

A diurnal observation of Small-toothed Palm Civets *Arctogalidia trivirgata* mating in Seima Protection Forest, Mondulkingi province, Cambodia

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Abstract.

Small-toothed Palm Civet *Arctogalidia trivirgata* is both nocturnal and arboreal making chance encounters with this species very rare. This species typically eludes conventional biodiversity survey techniques such as ground-based camera trapping. Small-toothed Palm Civet breeding behaviour has not been recorded in the wild and this paper describes a chance observation of mating between two Small-toothed Palm Civets in evergreen forest in eastern Cambodia.

Keywords: breeding behaviour, copulation, evergreen forest, Civet

Small-toothed Palm Civet *Arctogalidia trivirgata* is found across South-east Asia, southern China and North-east India (Corbet & Hill 1992) and is currently listed as Least Concern on the IUCN Red List of Threatened Species (IUCN Red List 2015). The majority of the records for this species are in evergreen and semi-evergreen forests (Walston & Duckworth 2003, Gray *et al.* 2014, Kakati & Srikant 2014). The species has also been recorded in *Melaleuca cajuputi*-dominated peat swamp forest (Willcox *et al.* 2012). However, because of its nocturnal and mainly arboreal habits (Duckworth & Nettelbeck 2008) this civet species has been less studied compared to some of its counterparts, as it evades conventional biodiversity survey techniques such as ground-level camera trapping (Willcox *et al.* 2012). The species was recorded in Cambodia for the first time during spotlighting surveys in 2003 in Seima Protection Forest, Mondulkingi province (Walston & Duckworth 2003), yet it has eluded larger scale surveys (Walston *et al.* 2001) and camera trapping in the same landscape (Gray *et al.* 2014). This paper describes a chance encounter of two Small-toothed Palm Civets mating in the wild; the first known record of this behaviour for this species.

Seima Protection Forest (SPF) is located in eastern Cambodia (Figure 1) and is comprised of evergreen, semi-evergreen, deciduous dipterocarp, and mixed deciduous forest (FA 2007) and ranges in elevation from 60–750 m asl. The site has a tropical monsoonal climate with a distinct wet season from May to October and a dry season from

November to April. The mean annual rainfall is 2,200 to 2,800 mm, with the majority falling during the wet season (Evans *et al.* 2013). SPF has a high biodiversity (Walston *et al.* 2001) and is home to globally important populations of endangered mammal species such as Yellow-cheeked Crested Gibbon *Nomascus gabriellae* and Black-shanked Douc Langur *Pygathrix nigripes* (Nuttall *et al.* 2013). SPF lies both within the Indo-Burma Hotspot (Tordoff *et al.* 2007) and the Lower Mekong Ecoregion Complex (Baltzer *et al.* 2011) and still contains large areas of near intact habitat (Evans *et al.* 2013). The main threats facing the forest and its biodiversity are forest clearance for economic land concessions (primarily rubber plantations), small-scale agricultural expansion by local communities, hunting, and illegal logging for luxury grade timber species (Evans *et al.* 2013).

