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Twenty-eight new and significant departmental reptile records for Paraguay

Veintiocho nuevos y significativos registros departamentales de reptiles para Paraguay

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ABSTRACT

Twenty-eight new distribution records are reported for twenty-seven species of Paraguayan reptiles. Eleven of these species are considered threatened at the national level (6 EN, 3 VU, 2 DD). Twenty two new departmental records are documented: *Phrynops hilarii* (Chelidae) in Misiones department; *Homonota marthae*, *Phyllopezus przewalskii* (Phyllodactylidae), *Philodryas bar-*

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oni and *P. psammophidea* (Colubridae) in Presidente Hayes department; *Teius oculatus* (Teiidae), *Cercosaura schreibersii* (Gymnophthalmidae), *Ophiodes intermedius* (Diploglossidae), *Amphisbaena mertensii* (Amphisbaenidae), *Boiruna maculata* and *Philodryas aestiva* (Colubridae) in Caazapá department; *Amphisbaena alba* (Amphisbaenidae) in Caaguazú and Cordillera departments; *Bothrops jararaca* (Viperidae), *Eunectes notaeus* (Boidae), *Helicops leopardinus* and *Hydrodynastes gigas* (Colubridae) in Guairá department; *Apostolepis dimidiata*, *Atractus paraguayensis* and *Mussurana bicolor* (Colubridae) in Itapúa department; and *Epicrates crassus* (Boidae) and *Phalotris nigrilatus* (Colubridae) in Concepción department. Significant range extensions of threatened or poorly-known species are also documented: The known distribution of the Endangered *Salvator duseni* (Teiidae) is extended 128.5 km to the east within Canindeyú department; that of the Vulnerable *Boa occidentalis* is extended 109.2 km to the southwest within Boquerón department; that of the Vulnerable *Epicrates alvarezi* (Boidae) is extended 136.6 km to the west within Boquerón department and 172.4 km to the northeast into Alto Paraguay department; that of *Caiman yacare* (Alligatoridae) is extended 132 km west within Boquerón department to the northern reaches of the Pilcomayo River. We also document an additional specimen of the rare *Philodryas agassizii* (Colubridae) and confirmation of the occurrence of the disputed form *Phalotris* "*punctatus*" in Paraguay.

Keywords: Caiman, distribution, herpetology, lizards, Neotropics, snakes.

RESUMEN

Se reportan veintiocho nuevos registros de distribución para veintisiete especies de reptiles de Paraguay. Once de estas especies están consideradas amenazadas a nivel nacional (6 EN, 3 VU, 2 DD). Se documentan veintidós nuevos registros departamentales: *Phrynops hilarii* (Chelidae) en el departamento de Misiones; *Homonota marthae*, *Phyllopezus przewalskii* (Phyllodactylidae), *Philodryas baroni* y *P. psammophidea* (Colubridae) en el departamento de Presidente Hayes; *Teius oculatus* (Teiidae), *Cercosaura schreibersii* (Gymnophthalmidae), *Amphisbaena mertensii* (Amphisbaenidae), *Boiruna maculata* y *Philodryas aestiva* (Colubridae) en el departamento de Caazapá; *Amphisbaena alba* (Amphisbaenidae) en los departamentos de Caaguazú y Cordillera; *Bothrops jararaca* (Viperidae), *Eunectes notaeus* (Boidae), *Helicops leopardinus* y *Hydrodynastes gigas* (Colubridae) en el departamento de Guairá; *Apostolepis dimidiata*, *Atractus paraguayensis* y *Mussurana bicolor* (Colubridae) en el departamento de Itapúa; y *Epicrates crassus* (Boidae) y *Phalotris nigrilatus* (Colubridae) en el departamento de Concepción. También se documentan extensiones significativas del rango de especies amenazadas o poco conocidas: La distribución de *Salvator duseni* (Teiidae), en peligro, se extiende 128.5 km hacia el este dentro del departamento de Canindeyú; la de *Boa occidentalis* (Boidae), vulnerable, se extiende 109.2

km hacia el suroeste dentro del departamento de Boquerón; la de *Epicrates alvarezi* (Boidae), vulnerable, se extiende 136.6 km hacia el oeste dentro del departamento de Boquerón y 172.4 km al noreste hacia Alto Paraguay department; y la de *Caiman yacare* (Alligatoridae) se extiende 132 km hacia el oeste dentro del mismo departamento hasta los alcances norteños del Río Pilcomayo. También se documenta un ejemplar adicional de la especie rara *Philodryas agassizii* (Colubridae) y confirmación de la existencia de la forma incierta *Phalotris* "*punctatus*" en el Paraguay.

