



## STATUS AND DIVERSITY OF SNAKES (REPTILIA: SQUAMATA: SERPENTES) AT THE CHITTAGONG UNIVERSITY CAMPUS IN CHITTAGONG, BANGLADESH

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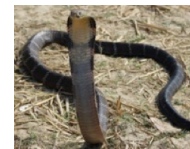
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**Abstract:** A study was conducted on the status and diversity of snakes of the Chittagong University Campus (CUC) between September 2013 and December 2014, and on preserved snake specimens of museums of CUC (Department of Zoology, University of Chittagong; Institute of Marine Sciences and Fisheries, University of Chittagong; and Institute of Forestry and Environmental Sciences, University of Chittagong). Thirty-six species of snakes belonging to 22 genera and five families (Typhlopidae, Pythonidae, Colubridae, Elapidae and Viperidae) were recorded from CUC during the study period. Colubridae comprised the highest (24 species i.e., 66.67%) number of species and Pythonidae the lowest (1 species). Checkered Keelback *Xenochrophis piscator* was the most common snake and the rarest was the Bengalese Kukri Snake *Oligodon dorsalis* belonging to the family Colubridae. Among venomous snakes Banded Krait *Bungarus fasciatus* was the most common snake and Black Krait *Bungarus niger* was the most rare. Their status in CUC has been assessed.

**Keywords:** Bangladesh, Chittagong University Campus, diversity, snake, status.

Most of the snakes are harmless and even beneficial to humans and to the natural ecosystem. They are good friends of farmers and help in maintaining the ecological balance. Snakes are found all over the world except the Arctic Region, New Zealand and Ireland (Goin & Goin 1971). There are about 3,496 species of snakes under 26 families around the world (Uetz & Hošek 2015).

Snakes of Bangladesh are still poorly known. Sarker (1975) identified 21 species of snakes from the preserved specimens in the museums of the Department of Zoology, University of Dhaka and Rajshahi. These specimens were collected from Dacca (Dhaka), Tangail, Faridpur, Pabna, Rajshahi, Chittagong and Chittagong Hill Tracts Districts. Husain (1977) compiled a list and confirmed 40 species of snake are found in Bangladesh. Montaquim (1979) collected 48 specimens from



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different parts of Bangladesh (Pabna, Faridpur, Jessore, Kusthia, Jamalpur, Sylhet, Dhaka, Tangail, Chittagong, Chittagong Hill Tracts and some parts of the Bay of Bengal) and reported 18 species of snakes. Later Montaquim et al. (1980) compiled the previous records and reported 28 species of snakes from Bangladesh. Rashid (1982) collected 47 specimens from Chittagong, Chittagong Hill Tracts, Dhaka, Comilla, Faridpur, Khulna, Mymensingh, Sylhet, Tangail and the Bay of Bengal and reported 27 species of snakes. Khan (1982) annotated a list of snakes and accounted 78 species for the country. Sarker & Sarker (1985) also compiled the records and reported 72 species of snakes from the country. Khan (1987) compiled the snake species again and reported 79 species. Sarker & Sarker (1988) also reported 88 species of snakes from Bangladesh. Later, Khan (1992) reported 81 species of snakes in Bangladesh updating his previous list. Subsequently, Sarker & Hossain (1997) reported 25 species from the costal islands of Bangladesh. Ahsan (1998) compiled the herpetofauna of Bangladesh and reported 77 species of snakes. Asmat & Hannan (2007) annotated 94 species of snakes from Bangladesh. Khan (2008) accounted for 98 species of snakes in his compiled list including 13 unconfirmed ones. Kabir et al. (2009) listed 91 species from Bangladesh under six families and 46 genera. Khan (2010) also reported 94 species of snakes from Bangladesh.

No systematic study on snakes of the Chittagong University Campus (CUC) is on record, so an attempt was made to do some preliminary work on snakes. Parvin (1999) reported 41 species of snakes from Chittagong region based on the preserved specimens of the verified museums of some pronounced institutions and she mentioned 23 species of snakes with CUC as the location.

