Rec. zool. Surv. India: Vol. 120(2)/189–192, 2020
DOI: 10.26515/rzsi/v120/i2/2020/147654

ISSN (Online) : 2581-8686
ISSN (Print) : 0375-1511

First record of *Boiga gokool* (Gray, 1835) (Reptilia: Squamata: Colubridae) from Northern Odisha with notes on morphology and natural history

Rakesh Kumar Mohalik[1], Pratyush P. Mohapatra[2]*, Prakash Mardaraj[3], Santibhusan Sahoo[4], Ashok Kumar Bhilala[2], Niladri B. Kar[5] and Sushil K. Dutta[6]

[1]Keonjhar Wildlife Division, Anandapur, Keonjhar, Odisha - 758021, India
[2]Zoological Survey of India, Central Zone Regional Centre, Vijay Nagar, Jabalpur - 482002, Madhya Pradesh, India; Email: pratyush.m@zsi.gov.in
[3]Palace, Rajnilgiri, Balasore, Odisha - 756040, India
[4]Hirakud Wildlife Division, Sambalpur, Odisha - 768027, India
[5]Department of Zoology, F. M. University, Nuapadhi, Balasore, Odisha - 756020, India
[6]Nature, Environment & Wildlife Society (NEWS), Turanga, Angul, Odisha - 759123, India

Abstract

Based on a male specimen of *Boiga gokool* collected from Balasore, Odisha, India, herewith we report the southernmost distribution of the species beyond its known distributional range. Additional information on scale reduction of the male specimen along with differences in hemipenial morphology with that of *Boiga trigonata* is provided. A bird in the diet of this species is reported for the first time in this paper.

Keywords: *Boiga trigonata*, Diet, Distribution, Hemipenis, Scale Reduction

Introduction

The colubrine snake genus *Boiga* Fitzinger, 1826 is currently represented by 35 nominal species (Uetz & Hošek, 2019; Giri *et al.*, 2019). From India 17 species are reported, of which three species namely *Boiga forsteni* (Duméril, Bibron & Duméril, 1854), *B. flaviviridis* Vogel and Ganesh, 2013 & *B. trigonata* (Bechstein, 1802) are so far known from Odisha (Whitaker & Captain, 2004; Dutta *et al*, 2009; Mohapatra *et al*., 2010; Das *et al*., 2010; Vogel & Ganesh, 2013). The East-Indian cat snake *Boiga gokool* (Gray, 1835) was known to have a narrow distributional limit in eastern India, mostly in the plains and low hills north and south of the Brahmaputra valley (Das *et al*. 2010). This species is endemic to South Asia and known with certainty from India, Bhutan and Bangladesh (Wallach *et. al*, 2014; Das, 2016). Das *et al*. (2010) mentioned centre of radiation of the species is Assam and the outer distributional records of the species were Darjeeling (West Bengal) to the west, Sadiya (Assam) to the north, Manipur to the east and Jessore (Bangladesh) to the South (Das *et al*., 2010). The correct spelling of the species epithet has remained a debate and although Das *et al*. (2010) clarified about the species name "*gokool*", later Wallach *et al*. (2014) used the name "*gocool*" as the correct spelling over "*gokool*" without any further clarification. Hence, in this paper the name of the species is maintained as *Boiga gokool*, as per Das *et al*. (2010).

Material and Methods

The snake was collected from a betel vine orchard (private land) after getting a rescue call by the farm owner. The animal was hand-picked and knowing it as a valuable discovery from the state, the voucher specimen was utilized for taxonomic studies. After taking live photos, the snake was euthanized using standard protocol and fixed in 4% formaldehyde solution. The hemipenis was everted by gently pressing the tail base from 15/16th subcaudal and then by separating the organ from the retractor muscle by cutting it with a scissors. Measurements were

* *Author for correspondence*

Article Received on: 20.09.2019 Accepted on: 16.11.2019

taken with the help of Mitutoyo™ digital calliper (Japan), to the nearest 0.1 mm and the body length and tail length were taken with the help of a meter tape. Counting of ventral scales was done as per Dowling (1951a) and dorsal scale reduction formula according to Dowling (1951b) with minor modification as per Das *et al.* (2010). For terminology of hemipenis description, we followed Keogh (1999) and Zaher (1999).

Abbreviations: ZMB, Museum für Naturkunde, Berlin, Germany; ZSI-CZRC, Zoological Survey of India, Central Zone Regional Centre, Jabalpur, Madhya Pradesh, India.

