REPTILES & AMPHIBIANS

New Localities and an Elevational Range Extension of the Green-striped Glass Frog, *Hyalinobatrachium talamancae* Taylor 1952 (Anura: Centrolenidae), in Costa Rica

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The Green-striped Glass Frog (*Hyalinobatrachium talamancae*) (Fig. 1) is distinguished from other centrolenids in Costa Rica by the presence of a middorsal green stripe that extends from the head to the cloaca, the heart distinctly visible in live individuals, and the lack of yellow margins on both sides of the middorsal stripe (Kubicki 2006, 2007, 2008). It is most similar to Starrett's Glass Frog (*H. vireovittatum*) but the distribution of the latter is restricted to the foothills of the Pacific slopes of Costa Rica (Hayes and Krempels 1985; Campos-Villalobos et al. 2020).

The Green-striped Glass Frog was known only from the type locality at an elevation of 1,116 m asl near Moravia de Chirripó, Cartago Province, Costa Rica (Taylor 1952; Savage 1974, 2002; Starrett and Savage 1973; Kubicki 2006, 2007) until it was "rediscovered" in 2001 by Kubicki (2006), who failed to find this species at the type locality. Kubicki (2007) also had clarified that specimens labelled *Hyalinobatrachium vireovittatum* in the collection of the University of Costa Rica had been misidentified and should be considered *H. talamancae*. Until now, the species' distribution was thought to be limited to a few isolated sites on the Atlantic slope of Costa Rica at elevations of 475–850 m asl (Kubicki 2006), although the IUCN SSC Amphibian Specialist Group (2020) continued to list the maximum elevational range as 1,116 m asl (Fig. 2). Based on unpublished personal observations and those of other reliable observers, Leenders (2016) noted the presence of additional populations on the Tenorio Volcano (Guanacaste Province) and on the slopes of the Tilarán, Central, and Talamanca Cordilleras.

These frogs are associated with high-gradient streams in primary and secondary forests (Kubicki 2006). However, these habitats are difficult to access, which could explain the low number of known localities reported to date and the apparent rarity of the species (Kubicki 2007). Herein, we report new localities in the Tilarán, Central, and Talamanca Cordilleras, including a new elevational record for the species.

At 2310 h on November 13 2018, we encountered and photographed a male and a female *H. talamancae* at the San Gerardo Station (Private Reserve), Monteverde, Abangares, Guanacaste Province, Costa Rica (10°21'49.0"N, 84°47'23.4"W; WGS 84; elev.1,250 m asl; Figs. 1A–B). This locality is classified as Premontane Wet Forest (Holdridge 1967) and is located 140 km straight line distance from the nearest known locality at Guayacan (Quebrada Ilex), Siquirres, Limon Province (Kubicki 2006; Fig. 2).

At 1015 h on July 25 2020, we encountered and photographed a male at Santa Cristina, La Suiza, Turrialba, Cartago Province, Costa Rica (9°47'43"N, 83°36'24"W; WGS 84; elev. 1,600 m asl; Figs. 1C–D). This locality, classified as Lower Montane Rain Forest (Holdridge 1967), is characterized by secondary vegetation and has been affected by livestock expansion. It is located 30 km from the nearest known locality at Guayacan (Quebrada Ilex) (Kubicki 2006). This report extends the upper elevational range reported for the species by 484 m (Fig. 2).

At 2000 h on November 28 2020, we encountered and photographed two vocalizing males at a private farm near the foothills of the Braulio Carrillo National Park, in the sector known as Cacho Negro, Colonia Cubujuquí, Sarapiquí, Heredia Province, Costa Rica (10°14'49.9"N 83°59'27.3"W; WGS 84; elev.499 m asl; Figs. 1E–F). One of the males was guarding an egg mass (Fig. 1F). This locality is classified as

