REPTILES & AMPHIBIANS

Herpetofauna of the Great Tectonic Lakes of Exaltación, Beni Department, Bolivia

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Abstract.—The Great Tectonic Lakes of Exaltación is a little-explored region of the Beni Department in Bolivia. During a multidisciplinary scientific expedition, we documented the herpetofauna of this part of the floodplains of the Llanos de Moxos and the Cerrado, confirming the presence of 25 amphibian species (Anura) and 40 reptilian species (Testudines, Crocodylia, and Squamata), and estimated species richness of 30 amphibians and 56 reptilian species for the region. Most reported species have wide distributions in the lowlands, except for *Leptodactylus* cf. *gracilis*, a species with a restricted distribution in the southern ecoregions of Bolivia. Two threatened turtle species (*Podocnemis unifilis* and *Chelonoidis denticulatus*) categorized as Vulnerable were present, as well as other larger reptilian species such as the Black Caiman (*Melanosuchus niger*) and the Spectacled Caiman (*Caiman yacare*).

Resumen.—Los Grandes Lagos Tectónicos de Exaltación son una región poco explorada del departamento de Beni en Bolivia con poco conocimiento sobre anfibios y reptiles. Durante una expedición científica multidisciplinaria documentamos la herpetofauna de esta parte de la región llanuras inundables de los Llanos de Moxos y el Cerrado, confirmando la presencia de 25 especies de anfibios (Anura) y 40 especies de reptiles (Testudines, Crocodylia y Squamata), y estimando una riqueza de 30 especies de anfibios y 56 de reptiles para la región. La mayoría de las especies reportadas tienen una amplia distribución en las tierras bajas, excepto *Leptodactylus* cf. *gracilis*, especie con distribución restringida a las ecorregiones al sur de Bolivia. Se hallaron dos especies de tortugas amenazadas (*Podocnemis unifilis* y *Chelonoidis denticulatus*) categorizadas como Vulnerables, así como otras especies de reptiles de mayor tamaño como el caimán negro (*Melanosuchus niger*) y el caimán de anteojos (*Caiman yacare*).

Beni, the second largest department in Bolivia, is among the departments with the greatest biodiversity, with its biogeographical and climatic conditions providing diverse terrestrial and aquatic lowland ecosystems rich in flora and fauna (Ibisch and Mérida 2003; Aguirre et al. 2009; FAN 2015; Aliaga-Rossel et al. 2020). Beni is dominated by the floodplains of the Llanos de Moxos and the Cerrado (Precambrian formations); however, smaller extensions of Amazon and Andean (Yungas) forests are present in northern and southwestern Beni, respectively (Navarro and Maldonado 2002; Ibisch and Mérida 2003; FAN 2015). The Great Lakes originated in a series of tectonic events that ended just under six thousand years ago (Pouilly and Beck 2004; Lombardo and Grützner 2021). These lakes are large, shallow depressions in the Precambrian Shield surrounded by enormous polycyclic plains where the outcropping sediments are Quaternary deposits (Navarro and Maldonado 2002; Pouilly and Beck 2004). The diverse and extensive aquatic network, together with the surrounding floodplains in central and northern Beni, including the Great Tectonic Lakes of Exaltación, are recognized as part of the Yata River Ramsar Site (FAN 2015; MMAyA 2015; Careaga et al. 2020). These wetlands are important for biodiversity and indigenous people, including the Cayubaba, Movima, Canichana, and Mojeño.

Herpetological research in Beni is scarce, particularly in formal publications (Middendorf and Reynolds 2000; Ten et al. 2001; Eversole et al. 2021; Rivas et al. 2022, 2023a). However, amphibian and reptilian species recorded from the floodplains of the Llanos de Moxos of Beni are mostly well-known species with widespread lowland distributions that are not considered threatened (De la Riva et al. 2000; Aguayo 2009; Cortez 2009; Embert et al. 2011; De la Riva and Reichle 2014). Some larger reptilian species are categorized as threatened (Cortez 2009; Aliaga-Rossel et al. 2020), including turtles (Podocnemidae, Testudinidae), caimans (Alligatoridae), and snakes (Boidae). The limited herpeto-

Reptiles & Amphibians ISSN 2332-4961
https://doi.org/10.17161/randa.v32i1.21473

logical research in the floodplains of the Llanos de Moxos probably is attributable to poor accessibility, as road infrastructure is incipient, and climatic and hydrological conditions (seasonal floods) are unfavorable, particularly during the rainy season, which is the ideal time for herpetological studies. However, huge areas of Beni remain to be explored, including large regions of the floodplains, the Amazonian forests, the Cerrado, and the Yungas.

