

First photographic evidences of two rare cats from Pakke Tiger Reserve, western Arunachal Pradesh

The Asiatic golden cat and marbled cat are popularly called small cat species among the wild felids. Both these cats are found distributed in the South East Asian region and come from a common lineage of bay cats¹ and inhabit moist evergreen forests. They are placed in the 'Near threatened' and 'Vulnerable' category respectively, according to the IUCN. Both are found in a variety of habitats². Nevertheless, both cats face enormous pressures from deforestation and hunting^{3,4}.

The marbled cat (*Pardofelis marmorata*) is found in tropical Indo-Malaya westward along the Himalayan foothills westward into Nepal and eastward into southwest China, and on the islands of Sumatra and Borneo. There are few locality records of this species^{2,5}. It is listed under Schedule I of the Indian Wildlife Protection Act, 1972, and also considered as Vulnerable by the IUCN⁴. The marbled cat is primarily associated with moist and mixed deciduous–evergreen tropical forest^{5,6}, and may prefer hill forests^{7–10}. A few sightings have been made in secondary forests or cleared areas near forests, but it is likely forest-dependent^{2,5}. Grassman and Tewes¹¹ reported the observation of a pair of adult marbled cats in a salt lick in Phu Khieu National Park, Thailand. Earlier reports from Yunnan Province, China in the 1970s, have confirmed its presence¹². The marbled cat is the size of a large domestic cat and resembles the clouded leopard morphologically, with a long tail, cloud-like pelage pattern and elongated canines^{5,13}.

The Asiatic golden cat, also known as Temminck's cat, is a medium-sized felid, which is found throughout South East Asia, from Nepal and parts of China to peninsular Malaysia and Sumatra, from the lowlands to altitudes of 3000 m (refs 14 and 15). Little is known about the status of the Asiatic golden cat and it is rarely seen in the wild¹⁶. However, there has been a recent increase in records from camera-trapping studies (J. Sanderson, pers. commun.)¹⁶ such as from Bhutan¹⁵ and Nepal¹⁷. Some studies have found more records of Asiatic golden cats than of other sympatric small felids, suggesting it may be more common than previously thought³.

The Asiatic golden cat is rather heavily built with a uniform but highly polymorphic pelage ranging from black to golden red, that may also be marked with spots and stripes in a pattern similar to that of the leopard cat⁵. The body size of the Asiatic golden cat is similar to that of the clouded leopard⁹. It does not show any significant preference for particular habitats⁹ and is known to occur in forested habitats, including dry deciduous forest, evergreen forest and tropical rainforest², as well as in more open habitats such as shrubs and grasslands¹⁸. Some studies have suggested it may be less common in montane forest: in the Kerinci Seblat National Park, Sumatra, all records for this species were from lowland forest with none from montane forest, unlike the clouded leopard and marbled cat⁸.

In India, the golden cat as well as the marbled cat are found in the North East where they occur mainly in forested hills and foothills of the Lesser Himalayas¹⁸. Recent records within the country include Namdapha National Park, Arunachal Pradesh¹⁹, Kanchenjunga Biosphere Reserve, Sikkim²⁰, Jeypore–Dehing lowland rainforest²¹, and Manas National Park in Assam¹⁸. The marbled cat appears to be restricted to the eastern Himalayan foothills between 1500 and 3000 m altitude, associated with moist deciduous and semi-evergreen forest habitats^{22,23}. It is found in NE India as well as in Jammu and Kashmir²⁴. Recent reports from India are from the Arunachal Pradesh^{25,26} and Manipur²⁷.

The Pakke Tiger Reserve (PTR), 92°36'–93°09'E and 26°54'–27°16'N, is situated in the East and West Kameng



Figure 1. *a*, The Marbled cat (*Pardofelis marmorata*) from Pakke Tiger Reserve, Arunachal Pradesh. *b*, Marbled cat skin from Pakke Kesang, western Arunachal Pradesh. (Photo: Salvador Lyngdoh.)

districts of Arunachal Pradesh at the foothills of the Lesser Himalayas. PTR is spread over 862 sq. km and is contiguous with the Nameri National Park (200 sq. km). The terrain is undulating and altitude ranges from 150 m to 2300 m. The general vegetation type of Pakke (and consequently of PTR) is classified as Assam valley tropical semi-evergreen forest^{28,29}, dominated by species of *Euphorbiaceae*, *Lauraceae*, *Meliaceae*, *Anacardiaceae* and *Annonaceae*, and made up of tracts of tropical evergreen, tropical semi-evergreen and secondary moist bamboo. There are more than 50 villages surrounding PTR, the nearest being approximately 0.5–1 km away from the park boundary.

