

SNAKES

Diversity of Snakes in and around Durgapur City, West Bengal, India



Barred wolf snake
- *Lycodon striatus*
(Photo credit:
Jibon Kishor
Chatterjee)

Snakes play a pivotal role as predators in the ecosystem by influencing nutrient flow (Pradhan et al. 2014). They are also well known for controlling rodent pests (Fitch 1949; Gibbons 1988). However, snake communities are highly vulnerable to habitat loss, pollution and various anthropogenic pressures and most recently there have been a great concern about conservation of snakes globally (Sahu et al. 2014). The global diversity of snakes comprises of about 3,619 species (Uetz & Hošek 2016) of which 297 snake species are found in India (Bansode et al. 2016). West Bengal is a home to 112 snake species under 9 families (Saha & Nandi 2005). Study of snake diversity from different parts of the country encompassing different habitat types are becoming more and more popular (Pradhan et al. 2014; Yadav et al. 2014; Khobragade & Pawar 2015; Sayeswara et al. 2015; Rout et al. 2016; Sirsat et al. 2016). In a previous study on herpetofauna during August 2009 to July



2011 our research team found 15 snake species from the present study location (Pal et al. 2012). However, it was felt important to repeat the study since new species were observed in the later years. Thus the present study was undertaken to update the checklist of snakes from Durgapur city.



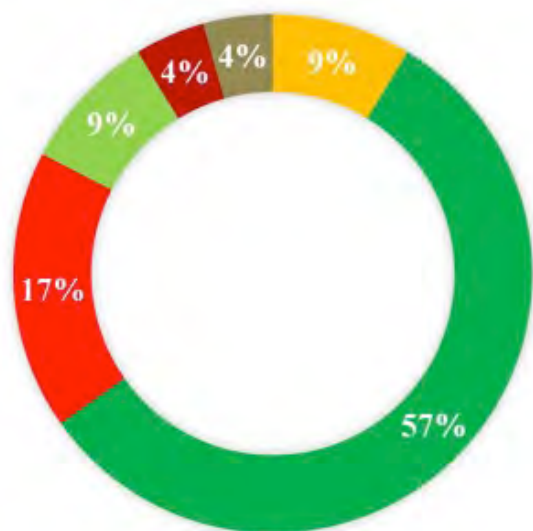
Study area

Materials and Methods

The present study was carried out in Durgapur, also known as ‘steel city’ of

West Bengal, India. The city encompasses 154 km² of area and is located at the transition zone between Chhota Nagpur plateau and Gangetic plains (23.48°N, 87.32°E, elevation 65 m MSL). The city was established in the first post-independence era in 1950s which now forms the most important industrial belt of India. Before urbanization this region was represented by dry deciduous forest, scrubland and a few agricultural lands of poor laterite soil. Presently the landscape has been changed by various degrees of accelerating human activities and is dotted with a large number of small and heavy industries which includes the Durgapur Steel Plant, Alloy Steel Plant, Durgapur Thermal Power Station and Durgapur Projects Limited. A large dam and various reserves have been constructed for water supply and flood control for the inhabitants of Durgapur and its surrounding regions. The city is both interspersed

and surrounded by forest patches. Soils of this area are mainly of three types - laterite soil with gravel, silty clayey soil and sandy clayey soil (Nayak & Roy 2016). The primary vegetation of the study area is represented by tropical dry deciduous plants dominated by *Shorea robusta* (Champion & Seth 1968).



- Boidae
- Colubridae
- Elapidae
- Typhlopidae
- Viperidae
- Pythonidae

Percentage distribution of snake family as recorded in the present study

The present study was carried out during March 2014 to February 2016. Surveys were systematically done on a monthly basis during the study period. However, there exists no single sampling method by which snake community density and diversity can be

