



# Extended distribution of Burmese python (*Python bivittatus* Kuhl, 1820) in north-west India

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## ABSTRACT

The Indian subcontinent is the home to three species of pythons, the Reticulated python (*Malayopython reticulatus*), the Indian python (*Python molurus*) and the Burmese python (*Python bivittatus*). The Indian python is widely distributed in peninsular India; however, the Burmese python occurs in the Indo-Chinese sub region. In between the years 2010 and 2017, a total of 18 individuals of python were sighted and rescued in different parts of Uttarakhand State, which were all Burmese pythons. Recently, an individual of Burmese python was also recorded from the Meerut Forest Division in Uttar Pradesh State, which perhaps constitute first ever record of the distribution of Burmese python in parts of North-west India.

**Key words:** Burmese python, Meerut, North-west India, Uttarakhand

## INTRODUCTION

Snakes in the families Boidae and Pythonidae constitute some of the most spectacular reptiles and comprise an enormous diversity of morphology, behaviour and ecology (Reynolds et al., 2014). Since the year 2009, *Python molurus* Linnaeus, 1758 (Indian python) and *Python bivittatus* Kuhl, 1820 (Burmese python) have been identified as separate species and the *Python reticulatus* (Reticulated python) has been assigned to the genus *Malayopython*, with new nomenclature *Malayopython reticulatus* Schneider, 1801 (Jacobs et al., 2009; Reynolds et al., 2014; Barker et al., 2015). Prior to these revisions, Indian python and Reticulated python were considered as congeners, while the Burmese python was considered a subspecies of the Indian python (Smith, 1943; O'Shea, 1998; Daniel, 2002; Whitaker and Captain, 2004). These revisions have made the Indian Subcontinent home to three species of pythons, the

Reticulated Python (*Malayopython reticulatus*), the Indian python (*Python molurus*) and the Burmese python (*Python bivittatus*). The Indian python is widely distributed in Indo-Gangetic plains from Sind in the northwest to Bengal in the northeast; however, the Burmese python occurs in the Indo-Chinese Sub region, southern China, Hong Kong and Hainan (Smith, 1943). Precise information on the distribution of the Burmese python in India is not available except for the Indo-Chinese Sub region, i.e., parts of northeastern India (Bhupathy, 1995; Daniel, 2002). A study carried out on the geographic distribution of pythons in India indicated that the Burmese python, which is a Malayan faunal element, has a wide distribution in northeastern India (Bhupathy, 1995).

This study revealed that the species is distributed along the Himalayan foothills, which include part of the Rajaji National Park, Terai and mangroves of the eastern coast at least as far as

Bhitarkanika Wildlife Sanctuary in India. After the first indication of the occurrence of Burmese pythons in Rajaji National Park (Bhupathy, 1995), few other expeditions have reported the occurrence of the species from the region (Nawab and Srivastava, 2008; Sondhi, 2010; Das et al., 2012; Joshi and Singh, 2015). Inventories made by the Zoological Survey of India on the fauna of Uttar Pradesh State corroborated the presence of Burmese python in Bahraich and Lakhimpur-Khiri districts (Bahuguna et al., 2015). However, any description and locality record has not been stated. A study carried out on the occurrence of Burmese python in upper Gangetic plains indicated that Burmese python is distributed in Rajaji National Park and adjacent areas, which was the new addition to the herpetofauna of Doon valley (Joshi and Singh, 2015).



**Fig. 1.** Location map of the sites of Burmese python

## MATERIALS AND METHODS

In between the years 2010 and 2017, a total of 18 sightings of Burmese pythons were made in different parts of Uttarakhand State (in

Rajaji National Park, Mussoorie hills and Doon valley; Fig. 1; Table 1). Some of the individuals were recorded in their natural habitats and some were rescued from urban areas and released to the forests. Among these, three fresh carcasses of Burmese pythons were also recorded in different national highways across the protected areas. On two occasions Indian python was also observed, however, their sightings were rare. Distinguishing Indian and Burmese pythons (Fig. 2) in the field can be difficult, since diagnostic characters are difficult to observe when animal is moving, high on a tree, or in shelter. Consequently, in addition to morphological identifiable features, photographic records were also



**Fig. 2.** A Burmese Python (*Python bivittatus*) after swallowing a goat and being released in the Timli Forest Range of the Kalsi Forest Division.

collected for documenting the abundance of species in specific area. All the individuals were identified based on description given by some of the researchers (Smith, 1943; O'Shea, 1998; Daniel, 2002; Jacobs, 2009). We also consulted forest department officials and local inhabitants about the presence of the focal species. Recently, an individual of Burmese python was recorded from Meerut Forest Division in Uttar Pradesh State (in July 2017), which indicates that the geographical range of Burmese python is extending in northwest India. This site is close to the Hastinapur Wildlife Sanctuary. This record perhaps constitutes a first ever record of a new range of the Burmese python in north India. In monsoon season, the occurrence of pythons, especially of juveniles outside protected areas and in and around the human settlements, was a commonly recorded phenomenon. We attribute this mainly to the movement of individuals along the flooding tributaries to the Ganges.

Details regarding the distributions of Indian and Burmese pythons in the region remain elusive.

