

# Observations of small carnivores in the southern Western Ghats, India

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## Abstract

Despite a diverse assemblage of small carnivores in the forests of the southern Western Ghats in India, there is a paucity of information on their ecology, distribution, behaviour and current conservation status. Chance observations generated during surveys for other purposes are therefore useful. Sightings and signs of small carnivores were recorded opportunistically during a study to assess the distributions of larger mammals in the southern Western Ghats. The study yielded sightings of seven species of viverrids, herpestids and mustelids. The Common Palm Civet *Paradoxurus hermaphroditus* and Small Indian Civet *Viverricula indica* were sighted most frequently. The restricted-range Brown Palm Civet *Paradoxurus jerdoni* was sighted once.

**Keywords:** endemic species, herpestid, mustelid, night drive, opportunistic sighting, viverrid

## Introduction

The southern Western Ghats, lying between 8° and 11°N, is an important ecological subunit of the Western Ghats global biodiversity hotspot in India (Myers *et al.* 2000). The region is dominated by moist forests and harbours higher levels of biodiversity and endemism than the rest of the Western Ghats (Nair & Daniel 1986, Daniels 1992, Ishwar *et al.* 2001, Vasudevan *et al.* 2001, Kumar *et al.* 2004). The Western Ghats is considered a global core area for small carnivore conservation, holding a number of endemic species, comprising the Nilgiri Marten *Martes gwatkinsii*, Brown Palm Civet *Paradoxurus jerdoni* and the Critically Endangered Malabar Civet *Viverra civettina*. The Brown Mongoose *Herpestes fuscus* and Stripe-necked Mongoose *H. vitticollis* are endemic to the Western Ghats and Sri Lanka (Schreiber *et al.* 1989). Species widespread outside the Western Ghats and Sri Lanka also occur. There is little current information on the ecology, status, distribution and behaviour of small carnivores in this region.

This paper details the opportunistic sightings of seven species of small carnivores in the southern Western Ghats (Fig. 1) during a large mammal survey carried out from April to June 2008 (Johnsingh *et al.* 2008).

## Study Area

The southern Western Ghats is biologically and topographically more diverse than the rest of the Western Ghats. The wide variation in rainfall together with the region's complex geography produces a diversity of vegetation types. Tropical dry thorn and dry deciduous forests occur in the low-lying rain shadow tracts on the eastern flanks. Moist forests including tropical moist deciduous and wet evergreen forests dominate up to about 1,500 m on the windward side (Champion & Seth 1968). These forests include some of the best representatives of non-equatorial tropical evergreen forests in the world. High elevation montane or shola forests and rolling grasslands above 1,500 m add to the diversity of habitats. Around 137 species of mammals have been recorded from the Western Ghats with 17 endemic species (CEPF 2007).

The region, straddling the states of Kerala and Tamil Nadu, is inhabited by several indigenous tribes including the Kadar, Mannan, Malayar/Malasar, Malai Malasar, Muthuvar, Malai Aryan, Kani, Ulladan, Urali, Hill Pulayar and Paliyar that are primarily dependent on the forest. However, the massive influx of settlers

over the last century has had a far greater impact on wildlife than the tribal population, effectively wiping out populations of many wildlife species widely outside protected areas. Hunting, habitat loss, degradation and fragmentation due to monoculture plantations, agriculture, dams, and development are the principal threats to biodiversity in the region (Nair 1991). A contiguous forested landscape until the beginning of the 20th century, the southern Western Ghats is now fragmented from north to south into the Anamalai, Periyar and Agasthyamalai landscape complexes (Nair 1991; Fig. 1).

## Methods

Direct sightings and indirect evidence of viverrids, herpestids, and mustelids were recorded opportunistically during drives or walks through forest areas. The work was conducted from April to June 2008 over the course of an extensive field survey to assess distributions of larger mammals. Since this was not a study of small carnivores, no relevant study design or sampling protocol was followed.