Palabras clave: Caiman, distribución, herpetología, reptiles, Neotropicos, serpientes.

INTRODUCTION

The publication of Cacciali et al. (2016b), which reviewed the state of knowledge on the distribution of Paraguayan reptiles, inspired a massive uptick in publications relating to biogeography, taxonomy and distribution. A single reference work summarizing current knowledge enabled researchers and amateurs alike to see the gaps in our knowledge, and to focus work to close them. Thus, in recent years the known distribution of several species has been extended to new departments (Motte, Barreto, Martínez, 2016; Atkinson, Smith, Sarvary, 2017; Buongermini and Cacciali, 2017; Zaracho, Tedesco, Motte, Yanosky, 2017; Martínez, Motte, Bauer, 2018; Martínez, Cacciali, Bauer, Cabral, Tedesco, 2019; Zárate, Núñez, Ortíz, Mendoza, Weiler, 2019; Cañete, Martínez, Bauer, 2020; Martínez, Bauer, Espínola, Goossen, 2020a; Martínez, Bauer, Espínola, Motte, 2020b; Mendoza Galeano, Nuñez, Zárate, Ortíz, Weiler, 2020; Ríos, Bascoulès, Vera, Smith, 2020; Goosen and Martínez, 2021; Motte, Bauer, Martínez, Bogarín, Goosen, 2021; Bueno-Villafañe, Bóveda, Valiente, Schaerer, Baez et al., 2022; Hicks, Burró, Wang, Dickens, Davies, 2022; Vetter, Bauer, Martínez, 2022; Cacciali, Rodríguez, Motte, 2023; Maciel, in press; Smith, Nicolay, Vera Burró, Redin Hurtado, Smith, 2024), there have been new country records (Atkinson, Smith, Dickens, Lee-Zuck, 2018; Carosini, Bueno-Villafañe, Caballero-Gini, Netto, 2021; Smith, Hicks, Brouard, 2021; Cacciali and Ortega, 2023), new taxonomic revalidations (Cacciali, Cabral, Ferreira, Köhler, 2016a; Cacciali, Martínez, Köhler, 2017a) and even new species to science described (Cacciali, Morando, Medina, Köhler, Motte, 2017b; Cacciali, Lotzkat, Gamble, Köhler, 2018a; Cacciali, Morando, Avila, Köhler, b; Cabral and Cacciali, 2021; Smith, Brouard, Cacciali, 2022). The growth of citizen science platforms (eg. GBIF, iNaturalist etc.) has also enabled a wider net of participants in this process, with users from different backgrounds sharing their observations and helping to document the herpetofauna of the more under-sampled areas of the country.

In this note, we provide photographic and specimen documentation of twenty-two additional departmental records as well as significant range extensions for six reptile species of interest.

MATERIAL AND METHODS

All specimens cited were collected using a range of accepted sampling techniques (Ribeiro-Júnior, Gardner, Ávila-Pires, 2008). These include pitfall trapping, active searching, collection of roadkill/dead specimens and incidental pickups. Voucher specimens were collected and, when necessary, dispatched ethically and humanely using techniques described by Simmons (2015) and were collected under permits from the Ministerio del Ambiente y Desarrollo Sostenible of Paraguay (MADES). All cited specimens are preserved and housed in the following registered Paraguayan collections: Colección Zoológica de la Fundación Para La Tierra (CZPLT-H) and Museo Nacional de Historia Natural del Paraguay (MNHNP). Species identifications were confirmed using external morphological characteristics, including general pattern/colouration, scale counts, and morphometrics with reference to original descriptions, cited taxonomic revisions and identification literature (Cei, 1993; Cacciali, 2024). Species that can be confidently and unequivocally identified from clear external characteristics were also included as photographic records. Taxonomy follows the online Reptile Database. (https://reptile-database.reptarium.cz/). All the localities for records mentioned are mapped in Fig. 29.

