

Notable observations on the melanistic Asiatic Golden cat (*Pardofelis temminckii*) of Sikkim, India

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ABSTRACT

During our investigations on the status of carnivores and their prey in Prek Chu Catchment (182 km²) of Khangchendzonga Biosphere Reserve (BR), Sikkim, from January 2009 to August 2010, we obtained the first photographic confirmation of Asiatic Golden cat *Pardofelis temminckii* from Sikkim and also a new altitudinal record (3,960 m) for the species. Of the five felids recorded from the area, the Asiatic Golden cat had the second highest photo-capture rate of 0.50 ± 0.16 (mean \pm S.E) photo-captures/100 trap days. Interestingly, all the photographs of the Asiatic golden cat from different parts of Prek Chu were of melanistic form and did not resemble any of described three subspecies of Asiatic Golden cat *viz.*, *Catopuma t. temminckii*, *C. t. dominicanorum*, and *C. t. tristis*. We hypothesize that either all the golden cats of Khangchendzonga BR are melanistic or they could be a different subspecies. Further research on these aspects using molecular genetics is underway.

KEYWORDS: Asiatic Golden cat, Camera trapping, Khangchendzonga Biosphere Reserve, Melanistic, Photo-capture rate, Subspecies

The Asiatic golden cat *Catopuma temminckii* Vigors and Horsfield, 1827, (earlier known as *Profelis temminckii*) is the largest of the group of smaller Oriental felines with the exception of clouded leopard *Neofelis nebulosa* (Prater, 1971; Mukherjee, 1998). Though it appears similar to the African golden cat *Profelis aurata*, it is slightly heavier and has a proportionately longer tail (Sunquist & Sunquist, 2002) and males are larger than females (Lekagul & McNeely, 1977; Tan, 1984; Nowell & Jackson, 1996). The most common body coloration is fox-red to golden-brown, but it can also be dark brown, pale cinnamon, bright red, or grey with occasional melanistic forms (Ghimirey & Pal, 2009). The pelt is usually quite uniform in colour, but there is a morph marked with a pattern similar to that of the ocelot *Leopardus pardalis* (Jutzeler, Xie & Vogt, 2010). This morph is found all over the species range in China, and has been reported mainly from Sichuan and Tibet (subspecies *Catopuma temminckii tristis*; Nowell & Jackson, 1996) and also detected in Bhutan (Wang, 2007). The species is distributed in India, China, Tibet and

Nepal (Sunquist & Sunquist, 2002), as well as in Bhutan, Bangladesh, Myanmar, Thailand (Nowell & Jackson, 1996), Lao PDR, Cambodia, Vietnam (Duckworth *et al.*, 2005), on the Malaysian peninsula, and in Sumatra, Indonesia (Sunquist & Sunquist, 2002). In India, its occurrence has been reported only from north eastern states *viz.*, Assam (Choudhury, 2007), Arunachal Pradesh (Datta, Anand & Naniwadekar, 2008; Selvan & Salvador, pers. comm. 2011) and Sikkim (Biswas & Ghose, 1982).

Study Area

Sikkim - a small mountainous state in the Eastern Himalayan region is positioned at the convergence of three biogeographic realms, *viz.*, Palaeartic, Africo-tropical and Indo-Malayan (Mani, 1974). This area is recognized as the global biodiversity hotspots (Myers *et al.*, 2000) and also one among the important global 200 ecoregions (Olson & Dinerstein, 1998). The Khangchendzonga Biosphere Reserve (BR) in Sikkim is one of the most significant biodiversity hotspots of India with

varying eco-zones from temperate to arctic (1,220–8,586 m), and a repository of many rare and endangered flora and fauna primarily due to its location and remarkable variations in altitude. The Khangchendzonga BR encompasses temperate, subalpine and alpine habitats (1,000 to 5,000 m) as well as rocky slopes, glacial moraines and permafrost areas (> 5,000 m) with diverse slope and aspect categories, along with a range of wildlife use. The BR consists of seven watersheds, viz., Lhonak, Zemu, Lachen, Rangyong, Rangit, Prek and Churong. We selected Prek *chu* (*chu* = river) catchment as our intensive study (Figure 1).

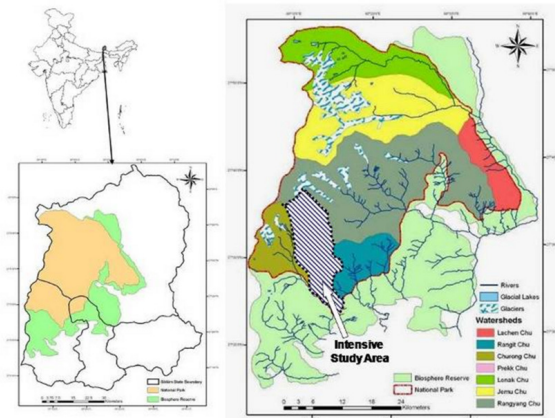


Figure 1. Location of Khangchendzonga Biosphere Reserve in Sikkim, India showing the different watersheds including Prek *Chu* catchment – the intensive Study Area.

In spite of such rich biodiversity, there has been no scientific survey or study on the assessment of mammalian assemblage in the area (Sathyakumar *et al.*, 2009) with the exception of Tambe (2007) who mentioned presence of some mammals in the region. With this background, a study on carnivores, ungulates and galliformes was initiated in Khangchendzonga BR during 2008.