## Observations

A total of five sightings was recorded for both the Common Palm Civet *Paradoxurus hermaphroditus* and Small Indian Civet *Viverricula indica*, three for both the Stripe-necked Mongoose and the Ruddy Mongoose *Herpestes smithii*, and singles for the Grey Mongoose *H. edwardsii*, Brown Palm Civet and Smooth-coated Otter *Lutrogale perspicillata*. Only the Stripe-necked Mongoose and Smooth-coated Otter were observed during the day; the remaining five were recorded only at night. The term 'pair' indicates that two animals were seen together, but we were not able to confirm their gender. Details of each record can be found in Table 1.

### Smooth-coated Otter *Lutrogale perspicillata*

A single sighting of a group of six Smooth-coated Otters took place on the Mullaperiyar reservoir in Periyar Tiger Reserve, Kerala. The sighting occurred at 09h45 when the animals were ashore. In addition, otter spraints were found on the banks of the Chimmony reservoir in Chimmony Wildlife Sanctuary, Kerala (10°26'N, 76°29'E) and tracks were observed in Malayattur Forest Division, Kerala (10°15'N, 76°50'E). However, the identity of the species that left the spraints and tracks is unknown.

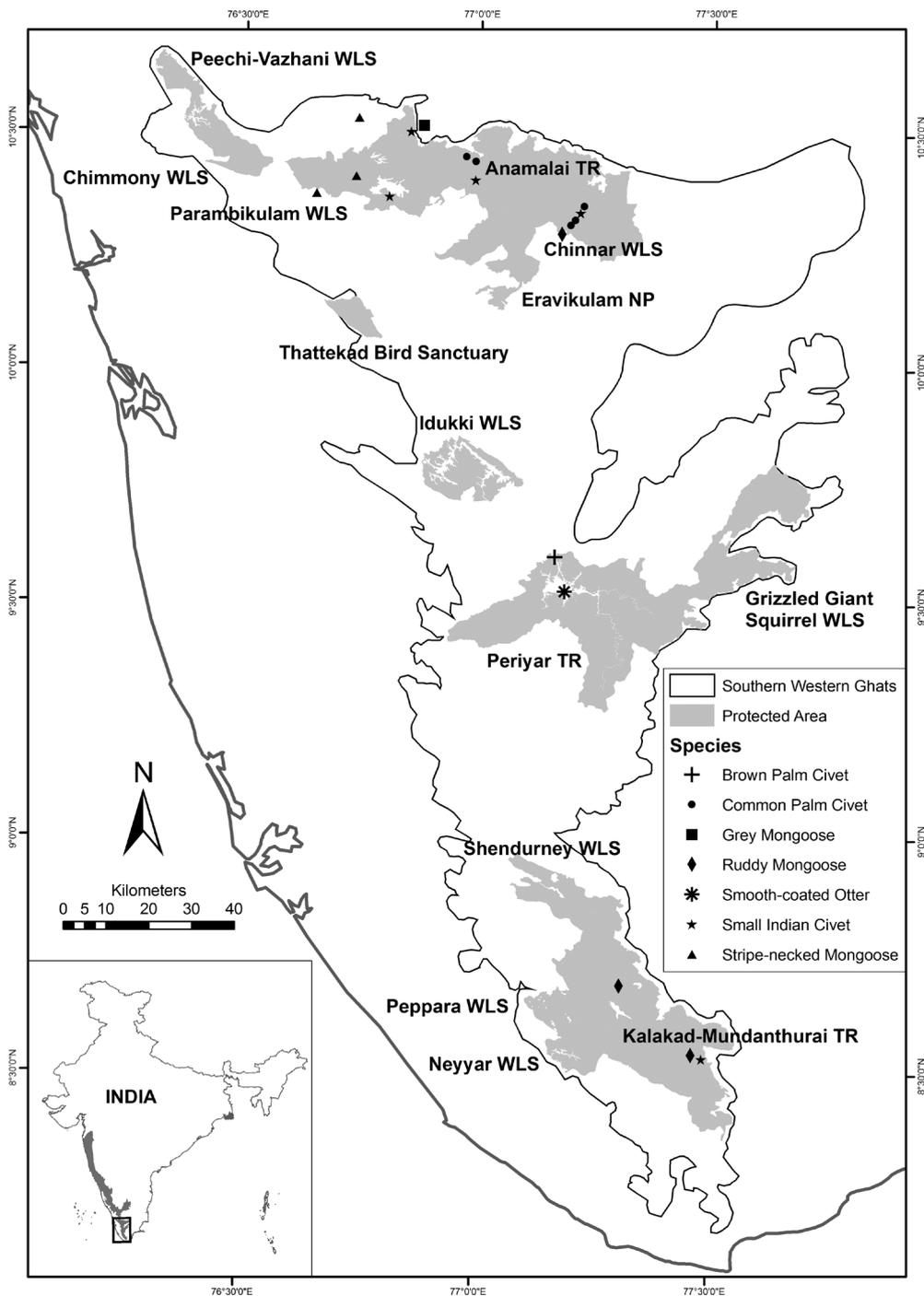


Fig. 1. The southern Western Ghats, showing locations of small carnivore sightings.

**Small Indian Civet *Viverricula indica***

The Small Indian Civet was sighted five times during night drives, at Top Slip in Anamalai Tiger Reserve, Tamil Nadu; Parambikulam Wildlife Sanctuary, Kerala; Anamalai Tiger Reserve on the road from Anamalai town to Valparai; Chinnar Wildlife Sanctuary, Kerala; and in Papanasam Range of Kalakad-Mundanthurai Tiger Reserve, Tamil Nadu. Except for the sighting in Parambikulam Wildlife Sanctuary that occurred in a moist deciduous habitat, the rest of the sightings were in dry deciduous forests. All the sightings were of solitary animals that disappeared as soon as they were illuminated by the headlights of the vehicle. Small Indian Civets have been reported to be the most common small carnivore in the drier forests of the southern Western Ghats and rare in the tropical wet evergreen forests of the region (Mudappa 2002).

