

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Centrolenidae, *Cochranella pulverata*, *Hyalinobatrachium aureoguttatum*:  
Distribution extension, Ecuador.

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The amphibian diversity in the Chocoan tropical rain forests of Ecuador is far from being thoroughly documented. Although Neotropical equatorial forests might be the most amphibian-diverse in the world (Duellman 1978; 2005; Lynch 2005; Ron 2001–2006), few studies have been directed towards understanding the richness of the Ecuadorian Chocó.

This is especially true for Glassfrogs (Centrolenidae), which known richness in Ecuador is rapidly increasing (14 species additions to country's checklist since 2004; Guayasamin and Bonaccorso 2004; Guayasamin et al. 2006a; 2006b; Cisneros-Heredia and McDiarmid 2006; Guayasamin and Trueb

2007; Cisneros-Heredia and Meza-Ramos 2007; Cisneros-Heredia and McDiarmid 2007; Cisneros-Heredia and Yáñez-Muñoz 2007; Cisneros-Heredia 2007). Glassfrogs are mainly considered to be a montane group, and the western slopes of the Ecuadorian Andes hold the highest richness for the country with 17 described species (Cisneros-Heredia and McDiarmid 2006; Coloma 2005–2007; Cisneros-Heredia and Meza-Ramos 2007; Cisneros-Heredia and McDiarmid 2007). Some other regions, like the lowlands of the Ecuadorian Chocó, also hold high centrolenid diversity (13 species, Table 1), and its species richness could be as important as the Andean, since more species might remain undescribed.

**Table 1.** Centrolenid frogs occurring in Ecuadorian Chocó.

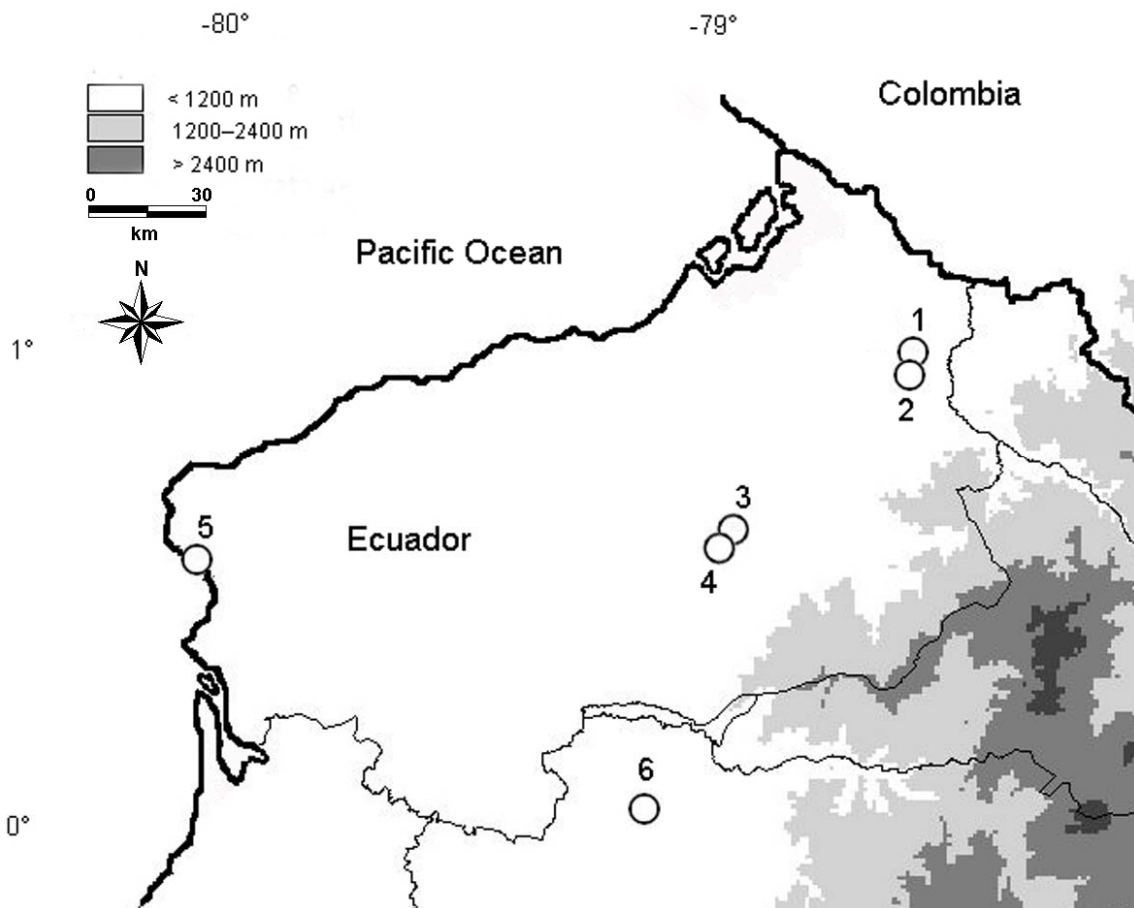
Species	Reference
<i>Centrolene callistommum</i>	Guayasamin and Trueb 2007
<i>Centrolene illex</i>	Guayasamin et al. 2006a
<i>Centrolene litorale</i>	Grant and Morales 2004
<i>Centrolene prosoblepon</i>	Boulenger 1898
<i>Cochranella albomaculata</i>	Guayasamin et al. 2006a
<i>Cochranella mache</i>	Guayasamin and Bonaccorso 2004
<i>Cochranella ocellifera</i>	Boulenger 1899
<i>Cochranella pulverata</i>	This work
<i>Cochranella spinosa</i>	Duellman and Burrowes 1989
<i>Hyalinobatrachium aureoguttatum</i>	This work
<i>Hyalinobatrachium fleischmanni</i>	Noble 1924
<i>Hyalinobatrachium petersi</i>	Goin 1961
<i>Hyalinobatrachium valerioi</i>	Duellman and Burrowes 1989

