

Southernmost record and comments on the natural history of the poorly known frog *Triprrion petasatus* (Anura: Hylidae) from Honduras

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Triprrion petasatus (Cope, 1856), commonly known as the Yucatan Casquehead Treefrog, is a moderately large frog; snout-vent length (SVL) ranges in males from 46.30 to 60.80 mm and females from 65.00 to 74.20 mm (Duellman and Klaas, 1964; Carbajal-Márquez et al., 2018). This species is distributed within the Yucatan Peninsula in Mexico, the savannahs of central Petén in Guatemala, northern and central Belize; from sea level to 740 m elevation (Wilson et al., 1986; Duellman, 2001; McCranie and Castañeda, 2007). A debatable population in Honduras located near Lake Yojoa (Lee, 1996; Carbajal-Márquez et al., 2018; Frost, 2022) was excluded by McCranie (2015) from the latest list of Honduran herpetofauna.

Information on its natural history is still scarce and has been mainly compiled from the Yucatan Peninsula (e.g., Duellman, 1970, 2001; Wilson et al., 1986; McCranie and Castañeda, 2007). Individuals of *T. petasatus* take

shelter in tree and rock holes during the day and during the dry season (Stuart, 1935; Duellman and Klaas, 1964). It breeds explosively in the surrounding water bodies and tree holes close to them, and hundreds of individuals have been observed during the day and night in the first rains of the year. Males generally vocalise from the edge of ponds and understorey between May and July, after which they seem to disappear (Stuart, 1935; Gaige 1936; Maslin, 1963; Duellman and Klaas, 1964). Cole and Barbour (1906) mentioned that *T. petasatus* vocalises in late March. The peculiar shape of its head functions as a defence mechanism to avoid predation and dehydration during droughts (Barbour, 1926; Stuart, 1935; Duellman and Klass, 1964). *Triprrion petasatus* is known to feed mainly on insects, predominantly beetles (Duellman and Klaas, 1964). Two subspecies of *Leptodeira frenata* are known to be predators of *T. petasatus* (Stuart, 1935; Duellman, 1958). Interestingly, an interspecific amplexus with *Incilius valliceps* has been reported (Carbajal-Márquez et al., 2018). Here we extend and discuss the known distribution of *T. petasatus* and describe new defensive behaviours for the species in Honduras.

We identified the species based on the morphological descriptions of Duellman (1970, 2001), McCranie and Wilson (2002), and McCranie and Castañeda (2007). We determined the sex of the individual through the presence of vocal sacs based on McCranie and Castañeda (2007). The specimen was deposited in the Herpetofauna collection of the Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano (voucher CZB-H-001). Distribution records were obtained from GBIF.org (2022). We define the abbreviations KU as the Kansas University (Kansas, USA) and the UF as the University of Florida (Florida, USA), which will be discussed below.

On 9 February 2022, at 22:03 h, we found an adult male of *T. petasatus* (Fig. 2A), while exploring the San Felipe River for the identification of the herpetofauna from

