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RANGE EXTENSION OF *ECNOMIOHYLA SUKIA* (HYLIDAE) IN GUANACASTE, COSTA RICA

EXTENSIÓN DE ÁREA DE DISTRIBUCIÓN DE *ECNOMIOHYLA SUKIA* (HYLIDAE) EN GUANACASTE, COSTA RICA

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Frogs of the genus *Ecnomiohyla* (Faivovich et al., 2005) are inhabitants of the tropical and humid forests of southeastern Mexico, Middle America, the northwest of Colombia, and the Amazonian upper basin of Brazil, Peru, Ecuador, and Colombia (Frost, 2023). Currently, this genus is composed of 12 species: *E. bailarina* Batista et al., 2014; *E. echinata* Duellman, 1961; *E. fimbrimembra* Taylor, 1948; *E. miliaria* Cope, 1886; *E. minera* Wilson, McCranie & Williams, 1985; *E. phantasmagoria* Dunn, 1943; *E. rabborum* Mendelson et al., 2008; *E. salvaje* Wilson, McCranie & Williams, 1985; *E. sukia* Savage & Kubicki, 2010; *E. thysanota* Duellman, 1966; *E. valancifer* Firschein & Smith, 1956; *E. veraguensis* Batista et al., 2014 (Frost, 2023).

Frogs of this genus are canopy-dwelling species that are rarely seen, and little is known about their reproduction, vocalizations, and conservation status (Salazar et al., 2021a, b; Zumbado et al., 2021). Furthermore, the distribution of some species within the genus is poorly understood because they are difficult to detect in the forest, however, it is possible that these species are relatively abundant in suitable habitats (Salazar et al., 2021a).

In Costa Rica, five species of this genus have been reported: *E. bailarina*, *E. fimbrimembra*, *E. miliaria*, *E. sukia*, and *E. veraguensis* (Savage & Kubicki, 2010; Kubicki & Salazar, 2015; Salazar et al., 2019). The Shaman Fringe-limbed Treefrog (*E. sukia*) is a nocturnal frog that inhabits lowland and montane humid tropical rainforests. It inhabits the canopy of primary and secondary forests and is usually found on the surface of vegetation, or on tree branches and uses water-filled cavities on trees to reproduce. Males call from high in the canopy at night, 3 to 20 m above the ground (Savage & Kubicki 2010; Stanley Salazar pers. comm).

To date, *E. sukia* has only been found in the Caribbean low and midlands in Costa Rica (Savage & Kubicki, 2010). The current distribution range of *E. sukia* is the Atlantic slope of central Costa Rica, in Limón, Heredia, and Alajuela Provinces, between 400-1,300 m a.s.l. (Fig. 3). According to the IUCN red list (IUCN, 2020) and Zumbado et al., (2021), the northernmost report of the species was from the Arenal Volcano Lake. The most northern confirmed record for this species was Sky Adventures at Arenal Volcano (10.425° N, 84.736° W, 800 m a.s.l.) (Wilbert Lazo, pers. comm). This paper presents two new records of *E. sukia* in the northernmost sector of the country, in the Guanacaste Mountain range.

On June 6th, 2017, F.Q. encountered an individual of *E. sukia* sleeping on a mossy branch (Fig. 1) in the Pitilla Biological Station (Sector Pitilla), a Tropical Wet Forest, transition to Premontane on the Caribbean side of the Área de Conservación Guanacaste (ACG) (10.989° N, 85.425° W, 675 m a.s.l.) (Fig. 3). During a walk on a trail, they spotted a frog of the genus *Ecnomiohyla* sleeping a meter above the ground, hidden among the moss, which made it difficult to detect. Some photographs were taken, and the individual remained in the same place after the observation.

