

Small carnivore records from the Oddar Meanchay* sector of Kulen–Promtep Wildlife Sanctuary, northern Cambodia

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Abstract

Here are presented the first published records of four small carnivore species within Kulen–Promtep Wildlife Sanctuary, northern Cambodia. Some records are at a presumed salt-lick, including the first published record of a Crab-eating Mongoose *Herpestes urva* at a salt-lick. The records were generated through camera-trapping from 16 January to 25 August 2011, by the Frontier–Cambodia Forest Research Project.

Keywords: camera-trap, Common Palm Civet, Crab-eating Mongoose, ferret badger, salt-lick, *Viverra*, *Viverricula*

កំណត់ត្រាពន្ធុកសត្វស្លឹកចំណីជាអាហារប្រភេទតូចៗ នៅក្នុងដែនដីម្រកសត្វព្រៃ ត្រពាំងស្រែ ព្រៃឃ្មុំ
ភូមិសាស្ត្រ នេត្តិកម្មមានជ័យ ភាគខាងជើងប្រទេសកម្ពុជា

អត្ថបទសង្ខេប

នេះគឺជាឯកសារបោះពុម្ពផ្សាយលើកទី១ ស្តីអំពីកំណត់ត្រាពន្ធុកសត្វស្លឹកចំណីជាអាហារប្រភេទតូចៗ ចំនួន បួនប្រភេទ ដែលមានវត្តមាននៅក្នុងដែនដីម្រកសត្វព្រៃត្រពាំងស្រែ-ព្រៃឃ្មុំ ភាគខាងជើងប្រទេសកម្ពុជា។ កំណត់ត្រាមួយចំនួនត្រូវបានគេស្រាវជ្រាវឃើញនៅតាមតំបន់ដីប្រាមរមមានរូបភាពប្រភេទស្ពាន់ (Herpestes urva) ដែលបានកត់ត្រានៅតំបន់ដីប្រាមរ។ វត្តមានប្រភេទសត្វទាំងនេះ ត្រូវបានស្រាវជ្រាវឃើញដោយ គម្រោងស្រាវជ្រាវព្រៃឈើ Frontier-Cambodia តាមរយៈការដាក់ម៉ាស៊ីនថតរូបភាពស្វ័យប្រវត្តិចាប់ពីថ្ងៃទី១៦ ខែមករា រហូតដល់ថ្ងៃទី២៥ ខែសីហា ឆ្នាំ២០១១។

ពាក្យគន្លឹះ៖ ម៉ាស៊ីនថតរូបភាពស្វ័យប្រវត្តិ សំពោតក្រអូប ស្ពាន់ ឆ្កែ ដីប្រាម អំបូរសត្វសំពោតធំៗ អំបូរ សត្វសំពោតតូចៗ។

Introduction

The current status of small carnivores within Cambodia is poorly understood, because few records have been published historically or recently (Holden & Neang 2009). Furthermore, published records of small carnivore presence at salt-licks, spatially limited areas that animals visit to ingest soil (geophagy), drink water or hunt (Klaus & Schmid 1998), are rarer still.

The function of geophagy and drinking the water at salt-licks is much debated, with several hypotheses proposed for the behaviour. The most common is the provision of sodium as the primary role (Kreulen 1985, Moe 1993, Abraham 1999, Rick *et al.* 2003, Ayotte *et al.* 2008, Dudley *et al.* 2011). Geophagy is common in mammals and has been observed in every continent except Antarctica (Klaus & Schmid 1998, Brightsmith 2004). Most known geophagous mammals are herbivores or frugivores; carnivores are seen at licks much less frequently, presumably because they gain sodium from their diet (Matsubayashi *et al.* 2006).

