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Additions to the Reptile Fauna of Paraguay with Notes on a Small Herpetological Collection from Amambay

Roy W. MCDIARMID and Mercedes S. FOSTER



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Specimens in a small collections of reptiles and amphibians from Parque Nacional Cerro Corá, Departamento Amambay, Paraguay are reported. Included are the first records of *Bachia bresslaui*, *Phrynops gibbus*, and *Ololygon fuscomarginata* for that country. Brief notes on morphology, distribution, and natural history of species collected are included. The systematic status of *Phrynops tuberculatus vanderhaegei* is evaluated.

Roy W. McDiarmid and Mercedes S. Foster, Biological Survey Section
U.S. Fish and Wildlife Service, National Museum of Natural History,
Washington, D.C. 20560, USA

Introduction

In 1980, the National Forest Service of Paraguay began an inventory of the country's flora and fauna. Initial efforts were concentrated in the national parks in order to provide information for guides to the common organisms of these areas (e.g., Ministerio de Agricultura y Ganadería, 1982). With this renewed interest in the biota of Paraguay, records of species not previously reported from the country, as well as distributional information, are of interest, since the herpetofauna of Paraguay remains poorly known despite early (Boettger, 1885a, b; Boulenger, 1894; Peracca, 1904; Bertoni, 1914, 1939), and even more recent reports (Scott and Lovett, 1975; Talbot, 1977). In 1980 (3-18 September) and 1983 (31 October-4 November), MSF made small collections of reptiles (4) and amphibians (69) at Parque Nacional Cerro Corá, Departamento Amambay, Paraguay. Herein we report on those collections.

Parque Nacional Cerro Corá is located near the Brazilian border in northeastern Paraguay (ca. 22° 38' S, 56° 03' 30" W, elev. ca. 500 m), ca. 32 km WSW of Pedro Juan Caballero. It lies in an area of subtropical moist forest between the 22° and 23° isotherms, and 1400 and 1500 mm isohyets (Farina Sanchez, 1973). Several habitats are represented in the park, including (1) pasture and low scrub, the latter dominated by spiny ground bromeliads, in areas cleared and periodically burned; (2) very open, low (canopy ca. 6 m) woodland with a dense understory including ground bromeliads and columnar cacti; (3) tall (ca. 15-20 m) semideciduous forest with a relatively open understory, apparently selectively logged ca. 35 years ago; and (4) relatively undisturbed gallery forest with an open understory. Unless otherwise noted, amphibians were collected in 1980 around a small (< 1 ha), probably man-made lagoon in a cleared area, or in the vicinity of an impoundment (10-15 m across) behind a low (ca. 1.5 m) dam on a small stream in a sparse woods. In 1983, most specimens were taken along a flooded road and from adjacent flooded pasture. Specimens are deposited in the National Museum of Natural History, Washington, D.C. (USNM).

Species accounts

Bachia bresslaui.

One male (USNM 253142) was collected during the day on 14 September, 1980 from under a board in a grassy, wooded area. It represents the first record of this species from Paraguay and the southernmost record for the genus (Dixon, 1973), and extends the range ca. 1100 km SSE from the nearest known locality at Utiarati, Rio Papagaio, Mato Grosso, Brazil. The Mato Grosso specimen comes from the upper Tapajós drainage system, a north-flowing tributary of the Amazon (Vanzolini, 1966). The Paraguayan locality lies near the divide between the drainage of the Alto Paraná and Paraguay rivers, which join to form the major southward flowing river, the Paraná, draining portions of southern Brazil, Paraguay, and northeastern Argentina.

With his report of the Amazonian locality of the second known specimen of *B. bresslaui*, Vanzolini (1966) questioned the accuracy of the locality "S. Paulo," recorded for the holotype in the specimen catalogue of the Instituto Butantan. He considered the presence of the species in São Paulo doubtful. However the type description (Amaral, 1935:250) for the species "... do interior do Estado de S. Paulo" as the type locality, which, considering our record from a site within the drainage basin of the Paraguay River, appears accurate, albeit imprecise.