Methods

The Great Tectonic Lakes of Exaltación (Fig. 1) (-12.67532– -13.37841 and -65.14412– -66.02991) includes the Great Tectonic Lakes of Exaltación Municipal Protected Area and the Cayubaba Indigenous Territory, both in Exaltación Municipality, Yacuma Province, Beni (FAN 2015; MMAyA 2015). The lakes are shallow (2–5 m deep) and isolated from the main rivers, and floods in the region are local. Biogeographically, the area is in the western and northern Beniano sectors of the Beniana biogeographical province of the Brazilian-Paranense region. Vegetation is a patchwork of oligotrophic flooded savannahs, with savanna forests and wooded savannahs, as well as patches of Cerrado, termite mound pampas, chaparral on well-drained soils, floodable herbaceous savannahs, Amazonian forests of black and clear waters along rivers, Amazonian gallery forests in valleys, and aquatic vegetation of poorly mineralized Amazonian swamp waters (Navarro 2011). Forests around the lakes and along rivers are used for small-scale agricultural activity. In contrast, the pampas, Cerrado patches, and savannahs are used for cattle ranching, with associated dry-season fires that create new pastures for livestock. Between 29 August and 26 September 2021, at the end of the dry season, we evaluated the diversity of amphibians and reptiles in the areas around the Iruyañez River (6 days), Lake Guachuna (10 days), Lake Rogaguado (7 days), and Lake Largo (6 days), all in the Great Tectonic Lakes of Exaltación region, using three established and complementary methods (active diurnal and nocturnal surveys and pitfall traps) to document herpetological diversity.

We conducted diurnal and nocturnal surveys through walks (occasionally by boat or truck) in gallery forests of the