A second observation was made on March 1st, 2023, at 13:01 h, while M.V.N., D.V-S., M.C. and D. V., were searching for the endangered Jícaro Danto tree (*Parmentiera valerii*). Right after encountering a tree specimen, a frog of the genus *Ecnomiohyla*

was spotted sleeping on a fallen branch at ground level (Fig. 2), at the Cabro Muco sector on the Pacific side of Miravalles National Park, a Premontane Rain Forest part of the Arenal Tempisque Conservation Area in the Guanacaste Province (10.718 °N, 85.142 °W, 115 m a.s.l.) (Fig. 3). It appeared that the arboreal frog had fallen with the branch, as the leaves were still fresh, and there had been a lot of wind that week. The frog was photographed and then released in the same place.

Figura 1. Individuo de *Ecnomiohyla sukia* encontrado en la estación Pitilla del Área de Conservación Guanacaste en 2017. Foto: F. Quesada.
Figure 1. Individual of *Ecnomiohyla sukia* found at the Pitilla station of the Área de Conservación Guanacaste in 2017. Photo: F. Quesada.

Figura 2. Individuo de *Ecnomiohyla sukia* encontrado en la localidad de Cabro Muco, en el Parque Nacional Miravalles-Jorge Manuel Dengo en 2023. Foto: M. van Noppen.
Figure 2. Individual of *Ecnomiohyla sukia* found in the town of Cabro Muco, in the Miravalles-Jorge Manuel Dengo National Park in 2023. Photo: M. van Noppen.

In both cases, the species identification was based on the dorsum tuberculate; absence of humeral projection; absence of keratin tipped tubercles on the dorsum; the presence of low and non-pointed tubercles on the eyes, and the absence of scattered black tubercles in the lower parts of the body with a scalloped fringe (Savage & Kubicki, 2010; Batista et al., 2014; Valencia-Zuleta et al., 2016). In both cases, the species was also corroborated by Stanley Salazar as *E. sukia*. These new records increase the known range of *E. sukia* from the northernmost report in Arenal Volcano by 54 km to the north in the Volcán Miravalles location and 97 km to the north in the Pitilla Biological Station. It is important to mention the record of the species *E. miliaria* in the Pacific (Barrio-Amorós & Torres, 2017), which recent observations suggest may belong to *E. aff. sukia* (Zumbado et al., 2021). However, these arguments still need to be corroborated and published to confirm a correct taxonomic identification and the subsequent correction of the geographic distribution.

Frogs of the genus *Ecnomiohyla* are found mainly in primary or little-disturbed humid tropical rainforests, where the trunks of the trees are extremely important for their reproduction, as they lay their eggs in water-filled cavities (Savage & Kubicki, 2010; Salazar et al., 2021b). The presence of this species in protected forests demonstrates the importance of national parks' function of preserving whole ecosystems and buffer zones, especially when not all flora and fauna residing in them are known.