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Herein, we add two species to the list of Chocoan Glassfrogs in Ecuador. We report for the first time *Cochranella pulverata* and *Hyalinobatrachium aureoguttatum* from the Ecuadorian Chocó. Specimens are deposited at the Museo de Zoología, Pontificia Universidad Católica del Ecuador, Quito (QCAZ), and at the División de Herpetología, Museo Ecuatoriano de Ciencias Naturales, Quito (DHMECN).

*Cochranella pulverata* was known previously from lowlands to moderate elevations in the Atlantic versant of north-central Honduras and Nicaragua, Costa Rica (up to 960 m), Panama; and the Pacific versant of Costa Rica and Panama south to the Department of Nariño in Colombia (up to 300 m) (Ruiz-Carranza et al. 1996; Acosta-Galvis 2000; McCraine and Wilson 2002; Savage 2002; IUCN et al. 2006). We report the presence of *Cochranella pulverata* in the following Ecuadorian

localities (Figure 1): Provincia Esmeraldas: 1) Durango (01°03' N, 78°37' W; 100 m), on 24 May 2006, a male perching over leaf at 3 m above a creek (QCAZ 32066); 2) Río Bogotá, recinto Durango (01°00' N, 78°37' W; 120–200 m), on 18 July 2005, a vocalizing male (DHMECN 3194) and a female (DHMECN 3195), both found on epiphytes adhered to rocks about 2 m above a creek; 3) Charco Vicente (0°42' N, 78°54' W; ca. 100 m), on 15 September 1992, an adult female (QCAZ 11368); 4) Salto del Bravo, Reserva Ecológica Cotacachi Cayapas (0°40' N, 78°57' W; 100 m), on 19 April 1993, an adult female (QCAZ 11367); 5) Estero Aguacate, Parroquia San Francisco del Cabo (00°39' N, 80°03' W, 10–64 m), on 15 August 2004, a female on upper side of ferns up to 1.6 m above ground (DHMECN 2612); Province of Pichincha: 6) Silanche (00°08' N, 79°08' W; ca. 400 m), on 1 May 2006, a male calling on the upper side of a leaf, 2 m above a creek (QCAZ 32224).



**Figure 1.** Map showing Ecuadorian records for *Cochranella pulverata*: (1) Durango; (2) Río Bogotá; (3) Charco Vicente; (4) Salto del Bravo; (5) Estero Aguacate; and (6) Silanche.