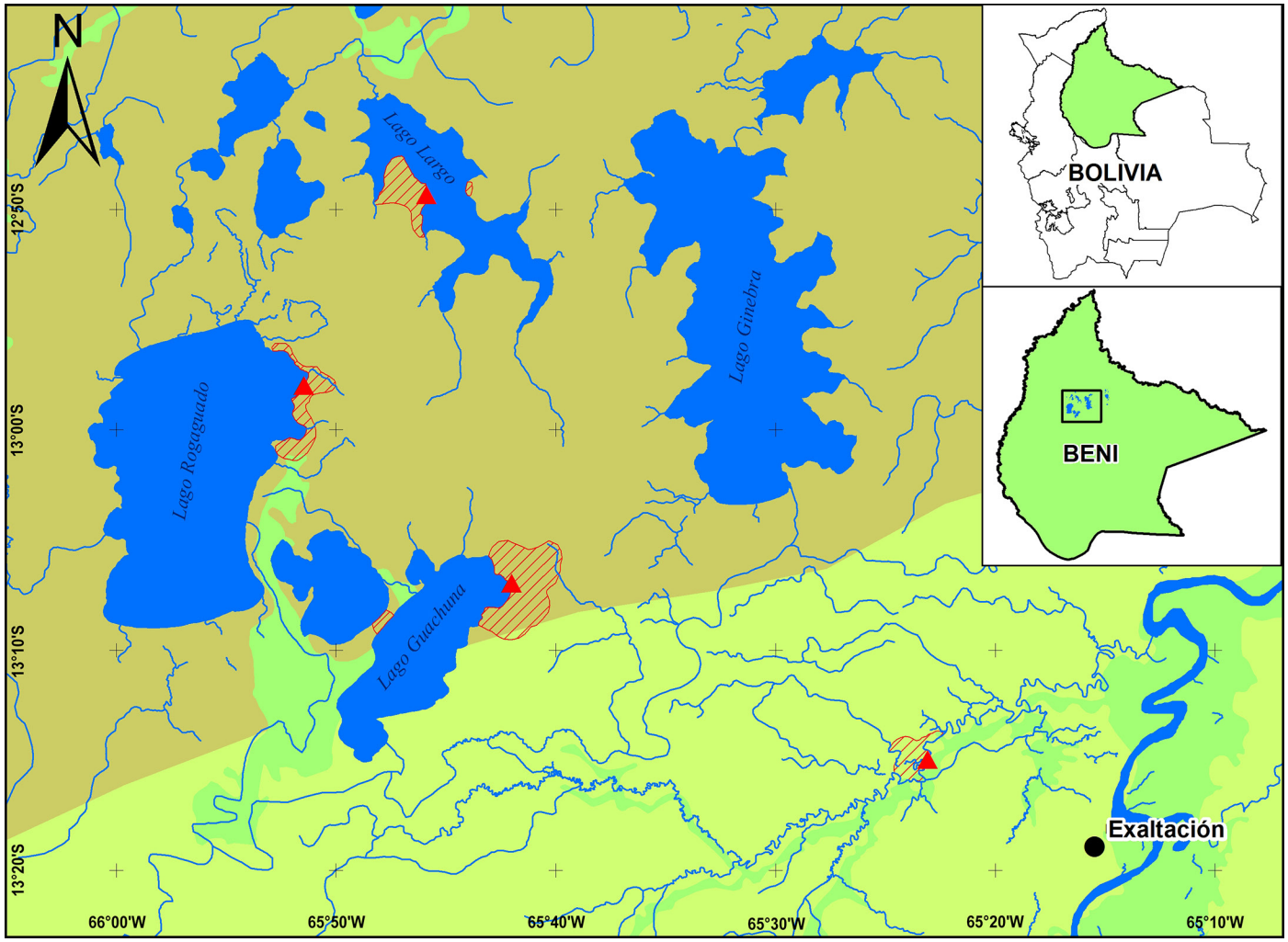

Figure 1. Herpetological sampling sites (red triangles) and intervening areas in the Great Tectonic Lakes of Exaltación, Beni, Bolivia. Ecoregions according to FAN (2016): Tan = Cerrado, light green = floodplains of the Llanos de Moxos, green = Southwestern Amazon Forest.

lakes, riparian forest, forest islands, chaparral, pampas or grasslands, and aquatic environments in the region. Diurnal surveys generally took place during mid-morning hours (0900–1200 h), a period with the greatest reptilian activity (particularly lizards and snakes), while nocturnal searches for amphibians, snakes, lizards, and amphisbaenians took place from sunset to around midnight (1900–2400 h). Pitfall traps with artificial barriers (plastic) were installed in primary and secondary forests at each camp to redirect and lead animals toward three buried buckets, one in the center and two at each end of the barrier. These methods were complemented by opportunistic observation and encounters. Common and easily identifiable species were recorded by direct observation or photographic records, but vouchers of rare species were collected.

Collected specimens were fixed and preserved according to preparation protocols of Cacciali (2013) and deposited in the herpetology collection of the Colección Boliviana de Fauna (CBF) in La Paz, and the Centro de Investigación de Recursos Acuáticos (CIRAH) in Trinidad, Beni. Taxonomic nomenclature follows Frost (2023) for amphibians and Uetz et al. (2024) for reptiles (except that we recognized Dipsadidae, considered a subfamily in the Reptile Database, as a family distinct from Colubridae). Threatened species categories follow the Bolivian Vertebrate Red Book (Aguirre et al. 2009) and the IUCN Red List of Threatened Species (IUCN 2023).

We prepared accumulation curves based on the days evaluated and calculated with the Software EstimateS 9.1.0 (Colwell 2013) and used the Jack 1 richness estimator to determine the expected richness of this region. We recorded relative abundance of each species by assigning them to one of four categories (Cortez-Fernández 2005): common (> 15 individuals), frequent (6–15 individuals), rare (2–6 individuals), and exceptional (1 individual). Likewise, we categorized habits for each species: terrestrial and/or semi-fossorial, arboreal, and aquatic or semi-aquatic (Rivas et al. 2022). In addition, we classified species according to size, differentiating between large (> 10 cm), medium sized (3.5–10 cm), and small (< 3.5 cm) amphibians and large (> 150 cm), medium sized (20–150 cm), and small (< 20 cm) reptiles.

Results and Discussion

During approximately 464 person-hours of active searches at the four sites evaluated, 29 days of active trapping, and additional opportunistic encounters, we recorded a total of 65 species (25 amphibians and 40 reptiles). Accumulation curves did not stabilize for amphibians (Fig. 2) or reptiles (Fig. 3) despite 29 days of sampling, indicating that additional sampling effort could add a substantial number of species. Jack-1 estimates indicated that amphibians could reach 30 species and reptiles 56 species (Figs. 2 and 3). Anurans had the greatest species richness (25 species), followed by snakes (19 species), lizards (15 species), turtles (4 species), and caimans (3 species).

Six anuran families (Bufonidae, Dendrobatidae, Hylidae, Leptodactylidae, Microhylidae, and Pipidae) were documented) (Table 1). Hylidae and Leptodactylidae were the most diverse, with ten species each, together representing 80% of all amphibian species recorded (Table 1, Fig. 4). *Leptodactylus,* with eight species, was the most speciose genus (Table 1, Fig. 4E–H). Diversity patterns in the forests and floodplains of the Beni Biosphere Reserve and Biological Station (and surrounding territories) and the city of Trinidad were similar (Middendorf and Reynolds 2000; Eversole et al. 2021; Rivas et al. 2023a).

In general, lowland anurans are relatively common and widely distributed in this region of Bolivia (De la Riva 1990; De la Riva et al. 2000; Köhler 2000; Reichle 2006; De la Riva and Reichle 2014; Rivas et al. 2022, 2023a). That 96% of the amphibians recorded during out surveys were typical lowland species and the vast majority were categorized as species of Least Concern (Aguayo 2009; Embert et al.