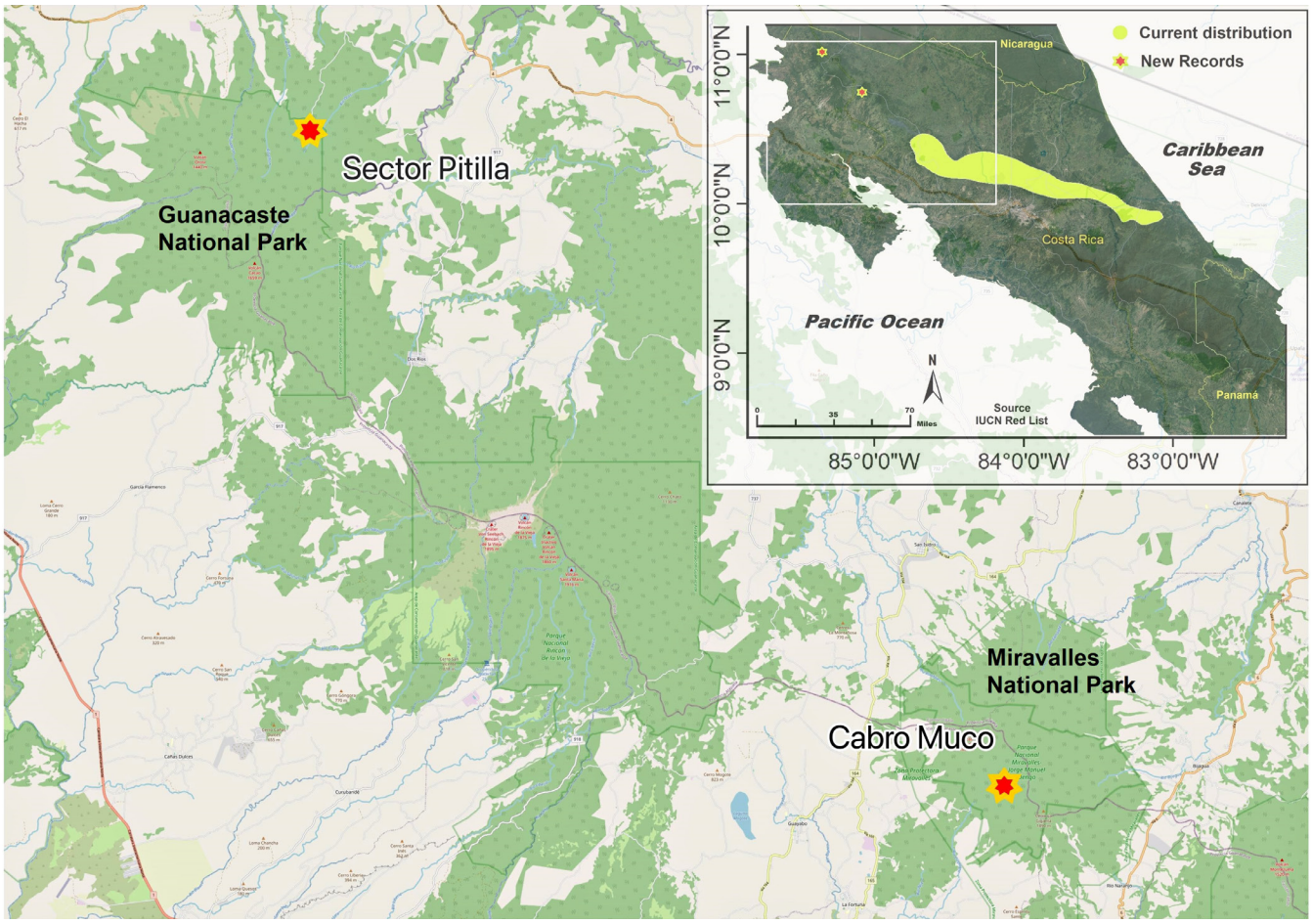

Figura 3. Mapa de Costa Rica que muestra la distribución actual de *Ecnomiohyla sukia* (Recuadro pequeño) y avistamiento de cerca de nuevos registros (estrellas rojas) de *Ecnomiohyla sukia* en el sector Pitilla de Área de Conservación Guanacaste (Parque Nacional Guanacaste) y Cabro Muco en el Parque Nacional Miravalles-Jorge Manuel Dengo (Parque Nacional Miravalles).

Figure 3. Map of Costa Rica showing the current distribution of *Ecnomiohyla sukia* (Small box) and close view sighting of new records (red stars) of *Ecnomiohyla sukia* in Pitilla sector of Área de Conserservación Guanacaste (Guanacaste National Park) and Cabro Muco in Miravalles-Jorge Manuel Dengo National Park (Miravalles National Park).

This range extension was possible due to naturalists' curiosity and scientists' support. This collaboration inspired the individuals involved to reflect on the importance of being attentive to the previous observations of local naturalists. Anyone's discoveries can play an important role in scientific research, and a clear example of this attitude is the recent discovery of *Tlalocohyla celeste* by a Bijagua local naturalist who said: "It's about being curious, wanting to know what is in your backyard, being observant and attentive to the natural world" (Varela-Soto et al., 2022). After this experience with *E. sukia*, his words resonate even more in our group, we hope that this note inspires others to continue their work in conservation.

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