Checklist

Checklist of mammals from Gunung Silam, Sabah, Malaysia

Besar KETOL[1], F. A. ANWARALI[1]*, Wahap MARNI[1], Isa SAIT[1], Maklarin LAKIM[2], Paul Imbun YAMBUN[2], Mohd Azib SALLEH[1], Mustafa Abdul RAHMAN[1] and M.T. ABDULLAH[1]

*[1]Department of Zoology, Faculty of Resource Science and Technology, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia. *email: faisal.anwarali@ttu.edu*

[2]Zoology Section, Sabah Parks, P.O. Box 10626, 88806 Kota Kinabalu, Sabah, Malaysia

ABSTRACT. Field survey was conducted in Mount Silam (Gunung Silam), Lahad Datu, Sabah in September 1995 to inventory the diversity of mammals. A total of 23 species of mammals representing 15 families were recorded. The most captured small mammal species was the Short-nosed Fruit Bat (*Cynopterus brachyotis*) and the most encountered large mammal was the Bearded Pig (*Sus barbatus*). This paper presents a preliminary mammalian list for Mount Silam.

INTRODUCTION

The distribution of mammals in lowland rainforests of Sabah was documented by Chasen & Kloss (1931) and followed by Davis (1962). Later, a study was conducted by Lim & Heyneman (1968) to examine the distribution and abundance of small mammals based on the altitudes in Mount Kinabalu and Tuaran. This was followed by Duff *et al*. (1984) and Stuebing & Gasis (1989) who studied the adaptations of mammals to the transformation of natural forest into commercial plantations in eastern Sabah. Ghazally *et al*. (1995) also made some descriptions of the mammals found in the Tawau Hill National Park. However, it was Payne & Francis (1985) who presented the first updated checklist of mammals from Borneo. But there is little information on the mammal species diversity in the eastern coast of Sabah. Therefore, we have conducted a short survey to document the species composition and abundance of mammals found in Mount Silam, Sabah.

Keywords: *Gunung Silam, Sabah, mammals, survey*

STUDY AREA

The study site is located about 20 km southwest to Lahad Datu, at Mount Silam area. It is located approximately 60 km from Danum Valley, which is a well studied area for mammals and birds (Ahmad, 1990; Mohd Zakaria, 1994). Mount Silam is an ultrabasic low-lying mountain with primary rainforest from 200 m to its summit at 884 m elevation (Proctor *et al*., 1988). The forest reserve, which includes Mount Silam was first gazetted in 1962 under the Ulu Segama Forest Reserve. The areas surrounding our study site is planted with agricultural cash crops including jackfruit (*Artocarpus* sp.), banana (*Musa* sp.) and oil palm. Encroachment into the reserve has always been a problem associated with the people who live in the areas adjacent to the reserve.

MATERIALS AND METHOD

Direct and indirect methods were used to document existence of mammals in the Mount Silam area. Indirect methods include vocalization, defecation, feeding signs and foot prints whereas direct methods include cage trap, mist-net, and spot lighting. One hundred standard wire mesh rat traps (29 cm × 22 cm × 50 cm) were placed at two locations on the forested slopes of Gunung Silam; 50 traps were placed at 180 m above sea level (a.s.l) and the rest were set up near Telekom communication tower at about 640 m a.s.l.. Banana and sweet potatoes were used as baits and were check twice daily, in the morning and evening (Lim, 1973).

Two sites were chosen for bat sampling; one was the banana plot in the lowland at 35 m a.s.l. and another was the forest near the tower. Bats were captured using standard Japan-made nylon mist nets measuring 12 m × 2 m with mesh size of 36 mm (Kunz, 1982). Depending on the suitability of the bat fly-ways, six nets were placed randomly; three were on the upland forest plot and another three were in the banana plot. Nets in the upland forest were left opened from dusk to dawn and checked every one hour or two hours between 1830 hrs to 2030 hrs. Bats captured were placed in cloth bags before being measured and processed.

Spot lighting survey was conducted from 2300 hrs until the next morning (0300 or 0400 hrs), following the road from the base camp (35 a.s.l.) up to 640 m a.s.l. of the tower. Two hand-held spotlights (60-100W) were used and powered by 12 volts batteries. Both sides of the road were surveyed from a moving vehicle concentrating on the road and the vegetation from ground levels to the canopy. Two short routes of about 4 km in total distance at the summit (884 m a.s.l.) and lowland area were surveyed on-foot. Identification of mammals was done following Payne & Francis (1985) and Khan (1992). Binoculars (Minolta 10 × 40 and Samsung 8 × 25) were used as observational aids during the surveys.

