

Study on Morphological description of Some Mammals in Naypyitaw Zoological garden

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Abstract

The study period lasted from May to August, 2018. This paper can carried out for 10 families, 12 genera and 16 species of class Mammalian. Recorded species were identified and classified systematically. The percentage of carnivorous mammal population was 7.14%, herbivorous mammal 86.19% and omnivorous mammal 6.67% were recorded. Among the recorded species, *Panthera tigris*, *P. tigris tigris*, *Elephas maximus*, *Axis porcinus* and *Rucervus eldii*, are the endanger species of Myanmar. Order Carnivora were plantigrade mammal. Order Artiodactyla (even toed) and Order Perissodactyla (odd-toed) were recorded ungulated mammal. The finding of this study served as a source of information in variety of Mammal species and the environmental studies. Naypyitaw Zoological Garden exhibits the various species of animals that distributed all over the country in captivity. Some animals were included from other parts of the world with similar climatic condition in order to draw public awareness on the nature of the animal world.

Key words: Mammalian, feeding habits, ungulated mammal

Introduction

Myanmar occupies one of the richest mammalian for any country of its size in the world possessing about 300 species. Among these species Tiger, Elephant, Rhinoceros, Tapir, Leopard, Clouded Leopard, Golden Cat, Leopard Cat, Bear, Red Panda, Gaur, Takin, Banteng, Serow, Red Goral, Blue Sheep, Leaf Deer, Brow-antlered Deer, Mush Deer, Black Muntjac and Irrawaddy Dolphin are threatened in Myanmar. (SeinTu,1998)

Naypyitaw Zoological Garden is the largest Garden in Myanmar, about 66.825 hectare (165-acre) and opened in 26th March, 2008. It is located at the Yangon- Mandalay highway about 400 km north of Yangon. Initially with about 420 animals trucked in from the Yangon Zoological Garden. In December 2009, it had 634 animals of 89 species, including 304 from 34 mammal species. Among them, the rare and endangered wildlife are being shown white tigers. The visitors can observe the rare wildlife at the Zoological Garden (Anonymous, 2013)

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Carnivorous animals are distinguished from pawed mammals by their large canine teeth and small incisors. The grinding teeth in the carnivore are generally sharp edged but in those species which adopt a more omnivorous diet, such as the civets, they are broader and more rounded (Tun Yin, 1966).

Herbivores are animal anatomically and physiologically adapted to eating plant materials. Herbivores form an important link in the food chain. Herbivores that eat leaves, shoots, and twigs are called browsers. Very large animals like elephants, rhinos, and moose are grazers and browsers. Some herbivores eat all of a plant but others only eat certain parts, like seeds, fruits, or flowers. Omnivores are animals that eat both plant- and animal-derived food. Humans, bears, and chickens are examples of vertebrate omnivores. (www.en.wikipedia.org)

Carnivores in turn consume herbivores for the same reason, while omnivores can obtain their nutrients from either plants or animals. Due to an herbivore's ability to survive solely on tough and fibrous plant matter, they are termed the primary consumers in the food cycle. (www.en.wikipedia.org)

Ungulates(hoofed mammal) are any members of a diverse clade of primarily large mammals that includes odd-toed ungulates such as zebra, horses and rhinoceroses, and even-toed ungulates such as cattle, pigs, giraffes, camels, deer, and hippopotamuses. Ungulates are typically herbivorous (www.ultimateungulate.org).

Zoological Gardens in protected areas managed mainly for ecosystem protection and human enjoyment at recreation. Direct exploitation is excluded and parks are designated to provide for environmental preservation as well as spiritual, scientific, educational and recreational opportunities. Those are environmentally and culturally compatible.

The present study was conducted with the following objectives;

- to study some mammals species in Naypyitaw Zoological Garden
 - to investigate their distribution, feeding types, habit and habitats and foot print of study species
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Materials and methods

Study Area

Naypyitaw Zoological Garden was chosen as study site which was situated in Naypyitaw, Mandalay Region. The study site is located between $19^{\circ} 51' 54''$ N and $96^{\circ} 15' 34''$ E. Zoological Garden was 66.825 hectare (165-acre) width. (Fig.1,2)

Study Period

It lasted from May to August, 2018.

Identification

The studied species of mammals were recorded and photographs were taken. Identification was followed after Corbet and Hill, (1992) and Storer *et.al.*, 1979



Fig.1 Map of Naypyitaw Zoological Garden
(Source: Environmental Conservation and Forestry Department)

Results and discussion

In the present study, a total of 16 species belong to the 12 genera, 10 families, and five orders were recorded in Naypyitaw Zoological Garden. Systematic positions of the studied species were followed after Corbet and Hill (1992), Storer *et.al.*, 1979.

