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Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

NOTE

ASSAMESE CAT SNAKE *BOIGA QUINCUNCIATA* (WALL, 1908) (REPTILIA: SQUAMATA: COLUBRIDAE) - NEW COUNTRY RECORD FOR BHUTAN

Lekey Chaida, Abhijit Das, Ugyen Tshering & Dorji Wangdi

26 April 2020 | Vol. 12 | No. 5 | Pages: 15664–15667

DOI: 10.11609/jott.5597.12.5.15664-15667



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Assamese Cat Snake *Boiga quincunciata* (Wall, 1908) (Reptilia: Squamata: Colubridae) - new country record for Bhutan

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Opisthoglyphous snakes of the genus *Boiga* are currently represented by 34 species globally (Uetz et al. 2019). Snakes of this genus are distributed in China, India, southeastern Asia, Sundaland, Nepal, and Bhutan. In Bhutan, the genus is so far represented by *Boiga gokool* (Gray, 1835), *B. cyanea* (Duméril, Bibron & Dumeril, 1854), *B. multifasciata* (Blyth, 1861), *B. ochracea ochracea* (Theobald, 1868), *B. ochracea stoliczkae* (Wall, 1909), and *B. siamensis* (Nutaphand, 1971). *Boiga quincunciata* (Wall, 1908) was first described in India from upper Assam, and is subsequently reported from Arunachal Pradesh, Mizoram, and West Bengal (Wall 1908; Ghosh & Mukherjee 2019).

In Bhutan 69 species of snakes represented by eight families and 35 genera are so far reported (Smith 1943; Biswas 1976; Bauer & Gunther 1992; Das & Palden 2000; Mitra 2009; Wangyal & Gurung 2010; Wangyal 2011, 2012, 2013; Das et al. 2016; Koirala et al. 2016; Wangyal & Gurung 2017; Wangdi 2018). All these studies exclude record of *Boiga quincunciata* from Bhutan. Seven *Boiga* spp. are known to occur in adjoining areas of northeastern India (Ahmed et al. 2009) and out of these

six species occur in Bhutan.

The record is based on a dead specimen. The specimen was partially damaged in the neck region; it was collected for preservation. Before fixing in 10% formalin a small piece of flesh from the damaged region was cut and preserved in 100% ethanol for DNA extraction in the future. For long term preservation it is now stored in 75% ethanol. We studied the fresh specimen before preserving and detailed morphological examination was done after preservation. Identification is based on Wall (1908) and Das (2018). We measured body length using a standard measuring tape (L.C. 1mm). Dorsal scale count was made by using magnifying hand lens (5x optic zoom). Images were taken using Canon EOS 7D Mark II digital camera. GPS Garmin GPSMAP 62sc and datum WGS84 was used for recording data. Coordinates were represented in decimal degrees, corrected to three decimal digits. Habitat classification was followed (as by Grierson & Long 1983).

Specimen examined: Since there is no standard system in the country to allocate e-voucher numbers, specimen and digital copies of images are deposited by

Editor: Karan Bahadur Shah, Budhanilakantha Municipality, Hattigaunda, Nepal.

Date of publication: 26 April 2020 (online & print)

Citation: Chaida, L., A. Das, U. Tshering & D. Wangdi (2020). Assamese Cat Snake *Boiga Quincunciata* (Wall, 1908) (Reptilia: Squamata: Colubridae) - new country record for Bhutan. *Journal of Threatened Taxa* 12(5): 15664–15667. <https://doi.org/10.11609/jott.5597.12.5.15664-15667>

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Funding: Department of Forests and Park Services, Royal Government of Bhutan.

Competing interests: The authors declare no competing interests.

Acknowledgements: We are grateful to our respective organizations for encouraging our research activities to add a new record to the country list. Thanks to the Royal Government of Bhutan, Department of Forests and Park Services (DoFPS) for granting permission for the field study and road kill specimen collection. We thank Dr. M. Firoz Ahmed of Aaranyak, Assam, India and Mr. Jigme Tshelthrim Wangyal of DoFPS, Bhutan for their help and inputs in identifying the species. We also thank Jomotsangkha Wildlife Sanctuary (JWS) administration for permitting to store the only collected specimen of *Boiga quincunciata* in the country under their care. We sincerely thank all reviewers/subject editors for their valuable feedbacks/comments that improved our text.