**Common Palm Civet *Paradoxurus hermaphroditus***

Sightings of two pairs of Common Palm Civets occurred in the Anamalai Tiger Reserve on the road from Anamalai town to Valparai. Three pairs of Common Palm Civets were sighted at different locations in Chinnar Wildlife Sanctuary, while driving along the road from Marayoor town to Chinnar. All the sightings occurred in dry deciduous habitats. One sighting in Chinnar Wildlife Sanctuary involved an unusual-pelaged animal. While driving to Chinnar from Marayoor town, two animals were observed in the headlights of the vehicle, foraging on the ground. Upon being lit by the headlights, they climbed the bushy embankment on the shoulder of the road and stood watching us for a few seconds, enabling close observation. One was instantly identified as a Common Palm Civet, yet the other, although similar in size, did not

Table 1. Locations of small carnivore sightings in the southern Western Ghats.

Species and Sighting Locations	State	Latitude (N)	Longitude (E)	Location type	Habitat type	No. of animals	Date
<b>Smooth-coated Otter</b>							
Periyar TR	Kerala	9°31'	77°11'	Reservoir	MDF	6	20 Jun 2008
<b>Small Indian Civet</b>							
Top Slip, Anamalai TR	Tamil Nadu	10°30'	76°51'	Dirt road	DDF	1	27 Apr 2008
Parambikulam WLS	Kerala	10°21'	76°48'	Dirt road	MDF	1	21 May 2008
Anamalai TR	Tamil Nadu	10°24'	76°59'	Tar road	DDF	1	22 May 2008
Chinnar WLS	Kerala	10°19'	77°12'	Dirt road	DDF	1	24 May 2008
Kalakad-Mundanthurai TR	Tamil Nadu	8°32'	77°28'	Tar road	DDF	1	14 Jun 2008
<b>Common Palm Civet</b>							
Anamalai TR	Tamil Nadu	10°26'	76°58'	Tar road	DDF	2	22 May 2008
Anamalai TR	Tamil Nadu	10°26'	76°59'	Tar road	DDF	2	22 May 2008
Chinnar WLS	Kerala	10°18'	77°11'	Tar road	DDF	2	24 May 2008
Chinnar WLS	Kerala	10°19'	77°12'	Tar road	DDF	2	24 May 2008
Chinnar WLS	Kerala	10°20'	77°13'	Tar road	DDF	2	24 May 2008
<b>Brown Palm Civet</b>							
Periyar TR	Kerala	9°35'	77°10'	Tar road	MDF	1	3 May 2008
<b>Stripe-necked Mongoose</b>							
Parambikulam WLS	Kerala	10°24'	76°44'	Dirt road	MDF	1	21 May 2008
Kollengode Range, Nemmara FD	Kerala	10°31'	76°44'	Dirt road	MDF	1	22 May 2008
Charpa Range, Vazhachal FD	Kerala	10°22'	76°39'	Dirt road	MDF	1	24 Jun 2008
<b>Ruddy Mongoose</b>							
Chinnar WLS	Kerala	10°18'	77°11'	Dirt road	DDF	1	24 May 2008
Kalakad-Mundanthurai TR	Tamil Nadu	8°32'	77°27'	Tar road	DDF	1	14 Jun 2008
Kalakad-Mundanthurai TR	Tamil Nadu	8°41'	77°18'	Tar road	DDF	1	15 Jun 2008
<b>Grey Mongoose</b>							
Sethumadai, Anamalai TR	Tamil Nadu	10°30'	76°52'	Dirt road	DDF	1	22 May 2008