Table 1 Systematic position of recorded species

No.	Order	Family	Scientific name	Local name
1.	Diprotodontia	Macropodidae	<i>Macropus rufogriseus</i>	Thar-pike-kaung
2.	Carnivora	Felidae	<i>Panthera pardus</i>	Kyar -thit
3.			<i>P. tigris</i>	Kyar
4.			<i>P.tigristigris</i>	Kyar - phyu
5.			<i>P.leo</i>	Chinthae
6.			<i>P.leokruger</i>	Chinthae -phyu
7.		Ailuridae	<i>Ailurus fulgens</i>	Watt-won-ni
8.		Ursidae	<i>Ursus thibetanus</i>	Watt -won
9.	Proboscidea	Elephantidae	<i>Elephas maximus</i>	Sin
10.	Perissodactyla	Equidae	<i>Equus burchellii</i>	Myin - kyar
11.	Artiodactyla	Hippopotamidae	<i>Hippopotamus amphibius</i>	Yay -myin
12.		Giraffidae	<i>Giraffa camelopardalis</i>	Thit-ka-la-oat
13.		Cervidae	<i>Axis porcinus</i>	Dayal
14.			<i>Rusa unicolor</i>	Satt
15.			<i>Rucervus eldii</i>	Thamin
16.		Bovidae	<i>Bos frontalis</i>	Nwar naout

Table 2 Percentage of mammalian population in Naypyitaw Zoological Garden

No.	Feeding type	Total	%
1	Carnivore	15	7.14%
2	Herbivore	181	86.19%
3	Omnivore	14	6.67%
		210	100%

Table 3 Number of carnivorous mammal species in Naypyitaw Zoological Garden

No	Species	Individual Number		Total	%
		Male	Female		
1.	<i>Panthera pardus</i>	-	1	1	6.7%
2.	<i>P.tigris</i>	-	1	1	6.7%
3.	<i>P.tigristigris</i>	2	2	4	26.6%
4.	<i>P.leo</i>	1	2	3	20%
5.	<i>P.leokruger</i>	2	4	6	40%
		5	10	15	100%

Table 4 Number of herbivorous mammal species in Naypyitaw Zoological Garden

No	Species	Individual Number		Total	%
		Male	Female		
1.	<i>Macropus rufogriseus</i>	2	5	7	3.87%
2.	<i>Elephas maximus</i>	5	9	14	7.74%
3.	<i>Equus burchellii</i>	4	3	7	3.87%
4.	<i>Hippopotamus amphibius</i>	1	3	4	2.21%
5.	<i>Giraffa camelopardalis</i>	3	3	6	3.31%
6.	<i>Axis porcinus</i>	28	33	61	33.70%
7.	<i>Rusa unicolor</i>	19	22	41	22.65%
8.	<i>Rucervus eldii</i>	18	18	36	19.89%
9.	<i>Bos frontalis</i>	2	3	5	2.76%
		82	99	181	100%

Table 5 Number of omnivorous mammal species in Naypyitaw Zoological Garden

No	Species	Individual Number		Total	%
		Male	Female		
1.	<i>Ailurus fulgens</i>	3	2	5	35.71%
2.	<i>Ursus thibetanus</i>	3	6	9	64.29%
		6	8	14	100%

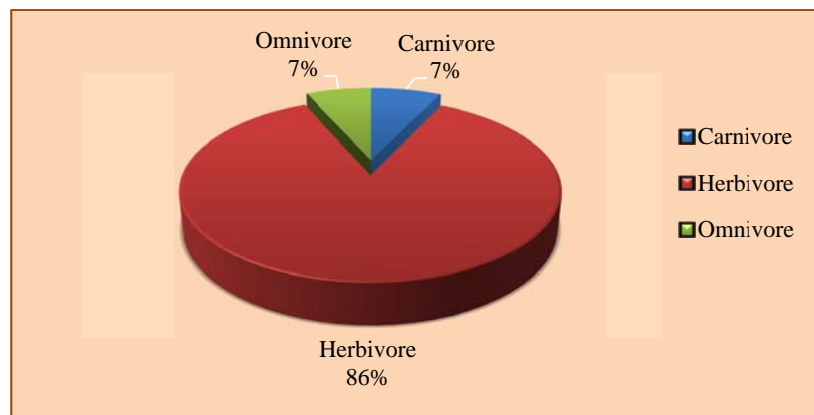
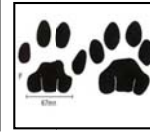


