



## Three new species of leaf litter frogs from the upper Amazon forests: cryptic diversity within *Pristimantis* “*ockendeni*” (Anura: Strabomantidae) in Ecuador

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### Abstract

We describe three new species of *Pristimantis* leaf litter frogs from the upper Amazon basin of Ecuador: *Pristimantis achuar*, *Pristimantis altamnis*, and *Pristimantis kichwarum*. Each of these new species was previously considered to be part of a single species, formerly known as *Eleutherodactylus ockendeni* (Boulenger) morph B. However, analysis of DNA sequences together with examination of the morphology of more than 600 specimens from Ecuador reveals that multiple species were confused under the same name. The morphological differences among the three new species are subtle but consistent: presence or absence of a black canthal stripe and/or supratympanic ridge, snout-vent length, and ventral colouration. The three species are generally allopatric and geographically restricted, although at some localities two of the species occur sympatrically.

### Resumen

Describimos tres especies nuevas de ranas del sotobosque de la cuenca Amazónica Ecuatoriana: *Pristimantis achuar*, *Pristimantis altamnis* y *Pristimantis kichwarum*. Estas especies fueron consideradas antes como una sola especie bajo el nombre *Eleutherodactylus ockendeni* (Boulenger) morfo B. Sin embargo, el análisis de secuencias de ADN y la examinación de la morfología de más que 600 especímenes Ecuatorianos indican que en realidad existen tres especies. Sus diferencias morfológicas son sutiles pero constantes: presencia o ausencia de una raya cantal negra y/o de un pliegue supratimpánico y su coloración ventral. Las tres especies tienen distribuciones alopátricas y distintas aunque en algunas localidades se puede encontrar dos de las tres especies juntas.

**Key words** Anura; new species; terrestrial frog; South America; *Pristimantis achuar*; *Pristimantis altamnis*; *Pristimantis kichwarum*

### Introduction

The upper Amazon region, particularly of Ecuador, is distinguished for having a great number of species of *Pristimantis* frogs (Lynch 1980; Flores & Vigle 1994; Zimmerman & Simberloff 1996; Coloma 2007). Though the upper Amazon rainforest of Ecuador is considered one of the most intensively studied areas in South America (Heyer 1988; Flores & Vigle 1994), the region is nonetheless vast, often scientifically unexplored, and biologically and topographically complex: unidentified specimens, new species, and range extensions of *Pristimantis* frogs are frequently discovered (recent examples include Cisneros-Heredia 2005, 2006; Elmer 2004; Guayasamín et al. 2006; KRE unpubl. data, G. Vigle unpubl. data).