DDF = Tropical Dry Deciduous Forest, MDF = Tropical Moist Deciduous Forest, TR = Tiger Reserve, WLS = Wildlife Sanctuary, FD = Forest Division

share the same pelage pattern. Its face and head had a few black markings while the entire anterior half of the body was white, the posterior half, including the tail, was black. Identification as a Common Palm Civet is based on its association with a confirmed Common Palm Civet, with the two animals being of similar size. The range officer of Chinnar Wildlife Sanctuary also described a civet-sized animal with a pelage that was half-white and half-black occurring in the area. The officer rejected a photograph in Menon (2003) of a Ratel (Honey Badger) *Mellivora capensis* as the unidentified animal, explaining clearly that the animal was not marked white-black dorso-ventrally as is the Ratel, but antero-posteriorly. During the same drive, two more pairs of Common Palm Civets were observed further along the road, all with normal coat markings. From the fact that all the sightings of Common Palm Civets occurred of animals in pairs, it may be speculated that the mating season for this species may have been ongoing or that they could have been mother-pup groups.

#### **Brown Palm Civet *Paradoxurus jerdoni***

The only Brown Palm Civet seen was a fresh road-kill near Kumily town at the outskirts of Periyar Tiger Reserve, amid moist decidu-

ous forest. The road from Kumily to the Forest Department office is flanked by grassland and fragments of tropical moist deciduous and wet evergreen forest. At 20h30, while driving, a small, dark, elongated animal was found prone by the roadside. Its pelage was uniformly blackish brown with a slightly grizzled appearance, darker around the head, neck, shoulders, legs and tail fading to a lighter brownish yellow on the abdomen. The tail was as long as the body; uniformly black and rounded but lacked a white tip. The Brown Palm Civet is a highly arboreal and frugivorous species restricted to rainforests in the Western Ghats. Although it is not as rare as previously thought to be, fragmentation of its rainforest habitat is likely to have adverse effects on its distribution and abundance (Mudappa 2002). This individual was probably trying to cross from one forest fragment to another when it was struck by a vehicle. Although the distribution of the Brown Palm Civet in the southern Western Ghats extends from the Anamalai Hills to the Agasthyamalai Hills (Rajamani *et al.* 2002), reports from Periyar Tiger Reserve are surprisingly sparse with only one published record of a dead specimen hunted by local tribals (Gupta 1997). This sighting confirms Periyar Tiger Reserve as part of the range of this endemic viverrid.

**Stripe-necked Mongoose** *Herpestes vitticollis*

The Stripe-necked Mongoose, the largest Asian mongoose (Van Rompaey & Jayakumar 2003), was sighted in Parambikulam Wildlife Sanctuary, Kollengode Range of Nemmara Forest Division, Kerala and in Charpa Range of Vazhachal Forest Division, Kerala. All sightings were of solitary animals in tropical moist deciduous habitat during the daytime.

**Ruddy Mongoose** *Herpestes smithii*

The Ruddy Mongoose was sighted on three occasions during night drives in dry deciduous forests, as solitary individuals, in Chinnar Wildlife Sanctuary and in Papanasam and Mundanthurai Ranges of Kalakad–Mundanthurai Tiger Reserve. This species is large and resembles the Grey Mongoose but sports a reddish-brown, grizzled appearance and a black-tipped tail (Prater 1998). It was instantly identified by its habit of walking with the tip of its tail turned upwards, a distinctive behavioural trait (Menon 2003). When lit by the vehicle headlights, all three individuals remained unperturbed and continued walking at the same unhurried pace, making no attempt to run for cover.

