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First records of *Bufo guttatus* from Bolivia with comments on *Bufo glaberrimus* (Amphibia: Bufonidae)

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Abstract. *Bufo guttatus* is recorded from Bolivia for the first time. This toad was found at four different localities which are suggested to reflect the southernmost extension of the species' range. Most specimens were found in primary forest at dusk or by night on river banks. Morphological characters which distinguish *B. guttatus* from a similar species, *B. glaberrimus*, are listed.

Key words. Amphibia, Anura, Bufonidae, *Bufo glaberrimus*, *Bufo guttatus*, distribution, taxonomy, Bolivia, Neotropics.

Introduction

Bufo guttatus Schneider, 1799 is a large toad ranging from the Guyana shield to eastern Peru via the central Amazon basin (Frost 1985; Rodríguez & Cadle 1990; Morales & McDiarmid 1996). A similar species, *B. glaberrimus* Günther, 1869 "1868", has been suggested to occur in Pacific Colombia[1] and in the upper Amazon basin of Colombia, Ecuador and Peru (Cochran & Goin 1970; Duellman 1978; Schlüter 1981 a; Frost 1985). The taxonomic relationships of these toads have been controversial. This is reflected by the treatment of *B. glaberrimus* both as a subspecies of *B. guttatus* (e.g. Stebbins & Hendrickson 1959; Rivero 1961) and as a distinct species (e.g. Rodríguez & Duellman 1994). De la Riva (1990) expected both mentioned species to occur in Bolivia. The purpose of this paper is (1) to report *B. guttatus* from Bolivia for the first time and (2) to provide diagnostic characters which separate *B. glaberrimus* as a distinct species (which remains unknown from Bolivia).

Records of *Bufo guttatus* in Bolivia

Voucher specimens are deposited at CBF (Colección Boliviana de Fauna, La Paz), CET A (Centro de Estudios Tropicales, amphibian collection, Sevilla), NKA (Museo de Historia Natural "Noel Kempff Mercado", amphibian collection, Santa Cruz de la Sierra) and ZFMK (Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn). Localities with specimens collected (as shown in Fig. 1) are as follows: (1) Departamento Pando: Provincia Nicolás Suárez: Río Tahuamanu, about 1 km above its confluence with Río Manuripi (11°06' S, 67°35' W): two sub-adults (CET A 1518–19), collected by IDlR, 1 July 1990; (2) Departamento La Paz: Provincia Iturralde: Comunidad Indígena "Puerto Araona" (12°31' S, 67°46' W; ca. 150–200 m elevation): adult (NKA 3683, 114.3 mm SVL), collected by GS, 21 October 1998; (3) Departamento Santa Cruz: Provincia Velasco: Parque Nacional "Noel Kempff Mercado", Río Pauserna, near Ahlfeld waterfalls on Río Pauserna (13°45' S, 60°59' W; ca. 245 m elevation): adult (ZFMK 69921, 133.0 mm SVL), collected by SL & SR, 14 Decem-

[1] A recent checklist of amphibians from Colombia (Ruiz-Carranza et al. 1996) lists *B. glaberrimus* only from east of the Andes.

ber 1998; (4) Departamento Santa Cruz: Provincia Velasco: Parque Nacional "Noel Kempff Mercado", Campamento Los Fierros (14°33' S, 60°53' W; ca. 200 m elevation): juvenile (CBF 3345, ca. 20.0 mm SVL), collected by SR, June 1998.

All specimens except one were collected at dusk or by night on banks of moderate-sized rivers in primary rain forests. At locality (3), at least 10 specimens were observed along a trail parallel and immediate to the river shore. In contrast, at locality (2), NKA 3683 was collected in a humid area in primary forest by night, but far away from running water. Usually when handling individuals, their parotoid glands exude a yellow substance; this is occasionally squirted away over a distance of up to ca. 1 m.

Comments

The Bolivian records, situated at the southern periphery of the Amazon basin, represent the southernmost known records of *B. guttatus*. Our findings suggest that *B. guttatus* is ranging from the Guyana shield over the entire Amazon basin. Its occurrence farther south is not very probable because biomes change and become significantly drier. The south-western range limit of *B. guttatus* may be represented by the records from the lowlands of south-eastern Peru (Rodríguez & Cadle 1990; Morales & McDiarmid 1996) and adjacent Bolivia. This species is not known from

