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Rediscovery of the rare earless lizard *Bachia blairi* (Squamata, Gymnophthalmidae) in Osa Peninsula, Puntarenas, Costa Rica after 28 years

Neftalí Chavarría Villagra[1], Marina Garrido-Priego[2] and Raby Nuñez Escalante[3,*]

The family Gymnophthalmidae is comprised of 281 species that occur from southern Mexico to Argentina (Pellegrino et al., 2021). The members of this morphologically diverse family were formerly included in the family Teiidae and referred as micro-teiids (Savage, 2002). Five of these gymnophthalmid lizards inhabit the Costa Rican forests: *Anadia ocellata* (Gray, 1845), *Bachia blairi* (Dunn, 1940), *Gymnophthalmus speciosus* (Hallowell, 1861), *Leposoma southi* (Ruthven & Gaige, 1924), and *Centrosaura apodemus* (Uzzell, 1966). The genus *Bachia* is represented by 31 species, most of which occur in South America (Uetz et al., 2023). These peculiar snake-like lizards have long tails, reduced limbs, no external ear openings and very small eyes (Savage, 2002).

Bachia blairi is the only species in the genus *Bachia* found in Costa Rica. It is a rarely seen leaf-litter lizard that is associated with accumulation of leaves between the buttressed roots of trees, where it preys on small beetles and caterpillars (McDiarmid and DeWeese, 1977). *Bachia blairi* is an endemic lizard from southwestern Costa Rica and adjacent Panama. In Costa Rica it is known from just a few records from sea level to 40 m elevation (Savage, 2002; Leenders, 2019), although in Panama two specimens were reported at 515 m elevation, which extended the altitudinal distribution of the species (Batista et al., 2020).

Nine specimens collected in the Osa Peninsula are the only known records of this species in Costa Rica. Six of them were found in the northeast of the peninsula (McDiarmid and DeWeese, 1977), two of them within Corcovado National Park, and the last one in the vicinity of the park. These last three specimens were deposited in the Museum of Zoology at the University of Costa Rica (5 July 1973, MZUCR-8153, Jay M. Savage; 1 June 1992, MZUCR-11375, T. Schultz; and 17 July 1994, MZUCR-11858, Gad Perry). In Panama, *B. blairi*'s presence is known from the holotype collected in the lowlands at Puerto Armuelles (Dunn, 1940), two specimens collected in the Chiriquí Viejo river's drainage (Batista et al., 2020), and one specimen observed in 2019 in central Panama which was reported in iNaturalist (Villanueva Maldonado, 2022). Here we report the re-discovery of two specimens of this rare lizard after 28 years without any reports in Costa Rica. Furthermore, we compiled all of the occurrences published so far (Fig. 1) and mapped its potential range within the Osa Peninsula.

Two earless lizards were found at 14:30 h on 19 October 2022 in the riparian forest near Izquierdo river, (8.499056ºN, -83.436000ºW; elevation 226 m) (Fig. 2), next to a rotting fallen tree with a thick layer of leaf litter (Fig. 3). Although both individuals moved very fast in a snake-like fashion through the leaves, we were able to capture one of them (Fig. 4). There is no other lizard similar to *B. blairi* in Costa Rica (Savage, 2002). The identification was, however, confirmed by Alejandro Solórzano, a herpetologist associated with the University of Costa Rica, who verified the taxonomy. The specimen was deposited in the Museum of Zoology at the University of Costa Rica (MZUCR-24237) (Fig. 5).

We used habitat as a guide to map a polygon distribution range within the Osa Peninsula. As environmental factors for the habitat, we considered both the land cover of the Osa Peninsula in 2019 obtained using images from Sentinel-2 satellite (source: Garrido-Priego et al. 2023) and elevation (source: Aster, images

[1] Río Tigre de Osa, Golfito, 60702 Puntarenas, Costa Rica.
[2] Division of Behavioural Ecology, Institute of Ecology and Evolution, University of Bern, Wohlenstrasse 50a, CH-3032 Hinterkappelen, Switzerland.
[3] Sierpefrogs, Sierpe de Osa, 60503 Puntarenas, Costa Rica.
[*] Corresponding autor. E-mail: sierpefrogs@gmail.com