Field work was carried in the winter of 2010–11. A pair of cameras were placed in each 2 × 2 km grid which covered the study area. Passive camera traps (Moultrie, D-40, Moultrie Feeders, Alabama) were deployed in several locations with a distance of 2–3 km between each unit to estimate the abundance of other mammal species as well. Cameras were operated 24 × 7, with a delay of 1 min for 33 days yielding an effort of 1638 trap nights. A total 490 km were walked extensively during the period of October 2010 to December 2010 (i.e. 39 days) was spent walking trails and streams. A total of 371 households were interviewed in socio-economic surveys spanning three districts of western Arunachal Pradesh, viz. East Kameng, Papumpare and Lower Subansiri. Various questions pertaining to livelihood and awareness as well as hunting prac-

tices were asked and answers were noted down in a standard questionnaire.

The marbled cat (*P. marmorata*) was photographed (Figure 1a) on the 43rd sampling day at 06:40 h and subsequently on the 48th sampling day at 15:18 h on the 11th camera trap station (27.07104N, 93.78225E, 553.10 m amsl). The chief vegetation around the area was dominated by *Duabanga* sp., *Dillenia indica*, *Pterospermum* sp., *Canarium strictum* and *Terminalia* sp.

Earlier records of marbled cats have been based on reports from local people from surrounding villages²⁶ and evidence of its presence was determined from skin (Figure 1b). Skins are usually kept for ritualistic purposes or as trophies by the local Nyishi tribes who dominate the area. In higher areas of PTR, residents have reported to have sighted and hunted the marbled cat. This was confirmed by photographs of the species which were shown to avoid any confusion with other lesser cats or carnivores.

The Asiatic golden cat was sighted in PTR²⁷ (Figure 2) at around 8:59 am on 5 December 2010 (27.05801N, 92.77662E, 157.3 m amsl). It was seen crossing the Nameri River, moving from the southeast towards the northeast. The vegetation around the sighting area included trees such as *D. indica*, *Terminalia bellerica*, *Castanopsis* sp., *Duabanga* sp. and *Canarium* sp. The terrain was undulating to hilly. According to Mishra²⁵ in Tawang and West Kameng districts in Arunachal Pradesh, no Asiatic golden cat was found in the region.



Figure 2. Asiatic golden cat (*Catopuma temminckii*) sighted in Pakke Tiger Reserve. (Photo: Salvador Lyngdoh.)

The other record of golden cat in Arunachal Pradesh is from the moist evergreen habitat of Namdapha National Park below 2000 m in Changlang District²⁶, in the eastern part of the state, approximately 360 km NE (aerial distance) of PTR (from the point of sighting of the golden cat). The other records of the species in Assam are at an approximate (aerial) distance of 115 km SW of PTR (Manas National Park) and 265 km NE of PTR (Jeypore–Dehing rainforest).

The Asiatic golden cat and the marbled cat are threatened primarily by habitat loss due to deforestation and also by indiscriminate snaring⁸. North East India still has 64% of its total geographical area under forest cover, which, however, is rapidly declining across the entire region²⁸. Additionally, the vast majority of the indigenous inhabitants of the region are meat-eaters and almost all communities have expert hunters and trappers²⁸. Hunting is regarded as a serious threat to wildlife in Arunachal Pradesh³⁰.

A study on wildlife hunting in four districts of Arunachal Pradesh, including East Kameng and Tawang districts³⁰, reported a total of 33 mammal species being hunted, including the golden cat. According to this study, the golden cat was hunted primarily for its skin. The marbled cat has also been reported by local people to be a nuisance for poultry depredation as well as other small livestock²⁵. Golden cats are also reported to have killed livestock, including poultry and larger animals such as sheep, goats, buffalo calves and other ungulates⁵. The Asiatic golden cat is threatened by declining ungulate abundance in many parts of South East Asia³. Earlier studies have shown rich mammalian assemblage at high altitudes in western Arunachal Pradesh, including 13 species of global conservation importance²⁵. Community-based initiatives which reduce over dependence on forest wildlife or the sustainable harvesting programmes are among the measures that could produce long-term benefits for the conservation of forest and habitats.

