

RECORDS OF THE SHREW-FACED SQUIRREL, *RHINOSCIURUS LATICAUDATUS* (MAMMALIA: RODENTIA: SCIURIDAE), IN SINGAPORE

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ABSTRACT. — By compiling past records and recent sightings, we report on the status and distribution of the shrew-faced squirrel (*Rhinosciurus laticaudatus*) in Singapore. Prior to 2011, all recent confirmed records were from the Bukit Timah Nature Reserve. Photographic evidence of its presence in the Central Catchment Nature Reserve is presented.

KEY WORDS. — *Rhinosciurus laticaudatus*, Sciuridae, Bukit Timah Nature Reserve, Central Catchment Nature Reserve, camera trap, critically endangered

INTRODUCTION

The shrew-faced squirrel, *Rhinosciurus laticaudatus* (Müller), is a medium-sized and monotypic squirrel with a head-body length of 19–23 cm and a tail length of 11–17 cm (Payne & Francis, 1985; Francis, 2008). *Rhinosciurus laticaudatus* has uniform dark brown upperparts and buff or white underparts (Lekagul & McNeely, 1988). The short and bushy tail is often held upwards when the squirrel is active. While the shrew-faced squirrel is similar in size to the plantain squirrel (*Callosciurus notatus*), the former possesses a pointed snout that is unique. *Rhinosciurus* superficially resembles treeshrews (order Scandentia), but the latter have relatively more pointed snouts (see Fig. 1a). In comparison, *Rhinosciurus laticaudatus* is distinguished by its shorter gape, and shorter and bushier tail. It differs from the diurnal squirrels in Singapore in that it is primarily terrestrial in habit, and its diet comprises mainly insects (Lekagul & McNeely, 1998).

Rhinosciurus laticaudatus occurs in the tropical humid lowland forests of Thailand, Peninsular Malaysia, Singapore, Sumatra, Borneo, and small adjacent islands (Duckworth et al., 2008). The species is categorised as ‘Near Threatened’ in the IUCN Red List due to the high forest conversion rates throughout its range, and it ‘almost qualifies as threatened under criterion A2c’ (Duckworth et al., 2008). Perhaps owing to the extremely low encounter rate and poor trap success for *Rhinosciurus laticaudatus* (Payne & Francis, 1985; Charles & Ang, 2010), very little is known about the shrew-faced squirrel. When performing a search in scientific databases, the term ‘*Rhinosciurus laticaudatus*’ appeared predominantly in articles on biodiversity surveys (e.g., Saiful & Nordin, 2004).

The present article is a compilation of records of *Rhinosciurus laticaudatus* in Singapore known to us.

PAST AND PRESENT RECORDS

The following list of shrew-faced squirrel records in Singapore is presented in chronological order. The symbol “●” refers to records based on verbal reports and/or literature only. The symbol “★” refers to records supported by photographs and/or specimens. Specimens preserved and deposited at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore are indicated by accession numbers with a ‘ZRC’ prefix.

- ★ Changi: A male (ZRC 4.9474) collected on 22 Jul.1908 by H.C. Robinson & E. Seimund.
- Seven specimens collected by H. C. Robinson from Singapore Island are deposited at The Natural History Museum in London, including an old male (original number 1122) collected from Changi on 24 Jul.1908 that was designated as the holotype for *Rhinosciurus leo* Thomas & Wroughton (1909).
- ★ Changi: Two male specimens (ZRC 4.9475 and ZRC 4.9476) obtained by Raffles Museum collectors on 2 Oct.1912 and 1 Oct.1912, respectively.

