Distribution and Status of Snakes around Hinthada University Campus

Ko Myint

Abstract

A total of 23 species of snake under 19 genera and 5 families belonging to a single Order Squamata were recorded. The recorded 5 families were involved Viperidae, Elapidae, Colubridae, Xenopeltidae and Typhlopidae. By the Families, the percentage of Colubridae was found to be the largest (65%) and Family Elapidae was the second largest (13%), and then followed by Viperidae (9%), Typhlonidae (9%) and Xenopeltidae with the least number (4%). Concerning with the species distribution, the value of relative frequency distribution (Rfd) were represented as 0.33 in F&R (Forest and Shrub), 0.24 in B&H (Building and Human habitation), 0.22 in G&R (Grass and Rice field) and 0.2 in D&P (Drainage and Pond) respectively. There were five species of snakes involving in the list of the CITIES in status as appendix II and III were discussed to take account into the list of national protected species.

Key words: Snakes, distribution, conservation, CITES-status

Introduction

Snakes have existed on earth for over 100 million years and yet today. The mention of snakes evokes terrible fears in this part of the world. Snakes are perceived as dangerous, harmful and unfriendly animals. It is common to kill them on sight (Mullin and Seigel, 2009). Snakes are in fact extremely beneficial animals and are also absolutely paramount to the health of many eco-systems, the environment and to biodiversity. People are still lack of understanding about the contributions of snakes to the ecology, agriculture, economy, trade, medicine and science and technology, have facilitated the consternation of snakes.

About 3500 species of snakes are recorded on earth inhabiting both land and sea, of which about 375 are venomous. Out of this vast number of the faunal spectrum of snakes only about 250 species are known to occur in the south-east Asia of which only about 60 species are poisonous (Sharma, 1999). Myanmar is rich of biodiversity including snakes which occur abundantly at every parts of region from smallest blind snake Typlonidae to the largest python Pythonidae (Smith, 1943). There were a total of 156 species of snake have been recorded, among them 39 species of dangerously venomous snakes are currently known to inhabit Myanmar and the adjacent coastal waters (Leviton et al., 2003; Zug, 2003).

The snakes occupy a wide range of habitats. These include fields, forests, wetlands, ponds, lakes, streams, rocky hillsides, farmland, uncompleted buildings and residential neighborhoods (O'Shea and Halliday, 2002). Recently a global study of snake populations from the centre for ecology and hydrology in England found that their population was declining around the world by the habitat degradation and increasing both locally and globally consumption of snakes for meats and skins very popular (Anonymous, 2013).

Trading on snakes is becoming wider and wider for various purposes. So the selling and buying of some rare and economically important snake species are prohibited by the law of the country or by the rule of Convention on International Trade in Endangered Species of Wild Fauna and Flora, CITES (CITES, 2010).

With regard to snake conservation and its long term survival, this study therefore was conducted with the aim of describing the snakes included in the list of CITES so as presenting CITES-status of snake species occur around the campus.

Assistant Lecturer, Dr., Department of Zoology, Hinthada University

Thus the study was carried out with the following objectives:

- To record the snake species and composition

- To observe the utilization of habitats and distribution of snake around Hinthada University Campus.

Materials and Methods

Study area

This study was carried out around Hinthada University Campus occupies the area of 37 hectares (91.45 acre) which is located at 17˙ 38′ N and 95˙ 26' E in Hinthada Township, Ayeyawady Region (Figure 1). The climate is tropical with extremely humid in rainy season and hot in dry season. At the study period, some space of the campus is also full of planted-woody trees (forest), in some areas cover with tall grasses, some more spaces cover with shrubs. There are also some artificial ponds which maintain permanent water body by filling with water pumping system in the year so as to feel as recreation for the students. The earthen long drainage in the south at the edge of the campus thriving waters from rainy season to early summer and a few acres of rice field in the north-east of the campus creates to be a favorable condition to inhabit the snakes and other animals.

Study period

This study was conducted from April 2010 to March 2013.