Results

Boiga gokool (Gray, 1835) (Figure 1-4)

Material examined: ZSI-CZRC- V-6868, 1 ex.: Male, India, Odisha, Balasore, Dagara (21°16'18.0"N, 87°6'57.0"E), Altitude 7 m asl, 12-VII-2018, Rakesh K. Mohalik.

Diagnostic characters: Snout to vent length: 610 mm; tail length 155 mm; 223 ventral scales; 99 divided subcaudals; 8 supralabials on both sides, of which 3rd to 5th touching eye; 11 infralabials, first chin shield touches 1st to 4th infralabials; nasal scale divided; a single loreal present between preocular and nasal scales; preocular one, does not reach up to dorsal surface of the head; 3 post oculars on right and 2 on left side, temporals 2+3; anal scale divided. Examining the diagnostic morphological characters such as 21 scale rows at mid body and the color pattern, the snake was identified as *Boiga gokool*.

Scale reduction points of male *Boiga gokool* (ZSI-CZRC-V-6868)

$$21\frac{3+\mathbf{4}\,(147)}{3+4\,(148)}19\frac{3+\mathbf{4}\,(150)}{3+4\,(151)}17\frac{3+4\,(223)}{3+4\,(223)}15\,(223)$$

The dorsal scale reduction formula for the species provided by Das *et al.* (2010) originating from the specimen (ZMB

Figure 1. *Boiga gokool* (live) from Dagara, Balasore, Odisha, India with the prey in the abdomen.

Figure 3. Lateral view of head of live specimen of *B. gokool* from Dagara, Balasore, Odisha.

Figure 2. Portrait of *Boiga gokool* from Dagara.

Figure 4. Dorsal view of head of live specimen of *B. gokool* from Dagara, Balasore, Odisha.

4859, female) shows some characteristic differences in point of reduction and can be attributed to the sex of the species. In this male specimen the reduction of dorsal scale rows from 21 to 19 appears 8 ventral anterior than the female specimen and the reduction from 19 to 17 appears 10 ventral anterior than the female. Additionally near the vent further reduction from 17 to 15 dorsal rows was observed in this male specimen.

Discussion

Although, *B. gokool* shows similarities with *B. trigonata* concerning habits, body proportions, coloration, head pattern and lepidosis, the former species can be differentiated from the latter by typical dorsal pattern, strongly enlarged vertebral scales, 17 scale rows at the posterior end at one head–length anterior to the anal scute, dorsolateral series of 45 – 50 dark brown to black and whitish edged Y-shaped markings separated by the light vertebral scale row and head with a small black diamond shaped nuchal spot that never extends to sides of neck.

The left side hemipenis of ZSI-CZRC-V-6868 was studied and compared with the hemipenis of *Boiga trigonata* (ZSI-CZRC-V-6783), collected from Gidlighogra, Mandla district, Madhya Pradesh (Figure 5). The hemipenis is 18.0mm in length and 8.6mm wide at the distal end. The overall hemipenial morphology of *B. gokool* matches with the description provided by Das e*t al.* (2010). However, it differs from the latter species having

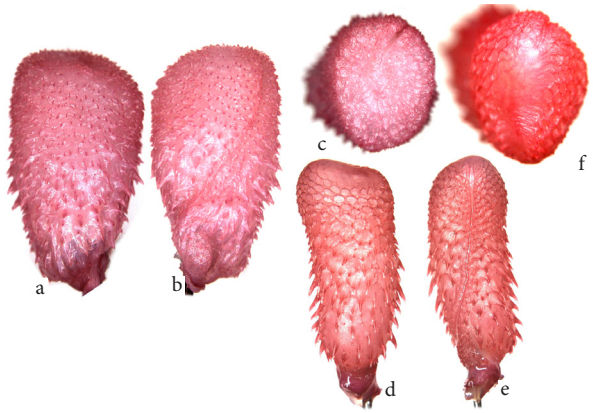

Figure 5. Hemipenes of *Boiga gokool* (ZSI-CZRC-V-6868) and *B. trigonata* (ZSI-CZRC-V-6783). **(a-c).** asulcate, sulcate and apical portion of *B. gokool* and **(d-f)** asulcate, sulcate and apical portion of hemipenis of *B. trigonata.*

