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NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Eleutherodactylidae, *Adelophryne adiastola* Hoogmoed and Lescure, 1984: First countries records and distribution extension from Ecuador and Brazil

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The family Eleutherodactylidae (Amphibia: Anura) consists of the caribbean clade (*Eleutherodactylus*) and its closest mainland relatives (*Diasporus, Adelophryne*, and *Phyzelaphryne*) that comprises a total of 199 species (Hedges et al. 2008). The genus *Adelophryne* Hoogmoed and Lescure, 1984, as currently defined, contains five minute leaf litter and semifossorial frogs: *Adelophryne adiastola* Hoogmoed and Lescure, 1984; *Adelophryne baturitensis* Hoogmoed, Borges, and Cascon, 1994; *Adelophryne gutturosa* Hoogmoed and Lescure, 1984; *Adelophryne maranguapensis* Hoogmoed, Borges, and Cascon, 1994; and *Adelophryne pachydactyla* Hoogmoed, Borges, and Cascon, 1994 (Hedges et al. 2008). These species are characterized mainly by having terminal discs on digits barely expanded, apically pointed, with circumferential grooves; finger IV reduced with two (*A. adiastola* and *A. pachydactyla*) or three (*A. baturitensis*, *A. gutturosa*, and *A. maranguapensis*) phalanges; head no wider than body; maximum SVL in males 12.6 mm and in females 17 mm (Duellman and Mendelson 1995; Hedges et al. 2008). This genus has a discontinuous distribution through northeastern Brazil (*A. baturitensis*, *A. maranguapensis*, and *A. pachydactyla*), in the Guiana shield region in northeastern South America (*A. gutturosa*), and in the Upper Amazon basin (*A. adiastola*) (Frost 2007; Hedges et al. 2008).

The knowledge of leaf litter and semifossorial frogs is poor because of their cryptic behavior, small sizes, and the ineffective collecting methods used in Neotropical herpetofauna surveys (Cisneros-Heredia and Reynolds 2007).

During 2007, herpetological studies were conducted at the Indigenous Shiwiar territories in the Pastaza Trench on Ecuadorian Amazonia, where we found one specimen of *Adelophryne adiastola*. The examination of material from herpetological collections provided localities from Colombia and one from Brazil. The aim of this article is to report the presence of *A. adiastola* in Ecuador and Brazil, and report the additional localities from Colombia.

Figure 1. Dorsal (A), ventral (B), and lateral (C) views of *Adelophryne adiastola* (DHMECN 4378, 12.6 mm SVL, male) from Kurintza, province of Pastaza, Ecuadorian Central Amazonia. Scale bars = 5.0 mm. Photos by H. M. Ortega-Andrade.

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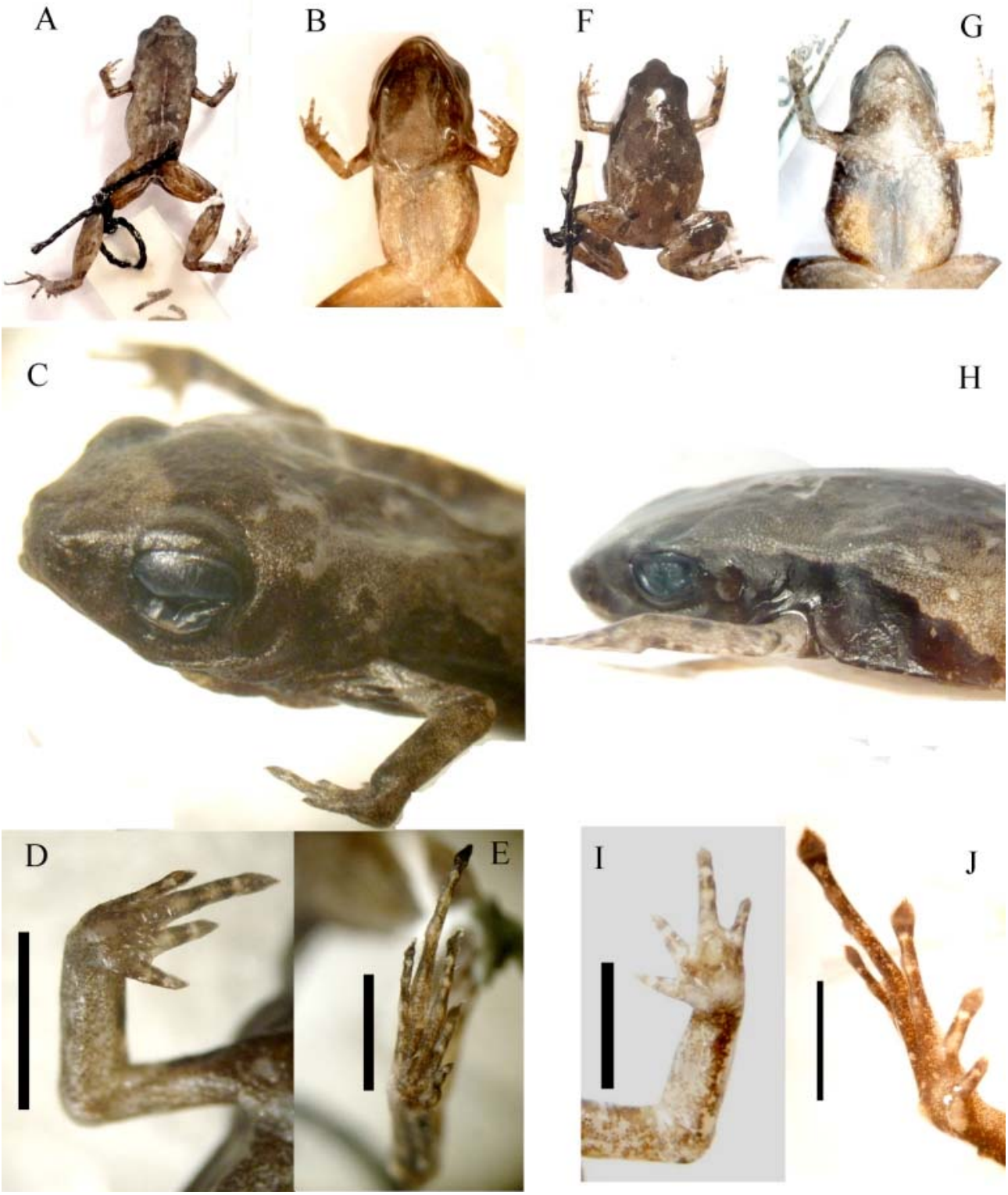