RESULTS

Testudines
Chelidae

Spot-bellied Side-neck Turtle, *Phrynops hilarii*
(Duméril and Bibron, 1835)

On 31 October 2019 an individual of this species was encountered crossing the road on Ruta Nacional XX, c. 4 km north of the entrance to Ayolas at the crossroads towards Atinguy (27°19'49.0"S 56°46'19.2"W), Misiones department by SG (Fig. 1). The individual had a carapace length of 400 mm and was identifiable based on the distinctive carapace shape and head pattern (Richard 1999). This is the first record of the species in Misiones department, Paraguay and the first report from the Paraguayan stretch of the lower Paraná River Basin. However, it is not unexpected given the known distribution of the species in Argentina (Buenos Aires, Chaco, Córdoba, Corrientes, Entre Ríos, Formosa, Misiones, Santa Fe, Santiago del Estero) (Richard, 1999; Derocco, Alcalde, Rosset, 2006; Cabrera, 2022). Previously, the species was known from just three Paraguayan records, all

Fig. 1. *Phrynops hilarii*, between Santiago de Misiones and the access road to Ayolas, Misiones department (Sergio Galeano 31 October 2019).

in the watershed of the Paraguay River (Cacciali, Scott, Aquino, Fitzgerald, Smith, 2016b). There are single literature records from Alto Paraguay/Presidente Hayes (Riacho Mosquito; Krieg, 1948), Concepción (near Concepción; Marano, 2011) and Ñeembucú (Pilar; Giraudo and Contreras, 1994) departments, in addition to a specimen collected by Captain Thomas J. Page (USNM 7320), that dates from a time when the borders of Paraguay were much greater. The species is considered "Endangered" in Paraguay (Martínez et al., 2020c).

Squamata
Phyllodactylidae

Martha's Straight-toed Gecko, *Homonota marthae*
Cacciali, Morando, Ávila and Kohler 2018

A recently described species endemic to the central Paraguayan Chaco, with all published records from Boquerón department. Remarkably there is no previously published record of this common Chaco gecko for Presidente Hayes department, although it is well known that it occurs there, and the closest locality is Toro Mocho (Boquerón department), about 4 km from the departmental border (Cacciali, Brusquetti, Bauer, Sánchez, 2007). Thus, we document its presence with three specimens CZPLT-H 2328, 2329 (11 October 2021), and CZPLT-H 2373 (12 March 2023) all from Laguna Capitán

Fig. 2. *Homonota marthae*, Chaco Lodge, Presidente Hayes department (Jean-Paul Brouard 23 September 2013).

(22°32'56.1"S 59°43'20.5"W), and a photographic record from Chaco Lodge (22°43'08.5"S, 59°59'58.3"W) on 23 September 2013, by JPB (Fig. 2). The species was Not Evaluated by Martínez et al. (2020c) but is a common peridomestic species in the central Chaco and thus seems likely to be of "Least Concern" in Paraguay.

Chaco Leaf-toed Gecko, *Phyllopezus przewalskii* Koslowsky, 1895

An adult CZPLT-H 1408 collected on 12 January 2019 at Pirahú (23°35'59.9"S 58°45'20.1"W) is the first documentation for Presidente Hayes department and very marginally the southernmost record in Paraguay. We also include an earlier photographic record from Chaco Lodge (24°43'08.5"S 59°59'58.3"W), Presidente Hayes department on 23 September 2013, by JPB (Fig. 3) suggesting a wide distribution in the department. The species has now been documented to occur in the Chaco and Cerrado of Alto Paraguay, Amambay, Boquerón, Concepción and Presidente Hayes departments (Cacciali et al., 2016b). It is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 3. *Phyllopezus przewalskii*, Chaco Lodge, Presidente Hayes department (Jean-Paul Brouard 23 September 2013).