Whenever possible, recorded data includes species, sex, morphological measurements, time of capture, locality, habitat and altitude. The abbreviations used were: W = weight (g), TL = total length (mm), HB = head to body length (mm), T = tail length (mm), HF = hind foot length (mm) and FA = forearm length (mm). Animal preservation followed protocols by Nagorsen and Peterson (1980); bats were preserved as whole specimen in 70% ethanol while rats were preserved as round skin specimen. All specimens were deposited into the reference collection facilities at UNIMAS. Common names in English were from Wilson & Reeder (2005) whereas Malay names were from Medway (1969) and Khan (1992), and are included in parentheses. Unless otherwise noted, the taxonomic arrangement herein follows Wilson & Reeder (2005) according to Order arrangements (Table 1).

SPECIES ACCOUNT

Scandentia

Three species of treeshrews: the Common Treeshrew (*Tupaia glis*), the Lesser Treeshrew (*T. minor*), and the Large Treeshrew (*T. tana*) were captured using standard collapsible traps at 640 m a.s.l..

Primates

Three species of primate were spotted in our survey. None of the primates were trapped except for the Slow Loris (*Nycticebus coucang*) which was caught by hand for photography purpose. Two individuals of the Slow Loris were sighted in the disturbed lowland at 110 m and 120 m altitude respectively and another two individuals were observed in the upland forest at 285 m and 350 m altitude on the slope of Mount Silam respectively. Eight individuals of the Pig-tailed Macaque (*Macaca nemestrina*) were observed moving into a corn field near a village on the western side of Mount Silam. A minimum of six individuals of the Bornean Gibbon (*Hylobates muelleri*) were estimated from sightings and their calls at 200 m and 700 m a.s.l..

Table 1. Species list of mammals that were recorded from Gunung Silam, Sabah.

No.	Family Species	Common Name English	 Malay
		SCANDENTIA	
	Tupaiidae		
1	*Tupaia glis*	Common Treeshrew	Tupai Muncung Besar
2	*T. minor*	Lesser Treeshrew	Tupai Muncung Akar
3	*T. tana*	Large Treeshrew	Tupai
		PRIMATES	
	Lorisidae		
4	*Nycticebus coucang*	Slow Loris	Kongkang
	Cercopithecidae		
5	*Macaca nemestrina*	Pig-tailed Macaque	Beruk
	Hylobatidae		
6	*Hylobates muelleri*	Bornean Gibbon	Wak Wak
		CHIROPTERA	
	Pteropodidae		
7	*Cynopterus brachyotis*	Short-nosed Fruit Bat	Cecadu Pisang
8	*Eonycteris spelaea*	Cave Nectar Bat	Cecadu Gua
9	*Macroglossus minimus*	Long-tongued Nectar Bat	Cecadu Madu Bakau
	Rhinolophidae		
10	*Rhinolophus acuminatus*	Acuminate Horseshoe Bat	Kelawar Ladam Kenarong
		PHOLIDOTA	
	Manidae		
11	*Manis javanica*	Pangolin	Tenggiling
		CARNIVORA	
	Felidae		
12	*Prionailurus bengalensis*	Leopard Cat	Kucing Batu
	Viverridae		
13	*Paguma larvata*	Masked Palm Civet	Musang Lamri
14	*Paradoxurus hermaphroditus*	Common Palm Civet	Musang Pulut
	Mephitidae		
15	*Mydaus javanensis*	Sunda Stink Badger	Teledu
		ARTIODACTYLA	
	Suidae		
16	*Sus barbatus*	Bearded Pig	Babi Hutan
	Tragulidae		
17	*Tragulus javanicus*	Lesser Mouse-deer	Kancil
	Cervidae		
18	*Muntiacus* sp.	Barking Deer	Kijang
19	*Rusa unicolor*	Sambar Deer	Rusa
		RODENTIA	
	Sciuridae		
20	*Sundasciurus lowii*	Low's Squirrel	Tupai Ekor Pendek
21	*Aeromys thomasi*	Thomas's Flying Squirrel	Tupai Terbang
	Muridae		
22	*Maxomys rajah*	Brown Spiny Rat	Tikus Duri Hitam Pudar
23	*Leopoldamys sabanus*	Long-tailed Giant Rat	Tikus Perah

