



# Ocular Abnormality in a Mesoamerican Cane Toad, *Rhinella horribilis* (Anura: Bufonidae), in Sinaloa, Mexico

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An abnormality is defined as any distortion of the normal standards in morphological variability and involves both malformations (permanent structural defects resulting from abnormal development) and deformities (alterations such as the amputation of an organ or a correctly formed structure) (Cortés-Suárez 2018b). Herein we report a unilateral ocular abnormality (absence of the right eye) in a juvenile Mesoamerican Cane Toad (*Rhinella horribilis*) (43 mm (SVL, weight 6 g) (Fig. 1), an abundant species with an extensive distribution that extends from the lower Rio Grande Valley of southern Texas and southern Sonora through tropical lowland Mexico and Central America to the western slopes of the Andes and western coastal South America to extreme northwestern Peru (Frost 2021; Pereyra et al. 2021). Juveniles are readily identified by a white spot below the eye, an enlarged triangular parotoid gland, a row of granules (sometimes connected) extending from the posterior tip of the parotoid gland along the side of the body, and the presence of a prominent tarsal fold (Hardy and McDiarmid 1969). These characters also differentiate juveniles from sympatric species such as the Pine Toad (*Incilius occidentalis*) and the Marbled Toad (*Incilius marmoratus*) (Oliver-López et al. 2009). The identity of the species was verified by Ricardo Palacios Aguilar and Jesús Loc Barragán.

This abnormality is similar to anophthalmia, which is characterized by the absence of one or both eyes, leaving the ocular cavity covered with skin (see Cortés-Suárez 2018a). However, the individual we found had part of the supraocular arch, a healed eye socket, and lesions on the rest of the body, including redness on its venter. Consequently, rather than a developmental anomaly, we believe that the absence of the eye in this toad was most likely caused by an infectious disease or predation after the larval stage. Potential predators include dragonfly larvae, certain crustaceans, other invertebrates such as leeches, and even fish (Sessions and Ballengeé 2010). Regardless of cause, the absence of an organ in a juvenile will likely have a negative effect on survival (Morales-Flores et al. 2021).

At 1330 h on 25 November 2021, the senior author found the toad on gravel at the edge of a stream near the Heladio Serrano Dam in the village of Surutato, Badiraguato Municipality, Sinaloa, Mexico (25°49'54.48"N, 107°34'17.36"W; elev. 1,498 m asl). After examining and photographing the toad, it was released at the site of capture. Photographs were deposited in the herpetological digital collection of the Natural History Museum of Los Angeles (LACM PC 2842–3).



Fig. 1. A juvenile Mesoamerican Cane Toad (*Rhinella horribilis*) with a unilateral ocular abnormality. Photographs by Héctor Alexis Castro-Bastidas.

Reports of morphological abnormalities are relatively scarce and rarely published in Mexico (Castro-Torreblanca and Blancas-Calva 2021). Although this instance was probably not a developmental defect, the detection and reporting of anomalies is important because of the possibility of environmental contaminants affecting amphibian populations (Blaustein and Johnson 2003; Aguillón-Gutiérrez 2018). In Sinaloa, the situation is further complicated by social conflicts during the last four decades (Hardy and McDiarmid 1969; Lemos-Espinal and Smith 2020), the recent report of a ranavirus outbreak in the northwestern parts of the state (Saucedo et al. 2017), and habitat alterations for tourism and agriculture.

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