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Range extension of *Cochranella mache* Guayasamin and Bonaccorso, 2004 (Anura: Centrolenidae) with comments on the distribution of *C. euknemos* (Savage and Starrett, 1967) in Colombia

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Seventy-four species of glassfrogs of the family Centrolenidae have been reported from Colombia, including two species of to the genus *Cochranella* that inhabit the Chocoan lowlands: *Cochranella euknemos* and *C. litoralis* (Frost, 2014). Ortega-Andrade et al. (2013) suggested the presence of *Cochranella mache* on the Chocoan lowlands of southwestern Colombia, based on ecological niche models; however, all known records of *C. mache* came from the north-western lowlands of Ecuador (Guayasamin and Bonaccorso, 2004; Cisneros-Heredia et al., 2007, 2008, 2009; Ortega-Andrade et al., 2013). Herein we report the first records of *C. mache* from Colombia, base don recent fieldwork and revision of amphibian collections deposited at Universidad del Valle (UV-C) and Instituto de Ciencia Naturales, Universidad Nacional de Colombia (ICN). These records significantly increase the geographic range of the species, and call for a review of the range of *C. euknemos* in the country

One adult male *Cochranella mache* (photographed and released, Figure 1.A) was observed at Vereda El Salto (3.855317 N, -76.78125 W, 750 m, Figure 2), Corregimiento 18, municipality of Buenavantura, department of Valle del Cauca, on 25 March 2014. It was active at 16h40 on leaf litter in primary forest next to a ravine, after rain. An adult male (UV-C 13658) was collected at Guaimia (3.718611 N, -76.963056

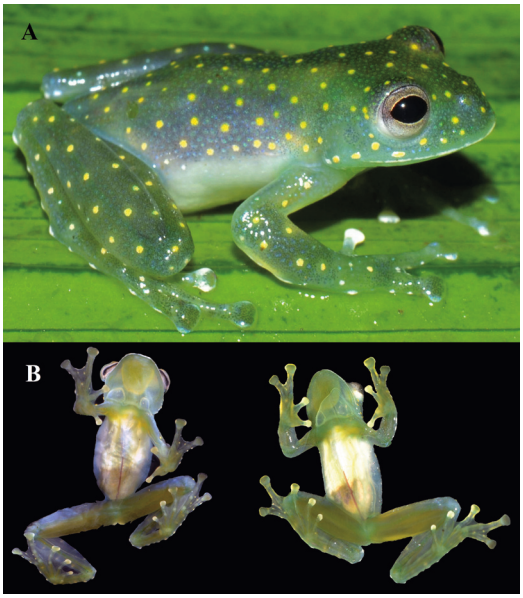

Figure 1. Dorsal (A) and ventral (B) views of *Cochranella mache* from El Salto, Buenaventura, Colombia, showing specific diagnostic features, including bluish-green dorsum with yellow spots and dermal enameled fold and tubercles on ventrolateral edge of limbs.

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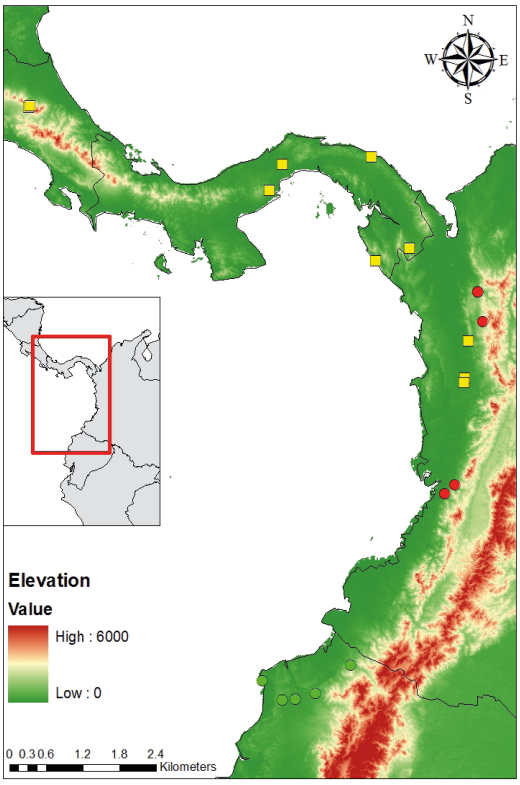

Figure 2. Distribution map of *Chocranella mache* (green dots represent previously known distribution, and red dots represent the new records) and *C. euknemos* (yellow squares).

Figure 3. Specimen of *Cochranella sp.* from of high lands of Risaralda, photo by John Lynch.

W, 43 m, Figure 2) "Bajo Anchicaya", municipality of Buenaventura, Valle del Cauca, on March 1999. An adult specimen (ICN 8665) was collected at the Amarrapado river (7.0167 N, -76.4 W, 850 m, Figure 2), municipality of Dabeida, department of Antioquia (on the border with deparment of Chocó) on September 1981. Two adult specimens (ICN 10689-90) were collected at an unspecific locality in the department of Chocó (Figure 2), on September 1982. Two adults specimens (ICN 19638-39) were collected at Quebrada La Miquera, Vereda Venados, Parque Nacional Natural Las Orquideas (6.529722 N, -76.308611W, 1030 m, Figure 2), municipality of Frontino, department of Antioquia, on May 1988.