Figure 2. Comparative photographs of dorsal, ventral, and lateral views and tips of digits in *Adelophryne adiastola* (DHMECN 4378, 12.6 mm SVL, male; A-E) and *Noblella myrmecoides* (DHMECN 4364, 13.4 mm SVL, gravid female; F-J). Scale bars = 2.0 mm. Photos by H. M. Ortega-Andrade.

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Abbreviations used in the text include: DHMECN = *División de Herpetología*, *Museo Ecuatoriano de Ciencias Naturales*, Quito, Ecuador; ICN = *Instituto de Ciencias Naturales*, Bogotá, Colombia; SVL= snout-vent length. Specimens were fixed in formalin and preserved in ethanol 75 %. Only specimen DHMECN 4378 was sexed. Measurements are in millimeters and were taken by a 0.5 mm precision dial caliper. Elevations and geographic coordinates were determined from the author's field notes, DHMECN databases, ICN database, physical map of the Republic of Ecuador (IGM 2008) physical map of the Republic of Colombia (IAvH 2007), and ARCVIEW 3.2 ESRI South America shape files. I follow the terminology of the vegetal formations according to the classification system proposed by Palacios et al. (1999) to Ecuador. The Research authorization (Nº001-IC-FAU / FLO-DRFN-P / MA) was issued by the *Ministerio del Ambiente de Ecuador*, Tena, Ecuador.

I report the presence of *Adelophryne adiastola* (Figures 1 and 2) in Ecuador from a single adult male specimen (DHMECN 4378, 12.6 mm SVL) collected by J. Santi and H. M. Ortega-Andrade on 22 April 2007, 2.1 Km E from Kurintza (02°03'50.6" S, 76°46'26.2" W; 296 m), province of Pastaza. The species is also reported to be present in Brazil, based on three specimens (ICN 50251, 12.4 mm SVL; ICN 50255, 12.8 mm SVL; ICN 50256, 13.3 mm SVL; mean SVL= 12.83 mm) collected on 3 January 2003, *Quebrada Potoa* at Tabatinga (04°15'06" S, 69°57'03" W, 125m), state of Amazonas. The specimen DHMECN 4378 was captured by J. Santi when it was moving on the leaf litter of primary forest floor at 10:00 h. This specimen was collected after approximately 120 min of intense search by visual encounter survey (VES) in a hilled forest, ca. 0.55 Km from a "*chacra"* (local agricultural practice). The specific area was not a secondary forest; in fact it was a well preserved forest, with trees reaching 25 meters high.

The specimens examined agree with the diagnosis and original description provided by Hoogmoed and Lescure (1984). *Adelophryne adiastola* differs from its congeners by the combination of the following characters: (1) having a reduced finger IV with two phalanges; (2) uniform brown dorsum; and (3) lacking pale spots on the flanks (Hoogmoed et al. 1994; Duellman and Mendelson 1995). *Noblella myrmecoides* (Anura: Strabomantidae; Figure 2) is a minute leaf litter frog that differs from *A. adiastola* mainly by: (1) absence of vomerine odontophores; (2) fingers short with tips not expanded or only slightly expanded; tips of at least toes III–IV acuminate; (3) prominent tarsal tubercle; (4) pair of distinct black inguinal spots; (5) side of head and flanks dark brown (Duellman 1991; De la Riva et al. 2008; Hedges et al. 2008).

