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NOTES ON GEOGRAPHIC DISTRIBUTION

Lepidobatrachus asper Budgett,1899 (Amphibia: Anura: Ceratophryidae): New country record, distribution map and natural history notes

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ABSTRACT: *Lepidobatrachus asper* is a large to medium frog known from the Chaco lowlands of Paraguay and Argentina. We provide the first species record for the Brazilian Chaco, which extends the species geographical distribution ca. 73 km northeast from Puerto Casado, Alto Paraguay Departament, Paraguay. We also provide a distribution map and information about the species habitat conditions and diet. The Brazilian Chaco is still poorly surveyed, and the rapid environmental degradation can lead to local extinctions of certain species.

Lepidobatrachus asper is known from the Chaco lowlands of Paraguay (Central, Boquerón, Presidente Hayes, and Alto Paraguay Departments) and Argentina (Formosa, Salta, Chaco, Santa Fé, Santiago del Estero, Cordoba and Corrientes Provinces) (Aquino *et al.* 1996; 2004; Brusquetti and Lavilla 2006; Frost 2011). It is a large to medium frog (max. male SVL = 70 mm; max. female SVL = 90 mm), with stout body that differs from the other two *Lepidobatrachus* species (*L. laveis* and *L. llanensis*) by a combination of rhomboidal pupil, vertebral shield prominent and a spindle-like plate on the back (Cei 1980). Breeding activity occurs during the rainy season mainly in temporary ponds with clay soil, where it remains underground without feeding during the dry/cold season similar to other species in the genus (Cei 1980). According to the IUCN Red List, this species is considered as "Near Threatened" because its remaining distribution range is estimated to reach no more than 20,000 km^2 and populations may be at risk due to fires and over-grazing by livestock (Aquino *et al*. 2004).

We collected four individuals of *L. asper* (Figure 1A and B; collecting permit provided by ICMBio number 19269-1) on February 10, 2012, in two temporary ponds (pond 1: 21°41'25"S, 57°43'16"W; pond 2: 21°41'17"S, 57°43'16"W; Figure 2 and 3B) located in the Patolá farm, municipality of Porto Murtinho, Mato Grosso do Sul State, Central Western Brazil. All individuals were deposited at the Coleção Zoológica de Referência da Universidade

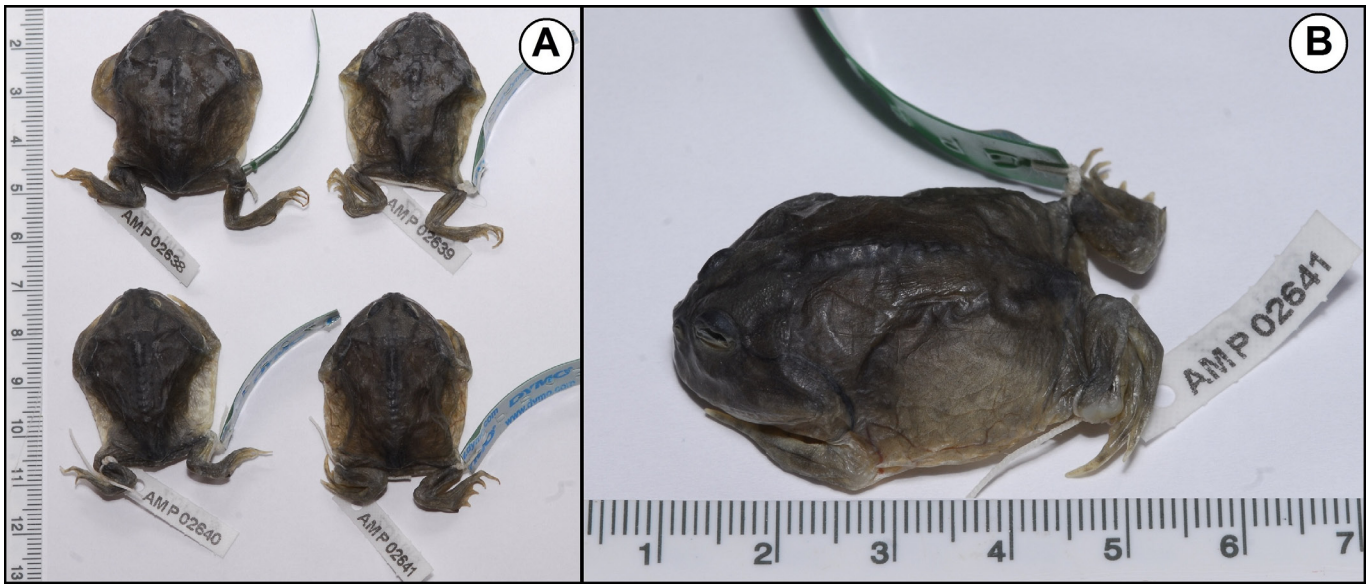

FIGURE 1. *Lepidobatrachus asper* collected in Febuary 2012 at the Patolá farm, Porto Murtinho municipality, Mato Grosso do Sul state, Brazil. A) Dorsal view of the four individuals. B) Detailed view of individual ZUFMS 02641. Photo by Paulo Robson de Souza