Blake *et al.* (2011) recorded two members of the Procyonidae, Crab-eating Raccoon *Procyon cancrivorus* and South American Coati *Nasua nasua*, at a salt-lick in Ecuador. Matsubayashi *et al.* (2006) recorded a total of eleven small carnivore species at salt-licks in the inland forests of Borneo, and suggested the hunting of geophagic prey as their main reason

for visiting licks. Because chances of being predated upon at the lick for the smaller carnivores themselves are high (Moe 1993), coupled with the risks of disease and parasite transfer (Henshaw & Ayeni 1971), the costs of visiting must be outweighed by the benefits (Klaus *et al.* 1998).

Frontier, a non-profit conservation and development non-governmental organisation, has been working within the western portion of Kulen–Promtep Wildlife Sanctuary in Oddar Meanchey* province since January 2011, and is the first body to survey that area for mammals. The eastern portion, that in Preah Vihear province, has been surveyed fairly intensively since 1999, with confirmed records of Fishing Cat *Prionailurus viverrinus* (Rainey & Kong 2010) and of several important bird species such as Sarus Crane *Grus antigone* (Hands Schuh *et al.* 2010) and Green Peafowl *Pavo muticus* (Goes 2009).

Study site

Kulen–Promtep Wildlife Sanctuary, covering an area of 4,099 km² and spanning three provinces, is Cambodia’s largest protected area. It was set up in 1993 to protect the Kouprey *Bos sauveli*, currently listed by *The IUCN Red List of Threatened Species* as Critically Endangered and which has not been seen reliably since the 1960s (Timmins *et al.* 2008). The sanctuary encompasses a range of habitats including lowland evergreen and deciduous dipterocarp forest as well as the second largest swamp in the country, and is home to a variety of large mammal species, with confirmed records from 2011 camera-trapping in the Oddar Meanchey sector including Asian Golden Cat *Pardofelis temminckii* (Edwards in press), Gaur *Bos gaurus*, Leopard Cat *Prionailurus bengalensis*, Red Muntjac *Muntiacus muntjak* and Eurasian Wild Pig *Sus scrofa* (Edwards in prep.).

A single presumed salt-lick was shown to us by locals, who told us animals such as primates and porcupines (Hystricidae) went there to practise geophagy. The camera-traps did capture groups of East Asian Porcupines *Hystrix brachyura* apparently engaged in geophagy at the site. The salt-lick consisted of a small patch of bare ground where two holes had been made by animals; the holes would fill up with water following heavy rain. The total area of the salt-lick comprised around 5 m², surrounded by lowland evergreen forest, approximately 1 km from a small resin-tappers’ camp, and a small, permanent river lay approximately 3 km from the salt-lick.

* Note added in proof: The survey location is in an area of inconsistent provincial assignment, but on the best available information it seems to be, at the time of survey, in Oddar Meanchay province, not Siem Reap province.

Methods

Five Bushnell CamTrakker camera-traps were placed at five locations (Table 1) within an area dominated by evergreen forest, all 4–8 km from the nearest village, from January to August 2011, with an average altitude of 100 m. Co-ordinates were derived from a GPS unit set to the India–Thai datum. Two camera-trap locations, in the dry riverbeds, were in areas heavily used by resin-tappers. Camera-traps were placed where large mammals were presumed most likely to travel within the dense forest, such as dry riverbeds. They were set to be active throughout the 24-hour cycle and at the highest sensitivity and resolution, taking three photographs per firing (a second apart), with the minimum gap between successive firings being set to ten seconds. Camera-traps were chained to trees approximately 1 m from ground level and aimed as near parallel to the ground as possible. No baits or lures were used.

Results

The survey from 16 January to 25 August 2011 captured wild mammal images from 1,801 firings, from 679 operational trap-nights. In total, images from 291 firings, representing 45 independent events (firings spaced 30 minutes or more apart), contained small carnivores (Table 1). The images captured comprised four species of small carnivore: Common Palm Civet *Paradoxurus hermaphroditus*, Yellow-throated Marten *Martes flavigula*, unidentified ferret badger *Melogale* and Crab-eating Mongoose *Herpestes urva* (Fig. 1). All species present were validated by independent examination of the photos (by J. W. Duckworth).