Data collection

. The habitats were categorized into four different forms such as grass and rice field (G&R); forest and shrub (F&S); pond and drainage (P&D) and building and human habitation (B&H) around the campus. Direct observation (visual counting) for searching snakes and indirect (opportunistic counting) searching were applied to collect the specimen. In use of direct observation method, the snakes were commonly searched in those of habitats at dusk around 18:00 to 21:00 hours twice a week. At night-survey for nocturnal snake the head lamp, touch light, long-neck boot, fork-stick and hand net were used in catching of snakes if needs the sample for taking measurements and identification. For diurnal snake the day-study was also made by similar activities to the night-survey. The snakes were recorded by just knowledge as name of the species, size, colour, habitat type and encountered frequency in individual numbers. The molted skins and any evidences of snakes were also collected for identification. Indirect (opportunistic counting) searching is by means of obtaining any information on snake or snake specimen from other people into taking account.

The identification was followed after O'Shea & Halliday, (2002), Leviton et al., (2003), Zug, 2003 and Das (2010). The measurements of body length and tail length of the snakes were taken. The scales on belly, scale rows on mid-body and sautés on the head were counted.

In statistical analysis, the value of Relative Frequency Distribution (RFD) was followed by Speigel (1992). The value of RFD was calculated: divided by the sum of a total number of frequencies in all areas (habitats) to the number of frequencies in a particular area (habitat).

Figure (1) Map of study area: Hinthada University Campus
(Source: Google Earth, 2013)

Results

A total of 23 species of snake under 19 genera and 5 families belonging to a single Order Squamata were recorded (Table 1, Plate 1). Recorded 5 families were involved Viperidae, Elapidae, Colubridae, Xenopeltidae and Typhlopidae. Among these Viperidae and Typhlonidae were each included by two species with three genera. Xenopeltidae with a single species and genus, Elapidae with three species and two genera were represented while Colubridae consisted of 15 species with 13 genera were recorded. By the Family, the percentage of Colubridae was found to be the largest (65%) and The Family Elapidae was the second largest (13%), then followed by Viperidae (9%), Typhlonidae ((9%) and Xenopeltidae with the least number (4%) (Figure 2).

Distribution of the snake species was categorized into four different habitat types. The largest number of species, such as 15 utilized by the forest and shrub, the second largest species number (11) in building and human habitation, then followed by grass and rice field and with the lowest (9) in drainage and pound were recorded (Table 2, Figure 3). Concerning with the species distribution, the value of Relative Frequency Distribution (RFD) presented by table 3 which were 0.33 in F&R, 0.24 in B&S, 0.22 in G&R and 0.2 in D&P respectively.

Internationally some rare and economically important snakes were banned by the rule of Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES. In this study there was recorded five species of snake have been described in the list of the CITES in 2010 (Table. 3).

Table (1) Recorded snake species from Hinthada University Campus

| Order	Family	Scientific name	Common name	Local name
Squamata	Viperidae	*Daboia russelii*	Russsell's viper	Mwe-pwe
		Trimeresurus sp.	-	Mwe-sein-me-chauk
	Elapidae	*Naja kaouthia*	Monocled cobra	Mwe-hauk
		Bungarus fasciatus	Banded krait	Ngan-taw-kyar
		Bungarus caeruleus	Many banded krait	Than-kwin-swat
	Colubridae	*Ptyas mucosa*	Indian rat snake	Lin-net
		Ptyas korros	Javan rat snake	Lin-mwe
		Elaphe radiatus	Copper head snake	Ngan-saung
		Chrysopelea ornata	Ornate flying snake	Htan-tet-mwe
		Ahatulla nasuta	Indian vine snake	Mwe-sein
		Dendrelaphis formosus	Bronzeback tree snake	Thit-chauk-mwe
		Amphiesma stolata	Striped keelback	Myit-chaw
		Oligodon albocinctus	Kukri snake	kway-mwe-hauk
		Enhydris enhydris	Green water snake	Yaw-mwe
		Xenochrophis piscator	Checkered keelback	Yaemwe byauk gyi
		Xenochrophis flaripunctatus	Common water snake	Yaemwe pyaukma
		Sinonatrix aequifasiata	Spotted keelback water snake	yaemwe
		Psammophis condanarus	Stripe-bellied tree snake	Thit-ket-lin
		Rhabdophis chrysarga	Speckle bellied keelback	Padat-layni
		Lycodon capucinus	Island wolf snake	Eain-sau-mwe
	Xenopeltidae	*Xenopeltis unicolor*	Malayan sunbean snake	Mwe-pyada
	Typhlopidae	*Typhlops diardii*	Blind snake	Tekaung-mwe
		Typhlops albiceps	Blind snake	Mwe-me-tauk
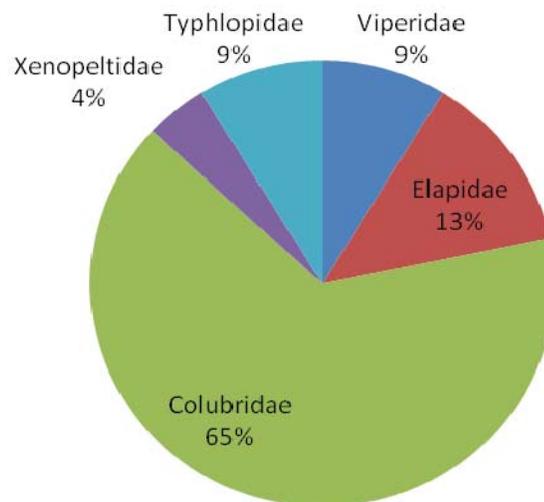
Figure (2) Species composition of snake by relative families