For the most part, the Paraguayan specimen agrees with the other two known individuals (Vanzolini, 1961, 1966) in details of scalation and color. Pertinent data are (characteristics differing from other specimens indicated parenthetically): snout-vent length 75 mm; tail length 88 mm, broken, may have been regenerated; scales around mid-body 35 (Dixon [1973] listed 33-35, but Vanzolini [1961, 1966] reported 35 in both known specimens); dorsal scales 50 (47-49), lanceolate, keeled; ventral scales 36 (but see below; Dixon [1973] listed counts of 37-38 in table 3, but of only 38 in the species account [p. 18]; Vanzolini [1961] reported 38 for both specimens); ventral scales quadrangular anteriorly but posterior margins of posterior ventral scales distinctly rounded and imbricate; gular scales 9; prefrontals absent; interparietal present, narrowly elongate; 1 preocular; 2 supraoculars; 1 postocular; temporals 0 + 1 (left), 1 + 1, supralabial 5 contacts parietal on left side through fusion with temporal 1; preanal pores 1 + 1; femoral pores 2 + 2 (1 + 2, 2 + 2); preanal scales 5 or 9 (4 + 5).

Dixon (1973) designated the enlarged scales immediately anterior to the anus as the preanal shields. He commented that three scales are normal unless they are divided transversally, forming two rows of shields. He reported six preanal scales (excluding two small lateral scales) for the specimen that Vanzolini (1966) described as having five preanal scales. Vanzolini obviously counted only the posterior row of enlarged scales and included two smaller laterals. Accordingly, Vanzolini's count of ventral scales rows is one higher than that reported by Dixon for the same specimen; the three scale range in ventrals (36-38) actually reflects different counting methods rather than different numbers of scale rows. Because the scales between the preanal pores are enlarged and distinct from the ventrals, we prefer to consider both rows as part of the preanal shield and record nine preanal scales. This interpretation changes the ventral scale range for the known specimens from 36-38 to 36-37.

Color and pattern of the Paraguayan specimen (Fig. 1) are paler than and slightly different from those in the other two specimens: dorsal head pattern similar to illustration of Amazonian specimen (Vanzolini, 1966:190), but less distinct and lacking dark lines on lateral margins of frontal and on parietals;

irregularly edged mid-dorsal stripe extending 5 dorsal scales onto body from posterior tip of interparietal and adjacent parietals, and dividing into a pair of dorsal lines separated by 2-3 dorsal scales that become interrupted dashes on posterior body, fading on tail; lateral brown stripes darkest on sides of head and neck, becoming fainter on sides, disappearing on tail; faint brown spots on chin and gulars; belly and ventral surface of tail cream. In life, dorsally light brown with dark brown lines; head very shiny medium brown; pale pinkish gray below; tail cream.

Phrynops gibbus.

One specimen (USNM 253211) taken at night, 14 September, 1980, represents the first record of *P. gibbus* from Paraguay. It was located on the mud bottom in shallow water at the edge of a small impoundment. The pond contained a dense growth of floating (*Eichhornia crassipes*) and submerged vegetation. This record represents a range extension to the southeast of ca. 2500 km from the closest published locality record at Yarinacocha, Rio Ucayali in east central Peru (Pritchard and Trebbau, 1984).

Ernst (1981a) indicated a locality in the central Amazon Basin (estimated from his map [p. 279.1] at ca. 5° S, 60° W) in the state of Amazonas, Brazil, but he did not mention the record in the text. This may account for its omission from the distribution map of *P. gibbus* in Pritchard and Trebbau (1984: fig. 21). The record (C. H. Ernst, pers. comm.) is based on a specimen (USNM 257780) collected in 1979 by R.I. Crombie (pers. comm.) 54 km (by road) ± SW Itaituba, Parque Nacional da Amazônia, Rio Tapajós, Brazil (4° 41' S, 56° 21' W). This locality (Fig.2) is actually in the states of Pará, lying ca. 400 km E of the locality in Amazonas, that Ernst plotted (1981a).¹ It is about 2000 km N of our Paraguayan locality.