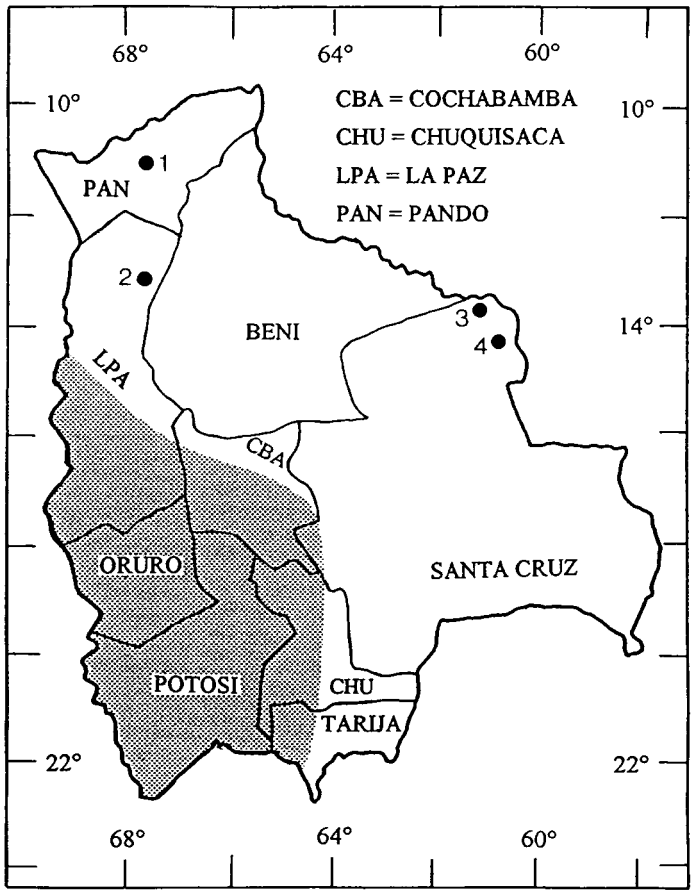

Fig. 1: Map of Bolivia with Departamentos and four localities (for details see text) where *Bufo guttatus* was found. Andean areas above 2500 m elevation are shaded.

other Peruvian lowland sites, although some of them are well surveyed (Schlüter 1981 b; Duellman & Salas 1991; Rodríguez & Duellman 1994; Duellman & Mendelson 1996; Duellman & Thomas 1996). However, from some of these sites, *B. glaberrimus* has been reported (Schlüter 1981 a; Duellman & Salas 1991; Rodríguez & Duellman 1994). In addition, two recent checklists of Peruvian amphibian species (Rodríguez et al. 1993; Morales 1995) mention *B. glaberrimus* only.

B. glaberrimus is considered a valid species here. We examined three adults from Ecuador (ZFMK 28046; ZSM [Zoologische Staatssamlung München] 29/162 [in all maturity was confirmed through dissection]) and used published data and figures of specimens from Ecuador (Duellman 1978) and Peru (Schlüter 1981 a; Rodríguez & Duellman 1994). For comparison, four adult *B. guttatus* from French Guyana (ZSM 500/1988, ZFMK 40466–67) and five sub-adults from central Brazil (ZSM 115/1988) were studied.

B. glaberrimus is considerably smaller than *B. guttatus*, adults or equal to smaller than 80.0 mm SVL (Rodríguez & Duellman 1994). In contrast, adult *B. guttatus* have at minimum 130.0 mm SVL. As indicated above, Bolivian specimens fit this latter size. *B. glaberrimus* can further be distinguished from *B. guttatus* by the absence of a pre-orbital ridge. Even four of the sub-adult *B. guttatus* from Brazil (42.9-54.8 mm SVL) have a pre-orbital ridge; only the smallest individual (32.2 mm SVL) lacks it. Adults and sub-adults hereby reported from Bolivia have a pre-orbital ridge while it is absent in the juvenile from locality (4). In addition, all *B. glaberrimus* examined by us have numerous minute white spots on the ventral side. Almost all *B. guttatus* (including Bolivian material) except the smallest sub-adult from Brazil and the juvenile from locality (4) in Bolivia show several cream-coloured rounded blotches of almost the size of the eye diameter on the venter.

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Zusammenfassung

Bufo guttatus wird erstmals für Bolivien nachgewiesen. Wir fanden diese Kröte an vier verschiedenen Stellen, die vermutlich die südliche Arealgrenze darstellen. Die meisten Exemplare wurden während der Dämmerung oder bei Nacht auf Flußbänken im Primärwald gefunden. Morphologische Unterschiede, die *B. guttatus* von einer ähnlichen Art, *B. glaberrimus*, unterscheiden, werden aufgeführt.

Resumen

Se registra por primera vez *Bufo guttatus* en Bolivia, en cuatro localidades que representan el límite sur de la especie. La mayoría de los ejemplares se encontraron de noche o al atardecer en orillas de ríos en bosque tropical primario. *Bufo guttatus* se diferencia de *B. glaberrimus*, que también podría encontrarse en Bolivia, por su mayor tamaño y por la presencia de una cresta preorbital.

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