Table (2) Distribution of snake species in relative habitats

Species	G&R	F&S	D&P	B&H
Daboia russelii	✓	✓		
Trimeresurus sp.		✓		
Naja kaouthia	✓	✓	✓	✓
Bungarus fasciatus	✓	✓	✓	✓
Bungarus caeruleus		✓	✓	✓
Ptyas mucosa	✓	✓	✓	✓
Ptyas korros	✓	✓	✓	✓
Elaphe radiatus	✓			✓
Chrysopelea ornata		✓		✓
Ahatulla nasuta		✓		
Dendrelaphis formosus		✓		
Amphiesma stolata	✓			
Oligodon albocinctus	✓			✓
Enhydris enhydris			✓	
Xenochrophis piscator			✓	
Xenochrophis flaripunctatus			✓	
Sinonatrix aequifasiata			✓	
Psammophis condanarus		✓		
Rhabdophis chrysarga	✓	✓		
Lycodon capucinus				✓
Xenopeltis unicolor	✓	✓		✓
Typhlops diardii		✓		✓
Typhlops albiceps		✓		✓

Notes: G&R= Grass and rice field, F&S= Forest and shrub, D&P= Drainage and pond, B&H= Building and human habitation
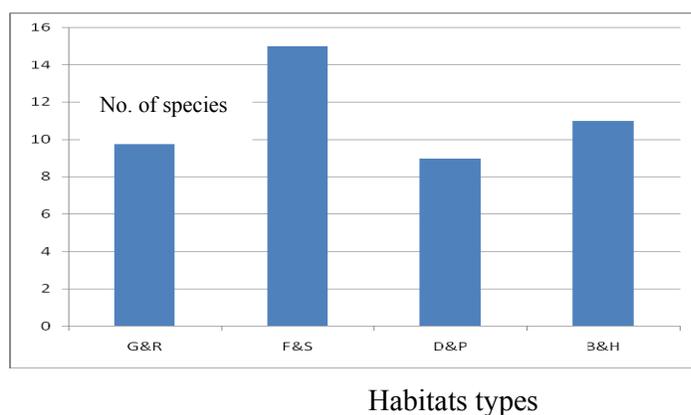

Habitats types

Figure (3) Number of snake species utilized by different habitats

Table (3) Relative frequency distribution by different habitats

	G&R	F&S	D&P	B&H
F	10	15	9	11
RFD	0.22	0.33	0.2	0.24

Notes: F= No. Of frequency of species distributed by a particular habitat
FRD= Relative Frequency Distribution

Table (4) Recorded snakes in list of the CITES

Scientific name	Common name	CITIES, status	Remark
Daboia russelii	Russsell's viper	App. II	Occasional
Naja kaouthia	Monocled cobra	App. III	Rare
Ptyas mucosa	Indian rat snake	App. II	Occasional
Ptyas korros	Javan rat snake	App. III	Common
Bungarus fasciatus	Banded krait	App. III	Common

Notes: App= Appendix

Discussion

A total of 23 species of snake recorded in the Hinthada University Campus during the study period was equal to the 14.7% of the total number of snake species (156) composition of the whole country, Myanmar. If even compared this number to the number of the south-east Asia (250) was 9.2% and was also 0.7% occupied to the world snake population (3500). Among recorded five families, a single Family of Colubridae with 15 species and plus three species from Family Typhlonidae and Xenopeltidae (18), non-venomous snakes, was found to be the largest composition which suggested being very beneficial to the environment in controlling the rodents and balancing the ecosystem. Being variety of snake species in this campus was also suggested it was probably due to abundance of prey and favorable habitat condition.