Gymnophthalmidae

Schreiber's Cercosaur, *Cercosaura schreibersii*
Wiegmann, 1834

An adult found dead in Barrio San Roque, Caazapá (26°11'35"S 56°22'12"W), Caazapá department on 16 January 2023 by JM (Fig. 4) is the first record of this species for Caazapá department. The specimen lacks a tail, but shows a bold white paravertebral line and 22 ventral scale rows (Cei 1993) and will be deposited in the MNHNP. *Cercosaura schreibersii* is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Teiidae

Ocellated Whiptail Lizard, *Teius oculatus*
(d'Orbigny and Bibron, 1837)

An individual captured and photographed (Fig. 5) by JM at Compañía 20 de Julio, Predio de la Facultad de Ciencias Veterinarias, Caazapá (26°09'36"S 56°21'41"W), Caazapá department on 25 November 2021 represents the first documentation for the department. The species is easily recognized by its distinctive colouration (Cei 1993). It has been previously reported from Alto Paraná, Caaguazú, Canindeyú, Guairá, Itapúa, Misiones, Ñeembucú

Fig. 4. *Cercosaura schreibersii*, Barrio San Roque, Caazapá, Caazapá department (José Maciel 16 January 2023).

Fig. 5. *Teius oculatus*, Compañía 20 de Julio, Predio de la Facultad de Ciencias Veterinarias, Caazapá, Caazapá department (José Maciel 25 November 2021).

Fig. 6. *Ophiodes intermedius*, Puesto Enramadita, Parque Nacional Caazapá, Caazapá department (Roberto Derna 28 March 2024).

and San Pedro departments (Cacciali et al., 2016b, c; Hicks et al., 2022; Smith et al., 2024). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c) and is apparently widespread in humid grassy areas in the southern half of the Oriental region of Paraguay (the region east of the Paraguay River).

Diploglossidae

Silver Glass Lizard, *Ophiodes intermedius*
Boulenger, 1894

An adult was photographed at Puesto Enramadita, Parque Nacional Caazapá by RD on 28 March 2024 (26°05'60"S 55°37'22"W) (Fig. 6) and is instantly recognizable because of its dorsal colouration and pattern (Cacciali and Scott, 2012). This is the first record of the species for Caazapá department. The species has been previously reported from Amambay, Boquerón, Canindeyú, Central, Ñeembucú, Paraguarí, Presidente Hayes and San Pedro (Cacciali et al., 2016b). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 7. *Amphisbaena alba*, Compañía Kapi'ipe, Barrero Grande, Cordillera department (Tito Lahaye 3 April 2021).

Amphisbaenidae

White Amphisbaenid, *Amphisbaena alba*
Strauch, 1881

An individual photographed on 3 April 2021 by TL in Compañía Kapi'ipe, Barrero Grande (25°23'49"S 57°03'29"W) Cordillera department is the first departmental record (Fig. 7). Additionally, on the iNaturalist platform, there are two photographs of interest of the species from nearby Caacupé (25°23'19.7"S 57°08'57.1"W), also Cordillera department by Joaquín Movia on 4 April 2021 (https://www.inaturalist.org/observations/72980135) and another from close to the campus of the Universidad Nacional de Caaguazú (25°26'44.6"S 56°00'49.5"W), Caaguazú department on 15 February 2024 by user jochen38 (https://www.inaturalist.org/observations/199356048) which is the first record for that department. The species is easily identifiable on the basis of the yellowish colouration with paler snout, enlarged temporal region and tail of similar width to the body. This is an uncommon amphisbaenid known only from the northern half of the Oriental region of Paraguay having been previously reported from Amambay, Alto Paraná, Central, Concepción and San Pedro departments (Cacciali et al., 2016b; Smith, Atkinson, Brouard, Pheasey, 2016). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 8. *Amphisbaena mertensii*, Compañía Boquerón, Caazapá department (Luz Benítez 27 March 2024)

Merten's Amphisbaenid, *Amphisbaena mertensii*
Strauch, 1881

A deceased specimen was photographed on 27 March 2024 at Compañía Boquerón, Caazapá department (26°14'39"S 56°15'10"W) by Luz Benítez (Fig. 8), representing the first departmental record. The specimen could be confidently identified as this species based on the high number of tail rings (>25), greater than any other Paraguayan Amphisbaenid, in combination with the pigmentation being restricted to the anterior part of the scales and the number of body rings being within the range 220-250 (Vanzolini, 2002; Corrêa and Meneses, 2020). This is a widespread amphisbaenid in the Oriental region of Paraguay and has been previously reported from Alto Paraná, Amambay, Caaguazú, Canindeyú, Central, Guairá, Itapúa and San Pedro departments (Cabral and Weiler, 2014; Cacciali et al., 2016b; Smith et al., 2016; Goosen and Martínez, 2021). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 9. *Epicrates crassus*, Horqueta, Concepción department (Nelson Vera 3 February 2022).