If *Emys stenops* (Spix) is a synonym of *P. gibbus*, as originally proposed by Bour (1973), then Spix's record of this form from the bank of the Rio Solimões (that portion of the Amazon river between 60° and 70° W latitude, extending from the Brazilian border near Leticia, downstream to the Rio Negro near Manaus (Vanzolini, 1981) places *P. gibbus* well within the Amazon basin. Ernst (1981a) and Pritchard and Trebbau (1984) apparently accepted this synonymy but did not include the locality for the holotype of *E. stenops* on their maps. Vanzolini (1981:xix), probably following Wermuth and Mertens (1961), listed *E. stenops* (Spix) as a synonym of *Phrynops rufipes* (Spix). However, Hoogmoed and Gruber (1983) redescribed the type and confirmed Bour's conclusion that *E. stenops* is a juvenal *P. gibbus*. Even though Pritchard and Trebbau (1984: fig. 21) depicted a major hiatus in the range of *P. gibbus*, we suspect that additional field work will show that it is widespread, although perhaps not common, in appropriate habitats throughout northern Brazil north of the Amazon.

In 1983, three additional specimens (CM 94314-15, 94322) of *P. gibbus* were taken at Cerro Corá, and a fourth (MNHNP 127522) from San Lorenzo, Departamento Central, east of Asunción, Paraguay. These five specimens are the southernmost records for the species, and the first from the south-flowing Paraná drainage system. Measurements of these Paraguayan specimens are given in Table 1. All agree with the definition in Ernst (1981a) and the photographs and description in Pritchard and Trebbau (1984).

After comparing our five specimens to *P. gibbus* recently collected along the Rio Santiago in Amazonas (4), and along the Rio Tambopata in Madre

¹ The locality record for *Rhinoclemmys punctularia* (Ernst, 1981: 276.1) from the central Amazon basin is also plotted in error; it is based on a specimen (C.H. Ernst, pers. comm.) taken near the *P. gibbus* locality, also in Parque Nacional da Amazônia on the Rio Tapajós. The presence of *R. punctularia* in the central Amazon basin is confirmed by three specimens (two in the Museum of Comparative Zoology, Harvard University [MCZ 2061 and 4060] from Amazonas, and one in the American Museum of Natural History [AMNH 62584] from Pará), that were examined by Ernst (1978) and listed by Pritchard and Trebbau (1984), but omitted from Ernst's map (1981b).