In life, the specimen DHMECN 4378 has a brown dorsum with a cream mid-dorsal stripe; a black triangular mark on the cloacal opening; arms and limbs with two and three transverse dark stripes; flanks without marks; belly with dense brown flecks creating a cream spotted pattern, chest and throat brown; iris gold. In preservative, dorsum creamy tan to dark brown, with a cream mid-dorsal stripe; upper eyelid dark brown; snout creamy tan; a creamy bordered triangular black mark on the cloacal opening; transversal dark brown stripes on the arms and limbs; dorsal surfaces of fingers and toes with transverse brown stripes; a irregular cream mark in the ventral portion of the flanks; belly cream with brown flecks; throat and chest with dense brown dark flecks (Figures 1 and 2).

Adelophryne adiastola was known previously from a reduced area (ca. 22,303 Km^2) in the frontier limits of northwestern Brazil, southeastern Colombia, and northeastern Peru (Hoogmoed et al. 1994; Lynch 2005; Hedges et al. 2008), and projected to occurs in approximately 221,694 Km^2 at the Upper Amazon Basin (Angulo et al. 2008).

The record of *Adelophryne adiastola* from Kurintza, Ecuador, comprises the westernmost locality in its distributional range, ca. 685 km from the western limit of the historical occurrence area (Lynch 2005; Hedges et al. 2008), located between the Department Amazonas in Colombia and the Department Loreto in Peru (Figure 3). In Ecuador, *Adelophryne adiastola* occurs at elevations below 300 m, in the

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Bosque Siempreverde de Tierras Bajas (Palacios et al. 1999) at Central Amazonia. The record of *A. adiastola* from Tabatinga, Brazil, comprises the southeastern known limit in its distributional range, ca. 46 km from the eastern limit of the historical occurrence area (Figure 3).

Currently, the Ecuadorian frogs of the family Eleutherodactylidae include only two species: *Adelophryne adiastola* in the Amazon Basin, and *Diasporus gularis* from lowlands in northwestern Ecuador. The Brazilian Eleutherodactylidae frogs include six species, five from the genus *Adelophryne* and *Phyzelaphryne miriamae.* Additional information about natural history and genetics are necessary to elucidate the conservation status and relationships of these tiny and cryptic frogs.

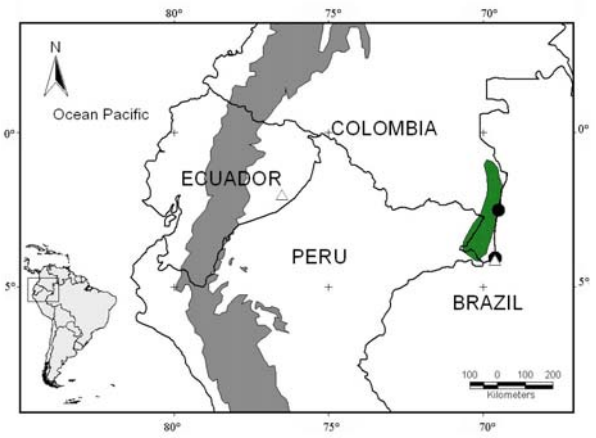

Figure 3. Distribution of *Adelophryne adiastola* in the Upper Amazon Basin: (Δ) new records from Ecuador and Brazil; (●) examined material. Green area represents the historical occurrence of *Adelophryne adiastola* (Lynch 2005; Hedges et al. 2008); grey area indicates elevations above 1000 m.

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Appendix

Specimens examined

***Adelophryne adiastola*: BRAZIL: Estado do Amazonas: Tabatinga, Quebrada Potoa,** 04°15'06" S, 69°57'03" W, 125m: ICN 50251, 50255–56, collected on 3 January 2003 by J.M. Renjifo. **COLOMBIA: Departamento Amazonas: Leticia**, 02°52' S, 69°44' W, 125 m: ICN 47267, collected on 11 November 2001 by O.V. Castaño; ICN 50252, collected on 15 January 2003 by A. Duarte; 04°06' S, 69°70' W, 125 m: ICN 50253, collected on 10 January 2003 by J. M Rengifo; ICN 50254 collected on 15 January 2003 by A. Tellez; ICN 50257–60, collected between 06 and 19 February 2003 by A. Duarte; ICN 50261–62 collected between 04 and 18 March 2003 by A.

Tellez; ICN 50263, collected on 31 October 2003 by M.C. Ardila; **ECUADOR: Pastaza Province: 2.1 Km E from Kurintza,** 02°03'50.6" S, 76°46'26.2" W, 296 m: DHMECN 4378, collected on 22 April 2007 by J. Santi and H.M. Ortega-Andrade.

***Noblella myrmecoides:* ECUADOR: Pastaza Province: 4 km SE from Kurintza**, 02°04’05" S, 76°45’24" W, 296 m: DHMECN 4364, collected on 16 April 2007 by H. M. Ortega-Andrade.