First camera-trap record of Small-toothed Palm Civet *Arctogalida trivirgata* from India

Kashmira KAKATI* and Shikha SRIKANT

Abstract

An April 2013 camera-trap record of Small-toothed Palm Civet *Arctogalida trivirgata* in Balpakram National Park, Meghalaya, constitutes the first camera-trap record of the species from India, and one of few records by any method from the country.

Keywords: Balpakram National Park, Meghalaya, shifting cultivation

Indian records of Small-toothed Palm Civet

Among the many proposed subspecies of Small-toothed Palm Civet *Arctogalidia trivirgata*, three groups are typically recognised: *A. t. leucotis* and allied forms, from mainland areas north of the Thai–Malay peninsula; *A. t. trivirgata* and allied forms from the Thai–Malay peninsula, Sumatra and Borneo; and *A. t. trilineata* from Java (Van Bemmel 1952, Corbet & Hill 1992).

There are few records of Small-toothed Palm Civet from the Indian sub-continent. The species has been considered to be very rare in the region (e.g. Choudhury 1999), although surveys among hunters suggest that it might be recorded only rarely because it is nocturnal and arboreal (Choudhury 2013). There may be only one historical record from India, from Nagaland in 1919 (Wroughton 1921). There are also statements of occurrence in Darjeeling (see below) and Sylhet, which lies mostly in present-day Bangladesh and the precise locality of the civet is not recorded (Blanford 1888–1891, Sclater 1891). There seem to have been no Indian records between 1919 and 1994. Since then, there have been five first-hand records from three sites, all in North-east India: (i) a captured juvenile seen at the village of Kothalguri, Dibrugarh district, in the state of Assam in 1994 and later released into the Upper Dehing (West Block) Reserve Forest (RF) near the village by A. U. Choudhury (verbally 2014). The animal is believed to have been caught somewhere in the belt of wet evergreen forest on the Assam (Tinsukia district) – Arunachal Pradesh (Tirap district) border (Choudhury 2013); (ii) three sightings at Namdapha National Park, Arunachal Pradesh, in 2009, 2012 and 2014 (Naniwadekar *et al*. 2013, Murali *et al*. 2014); and (iii) a sighting at Dampa Tiger Reserve, Mizoram state in 2014 (Raman & Zakhuma 2014).

We hereby add Balpakram National Park, Meghalaya state, also in North-east India, as another locality record in India for the Small-toothed Palm Civet. This record is the first in India by the camera-trap method.

Study area

The Balpakram–Baghmara Landscape is approximately 600 km^2 and is located in the South Garo Hills district of the state of Meghalaya, North-east India. Government-owned forests cover 68% of the landscape and comprise two protected areas, Balpakram National Park (notified area 220 km^2 + 132 km^2 acquired but yet to be notified) and Siju Wildlife Sanctuary (5.18 km^2), and two Reserve Forests (RF): Baghmara RF (43.9 km^2) and Rewak RF (6.47 km^2) (Fig. 1). The remaining is community land of the Garo tribe, where land use includes shifting cultivation, areca nut, cashew and rubber plantations, community forests and village settlements. Altitude ranges from 50 to 1,023 m asl at Chutmang peak. Both primary and secondary stands of Tropical Moist Evergreen Forest, Tropical Semi-evergreen Forest and Tropical Moist Deciduous Forest, as defined by Champion & Seth (1968), occur here, as do grasslands, shola and riparian forests and degraded land (Kumar & Rao 1985). The terrain is hilly with deep gorges and limestone formations (Wanniang & Thiek 2007).

Methods

Systematic camera-trapping under a three-year project 'Assessing Mammal Presence in the Balpakram–Baghmara Landscape, Meghalaya, India' is underway. The study design uses 2 km × 2 km grid cells where eight camera-traps per cell are deployed for 10 consecutive days. Two to three cells are sampled per camera-trap session, with each cell sampled once. During January to May 2013 and November 2013 to April 2014, 24 cells were sampled. At one station, the camera-trap was stolen. Therefore, results were obtained from camera-traps deployed at 191 different stations for a total of 1,910 camera-trap-nights. Camera-trap stations are selected after sign surveys in each cell.

A sign survey in the Chutmang West grid cell on 24 March 2014 revealed tracks probably of Leopard Cat *Prionailurus bengalensis*, another larger but indistinct carnivore track and remains of a freshly killed crab on the Agisep stream bed, as well as Sambar *Rusa unicolor* droppings further along the trail.