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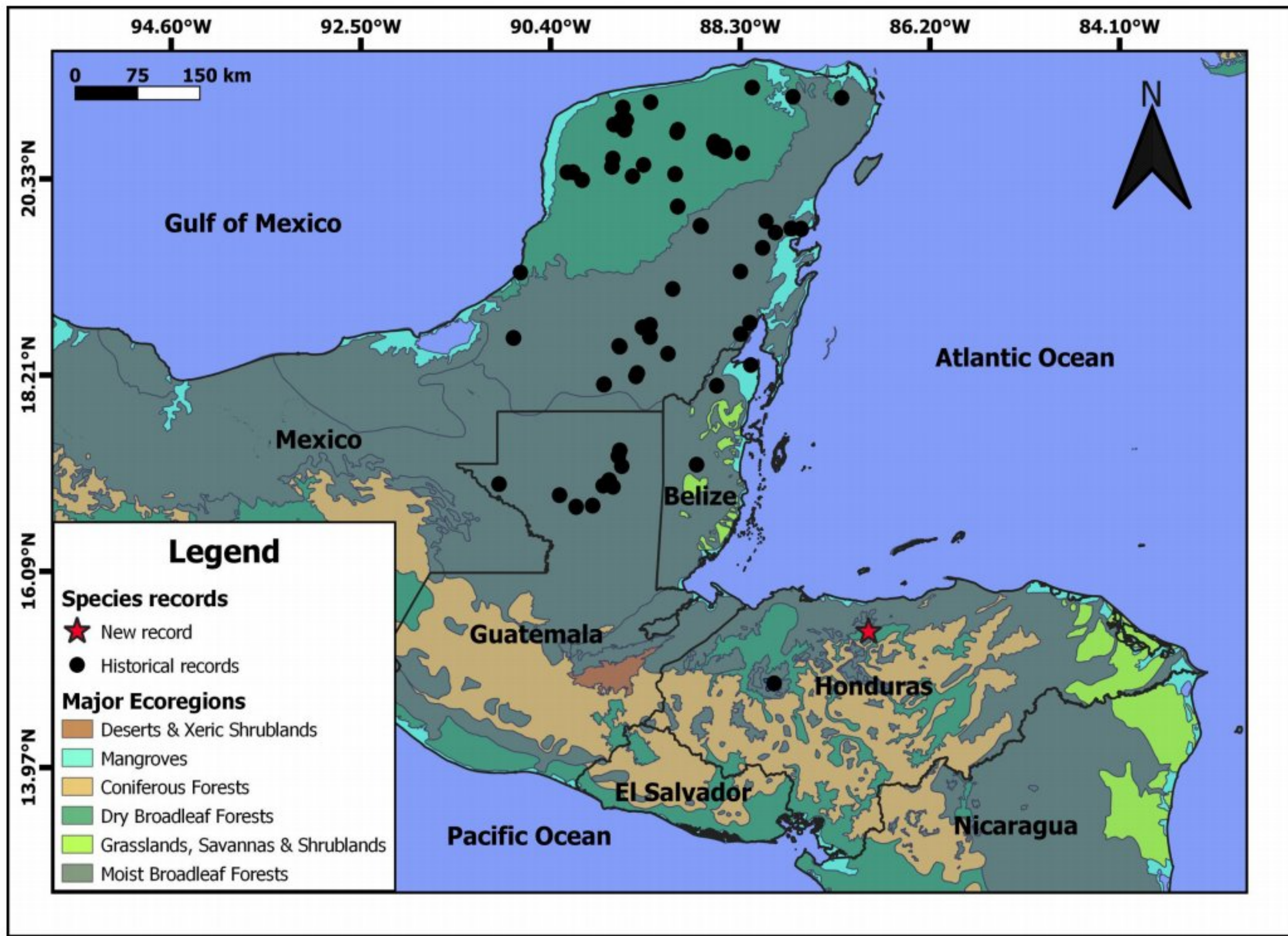


Figure 1. Distribution of *Triprrion petasatus* based on ecoregions adapted from Dinerstein et al. (2017). The new record reported herein is represented by a red star and the historical records represented by a black circle.

the site located in the Colibrí Esmeralda Hondureño Wildlife Refuge, Aguán Valley, Olanchito Municipality, Yoro Department, Honduras (15.4367°N, 86.8783°W; 284 m elevation; Fig. 1). This locality receives an annual precipitation that varies from 800 to 2100 mm and temperatures vary between 20 and 33 °C (Asesora, 2009). This area is one of the driest in Honduras where thorny, deciduous xerophytic plants and trees with elongated and rounded crowns are common (Townsend, 2014). The individual was sheltered inside a rock cavity at a depth of 5 cm, located at 80 cm from the ground and three meters from the riverbank (Fig. 2B, C). The individual seemed to exhibit phragmotic behaviour, defending itself in the cavity from our attempts to manipulate and collect it, using its ossified head as a barrier. When handled for the first time, the individual tried to escape, without making any sound. When handled for the second time, it emitted two agonistic “crack-crack-crack” vocalisations, and successively expelled cloacal discharge.

At the study site, we also found other anuran species

such as *Dendropsophus microcephalus* Cope 1886, *Engystomops pustulosus* Cope 1864, *Hypopachus variolosus* Cope 1866, *Smilisca baudinii* Duméril & Bibron 1841, *Trachycephalus vermiculatus* Duméril & Bibron 1841 and *Rhinella horribilis* Wiegmann, 1833, similar to those found by Wilson et al. (1986). The specimen is described morphologically as follows: SVL = 68.37 mm; body mass = 11.00 g; head length = 22.45 mm, head width = 19.68 mm, eye diameter = 6.60 mm; tympanum diameter = 3.62 mm; hand length = 17.08 mm; foot length = 24.10 mm; tibia length = 27.89 mm (morphometric measurements *sensu* Watters et al., 2016).