- Bukit Timah Nature Reserve, Fern Valley: One individual trapped in 1985 (Yong, 1985).
- Bukit Timah Nature Reserve: Possible example observed foraging along a fallen tree on 21 Feb.1989 by Ho Hua Chew (Anonymous, 1989). The animal was described as between plantain squirrel and slender squirrel (*Sundasciurus tenuis*) in size, dark brown with buffy wash on flanks and thighs, with short and bushy tail, and pointed snout.
- ★ Bukit Timah Nature Reserve, Cave Path: An individual observed moving on the forest floor at 0217 hours on 27 Jul.2004 by AWMY and NTLL. Its head was photographed by AWMY (Fig. 2).
- ★ Bukit Timah Nature Reserve, Cave Path: An individual found dead with head injury by a ranger from the National Parks Board (NParks) on 24 Mar.2007 at 1530 hours is now preserved at the Raffles Museum under ZRC 4.8185 (Fig. 1b).

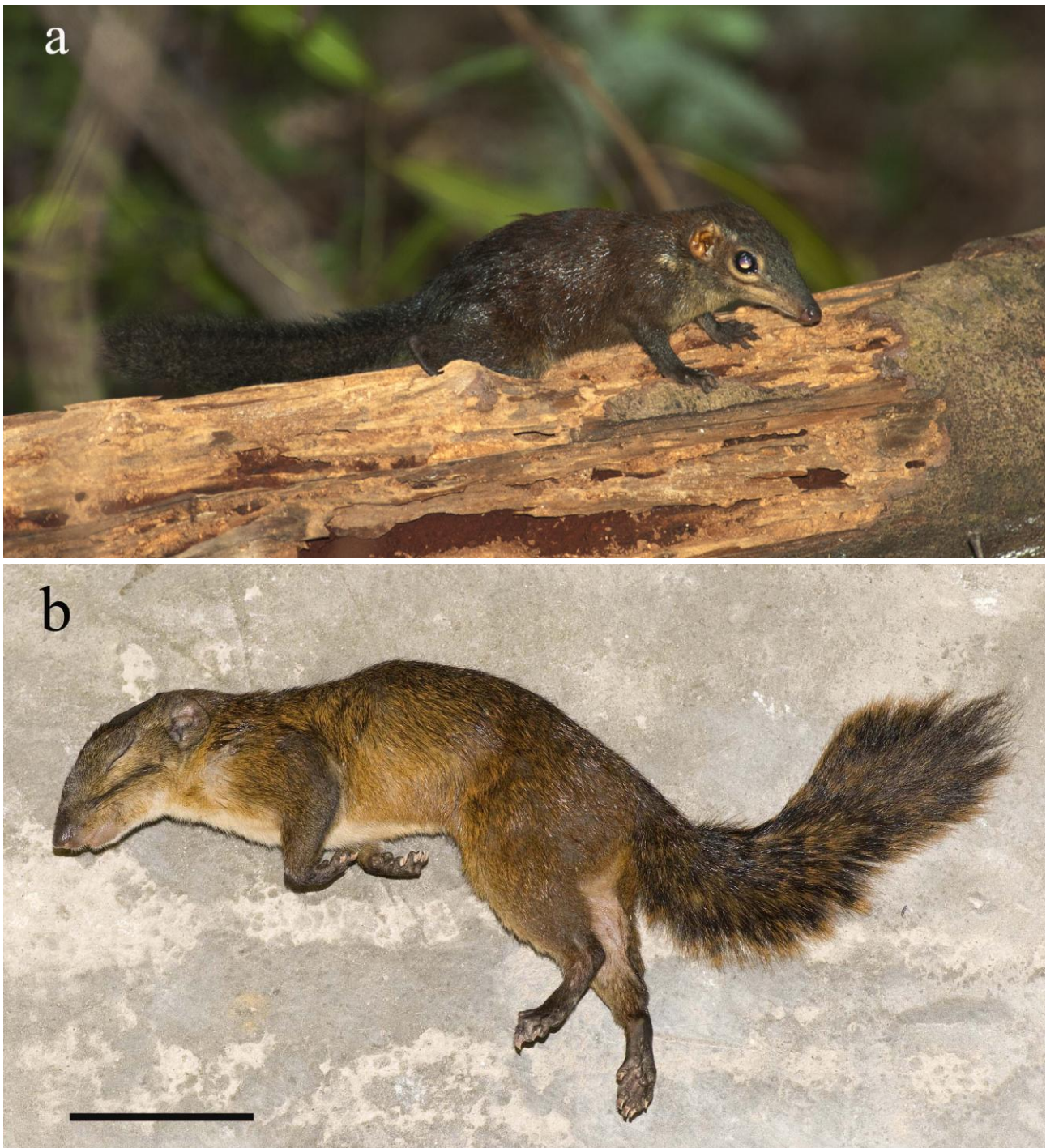


Fig. 1. Lateral views of a *Tupaia glis* (a); and a specimen of *Rhinosciurus laticaudatus* found freshly dead at the Bukit Timah Nature Reserve (ZRC 4.8185) (b). Scale bar = 50 mm.

- Bukit Timah Nature Reserve, forest beside Main Road between entrances of Jungle Fall Path and Rengas Path: An apparent female with juvenile following closely, foraging on forest floor, observed by Leong Tzi Ming on 22 Jul.2009 at 1615 hours.
- Bukit Timah Nature Reserve, junction of Catchment Path and Tiup Tiup Path: An apparent female with yellowish-grey pelage and holding what appeared to be an infant squirrel in its mouth, observed by Leong Tzi Ming on 27 Mar.2010 at 1740 hours.
- ★ Bukit Timah Nature Reserve, forest bordering the Bukit Timah Expressway: One animal photographed by NParks camera trap on 10 Apr.2011 at 0739 hours.
- ★ Central Catchment Nature Reserve, Chestnut forest: Multiple occasions of *Rhinosciurus laticaudatus* photographed by NParks camera traps during Aug.2011 (Fig. 3).
