

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Centrolenidae, *Centrolene peristictum*, *Centrolene prosoblepon*, *Cochranella cochranae*, *Cochranella midas*, *Cochranella resplendens*, *Cochranella spinosa*, *Hyalinobatrachium munozororum*: Range extensions and new provincial records

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In their review on the frogs of the family Centrolenidae (Glassfrogs), Lynch and Duellman (1973) summarized the knowledge on taxonomy and distribution of these frogs in Ecuador. That work suggested that most Ecuadorian Glassfrogs had limited distributions. However, while certain species seem to be truly endemic to small geographic areas, other cases of apparent high endemism degree are partially an artifact of inadequate herpetological exploration of certain areas, little awareness on the importance of publishing new distributional records, or taxonomic problems that limit the identification of preserved specimens. Herein, we report several records of Ecuadorian Glassfrogs that extend their distributional, elevational, and provincial ranges.

Voucher specimens are deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM), D. F. Cisneros-Heredia's collection housed at Universidad San Francisco de Quito, Quito, Ecuador (DFCH), Museo de Zoología, Pontificia

Universidad Católica del Ecuador, Quito, Ecuador (QCAZ), and Fundación Herpetológica Orcés, Quito, Ecuador (FHGO). Specific locations and elevation of the new occurrences were determined using collector's field notes, the physical map of the Republic of Ecuador 1:1'000000 published in 2000 by the Instituto Geográfico Militar and the gazetteer of Lynch and Duellman (1997).

The generic classification follows Ruíz-Carranza and Lynch (1991). However, as Savage (2002) recently changed the generic assignment of the species with humeral spine in males (resurrecting the genus *Centrolenella* to the big-eyed species groups and restricting the *Centrolene* to part of the *C. geckoideum* group), and as the systematics of centrolenids is still controversial, we present the two combinations to facilitate information retrieval.

***Centrolene peristictum* or *Centrolenella peristicta*.** Known from two widely separated areas (ca. 170 km apart) at altitudes ca. 1400 m in the Pacific slopes of the Andes of Colombia and Ecuador. The first area goes along the western slopes of the Cordillera Occidental in Colombia south to extreme northwestern Ecuador (Maldonado, Province of Carchi). The second area is in central western Ecuador, at the species type-locality (Tandapi, Province of Pichincha) (Lynch and Duellman 1973; Duellman and Burrowes 1989; Frost 2004). The species is classified as Vulnerable in the 2004 IUCN Red List of Threatened Species (Coloma et al. 2004a).

One male of *C. peristictum* (USNM 286714) was collected while calling next to an egg mass (USNM 286715) deposited on the upper side of a leaf ca. 2 m above water at Río Faisanes, ca. 15 km NE of La Palma, on the old Quito - Chiriboga - Santo Domingo road (00°19'S 78°49'W, 1380 m), Province of Pichincha, on 17 February 1979 by R. W. McDiarmid. Another specimen (QCAZ 6446) was collected at Río Guajalito Protection Forest (00°14'S 78°49'W, 1900 m), Province of Pichincha, on 01 October 1994 by J. Molineros. These two localities partially fill the gap between previously known populations, and extend the elevational range of the species to at least 1900 m.

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Centrolene prosoblepon or *Centrolenella prosoblepon*. Occurs from eastern Honduras through Central America, along the Pacific slopes of Colombia and into Ecuador where it reaches its southernmost distribution (Frost 2004). *Centrolene prosoblepon* was previously known in Ecuador from the northern and central Pacific lowlands and western slopes of the Andes, between 200–800 m, in the provinces of Carchi, Imbabura, Los Ríos, Pichincha and Bolívar (Lynch and Duellman 1973; Duellman and Burrowes 1989).

Records presented herein constitute the first reports from the provinces of Esmeraldas, Guayas, El Oro, and Cotopaxi, and represent substantial extensions for the altitudinal and range distribution of the species. A series of specimens (USNM 541904-541915) collected at Bilsa Biological Reserve, Río Aguacatal, 41 km WSW of Quininde (ca. 00°22'S 79°45'W, 300–750 m), Province of Esmeraldas, between 03 to 13 July 2000 by G. Vigle, represent the westernmost South American locality, ca. 80 km NNW from closest previous record, partially filling the gap between Colombian and Ecuadorian localities. A specimen (USNM 288438) from “Guayaquil” collected on March 1954 by M. Olalla, come from some point in the Chongon-Colonche hills near the actual town of Guayaquil, Province of Guayas, extending the range of the species ca. 90 km WSW from previous localities, filling the gap between northern and southern Ecuadorian localities and representing the first record of a Centrolenid from the Coastal Cordillera (Cordillera de la Costa) of Ecuador. Two specimens (USNM 286738-39) collected at 16.8 km W of Piñas, on the old road (ca. 03°40'S 79°40'W, ca. 600 m), Province of El Oro, on 20 October 1979 by R. W. McDiarmid, represent the southernmost locality for the distribution of the species, extending its range ca. 220 km SSW. The following records from the provinces of Pichincha and Cotopaxi extend the elevational range of *C. prosoblepon* to at least 1110 m. One specimen (USNM 288441) collected “below Sigchos, W slope of the Andes” (ca. 00°42'S 78°53'W), Province of Cotopaxi, on October 1954 by P. Proaño, and three male specimens (DFCH-USFQ 293-295) (Figure 1) collected while calling on leaves between 3 to 5 m above a small rivulet at the Mashpi Reserve, 18 km N of San Miguel de Los Bancos, on the road between Nanegalito-