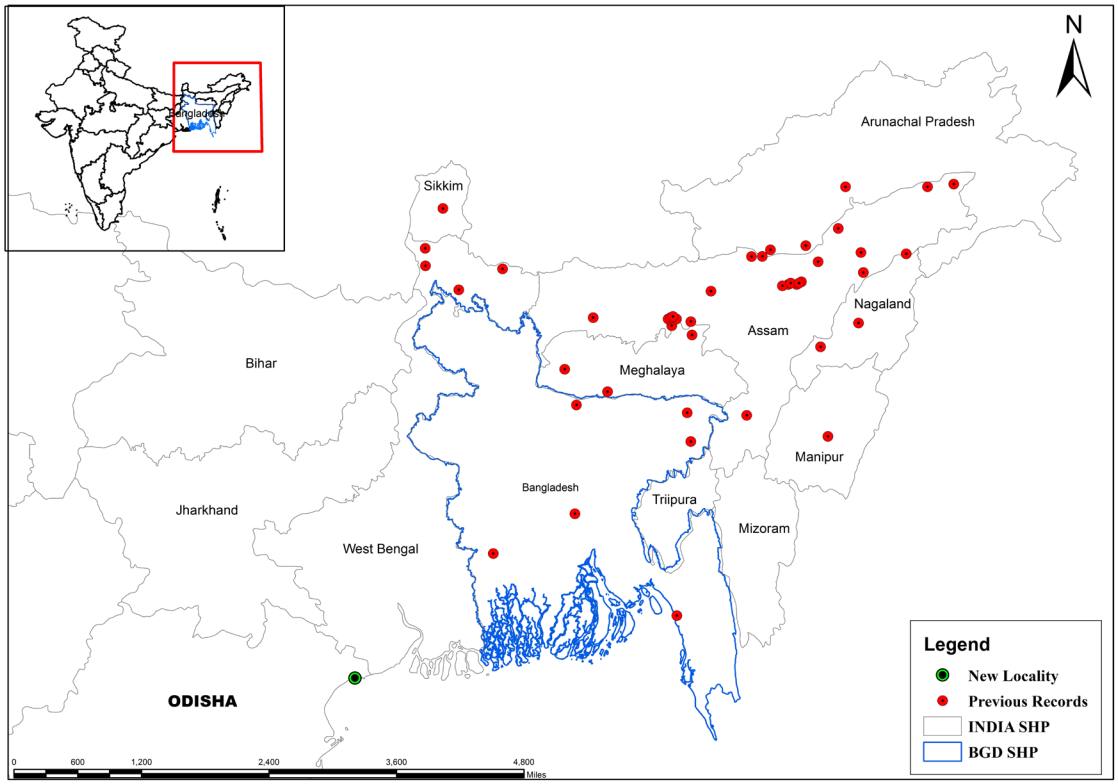

Figure 6. Updated distributional map of *B. gokool* showing previously known localities (red dots) in India and Bangladesh and the present, southernmost record from Dagara, Odisha (blue dot).

more rounded in shape and having apical differentiation. The apical portion in *B. gokool* has callices with spinulets at the periphery whereas in *B. trigonata* the apical portion is nude and without any callices.

Das e*t al*. (2010) mentioned that *B. gokool* is recorded from states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, northern West Bengal and possibly Sikkim in India. In Bangladesh this species appeared to be uncommon, distributed in the mixed evergreen forests of North eastern part (Hasan *et al*., 2014). Furthermore, based on the voucher sample collected from Odisha (ZSI-CZRC-V-6868) the range of the species is further extended southwards up to Balasore, Odisha (Figure 6). The present locality is 290 km from the closest known distribution range, Jessore of Bangladesh. The distribution of the species in Odisha reflects the possibility of occurrence of the species in Bihar, Jharkhand and southern West Bengal. This species is sympatric with *B. trigonata, Ahaetulla anomala, A. nasuta, Dendrelaphis tristis* and *Lycodon aulicus*. Odisha is the southernmost distribution limit of the species in India.

The snake was observed in a betel vine orchard and had devoured a chick of Asian pied starling (*Gracupica contra*). Feeding habits of *Boiga gokool* has been summarized by Das *et al*., 2010. Based on earlier reports and published literatures, this species is known to feed on agamids, geckos and mice (Greene, 1989; Shaw e*t al*., 1941, 1999; Wall, 1910). Therefore, this is first report of a bird in the diet of this species.