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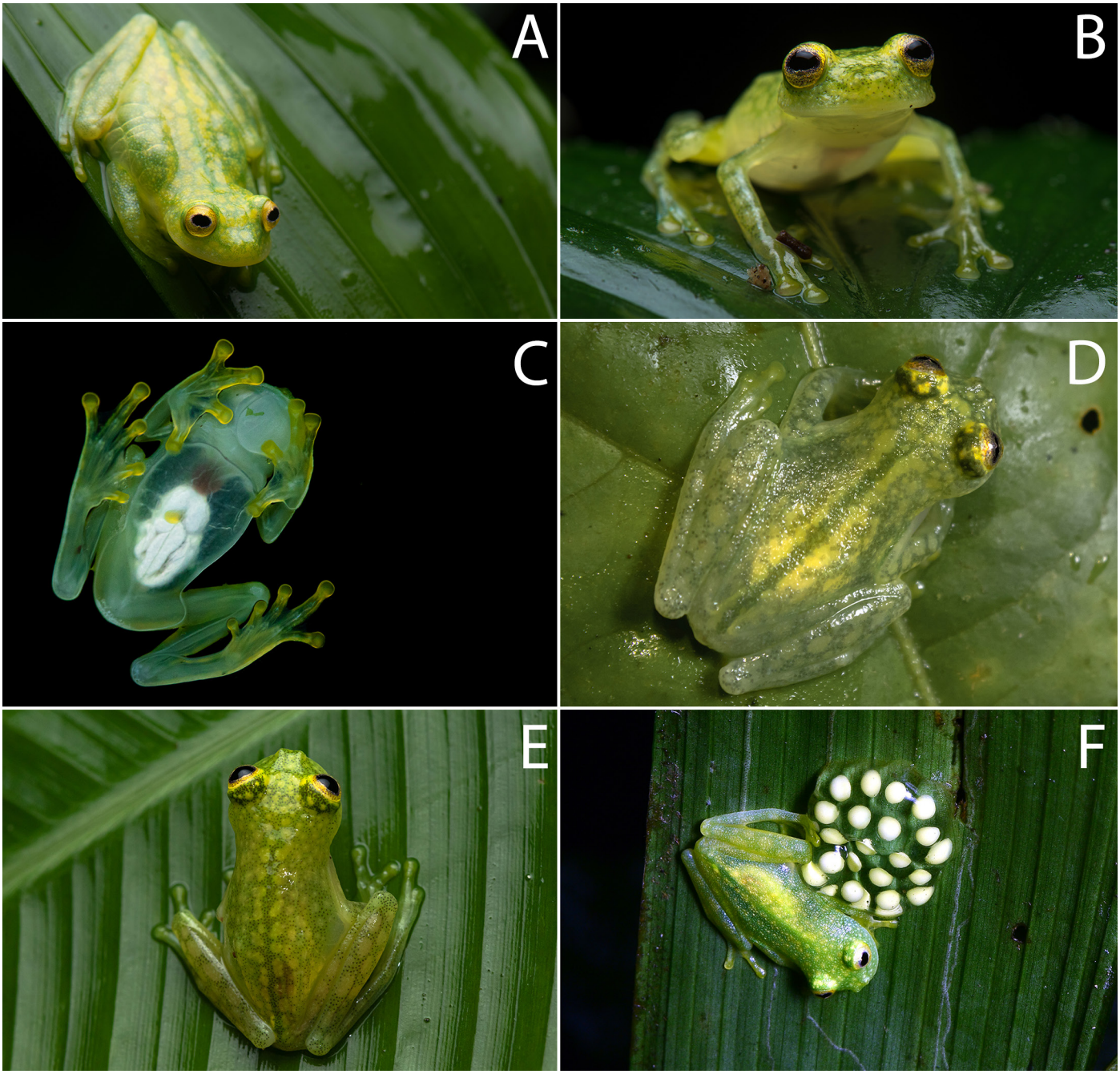

Fig. 1. Green-striped Glass Frogs (*Hyalinobatrachium talamancae*) from Costa Rica: Detail of the longitudinal green stripe of a pregnant female (A) and a frontal view of a male (B) from the San Gerardo Station, Monteverde, Abangares, Guanacaste Province; the distinctly visible heart (C) and a dorsal view of a male (D) from Santa Cristina, La Suiza, Turrialba, Cartago Province; and a dorsal view of a male (E) and a male guarding an egg mass (F) from Cacho Negro, Sarapiquí, Heredia Province. Photographs by Felix Salazar (A–B), Anthony Abarca Zúñiga (C–E), and Donovan Corrales (F).

Tropical Wet Forest (Premontane transition) (Holdridge 1967) and has been impacted dramatically by human activities, mainly deforestation for livestock grazing. Another three individuals were heard in vegetation near the stream. This new locality is 53 km from the nearest known locality at Guayacan (Quebrada Ilex) (Kubicki 2006; Fig. 2).

Photographic vouchers have been deposited in the Biodiversity Collections, Department of Integrative Biology, University of Texas at Austin (TNHC 116047–51). The identity of these frogs was confirmed from photographs by Juan Abarca, Universidad Nacional, Heredia, Costa Rica.

The populations in the Cordillera Tilarán, which are within a private reserve, appear to be stable and are not currently threatened (Félix Salazar, pers. comm. 2021). However, the populations in the Talamanca and Central Cordilleras were in areas negatively impacted by human activities, indicating a need to develop conservation strategies for these areas.

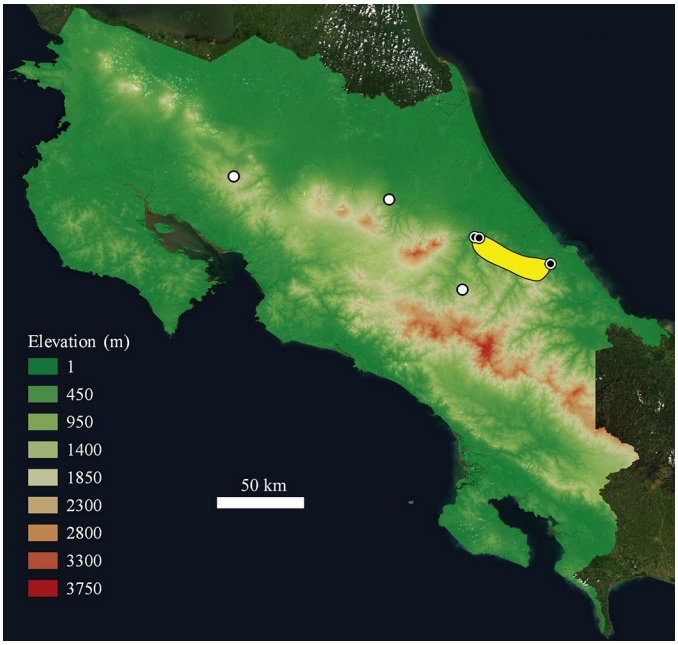

Fig. 2. Distribution of the Green-striped Glass Frog (*Hyalinobatrachium talamancae*) in Costa Rica. Previously documented localities (Quebrada Ilex, Quebrada Talamancae, and La Asunción) are indicated by black dots, the yellow area marks the distribution according to the IUCN SSC Amphibian Specialist Group (2020), and new records are indicated by white dots. Geographic coordinate system WGS84. Map by Christian G. Herrera using QGis 3.4.15 with shape files Costa Rica 2014 v.1.2.

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