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Short Communication

From one to two: Unveiling tail bifurcation in Tokay Gecko (*Gecko gecko*) from Satchari National Park, Northeast Bangladesh

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ABSTRACT

This study documents a case of tail bifurcation in the Tokay Gecko (*Gecko gecko*) observed in Satchari National Park, Bangladesh. While generally abundant, this instance underscores limited research on the species in the region. The unusual tail morphology and loss of digits on a hindlimb suggest predation and its potential adverse effects on the Gecko's fitness, warranting further investigation.

Introduction

The Tokay Gecko is the only species representing the genus *Gecko* under the family Gekkonidae in Bangladesh (IUCN Bangladesh, 2015). The species has a broad global distribution in South and Southeast Asian countries, and it is listed as Least Concern in Bangladesh, but the global status has not been assessed (IUCN Bangladesh, 2015; Mithu et al., 2024). In Bangladesh, it is widely distributed but relatively more concentrated in the forests and known to inhabit large trees in the forests, old buildings, and secluded places in human settlements (Khan, 1982; IUCN Bangladesh, 2015). Lizards have the extraordinary ability to regenerate their broken tails, which is essential to ensure their survival (Alibardi, 2010), because individuals without regenerated tails could experience a reduction in their fitness for some behavioral aspects such as habitat selection, foraging, anti-predatory behavior, social, and reproductive issues (Bateman and Fleming, 2009; Ramos et al., 2021). Tail bifurcation is where the tail duplicates as it regrows after mechanical damage (Khandakar and Sultana, 2020). Several studies reported tail bifurcation in amphibian and reptilian species around the world (Ananjeva and Danov, 1991; Kumbar et al., 2011; Mitchell et al., 2012; Conzendey et al., 2013; Cordes and Walker, 2013; Martins et al., 2013; Mata-Silva et al., 2013; Vrcibradic and Niemeyer, 2013; Dudek and Ekner-Grzyb, 2014; Passos et al., 2014; Plessey et al., 2014; Pelegrin and Leão, 2016; Hass et al., 2018). Although the geographical distribution range of the Tokay gecko (*Gecko gecko*) is extensive, only one previous instance of tail bifurcation in the Tokay Gecko was reported from India (Geogi et al., 2018). Herein, we present an observation of tail bifurcation in Tokay Gecko (*Gecko gecko*) from northeast Bangladesh.

During our night survey of nocturnal animals on September 18, 2024, at 08:21 pm +06 GMT, we encountered an individual of Tokay Gecko (*Gecko gecko*) on the wall of a tea stall inside the Satchari National Park (24.12487612, 91.44672662). Satchari National Park is a semi-evergreen forest (243 ha) in north-eastern Bangladesh across the border from Tripura state in India (Ahmed and Naher, 2021; Mithu et al., 2024). The Gecko produced a loud and rhythmic sound from the wall approximately 6 meters above the ground. Upon closer observation with a Bushnell 8x42 binocular, we noticed that the Gecko had a bifurcated tail, and its right hindlimb was devoid of claws and digits (Fig. 1). The additional tail arose from the tip

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of the main tail at a 60° angle. The length of the extra tail was longer than the main tail. At the midpoint of the main tail, the tip of the tail changed its direction towards the additional tail. We observed this event and captured photographs using a digital camera (Nikon D7100 equipped with a 70–300 mm lens).

Fig. 1. The Tokay gecko, with a bifurcated tail and right hindlimb without claws and digits, was attacked by a predator or competitor.

Tail autotomy or tail casting is an anti-predatory strategy that has been observed in 13 out of 20 lizard families (Downes and Shine, 2001; Bateman and Fleming, 2009; Gogoi et al., 2018). Although tail autotomies are survival tactics in lizards, losing the tail can increase susceptibility to predators in the future. (Arnold, 1984; Mc Connachine and Whiting, 2003). A lizard can regenerate a lost tail throughout its life (Maginnis, 2006). Imperfect tail regeneration can cause different tail abnormalities, such as warped, curly, and supernumerary tails (Meyer et al., 2002; Passos et al., 2016). Tail bifurcations are considered to be a result of previous injuries, which can occur due to the incomplete caudal autotomy, crushed spinal cord, and ependymal within the tail when it regrows after any mechanical damages (Lynn, 1950; Alibardi, 2010). Previously, Gogoi et al. (2018) reported tail bifurcation in the Tokay geckos from India, where both tails were similar in length and color. Our finding differs from the previous study, as the additional tail was larger than the main tail in this study.

Furthermore, we found the main tail changed its direction toward the additional tail at the midpoint, which was previously undocumented. The loss of claws with digits from the right hindlimb and bifurcated tail suggests that the individual was attacked by predators or large-sized geckos of the same species and somehow escaped. We suspect the presence of multiple tails in this individual could affect its fitness in negative ways and could make it more conspicuous to predators, potentially reducing activity, modifying foraging behavior, and reducing mating opportunities, as stated in other studies (Chapple and Swain, 2002; Passos et al., 2014). Sighting of Tokay gecko is a common phenomenon in forested areas of north-eastern and south-eastern regions of the country. The sighting of a bifurcated-tailed Tokay Gecko (*Gecko gecko*) has not been reported so far from Bangladesh. Despite its wide distribution over the country and tremendous poaching pressures, the Tokay gecko has been relatively neglected in research in Bangladesh. We recommend further studies on the effects caused by supernumerary tails, such as foraging efficiency, predator evasion, mating success, behavioral changes, and tail regeneration mechanism in Tokay geckos.

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Author Contribution

Atikul Islam Mithu: Conceptualization, data collection, manuscript writing. Harish Debbarma: Data collection, resources.

Declaration of conflicting interests

The authors declare that there are no conflicts of interest regarding the publication of this article. They have no financial, personal, or professional relationships that could be interpreted as influencing the research, analysis, authorship, or publication of this work.

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