New record

A Small-toothed Palm Civet was camera-trapped at 20h33 on 2 April 2013 in Balpakram National Park (Fig. 2). The camera-trap station (Fig. 3), in an area of Tropical Moist Evergreen forest on a low, south facing slope of the Chutmang hills, was in the Chutmang West grid cell in the rocky Agisep stream at 25°18′14″N, 90°44′05″E (datum WGS84) at a nominal altitude of 693 m (recorded with a Garmin Etrex GPS). The camera-trap was facing, and six feet from, where a narrow foot-trail crossed the stream-bed. The Chutmang peak was about 880 m northeast of this location. At the time of survey, the stream had very little flowing water. It broke the canopy by about 15 m.

Tree species such as *Walsura robusta* and *Mesua ferrea* formed a closed canopy on either side of the stream, with cane

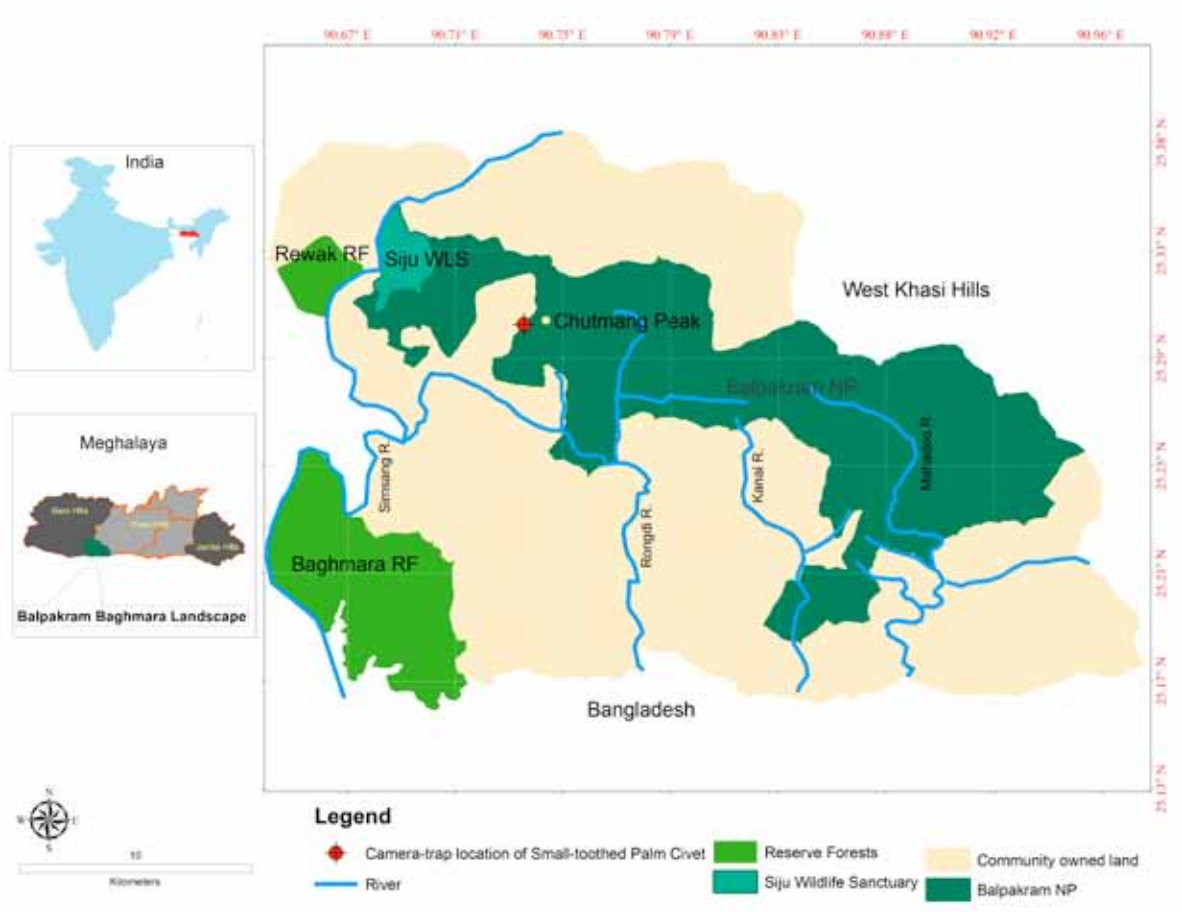

Fig. 1. The Balpakram–Baghmara Landscape, Meghalaya, India, showing location of camera-trapped Small-toothed Palm Civet *Arctogalida trivirgata*.

Fig. 2. Camera-trap photograph of Small-toothed Palm Civet *Arctogalida trivirgata*, Balpakram National Park, Meghalaya, India, on 2 April 2013.