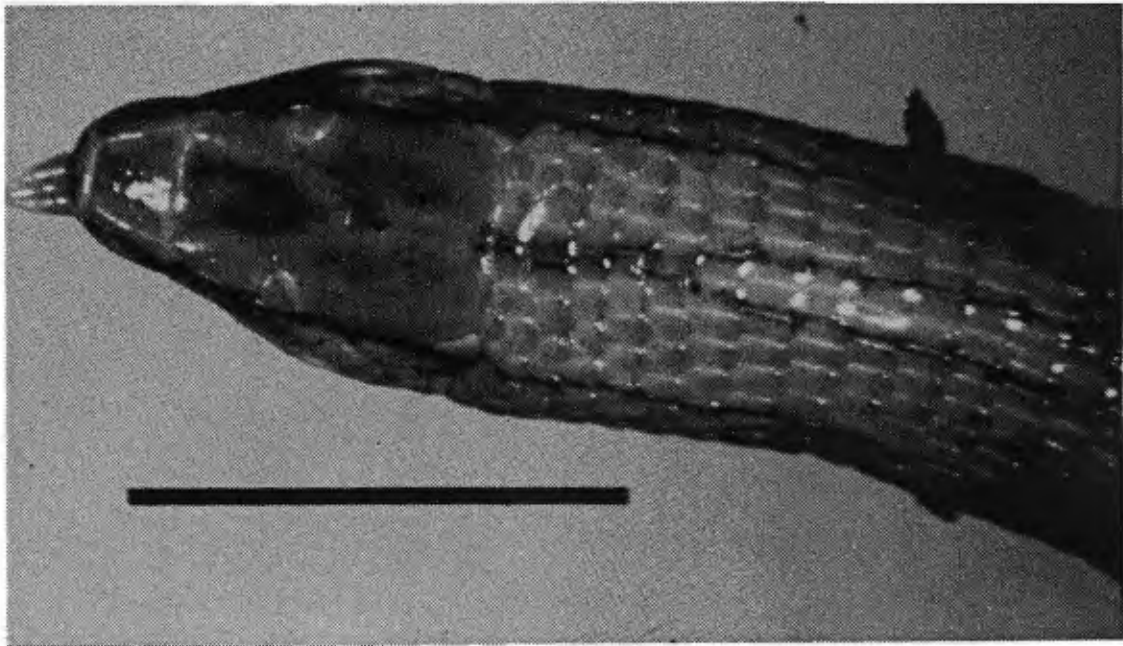


Fig. 1. Dorsal view of head and anterior body of *Bachia bresslaui* (USNM 253142). Line = 10 mm.

de Dios (1), Peru, and from the Rio Tapajós, Pará, Brazil (1), we have concluded that they are not specifically distinct, since size, proportions and coloration generally agree. The Rio Santiago records are the western most for the species and extend the range of *P. gibbus* along the Rio Alto Marañon above the Pongo Manseriche into the Rio Santiago drainage. The Rio Tambopata material extends the previously reported range of *P. gibbus* in Peru about 800 km from Yarinococha. This locality is about 1400 km northwest of the Paraguayan localities and is the first from the Rio Madeira drainage, a major north flowing tributary of the Amazon. These records will be reported in more detail elsewhere (McDiarmid, unpubl. data). The range of *P. gibbus* as currently known is shown in Figure 2.

We also compared our specimens to the brief description of *Phrynops tuberculatus vanderhaegei* given by Bour (1973), who listed the type specimen as a living adult male, without a number, probably from the vicinity of Asunción, Paraguay. The sizes and proportions of the specimens agree; minor details of colorations differ as follows (data from Bour in parentheses): head uniform dark gray with indistinct small tan spots, especially laterally (gray with brown or orange vermiculations); color on throat and neck yellow, yellow with gray markings, or diffuse gray (uniform pale yellow); plastron color varying from dark brown with paler edges of gular, femoral, and anal margins to yellowish tan with darker brown blotches on intergular, humerals, pectorals, and femorals with gulars and anals uniformly pale (plastron covered with central dark brown blotch with extensive pale, pigmentless areas on intergular, gulars, humerals, femorals, and anal scutes, especially along the seams) - some of the dark coloration on certain of our specimens may be largely the result

