conservation status.

### Conclusions

This is the first record of Burmese Ferret Badger in Kathmandu Valley and protected area. Moreover this is the first record on camera trap and recorded in dense mixed forest of *Schima wallichii* and *Castanopsis indica*. There is scattered information on Burmese ferret badger and in geographic distribution and conservation status not robust in Nepal. The species level confirmation based on pelage colouration is still a debate therefore a systematic and detail research on distribution and abundance this species in warranted from Nepal.

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**Author Contributions:** NPK: Overall research design, conceptualization, field study, data collection, data analysis, manuscript write up, and revision; LPP: data analysis, manuscript write up, review; SMP: fieldwork for data collection, research study; KBS: data analysis guidance, identification, writing, and reviewing.

**Conflict of Interest:** The authors declare no conflict of interest.

**Data Availability Statement:** The data that support the finding of this study are available from the corresponding author, upon reasonable request.

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