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Short Communication

Evidence of presence of Marbled Cat *Pardofelis marmorata* (Martin, 1837) in Neora Valley National Park, Central Himalaya, India

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Abstract

The Marbled Cat (*Pardofelis marmorata* (Martin, 1837)) is an elusive and near threatened species as per the IUCN assessment and listed in the CITES Appendix – I. Present study record the first photographic evidence of Marbled Cat *Pardofelis marmorata* (Martin, 1837) in the Neora Valley National Park, Central Himalaya, India. Although, it was recorded from many parts of its range, the two camera trapped photographs within the National Park is claimed to be the first ever evidence of its occurrence in the Park. Nevertheless, many other ecological information such of population size, food and feeding behaviour etc. on the species is still unknown. Neora Valley National Park has not been given much of priority in terms of studying the ecology of the small carnivores existing inside the park and therefore need further investigations.

Keywords: Carnivore, Himalaya, Marbled Cat, Neora Valley

Introduction

The Marbled Cat *Pardofelis marmorata* (Martin, 1837) is a near threatened species as per the IUCN (Ver 3.1) and listed in the Appendix-I of the Convention on International Trade in Endangered Species (CITES) of Wild Fauna and Flora (Ross *et al*., 2016). In India, this species is protected under Schedule I of the Wildlife (Protection) Act, 1972. The phylogenetic studies reveal that the species has originted from its ancestor the Bay cat, around 1.4 million years ago (O'Brien & Johnson, 2007). The known range of this species is spread from the foothills of the Himalayas in India and Nepal to eastward in South-Eastern China, main land south-east Asia and in Borneo and Sumatra Islands of Indo-Malayan biogeographic realm (Ross *et al*., 2016). However, presence of this species is doubtful in Nepal and needs confirmation (Dahal & Dahal, 2017). In India, the range of marbled cat is fragmented and restricted to the Cental Himalayan region of North Bengal and Sikkim and to North-Eastern Hill tracts, States of Arunachal Pradesh, Manipur, Meghalaya, Assam, Nagaland, Mizoram and Tripura, within an elevational range of 1500-3000 m ASL (Ross *et al*., 2016), although it is recorded from 3810 m ASL from neighbouring Bhutan (Dhendup, 2016). Marbled cat is a predominantly diurnal, arboreal and extremely elusive species (Nijman & Shepherd, 2015; Johnson *et al*., 2009; Singh & Macdonald, 2017), although some reported it as nocturnal because of the activity pattern of the prey (Sunquist & Sunquist, 2017 ; Borries *et al*., 2014). Marbled cat is reported to be least encountered species in camera trap surveys (Datta *et al*., 2008). Although similar looking at times, but marbled cat differs from its sympatric species clouded leopard by smaller in size and less distinct coat colour and patterns as this species varies from grey brown to red brown with irregular dark margined patches in the coat (Menon, 2014). Nevertheless, it is also reported to be melanistic (Wibisono & McCarthy, 2010) and thereby leading to more confusion in field sightings.

Several studies have been conducted to document the mammalian diversity with special reference to carnivores in the Neora Valley National Park in Kalimpong District of West Bengal, following different methods such as: direct observations, questionnaire and indirect evidences (Biswas *et al*., 1999; Chakraborty, 2008; Mallick, 2012). Marbled cat has been previously reported to be found in

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the Neora Valley National Park (Mallick, 2012), which was with out any photographic evidence of its occurrence or correct identification of the species. The present study confirms the presence of this elusive cat species in the Neora Valley National Park with photographic evidence from camera traps.

Material and methods

Study Area

Neora Valley National Park with an area of 88 km^2 is situated in the biogeographic zone 2C of the Indian Himalayas (Rodgers and Panwar, 1988). The Park has an altitudinal gradient of 670 m to 3200 m with vegetation constituting tropical lower hill forest, sub-tropical middle hill forest, temperate upper hill forest and sub-alpine (Mallick, 2010). Its diverse vegetation along with hill and valley regions with much topographic variability makes the PAs rich in fauna as well as faunal resources. The Neora River flows from the north to south of the National Park along with its tributaries.

Methodology

For field work in the Neora Valley National Park to assess the faunal diversity, different methods including camera trapping for elusive and nocturnal species was used. Present survey has been started since March, 2016 and is still going on. The entire National Park was divided into 1 km X 1 km grid. Within the 88 grids of the entire park 82 grids has been selected for survey as rest of the 6 grids covers less than 30% of the 1km^2 area. 10 infrared camera traps (SPYPOINT Model No- Force 11D) were deployed in both upper and lower regions at varying altitude. A single camera trap was placed for 15-20 days at every trap stations and has been rotated around grids to record the presence/ abundance of elusive mammals and ground birds.

Result and Discussion

During the fieldwork, on 14th November 2017 at 22:46hr, a photograph of marbled cat was captured in the camera, while it was crossing the trail, near Kattus Dara (Lat.

