REPTILES & AMPHIBIANS

New Data on Reproduction of the Shaman Fringe-limbed Treefrog, *Ecnomiohyla sukia* Savage and Kubicki 2010 (Anura: Hylidae)

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The Shaman Fringe-limbed Treefrog (*Ecnomiohyla sukia*) and its 11 congeners (Frost 2021) are canopy-dwelling anurans known to reproduce in tree holes in the dense primary rainforests in Central and northwestern South America (Duellman 2001). Little is known about the reproductive habits of many species in the genus (Mendelson et al. 2015). The Shaman Fringe-limbed Treefrog is probably the best-studied species, as it is relatively common in some parts of its distribution in Costa Rica (Savage and Kubicki 2010). Both males and females call in order to locate one another (Salazar et al. 2021)

Fig. 1. The tree trunk showing the water-filled crevice where a male Shaman Fringe-limbed Treefrog (*Ecnomiohyla sukia*) appeared to be guarding tadpoles (A); the male surfaced after submerging in the water when it was disturbed by observers (B); a tadpole apparently feeding on the skin of the attending male (C); two metamorphs immediately before leaving the water (D). Photographs by S. Salazar (A–B) and Rosbil González (C–D).

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and eggs are laid in treeholes by the female, but which parent takes care of them and whether tadpoles eat trophic eggs laid by the female remains unknown (Hoffmann and Kubicki 2011). Savage (2002) had suggested that some species now assigned to the genus *Ecnomiohyla* engage in the latter but this has yet to be confirmed. Herein we provide some additional information on the reproductive behavior of *E. sukia*.

During the night of 1 December 2020 (moon phase waning gibbous), while exploring a rainforest at Rio Blanco, near Santa Clara, Guápiles, Limón, Costa Rica (10.219°N, 83.949°W), we heard a male *E. sukia* calling at 2330 h from a vertical crevice in a tree 2.98 m above the ground (Fig. 1A). The water-filled crevice was 13 cm deep and had a diameter of 8.5 cm. When we disturbed it, the male submerged. The male reemerged after two minutes (Fig. 1B) and, while we were waiting, we noticed the presence of several tadpoles of different sizes (indicative of multiple ovidepositions). We subsequently monitored the site for 26 days. The male was present day and night only during the first four days, when we saw it on several occasions immobile in the water with tadpoles apparently feeding on its skin (Fig. 1C). On days 22–24, two metamorphs with very short tails abandoned the crevice (Fig. 1D); after that we saw no more tadpoles, but when and how they disappeared is unknown. Months later, on 7 April 2021, we found a cat-eyed snake (*Leptodeira* sp. aff. *ornata*), a known predator of anurans (Bello-Sánchez et al. 2018), inside the hole but saw no tadpoles or other anurans.

Ecnomiohyla sukia appears to be most active during the drier months from February to April (Savage and Kubicki 2010). Herein we observed calling, tadpoles, and a guarding male in December. Tadpoles appeared to feed on the skin of the attending male, which abandoned the site 18 days prior to complete metamorphosis of the larvae; however, we cannot be sure if this is normal behavior or if the male was disturbed and left the crevice or fell victim to a predator. We observed no other adults near the hole during the 26-day monitoring period or thereafter, nor were more eggs deposited. The latter raised doubts about the need for trophic eggs deposited as food for larvae and the disappearance of small tadpoles might indicate predation by larger larvae. Much remains to be learned about these enigmatic treefrogs.

Literature Cited

Bello-Sánchez, E.A., A. González Christen, R.L. Nochebuena Morales, and J.E. Morales Mávil. 2018. *Leptodeira septentrionalis* (Northern Cat-eyed Snake). Diet. *Herpetological Review* 49: 756.

Duellman, W.E. 2001. *The Hylid Frogs of Middle America*. New and Expanded Edition. Two Volumes. Contributions to Herpetology Volume 18. Society for the Study of Amphibians and Reptiles, St. Louis, Missouri, USA.

Frost, D.R. 2021. *Amphibian Species of the World: An Online Reference*. Version 6.1. American Museum of Natural History, New York, New York, USA. <https://amphibiansoftheworld.amnh.org/Amphibia/Anura/Hylidae/Lophyohylinae/Trachycephalus/Trachycephalus-vermiculatus>. https://doi.org/10.5531/db.vz.0001.

Hoffmann, H. and B. Kubicki. 2011. The tadpole of *Ecnomiohyla sukia* Savage & Kubicki, 2010 (Amphibia: Hylidae). *Zootaxa* 2793: 63–66. https://doi.org/10.11646/zootaxa.2793.1.6.

Mendelson, J.R., III, A. Eichenbaum, and J.A. Campbell. 2015. Taxonomic review of the populations of the fringe-limbed treefrogs (Hylidae: *Ecnomiohyla*) in Mexico and nuclear Central America. *South American Journal of Herpetology* 10: 187–194. https://doi.org/10.2994/SAJH-D-15-00010.1.

Salazar, S., A.C. Montes-Correa, and C.L. Barrio-Amorós. 2021. Description of two previously unknown anuran vocalizations from the Caribbean rainforests of Costa Rica. *Anartia* 32: 67–70.

Savage, J.M. 2002. *The Amphibians and Reptiles of Costa Rica. A Herpetofauna between Two Continents, between Two Seas*. University of Chicago Press, Chicago, Illinois, USA.

Savage, J.M. and B. Kubicki. 2010. A new species of fringe-limb frog, genus *Ecnomiohyla* (Anura: Hylidae), from the Atlantic slope of Costa Rica, Central America. *Zootaxa* 2719: 21–34. https://doi.org/10.11646/zootaxa.2719.1.2.