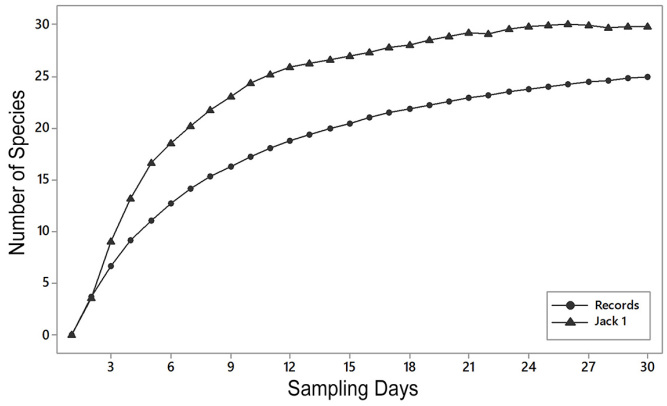

Figure 2. Amphibian accumulation curve for the Great Tectonic Lakes of Exaltación, Beni, Bolivia. Species records (points) and species richness estimated by Jack 1 (triangles).

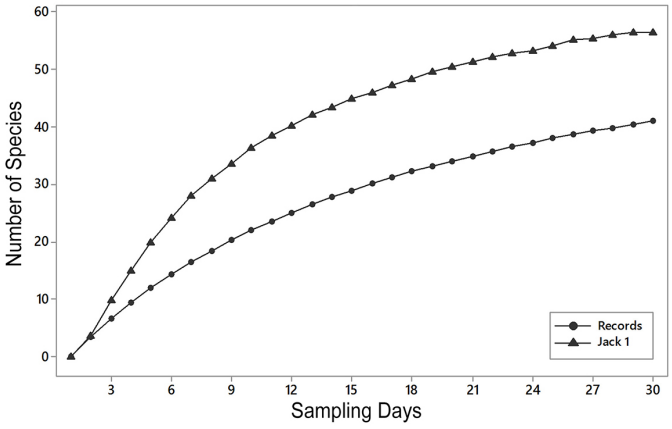

Figure 3. Reptilian accumulation curve for the Great Tectonic Lakes of Exaltación, Beni, Bolivia. Species records (points) and species richness estimated by Jack 1 (triangles).

Table 1. Amphibian and reptilian diversity of the Great Tectonic Lakes of Exaltación, Beni, Bolivia. Sites: RI = Iruyañez River, LG = Lake Guachuna, LR = Lake Rogaguado, LL = Lake Largo. Habitat: I = Gallery forest, II = Riparian forest, III = Forest island, IV = Chaparral, V = Pampas or Grasslands, VI = Aquatic environments. Method: 1 = Active searches, 2 = Pitfall traps, 3 = Opportunistic encounters. Threatened species categories (Bolivian Red Book and IUCN Red List): NE = Not evaluated, LC = Least concern, CD = Conservation dependent, NT = Near threatened, VU = Vulnerable.

Taxon	Site(s)	Habitat	Method	Red Book	Red List
AMPHIBIA: ANURA					
Bufonidae					
Rhinella major (Müller and Hellmich 1936)	RI, LG	I, II, V	1	LC	LC
Rhinella marina (Linnaeus 1758)	RI, LG, LR, LL	I, II, VI	1	LC	LC
Dendrobatidae					
Ameerega picta (Tschudi 1838)	LL	I, VI	1	LC	LC
Hylidae					
Boana albopunctata (Spix 1824)	LG, LR	I	1	LC	LC
Boana punctata (Schneider 1799)	LR, LL	I, VI	1, 3	LC	LC
Boana raniceps (Cope 1862)	RI, LR	I, II, V, VI	1	LC	LC
Dendropsophus minutus (Peters 1872)	LR	I, VI	1	LC	LC
Dendropsophus nanus (Boulenger 1889)	LR	I, VI	1	LC	LC
Lysapsus limellum (Cope 1862)	LR, LL	VI	1	LC	LC
Osteocephalus taurinus (Steindachner 1862)	LG, LR, LL	I	1	LC	LC
Scinax cf. *fuscomarginatus* (Lutz 1925)	LR	I	1	LC	LC
Scinax nasicus (Cope 1862)	RI, LG, LR	I, II, III, IV, V, VI	1	LC	LC
Trachycephalus typhonius (Linnaeus 1758)	RI, LR	I, II	1	LC	LC
Leptodactylidae					
Adenomera hylaedactyla (Cope 1868)	RI, LG, LR, LL	I, II	1, 3	LC	LC
Leptodactylus bolivianus (Boulenger 1898)	LL	I	1	LC	LC
Leptodactylus fuscus (Schneider 1799)	RI, LG, LR, LL	I, II, VI	1	LC	LC
Leptodactylus cf. *gracilis* (Duméril and Bibron 1840)	LG	I	1	LC	LC
Leptodactylus leptodactyloides (Andersson 1945)	RI, LG, LR, LL	I, II, VI	1, 3	LC	LC
Leptodactylus macrosternum (Miranda-Ribeiro 1926)	RI, LG, LR	I, II, VI	1	LC	LC
Leptodactylus podicipinus (Cope 1862)	LR	I	1	LC	LC
Leptodactylus vastus (Lutz 1930)	LG, LR, LL	I	1	LC	LC
Leptodactylus sp.	LL	I	1	—	—
Physalaemus albonotatus (Steindachner 1864)	RI, LG, LR	I, III	1, 3	LC	LC
Microhylidae					
Elachistocleis ovalis (Schneider 1799)	LG, LL	I, VI	1	LC	LC
Pipidae					
Pipa pipa (Linnaeus 1758)	LL	VI	1	LC	LC
REPTILIA: TESTUDINES					
Chelidae					
Phrynops geoffroanus (Schweigger 1812)	LR, LL	VI	1	LC	NE
Podocnemidae					
Podocnemis unifilis Troschel 1848	RI	VI	1	VU	VU
Testudinidae					
Chelonoidis carbonarius (Spix 1824)	LG	I, IV	1, 3	NT	NE
Chelonoidis denticulatus (Linnaeus 1766)	LG	I	1	NT	VU