1. Johnson, W. E., Eizirik, E., Pecon-Slatery, J., Murphy, W. J., Antunes, A., Teeling, E. and O'Brien, S. J., *Science*, 2006, **311**, 73–77.
2. Nowell, K. and Jackson, P., *Wild Cats. Status Survey and Conservation Action Plan*. IUCN/SSC Cat Specialist Group,

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- Gland, Switzerland and Cambridge, UK, 1996.
3. Sanderson, J., Mukherjee, S., Wilting, A., Sunarto, S., Hearn, A., Ross, J. and Khan, J. A., In IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4, 2008; www.iucnredlist.org; assessed on 12 December 2010.
 4. Hearn, A. *et al.*, In IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4, 2008; www.iucnredlist.org; accessed on 17 January 2011.
 5. Sunquist, M. E. and Sunquist, F., *Wild Cats of the World*, University of Chicago Press, Chicago, Illinois.
 6. Rabinowitz, A. R. and Walker, S. R., The carnivore community in a dry tropical forest, 1991.
 7. Duckworth, J. W., Poole, C. M., Tizard, R. J., Walston, J. L. and Timmins, R. J., *Biodivers. Conserv.*, 2005, **14**, 1263–1280.
 8. Holden, J., *Cat News*, 2001, **35**, 11–14.
 9. Grassman Jr, L. I., Tewes, M. E., Silvy, N. J. and Kreetiyutanont, K., *J. Mammal.*, 2005, **86**, 29–38.
 10. Morino, L., *Cat News*, 2009, **50**, 20–20.
 11. Grassman Jr, L. I. and Tewes, M. E., *Cat News*, 2002, **36**, 19.
 12. Wang Zongyi and Wang Sung, *Cats of the World: Biology, Conservation and Management* (eds Miller, S. D. and Everett, D. D.), National Wildlife Federation, Washington DC, 1986, pp. 201–210.
 13. Pocock, R. I., *Proc. Zool. Soc. London*, 1932, 741–766.
 14. Baral, H. S. and Shah, K. B., *Wild Mammals of Nepal*, Himalayan Nature, Kathmandu, 2008.
 15. Wang, S. W., *Cat News*, 2007, **47**, 27–28.
 16. Jutzeler, E., Xie, Y. and Vogt, K., *Cat News, Spec. Issue*, 2010, **5**, 40–41.
 17. Ghimirey, Y. and Pal, P., *Cat News*, 2009, **51**, 19.
 18. Choudhury, A., *Cat News*, 2007, **47**, 29.
 19. Datta, A., Anand, M. O. and Naniwadekar, R., *Biol. Conserv.*, 2008, **141**, 1429–1435.
 20. Bashir, T., Bhattacharya, T., Poudyal, K. and Sathyakumar, S., *Nebio*, 2011, **2**, 1–4.
 21. National Geographic Daily News, <http://news.nationalgeographic.com/news/2010/03/photogalleries/100312-cat-speciesrain-forest-pictures/>; 2010.
 22. Biswas, B. and Ghose, R. K., Report, Zoological Survey of India, Kolkata, 1982.
 23. Banerjee, L. K., Report, Botanical Survey of India, Department of Environment, Howrah, Calcutta, 1984.
 24. Menon, V., *A Field Guide to Indian Mammals*, Dorling Kindersley/Penguin, New Delhi, India, 2003.
 25. Mishra, C., Madhusudan, M. D. and Datta, A., *Oryx*, 2006, **40**, 29–35.
 26. Datta, A., Naniwadekar, R. and Anand, M. O., Final report to the Rufford Small Grants Program (UK), Nature Conservation Foundation, Mysore, 2008, p. 80.
 27. Ramakantha, V., Gupta, A. K. and Kumar, A., Biodiversity of Northeast India: An overview, 2003; <http://wiienviis.nic.in/rainforest/chapter1.htm>; accessed on 17 January 2011.
 28. Champion, H. G. and Seth, S. K., *The Forest Types of India*, The Manager of Publications, Delhi, 1968.
 29. Borah, J., Sharma, T., Lyngdoh, S. and Tapi, T., *Cat News*, 2010, **52**, 24–25.
 30. Aiyadurai, A., Report submitted by Nature Conservation Foundation, India, to the Rufford Small Grants Foundation, UK, 2007.

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