- ★ Central Catchment Nature Reserve, Upper Peirce forest: An apparent mother and child photographed by camera trap (set by Ou Yang Xiuling) on 28 Oct.2011 at 1012 hours (Fig. 4).
- ★ Central Catchment Nature Reserve, Upper Peirce forest: One individual photographed by camera trap (set by AWMY) on 23 Nov.2011 at 1836 hours (Fig. 5).
- Central Catchment Nature Reserve, Sime forest: A brownish squirrel with a snout longer than that of a slender squirrel and a tail bushier than that of a common tree shrew was observed by Ou Yang Xiuling on 4 Jan.2012 between 1100–1200 hours. The animal was observed picking up an item from the ground and eating it on a vine approximately 1.5 m above the ground; the animal was also observed to be flicking its tail up and down. Record unconfirmed due to lack of photographic evidence.



Fig. 2. Head of a *Rhinosciurus laticaudatus* observed at the Bukit Timah Nature Reserve at 0217 hours on 27 Jul.2004. (Photograph by: Alan W. M. Yeo).



Fig. 3. An infrared image of a *Rhinosciurus laticaudatus* at Central Catchment Nature Reserve on 11 Aug.2011. (Photograph by: NParks).



Fig. 4. An infrared image of an apparent female *Rhinosciurus laticaudatus* with offspring at Central Catchment Nature Reserve. (Photograph by: Ou Yang Xiuling).



Fig. 5. An image of *Rhinosciurus laticaudatus* at Upper Peirce forest, Central Catchment Nature Reserve. (Photograph by: Alan W. M. Yeo).

DISCUSSION

While *Rhinosciurus laticaudatus* was historically collected from Changi, it is most probable that this forest species currently exists only in the forested areas of the Bukit Timah and Central Catchment Nature Reserves. Prior to 2011, all recent records of the shrew-faced squirrel were from Bukit Timah Nature Reserve. Consequently, Teo & Rajathurai (1997) concluded that the species is confined to the Bukit Timah Nature Reserve. However, it is now evident that *Rhinosciurus laticaudatus* exists and is reproducing in the Central Catchment Nature Reserve as well (see Fig. 3).