Boidae

Eastern Rainbow Boa, *Epicrates crassus*
Cope, 1862

A juvenile individual (Fig. 9) found severed in two at Horqueta (23°19'41"S 57°03'05"W), Concepción department by Nelson Vera on 3 February 2022 is the first record for the department. It is the only member of its genus that occurs in the Oriental region of Paraguay, where it is rarely reported (Cacciali 2024). The species has been previously reported from Alto Paraná, Amambay, Caaguazú, Canindeyú and San Pedro departments (Waller, Micucci, Buongermini Palumbo, 1995; Cacciali et al., 2016b). It is considered to be "Endangered" in Paraguay (Martínez et al., 2020c).

Yellow Anaconda, *Eunectes notaeus*
Cope, 1862

An adult (Fig. 10) photographed on 30 January 2024 at Barrio Estación, Villarrica, Guairá department (25°47'36.2"S 56°27'32"W) by Victor Portillo, is the first record for the department. This is a common species in wetlands in the watersheds of the Paraguay and Paraná Rivers and has been

Fig. 10. *Eunectes notaeus*, Barrio Estación, Villarrica, Guairá department (Víctor Portillo 30 January 2024).

previously reported from Alto Paraguay, Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes and San Pedro departments (Waller et al., 1995; Cacciali et al., 2016b; Zárate et al., 2019; Smith et al., 2024). It is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Viperidae

Yarará Lancehead, *Bothrops jararaca*
(Wied, 1824)

An individual captured and photographed on 17 January 2024 at Yvyty Mirí, Santa Cecilia, Guairá department (25º48'49.6"S 56º12'12.4"W) by HN (Fig. 11) is the first record of this Atlantic Forest endemic species from the department. It was identified based on the diagnostic characters listed by Harvey, Aparicio, Gonzales (2005). The species has now been documented to occur in Alto Paraná, Canindeyú, Guairá and Itapúa departments (Cacciali et al., 2016b). It is considered to be "Vulnerable" in Paraguay (Martínez et al., 2020c).

Fig. 11. *Bothrops jararaca*, Yvyty Mirí, Santa Cecilia, Guairá department (Harald Nicolay 17 January 2024).

Colubridae

Variable Blackhead, *Apostolepis dimidiata*
(Jan, 1862)

An individual that had been killed and mutilated (Fig. 12) was photographed by Sergio Sotelo at General Artigas (26°57'06"S 56°13'46"W), Itapúa department on 28 November 2022 and is the first record for that department. It was identified based on the lack of a vertebral line and collar, and presence of broad black flank bands, in combination with white in the labial area (Cacciali 2024). Blackish lateral spots on the ventral scales indicate that the individual belongs to the typical form, and not the form "*barrioi*" (Cabral, de Lema, Renner, 2017). The species is now known to occur in Amambay, Central, Concepción, Guairá, Itapuá and San Pedro departments (Cabral and Weiler, 2014; Cacciali et al., 2016b; Smith et al., 2016; Cabral et al., 2017). It is considered to be "Data Deficient" in Paraguay (Martínez et al., 2020c), but apparently has a wide distribution in the Oriental region of Paraguay. As members of this genus are known to be difficult to detect, we suspect that the species is easily overlooked rather than rare.

Fig. 12. *Apostolepis dimidiata*, General Artigas, Itapúa department (Sergio Sotelo 28 November 2022).

Fig. 13. *Atractus paraguayensis*, General Artigas, Itapúa department (Sergio Sotelo 19 April 2022).

Paraguayan Tellurian Snake, *Atractus paraguayensis*
Werner, 1924

A juvenile (Fig. 13) photographed by Sergio Sotelo at General Artigas (26°56'32"S 56°13'31"W), Itapúa department on 19 April 2022 is the first official record for that department. The specimen was identified using the criteria established by Passos, Fernandes, Bérnils, Moura-Leite (2010) including the irregular line of paravertebral blotches and the presence of a black collar. The species has been previously reported from Cordillera, Misiones, Ñeembucú, Paraguarí and San Pedro departments in Paraguay (Cabral and Weiler, 2014; Cacciali et al., 2016b; Mendoza Galeano et al. 2020; Smith et al., in press). It is considered to be "Endangered" in Paraguay (Martínez et al., 2020c).