Chiroptera

All three fruit and nectar feeding bats, the Short-nosed Fruit Bat (*Cynopterus brachyotis*), the Cave Nectar Bat (*Eonycteris spelaea*), and the Long-tounged Nectar Bat (*Macroglossus minimus*) were captured in the lowland forest of 35 m a.s.l. near the banana plots. None of these bats were collected at the higher elevation. Our single insect eating bat captured in this survey was the Acuminate Horshoe Bat (*Rhinolophus acuminatus*). Three individuals of this species were collected at 640 m a.s.l. The taxonomy of this species is yet to be resolved as they are rare and several subspecies are recognized within this taxonomic unit (Csorba *et al*. 2003). Our specimens have the following measurements: W = 7-10, TL = 50, T = 22-23, FA = 43-45.

Pholidota

The Pangolin (*Manis javanica*) was found near an agricultural area at 120 m a.s.l. which was moving along the Danum Valley road around 2 am.

Carnivora

The Leopard cat (*Prionailurus bengalensis*) was spotted on two different days at a close range on the roadside at 100 m and 185 m a.s.l respectively, around 1-2 am. We also collected single male individual of the Masked Palm Civet (*Paguma larvata*) in a cage trap and had the following measurements: W = 900, HB = 370, T = 360, HF = 75, E = 35. When compared to other published record (Payne & Francis, 1985), it was an immature individual. The Common Palm Civet (*Paradoxurus hermaphroditus*) was spotted feeding on a banana tree at 350 m a.s.l.. A Sunda Stink Badger (*Mydaus javanensis*) was also recorded - a road kill on the Lahad Datu-Silam road. The Sunda Stink Badger is known to be restricted to Java, Sumatra, Borneo and North Natuna Islands (Yeen & Larivière 2003).

Artiodactyla

A group of six Bearded Pig (*Sus barbatus*) comprising of adults and immatures were observed crossing a trail near the base camp at 35 m altitude with numerous tracks within Mount Silam area. An individual of the Lesser Mouse-deer (*Tragulus javanicus*) was spotted moving on the upland forest road at 500 m a.s.l. whereas *Muntiacus* sp. (Barking Deer) was recorded based on their distinct vocalisation during the day time. The Sambar Deer (*Rusa unicolor*) was identified based on foot-prints of various size (80 × 35 mm to 65 × 25 mm) on the old logging roads, sandy river bank and disturbed forest at 155 m elevation.

Rodentia

A Low's Squirrel (*Sundasciurus lowii*) was captured in a cage trap. Thomas's Flying Squirrel (*Aeromys thomasi*) was sighted twice on large tree branches before gliding away. They were observed at 285 m and 190 m elevation along the forested upland road. Although the species conservation status is listed as data deficient under IUCN (2009), their occurrence is restricted to Borneo. Therefore it is important to implement a proper management plan along their known geographic range in Borneo. We also captured two male individuals of the Brown Spiny Rat (*Maxomys rajah*) in cage traps. The taxonomic status of this species is not resolved due to the uncertainty in the geographic range (Wilson & Reeder, 2005). Our specimens were measured as follows: W = 110-130, TL = 391-396, T = 193-202, HF = 38. A single individual of the Long-tailed Giant Rat (*Leopoldamys sabanus*) was capture in a cage trap at 180 m altitude. Similar to the Brown Spiny Rat, the Long-tailed Giant Rat was previously reported with noticeable morphological variations between population from north and south of Isthmus of Kra, and among insular specimens from the Sunda Shelf. The following measurement was taken from a male individual from Mount Silam: W = 327, TL = 640, T = 390, HF = 46.

CONCLUSIONS

A total of 23 species from seven orders and 15 families were recorded around Mount Silam area. The survey suggests that Mount Silam still

harbors a notable number of mammalian species. Mist-netting was inefficient in capturing insect bats i.e. one species in this survey. Future surveys could include harp traps and other indirect method such as camera traps to improve and better document the diversity of Mount Silam.

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