**Grey Mongoose** *Herpestes edwardsii*

A single Grey Mongoose was sighted in a dry deciduous and thorn scrub habitat near Sethumadai, in the vicinity of Anamalai Tiger Reserve.

**Discussion**

All small carnivore sightings were in or adjacent to protected areas. While this may suggest that their status outside such places could be of concern, it may simply reflect unequal search effort, in that night drives were not conducted at the same rate outside protected areas.

Few comprehensive ecological studies exist on the small carnivores of India, notably on the Brown Palm Civet (Mudappa 2001) Asian Small-clawed Otter *Aonyx cinerea* (Perinchery 2008) and Smooth-coated Otter (Anoop & Hussain 2004, 2005, Perinchery 2008). Their roles as predators, prey and seed dispersers have been inadequately investigated even as severe loss and fragmentation of their habitat threatens their populations (Mudappa 2001, Mudappa *et al.* 2007). Most viverrids, herpestids and mustelids are cryptic species that among popular minds lack the panache of large carnivores such as the Tiger *Panthera tigris* to attract conservation and research funding. When information on their ecology and behaviour is not readily forthcoming, opportunistic observations such as these have to be exploited to further our knowledge about these fascinating creatures.

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**CORRIGENDUM**

**“A road kill of the Ethiopian Genet *Genetta abyssinica* along the Addis Ababa–Dira Dewa Highway, Ethiopia” by Mundanthra BALAKRISHNAN and AFEWORK Bekele (2008, *Small Carnivore Conservation* 39: 37–38).**

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ባለፈው እትመት በትናንሽ ሥጋበል እንሰሳት እንክብካቤ ላይ የወጣው (2009 ቁ.39) በባላክሪሽናንና በቀለ (2001) የተባራራው በመኪና መንገድ ላይ ተገድሎ የተገኘው የኢትዮጵያ ገነት ሽለምጥማጥ ተብሎ ነበር። በሥዕል አንድ ላይ የተገለጸው የኢትዮጵያ ነጠብጣባዊ ገነት ተብሎ ይስተካከል።

In the previous issue of *Small Carnivore Conservation* (2009, vol. 39), Balakrishnan & Afework (2008) illustrated a road-killed specimen identified as an Ethiopian Genet *Genetta abyssinica* Rüppell, 1836 (Fig. 1, p. 37) and kept at the Zoological Natural History Museum, Addis Ababa University, Ethiopia (specimen accession number: ZNHM – AAU M2008 – 108). Although some diagnostic, coat pattern traits corresponding to the species were given (p. 38), the skin illustrated in Figure 1 undoubtedly corresponds to a specimen of Common Small-spotted Genet *Genetta genetta* (Linnaeus, 1758). Here follows a series of diagnostic traits that can be observed from the figure and that characterise the latter species. These contradict the description of the skin made by Balakrishnan & Afework (2008): (i) the tip of the tail, which is slightly cut, appears bright, (ii) the first two longitudinal rows of dorsal spots show important (first row) to weak (second row) coalescence, never forming continuous stripes, (iii) the coat of legs exhibits dark areas, (iv) a well-visible “dirty” stripe longitudinally crosses the rings of the upper part of the tail, and (v) hairs on tail are long, resulting in a confused “black and white” annealing pattern on the upper part of the tail. As a consequence of this re-identification, ZNHM should be considered as not holding any specimens of *Genetta abyssinica* in its collections.

Recently, an interactive identification key for Genettinae was developed and made available to assist a wide spectrum of

biodiversity actors in the sometimes difficult identification of genets (Gaubert et al. 2008; accessible at: <http://lis.snv.jussieu.fr/apps/xper/data/genettes/web/index.html.en>). We encourage field survey reports to base their species identification on this updated taxonomic tool, which among other things provides a series of illustrated material and descriptive lists of character traits for each species. Any feedbacks on the practical aspects of this identification key are welcome to improve the utility of this tool.

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