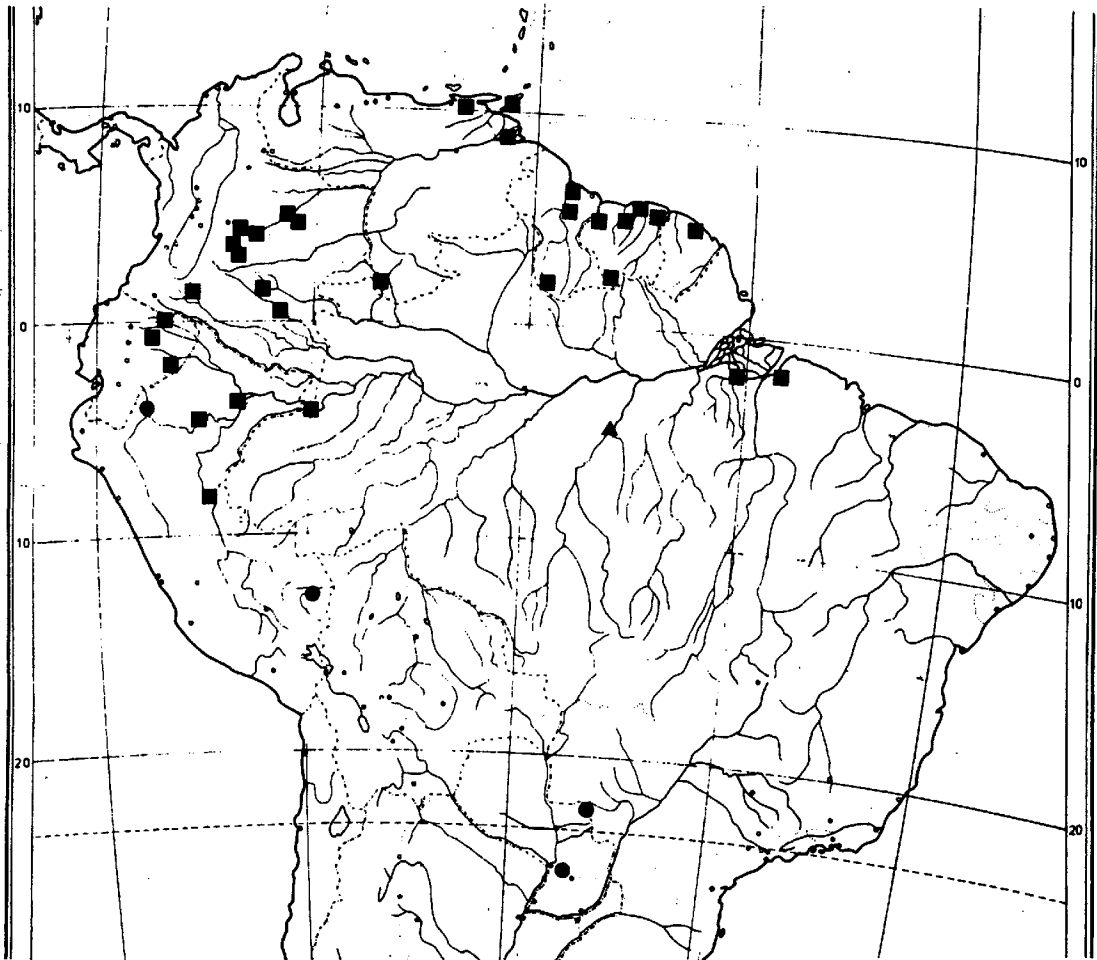


Fig. 2. Distribution records of *Phrynops gibbus*. Squares = localities taken from Mittermeier et al. (1978); triangle = correctly plotted locality of USNM 257780 (see text); dots = localities of specimens reported herein. Type locality of *P. t. vanderhaegei* insufficiently precise to plot (Bour, 1973).

of staining; upper jaws with faint dark streaks, lower jaws with or without faint marks (jaws pale yellow).

Bour (1973) remarked that in coloration and certain peculiarities of morphology, *P. t. vanderhaegei* strongly resembled *P. gibbus*. The only characteristics he listed that seem to be diagnostic are the absence of axillary scutes (which he questioned as anomalous) and the partial separation of the supracaudal scutes by the posterior extension of the last vertebral scute. Examination of the axillary condition in *P. gibbus* shows that the scute character is variable (visible on only one side in a specimen from Peru); again, no difference between the Paraguayan specimens and *P. gibbus* from Peru was found.

