



A new frog family (Anura: Terrarana) from South America and an expanded direct-developing clade revealed by molecular phylogeny

MATTHEW P. HEINICKE¹, WILLIAM E. DUELLMAN², LINDA TRUEB², D. BRUCE MEANS³,
ROSS D. MacCULLOCH⁴, & S. BLAIR HEDGES^{1,5}

¹Department of Biology, 208 Mueller Laboratory, The Pennsylvania State University, University Park, PA 16802, USA.
E-mail: mph177@psu.edu, sbh1@psu.edu

²University of Kansas Natural History Museum and Biodiversity Research Center, 1345 Jayhawk Blvd., Lawrence KS 66045, USA.
E-mail: duellman@ku.edu, trueb@ku.edu

³Coastal Plains Institute, 1313 Milton Street, Tallahassee, FL 32303, USA. E-mail: means@bio.fsu.edu

⁴Department of Natural History, Royal Ontario Museum, 100 Queen's Park, Toronto, ON M5S 2C6, Canada.
E-mail: rossm@rom.on.ca

⁵Corresponding author. E-mail: sbh1@psu.edu.

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Abstract

Three frogs of a new species found in cloud forests on two nearby mountains in Guyana were included in a molecular phylogeny of 17 nuclear and mitochondrial genes (10,739 aligned sites) that revealed that their closest relative is Terrarana (Brachycephalidae, Craugastoridae, Eleutherodactylidae, and Strabomantidae) and their next-closest relative is Hemiphractidae (marsupial frogs). We place these frogs in a new family, genus, and species which is strongly supported as the basal clade within Terrarana: Ceuthomantidae n. fam., *Ceuthomantis smaragdinus* n. gen. n. sp. Morphological evidence supports the placement of two other species from the Guiana Highlands, *Pristimantis aracamuni* (Barrio-Amorós & Molina) and *P. cavernibardus* (Myers & Donnelly), in the new family and genus. This close phylogenetic relationship of terraranans and marsupial frogs, nearly all of which have direct development, supports an hypothesis that direct development evolved early in the evolution of this huge clade (~1000 species), for which we propose the unranked taxonomic epithet Orthobatrachia.

Key words: Amphibia, Ceuthomantidae, Guyana, Hemiphractidae, Nobleobatrachia, Orthobatrachia, Terrarana