Figure 2. Temporary pond surrounded by pasture and Chacoan vegetation, at the Patolá farm, which represents the general aspect of the two temporary ponds where the juveniles of *L. asper* were collected. Photo by Gabriel Paganini Faggioni

Federal de Mato Grosso do Sul (acronym ZUFMS), Campo Grande, Brazil. This is the first record of *L. asper* for Brazil, which extends the species distribution ca. 73 km northeast from Puerto Casado, Alto Paraguay Departament, Paraguay (22°18'0.00"S, 57°58'0.00"W; Figure 3). Two individuals (ZUFMS 02640 and ZUFMS 02641) were collected in pond 1 at 20:15 h. Both were found underwater at about 10 cm deep in contact with the bottom. The area of pond 1 was 1347 m^2, water temperature was 30.7° C, air temperature was 27.3° C, and the relative air humidity was 69%. Both individuals were juvenile, with SVL (snout vent length) of 37.05 mm and 37.85 mm. The other two individuals (ZUFMS 02638 and ZUFMS 02639) were collected in pond 2 at 20:50 h, also underwater at about 10 cm deep in contact with the bottom. The area of pond 2 was 1643 m^2, water temperature was 32.9° C, air temperature was 26.8° C, and the relative air humidity was 85%. Both individuals were also juveniles, with SVL of 39.05 mm and 34.35 mm. The four juveniles had empty stomachs, but material was found in the intestines and identified to order level. Plant material (flower, seed and sticks) and grains of sand were found in the intestines of two individuals (ZUFMS 02641 and ZUFMS 02640), which probably represent unintentional ingestion when preying on arthropods. Remains of aquatic coleopteran were found in the intestines of individuals ZUFMS 02638 and ZUFMS 02639. Terrestrial coleopteran was found in ZUFMS 02638. Araneae was found only in ZUFMS 02640, and Acari and Blattodea were found only in ZUFMS 02638.

The distribution map shown in Figure 3A was made based on records gathered from four sources (Faivovich 1994; Aquino *et al.* 1996; 2004; Brusquetti and Lavilla 2006) in addition to the new record (red circles on Figure 3A and B). Faivovich (1994) compiled 23 localities where the species occur in the Argentinean Provinces of Chaco, Córdoba, Corrientes, Santa Fé and Santiago del Estero, and three in the Paraguayan Departments of Alto Paraguay, Presidente Hayes and Central (Figure 3A, white circles; for details of the localities see Faivovich 1994). Aquino *et al.* (1996) registered the species in four localities in Paraguay (Figure 3A, diamonds): two in Filadelfia, Boquerón Departament, and other two at Parque Nacional Defensores del Chaco, Alto Paraguay Departament. Aquino *et al.* (2004) also registered *L. asper* in ten localities (Figure 3A, squares): two in Paraguay (Presidente Hayes Departament) and eight in Argentina (two in Formosa Province, one in Salta Province, one in Chaco Province, two in Santa Fé Province and two in Santiago del Estero Province). Brusquetti and Lavilla (2006) registered the