This new record in the Aguán Valley in Yoro extends the distribution of *T. petasatus* approximately 134.84 km from the only other considered locality in Honduras [see McCranie (2015) for further discussion], and is the ninth voucher for the country. In addition, our specimen (CZB-H-001) represents the largest SVL (68.37 mm) regarding the highest known value (60.80 mm) within the range for males (Duellman and Klaas, 1964). Furthermore,



Figure 2. Specimen and locality in Honduras: (A) Adult male of *Triprion petasatus* (voucher CZB-H-001; snout-vent length = 68.37 mm). (B) San Felipe stream, tributary of Aguán River, Yoro department. (C) Hole inside the wall where the individual was hiding. Photographs by Cristopher A. Antúnez-Fonseca (A), Manfredo A. Casco-Turcios (B and C).

for the first time we describe the defensive behaviour of *T. petasatus* including defensive vocalisations, which we consider to be a distress scream during the handling of the individual (see Toledo et al., 2015), and cloacal discharge, an anti-predator counterattack mechanism well known in anurans and present in hylids (see Ferreira et al., 2019). This new sighting supports that *T. petasatus* inhabits dry environments in Honduras, which is considered the preferred habitat of the species (Duellman and Klaas, 1964), although it also inhabits wet and mangrove forests [see distribution in the ecoregions of Dinerstein et al. (2017) in Fig. 1]. The two records from Honduras may be geographically related. The Aguán Valley is connected with the Sula Valley through the dry riverbeds surrounded by the Sierra de Nombre de Dios to the north and by the Sierra de Sulaco to the south, being the Sula Valley connected with Lake Yojoa in the south [see Townsend (2014) for a discussion of the Cordillera Central de la Serranía].

Triprion petasatus is rare in Honduras, and most of its records, excluding the one described herein and those by Cole and Barbour (1906) in Yucatan, seem to be during the first rains of the year between May and July, which coincides with its breeding activity (see

Stuart, 1935; Duellman and Klaas, 1964; McCranie and Castañeda, 2007). Wilson et al. (1986) recorded this species for the first time from six poorly preserved specimens (KU 194659-64) obtained from a local inhabitant of Santa Elena, near Lake Yojoa, Department of Cortés. The locality visited by Wilson et al. (1986), was based on information from specimens exported to Florida, USA, between 1978 and 1979 to wildlife dealers. McCranie (2015) visited Santa Elena in Cortés several times to search *T. petasatus* without success. Interestingly, he ascertained that the local inhabitants did not seem to know it, and he did not consider this site to be its preferred habitat. The presence of this species in Honduras has been related to illegal pet trade (Wilson et al., 1986). Taking all of this into account, McCranie (2015) suggested disregarding the records of Wilson et al. (1986), which presented the only evidence of *T. petasatus* in Honduras. Other specimens from Honduras (UF 106022 and skeleton 54924) were from an unknown locality (GBIF.org, 2022), although McCranie and Wilson (2002) considered UF 106022 to be from Santa Elena, Cortés. Based on our record, we suggest that *T. petasatus* should be included in the Honduran herpetofauna, as we consider this species native to the

two reported localities in this country. However, more sampling efforts are needed to confirm the presence of this species in Santa Elena.

For Honduras, many of the aspects of the natural history and known distribution for the species are based on statements of local inhabitants. Wilson et al. (1986) mentioned that the community referred to this species as “bony frogs”, which emitted vocalisations like “ducks”, and were observed in small ponds adjacent to riverbanks at the end of May when the first rains started. Moreover, morphological characteristics can favour the survival of individuals in their habitats (e.g., Ficetola and De Bernardi, 2006). We agree with the hypothesis proposed by Duellman and Klaas (1964) that the head shape of *T. petasatus* is an adaptation to survive the dry environment where it lives. According to Duellman and Klaas (1964), Barbour (1926), Stuart (1935), as well as suggested by our observation, we consider that the evolution of the oddly-shaped and rigid head in *T. petasatus* has allowed its use as a barrier to avoid the entrance of predators inside their shelters (tree and/or rock hollows; see Fig. 2A, C).

Triprion petasatus is catalogued as Least Concern by the IUCN Red List, but habitat loss, agricultural expansion and climatic variability are major threats (IUCN SSC Amphibian Specialist Group, 2020). Therefore, we highlight the need to protect this species in the Colibrí Esmeralda Hondureño Wildlife Refuge. Despite being a relatively small protected area (about 1200 ha), it houses important endemic species of plants such as *Stenocereus yunckeri* Standl. and *Opuntia hondurensis* Standl. (Carrasco et al., 2013), and endemic vertebrates such as *Amazilia luciae* Lawrence, 1868 and *Ctenosaura melanosterna* Buckley & Axtell, 1997 (Asesora, 2009). Our work contributes to a better understanding of the distribution and biology of this elusive species, although these aspects, specifically in Honduras, are still poorly known.

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