

Species Diversity of Snakes in Pachmarhi Biosphere Reserve

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Abstract

Madhya Pradesh (MP), the central Indian state is well-renowned for reptile fauna. In particular, Pachmarhi Biosphere Reserve (PBR) regions (Districts Hoshangabad, Betul and Chindwara) of MP comprises a vast range of reptiles, especially herpetofauna yet unexplored from the conservation point of view. Earlier inventory herpetofaunal study conducted in 2005 at MP and Chhattisgarh (CG) reported 6 snake families included 39 species. After this preliminary report, no literature existing regarding snake diversity of this region. This situation incited us to update the snake diversity of PBR regions. From 2010 to 2012, we conducted a detailed field study and recorded 31 species of 6 snake families (Boidae, Colubridae, Elapidae, Typhlopidae, Uropeltidae, and Viperidae) in Hoshangabad District (Satpura Tiger Reserve) and PBR regions. Besides, we found the occurrence of *Boiga forsteni* and *Coelognatus helena monticollaris* (Colubridae), which was not previously reported in PBR region. Among the recorded, 9 species were Lower Risk – least concerned (LR-lc), 20 were of Lower Risk – near threatened (LR-nt), 1 is Endangered (EN) and 1 is vulnerable (VU) according to International Union for Conservation of Nature (IUCN) status. Hence, there is an urgent need for strategies to conserve these rare and threatened snakes in PBR.

Keywords: Herpetofauna; Species diversity; Check list; Satpura Tiger Reserve (STR); Pachmarhi Biosphere Reserve (PBR)

Introduction

There is growing evidence about the rich herpetofaunal diversity of India [1-4]. Herpetofauna includes both reptiles and amphibians. Among the herpetofauna reported, reptiles (518 species) [5] were higher in India as compared to amphibians (314 species) [6]. The government of India has established 18 Biosphere Reserves. Pachmarhi biosphere reserve (PBR) is one among the biodiversity rich in fauna and flora, established on 3rd March 1999. PBR lies in between latitude 20°20'00" to 22°50'00" North and longitude 77°45'00" to 78°56'00" East and encompass total area 4926.28 km², includes three districts (Hoshangabad, Betul and Chindwara) of Madhya Pradesh (MP). The total area of Hoshangabad district is 5408.23 km², includes three protected wildlife areas. It includes three wildlife conservation units i.e. Bori Sanctuary, Satpura National Park and Pachmarhi Sanctuary covering the areas 518.00 km², 524.37 km² and 461.37 km² respectively. Satpura Tiger Reserve (STR) lies between the latitude 22° 19' 28" N to 22° 45' 30" N and longitude 77° 53' 48" E to 78°34' 0" E. The total area of PBR is 4926.28 km². STR is encompassed of moist deciduous forests. The forest has prominent floral species includes teak, saja, tendu, Harra, Mahua, and Dhawda. There are three clear season found in this region are dry, wet and cold. The cold season starts from November and last up to end of February. It's followed by hot season which last up to middle of June. The coolest months are December to January and the hottest most are March, April and May. The average rainfall is about 2000 mm per year.

Apart from flora, faunal species such as Tiger, Leopard, Bison, Wild dogs, Bear, Chital, and Sambar Indian Giant Squirrel etc. were found in these forests. This reserve occupies a diverse range of habitats suitable for Herpetofauna, especially for reptiles. Snakes are the one among this reptile fauna frequently found in this reserve and their diversity in this region is poorly understood or not yet totally explored. Earlier study conducted by Kailash Chandra and Pawan [7] reported the vast herpetofaunal diversity of MP and Chhattisgarh (CG). After this preliminary report, there is no literature available regarding snake diversity in this region. This situation prompted us to conduct the present study to update the species diversity of snakes in the PBR and adjoining regions.

Methodology

Study area and field survey

The study survey was conducted during 2010 to 2012 in selected habitat of reptiles at Different tehsils of Hoshangabad, Betul and Chindwara district (Figure 1) for the possibility of availability of the species with the help of local communities residing on selected zone of PBR by interviewing and showing different colors photographs of snakes. On the basis of identification by the local communities, check list was prepared as a primary data. The secondary data for this observation were obtained after the examination and careful identification by the MP Forest Department (Figures 2-7).