#### STUDY AREA

CUC (Fig. 1) is situated at Zubra Village under Fatehpur union parishad of Hathazari upazila (sub-district) in Chittagong District, Bangladesh (22°27'30"–22°29'0"N & 91°46'30"–91°47'45"E; area 7.10km<sup>2</sup>). It is about 22km north of the Chittagong City, 3km southwest of Hathazari upazila headquarters and about 6km east from the Bay of Bengal. CUC is surrounded by hills of Chittagong hill region and bisected by a small stream. It is decked with about 72% hills, lakes, ponds and plains and the valleys are 15.9m above sea level (Islam et al. 1979). The soil of CUC is acidic in nature, pH is lower than 5.5 and texture varies from sandy loam to clayey loam; therefore the water holding capacity in the soil is very poor (Islam et al. 1979).

There are three seasons in CUC like elsewhere in

Bangladesh (Ahmad 1968): Summer (March–May), Rainy (June–October) and Winter (November–February). The University area enjoys a tropical climate characterized by hot and humid monsoon, and cool and dry winter. About 60% land area of CUC is covered by steep and very steep hills (Hossain et al. 2013); although it is composed of hills, valleys and plains.

#### METHODS

The study was conducted in CUC between September 2103 and December 2014. The study on preserved snake specimens of the museums of CUC (Department of Zoology, University of Chittagong [DOZ, CU]; Institute of Marine Sciences and Fisheries, University of Chittagong [IMSF, CU]; and Institute of Forestry and Environmental Sciences, University of Chittagong [IFES, CU]) was also carried out during the study period to know previously recorded snakes in CUC. Field observations were done throughout day and night but emphasis was given to night and morning when snakes are more active than other times, to find the snakes in their natural habitat. Opportunistic findings of snakes have also been included in the list. The whole study area was divided into six sites for convenience of the study (Fig. 1) and each site was further divided into two sub-sites to observe as diurnal and nocturnal sessions.

Site A (1): Comprised Shah Amanat Hall, Shah Jalal Hall, Faculty of Business Administration, northern portion of Kata Pahar and adjacent areas.

(2): Composed of Zero Point, Shaheed Minar, southern portion of Kata Pahar, Deshnetri Begum Khaleda Zia Hall, Shamsunnahar Hall, Pritilata Hall, University Club and a part of the Teachers' quarters.

Site B (1): Consisted of Sohrawardi Hall, Security Office, Central Mosque and adjacent areas.

(2): Contained Alaol Hall, F. Rahman Hall, Law Faculty, Medical Center, University Collage, and Old Shamsunnahar Hall, Officers' quarters, Pagoda and adjacent areas.

Site C (1): Comprised Central Field, University Press, Medical Colony and adjacent areas.

(2): Consisted of Social Science Faculty, Tele Hill, Probashi Colony, Shaheed Abdur Rab Hall and Bangabandhu Hall.

Site D (1): Consisted of Tangail Colony, Arts faculty, west and northern sides of Arts Faculty, water fall and adjacent areas.

(2): Composed of Arts Faculty Jhupri, Science Faculty and adjacent areas.

Site E (1): Comprised Institute of Marine Sciences and Fisheries, Faculty of Biological Sciences, Hill Bottom