Pacto-Gualea-Mashpi-Pachijal (00°09'S 78°50'W, 1100 m), Province of Pichincha, on 08 February 2003 by D. F. Cisneros-Heredia and G. Robayo.



Figure 1. Adult male *Centrolene prosoblepon* (DFCH-USFQ 293). Mashpi Reserve, Province of Pichincha, Republic of Ecuador. 08 February 2003. Photo by D. F. Cisneros-Heredia.

Cochranella cochranae. Endemic to Ecuador, reported from only four localities (1100–1300 m) on the eastern slopes of the Andes, at the provinces of Sucumbíos, Pastaza, and Tungurahua (Lynch and Duellman 1973; Frost 2004). The species is classified as Vulnerable in the 2004 IUCN Red List of Threatened Species (Coloma et al. 2004b). Several specimens collected at the San Rafael falls represent the first records from the Province of Napo: USNM 284304-6 (14 km by road SW of Reventador, ca. 00°02'S 77°33'W, 1400–1500 m), collected on 21-22 February 1985 by M. S. Foster, and USNM 286632-36 (at Km 102, INECEL Station, ca. 00°02'S 77°33'W, 1350 m), collected on 23 February 1979 by R. W. McDiarmid and E. Schupp. Previous reports from the Province of Napo (KU 123216–8, Lynch and Duellman 1973) actually come from a locality in the Province of Sucumbíos. A specimen (USNM 288452) from near Loreto (ca. 00°40'S 77°18'W, ca. 700 m), Province of Orellana, collected on January 1951 by C. A. Olalla, is the first provincial record, extending the lower elevational distribution of the species to at least 700 m and, together with records from Napo, partially filling the gap between northern and southern populations. Two specimens (DFCH D100-1: male and female) collected at a stream near Bombuscaro River, ca. 15 km S from Zamora city, Podocarpus National Park, western slope of Contrafuerte de Tzunantza (ca. 04°14'S

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78°56'W, 1820 m), on 08 September 2002 by F. Smith, together with a specimen (FHGO 2804) from Romerillos (04°14'S 78°56'W, 1800 m), collected on 22 February 2000 by F. Nogales and D. Almeida, are the first records from the Province of Zamora-Chinchipec and the southernmost records in the distribution of the species, extending its range ca. 310 km S and its elevational distribution to at least 1820 m.

Cochranella midas. Occurs up to about 300 m at two widely separated areas (ca. 350 km) in the western Amazon basin: northeastern Amazonian Ecuador, at two nearby localities, and northeastern Peru (Lynch and Duellman 1973; Duellman 1978; Frost 2004). Reports presented herein are first provincial records, filling the gap between Ecuadorian and Peruvian localities, and extending the elevational distribution of the species to at least 600 m (Figure 2): DFCH-D102, collected at the Tiputini Biodiversity Station (00°37'S 76°10'W, 190-270 m), Province of Orellana by K. Swing on November 1998, QCAZ 22876, collected at the Yasuní Scientific Station (00°40'S 76°24'W, ca. 230 m), Province of Orellana, by M. Read on 13 May 1995; QCAZ 20001-2, collected at Puerto Misahualli (01°02'S 77°40'W, ca. 400 m), Province of Napo, by F. Ayala on 15 March 2001; and USNM 288437, collected at Río Oglán, Curaray (01°19'S 77°35'W, ca. 600 m), Province of Pastaza, by R. Olalla on April 1953.



Figure 2. Adult *Cochranella midas*. Tiputini Biodiversity Station, Province of Orellana, Republic of Ecuador. July 2003. Photo by the Applied Ecology Research Group, University of Canberra.

Cochranella resplendens. This species occurs below 200 m in the upper Amazon Basin in Ecuador and southeastern Colombia (Frost 2004). It was previously known in Ecuador only from the type locality at Santa Cecilia, Province of Sucumbíos (Lynch and Duellman 1973). The species is classified as Vulnerable in the 2004 IUCN Red List of Threatened Species (Castro et al. 2004).