All confirmed sightings of the shrew-faced squirrel, including photographs from camera traps, suggest that it is predominantly terrestrial and diurnal. However, the one example photographed on 27 Jul.2004 was foraging in the darkness at 0217 hours. Despite the animal's mainly diurnal habits, the shrew-faced squirrel is apparently elusive (pers. obs.) and/or rare. Indeed, no *Rhinosciurus laticaudatus* was encountered during the extensive Nature Reserves Survey from Jun.1993 to Jul.1997 (Teo & Rajathurai, 1997). Teo & Rajathurai (1997: 372) even speculated that the shrew-faced squirrel could have been outcompeted by the 'abundant' *Tupaia glis*. This speculation seems questionable as the two species are sympatric in many areas, and are unlikely to occupy the same niche. The rarity of one is more likely caused by certain environmental factors, and not likely to be direct competition for the same resources. Owing to its apparent rarity, Lim et al. (2008) classified the shrew-faced squirrel as 'critically endangered' in Singapore.

Nevertheless, given that a number of the recent records were obtained with camera traps, it is noteworthy to point out that these equipment are highly effective for sampling such elusive and/or rare animals (e.g., Lim & Ou Yang, 2012). We, therefore, highly recommend extensive and long-term camera-trapping efforts to better document wildlife in the forested areas of Singapore, including those on the larger adjacent islands such as Pulau Ubin and Pulau Tekong.

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LITERATURE CITED

- Anonymous, 1989. Recent reports. *The Pangolin*, **2**: 1–5.
- Charles, J. K. & B. B. Ang, 2010. Non-volant small mammal community responses to fragmentation of kerangas forests in Brunei Darussalam. *Biodiversity and Conservation*, **19**: 543–561.
- Duckworth, J. W., E. Meijaard, B. Lee & R. J. Tizard, 2008. *Rhinosciurus laticaudatus*. IUCN Red List of Threatened Species. Version 2011.2. www.iucnredlist.org. (Accessed 21 Feb.2012).
- Francis, C. M., 2008. *A Field Guide to the Mammals of South-east Asia*. New Holland Publishers. London. 392 pp.
- Lekagul, B. & J. A. McNeely, 1988. *Mammals of Thailand. 2nd Edition*. Association for the Conservation of Wildlife, Bangkok. 758 pp.
- Lim, K. K. P., R. Subaraj, S. H. Yeo, N. T-L. Lim, D. Lane & B. Y. H. Lee, 2008. Mammals. In: Davison, G. W. H., P. K. L. Ng & H. C. Ho (eds.), *The Singapore Red Data Book. Threatened Plants & Animals of Singapore. 2nd Edition*. Nature Society (Singapore), Singapore. Pp. 190–207.
- Lim, N. T-L. & X. Ou Yang, 2012. Occurrence of the Malay civet, *Viverra zibetha* (Mammalia: Carnivora: Viverridae) in Singapore. *Nature in Singapore*, **5**: 79–81.
- Payne, J. & C. M. Francis, 1985. *A Field Guide to the Mammals of Borneo*. The Sabah Society, Kota Kinabalu. 332 pp.
- Saiful, A. A. & M. Nordin, 2004. Diversity and density of diurnal squirrels in a primary hill dipterocarp forest, Malaysia. *Journal of Tropical Ecology*, **29**: 45–49.
- Teo, R. C. H. & Rajathurai, 1997. Mammals, reptiles and amphibians in the nature reserves of Singapore: Diversity, abundance and distribution. *The Gardens' Bulletin, Singapore*, **49**: 353–425.
- Thomas, O. & R. C. Wroughton, 1909. Diagnoses of new mammals collected by H. C. Robinson in the Malay Peninsula and Rhio Archipelago. *Annals and Magazine of Natural History, Series 8*: 439–441.
- Yong A. N., 1985. *Taxonomy of Chigger Mites and their Distribution on Small Mammals in Singapore*. Unpublished Thesis, National University of Singapore, Singapore. 89 pp.