REPTILIA: CROCODYLIA					
Alligatoridae					
Caiman yacare (Daudin 1801)	RI, LG, LR, LL	VI	1	LC	LC
Melanosuchus niger (Spix 1825)	RI, LG, LR, LL	VI	1	VU	CD
Paleosuchus palpebrosus (Cuvier 1807)	LG	I, VI	1	NT	LC
REPTILIA: SQUAMATA					
Dactyloidae					
Anolis fuscoauratus D´Orbigny 1837	LG	V	1	LC	LC
Anolis meridionalis Boettger 1885	LG	I	1, 3	LC	LC
Anolis ortonii Cope 1868	LR	I	1	LC	LC
Gymnophthalmidae					
Cercosaura eigenmanni (Griffin 1917)	LL	I	1	LC	LC
Cercosaura ocellata Wagler 1830	LG, LR	I	1	LC	LC
Cercosaura parkeri (Ruibal 1952)	RI, LG, LR	I, III	1	LC	LC
Iguanidae					
Iguana iguana (Linnaeus 1758)	RI	II	1	LC	LC
Scincidae					
Exila nigropalmata (Andersson 1918)	RI, LG, LL	I, III	1	LC	LC
Manciola guaporicola (Dunn 1935)	LG, LL	I, V	1	LC	LC
Teiidae					
Ameiva ameiva (Linnaeus 1758)	RI, LG, LR, LL	I, II, III, IV, V	1	LC	LC
Kentropyx calcarata Spix 1825	RI	II	1	LC	LC
Salvator merianae Duméril and Bibron 1839	RI, LG, LR	I, III	1	LC	LC
Tupinambis teguixin (Linnaeus 1758)	LR	I	1	LC	LC
Tropiduridae					
Stenocercus caducus (Cope 1862)	LG, LR, LL	I, IV	1	LC	LC
Boidae					
Corallus hortulana (Linnaeus 1758)	LR, LL	I	1	LC	LC
Colubridae					
Chironius exoletus (Linnaeus 1758)	LR, LL	I, V	1	LC	LC
Chironius flavolineatus Jan 1863	RI, LL	I, IV	1	LC	LC
Drymarchon corais (Boie 1827)	LG	I	1	LC	LC
Leptophis ahaetulla (Linnaeus 1758)	RI, LR	I, II	1	LC	LC
Mastigodryas boddaerti (Sentzen 1796)	LL	I	1	LC	LC
Palusophis bifossatus (Raddi 1820)	LG	I	1	LC	LC
Spilotes pullatus (Linnaeus 1758)	LR	I	1	LC	LC
Dipsadidae					
Erythrolamprus almadensis (Wagler 1824)	LR	V	1, 3	LC	LC
Erythrolamprus poecilogyrus (Wied-Neuwied 1824)	RI, LR	I, II, V, VI	1, 2, 3	LC	LC
Helicops leopardinus (Schlegel 1837)	LR, LL	VI	1	LC	LC
Helicops polylepis Günther 1861	RI	VI	1, 3	LC	LC
Hydrops triangularis (Wagler 1824)	LR	VI	1	LC	LC
Leptodeira annulata (Linnaeus 1758)	RI, LG, LR, LL	I, III	1	LC	LC
Thamnodynastes pallidus (Linnaeus 1758)	LG	I, V	1	LC	LC
Leptotyphlopidae					
Epictia sp.	RI	III	1, 2	—	—
Typhlopidae					
Amerotyphlops brongersmianus (Vanzolini 1976)	LG	I	1, 2	LC	LC
Viperidae					
Bothrops mattogrossensis Amaral 1925	LG, LL	I, VI	1	LC	LC
Crotalus durissus Linnaeus 1758	LG	IV	1, 3	LC	LC