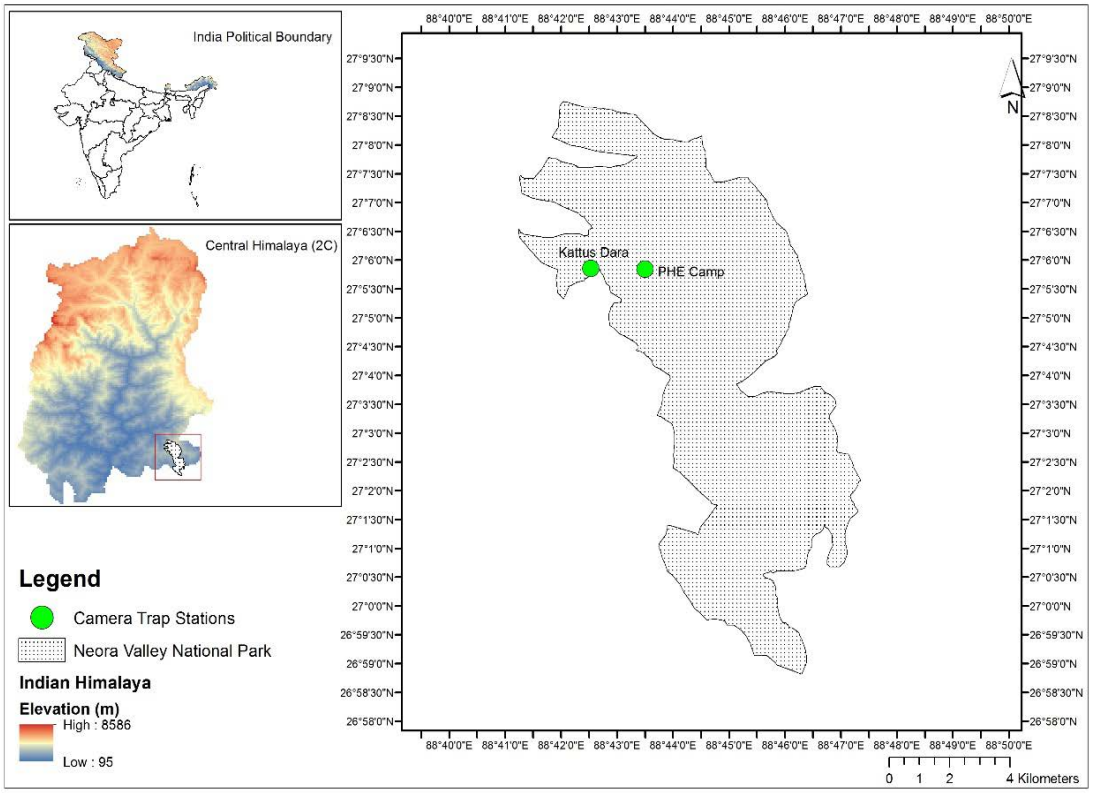

Figure 1. Study area pointing the location points of the camera traps capturing the Marbled Cat Images.

Figure 2. Camera trap 1 recording the first individual.

Figure 3. Camera trap 2 recording the second individual.

27.09757N Long. 88.70886E; 2605 m MSL) Figure 1. Subsequently, a second camera captured a marbled cat on 16th April, 2018 at 21.38 hr, near PHE Camp (Lat. 27.097375N Long. 88.725012E; 2175 m MSL) (Figure 2&3). Additionally, photographs of a squirrel (*Dremomys lokriah* (Hodgson, 1836)) (n=5) and rats (*Niviventer* sp) (n=13) were recorded in the camera trap sites. Previous studies have evident rodents as a substantial food source for this cat species other than birds (Guggisberg, 1975; Sunquist & Sunquist, 2017). Apart from the bamboo patches in that area, significant density of Stone oak trees (*Lithocarpus pachyphyllus*) is recorded from the area. Marbled cats are known to inhabit different types of vegetation (Menon, 2014). In the present study, marbled cat was recorded in a mixed bamboo forest as well as in a broadleaf forest with predominantly *Pinus* sp in the area.

Although, it is recorded from many parts of its range (Ross *et al.,* 2016; Sunquist & Sunquist, 2017), ecological information on the species is scanty. Studies also have reported variation and differences in the habitat and food choice, based on the recorded locations and the presence of competing species (Borries *et al*., 2014). However, altitudinal separation also has been noted for marbled cat to avoid other sympatric species (Johnson *et al*., 2009). Not only the lack of knowledge, but also an increase in anthropogenic pressure *viz*. habitat encroachment and conversion of forest covers into other land use practices leading to space crunch for the species (Hearn *et al*., 2016). Hence, detailed studies focusing different ecological aspects of marbled cat is highly essential for Neora Valley National Park to understand the population and prepare suitable conservation strategies for such rare small carnivore.

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