Common Palm Civets were the most commonly recorded small carnivore, comprising 76% of independent events, and were captured in every location, always at night (18h01–06h00). Common Palm Civet was photographed at the salt-lick in groups ranging from one to five individuals (Fig. 2). When in such groups animals tended to spend much time (periods of up to 39 minutes) in and around the holes at the salt-lick, although whether they were practising geophagy, drinking water in the holes, or engaged in something else cannot be determined. The two records of apparently solo animals at the lick both spent less than two minutes there and did not go near the holes, and in every other location only individual animals were seen.

Yellow-throated Marten was only recorded twice, at 14h17 on 8 February at a small stream and at 04h09 on 23 August at the salt-lick. The latter animal did not apparently approach the holes, and stayed less than three minutes. Crab-eating Mongoose, like Yellow-throated Marten, spent under two minutes at the lick and seemed to be passing, rather than visiting, the lick. All images of it were by day (06h01–18h00), and each recorded only a single animal. Ferret badger, the only small carnivore photographed but not recorded at the salt-lick, was only recorded once: at 21h22 on 31 January 2011.

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Table 1. Locations of camera-traps in Kulen–Promtep Wildlife Sanctuary, northern Cambodia, in 2011, with number of independent events for each species at each.

Camera-trap location and recorded altitude	Site Description	Species recorded (number of independent events)
14°04'07.037"N, 104°11'41.608"E; 96 m	Dry river bed	Common Palm Civet (5), Crab-eating Mongoose (5)
14°04'02.922"N, 104°11'47.091"E; 104 m	Dry river bed	Common Palm Civet (20), Crab-eating Mongoose (1), ferret badger (1)
14°03'05.187"N, 104°11'29.966"E; 92 m	Small stream	Common Palm Civet (1), Crab-eating Mongoose (1), Yellow-throated Marten (1)
14°04'20.056"N, 104°09'09.183"E; 99 m	Small stream	Common Palm Civet (1)
14°03'32.782"N, 104°10'10.87"E; 101 m	Salt-lick	Common Palm Civet (7), Crab-eating Mongoose (1), Yellow-throated Marten (1)



Fig. 1. Crab-eating Mongoose *Herpestes urva* in a dry river bed, Kulen–Promtep Wildlife Sanctuary, Cambodia, 2011. © Frontier.



Fig. 2. Group of Common Palm Civets *Paradoxurus hermaphroditus* at a salt-lick, Kulen–Promtep Wildlife Sanctuary, Cambodia, 2011. © Frontier.

Discussion

The camera-trap data presented here, to the best of my knowledge, represent the first published records of four small carnivore species within Kulen–Promtep WS, although all (and various other small carnivore species) have also been recorded by surveys in the Preah Vihear portion of the sanctuary during recent years (H. J. Rainey *in litt.* 2012); the western portion of Kulen–Promtep WS has never been surveyed before for mammals. They are the first published records of three of those species at presumed salt-licks within Cambodia (although all three have been photographed at salt-licks within the Preah Vihear sector; H. J. Rainey *in litt.* 2012), and apparently the first published record of Crab-eating Mongoose at a salt-lick anywhere. Other mongoose species have been recorded at salt-licks: Matsubayashi *et al.* (2006) recorded Short-tailed Mongoose *H. brachyurus* and Collared Mongoose *H. semitorquatus* at salt-licks in Borneo. We recorded a mongoose at the salt-lick only once (and perhaps not using the lick's special features in any meaningful sense); Matsubayashi *et al.* (2006) also found mongooses to be infrequent salt-lick visitors. Common Palm Civet is highly frugivorous (e.g. Su Su & Sale 2007) so, although it is in the order Carnivora, it is not surprising to find it regularly using a salt-lick, contrasting with the generally low lick use of strict carnivores (Matsubayashi *et al.* 2006).