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Acosta-Galvis (2000) stated that the southern limit of the distribution for *Cochranella pulverata* in Colombia was Departamento Nariño (Colombian-Ecuadorian border), but did not precise a certain locality. Based on that, we extend the distributional range of the species ~ 140 km southwards, being Silanche the southern limit for the known distribution of the species. *Cochranella pulverata* was found sympatrically with *Centrolene callistommum* and *Hyalinobatrachium aureoguttatum* in Durango; with *Centrolene prosoblepon* and *H. fleischmanni* in Estero Aguacate; with *Centrolene ilex*, *C. callistommum*, *Cochranella albomaculata*, and *H. aureoguttatum*

in Río Bogotá, recinto Durango; and with *C. prosoblepon* in Charco Vicente.

*Cochranella pulverata* is distinguished from other Glassfrogs by the following characters: (1) lime green dorsum with small yellow-white spots; (2) light green bones; (3) venter completely transparent with white heart, liver, and digestive tract; (4) snout truncate from above and obtuse in profile; (5) indistinct tympanum; (6) SVL 22–29 mm in adult males and 23–33 mm in adult females and (7) webbing formula between outmost fingers: II 1 ½– 3 III 1 ½–1 ¼ IV (Savage 2002) (Figure 2).



**Figure 2.** Dorsal and ventral views of *Cochranella pulverata* (QCAZ 32224).

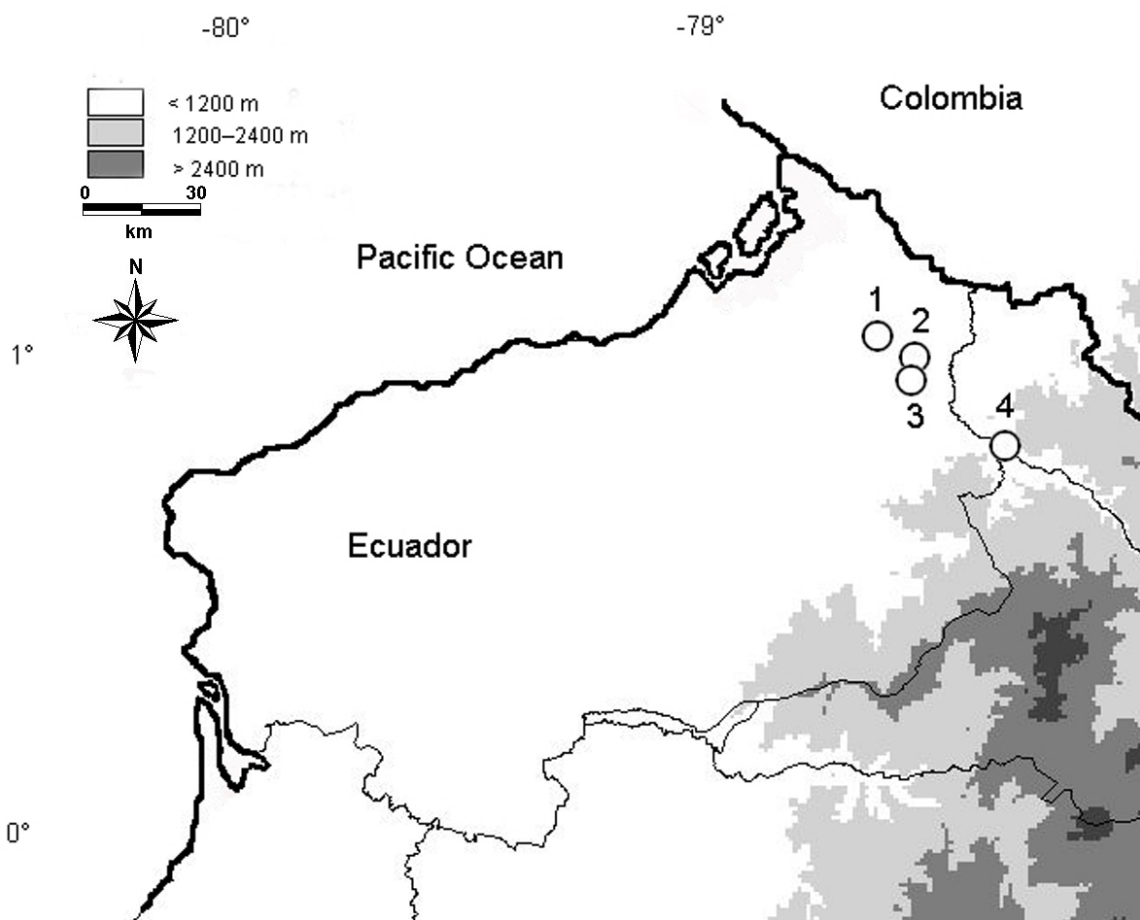
The *Hyalinobatrachium pulveratum* species group was proposed by Ruiz-Carranza and Lynch (1991) to contain the former *Centrolenella pulverata* and *C. antisthenesi*. Cisneros-Heredia and McDiarmid (2006) proposed a new combination for both species, linking them to *Cochranella* (as *C. pulverata* and *C. antisthenesi*). We follow their proposal, with the caveat that *Cochranella*, as currently defined, is not monophyletic (Ruiz-Carranza and Lynch 1991; Guayasamin *et al.* 2006b). We suggest that further taxonomic changes in the family should be based on a phylogenetic framework to avoid subjectivity in the generic placement of species.

