

MISCELLANEOUS NOTES

Rediscovery of the Critically Endangered frog, *Craugastor angelicus*, in Costa Rica

Craugastor angelicus (Savage, 1975) has been rediscovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, at an elevation of ca. 1,550 m. Along with my wife, Aura Reyes, we discovered a single adult male *C. angelicus* (Fig. 1) in July of 2016, during one of our regular amphibian surveys in the country. We found the individual at night while making a random stop along the road between Santa Elena de Monteverde and San Gerardo to listen to anuran vocalizations. The *C. angelicus* was not heard vocalizing, but was observed on the gravel substrate along the edge of the road. The frog was collected and deposited in the taxonomic reference collection of the Costa Rican Amphibian Research Center (CRARC 0243). This discovery comes more than two decades after the last reported observation of this species, which in recent years has been considered as possibly extinct (Pounds et al., 2008).

Craugastor angelicus is endemic to Costa Rica, with populations recorded from the Cordillera de Guanacaste (Cerro Cacao), the Cordillera de Tilarán, and the Cordillera Volcánica Central at elevations from 656 to 1,600 m (Savage, 2002). This species has been assigned to the *Craugastor punctariolus* species group, which is comprised of 34 species that are endemic to Central America (Chaves et al., 2014). Eight species from this group have been documented in Costa Rica, and all are believed to have suffered major declines, with seven of the eight species listed on the IUCN Red List as Critically Endangered (IUCN, 2016); extant populations of only three of the eight species native to Costa Rica (i.e., *C. fleischmanni*, *C. ranoides*, and *C. taurus*) were known to exist due to confirmed observations or collections made during the last decade (Puschendorf et al., 2005; Ryan et al., 2011; Chaves et al., 2014). Herein I confirm the presence of a fourth species (*C. angelicus*) in Costa Rica.

Craugastor angelicus is distinguished from the other members of the *C. punctariolus* species group in lower Mesoamerica based on the presence of white nuptial pads and the absence of vocal slits (Savage, 1975, 2002). The male specimen we rediscovered displays white nuptial pads (Fig. 2) and lacks vocal slits, confirming its identification as *C. angelicus* according to our current taxonomic understanding of the *C. punctariolus* species group. *Craugastor angelicus* is one of two species in the *C. punctariolus* species group that has been documented to inhabit the Cordillera de Tilarán; the other species documented from this area is *C. ranoides*, but at elevations below 1,300 m (Savage, 2002).



Fig. 1. An adult male *Craugastor angelicus* (SVL 50.8 mm) discovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, in July of 2016. © Brian Kubicki



Fig. 2. The white nuptial pad structure evident on Finger I of the male *Craugastor angelicus* discovered in the Cordillera de Tilarán, Provincia de Guanacaste, Costa Rica, in July of 2016. © Brian Kubicki

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Comments on the distribution and conservation of Morelet's Leaf Frog, *Agalychnis moreletii* (Amphibia: Hylidae), in Oaxaca, Mexico

Agalychnis moreletii (Dumeril, 1853) is distributed in disjunct populations on the Atlantic versant from northeastern Puebla and southeastern Veracruz, Mexico, to northwestern Honduras, and on the Pacific versant from south-central Guerrero, Mexico, to central El Salvador, at elevations from 200 to 2,130 m (Köhler, 2011; Frost, 2016).

On 17 June 2016 at 1940 h, we observed an adult female *A. moreletii* crossing Mexican federal highway 131 at ca. 1.7 km (straight line) SSW of San Gabriel Mixtepec, Municipio de San Gabriel Mixtepec, Oaxaca, Mexico (16.079700°N, -97.085831°W; WGS 84), elev. ca. 781 m. The frog was found next to a small roadside stand of coffee trees, where we then found a single adult male. We returned to the same site on 19 June at 2200 h, and found four additional adult males calling from branches in coffee trees (Fig. 1). A photograph of one of these individuals is deposited in the University of Texas at El Paso Biodiversity Digital Collection (Photo Voucher UTEP G-2016.28).

Agalychnis moreletii has been reported from several localities in Oaxaca: Campamento Vista Hermosa, K.U. (2, 1 tadpole); Mirador, A.M.N.H. (10); Nuevo Raza Zacatepec, U.I.M.N.H. (1); 28.2 km N of Pochutla, U.M.M.Z.; 7.1 km N of San Gabriel Mixtepec, U.T.A. (1); 13 km S of San Gabriel Mixtepec, U.S.N.M. (2, 1 egg, 1 tadpole*); 2 km S of Vista Hermosa, K.U. (23, 2 tadpoles, 2 eggs) (Duellman, 2001). Caldwell (1974) also reported *A. moreletii* N of San Gabriel, in 1969 and 1970. This species, however, was not detected during surveys conducted by Lips et al. (2004) at the same localities in July of 2000. Consequently, Lips et al. (2004) suggested that *A. moreletii* potentially had been extirpated from the Sierra Madre del Sur in Oaxaca, and Guerrero, since it had not been collected in this region since 1984. Delia et al. (2013) reported rediscovering the species when they revisited the region in 2007. Additionally, Caviedes-Solis et al. (2015) reported finding *A. moreletii* in 2007 at Pluma Hidalgo, in the Sierra Madre del Sur, and Vázquez-Vega et al. (2015) also found this species in Pluma Hidalgo in 2008, and then