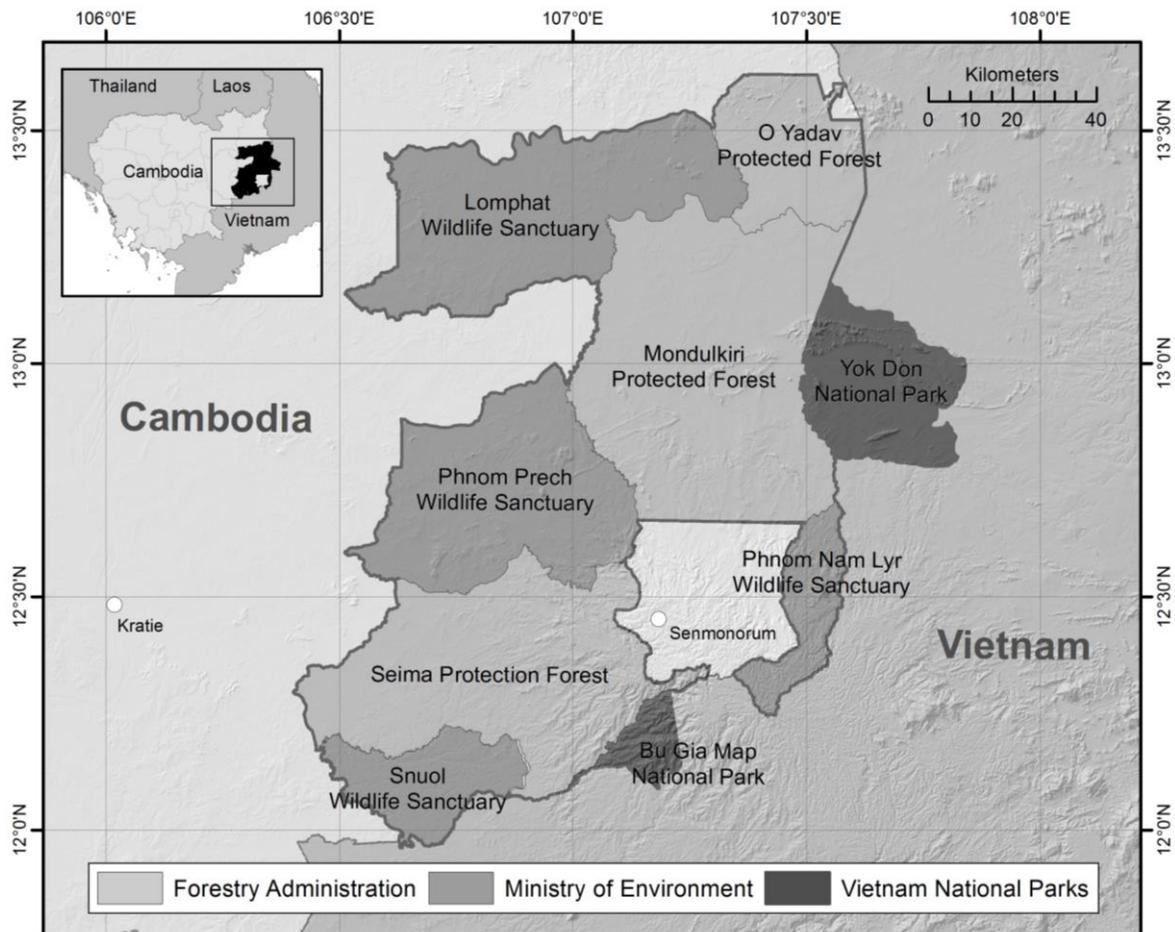


Figure 1. Map of protected areas in eastern Cambodia, and three contiguous protected areas in Vietnam. Seima Protection Forest is located in the bottom centre of the map.

Civets are a target taxonomic group for hunters in the area, with a high proportion of law enforcement confiscations of Common Palm Civet *Paradoxurus hermaphroditus*. There are no known records of Small-toothed Palm Civet being confiscated by enforcement staff within SPF. Snare removal activities within SPF removed a total of 561 snares

between May and September of 2015. Earlier studies have shown that snaring intensity within SPF is particularly high in the evergreen forest, along the Cambodia–Vietnam border and close to human settlements (O’Kelly 2013).

On 20 February 2015, BB and a local research assistant heard and then spotted two Small-toothed Palm Civets commencing intercourse approximately 8 m above the ground in the thick foliage of a small tree (provisionally identified as *Irvingia malayana*). The observation was made in an area of near pristine evergreen forest (12° 19' 15" N, 107° 4' 2" E, 430 m asl), along an old logging route, and about 1 km from the closest village. This area is believed to have relatively low hunting pressures as it is frequently used by local and foreign researchers for the habituation of two gibbon groups. Small-toothed Palm Civets are known to be nocturnal, however the encounter happened at 09h30 in broad daylight and both animals appeared to be active. Copulation was dictated by the male who, using both his teeth and front legs, subdued the female before thrusting aggressively for 10 to 20 seconds. This was repeated with breaks of about 1 to 2 minutes (Figure 2) between copulation bouts for about 30 minutes. The very aggressive nature of the mating was evident from the start with the female emitting loud hisses when approached and the male used its teeth to grab the female’s neck. Similar behaviour was described for the Masked Palm Civet *Paguma larvata* in Bangladesh (Al-Razi *et al.* 2014). The act appeared to subdue the female for a short period of time allowing the male to proceed with the copulation bout. Although both individuals were aware of our presence, the animals did not disperse or stop their copulating. Once the act was over the female curled up and appeared to fall asleep whilst the male remained awake (Fig. 3), repeatedly checking us, until finally falling asleep next to its mate.

Notwithstanding the paucity of records for this species it may be more common than it was believed to be (Willcox *et al.* 2012). Diurnal observations of the species have been accidental, and considering its primarily nocturnal and arboreal behaviour, the best way to monitor local and regional populations may be using spotlighting at night, as has been suggested by Walston & Duckworth (2003). The species is not threatened compared to other small carnivores in mainland South-east Asia and is not considered to be a conservation priority (Willcox *et al.* 2012). Here we describe an insight into the breeding habits of this civet species. Further research is needed to elucidate the Small-toothed Palm Civet’s behavioural ecology, including feeding, sociality, and rearing of the young.



Figure 2. The two Small-toothed Palm Civets *Arctogalidia trivirgata* at rest in the dense canopy after a copulation bout, Seima Protection Forest, Cambodia, February 2015 (Photo: B. Barca, WCS Cambodia).



Figure 3. The male Small-toothed Palm Civet at rest after copulation, Seima Protection Forest, Cambodia, February 2015 (Photo: B. Barca, WCS Cambodia).

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