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First report of melanism in the salamander *Bolitoglossa rufescens* (Caudata: Plethodontidae) in Veracruz, México

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ABSTRACT

Several cases of pigmentary abnormalities have been documented in salamanders. These abnormalities can be partial or total and are derived from the absence or excess of pigmentation produced by chromatophores (pigment cells). Here, we present the first record of melanism in the salamander *Bolitoglossa rufescens*, from Veracruz, Mexico, being this the second case of abnormal pigmentation in the genus *Bolitoglossa*.

Key Words: Amphibians, Chromatophores, Pigmentary abnormalities.

The color we perceive from animals is influenced by the spatial distribution of chromatophores (pigment cells), the amount and type of pigment they contain, as well as the reflection of light on them (Rivera *et al.*, 2001). There are different pigment cells: melanophores (black-brown), xanthophores (yellow), cyanophores (blue), erythrophores (red), and leukophores (white) (Fernández Guiberteau *et al.*, 2012). Several cases of pigmentary abnormalities have been reported in the herpetological literature, either extensive (e.g. William *et al.*, 2018; MacKnight and Burrow, 2019) or partially affecting pigmented areas of the body (e.g. Aguilar-López *et al.*, 2017; Hughes *et al.*, 2019) and remains a topic of interest for herpetologists and herpetoculturists (Lunghi *et al.*, 2017).

In salamanders, the most frequent abnormalities involve diminished pigmentation, corresponding for instance to cases of albinism and leucism (Lunghi *et al.*, 2017), in which individuals are characterized by presenting a white or pale color. On the other hand, reports of individuals with higher amount of pigmentation than in typical or normal individuals are also rare (Jablonski *et al.*, 2014; Lunghi *et al.*, 2017). Although some species of salamanders naturally present dark pigmentation

or melanism (dominance of melanophores; e.g. *Bolitoglossa tenebrosa*, *Isthmura corrugata*), there are a limited number of cases of aberrant melanism (when the pigmented cells are more abundant than in normal individuals) reported in these amphibians, for example in *Salamandra salamandra*, *Triturus marmoratus*, *Calotriton asper*, *Euproctus montanus*, *Lissotriton boscai*, *Speleomantes imperialis* and *S. flavus* (Manenti, 2006; Rivera *et al.*, 2001; Bermejo and Otero, 2012; Lunghi *et al.*, 2017).

In this paper we present the first report of melanism in the Northern Banana Salamander, *Bolitoglossa rufescens* (Cope, 1869). On November 2, 2019, around 18:00 h we observed an adult individual of *B. rufescens* (snout-vent length: 28 mm; total length: 51 mm) that was perched on a wall at about 0.5 m from the ground (Fig. 1 A, B), in the backyard of a house at the municipality of Fortín de las Flores, in the region known as the “Altas Montañas” in west-central Veracruz state, Mexico (18°54'27.3"N, 96°57'39.8"W, 950 m a.s.l.). Noticing an unusual appearance of the salamander, we captured it to see if its particular dark color remained the next day, once removed from the encounter site. On the morning of November 3, we photographed the individual exposed to daylight (Fig. 1 C, D) and