A status review of small carnivores in Laos, including similar lowland habitats (Duckworth 1997) found the five most regularly recorded small carnivore species to be Yellow-throated Marten, Common Palm Civet, Crab-eating Mongoose, Large Indian Civet *Viverra zibetha* and Small-toothed Palm Civet *Arctogalidia trivirgata*. This list is similar to the species list in our study. That we recorded no Small-toothed Palm Civet may simply reflect that this species is highly arboreal: it is best surveyed by spotlighting (Walston & Duckworth 2003). By contrast, there are few recent ferret badger records from Cambodia or Laos (and very few identified to species), although the reasons for this are unclear (Schank *et al.* 2009, Robichaud 2010).

Perhaps the most surprising, and somewhat concerning, result of this survey is the absence of records of *Viverra* spp. or of the allied Small Indian Civet *Viverricula indica*: these ground-dwelling species are readily camera-trapped when present. There was no evidence of specific hunting pressure on small carnivores within the area at the time of survey, but evidence of hunting was seen in the survey area in the form of snares and traps, and through frequent observations of locals taking their catches, namely rats (Muridae) and Northern Treeshrews *Tupaia belangeri* (never small carnivores), home. Any earlier pressure specifically on small carnivores is unknown: perhaps previously high hunting pressure caused a current lack or rarity of *Viverra* and *Viverricula* in the area. Other surveys in Cambodia have camera-trapped them: Large-spotted Civet *V. megaspila* was found in Botum Sakor National Park (Royan 2010), and Gray *et al.* (2010) found it the most frequently recorded small carnivore species within Mondulhiri Protected Forest. Large-spotted Civet, Large Indian Civet *V. zibetha* and Small Indian Civet all inhabit the Preah Vihear Protected Forest (Schank *et al.* 2009), only some 80 km east of our Kulen–Promtep WS camera-trap area. Within the Phnom Samkos Wildlife Sanctuary and the Central Cardamoms Protected Forest, Large Indian,

Small Indian and Large-spotted Civets were all camera-trapped, the former two regularly (Holden & Neang 2009).

A camera-trap survey in six of the REDD Community Forests in Oddar Meanchey province (the closest being Sangkrou Preycheu, bordering Kulen–Promtep WS on the western side) also found no records of *Viverra* or *Viverricula* (Elliot *et al.* 2011). This survey had fewer trap-nights (just one or two at each location) and found three of the same four small carnivore species as during this survey (and Small Asian Mongoose *Herpestes javanicus*, but no ferret badgers). Only further survey could clarify the reasons for this strange gap in records of *Viverra* and *Viverricula* in Oddar Meanchey province.

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ANNOUNCEMENT

International Badger Symposium, Edmonton, Alberta, Canada, 1-4 October 2013

Alpha Wildlife Research & Management will be hosting the first *International Badger Symposium* in October 2013. The symposium aims to bring together researchers, conservationists and managers working on the following species: American Badger *Taxidea taxus*, European Badger *Meles meles*, Ferret Badgers *Melogale spp.*, Stink Badgers *Mydaus spp.*, Hog Badger *Arctonyx collaris*, Honey Badger *Mellivora capensis*. To present original research findings, conservation programs, or reviews on symposium topics, please submit abstracts before **15 September 2012**.

For further details consult the symposium website: <http://www.alphawildlife.ca/2013badgersymposium> and/or contact Gilbert Proulx (e-mail: gproulx@alphawildlife.ca). Selected papers for oral presentations or posters will be published as a peer-reviewed book by Alpha Wildlife Publications.

Symposium topics:

- Evolutionary history
- Phylogenetic relationships
- Distribution and status
- Population structure and spacing
- Reproductive Biology
- Man-caused and natural mortality
- Parasites and Diseases
- Habitat Ecology
- Food Habits
- Translocation
- Interspecific Relationships
- Man-Badger Relationships
- Research & Management Techniques
- Conservation Programs