All specimens reported herein have the diagnostic features of *Cochranella mache* described by Guayasamin and Bonaccorso (2004) and Cisneros-Heredia et al. (2008), including ventrolateral edges of fingers IV, forearms, elbows, toe V, tarsi, and heels with dermal enameled folds and tubercles (Figure 1.A-B), diagnostic features that separate them from *C. euknemos*.

These new records significantly extend the geographic range of *C. mache* northwards (721 km north of the nearest locality in Ecuador, Figure 2) and represent the first reports of the species in Colombia. *Cochranella mache* is currently classified as an Endengered (EN) species according to The IUCN Red List of Threatened Species (Guayasamin 2006). Its categorization was based on its extent of occurrence thought to be less than 5,000 km2, essentially known from only one location (the Mache-Chindul mountains in northwestern Ecuador), and continuing declines in the extent of its habitat. Data presented herein shows that the species has a significantly larger extent of ocurrence towards Colombia, but habitat destruction is a major factor on that country too. A re-evaluation of the species' IUCN Red List category is needed.

This new information calls for a revision of the range of *Cochranella euknemos* in Colombia, since several specimens herein identified as *C. mache* were previously reported as *C. euknemos*. Both are sister-species and morphologically similar, which has prompted to its confusion (all UV-C and ICN specimens herein reported were formerly identified as *C. euknemos*). Hayes and Starrett (1980) first reported *C. euknemos* from Colombia based on a specimen collected in the department of Antioquia (Natural History Museum of Los Angeles County, LACM 47066 collected at Arquia river, Finca Los Llanos, above Vegaez). We examined photographs of this specimen and confirmed its identity as *C.*

euknemos. Lynch and Suárez-Mayorga (2004) reported *C. euknemos* from the departments of Antioquia and Chocó, and although most of their specimens are in fact *C. mache* (ICN 8665, 10689–90), one specimen from the department of Chocó is *C. euknemos* (ICN 16876 collected at the road to Tamando, 5 km from the bypass to the road to Yuto, municipality of Quibdó). Lynch and Suárez-Mayorga (2004) and Bernal and Lynch (2008) reported *C. euknemos* from the department of Risaralda, however all those records correspond to an undescribed species (Figure 3), which inhabits forests above 1500 m (while *C. euknemos* and *C. mache* are lowland species). Therefore, *C. euknemos* is in fact known from just two Colombian localities in the departments of Antioquia and Choco. *Cochranella euknemos* and *C. mache* seem to be parapatric, apparently having some range overlap on the lowlands of the department of Choco (Figure 2).

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References

Cisneros-Heredia, D.F., McDiarmid, R.W. (2007): Revision of the characters of Centrolenidae (Amphibia: Anura: Athesphatanura), with comments on its taxonomy and the description of new taxa of glassfrogs. Zootaxa **1572**: 1–82.

Cisneros-Heredia, D.F., Delia, J., Yánez-Muñoz, M., Ortega-Andrade, H.M. (2008): Natural history and intraspecific variation of the Ecuadorian Blue Glassfrog *Cochranella mache* Guayasamin & Bonaccorso, 2004. Herpetozoa **21**: 57–66.

Cisneros-Heredia, D.F., Delia, J., Yánez-Muñoz, M., Ortega-Andrade, H. (2009): Endemic Ecuadorian glassfrog *Cochranella mache* is Critically Endangered because of habitat loss. Oryx **44** (1): 114–117.

Frost, D.R. 2014. Amphibian Species of the World: an Online Reference. Version 6.0 (09 March of 2015). Electronic Database accessible at http://research.amnh.org/herpetology/amphibia/index.html. American Museum of Natural History, New York, USA.

Guayasamin, J.M., Bonnacorso, E. (2004): A new species of glass frog (Centrolenidae: *Cochranella*) from the lowlands of northwestern Ecuador, with comments on the *Cochranella granulosa* group. Herpetologica **60**: 485–494.

Guayasamin, J.M. (2006): *Cochranella mache*. The IUCN Red List of Threatened Species. Version 2014.3. Available at: http://www.iucnredlist.org. Last accessed on 19 November 2014.

Hayes, M.P. & P.H. Starrett, 1980. Notes on a collection of centrolenid frogs from the Colombian Chocó. Bulletin Southern California Academy of Sciences 79: 89-96.

Lynch, J.D. & A. Suarez-Mayorga. 2004. Catálogo de anfibios en el Chocó Biogeográfico. p. 654-668. In Rangel (ed.) Colombia Diversidad Biótica IV, El Chocó Biogeográfico/Costa Pacífica. Volumen I. Bogotá: Universidad Nacional de

Ortega-Andrade, H.M., Rojas-Soto, O., Paucar, C. (2013): Novel data on the ecology of *Cochranella mache* (Anura: Centrolenidae) and the importance of protected areas for this critically endangered glassfrog in the Neotropics. PLoS ONE **8** (12): e81837.

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