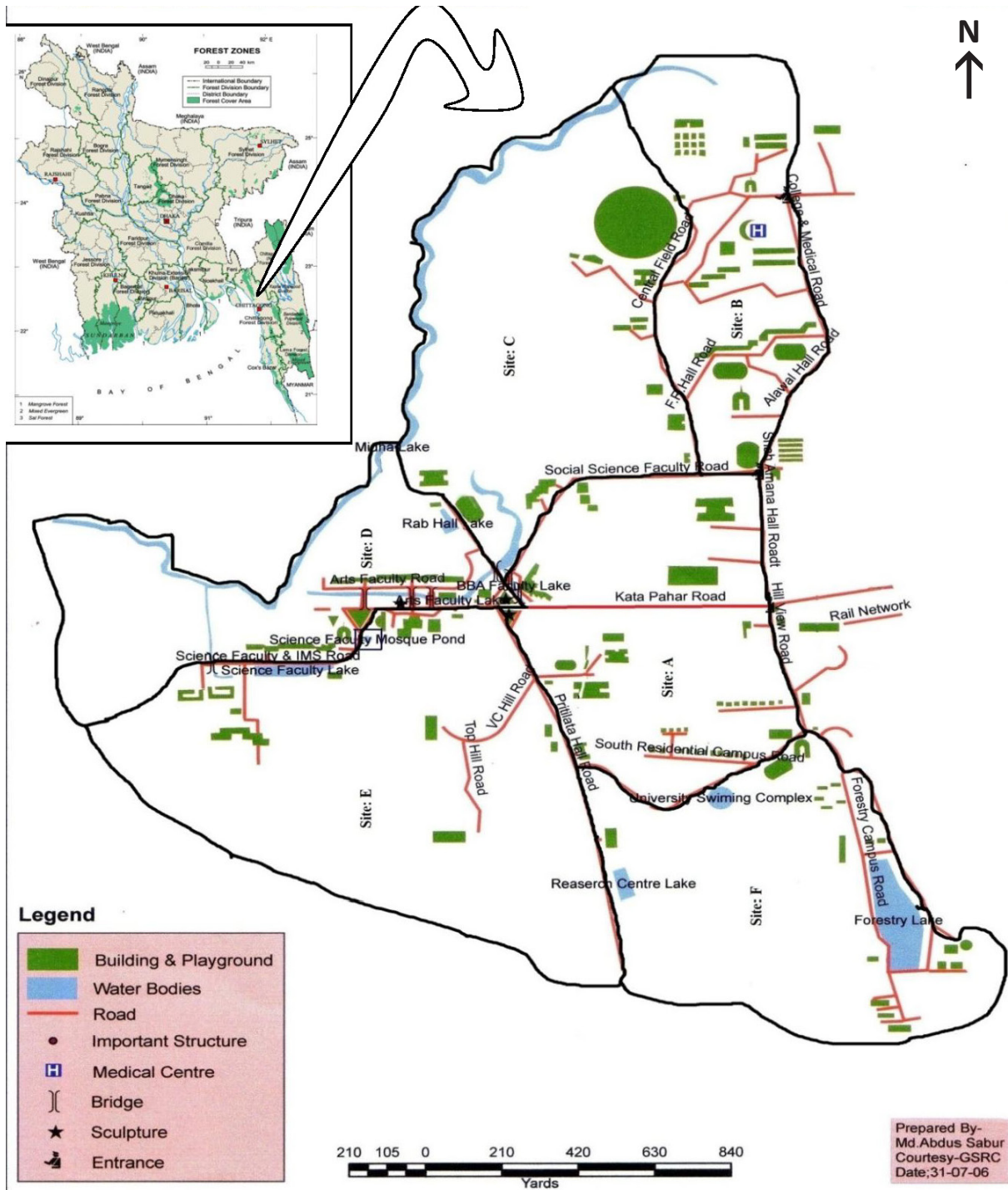


Figure 1. University of Chittagong - Campus map

Colony and surrounding areas.

(2): Composed of Central Library, IT building, VC Hill, Islamia Colony and Botanical Garden.

Site F (1): Consisted of RCMPs, Gol Pukur, South Campus forest region and South Campus lakes.

(2): Included an area with southern Campus Mosque,

Teachers' Quarters and Institute of Forestry and Environmental Sciences (IFESCU).

The snakes that are considered very common (VC), were those observed more than 15 times (>75% of the total observation days), common (C) were seen 10–14 times (50–74 % of the total observation days), fairly

common (FC) were spotted 5–9 times (25–49 % of the total observation), uncommon (UC) were noticed 1–4 times (1–24 %, of the total observation days); and no sighting of the snakes in the field but found only in the museum as preserved specimens which are previously collected from CUC also listed in this list as rare species.

## RESULTS

Thirty-six species of snakes (Table 1) belonging to 22 genera under five families were recorded from CUC during the study period (Images 1–21). Of which 24 species (66.67%) were sighted during the field study but 27 species (75%) were recorded from the museums as preserved specimens collected from the CUC (Images