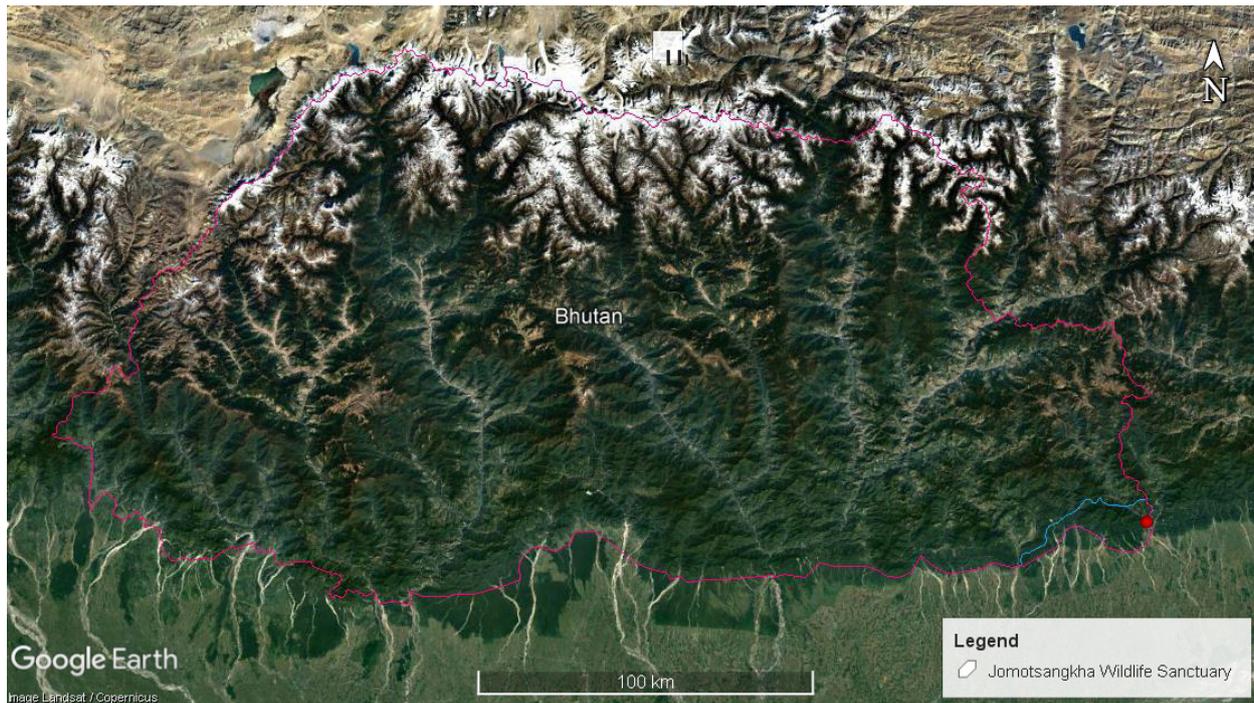


Figure 1. Bhutan map showing record place of *Boiga quincunciata*.

the author in Jomotsangkha Wildlife Sanctuary (JWS), Samdrupjongkhar, Bhutan for reference. Wall (1908) was referred to identify the species where it is described as *Dipsadomorphus quincunciata* from Assam.

Morphology: Rostral touches six shields; internasal two; nasals two subequal shields touching the 1st and 2nd superlabials; loreal one; preocular one, barely reaching crown. Postoculars two; temporals small scale-like, superposed anteriorly. Supralabials eight on the right side with the 3rd, 4th and 5th touching the eye (Image 1). Dorsal Scales 19:19:15; mid body or vertebral scales 310 (Image 2); ventrals 242; anal divided; subcaudals 119 (Image 3). Total body length 149cm. Tail length 33cm. Vertebrae enlarged with smooth dorsal part. Colour yellowish or greyish-brown above speckled with dark brown. A series of dark brown spots with white edge present on vertebrae. Venter yellowish-white with white or brown spots present on outer margins. Three longitudinal stripes present on nape. Head is distinct from neck; body is slender and elongate, eyes large with vertical pupil.

Field Observation: On 26 March 2019 at 07.30h, during the drive to Menjiwoong Village from Jomotsangkha Town (29.939°N & 92.101°E, 345m) (Figure 1; Image 4) the first author encountered a road kill of *Boiga quincunciata* near Jampani located at the left bank of Jomochu (a tributary of Dansari River in India).

The surrounding forest type falls under tropical forest with *Tetrameles nudiflora*, *Pterospermum acerifolium*, *Bombax ceiba*, *Duabanga grandiflora*, and *Ficus* species as major crown cover with thick undergrowth of climbers and large bamboos. Das (2018) had also made similar observation where this species inhabits wet evergreen forest, arboreal on undergrowth especially bamboo.