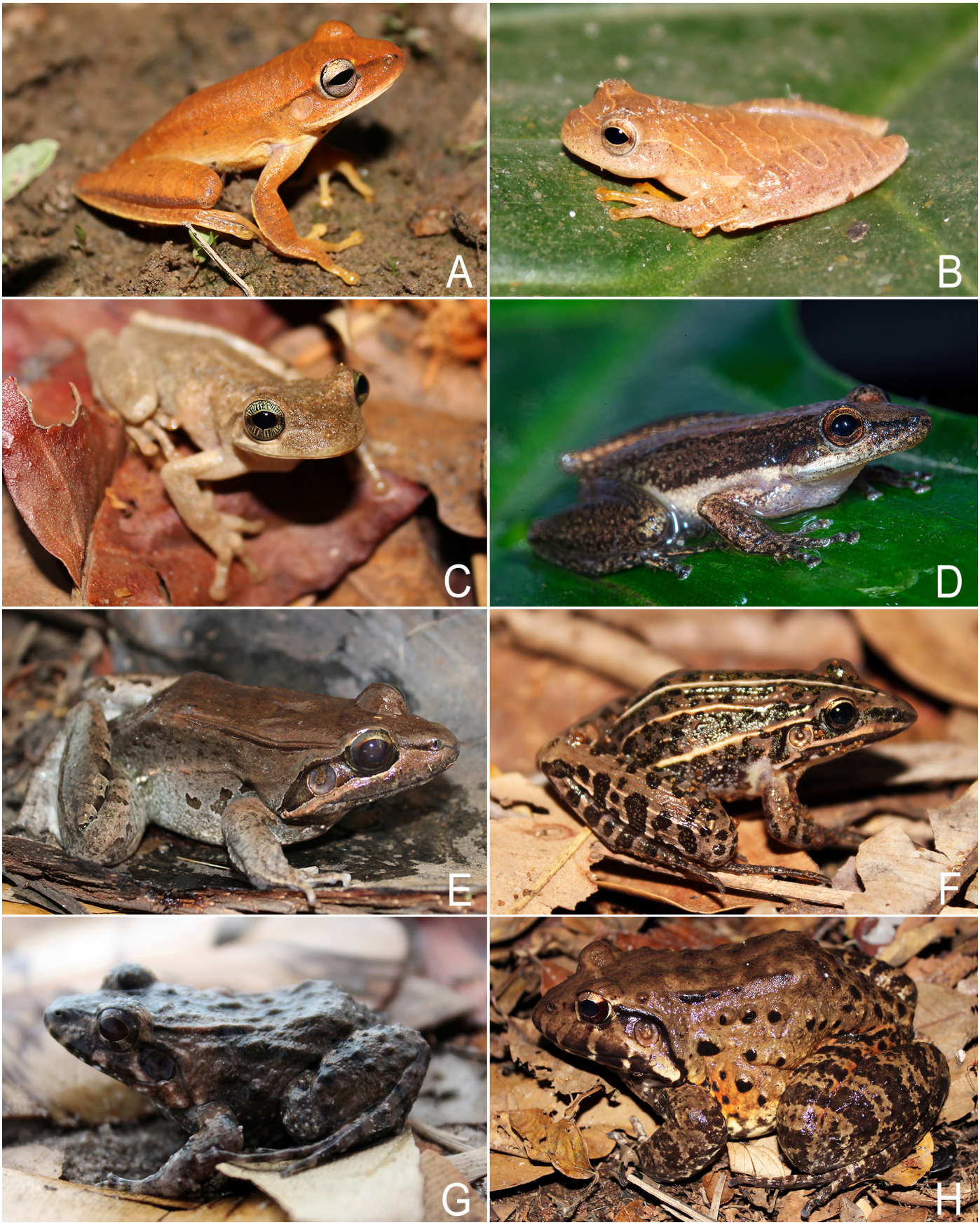

Figure 4. Some amphibians found in the Great Tectonic Lakes of Exaltación, Beni, Bolivia: *Boana albopunctata* (A), *Dendropsophus minutus* (B), *Osteocephalus taurinus* (C), *Scinax* cf. *fuscomarginatus* (D), *Leptodactylus bolivianus* (E), *Leptodactylus* cf. *gracilis* (F), *Leptodactylus* sp. (G), *Leptodactylus vastus* (H). Photographs by Luis Rivas (A–C, E–H) and Robert Wallace (D).