Acknowledgements

We are grateful to the Principal Chief Conservator of Forests (Wildlife), the Divisional Forest Officer and staff of Balasore Forest Division, Odisha, India for support. We are thankful to Dr. Kailash Chandra, Director, Zoological Survey of India and Dr. S. Sambath, Office in charge, CZRC, ZSI, Jabalpur for generous support and encouragement.

References

Das, A. 2016. Addition to the herpetofauna of Royal Manas National Park, Bhutan, with six new country records. *Herpetology Notes*, **9**: 261-78.

Das, A., Mohapatra, P.P., Purkayastha, J., Sengupta, S., Dutta, S.K., Ahmed, M.F. and Tillack, F. 2010. A contribution to *Boiga gokool* (Gray, 1835) (Reptilia: Squamata: Colubridae). *Russian J. Herp.*, **17**(3): 161-78.

Dowling, H.G. 1951a. A proposed standard of counting ventrals in snakes, *Brit. J. Herp.*, **1**(5): 97-99.

Dowling, H.G. 1951b. A proposed method of expressing scale reductions in snakes. *Copeia*, **1951**(2): 131-34. https://doi.org/10.2307/1437542.

Dutta, S.K., Nair, M.V., Mohapatra, P.P. and Mahapatra, A.K. 2009. *Amphibians and reptiles of Similipal Biosphere Reserve*. Regional Plant Resource Centre publication, Bhubaneswar, Odisha: 1-174.

Giri, V.B., Deepak, V., Captain, A., Pawar, S. and Tilak, F. 2019. A new species of *Boiga* Fitzinger, 1826 (Serpentes: Colubridae) from the northern Western Ghats of India. *J. Bombay Nat. Hist. Soc.*, **116**: 1-11. https://doi.org/10.17087/jbnhs/2019/v116/144901.

Greene, H.W. 1989. Ecological, evolutionary, and conservation implications of feeding biology in old world cat snakes, genus *Boiga* (Colubridae). *Proc. Calif. Acad. Sci., San Francisco*, **46**(8): 193-207.

Hasan, M.K., Khan, M.M.H. and Feeroz, M.M. 2014. *Amphibians and reptiles of Bangladesh, a field guide*. Arannayk foundation, Dhaka, Bangladesh: 1-191.

Keogh, J.S. 1999. Evolutionary implications of hemipenial morphology in the terrestrial Australian elapid snakes. *Zoological Journal of Linnean Society, London*, **125**: 239-78. https://doi.org/10.1111/j.1096-3642.1999.tb00592.x.

Mohapatra, P.P., Das, A., Tillack, F. and Dutta, S.K. 2010. Taxonomy, natural history and distribution of *Boiga forsteni* (Duméril, Bibron and Duméril, 1854) (Serpentes: Colubridae) from Orissa, India. *Russ. J. Herp.*, **16**(4): 243-52.

Shaw, G.E., Shebbeare, E.O. and Barker, P.E. 1999. *The snakes of Sikkim and Bengal*. Asiatic Publishing House, Delhi [reprint]: 1-125.

Shaw, G.E., Shebbeare, E.O. and Barker, P.E. 1941. The snakes of northern Bengal and Sikkim. Part IX, *J. Darjeeling Nat. Hist. Soc.*, **15**(2): 60-68.

Uetz, P and Hošek, J. 2019. The reptile database. Accessed on 18 Sept. 2019. http://www.reptile-database.org.

Vogel, G. and Ganesh, S.R. 2013. A new species of cat snake (Reptilia: Serpentes: Colubridae: *Boiga*) from dry forests of eastern Peninsular India. *Zootaxa*, **3637**(2): 158-168. https://doi.org/10.11646/zootaxa.3637.2.6. PMid: 26046190.

Wall, F. 1910. Notes on snakes collected in Upper Assam, Pt. 2. *J. Bombay Nat. Hist. Soc.*, **19**(4): 825-45.

Wallach, V., Williams, K.L. and Boundy, J. 2014. *Snakes of the World, a Catalogue of Living and Extinct Species*. Taylor and Francis, CRC Press: 1-1237.

Whitaker, R. and Captain, A. 2004. *Snakes of India, the field guide*. Draco Books, Chennai: 1-385.

Zaher, H. 1999. Hemipenial morphology of the South American Xenodontine snakes, with a proposal for a monophyletic Xenodontinae and reappraisal of Colubroid hemipenes. *Bulletin of the American Museum of Natural History*, **240**: 1-168.