



First Record of a Merolepid Checkered Keelback, *Fowlea piscator* (Schneider 1799), from Nagpur, Maharashtra, India

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The Checkered Keelback (*Fowlea piscator*) is a widely distributed natricid prevalent across southern Asia, with its range extending from Afghanistan to southern China and parts of Southeast Asia (Das and Das 2017). This medium-sized semi-aquatic snake is closely associated with freshwater ecosystems, including rivers, ponds, and rice paddies, where it thrives in high abundance (Wallach et al. 2014). Due to its adaptability and frequent encounters in such habitats, the Checkered Keelback (*Fowlea piscator*) is considered one of the most ubiquitous snakes in India (Whitaker and Captain 2004).

In reptiles, beta-keratins play a crucial role in providing mechanical resistance and structural integrity to scales, as well as protection against ultraviolet radiation, abrasions, and water loss, thereby safeguarding them from environmental stressors and predators (Alibardi 2003). However, certain genetic anomalies or environmental factors can disrupt beta-keratin production, leading to a complete absence of scales. This has been observed in a scaleless Western Diamondback Rattlesnake (*Crotalus atrox*), in which large portions of the skin lacked scales, resulting in delicate and wrinkled skin morphology (Toni and Alibardi 2007). The absence of beta-keratins in these individuals suggests a critical role of this protein in scale development and maintenance. This phenomenon, referred to as merolepidosis in snakes, is rare and highlights the complex interplay of genetics and external conditions in scale formation.

I herein report the first documented case of merolepidosis in a Checkered Keelback (*Fowlea piscator*) (Fig. 1). The snake (~ 60 cm total length) was rescued by local snake rescuers Santosh Soni and Gaju Patle at 1530 h on 11 July 2024 from a residence at Plot No. 203, Niranjan Nagar, Nagpur, Maharashtra, India. The snake exhibited a notable absence of dorsal scales, with only a few wrinkled scales present on the head and along the dorsum, although ventral scales appeared unaffected. After a detailed examination, the snake was released into natural habitat.

Merolepidosis was first documented in India in 2021 in two Spectacled Cobras (*Naja naja*) from an industrial area in Solapur, Maharashtra (Sayyed and Shinde 2021). A second case was recorded in 2023 in a Common Trinket Snake (*Coelognathus helena*) from an industrial area in Porbandar, Gujarat (Vyas 2023). This record, the third in India, also originated in an industrial area, suggesting a causative role of environmental pollutants.

The role of environmental pollution in inducing genetic mutations and phenotypic anomalies in wildlife has been well-documented (e.g., Sutton and Harris 1972). For example, Gray et al. (2001) reported multiple abnormalities, including merolepidosis, in Eastern Gartersnakes (*Thamnophis s. sirtalis*) at a superfund site in Pennsylvania, USA, and attributed these irregularities to the mutagenic effects of environmental toxins. Such evidence underscores the long-recognized impact of anthropogenic pollutants on the genetic and morphological integrity of affected organisms.

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Literature Cited

- Alibardi, L. 2003. Adaptation to the land: The skin of reptiles in comparison to that of amphibians and endotherm amniotes. *Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution* 298: 12–41. <https://doi.org/10.1002/jez.b.24>.
- Das, I. and A. Das. 2017. *A Naturalist's Guide to the Reptiles of India, Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka*. Prakash Books, New Delhi, India.
- Gray, B., H.M. Smith, J. Woodling, and D. Chiszar. 2001. Some bizarre effects on snakes, supposedly from pollution, at a site in Pennsylvania. *Bulletin of the Chicago Herpetological Society* 36: 144–148.
- Sayyed, A. and R. Shinde. 2021. Two merolepid (partially scaleless) Indian Cobras (*Naja naja*) from Maharashtra, India. *Reptiles & Amphibians* 28: 529–530. <https://doi.org/10.17161/randa.v28i3.15791>.
- Sutton, H.E. and M.I. Harris (eds.). 1972. *Mutagenic Effects of Environmental Contaminants*. Academic Press, New York, New York, USA. <https://doi.org/10.1016/B978-0-12-677950-9.X5001-6>.



Figure 1. A merolepid (partially scaleless) Checkered Keelback (*Fowlea piscator*) rescued from a residence in Niranjan Nagar, Nagpur, Maharashtra, India. Photographs by Gaju Patle and Santosh Soni.

Toni, M. and L. Alibardi. 2007. Soft epidermis of a scaleless snake lacks beta-keratin. *European Journal of Histochemistry* 51: 145–152. <https://doi.org/10.4081/1136>.

Vyas, R. 2023. Merolepid Common Trinket Snake (*Coelognathus helena helena*). *Reptiles & Amphibians* 30: e18569. <https://doi.org/10.17161/randa.v30i1.18569>.

Wallach, V., K.L. Williams, and J. Boundy. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. CRC Press, Boca Raton, Florida, USA.

Whitaker, R. and A. Captain. 2004. *Snakes of India. The Field Guide*. Draco Books, Chennai, India.