*Hyalinobatrachium aureoguttatum* was known previously from extreme southwestern Panama and the Pacific lowlands and western slopes of the Cordillera Occidental of Colombia, in the departamentos Antioquia, Chocó, Risaralda, and Valle del Cauca, at altitudes between 45–1570 m (Barrera-Rodríguez and Ruiz-Carranza 1989; Ruiz Carranza *et al.* 1996; Ibáñez *et al.* 1999; Acosta-Galvis 2000). In Ecuador, this species was collected in the following localities (Figure 3): Provincia Esmeraldas: 1) 2 km E of San Francisco (Durango - San Francisco), on the road to Durango (01°05' N, 78°41' W; 63 m), on 01 December 2004 and 25 May 2006, seven males (QCAZ 27429,

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28802, 32101, 32105, 32129, 32132, and 32133); 2) Durango (01°03' N, 78°37' W; 100 m), on 01 July 1994 and 24 May 2006, six males (QCAZ 6302, 6303, 6441, 6442, 32069, and 32070); 3) Río Bogotá, recinto Durango (01°00' N, 78°37' W; 120–200 m), 13–15 August 2005, five males (DHMECN 3221–25); Provincia Imbabura: 4) 6 km east of Lita (00°52' N, 78°26' W; 600 m), on 01 February 1994, a male (QCAZ 4323). *Hyalinobatrachium aureoguttatum* is known to reach its southern distribution limit at 3°45' N.

Here we give the first reports of *H. aureoguttatum* for Ecuador, extending the known geographic range ~ 375 km to the south (6 km east of Lita) (Figure 3). The species was found in sympatry with *Centrolene callistommum* in 2 km east of San Francisco (Durango - San Francisco); with *Centrolene callistommum*, *Centrolene ilex*, *Cochranella albomaculata*, and *Cochranella pulverata* at Río Bogotá, recinto Durango; and with *Cochranella albomaculata* at 6 km east of Lita.



**Figure 3.** Map showing Ecuadorian records for *Hyalinobatrachium aureoguttatum*. (1) 2 km east of San Francisco; (2) Durango; (3) Río Bogotá; (4) 6 km east of Lita.

*Hyalinobatrachium aureoguttatum* is easily diagnosed by the combination of the following characters: (1) light green dorsum with a pale yellow reticulum and between two and six large, bright yellow dots (Colombian populations also have dark flecks); (2) white bones; (3) venter

completely transparent with white or red heart, and white liver and digestive tract; (4) snout rounded from above and in profile; (5) tympanic membrane fairly indistinct, tympanic annulus evident anteroventrally; and (6) SVL 19–21 mm in adult males (Figure 4).

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**Figure 4.** Dorsal and ventral views of *Hyalinobatrachium aureoguttatum* (QCAZ 32068).

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