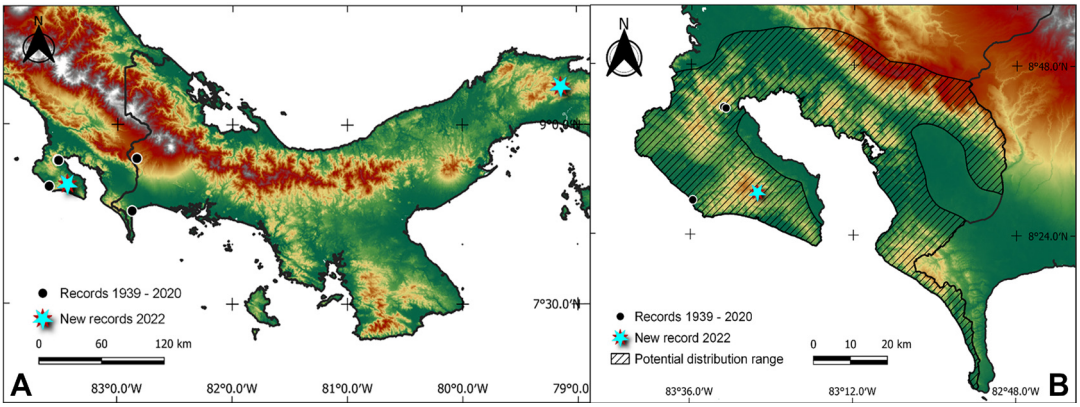

Figure 1. Recorded specimens of *Bachia blairi* in Costa Rica and Panama (A) and potential distribution range in southern Costa Rica (B).

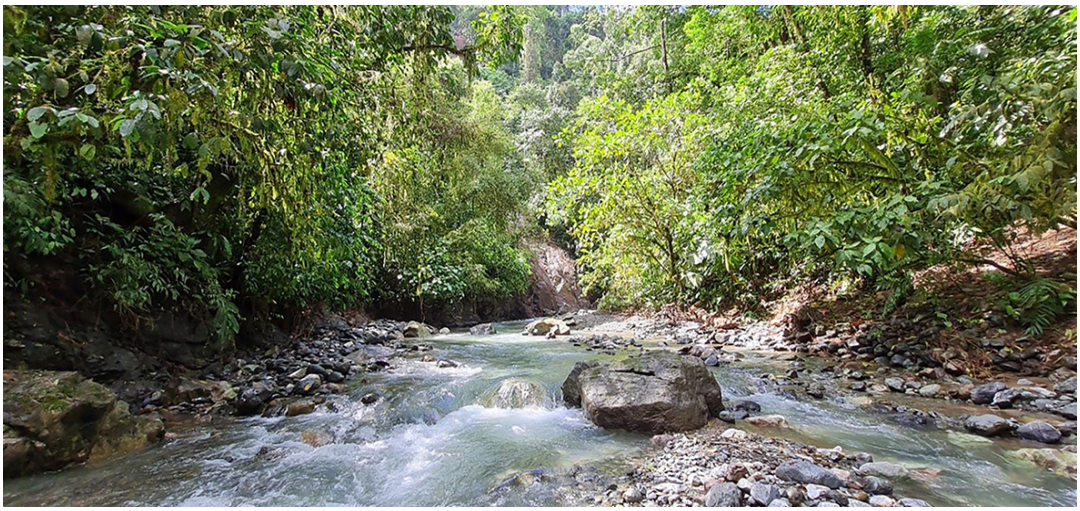

Figure 2. Gallery forest**,** Izquierdo river, Osa Peninsula where the lizards were found. Photo by Neftalí Chavarría Villagra.

courtesy of "NASA/METI/AIS/Japan Spacesystems, and U.S./Japan ASTER Science Team, Aster"; 30-meter resolution). Further surveys would be needed to evaluate the ecological niche of *B. blairi*, so we can better understand the species' habitat requirements.

This re-discovery showcases the importance of natural history research for understanding and conserving reptiles, with more than 21% of reptiles at risk of extinction (IUCN, 2023). Only by providing information about their ecology, habitat, and behaviour can we better understand their ecological requirements and develop suitable conservation strategies.

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Figure 3. The two specimens were found in the leaf litter under this log. Photos by Neftalí Chavarría Villagra.

Figure 4. Specimen (MZUCR-24237). Photo by Raby Nuñez Escalante.

Figure 5. Portrait of individual (MZUCR-24237). Photo by Raby Nuñez Escalante.

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