**Table 1. List of snakes of the Chittagong University Campus, Bangladesh.**

	Family	Scientific name	Common name	Status (CUC)	Museum voucher No.
1	Typhlopidae	<i>Ramphotyphlops braminus</i>	Common Worm Snake, Brahminy Blind Snake	R	81CU*
2	Typhlopidae	<i>Argyrophis diardii</i>	Diard's Blind Snake	UC	32CU, 33CU, 78CU
3	Typhlopidae	<i>Typhlops jerdoni</i>	Jerdon's Blind Snake	UC	
4	Pythonidae	<i>Python bivittatus</i>	Burmese Python	FC	
5	Colubridae	<i>Ahaetulla nasuta</i>	Common Whip Snake, Common Vine Snake	C	74CU
6	Colubridae	<i>Ahaetulla prasina</i>	Short-nosed Vine Snake	UC	12CU, 52CU, 113CU
7	Colubridae	<i>Amphiesma stolatum</i>	Striped Keelback	UC	86CU, 87CU
8	Colubridae	<i>Atretium schistosum</i>	Olive Keelback	R	95CU
9	Colubridae	<i>Boiga cyanea</i>	Green Cat Snake	UC	
10	Colubridae	<i>Boiga cynodon</i>	Bengal Cat Snake	R	120CU
11	Colubridae	<i>Boiga gokool</i>	Eastern Cat Snake	R	IFESCU04**
12	Colubridae	<i>Boiga ochracea</i>	Tawny Cat Snake	UC	
13	Colubridae	<i>Chrysopelea ornata</i>	Ornate Flying Snake	UC	
14	Colubridae	<i>Coelognathus radiatus</i>	Copper-headed Trinket Snake	FC	62CU
15	Colubridae	<i>Dendrelaphis pictus</i>	Painted Bronze-back Tree Snake	FC	
16	Colubridae	<i>Dendrelaphis tritis</i>	Common Bronze-back Tree Snake	C	8CU, 54CU
17	Colubridae	<i>Enhydryis enhydryis</i>	Common Smooth Water Snake	R	47CU
18	Colubridae	<i>Lycodon aulicus</i>	Common Wolf Snake	VC	83CU
19	Colubridae	<i>Lycodon jara</i>	Yellow-speckled Wolf Snake	R	82CU
20	Colubridae	<i>Oligodon albocinctus</i>	White-barred Kukri Snake	R	84CU
21	Colubridae	<i>Oligodon cyclurus</i>	Cantor's Kukri Snake	UC	
22	Colubridae	<i>Oligodon dorsalis</i>	Bengalese Kukri Snake, Spot-tailed Kukri Snake	R	61CU
23	Colubridae	<i>Psammodynastes pulverulentus</i>	Mock Viper	UC	
24	Colubridae	<i>Ptyas korros</i>	Indo-Chinese Rat Snake	VC	103CU, 104CU
25	Colubridae	<i>Ptyas mucosa</i>	Indian Rat Snake	C	101CU
26	Colubridae	<i>Rhabdophis subminiatus</i>	Red-necked Keelback	FC	88CU
27	Colubridae	<i>Xenochrophis flavipunctatus</i>	Checkered Keelback	VC	13CU, 89CU
28	Colubridae	<i>Xenochrophis flavipunctata</i>	Yellow-spotted Keelback	R	94CU
29	Elapidae	<i>Bungarus caeruleus</i>	Common Krait	R	124CU
30	Elapidae	<i>Bungarus fasciatus</i>	Banded Krait	VC	67CU
31	Elapidae	<i>Bungarus niger</i>	Black Krait	R	81bCU
32	Elapidae	<i>Naja kaouthia</i>	Monocellate Cobra, Monocled Cobra	C	30CU, 70aCU, 72CU
33	Elapidae	<i>Naja naja</i>	Binocellate Cobra, Spectacled Cobra	UC	68CU
34	Elapidae	<i>Ophiophagus hannah</i>	King Cobra	UC	58CU, 60CU, 76CU, 77CU
35	Viperidae	<i>Trimeresurus albolabris</i>	White-lipped Tree Viper	C	
36	Viperidae	<i>Trimeresurus erythrurus</i>	Spot-tailed Pit Viper	R	34CU, 35CU, 137CU,

CUC - Chittagong University Campus; \* DOZ, CU - Department of Zoology, University of Chittagong; \*\* IFES, CU - Institute of Forestry and Environmental Sciences, University of Chittagong.



22–24). Among the recorded species 15 (i.e., 41.67%) were found both in the field and museums; 12 were found in the museums and nine were observed during field study.