With regard to the venomous snakes, five species (two in Family Viperidae and three in Elapidae) were found inhabiting in the campus. These kinds of snake are really harmful to humans when they bite. However the venomous snakes are not always our enemy but to be considered as just snakes, its number' declination will affect our environment. Mullin and Seigel (2009) stated that the snakes are absolutely paramount to the health of many eco-systems, the environment and to biodiversity. They are extremely valuable components to the ecological communities in which they live: playing several complex roles including that of predators and prey.

The distribution of snake species mostly in F&S was indicated by the value of RFD as 0.33 and the lowest in D&P as 0.2. It was therefore assumed that among the habitats, the F&S is the most favorable home for snake species. One thing would be discussed with just the snake' survival in any particular ecosystem that there was no doubt on recently produced new buildings in this university campus by clearing the trees would be affected the snake's population leads to declination. Anonymous (2013) described that the destruction of habitat due to urban sprawl and deforestation has caused population declines or even extinction of many of the world's snake species.

(A) *Daboia russelii*   (B) *Naja kaouthia*   (C) *Bungarus fasciatus*
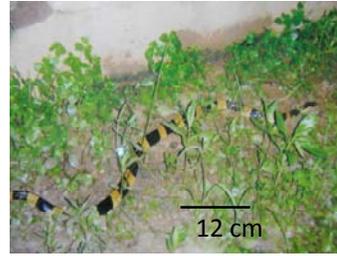
(D) *Bungarus caeruleus*   (E) *Ptyas korros*   (F) *Ptyas mucosa*
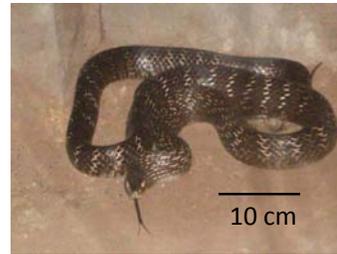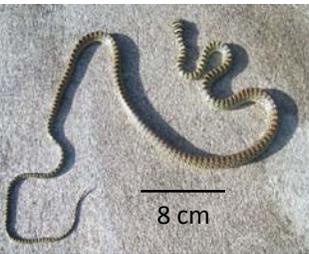
(G) *Elaphe radiatus*   (H) *Chrysopelea ornata*   (I) *Ahatulla nasuta*
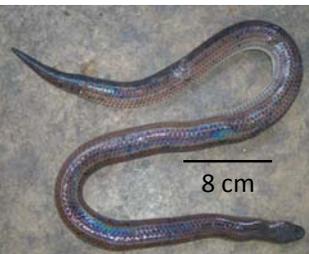
(J) *Oligodon albocinctus*   (K) *Xenopeltis unicolor*   (L) *Psammophis condanarus*
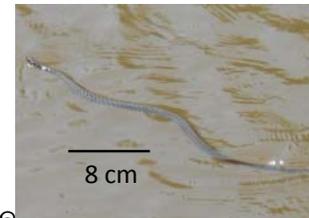
(M) *Amphiesma stolata*   (N) *Xenochrophis piscator*   (O) *Typhlops albiceps*

Plate (I) Some recorded snake species from Hinthada University Campus

Trading some rare and economically important snakes has been banned by the CITIES. In the present study five species of snakes were included in the list of CITIES (2010) in status as appendix II and III which means those species would be extinct after 30 and 50 years if they are not prohibited from illegal trade (CITES, 2010). In Myanmar only two snake species, *Python reticulatus* and *Python molurus* have been protected as national level. It was thus suggested that the mentioned snake species (Table 2) should be protected by the law after taking account into national protective species and should be made more public awareness programs to keep those valuable natural resources sustainable in ecosystem.

Conclusion

During the study period, 23 species of snakes under a single Order belonging to five Families and 19 Genera (occupies 14.7% of country species) were recorded in Hinthada University Campus. The highest species composition was found in Family Colubridae. It was recorded 5 species as venomous while the rest, 18 species as non-venomous snakes. The distribution of snake species was mostly in F&S and the lowest in D&P. There were five species of snakes included in the list of CITIES in status as appendix II and III should be prohibited from illegal trade through the Nation and should be considered to take account into the list of national protected species so as to give them proper legal protection.

Acknowledgements

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