



New Elevational Record of the Dry Forest Toad, *Incilius coccifer* (Cope 1866), in Cartago Province, Costa Rica

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The New World anuran genera *Incilius* currently comprises 39 species, 12 of which occur in Costa Rica (Frost 2023). These toads are widely distributed across Costa Rican ecoregions, but different species have distinct habitat requirements. The Dry Forest Toad (*Incilius coccifer*) typically inhabits dry lowland forests and humid montane forests on the North and Central Pacific Slopes and the Central Valley at elevations from sea level to 1,435 m asl (Leenders 2017; Savage 2002).

At 1936 h on 19 August 2022, while conducting amphibian surveys in an urban area near El Carmen, Cartago, Costa Rica (9.88056 N, 83.91861 W; elev. 1,539 m asl), we encountered a juvenile Dry Forest Toad on a rock in a small canal near pastureland, approximately 25 m from a busy road. Minutes later, at 1938 h, we found an adult (Fig. 1) in the process of leaving a nearby burrow. Other anurans detected at the site included the Golden-Eyed Leaf Frog (*Agalychnis*

annae), Meadow Treefrog (*Isthmohyla pseudopuma*), Montane Leopard Frog (*Lithobates taylori*), and Mesoamerican Cane Toad (*Rhinella horribilis*). Riparian vegetation was less than one meter in height. No other individuals of *I. coccifer* were found that night.

At 1909 h on 25 August 2022, we encountered another *I. coccifer* in a roadside ditch in a different disturbed area near that of the previous observation (9.88278 N, 83.91889 W) but at a higher elevation (1,572 m asl) that represents the highest elevational record for the species. A photographic voucher has been deposited in the KUDA Digital Archive (KUDA 13992) and the identity of the species was confirmed from the photograph by Jonathan Vega-Coto.

Amphibian distribution ranges depend largely on temperature variations and some species may actually benefit by climate change; those who have higher tolerance for increasing or higher ambient temperatures may expand their ranges in response to environmental warming (Lopez-Alcaide and Macip-Rios 2011). Our observation of *I. coccifer* at higher elevations than previously reported suggests that these toads are taking advantage of increasing global temperatures to colonize new areas.

Literature Cited

- Leenders, T. 2016. *Amphibians of Costa Rica: A Field Guide*. Cornell University Press, Ithaca, New York, USA.
- López-Alcaide, S. and R. Macip-Ríos. 2011. Effects of climate change in amphibians and reptiles, pp. 163–184. In: O. Grillo and G. Venora (eds.), *Biodiversity Loss in a Changing Planet*. InTech, Rijeka, Croatia. <https://doi.org/10.5772/24663>.
- Savage, J.M. 2002. *The Amphibians and Reptiles of Costa Rica: A Herpetofauna Between Two Continents, Between Two Seas*. University of Chicago Press, Chicago, Illinois, USA.



Figure 1. An adult Dry Forest Toad (*Incilius coccifer*) from El Carmen, Cartago, Costa Rica. Photograph by Alexander Moya-Valverde.