Results and Discussion

We recorded 31 species of 6 snake families (Boidae, Colubridae, Elapidae, Typhlopidae, Uropeltidae, and Viperidae) (Table 1) in STR and PBR regions. An earlier study conducted by Kailash Chandra and Pawan [7] reported only 3 species of 3 snake families include Typhlopidae (*R. braminus*), Uroleptidae (*U. ocellata*), and Viperidae (*T. gramineous*) in the PBR region of Hosangabad. In the present study, we recorded the availability of 3 more snake families includes Boidae, Colubridae, and Elapidae. Besides, we found the occurrence of *B. forsteni* and *C. h. monticollaris* (Colubridae) in PBR region. None of the earlier study reported these 2 species in Madhya Pradesh region. Similarly, two studies reported the availability of *C. h. monticollaris*. A study conducted by Nitin [8] concluded the new locality of *C. h. monticollaris* in Vansda National Park, Navsari, Gujarat, India. Subsequently, Bhupathy and Sathishkumar [9] reported *C. h.*

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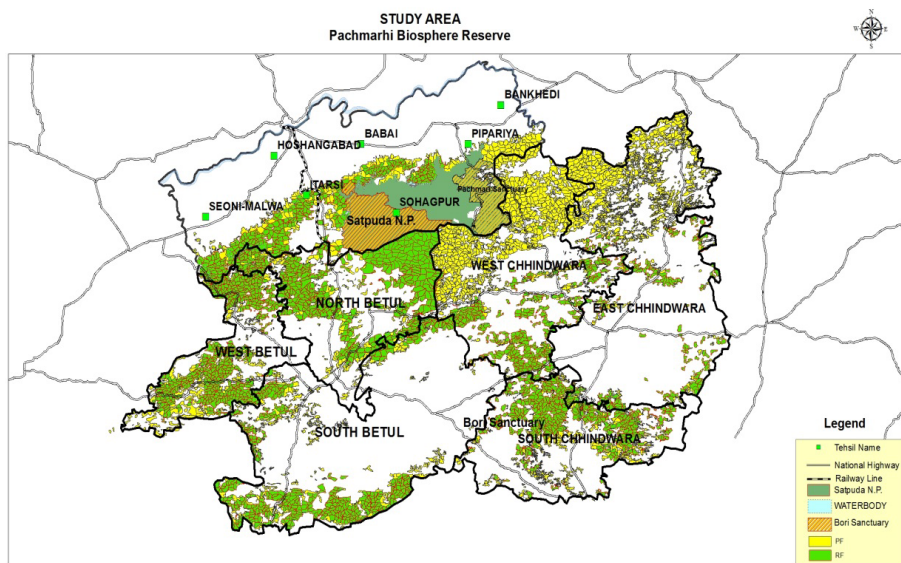
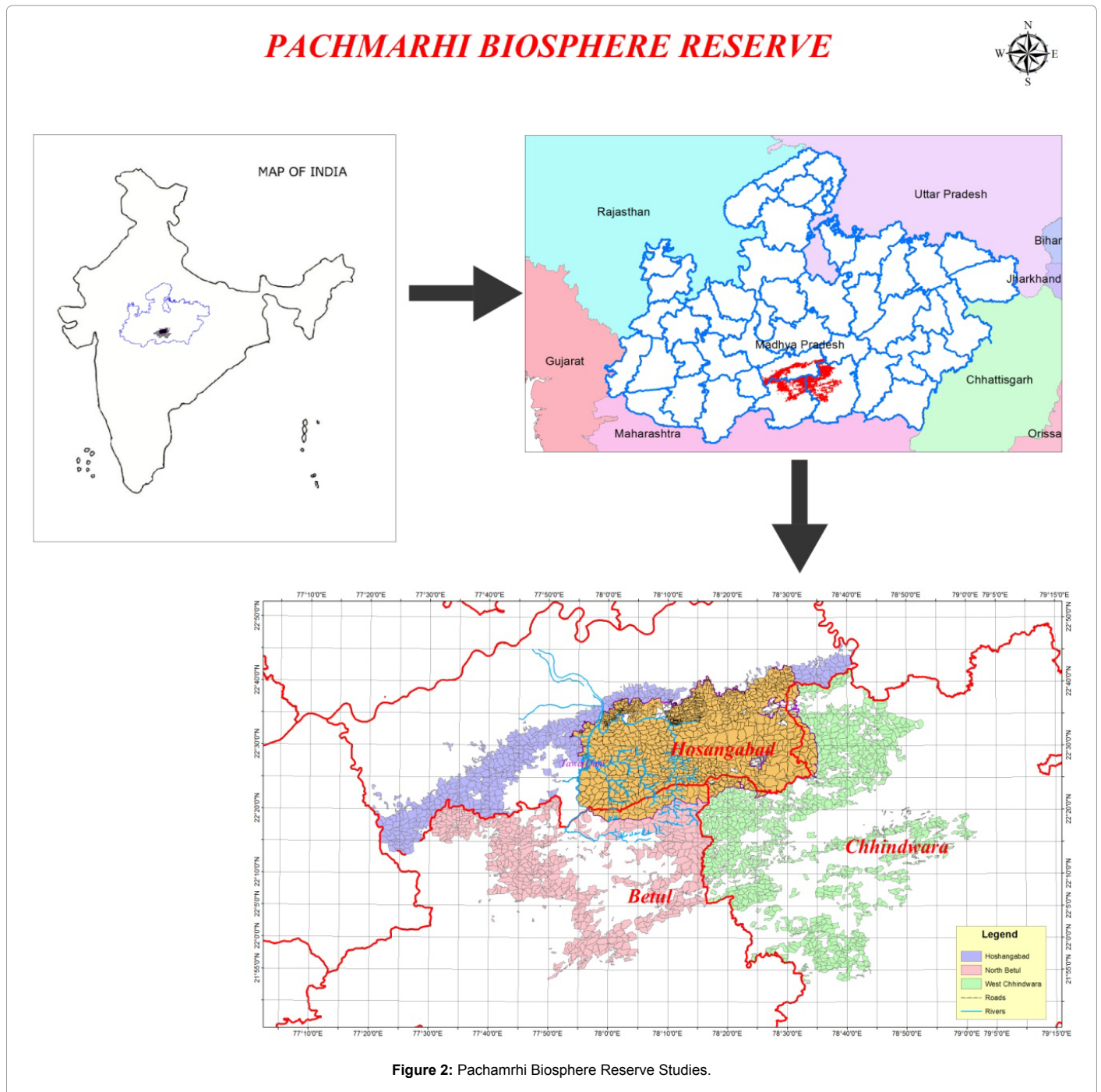