Two specimens (FHGO 1305, 1324) were collected at Pozo Garza, Oryx (01°26'S 77°03'W, 300 m), Province of Pastaza, by J.-M. Touzet on 06 July 1989, and two specimens (DFCH D103-4) were collected at the Tiputini Biodiversity Station (00°37'S 76°10'W, 190-270 m), Province of Orellana, by D. F. Cisneros-Heredia and A. Chiriboga on August 1999. These are first provincial records, the second and third known localities of the species in Ecuador, and the southernmost populations in the distribution of the species. The record from the Province of Pastaza extends the distribution of the species ca. 170 km S from the type locality, and the record from the Province of Orellana ca. 125 km SE.

Cochranella spinosa. Distributed on the Atlantic slopes from Costa Rica to eastern Panama, and on the Pacific slopes from Costa Rica along the lowlands through western Colombia to Ecuador, up to 560 m (Savage 2002; Frost 2004).

Cochranella spinosa was previously known from just one locality in Ecuador (Río Palenque, Province of Los Ríos, Duellman and Burrowes 1989) (Figure 3). One specimen (USNM 288443) collected at Río Blanco, near the mouth of Río Yambi (ca. 00°01'S 79°08'W, ca. 700 m), Province of Pichincha, by M. Olalla on February 1959, presents a first provincial record, partially filling the gap between Colombian and Ecuadorian localities and extending the elevational distribution of the species to at least 700 m.

Hyalinobatrachium munozorum. Known from few localities in the Amazonian lowlands of Colombia, Ecuador, and Peru (Ruíz-Carranza and Lynch 1998; Frost 2004). It was previously known in Ecuador just from its type locality (Lynch and Duellman 1973). One specimen (DFCH D105) was collected while sitting on the trunk of a *Ceiba* tree

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in primary terra firme forest, ca. 25 m above the floor, at the Tiputini Biodiversity Station (00°37'S 76°10'W, 190–270 m), Province of Orellana, by D. F. Cisneros-Heredia on 02 January 1998. This record is the first from the Province of Orellana, increasing its geographical range ca. 125 km NW from the type-locality, and partially filling the gap between Ecuadorian and Peruvian localities.



Figure 3. *Cochranella spinosa*. Río Palenque Scientific Center, Province of Los Ríos, Republic of Ecuador. Photo by Roy W. McDiarmid.

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Literature Cited

- Castro, F., J. V. Rueda, W. Bolívar, R. A. Estupiñan, L. A. Coloma, S. Ron, and A. Almendáriz. 2004. *Cochranella resplendens*. In: IUCN 2004. 2004 IUCN Red List of Threatened Species. <www.redlist.org>. Captured on 10 November.
- Coloma, L. A., S. Ron, and D. Almeida. 2004a. *Cochranella cochranae*. In: IUCN 2004. 2004 IUCN Red List of Threatened Species. <www.redlist.org>. Captured on 10 November 2005.
- Coloma, L. A., S. Ron, J. Lynch, D. F. Cisneros-Heredia, and E. Wild. 2004b. *Centrolene peristictum*. In: IUCN 2004. 2004 IUCN Red List of Threatened Species. <www.redlist.org>. Captured on 10 November 2005.
- Duellman, W. E. 1978. The biology of an Equatorial Herpetofauna in Amazonian Ecuador. University of Kansas, Museum Natural History, Miscellaneous Publications 65: 1-352.
- Duellman, W. E. and P. A. Burrowes. 1989. New species of frogs, *Centrolenella*, from the Pacific versant of Ecuador and southern Colombia. Occasional Papers, Museum Natural History, University Kansas 132:1-14.
- Frost, D. 2004. Amphibian Species of the World: an online reference. V.3.0 (22 August 2004). <http://research.amnh.org/herpetology/amphibi a/index.html>. American Museum of Natural History, New York, USA. Captured on October 2005.
- Lynch, J. D. and W. E. Duellman. 1973. A review of the Centrolenid frogs of Ecuador, with descriptions of new species. Occasional Papers, Museum Natural History, University Kansas 16: 1-66.
- Lynch, J. D. and W. E. Duellman. 1997. Frogs of the genus *Eleutherodactylus* in Western Ecuador. University of Kansas, Museum Natural History, Special Publication 23: 1-236.
- Ruíz-Carranza, P. M. and J. D. Lynch. 1991. Ranas Centrolenidae de Colombia I. Propuesta de una nueva clasificación genérica. *Lozania*, 57: 1-30.
- Ruíz-Carranza, P. M. and J. D. Lynch. 1998. Ranas Centrolenidae de Colombia XI. Nuevas especies de ranas cristal del género

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Hyalinobatrachium. Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales 22(85): 571–586..

Savage, J. M. 2002. The Amphibians and Reptiles of Costa Rica. Chicago, Univ. Chicago Press. 934 p.

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