



Leucism in *Ichthyophis* Fitzinger 1826: A Rare Chromatic Anomaly in a Gymnophionan from the Western Ghats, Karnataka, India

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Gymnophiona (caecilians), one of the three surviving orders of amphibians, are understudied. Currently, 225 recognized species are distributed across the tropics and subtropics (Venu et al. 2024; Frost 2025). Fifteen of the 41 species of caecilians recorded in India are in the genus *Ichthyophis* Fitzinger 1826 (Dinesh et al. 2024; Frost 2025). The Western Ghats, one of the eight globally recognized biodiversity hotspots (Myers et al. 2000), harbors approximately 70% of the known Indian caecilian species (Venu et al. 2020).

The burrowing, secretive, and nocturnal nature of caecilians renders them unfamiliar to many herpetologists, and their biology remains one of the least understood among amphibians and reptiles (Taylor 1968; Nussbaum and Wilkinson 1989; Gower and Wilkinson 2005). Despite their fossorial lifestyle, caecilian coloration is remarkably diverse, with blue and yellow hues being the most common, and patterns often including longitudinal lateral stripes and sharp lines dividing different colors or irregular blotches (Wollenberg and Measey 2009).



Figure 1. *Ichthyophis* sp. from Ankola, Uttara Kannada, Karnataka, India: Leucistic individual (left) and typically colored individual (right). Photographs by Srijan C.K.



Figure 2. Habitat where *Ichthyophis* sp. were found in Ankola, Uttara Kannada, Karnataka, India. Photograph by Srijan C.K.

Amphibian coloration is determined by chromatophores, which are pigment-bearing cells in the skin. These cells include melanophores (containing eumelanin), iridophores

(reflective structures), and xanthophores (containing carotenoids and pteridines) (Duellman and Trueb 1994; Stuckert et al. 2019). Any alteration in these cells or their pigments can result in chromatic anomalies (Duellman and Trueb 1994; Brito-Zapata 2021). Chromatic anomalies in caecilians are rarely documented and a review by Guimarães Dias et al. (2024) documented chromatic anomalies in only ten species.

Leucism has been reported in only three species of caecilians: *Ichthyophis kodaguensis* Wilkinson, Gower, Venu, and Venkatachalaiah 2007 (Venu et al. 2021), *Gymnopsis multiplicata* Peters 1874 (Villagra and Escalante 2023), and *Caecilia tentaculata* Linnaeus, 1758 (Guimarães Dias et al. 2024).

During a herpetological survey at 0113 h on 13 June 2024, we found an unusual caecilian in Ankola, Uttara Kannada District, Karnataka, India (14.5935, 74.4834; elev. 550 m asl), that we identified as a leucistic caecilian belonging to the genus *Ichthyophis* (Fig. 1). It exhibited normal eye coloration, consistent with the characteristics of leucistic individuals, as opposed to albinos, which typically lack pigmentation in the eyes (Dyrkacz 1981). Normal individuals of *Ichthyophis* also were observed in the same location on the same day, allowing for direct comparison (Fig. 1). The habitat consisted of evergreen forest, featuring a small hill stream and rocky laterite patches (Fig. 2). In addition to this finding, we reviewed reports of chromatic anomalies in five species of Gymnophiona from India (Table 1).

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Table 1. Documented cases of chromatic anomalies in caecilians from India.

Species (type of anomaly)	Location	Reference
<i>Gegeneophis mhadeiensis</i> (albinism)	Chavatyaar, Chavato vaddo, Chorla village, Western Ghats, northern Karnataka (15.6525, 74.1270)	Bhatta et al. 2007
<i>Ichthyophis kodaguensis</i> (leucism)	Kodagu, Karnataka (12.4730, 75.7808)	Venu et al. 2021
<i>Ichthyophis beddomei</i> (albinism)	Regional Agricultural Research Station, Ambalavayal, Wayanad, Kerala (11.6233, 76.2177)	Venu et al. 2022
<i>Ichthyophis beddomei</i> (hypermelanism)	Kuchikunnel tea plantations, Gudalur, Nilgiris, Tamil Nadu, (11.5216, 76.4891)	Venu et al. 2022
<i>Uraeotyphlus narayani</i> (blue)	Regional Coffee Research Station, Chundale, Wayanad, Kerala (11.9558, 76.1055)	Venu et al. 2022
<i>Uraeotyphlus narayani</i> (partial melanism)	Regional Agricultural Research Station, Ambalavayal, Wayanad, Kerala (11.6233, 76.2177)	Venu et al. 2022
<i>Gegeneophis ramaswamii</i> (blue)	Chuldmanur, Thembakalu, Thiruvananthapuram, Kerala (8.8780, 76.9016)	Venu et al. 2022
<i>Ichthyophis</i> sp. (leucism)	Ankola, Uttara Kannada, Karnataka (14.5935, 74.4834)	This study

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