**Table 1.** Sites in Uttarakhand and U.P. from where individuals of Burmese pythons were recorded from 2010-2017

Sl.	Locality with Coordinates and date	Remarks
1	Rajaji National Park, Khara (29°53'50.5"N, 78°16'47.8"E; 31.3.2007), Chilla (29°58'15.6"N, 78°12'41.8"E; 9.8.2007), Haridwar (29°56'23"N, 78°7'23"E; 16.5.2008) and Motichur forests (30°00'54.4"N, 78°11'48.8"E; 14.7.2008 )	Specimens from Khara, Chilla and Haridwar forests were recorded during 2007-2008. The individual in Motichur forest was found killed in road accident.
2	Dehradun Forest Division, Near Jakhan area (30°21'57.7"N, 78°04'38.7"E; 15.9.2010), Lacchiwala forest (30°15'19.1"N, 78°01'55.8"E; 8.11.2011), Rishikesh forest (30°10'02.0"N, 78°14'20.7"E; 10.10.2015), near Mathurawala area (30°15'36.2"N, 78°02'10.5"E; 21.10.2011) and Asarori forest (4 individuals; 30°15'10.4"N, 77°58'34.8"E; 23.6.2011, 19.8.2011, 6.9.2011, 8.11.2011)	In all the sites individuals were identified and rescued.
3	Kalsi Forest Division, Timli forest (30°20'–30°25'N, 77°40'–77°45'E; 14.10.2011)	Individual was identified and rescued.
4	Ramnagar Forest Division , Near Ramnagar-Haldwani motor road (29°22'17"N, 79°8'33"E; 27.6.2017)	Found killed in road accident.
5	Haridwar Forest Division, Chandi (29°56'10.9"N, 78°10'28.7"E; 5.7.2014) and Chiriapur forests (29°50'06.3"N, 78°11'54.9"E; 15.6.2010)	Individual recorded at Chandi forest was rescued and identified However, the other individual was found killed in road accident.
6	Mussoorie Forest Division, Sahastra Dhara forest (30°23'07.4"N, 78°07'40.5"E; 8.7.2016) and Rajpur area (30°24'08.0"N, 78°05'21.0"E; 6.9.2010)	Individuals were identified and rescued.
7	Meerut Forest Division, In a private land near Parikshitgarh forest (28°58'81.4"N, 77°57'40.9"E; 12.7.2017)	Individual was rescued by Forest Department and identified by us.

A study opined that the Terai forests of the southern Himalayas provide a corridor of suitable habitat, allowing species from the Indo-Chinese sub region to spread across the north of the Indian sub region and the tributaries of the river Ganges including the flood plains of Uttar Pradesh state (O'Shea, 1998). In Bangladesh, eastern India, West Bengal, Odisha, and west along the southern Nepalese border to Uttarakhand, Burmese pythons are sympatric and in some places synoptic with Indian pythons (Barker and Barker, 2008). A majority of the sightings were made during the summer and monsoon season near natural water sources, in grasslands, and riparian corridors of the Ganges. All these sites are located in northwestern India and are part of the Indo-Gangetic plains. The largest portion of the area is in Shivalik's Biogeographic Subdivision, which constitutes an important repository of reptilian fauna.

## RESULTS AND DISCUSSION

Available literature and our field observations indicate that the Indian and Burmese pythons occur

in parts of the upper Gangetic Plains. Observations also reveal that various protected areas in the upper Gangetic Plains Province provide suitable habitat for the Burmese python in the tropical moist deciduous forest of northwestern India, with the Ganges and the extensive network of seasonal rivers contributing to survival and dispersal of the species. The breeding months of the python were recorded from December to February, and laying of eggs from the months March to June (Daniel, 2002) which normally pronounced as monsoon season in north India during which tributaries of river Ganges have floods. Therefore, several torrential streams, which spread across the forest areas facilitates in the distribution of species in large landscape.

Considering the records of Zoological Survey of India (Bahuguna et al., 2015) on the distribution of Burmese python in the region and keeping in view the frequent sightings of species in area, it seems that Burmese python is occurring sympatric with Indian python in Doon valley and adjacent

areas and occupied a long stretch along the river Ganges in northwest India. However, long-term field observations and detailed habitat surveys are required to be carried out to reach some conclusion.

A study indicated that the known northwestern and southeastern extent of the species' distribution is in the Rajaji National Park in Uttarakhand and the Bhitarkanika Wildlife Sanctuary in Odisha, respectively (Bhupathy, 1995). However, the precise limits have not been determined nor have any specific studies targeted the species. Another study indicated that the existence of the Burmese python in various disjunct localities in the foothills of the Himalayas along the Indian-Nepalese border suggests that the range of the species might extend west along the Ganges, north along the Gandak River to the vicinity of Chitwan, and northwest along the Ghaghara River and its tributaries that drain towards south-western Nepal and eastern Uttarakhand (Barker and Barker, 2008). This report represents a small northward expansion of the known range of the Burmese python, i.e., the Rajaji National Park and Corbett Tiger Reserve. Besides, the report provides the first ever record of the fact that Burmese python is distributed within northwest India. Since the protected areas that lies within the Upper Gangetic Plains are serving as a hub for the species in the northwestern Shivalik Landscape, long-term studies on the distribution of species would be of paramount importance.

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