Leopard Keelback, *Helicops leopardinus*
(Schlegel, 1837)

A deceased juvenile individual (Fig. 14) was photographed at Villarrica (25°44'56"S 56°26'05"W), Guairá department on 25 November 2022 by

Fig. 14. *Helicops leopardinus*, Villarrica, Guairá department (Victor Duarte 25 November 2022).

Victor Duarte, representing the first departmental record. It is easily recognizable based on the distinctive head shape and eyecatching ventral colouration (Cacciali 2024). This is an abundant snake in wetlands of the Paraguay River Basin and this latest record approximately corresponds to the eastern limits of its known distribution in Paraguay. The species has been previously reported from Alto Paraguay, Amambay, Caaguazú, Central, Concepción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes and San Pedro departments in Paraguay (Cabral and Weiler, 2014; Cacciali et al., 2016b; Smith et al., 2024). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 15. *Hydrodynastes gigas*, Compañía Isla Perú, Iturbe, Guairá department (Emily Gallardo 18 November 2022).

False Water Cobra, *Hydrodynastes gigas*
Duméril, Bibron and Duméril, 1854

Two mutilated individuals (Fig. 15) were photographed at Compañía Isla Perú, Iturbe (26°03'32"S 56°33'02"W), Guairá department on 18 November 2022 by Emily Gallardo, representing the first departmental record. This is a common and familiar wetland species in Paraguay, previously reported from Alto Paraguay, Caaguazú, Central, Concpeción, Cordillera, Itapúa, Misiones, Ñeembucú, Paraguarí, Presidente Hayes and San Pedro departments in Paraguay (Cabral and Weiler, 2014; Cacciali et al., 2016b; Smith et al., 2016, 2024; Zárate et al., 2019). It is considered to be "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 16. *Boiruna maculata*, Compañía Ñaumby, Boquerón – Caazapá, Caazapá department (Virgilio Ramírez Sosa 7 November 2023).

False Mussurana, *Boiruna maculata*
(Boulenger, 1896)

A subadult (Fig. 16) photographed on 7 November 2023 at Compañía Ñaumby, Boquerón – Caazapá, Caazapá department (26°12'53.3''S 56°15'32.5"W) by Virgilio Ramírez Sosa, is the first record for the department. The red and black colouration of immature specimens is diagnostic (Cacciali 2024). This is a widespread species in the Chaco and watersheds of the Paraguay and Paraná Rivers and has now been reported from Alto Paraguay, Boquerón, Caazapá, Central, Itapúa, Misiones, Ñeembucú, Presidente Hayes and San Pedro departments (Cacciali et al., 2016b; Atkinson et al., 2017; Hicks et al., 2022). It is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Bicoloured Mussurana, *Mussurana bicolor*
(Peracca, 1904)

A species distributed largely in the Paraguay River Basin (Cacciali et al. 2016b), here we provide documentation of an eastern extension in Paraguay. An individual (Fig. 17) photographed by Sergio Sotelo at General Artigas (26°56'26"S 56°14'04"W), Itapúa department on 25 October 2021 extends the distribution east along the Paraná River Basin as the first record for that department. *Mussurana bicolor* is now known to occur in Alto Paraguay, Boquerón, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Presidente Hayes and San Pedro departments. It is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 17. *Mussurana bicolor*, General Artigas, Itapúa department (Sergio Sotelo 25 October 2021).

Blackish Burrowing, Snake *Phalotris nigrilatus* Ferrarezzi, 1993

A recently dead individual photographed (Fig. 18) by JM in the district of San José Obrero, near Loreto, Concepción department (23°11'18.7"S 57°22'49.3"W) on 25 January 2024 is the first record of this rare Paraguayan endemic species outside of San Pedro department (Cacciali et al., 2016b, Cacciali, Mee, Plettenberg Laing, Krause, McLaughlin et al., 2020). No other Paraguayan *Phalotris* shows such extensive black colouration on the head, dorsum and ventrum (Cacciali 2024). It extends the distribution of the species 120.6 km to the north of the closest known locality Estancia Karumbe, San Pedro department. The species is considered to be "Endangered" in Paraguay (Martínez et al., 2020c).