Table 1. Snake diversity recorded from Durgapur city, West Bengal

Family	Common name	Scientific name	Local name	Habitat	Relative abundance	IUCN category
Boidae	Common sand boa	<i>Gongylophis conicus</i>	Tutur, Bali-bora, dhulo-bora	T	D	-
	Red sand boa	<i>Eryx johnii</i>	Lal bali-bora	T	D	-
Colubridae	Common vine snake	<i>Ahaetulla nasuta</i>	Lau-doga	Ar	C	-
	Striped keelback	<i>Amphiesma stolatum</i>	Hele, Halhala	T	A	-
	Banded racer	<i>Argyrogena fasciolata</i>	Khet-mete	T	D	-
	Olive keelback	<i>Atretium schistosum</i>	Kerul	Aq	C	LC
	Common cat snake	<i>Boiga trigonata</i>	Bonkoraj, biral-chokho	Ar	D	LC
	Ornate flying snake	<i>Chrysopelea ornata</i>	Kal-nagini	Ar	D	-
	Common bronzeback tree snake	<i>Dendrelaphis tristis</i>	Betanchora	Ar	D	-
	Common smooth-scaled water snake	<i>Enhydryis enhydryis</i>	Metuli	Aq	D	LC
	Common kukri snake	<i>Oligodon arnensis</i>	Udoykal	T	C	-
	Common wolf snake	<i>Lycodon aulicus</i>	Ghor-chiti	T	A	-
	Barred wolf snake	<i>Lycodon striatus</i>	Chiti	T	C	-
	Indian rat snake	<i>Ptyas mucosa</i>	Dhaman, daras	T	A	-
	Checkered keelback	<i>Xenochrophis piscator</i>	Dhora, Jol dhor	Aq	B	-
Elapidae	Common krait	<i>Bungarus caeruleus</i>	Domnachiti, kalaj	T	C	-
	Banded krait	<i>Bungarus fasciatus</i>	Raj-sanp, sakhamuti	T	A	LC
	Spectacled cobra	<i>Naja naja</i>	Gokhro	T	C	LC
	Monocled cobra	<i>Naja kaouthia</i>	Keute, samuk-vanga	Semi Aq	B	LC
Pythonidae	Indian rock python	<i>Python molurus molurus</i>	Ajgar, mayal	T	D	-
Typhlopidae	Beaked worm snake	<i>Grypotyphlops acutus</i>	Talia	F	C	LC
	Brahminy worm snake	<i>Ramphotyphlops braminus</i>	Telenga	F	B	-
Viperidae	Russell's viper	<i>Daboia russelii</i>	Chandrabora	T	C	LC

Abbreviations used: T – Terrestrial; Ar – Arboreal; Aq – Aquatic; F – Fossorial; - - Not Evaluated by IUCN; LC - Least Concern

Relative abundance expressed as sighting frequencies (encounter rates) of each species. A, B, C and D stands for sighting frequencies where “A” stands for most common while, “D” stands for least common/rare snake species. Encounter rates A (75–100%), B (50–74.99%), C (25–49.99%) and D ($\leq 24.99\%$) from the sites of their occurrence throughout the entire study period.



Common kukri snake - *Oligodon arnensis* (Photo credit: Arghaya Mondol)

holistically assessed (Sutherland 2006). In the present study multiple methods were used to evaluate snake diversity (for making checklist and comment on relative abundance), which included hand capturing, extensive searches in micro habitats, opportunistic spotting, road-kill analysis and information collection from local people. Snakes were identified following Daniel (2002), Das (2002) and Whitaker & Captain (2008).

Results and Discussion

A total of 23 snake species under 6 families were recorded during the present study (Table 1). Mention may be made that in a previous study from the present location Pal et al. (2012) had reported 15 different snake species. Colubridae was recorded as the most diverse snake family in the present study with 13 species while *Amphiesma stolatum*, *Lycodon aulicus* and *Ptyas mucosa* were recorded as the most abundant snakes. Five snake species (21%) in the present study recorded were venomous with maximum abundance of *Daboia russelli*. Tambre & Chavan (2016) have made similar findings from other parts of the country. All the three keel-back snakes were frequently spotted along with two blind snakes and this finding corroborates well with previous findings made from the present study location by Pal et al. (2012). During the present study arboreal snake species were spotted less frequently which has been reflected in their lower relative abundance.

All the snake species noted during the present study belonged to either Least Concern (LC) or Not Evaluated (NE) category as designated by IUCN (IUCN 2016). However,

snakes, both venomous and non-venomous were found to be killed by local inhabitants due to fear. Also, the present study location is facing immense threat from burgeoning human activities. Anthropogenic disturbances in the forms of road kill, urbanization, tourist pressure, livelihood dependence and pollution are destroying snake diversity from Durgapur and its surrounding areas. Its high time to act and concerns from all corner of the society is the prime need of the hour to conserve this diverse ecoregion.