2011; De la Riva and Reichle 2014; Rivas et al. 2022, 2023a) was not surprising. However, the record of *Leptodactylus* cf. *gracilis* (Fig. 4F) is unique for the Great Tectonic Lakes of Exaltación; the species was recorded previously only in the Interandean Dry Forests and Tucuman-Bolivian Forests of southern Bolivia (De la Riva et al. 2000; De la Riva and Reichle 2014). This record (*L.* cf. *gracilis*) and those of *Scinax* cf. *fuscomarginatus* (Fig. 4D) and *Leptodactylus* sp. (Fig. 4G) require in-depth taxonomic studies to confirm identities and taxonomic status. Terrestrial and semi-fossorial anurans in the families Bufonidae, Leptodactylidae, Microhylidae, and Dendrobatidae comprise 56% of reported amphibian species, treefrogs in the family Hylidae 36%, and aquatic frogs in the families Hylidae and Pipidae only 8%. Large anurans (*Rhinella marina*, *Leptodactylus vastus*, *Leptodactylus bolivianus*) represent only 12%, medium-sized 60%, and small 28% of all recorded amphibians.

Reptiles at the Great Tectonic Lakes of Exaltación is composed of one crocodilian family (Alligatoridae), three families of turtles (Chelidae, Podocnemidae, and Testudinidae), and 12 families of squamates (Dactyloidea, Gymnophthalmidae, Iguanidae, Scincidae, Teiidae, Tropiduridae, Boidae, Colubridae, Dipsadidae, Leptotyphlopidae, Typhlopidae, and Viperidae) (Table 1). All are common inhabitants of the Bolivian lowlands (Fugler et al. 1995; Dirksen and De la Riva 1999; Embert 2007; Aliaga-Rossel et al. 2020; Domic-Rivadeneira et al. 2021; Rivas et al. 2023a, 2023b). Squamates accounted for ~ 83% of the total number of reptiles recorded, with colubrids and dipsadids, each with seven species, the most speciose families (Table 1, Fig. 5).

Lowland reptiles generally have broad distributions in various ecoregions across Bolivia (Fugler et al. 1995; Dirksen and De la Riva 1999; Embert 2007; Aliaga-Rossel et al. 2020; Rivas et al. 2022, 2023a) and South America (Avila-Pires 1995; Rueda-Almonacid et al. 2007; Nogueira et al. 2019); however, records are typically scarce due to the low detectability and cryptic habits of many species (Fugler et al. 1995; Dirksen and De la Riva 1999; Embert 2007; Rivas et al. 2018). In general, reports of reptiles from the Great Tectonic Lakes of Exaltación are typical lowland species, particularly from the Amazon forest, floodplains of the Llanos de Moxos, and Cerrado. However, the taxonomic status of one specimen, a blindsnake in the genus *Epictia* (Leptotyphlopidae), remains to be determined because of taxonomic uncertainties for this group in Bolivia. Most reptilian records are anecdotal, except for *Ameiva ameiva* and *Caiman yacare*, which are common in the region and other Bolivian lowlands (Fugler 1989; Gonzales 1998; Dirksen and De la Riva 1999; Ten et al. 2001; Cortez-Fernández 2005; Embert 2007; Harvey et al. 2012; Rivas et al. 2022, 2023a, 2023b).

Strictly fossorial reptiles (*Amerotyphlops brongersmianus* and *Epictia* sp.) represent only 5% of the total number of reported species, aquatic or semi-aquatic reptiles 19%, and arboreal reptiles 27%; the remainder (49%) are generalists but mostly terrestrial. Large reptiles account for 24% of registered species, medium-sized species 49%, and small species 27%. The large squamates (*Salvator merianae, Tupinambis teguixin*, *Drymarchon corais*, *Palusophis bifossatus, Spilotes pullatus*) are essential for the health of terrestrial ecosystems, providing a series of environmental services, particularly by controlling populations of invertebrates and vertebrates (Marques and Muriel 2007; Marques et al. 2014; Prudente et al. 2014), including venomous snakes (Elapidae and Viperidae), which can pose a danger for local villagers. *Salvator* and *Tupinambis* are harvested through subsistence hunting for their meat and skin by some indigenous peoples of the Bolivian lowlands (Tejada et al. 2006; Cortez 2009); however, in other regions of South America, they are harvested commercially (Yanosky and Mercolli 1992; De Bargas et al. 2003; Ferreguetti et al. 2018).

Two species of tortoises (*Chelonoidis denticulatus* and *C. carbonarius*) share the same habitats in the Great Tectonics Lakes of Exaltación and elsewhere in South America (Rueda-Almonacid et al. 2007; Domic-Rivadeneira et al. 2021) and likely compete for the same food resources. Their populations suffer intense pressures from subsistence hunting by local inhabitants and indigenous communities (Townsend 1996; Tejada et al. 2006), which also applies to Spectacled (*Caiman yacare*) and Black Caimans (*Melanosuchus niger*) throughout Bolivia (Liceaga et al. 2001; Cisneros and Van Damme 2005; Aguilera et al. 2008; Llobet et al. 2009; Rivas et al. 2023b).