The most recent report on country's biodiversity by Wangyal & Gurung (2017) had listed only six species of cat snakes from Bhutan. Das et al. (2016) listed three species of *Boiga* (*siamensis*, *gokool*, and *ochracea*) from Royal Manas National Park. *Boiga ochracea* is known from Mongar 1,541m, Langthel and Taksha (Wangyal & Tenzin 2009; Tshewang & Letro 2018). *Boiga cyanea* had been recorded from Mongar at 1,929m and JWS at 340m (Wangyal & Tenzin 2009; Wangdi 2018). *Boiga multifasciata* is listed from Trashiyangtse, Lhuntse 1,170m, below 1,500m at Jigme Dorji National Park, Langthel and Taksha (Wangyal & Tenzin 2009; Koirala et al. 2016; Tshewang & Letro 2018). *Boiga siamensis* was recorded from JWS at 234m (Lekey Chaida pers. obs 22 May 2019).

Currently in India and Bhutan, *Boiga quincunciata* is known from Arunachal Pradesh: Bandardewa, Chimpu, Papum Pare, Pashighat (Borang et al. 2005; Sanyal & Gayen 2006); Assam: Tinsukia, Jeypore Reserve Forest, Garbhanga Reserve Forest, Manas Tiger Reserve, Borail



Image 1. Head of Assamese Cat Snake *Boiga quincunciata*.

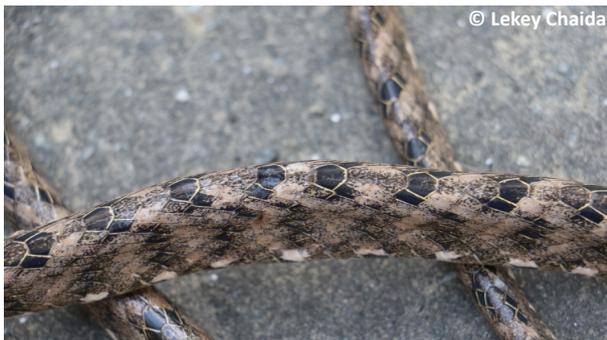


Image 2. Unique arrangement of large mid dorsal scales.



Image 3. Ventral subcaudal scales.



Image 4. Habitat of *Boiga quincunciata* in Jomotsangkha Wildlife Sanctuary.

Wildlife Sanctuary (Wall 1908; Agarwal & Ghosh 1995; Sengupta et al. 2000; Abhijit Das pers. obs. 28 August 2012); West Bengal: Buxa Tiger Reserve (Ghosh & Mukherjee 2019); Sawleng, Mizoram (H.T. Lalremsanga pers. comm. August 2009); upper Myanmar (CAS 224439), and in JWS from Bhutan (this study).

In Assam, individuals were obtained within 40–200m elevation. In Mizoram the female individual was obtained from 950m elevation. The specimen collected from upper Myanmar was obtained from Kachin State at an elevation of 650m. The northern Bengal record is from 744m (Ghosh & Mukherjee 2019).

Boiga quincunciata is nocturnal and arboreal. Found both in mixed deciduous and evergreen forests., one was collected from a rocky crevice (17.45h) at ca. 2m above ground and other was from a tree ca. 5m above ground at around 21.00h (Sengupta et al. 2000). In

Barail Wildlife Sanctuary, one male individual was found active among bamboo along streams at 21.00h (Abhijit Das pers. obs. 28 August 2012). In Upper Burma, Smith (1940) obtained specimens from inside bamboo during winter month. He reports this snake as inoffensive. The female specimen from Garbhanga Reserve Forest laid two elongated eggs in July and another clutch of two eggs were laid two days after the first. Eggs measure 45.35×13.45 mm (Das 2010).

With the confirmed occurrence of Assamese Cat Snake *Boiga quincunciata* in Jomotsangkha Wildlife Sanctuary, Bhutan now have seven *Boiga* species and 70 snakes in the herpetofauna list and this region should be prioritized for future survey efforts. Follow-up efforts should target in tropical and subtropical forest near riverine ecosystems, bamboo forest and even near human settlement to get additional distribution range of this snake in the country and region.

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

April 2020 | Vol. 12 | No. 5 | Pages: 15535–15674

Date of Publication: 26 April 2020 (Online & Print)

DOI: 10.11609/jott.2020.12.5.15535-15674

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