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Black-bellied Coral Snake *Sinomicrurus nigriventer* (Wall, 1908) (Elapidae): an extended distribution in the western Himalaya, India

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The Indian Himalaya region (IHR) is bestowed with rich and endemic biodiversity (Pandit et al. 2007). It is broadly categorized into the western Himalaya, central Himalaya, and northeastern Himalaya (Nautiyal et al. 2005). The western Himalayan region has a unique topography, great variation in altitude and a broad range of vegetational and faunal diversity. The region serves as home for a variety of endemic and threatened fauna (Maikhuri 2018). Nested in the western Himalaya, the state of Uttarakhand possesses a distinct identity of its natural ecosystems, which supports a remarkable diversity of fauna, including at least 72 species of reptiles and amphibians (Vasudevan & Sondhi 2010). Interestingly, several studies on snake ecology have been conducted in the world, but a comprehensive understanding in terms of range distribution and population biology of many snakes is still deficient (Mullin & Seigel 2009).

Coral snakes are a large group of elapid snakes (Döring 2020), which are venomous but commonly less involved in envenomation (Richardson & Little 2012). Generally, elapid snakes are fossorial and show solitary behaviour (Döring 2020). Currently, 107 species of coral snakes belonging to five genera are recognized in the world, most of them (~76%) being found in the New World (Uetz et al. 2020). India is home to seven coral snake species (Whitaker & Captain 2004; Smith et al. 2012; Mirza et al. 2020), of these *Sinomicrurus macclellandi* (Reinhardt, 1844) was considered to have a wide distribution across the Himalaya, the northeastern hills, and adjoining countries, represented by at least five distinct 'colour forms' (Smith 1943).

The Black-bellied Coral Snake was initially described by British naturalist Col. Frank Wall as a variety of the Macclelland's Coral Snake *Sinomicrurus macclellandi*; however, in a recent study, Mirza et al. (2020) rediscovered this snake from Himachal Pradesh and compared it with existing museum specimens of *Sinomicrurus* spp. Based on morphological and molecular data, the authors concluded that *Sinomicrurus nigriventer* (earlier considered as a variety of *Sinomicrurus macclellandi*) deserves to be considered a distinct species.

Until now, *S. nigriventer* was only known to occur from Solan District (Kasauli and Nairani localities) of Himachal Pradesh, the western Himalaya (Wall 1908; Mirza et al. 2020). The current communication reports

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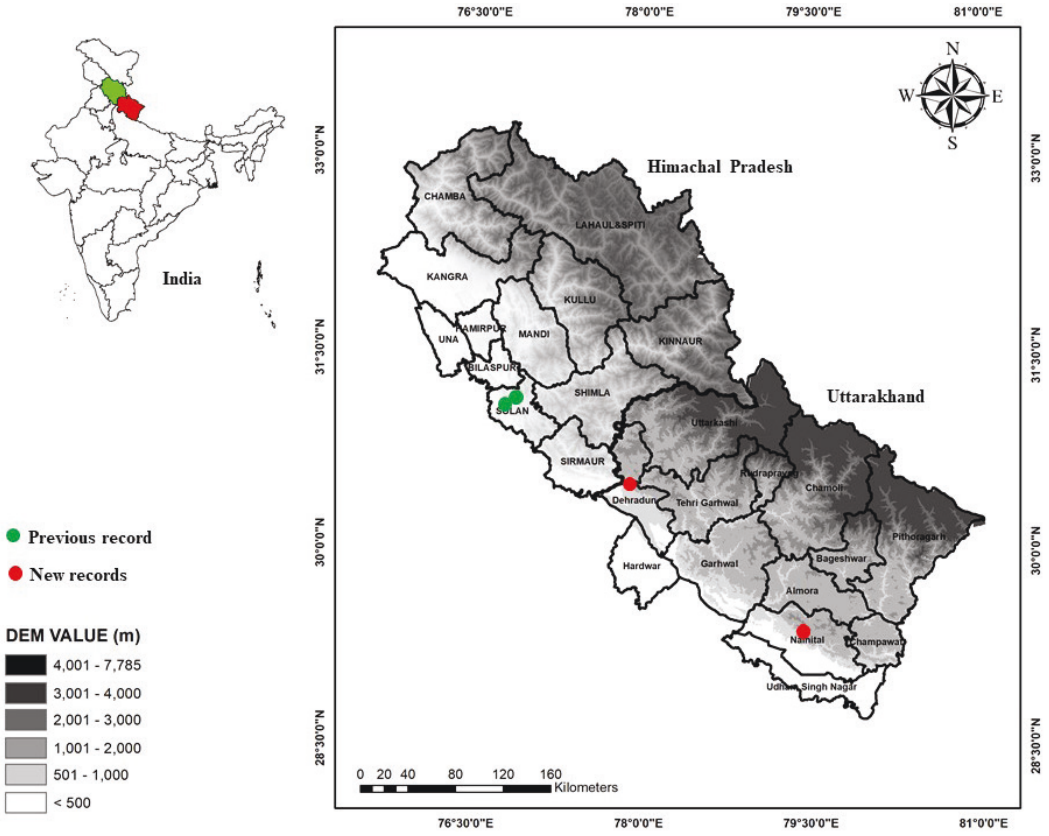