The alleged supracaudal separation by the vertebral scute cannot be seen in the photographs of the living type. Unfortunately, the photograph of a second purported specimen of *P. vanderhaegei* (Pritchard, 1979) does not allow evaluation of this characteristic. Most specimens of *P. gibbus* that we examined, including the Paraguayan material, have a straight or nearly straight seam between the last vertebral and the supracaudals. In a few specimens (CM

Table 1. Measurements (mm) of specimens of *Phrynops gibbus* from Paraguay. CL = carapace length (straight line); CW = carapace width; PLmi = plastron length (midline); PLma = plastron length (maximum); SD = shell depth (maximum); ALW = width of anterior lobe of plastron; PLW = width of posterior lobe of plastron; ASW = width of anal scutes (maximum); BW = bridge width; HW = head width (maximum)

Mus.	No.	Sex	CL	CW	PLmi	PLma	SD	ALW	PLW	ASW	BW	HW
USNM	253211	M	143	101	117	128	46	73	63	44	30	29
CM	94314	M	172	115	141	152	55	81	71	50	34	34
CM	94322	F	146	100	123	133	47	73	63	45	30	30
CM	94315	F	192	132	156	169	67	94	87	55	41	37
MNHNP	127522	F	200	141	168	184	68	100	93	70	45	41

94314, 94322), however, a posterior extension of the last vertebral along the midline inserts slightly into the suture between the supracaudals. In our opinion, this trait is variable and not useful in distinguishing the Paraguayan population.

Based on the above comparisons, we conclude that Bour's *vanderhaegei* is more similar to *P. gibbus* than to *P. tuberculatus*, and in fact, we see no consistent way of distinguishing them. We thus consider all material from Paraguay to be representative of a single species, *P. gibbus*. Pritchard (1979) also considered *vanderhaegei* to be distinct from *P. tuberculatus*, primarily on the basis of the stated range and Bour's (1973) indication that it lacked neck tubercles and had a brown plastron. Whether populations of this wide ranging species are geographically recognizable, will be determined only after detailed analysis of its geographic variation. All characteristics that Bour (1973) listed in his description (except as noted above) are approximated by or included within the variation seen in the material we examined from Paraguay, Peru and Brazil, or encompassed by data and photographs in Pritchard and Trebbau (1984). Nevertheless, specimens are few, and recent collection of *P. gibbus* from outside its previous known range indicates the need for more extensive sampling in appropriate habitat in the southern portions of the Amazon Basin.

Surprisingly, Pritchard assigned (1979:783) *vanderhaegei* to the subgenus *Batrachemys* which he defined as a group of species with heads broader (greater than 21% of carapace length) than those of species in the subgenus *Mesoclemmys*. Yet the head width of the type of *vanderhaegei* is only 20% of the carapace length (Bour 1973). Our Paraguayan specimens of *P. gibbus* also have a relatively narrow head (20% or less of carapace length). The significance of these proportions, particularly with regard to subgenera, is unknown since only limited information on allometric changes and geographic and sexual variation in size in *Phrynops* is available (Rhodin and Mittermeier, 1983; Pritchard and Trebbau, 1984). Until growth patterns, and variation in size and proportions are known, use of these characteristics to separate taxa is inappropriate.

***Ololygon fuscomarginata*.**

(USNM 253100-253102; 1 Nov.). A large chorus of this species was present on the nights of 31 October to 3 November in an area of pasture flooded to a depth of ca. 40 cm. Males were perched head above, ca. 15 to 30 cm. above the water, parallel to the length of narrow laves of a dense, emergent grass. The calling frogs were always positioned with their heads thrown back, forelimbs extended, and golden-yellow vocal sacs inflated. Several pairs were in amplexus. To the best of our knowledge, these are the first published records of the species from eastern Paraguay. Duellman (1977) listed Paraguay in the range of this species, but that may have been based on its reported occurrence in Argentina, a report discounted by Cei (1980), who stated that *O. fuscomarginata* cannot be considered a member of the Argentine batrachofauna.

Other species collected at Cerro Corá.

Botrops moojeni (USNM 253143-144, 15 Sept.),

Bufo paracnemis (USNM 253603, tadpoles near metamorphosis, 14 Sept.; many adults observed).

Leptodactylus labyrinthicus (USNM 253115, adult and USNM 253610, tadpoles, 3 Nov.).