Season is less of a factor in explaining detectability and abundance for reptiles than for amphibians, but the dry season is generally more favorable for finding and reporting reptiles. A large percentage of reptilian records were associated with gallery, riparian, and island forests, but a small number of species were also detected in other habitats. Due to the low number of encounters, ascertaining whether most species are specialists or habitat generalists is difficult.

Erythrolamprus poecilogyrus and *Thamnodynastes pallidus* are both widely distributed in South America but likely represent species or subspecies complexes (Nogueira et al. 2019; Entiauspe-Neto et al. 2021; Trevine et al. 2021), and few Bolivian publications refer to these taxa as *E. poecilogyrus* and *T. pallidus* (Fugler et al. 1995; Gonzales 1998; Ten et al. 2001; Cortez-Fernández 2005; Schalk et al. 2013; Mano-Cuellar et al. 2015; Eversole et al. 2021; Rivas et al. 2022, 2023a). As in Brazil (Entiauspe-Neto et al. 2021; Trevine et al. 2021), future taxonomic studies of these snakes should clarify the identity of these taxa.

Beni faces a series of challenges regarding land use and environment, with activities such as forestry, livestock, and industrial agriculture increasing considerably (De la Riva and Reichle 2014; FAN 2015; GAD Beni 2019). The impact of

Figure 5. Some reptiles found in the Great Tectonic Lakes of Exaltación, Beni, Bolivia: *Anolis ortonii* (A), *Cercosaura parkeri* (B), *Exila nigropalmata* (C), *Stenocercus caducus* (D), *Chironius flavolineatus* (E), *Drymarchon corais* (F), *Helicops polylepis* (G), *Amerotyphlops brongersmianus* (H). Photographs by Luis Rivas.

these activities on wildlife is poorly documented, but they likely have irreversible consequences. For example, livestock and other agricultural activities often are the cause of forest and pampas fires, the frequencies of which are among the highest in Beni, especially in Exaltación Municipality (FAN 2015). During our surveys, we observed a considerable number of fires in forests and particularly in the pampas, and this seasonal activity appears to be a frequent, possibly annual reality in the region. Herpetofaunal richness in post-burn chaparral and grasslands is poor compared to forests surrounding the lakes and rivers. Furthermore, colonization of such environments by amphibians is challenging, given the frequency of fires during the dry season. Fire is particularly threatening for slow-moving animals such as tortoises (Domic-Rivadeneira et al. 2021), the local species of which (*Chelonoides denticulatus* and *C. carbonarius*) are categorized as Near Threatened in the Bolivian Red Book (Cortez 2009) and *C. denticulatus* is listed as Vulnerable on the IUCN Red List (Tortoise & Freshwater Turtle Specialist Group 1996). Protecting the forests around the lakes and rivers is essential, as they act as barriers against fires and constitute a natural refuge for fauna.

Yellow-spotted River Turtles (*Podocnemis unifilis*, Vulnerable) and Spectacled Caimans (*C. yacare*) are important meat resources for the inhabitants of the region. We observed small numbers of *Podocnemis* along the Iruyañez River and many nests and signs on beaches, suggesting the presence of reproductive populations. We also encountered *C. yacare* in aquatic ecosystems at the four locations we surveyed. However, these populations could be placed at risk if the exploitation of *P. unifilis* eggs or large individuals of *C. yacare* is indiscriminate.

Local inhabitants of the Great Tectonic Lakes of Exaltación are in a daily, direct, and close relationship with nature. However, the indiscriminate killing of snakes is still common in the region, mainly attributable to the fear of these organisms and the false belief that all are venomous. The impact on regional snake populations is unknown, but educating residents regarding the importance and benefits of these organisms for nature and people is necessary. As for the other threats to the regional herpetofauna, the information derived from our work will be used to promote and implement conservation programs in collaboration with local stakeholders.

Acknowledgements

We thank the Dirección General de Biodiversidad y Áreas Protegidas of the Ministerio de Medio Ambiente y Agua for authorization of the scientific expedition to the Great Tectonic Lakes of Exaltación through Research Permit MMAYA/VMABCCGDF/DGBAP/MEG Nº0128/2019, to the Wildlife Conservation Society and the Llanos de Moxos Working Group for the invitation to participate in such an important scientific expedition, to the Gobierno Autónomo Municipal de Exaltación and the communities of the Cayubaba Indigenous Territory for accompanying us and participating in the herpetological research, and especially the field assistants from Exaltación, San Carlos, Coquinal, and Maravillas.

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