



# First Record of Body-bending Behavior from Asia in the Arrow-Headed Trinket Snake, *Coelognathus helena nigriangularis* (Squamata: Colubridae)

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Snakes display a wide variety of antipredator tactics that include cryptic coloration, immobility, struggling, cloacal discharge, sound production, S-coil posture, tail vibrations, actively breaking the tail, exuding blood from the eyes, feigning death, biting, and spitting venom (e.g., Greene 1997). Body-bending behavior was described as “a cryptic defensive behavior in arboreal snakes” by Marques et al. (2006) and was described for the first time by Beebee (1946). Subsequently, this behavior has been recorded in various species from the Western Hemisphere by Abuys (1986), Marques et al. (2006), Doherty-Bone (2009), Maddock et al. (2011), Pinheiro Miranda et al. (2012), Ribeiro Duarte (2012), and Torres et al. (2015). Herein, we report the first observed occurrence of this behavior in the Arrow-Headed Trinket Snake (*Coelognathus helena nigriangularis*) from the Indian Subcontinent.

Arrow-Headed Trinket Snakes are known to occur in eastern Maharashtra, eastern Madhya Pradesh, Andhra Pradesh, Jharkhand, Odisha, southern Chhattisgarh, and West Bengal (Lampe 1902; Edake 2011; Srivastava et al. 2013; Kantimahanti et al. 2015; Mohapatra et al. 2016; Chowdhury et al. 2018; Uetz et al. 2019).

At 1024 h on 17 December 2017, the senior author encountered an adult Arrow-Headed Trinket Snake (Fig. 1A) along a blacktop road in the Melghat Tiger Reserve near the Belkund Rest House, Koha (21.333932°N, -77.138479°E) at an elevation of 731 m. The unsexed snake (~1,400 mm in total length) was basking. Upon closer observation, we noticed multiple, regular bends in its body, causing it to resemble a piece of bamboo (Figs. 1B & 1C). We observed the snake for 40 min, during which it exhibited body-bending behavior with its head slightly elevated for 15 min.



**Fig. 1.** (A) An adult Arrow-Headed Trinket Snake (*Coelognathus helena nigriangularis*) observed near the Belkund Rest House in the Melghat Tiger Reserve, Maharashtra, India. (B & C) The snake exhibiting body-bending behavior with a slightly elevated head. Photographs by Dinesh Khate.

Marques et al. (2006) suggested that body-bending behavior served primarily as a cryptic function in arboreal snakes as the transition from a stretched position to a bent posture removed the visual cues (i.e., an elongate search image) perceived by a predator. Maddock et al. (2011) indicated that such behavior could be more widespread than previously thought and that the adaptive value of this behavior could extend beyond an arboreal lifestyle. Ribeiro Duarte (2012) suggested that it might serve as a signal to a predator that the latter had been detected and that the snake was prepared to flee or strike. Regardless of its primary purpose, body-bending appears to be an effective anti-predator behavior, and the diversity of species employing this strategy may be regarded as an instance of behavioral convergence.

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