Common wolf snake - *Lycodon aulicus* (Photo credit: Arghaya Mondol)

References

- Bansode, S.A., V.R. More & K.A. Mirza (2016).** A Study on snakes from Mokhada and Jawhar (Dist. Palghar) Maharashtra, India. *International Journal of Fauna and Biological Studies* 3(5): 103-115.
- Champion, H.S. & S.K. Seth (1968).** *A Revised Survey of Forest Types of India*. Manager of Publications, Delhi, Dehradun. 404pp.
- Daniel, J.C. (2002).** *The Book of Indian Reptiles and Amphibians*. 1st Ed., Oxford University Press, Bombay. 252pp.
- Das, I. (2002).** *A Photographic Guide to the Snakes and Other Reptiles of India*. 1st Ed., New Holland Publication, U.K. 246pp.
- Fitch, H. (1949).** Study of Snake Populations in Central California. *American Midland Naturalist* 41: 513-579.
- Gibbons, J. (1988).** The management of reptiles, amphibians and small mammals in North America: the need for an environmental attitude adjustment, U.S. Department of Agriculture, Forest Service, GTRRM-166.
- IUCN (2016).** The IUCN Red List of Threatened Species. Version 2016-3. <www.iucnredlist.org>. Downloaded on 10 May 2017.
- Khobragade, K. & V.B. Pawar (2015).** Diversity and ecological status of serpent fauna of degraded forest habitats of in and around Lonar lake reservoir (Lonar Crater Rim), Buldhana District, Maharashtra. *International Journal of Engineering Science Invention* 4(1): 19-21.
- Nayak, A.K. & U.S. Roy (2016).** An observation on the Odonata fauna of the Asansol-Durgapur Industrial Area, Burdwan, West Bengal, India. *Journal of Threatened Taxa* 8(2): 8503-8517.
- Pal, A., S. Dey & U.S. Roy (2012).** Seasonal diversity and abundance of herpetofauna in and around an industrial city of West Bengal, India. *Journal of Applied Sciences in Environmental Sanitation* 7(4): 281-286.
- Pradhan, S., D. Mishra & K.R. Sahu (2014).** An inventory and assessment of snake diversity of Gandhamardan hills range of western Orissa, India. *International Journal of Pure and Applied Zoology* 2(3): 241-245.
- Rout, S., B. Baruah, N. Mishra & T. Panda (2016).** Diversity of herpetofaunal community in Kuldiha wildlife sanctuary,



Odisha, India. *Current Life Sciences* 2 (1): 9-14.

Saha, B.K. & N.C. Nandi (2005). A checklist of ophidian fauna of West Bengal, India along with their status, distribution and conservation. *Journal of Environment & Sociobiology* 2(1&2): 49-60.

Sahu, K.R., D. Mishra & S. Pradhan. (2014). An inventory of Amphibian fauna of Gandhamardan hills range of western Orissa, India. *International Journal of Research in Zoology*, 4(1): 6-9.

Sayeswara, H.A., E.N. Jeevan, H.M. Ashashree, K.L. Naik & N.K. Swamy (2015). A checklist of snakes in and around Shivamogga city corporation, Karnataka, India. *International Journal of Science and Nature* 6(3): 495-500.

Sirsat, C.V., M.U. Patil & V. Ujiwal (2016). Analysis of data on snakes diversity and ecological status from Aurangabad district, (MS) India. *Bioscience Discovery* 7(2): 162-165.

Sutherland, W.J. (2006). *Ecological Census Techniques*. University Press, Cambridge, U.K. pp. 432.

Tambre, G.N. & S.P. Chavan (2016). Snake species diversity of Swami Ramanand Teerth Marathwada University, Nanded, Maharashtra State, India. *International Journal of Current Research and Academic Review* 4(6): 104-115.

Uetz, P. & J. Hošek (eds.) (2016). The Reptile Database. <http://www.reptile-database.org/db-info/SpeciesStat.html>. Accessed on 09th September 2016.

Whitaker, R. & A. Captain (2008). *Snakes of India. The Field Guide*. Draco Books, Chengalpattu, Tamil Nadu. pp xiv+479.

Yadav, O.V., S.R. Yankanchi & A.M. Patil (2014). Diversity, threats and conservation of herpetofauna in Shivaji University Campus, Kolhapur, Maharashtra, India. *International Journal of Current Microbiology and Applied Sciences* 3(6): 742-749.

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