Among the 36 species of snakes, three species (8.33%) belong to the family Typhlopidae, one species (2.78%) of Pythonidae, 24 species (66.67%) of Colubridae, six species (16.67%) of Elapidae and two species (5.56%) of Viperidae. The total recorded species are 87.80% compared to the Chittagong region (41 species: Parvin 1999) and 39.56% snakes of Bangladesh (91 species: Kabir et al. 2009). Four species (11.11%) of snakes are very common, five species (13.89%) are common, nine species (25%) are fairly common, six species (16.67%) are uncommon; and 12 species (33.33%) are rare in the CUC. Overall, Checkered Keelback *Xenochrophis piscator* is the most common, and Bengalese Kukri Snake *Oligodon dorsalis* is the rarest snake. There are only eight species (22.22% of the total snakes of CUC) of venomous snakes occurring in CUC; six species (75%) under three genera (*Bungarus*, *Naja* and *Ophiophagus*) belong to the family Elapidae and two species (25%) under one genus (*Trimeresurus*) to Viperidae. Among them Banded Krait *Bungarus fasciatus* is the most common. Except three semi-aquatic species (*Xenochrophis piscator*, *X. flavipunctata* and *Enhydris enhydris*) all the snakes found in CUC are terrestrial.

Further studies are needed to know the detailed ecology of the snakes that inhabit CUC. Habitat is being destroyed due to the collection of litter and the cutting of shrubs for fuel by the local people. Furthermore, human settlements in the valleys and in the bottom of the hills, aquaculture in the re-excavated water bodies and agricultural practices are also destroying the habitat of the snakes. All the above factors are causing unsustainable diversity of snakes, so we need to minimize the problems for future sustainable development of snake diversity in CUC.

## REFERENCES

- Ahmad, N. (1968). *An Economic Geography of East Pakistan*. Oxford University Press, Oxford, 401pp.
- Ahsan, M.F. (1998). Country reports for Bangladesh - Herpetofauna of Bangladesh: present status, distribution and conservation, pp. 9–17. In: *Biology and Conservation of the Amphibians, Reptiles and Their Habitats in South Asia*. (Silva, A de eds.). Proceedings of the International Conference on the Biology and Conservation of the Amphibians and Reptiles of the South Asia, Sri Lanka, August 1–5, 1996. Amphibia and Reptile Research Organization of Sri Lanka, Kandy.
- Asmat, G.S.M. & M.A. Hannan (2007). *Checklist of Wild Animals of Bangladesh*. Gazi Publishers, Dhaka, 292pp.
- Goin, J.C. & O.B. Goin (1971). *Introduction to Herpetology - 2<sup>nd</sup> Edition*. W. H. Freeman & Company, San Francisco, 353pp.
- Hossain, M.S., S. Muhammad, A.A. Mamun & S.M.S. Haque (2013). Patch weeding on success of plantation in Chittagong University. *Bangladesh Research Publication Journal* 9(2): 75–78.
- Husain, K.Z. (1977). Bangladesher banayanjontu shampad O tar sangrakshan (Wild animals of Bangladesh and their conservation) (in Bengali). *Bangla Academy Bijnan Patrica* 3(3): 1–11.
- Islam, A.T.N.T., H.S.S. Chowdhury, A.K.M.M. Hoque & S.A. Malik (1979). *Detailed Soil Survey Chittagong University Campus, Chittagong 1974* [Preliminary Edition (S.M. Saheed, (ed.))]. Department of the People's Republic of Bangladesh, Dacca. 207pp+iii.
- Kabir, S.M.H., M. Ahmad, A.T.A. Ahmed, A.K.A. Rahman, Z.U. Ahmad, Z.N.T. Begum, M.A. Hassan & M. Khondker (eds.) (2009). *Encyclopedia of Flora and Fauna of Bangladesh - Vol. 25. Amphibians and Reptiles*. Asiatic Society of Bangladesh, Dhaka, 204pp.
- Khan, D.R. (2010). *Wildlife of Bangladesh - A Checklist (from Amphibia to Mammalia with Bengali Names)*. Shahitya Prakash, Dhaka, 128pp.
- Khan, M.A.R. (1982). *Wildlife of Bangladesh - A checklist*. The Dhaka University Press, Dhaka, 174pp.
- Khan, M.A.R. (1987). *Bangladesher Banaya Prani (Wildlife of Bangladesh) - Vol. 1*. (in Bengali) Bangla Academy, Dhaka, 169pp.
- Khan, M.A.R. (1992). *Bangladesher Shap (Snakes of Bangladesh)* (in Bengali). Bangla Academy, Dhaka, 227pp.
- Khan, M.M.H. (2008). *Protected Areas of Bangladesh - A Guide to Wildlife*. Nishorgo Program, Bangladesh Forest Department, Dhaka, 304pp.
- Montaquim, M.A. (1979). Snakes of several districts of Bangladesh. MSc Thesis (Unpublished), University of Dhaka, Dhaka, 63pp+Vpls.
- Montaquim, M.A., A.H. Sarkar, M.A.R. Khan & K.Z. Husain (1980). List of the snakes of Bangladesh. *Bangladesh Journal of Zoology* 8(2): 127–129.
- Parvin, S. (1999). On some snakes of Chittagong. MSc thesis (Unpublished) University of Chittagong, Chittagong, 188pp.
- Rashid, S.M.A. (1982). On some snakes of Bangladesh with notes on their habit, habitat, status and distribution. MSc Thesis (Unpublished). University of Dhaka, Dhaka, xv+108pp.
- Sarker, M.A.H. (1975). Snakes of Bangladesh. MSc Thesis (Unpublished). University of Dhaka, Dhaka, xii+70pp.
- Sarker, M.S.U. & M.L. Hossain (1997). Ecological study on the wildlife resources of coastal islands and their conservation. *The Journal of Noami* 14(1&2): 39–54.
- Sarker, M.S.U. & N.J. Sarker (1985). Reptiles of Bangladesh (with their status, distribution and habitat). *Tigerpaper* XII(2): 6–12.
- Sarker, M.S.U. & N.J. Sarker (1988). *Wildlife of Bangladesh (A Systematic List with Status, Distribution and Habitat)*. The Rico Printers, Dhaka, 69pp.
- Uetz, P. & J. Hošek (eds.) (2015). The Reptile Database. <http://www.reptile-database.org/db-info/SpeciesStat.html>. Accessed on 31 August 2014.