Methodology

Field surveys were carried out in all seven watersheds of the BR, but Prek *chu* catchment was selected and intensively surveyed because it represents all the habitats of the BR (Sathyakumar *et al.*, 2009). Since camera trapping is the most appropriate method for mammal inventories in all environmental conditions especially for cryptic animals (Silveira, Jacomo Anah & Diniz-Filho, 2003), we laid 27 camera trap units at 71 different sites in 2 km x 2 km grids of the Prek *chu* catchment

placed along trails or paths that were actively used by study species evident from their signs such as: tracks, feeding signs, marking signs (spray, scrape), pug/h hoof marks, digging signs, scats/faeces and other signs (Ahlborn & Jackson, 1988) with at least one camera trapping unit covering each of the grids. Camera units were attached to trees/rocks 15–30 cm above the ground and 3–5 m from a trail or point where animal movement might be expected. The camera trapping was done continuously (24 hrs) in all the seasons from January 2009 to August 2010 using Deercam (2), Wildview (2), Stealthcam (18) and Moultrie (5) instruments.

Results

A sampling effort of 6,278 camera-days across 71 sample sites was achieved in the three survey zones (1,407 camera-days in temperate, 3,061 camera-days in subalpine, 1,810 camera-days in alpine), resulting in 4,517 photographs. Of these, there were 2,668 wild animals (mammals & birds), and 1,894 were domestic animals and human. We obtained 25 photo captures of Golden cat, the first photographic confirmation from Sikkim. All the golden cat captures were melanistic (Figure 2). Neither of them had the most common fox-red to golden-brown colour nor the morph marked with a pattern similar to that of the ocelot. During the 20 months survey, 42 mammal species were recorded, five of which were felids ($n = 85$ photographs). Other felids captured were snow leopard *Panthera uncia*, clouded leopard, jungle cat *Felis chaus* and leopard cat *Prionailurus bengalensis*. Melanistic golden cat photographs were captured from 11 sites situated in different grids of temperate (3 sites) and subalpine forests (8 sites) ranging from 1,980 m to 3,960 m. While the sites situated in temperate zone were dominated by *Castanopsis-Symplococ-Quercus* forest, the sites situated in subalpine zone were either dominated by *Abies-Betula-Rhododendron* forest or dwarf *Rhododendron* at >3,700 m. We calculated photographic encounter rate (No. of photographs \times 100 / Total No. of trap days) for all felids and found that the photographic encounter rate of the melanistic golden cat was the second highest (0.50 ± 0.16 [\pm S.E]) following the leopard cat (2.16 ± 0.72), a very common felid of north east India. Photographic encounter rate of the melanistic golden cat was highest in 2,500–3,000 m elevation zone (0.77 ± 0.51) followed by 3,500–4,000 m (0.69 ± 0.21), though the differences were

non-significant (Kruskal-Wallis Chi square = 4.09, df = 3, p = 0.25).



Figure 2. Photo captures of melanistic golden cats from different camera locations in *Prek Chu* catchment area of Khangchendzonga Biosphere Reserve

Discussion

Our observations have three very interesting aspects. Firstly, all the photo captures were of melanistic morphs which are reported as occasional from elsewhere (Ghimirey & Pal, 2009). In China, the ocelot morph seemed to be more common than the uniform morph (Jutzeler *et al.*, 2010) of golden cat. The recent camera trap capture of this ocelot morph from high altitudes of Bhutan (Wang, 2007) has also confirmed its presence in Eastern-Himalayan montane forests but not mentioned about the presence of the melanistic form there. Records from Arunachal Pradesh (Datta *et al.*, 2008; Selvan & Salvador, pers. comm. 2011) and Assam (Choudhury, 2007) have also not mentioned about the presence of the melanistic form of golden cat. Interestingly, the occasional melanistic form was photographed only from Makalu-Barun National Park, Nepal (Ghimirey & Pal, 2009) which is further west of Khangchendzonga BR. Our results indicate that the melanistic form of golden cat is more common in Khangchendzonga BR than the common golden-brown or ocelot

morph though they may be present but not detected and this may be the case for Nepal Himalaya also.

Secondly, none of the melanistic golden cat photographs that we obtained from Khangchendzonga BR matched with the photographs and descriptions of the other three subspecies *viz.*, *Catopuma t. temminckii*, *C. t. dominicanorum*, *C. t. tristis* (Grubb *et al.*, 2005). Uniform coat colour without any pattern suggested close resemblance with the most common and widely distributed subspecies *C. t. temminckii*; but non detection of this most common morph raises the question as to whether all the golden cats of Khangchendzonga BR are melanistic in colour or they are a different subspecies of golden cat. To be conclusive, we are investigating these aspects using molecular genetic studies. Further investigations using camera traps and genetics are required in eastern parts of Sikkim to know the exact distribution of this melanistic morph and for the detection of ocelot and the common morph of golden cat.

Thirdly, we report a new altitude record of 3,960 m for the golden cat. There are studies suggesting that the golden cat may be less common in montane forests (Holden, 2001; Mishra, Madhusudan & Datta, 2006), although it has been recorded at an elevation of 3,738 m in Bhutan (Wang, 2007). Our observations confirmed that it is common in montane forests dominated by *Abies* and *Rhododendron*, and it could also inhabit the tree line zone with dwarf *Rhododendrons*.

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