L. gracilis (USNM 253114, 2 Nov.).

L. fuscus (USNM 253106, 13 Sept., only individual seen that month: USNM 253107, 253108-110, 253111-113, 31 Oct.-2 Nov., common).

L. podicipinus (USNM 253116-120, 153121, 253122, 253124-125, 3, 13, 14 Sept., 2 Nov.).

Adenomera hylaedactyla (USNM 253105, 3 Sept.).

Pseudopaludicola ameghini (USNM 253138, along creek through forest, 18 Sept.; USNM 253139-140, in flotted pasture, 3 Nov.).

Physalaemus centralis (USNM 253126, 14 Sept.).

P. cuvieri (USNM 253127-128, 3 Nov.).

Physalaemus nattereri (USNM 253129-130 and 253131 [skel.], 253132-135, 253136, adults, USNM 253612, eggs; 13, 14, 15, Sept., 3 Nov.; first collected at night, 13 Sept., following heavy rain during the day; most hopping along dirt road and covered with sandy soil as if recently emerged from burrows; occasional individuals heard calling at the lagoon 13 Sept., vocal sac black, mottled yellow-green; on 14 Sept., 10-15 individuals chorusing there, several amplexing pairs, and eggs deposited in foam nests floating at water's surface, but generally attached to bank under overhanging vegetation [reproductive behavior and larval development of these species in the state of São Paulo, Brazil, described by Vizotto, 1967]).

P. santafecinus (USNM 253137, 3 Nov.).

Hyla nana (USNM 253086-093, 253094, 253095, 3, 13 Sept., 31 Oct.; common during both visits; calling in mixed choruses with *H. bivittata* from vegetation emergent from and adjacent to lagoon and flooded pasture, 31 Oct.-3 Nov.).

H. bivittata (USNM 253084, 253085, 253080-083, adults, and USNM 253604-605, 253606, tadpoles, 3, 13 Sept., 31 Oct., 3, 4 Nov.; common during both visits).

Ololygon eringiophila (USNM 253096 31 Oct.).

O. x-signata (USNM 253103-104, 13 Sept.).

Chiasmocleis albopunctata (USNM 253141, 31 Oct., species chorusing in flooded pasture).

Also included in the collection were one kind of hylid tadpole (USNM 253607-608, 3, 4 Nov.) and two kinds of letdodactylid tadpoles, possibly of the genus *Physalaemus* (USNM 253611, 253613, 3 Nov.), that we were unable to identify to species. A fourth unidentified species (USNM 253609, 4 Nov.) is represented by two tadpoles (Gosner stages 40, 41) with small toe discs and reduced webbing suggestive of the hylid *Aplastodiscus perviridis*. However, comparison of these specimens to the description of the larva of *A. perviridis* (Caramaschi et al., 1980) indicates that some other species is represented. The tadpoles have a sinistral, horizontally oriented spiracle free from border and longer than eye width; anal opening appears dextral; mouth small, directed anteroventrally; disc entire, bordered by single row of small papillae, interrupted anteriorly; tooth row formula 1, 1-1/3; body subovoid, light brown; eyes dorsolateral, not forming lateral profile from above; caudal musculature pale with faint marking, darkest along midline on anterior quarter of tail; dorsal fin deepest, moderately pigmented to tip, ventral fin depth ca. 60% of dorsal, clearer, with faint concentrations of pigment; total length 58 mm, body length 15 mm (second specimen with damaged tail).

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Resumen

Se informa acerca de una colección pequeña de reptiles y anfibios del Parque Nacional Cerro Corá, Departamento Amambay, Paraguay. Se incluye los primeros registros de *Bachia bresslaui*, *Phrynops gibbus*, y *Oloolygon fuscomarginata* del país. Además, hay informes breves sobre las morfologías, las distribuciones, y las historias naturales de las especies que se ha coleccionado, y comentario sobre la taxonomía de varias especies de *Phrynops*.

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STUDIES ON NEOTROPICAL FAUNA AND ENVIRONMENT

Ecology and Systematics

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