Image 1. *Typhlops jerdoni* Jerdon's Blind Snake



Image 2. *Python bivittatus* Burmese Python



Image 3. *Ahaetulla prasina* Short-nosed Vine Snake



Image 4. *Boiga ochracea* Tawny Cat Snake



Image 5. *Chrysopelea ornata* Ornate Flying Snake



Image 6. *Coelognathus radiatus* Copper-headed Trinket Snake



Image 7. *Lycodon aulicus* Common Wolf Snake



Image 8. *Oligodon cyclurus* Cantor's Kukri Snake



Image 9. *Psammodynastes pulverulentus* Mock Viper



Image 10. *Xenochrophis piscator* Checkered Keelback



Image 11. *Rhabdophis subminiatus* Red-necked Keelback



Image 12. *Ptyas korros* Indo-Chinese Rat Snake





Image 13. *Amphiesma stolatum* Striped Keelback



Image 14. *Dendrelaphis pictus* Painted Bronze-back Tree Snake

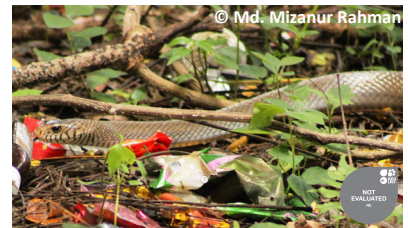


Image 15. *Ptyas mucosa* Indian Rat Snake



Image 16. *Boiga cyanea* Green Cat Snake



Image 17. *Ophiophagus hannah* King Cobra



Image 18. *Naja kaouthia* Monocled Cobra



Image 19. *Bungarus fasciatus* Banded Krait

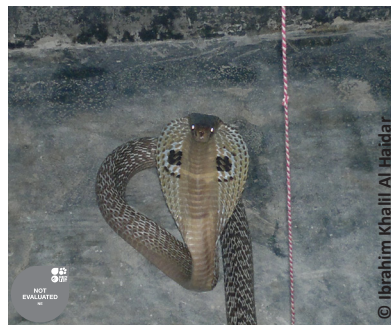


Image 20. *Naja naja* Spectacled Cobra



Image 21. *Trimeresurus albolabris* White-lipped Tree Viper



Image 22. Preserved specimens from the museum, Department of Zoology, University of Chittagong - *Dendrelaphis tritis* Common Bronze-back Tree Snake Voucher no. 8CU







Image 23. Preserved specimens from the museum, Department of Zoology, University of Chittagong - *Boiga cynodon* Bengal Cat Snake Voucher no. 120CU



Image 24. Preserved specimens from the museum, Department of Zoology, University of Chittagong - *Bungarus caeruleus* Common Krait Voucher no. 124CU