Figure 1: Study area. Study survey was conducted at Pachamrhi Biosphere Reserve

S. No	Family	Zoological Name	English Name	Genus	IUCN status
1	Boidae	<i>Eryx johnii</i> (Russell, 1801)	Red Sand Boa	Eryx	LR-Ic
		<i>Gongylophis conicus</i> / <i>Eryx conica</i> (Schneider, 1801)	Common Sand Boa	Gongylophis	LR-nt
		<i>Python molurus</i> (Linnaeus, 1758)	Indian Rock Python	Python	LR-nt
2	Colubridae	<i>Ahaetulla nasutus</i> (Andersson, 1898)	Common Green Whip Snake	Ahaetulla	LR-nt
		<i>Amphiesma stotatum</i> (Linnaeus, 1758)	Buff striped keel back (sita ki laad)	Amphiesma	LR-nt
		<i>Argyrogena fasciolata</i> (Shaw, 1802)	Fosicoled Banded Racer	Argyrogena	LR-nt
		<i>Atretium schistosum</i> (Daudin, 1803)	Olive Keelback Water Snake	Atretium	LR-nt
		<i>Boiga forsteni</i> (Duméril, Bibron & Duméril, 1854)	Forsten's Cat Snake	Boiga	LR-Ic
		<i>Boiga trigonata</i> (Schneider in Bechstein, 1802)	Common Cat Snake	Boiga	LR-Ic
		<i>Coelognathus helena monticollaris</i> (Sculz, 1992)	Montane trinket snake	Coelognathus	VU
		<i>Dendrelaphis tristis</i> (Daudin, 1803)	Common bronze back tree snake	Dendrelaphis	LR-Ic
		<i>Elephe helena helena</i> (Daudin, 1803)	Common trinket snake	Coelognathus	LR-nt
		<i>Lycodon aulicus</i> (Linnaeus, 1758)	Common aulicus	Lycodon	LR-Ic
		<i>Lycodon striatus</i> (Shaw, 1802)	Barred Wolf Snake	Lycodon	LR-nt
		<i>Macropisthodon plumbicolour</i> (Cantor, 1839)	Green Keel Back	Macropisthodon	LR-nt
		<i>Oligodon arnesis</i> (Shaw, 1802)	Common Kukri Snake	Oligodon	LR-Ic
		<i>Oligodon taeniolatus</i> (Jerdon, 1853)	Russell Kukri Snake	Oligodon	LR-nt
		<i>Psammophis longifrons</i> (Boulenger, 1890)	Stout sand snake	Psammophis	LR-nt
		<i>Ptyas mucosus</i> (Linnaeus, 1758)	Rat Snake	Ptyas	LR-nt
<i>Sibynophis subpunctatus</i> (Duméril & Bibron, 1854)	Common Satak	Sibynophis	LR-nt		
<i>Xenochoropsis piscator</i> (Schneider, 1799)	Checked Keelback	Xenochoropsis	LR-Ic		
3	Elapidae	<i>Bungarus caeruleus</i> (Schneider, 1801)	Common Krait	Bungarus	LR-nt
		<i>Bungarus fasciatus</i> (Schneider, 1801)	Banded Krait	Bungarus	LR-nt
		<i>Naja naja</i> (Linnaeus, 1758)	Cobra	Naja	LR-nt
		<i>Naja Naja Kaouthia</i> (Lesson, 1831)	Monocled Cobra	Naja	EN
4	Typhlopidea	<i>Ramphotyphlops braminus</i> (Daudin, 1803)	Brahminy worm Snake	Ramphotyphlops	LR-nt
		<i>Grypotyphlops acutus</i> (Duméril, Bibron & Duméril, 1844)	Beak-nosed Worm Snake	Typhlops	LR-Ic
5	Uropeltidae	<i>Uropeltis ocellata</i> (Beddome, 1863)	Ocelate Sheild tail	Uropeltis	LR-Ic
6	Viperidae	<i>Echis carinata</i> (Schneider, 1801)	Saw Scaled Viper	Echis	LR-nt
		<i>Trimeresurus (Lachesis) gramineous</i> (Shaw, 1802)	Bamboo Pit viper Snake	Trimeresurus	LR-nt
		<i>Vipera russelli</i> (Shaw & Nodder, 1797)	Russell's viper	Daboia	LR-nt

IUCN status: EN – Endangered, LR-Ic – Lower Risk-least concerned, LR-nt – Lower Risk-near threatened, VU - Vulnerable

Table 1: List of snake species found in STR.



monticollaris in highest number at Meghamalai area, Western Ghats, India.

Among the recorded, 9 species (*E. johnii*, *B. forsteni*, *B. trigonata*, *D. tristis*, *L. aulicus*, *O. arnesis*, *X. piscator*, *G. acutus*, and *U. ocellata*) were Lower Risk – least concerned (LR-lc), 20 (*G. conicus* / *E. conica*, *P. molurus*, *A. nasutus*, *A. Stolatum*, *A. fasciolata*, *A. schistosum*, *E. h. helena*, *L. striatus* *M. plumbicolour*, *O. taeniolatus*, *P. longifrons*, *P. mucosus*, *S. subpunctatus*, *B. caeruleus*, *B. fasciatus*, *N. naja*, *R. braminus*, *E. carinata*, *T. gramineous*, and *V. russelli*) were of Lower Risk – near threatened (LR-nt), 1 (*N. N. Kaouthia*) is Endangered (EN) and 1 (*C. h. monticollaris*) is vulnerable (VU) according to

International Union for Conservation of Nature (IUCN) status (Table 1) and few belongs to rare category that is globally threatened. Hence, there is an urgent need for strategies to conserve these rare and threatened snakes in STR and PBR. Further well planned systematic approaches are needed in future to conserve the herpetofauna in these regions.

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Figure 3: Checkered Keelback (*Xenochoropsis piscator*).



Figure 6: Indian Rock Python (*Python molurus*).



Figure 4: Cobra (*Naja naja*).



Figure 7: Common Sand Boa (*Gongylophis conicus* / *Eryx conica*).



Figure 5: Common Krait (*Bungarus caeruleus*).

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