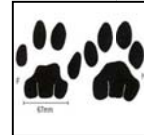
Fig.2 Percentage of mammalian population in Naypyitaw Zoological Garden (according to feeding habits)



A. *Panthera pardus*



B. *Panthera tigris*



C. *Panthera tigris tigris*



D. *Panthera leo*



E. *Panthera leo krugeri*

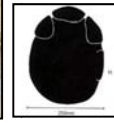
Recorded carnivorous mammal species with their foot prints



Plate I Recorded carnivorous and omnivorous mammal species with their foot prints in Naypyitaw Zoological Garden



A. *Macropus rufus*



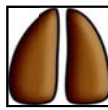
B. *Elephas maximus*



C. *Equus burchellii*



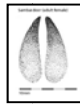
D. *Hippopotamus amphibius*



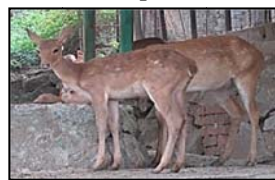
E. *Giraffa camelopardalis*



F. *Axis porcinus*



G. *Rusa unicolor*



H. *Rucervus eldii*



I. *Bos frontalis*

Plate II. Recorded herbivorous mammal species with their foot prints in Naypyitaw Zoological Garden

Table 6 Import countries of recorded some mammal species and their feeding habits

No	Scientific name	Commonname	Feeding habits	Import countries
1	<i>Macropus rufogriseus</i>	Red-necked wallaby	Herbivore	Eastern and southeastern Australia.
2	<i>Panthera pardus</i>	Leopard	Carnivore	Africa, Sahara, South Asia. Central Myanmar.
3	<i>P.tigris</i>	Bengal tiger	■	South Asia, near India in northwest Myanmar
4	<i>P.tigristigris</i>	White tiger	■	China, South Africa
5	<i>P.leo</i>	Lion	■	South Africa ,India
6	<i>P.leokrugerii</i>	White lion	■	South Africa
7	<i>Ailurusfulgens</i>	Red panda	Omnivore	Northern Myanmar, Nepal, India, China.
8	<i>Ursus thibetanus</i>	Asian black bear	Omnivore	East of the Himalayans, Vietnam, China, Thailand
9	<i>Elephas maximus</i>	Asian elephant	Herbivore	Southeast Asia, China and Central Myanmar
10	<i>Equus burchellii</i>	Burchell's zebra	■	Southeastern Africa
11	<i>Hippopotamus amphibius</i>	Hippopotamus	■	Central Africa
12	<i>Giraffa camelopardalis</i>	Giraffe	■	Africa
13	<i>Axis porcinus</i>	Hog deer	■	India, Southeast Asia, Myanmar and Thailand.
14	<i>Rusa unicolor</i>	Sambardeer	■	India, Northern Myanmar, China, Taiwan, Malaysia,
15	<i>Rucervus eldii</i>	Eld's deer	■	Southeast Asia, India, Central Myanmar
16	<i>Bos frontalis</i>	Mythum	■	Nepal, India, Peninsular Malaysia, Myanmar,

Table 7. Conservation status of recorded some mammal species

No	Scientific name	EX	EW	CR	EN	VU	LR	ED	NT	LC	DD	NE
1	<i>Macropus rufogriseus</i>									√		
2	<i>Panthera pardus</i>								√			
3	<i>P.tigris</i>				√							
4	<i>P.tigristigris</i>				√							
5	<i>P.leo</i>					√						
6	<i>P.leokrugeris</i>					√						
7	<i>Ailurus fulgens</i>					√						
8	<i>Ursus thibetanus</i>					√						
9	<i>Elephas maximus</i>				√							
10	<i>Equus burchellii</i>									√		
11	<i>Hippopotamus amphibius</i>					√						
12	<i>Giraffa camelopardalis</i>									√		
13	<i>Axis porcinus</i>				√							
14	<i>Rusa unicolor</i>					√						
15	<i>Rucervuseldii</i>				√							
16	<i>Bos frontalis</i>					√						

Source: IUCN (International Union for Conservation of Nature and Natural Resources) Red List 2018

- | | |
|--------------------------|-----------------------------|
| EX - Extinct | ED - Conservation Dependent |
| EW - Extinct in the wild | NT - Near Threatened |
| CR - Critically Endanger | DD - Data Deficient |
| EN - Endangered | NE - Not Evaluated |
| VU - Vulnerable | DC- Domesticated |
| LR - Lower Risk | LC- Least concern |

In present study, a total of 16 species belonging to the 12 genera, 10 families, and five orders were recorded in Naypyitaw Zoological Garden. According to data, Naypyitaw Zoological Garden 210 animals of different mammal species, including 117 females and 93 males were recorded (Table 1,3,4,5). The percentage of carnivorous mammal population was 7.14%, herbivorous mammal 86.19% and omnivorous mammal 6.67% were recorded (Table 2).