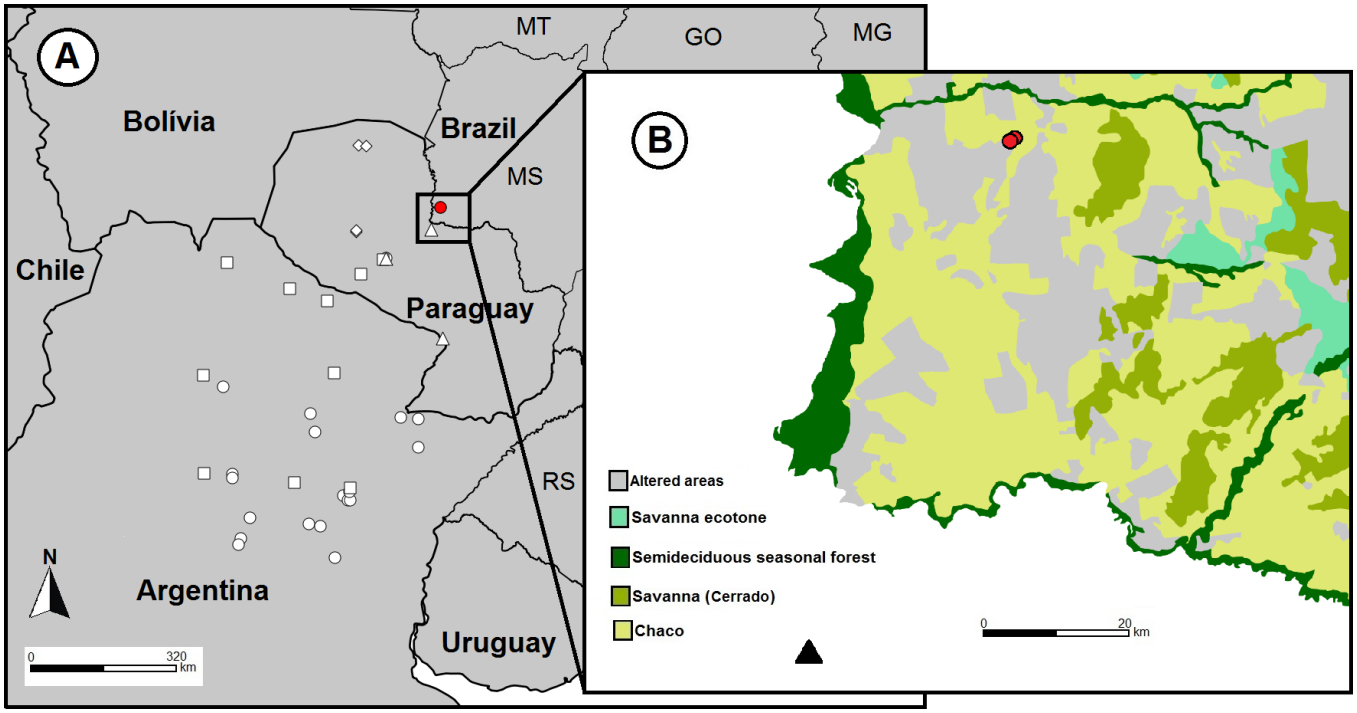

Figure 3. Map showing the known distribution of *Lepidobatrachus asper*. A) Distribution map in South America: literature records are represented by white circles (Faivovich 1994), squares (Aquino *et al.* 2004), triangles (Brusquetti and Lavilla 2006) and diamonds (Aquino *et al.* 1996), while new records are represented by red circles. B) Detail of the new records (red circles) in Mato Grosso do Sul state (MS), Brazil, showing the closest record in Paraguay (black triangle; Brusquetti and Lavilla 2006) and vegetation type in 2007 according to MMA (Ministério do Meio Ambiente; shapefile downloaded from http://mapas.mma.gov.br/i3geo/datadownload.htm). Note the large amount of altered areas, which probably have increased since 2007.

species at three localities in Paraguay (Figure 3A, triangles): one in Puerto Casado, Alto Paraguay Departament, one at Estancia Juan de Salazar, Presidente Hayes Departament, and one in Asunción, Central Departament.

The southwestern region of Mato Grosso do Sul State harbors a flora and fauna typical of the Chaco domains, in addition to the influence of the adjacent Cerrado and Pantanal (Prado *et al*. 1992; Prado 1993a,b; Straube *et al.*2006; Souza *et al*. 2010; Amaral *et al*. 2012). This area is the only under the influence of the Chaco domain in Brazil, which is isolated from the remaining Chaco by the Paraguay and Apa rivers. Some typical Chacoan species were recently registered in this area (Souza *et al*. 2010), including the first record for the toad *Melanophryniscus klappenbachi* (Amaral *et al*. 2012). In fact, the fauna of the region has been poorly studied and the occurrence of species frequently recorded in Chacoan areas is expected (Strüssmann *et al.* 2011). The natural vegetation of the Chaco, including the Brazilian part, has been suffering severe degradation, resulting from logging, agriculture and livestock (Bucher and Huszar 1999; Silva *et al*. 2008; CI, ECOA, Fundación AVINA, Instituto SOS Pantanal and WWF-Brasil 2009). Some recent records (Souza *et al*. 2010; Amaral *et al*. 2012; present study) have shown that the Brazilian Chaco is still poorly surveyed, and the rapid environmental degradation can lead to local extinctions of certain species before they are recorded. There are no conservation units in the Brazilian Chaco, which would be a way to protect its unique biodiversity.

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