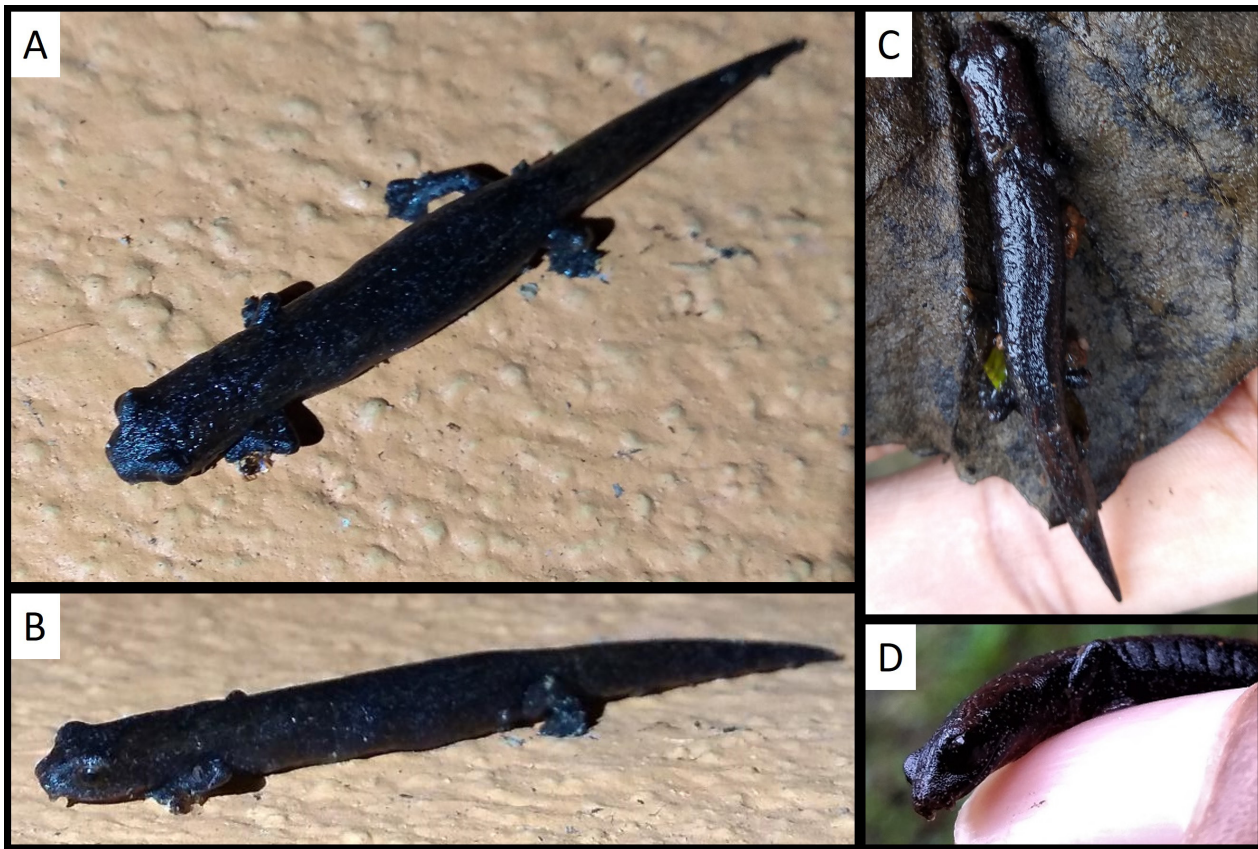


Figure 1. Adult of *Bolitoglossa rufescens* with melanism, from Fortín de las Flores, Veracruz, Mexico.

afterwards released it at the same place of collection. The individual presented a uniform dark pigmentation with small light spots distributed throughout the body. During day, the individual maintained its black pigmentation, and only the dorsal (still notoriously dark) showed a slightly dark brown hue (Fig. 1D). This coloration differs from the dark brown pattern on the belly and sides, and light brown to reddish back of normal individuals (Fig. 2). We deposited a photograph of the studied specimen in the photographic collection of the Natural History Museum of Los Angeles (LACM PC 2482).

Our observation represents the first report of melanism in *Bolitoglossa rufescens*. It should be noted that, during field-work in the last nine years at the “Altas Montañas” region, no other individuals of this species have been observed presenting any type of conspicuous pigmentary abnormalities (Vásquez-Cruz obs. pers.). Previously, Ruiz-Villanueva *et al.* (2018) reported leucism in *Bolitoglossa engelhardti* salamander in Guatemala. Therefore, our observation represents the second case of pigmentary abnormality in *Bolitoglossa*, as well as the first case of melanism in this genus.



Figure 2. Adults of *Bolitoglossa rufescens* with typical color patterns of light brown (A) and dark brown tones (B), both observed in the “Altas Montañas” region from central-western Veracruz, Mexico.

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