Groombridge and Jenkins, 1994 reported that Myanmar supports at least 251 mammal species are known occur. Seven mammal species are thought to be endemic to Myanmar (Bates, *et al.*, 2004). Large carnivorous mammal species are listed as conservation status under the IUCN Red List. According to Red List, two endangered species (Tiger, White tiger), two vulnerable species (Lion, White lion), one near threatened species (Leopard) were recorded. In herbivorous mammals, three endangered species, three vulnerable species and three least concern were recorded. Omnivores; two vulnerable species (bear) were recorded. (Table.6)

Leopards are versatile hunters, preying upon a wide range of mammals from medium - size ungulates such as *Axis axis* and calves of domestic cattle to small rodents, as well as birds and reptiles (Corbet and Hill, 1992).

Myanmar is thought to possess the largest number of wild tigers after India. In 2004, Myanmar set aside a stretch of jungle the size of Vermont in the isolated Hukawng Valley to become the world's largest tiger reserve. An estimated 50 to 100 tigers were killed every year in Myanmar, during the 1980s. Many were killed by poachers to supply the Chinese traditional medicine trade ([www.wild animal of Myanmar](http://www.wildanimalofmyanmar.org)).

The white tiger is a Bengal tiger that has mutated genes, meaning that it is white in colour with black stripes. A few years ago, however, the capture of a white tiger in Indian and subsequent breeding expedients involving the tigers and its offspring have resulted in a species of albino tiger which breed true. This species are also currently on display at the Naypyitaw Zoology Garden (SeinTu, 1998).

Bears, depending on the local habitat, are more omnivorous: the giant panda is almost exclusively a herbivore, but will take fish, eggs and insects. The red panda lives in the mountain forests from Nepal to northern Myanmar to central China (www.animaldiversity.org)

It was recorded that nine species of deer live in Myanmar. The major threats are conversion to agriculture, fuelwood extraction, and hunting, particularly of Eld's deer. McShea, *et al.*, 1999 reported that

Myanmar also possess an endemic subspecies of Eld's Deer *Rucervus eldii*, which occur in the central dry zone. Among the recorded species, *Panthera tigris*, *P. tigris tigris*, *Elephas maximus*, *Axis porcinus* and *Rucervus eldii*, are the endanger species of Myanmar. Many herbivorous are ungulate mammal. The two major groups of living hoofed mammals are the Artiodactyla, or even-toed mammals; and the Perissodactyla, or odd-toed mammals.

In the present study, Order carnivores were plantigrade mammal food print. In ungulate mammals; Order proboscides (Elephant) was five toed on forefoot and four on hind foot. In odd-toed; *Equus burchelli* was one toed, In even-toed mammals; *Hippopotamus amphibious* was four toed, *Giraffa camelopardalis*, *Axis porcinus*, *Rusa unicolor*, *Rucervus eldii* and *Bos frontalis* were two toed.

A kangaroo is a marsupial from the family Macropodidae (macropods, meaning 'large foot'). Marsupials have short forelimbs, large hind limbs adapted for leaping, and a long tapered tail.

Wildlife conservation includes all human effort to preserve wild animals from extinction. It involves the protection and wise management of wild species and their environment. Some species have become extinct due to natural causes, but the greatest danger to wildlife result from human activities. Thus, we ourselves have created their needs for wildlife conservation.

The present study area, Naypyitaw Zoological Garden has favorable ecosystem for mammals and they are well adapted to their environment. Abundance of food is provided as long term maintenance for mammals in Zoological Garden.

Acknowledgements

I am very grateful to Dr Kyaw Kyaw Khaung, Rector of East Yangon University for his permission and encouragement to work this research. I would like to thank Dr Nilar Aung, Prorector of East Yangon University for her keen advice and encouragement. My special thanks go to Dr Thet Thet Myaing, Professor, Head of Zoology Department and Dr Khin Nang Myint, Professor, Zoology Department, East Yangon University for their good suggestions to complete this research work. My deepest obligations go to Dr Khin Maung Oo, Dr Ni Lar Than, Dr Nyo Mie Kyaing and Dr Aye Thida Than, Associate Professors of Zoology Department, East Yangon University for their comments and criticisms.

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