Figure 1. Distribution records of *Sinomicrurus nigriventer* in Himachal Pradesh and Uttarakhand in the western Himalaya.

for the first time, two confirmed distributional records of *S. nigriventer* from the adjoining Himalayan state of Uttarakhand (Figure 1), extending the geographic range of this newly proposed species further south and east along the western Himalaya.

During recent field explorations in the Kumaon and Garwhal regions of this largely mountainous state, the authors recorded a dead and a live specimen each. A detailed scrutiny of literature such as Reinhardt (1844), Wall (1908), Whitaker & Captain (2004), and Mirza et al. (2020) along with morphological characteristics revealed that both these individuals belong to the *Elapidae* family of *Sinomicrurus* genus, namely, *S. nigriventer*.

The first observation consists of a dead specimen of *S. nigriventer* found on 11 August 2019 from Nainital Forest Division at an elevation of 1,113 m (29.343^{0}N, 79.621^{0}E). The specimen was found upturned by the side of a small foot-bridge crossing a flowing stream (Image 1). Judging from its intact body, and the fact that no rigor mortis had set in, it appeared that this black-bellied coral snake had died recently, but the cause of death could not be ascertained although ants were seen feeding on it. The specimen was collected, fixed and preserved in 70% ethanol and deposited in the museum of the Wildlife Institute of India, Dehradun (WIIAD724). The total length of the snake recorded was 380 mm and tail length was 36 mm. The scale count of this specimen include dorsals 13:13:13, ventrals 231, sub-caudals 29 (paired), supralabials 7/7 and infralabials 7/7. The sighting location consisted of rocky slopes amidst riverside and major vegetation observed nearby were *Bauhinia vahlii, Debregeasia hypoleuca, Woodfordia fruticosa, Ricinus communis, Ageratina adenophora, Urtica dioica, Rubus ellipticus, Lantana camara*, and *Rumex nepalensis*.

The second, more recent observation consists of a live specimen of *S. nigriventer* encountered in the Bhadraj Block of Benog Wildlife Sanctuary (BWS) in Mussoorie Forest Division (Image 2). The snake was sighted on the way to Bhadraj temple (30.470^{0}N, 77.970^{0}E) during daylight (12:47 h) on 20 September 2020 at an elevation of 1,914 m. Information on the snake species was recorded, the snake was photographed and identified visually based on coloration and body pattern. BWS mainly constitutes of Ban oak *Quercus leucotrichophora* forest with dominant species such as *Rhododendron arboreum, Lyonia ovalifolia, Berberis* spp. and *Ageratina adenophora* and undulating terrain consisting of

Image 1. A dead individual of *Sinomicrurus nigriventer* found in Nainital Forest Division: A—ventral aspect | B—dorsal aspect. © Jignasu Dolia.

dense grassy slopes (Kumar et al. 2012). The area is characterized by small natural water catchments, although stagnant.

The first record of *S. nigriventer* is an important addition to the knowledge of medically important snakes of Uttarakhand. The recent specimen from Himachal Pradesh was reported from 870m elevation (Mirza et al. 2020) and the two specimens from Uttarakhand were found at 1,100m and 1,900m. Interestingly, both specimens were found during the monsoon period, which may suggest some seasonal activity pattern. Moreover, considering the limited distribution records of the Black-bellied Coral Snake from the western Himalaya, the current communication with a report on its occurrence in Nainital and Mussoorie forest divisions indicates that the cool sub-tropical and temperate forests (1,000–2,000 m) with dense grassy slopes are under-explored in terms of reptilian diversity. Further field investigations are required to determine the status of this venomous snake and to investigate if the species also occurs in similar habitats of the western Himalaya.

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Image 2. *Sinomicrurus nigriventer* recorded in Benog Wildlife Sanctuary, Uttarakhand. © Vartika Chaudhary.

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