Fig. 3. Camera-trap station where a Small-toothed Palm Civet *Arctogalida trivirgata* was photographed in Balpakram National Park, Meghalaya, India, on 2 April 2013.

and ferns on the bank slopes. Canopy height, estimated visually, was over 25 m. The camera-trap was fixed to a fallen log, 1 foot above ground level. The camera-trap station was 100–130 m inside the Balpakram National Park boundary, just outside which lay shifting cultivation or *jhum* areas of the village of Meduawe. This included open grassy fields and 2-year *jhum* fallows dominated by *Macaranga denticulata*.

Other species photographed at this camera-trap station were Crab-eating Mongoose *Herpestes urva*, an unidentified weasel *Mustela*, Asiatic Brush-tailed Porcupine *Atherurus macrourus* and Sambar. Chutmang peak and the Balpakram plateau in the National Park are sites of cultural and scenic interest for the Garos, especially for those who retain traditional belief. People from the local area as well as other parts of the Garo Hills often visit these two sites on day-trips. People were photographed at the camera-trap station on three of the

10 camera-trap-days. On the day of camera-trap deployment itself (25 March 2013), 23 young people were photographed walking up or down the trail between 11h00 and 15h00. A few of the youth piled stones and sticks, considered a token ritual offering to spirits, on the two rocks between which the Small-toothed Palm Civet is seen in the photograph.

Discussion

This is the first published camera-trap record of the Small-toothed Palm Civet from India, and the first confirmed record of the species for the state of Meghalaya. Meghalaya may represent the western distribution limit of Small-toothed Palm Civet, if its Indian range is limited to forests south of the Brahmaputra river as proposed by Choudhury (2013). A record from over 150 years ago from Darjeeling district (Sclater 1891) is located in present day West Bengal, and is from west of Meghalaya. Citing the lack of any nearby record since, however, Choudhury (2013) doubted its validity, while conceding it to be possible. We were unable to locate references to camera-trap records of the northern (Indo-chinese) subspecies-group except for one photograph of a dead animal being carried by a hunter in Veunsay, Cambodia (B. Rawson per J. W. Duckworth *in litt*. 2014). One animal, however, was captured in a chicken-baited cage-trap kept at ground level in Phu Khieo Wildlife Sanctuary in north-eastern Thailand during a carnivore study in 1998–2002 (Lon Grassman *in litt*. 2014). On the other hand, the Sundaic forms are camera-trapped occasionally, at least in Borneo (e.g. Fig. 11b in Eaton *et al*. 2010).

It has been suggested that even where common, the species is not often detected on camera-traps because of its mainly arboreal nature; and therefore a lack of camera-trap records does not imply it is rare (Walston & Duckworth 2003, Duckworth & Nettelbeck 2008, Willcox *et al*. 2012). No photographs were obtained during 2,240 camera-trap-nights at Namdapha (Datta *et al* 2008), a site known to hold the species (Murali *et al*. 2014), nor in over 3,000 camera-trap-nights across the Jeypore–Dehing Landscape (Kakati 2010), which includes the Upper Dehing (West Block) Reserve Forest, near where A. U. Choudhury (verbally 2014) has the only first-hand record for Assam. Both Namdapha and the Jeypore–Dehing Landscape have tall, wet evergreen forest (Assam Valley Tropical Wet Evergreen forest, category 1B/C1; Champion & Seth 1968); most or all records from South-east Asia of the northern forms of Small-toothed Palm Civet come from evergreen forest (e.g. Duckworth 1997, Walston & Duckworth 2003, Duckworth & Nettelbeck 2008, Willcox *et al*. 2012).

Even though the Jeypore–Dehing Landscape in Assam has a previous record of Small-toothed Palm Civet, this civet was not detected during several spotlight surveys there in 2007–2010 by KK. In over 32 hours of spotlighting on 20 days (mostly from a jeep, some on foot) KK had about 50 animal sightings. This included Red Giant Flying Squirrel *Petaurista petaurista candidula* (20 sightings), Common Palm Civet *Paradoxurus hermaphroditus* (eight sightings involving 10 animals), Large Indian Civet *Viverra zibetha* (two sightings), Small Indian Civet *Viverricula indica* (two sightings), Masked Palm Civet *Paguma larvata* (one sighting of two animals) and Particoloured Flying Squirrel *Hylopetes alboniger* (one sighting), among other species. In limited spotlighting (8 hours) from a vehicle in the Baghmara Reserve Forest of the Balpakram–Baghmara Landscape in 2014, we had 12 animal sightings including Common Palm Civet (two sightings), Bengal Slow Loris *Nycticebus bengalensis* (two sightings) and Asian Elephant *Elephas maximus* (four sightings of groups). It is therefore possible, given the number of other arboreal animals seen, that Small-toothed Palm Civet is indeed rare in the Indian part of its range.

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Madhuban Hill, Government Press Road, P.O. Bamunimaidam, Guwahati-781021, Assam, India.
***Email: kashmirak@hotmail.com**