Brazilian Green Racer *Philodryas aestiva* (Duméril, Bibron and Duméril, 1854)

A roadkill individual (Fig. 19) was photographed by JM at Compañía Solalinde, Coronel Maciel (26°10'26.5"S 56°25'32.4"W), Caazapá depart-

Fig. 18. *Phalotris nigrilatus*, San José Obrero of Paso Horqueta, near Loreto, Concepción department (Jose Maciel 25 January 2024).

Fig. 19. *Philodryas aestiva*, Compañia Solalinde, Coronel Maciel, Caazapá department (José Maciel 9 March 2024).

Fig. 20. *Philodryas baroni*, c. 5.5 km east of Buena Vista 2, Presidente Hayes department (Nicole Stepan).

ment on 9 March 2024 and is the first departmental record (Cacciali et al., 2016b). The species is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c), however its known distribution is associated with the threatened Atlantic Forest ecoregion, with previous specimen reports from Caaguazú, Canindeyú, Guairá and Itapúa (Cacciali et al., 2016b).

Point-nosed Racer, *Philodryas baroni*
Berg, 1895

A roadkill individual (Fig. 20) was collected (CZPLT-H 2473) c.5.5 km east of Buena Vista 2 at (22°36'20.5"S 59°38'25.5"W), Presidente Hayes department on 29 February 2024. It is the only member of the genus with a distinctive upturned nose (Cacciali 2024). It is the first record of this Chaco endemic species in Paraguay outside of Boquerón department (Cacciali et al., 2016b). The species is considered to be of "Least Concern" in Paraguay, however there are very few documented records of the species in the country (Martínez et al., 2020c).

Fig. 21. *Philodryas psammophidea* juvenile, Laguna Capitán, Presidente Hayes department (Paul Smith 20 March 2024).

Chaco Racer, *Philodryas psammophidea*
Günther, 1872

A juvenile individual (Fig. 21) was collected (CZPLT-H 2477) at Laguna Capitán (22°32'56.1"S 59°43'20.5"W), Presidente Hayes department on 20 March 2024. The only previous report of the species in Presidente Hayes department, from Pozo Colorado (Cacciali et al. 2016b) is an error, and the cited photographs were taken in Boquerón department (H. del Castillo pers. comm.). This is thus the first record of this species in Paraguay outside of Boquerón department (Cacciali et al., 2016b). The species is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Significant range extensions

Teiidae

Yellow Tegu, *Salvator duseni*
(Lönnberg, 1910)

On 15 July 2021 an individual of this species was observed and photographed by SDR, (jointly with Óscar Rodriguez, Juan José Resquín and

Fig. 22. *Salvator duseni*, Costanera de Salto del Guairá, Canindeyú department (Sergio Ríos 15 July 2021).

Nelson Pérez) on the Costanera de Salto del Guairá, Canindeyú department (24º04'43.9"S 54º18'42.8"W) (Fig. 22). The species was identified by the small size (compared to other members of the genus), the distinctly yellowish background colouration (as opposed to white or red) and the dark colouration on the dorsal side of the head, supported by other diagnostic characters listed by Péres and Colli (2004). *Salvator duseni* is strongly associated with the Cerrado ecoregion and has been previously reported from Amambay, Canindeyú and Concepción departments. The current record extends the distribution approximately 128.5 km to the far east of Canindeyú department from the previous most easterly record at Colonia Ybycuí, also Canindeyú department (Cacciali et al., 2016b; MNHNP 4342, 4343). The species is considered "Endangered" in Paraguay (Martínez et al., 2020c).

Boidae

Chaco Rainbow Boa, *Epicrates alvarezi* Cope, 1862

An individual of this species was photographed (Fig. 23) on 2 February 2024 on the road close to Estancia Las Gringas, c 12.5 km northeast of the Prefectura Naval de Pozo Hondo (22°12'54.0"S 62°25'32.3"W) by PS and MF, (and was also observed by PC). This extends the range of the species in the Paraguayan Chaco and into the northern Pilcomayo region, 136.6

Fig. 23. *Epicrates alvarezi*, close to Estancia Las Gringas, c 12.5 km northeast of the Prefectura Naval de Pozo Hondo, Boquerón department (Paul Smith 2 February 2024).

km southwest of the nearest known locality, Parque Nacional Teniente Agripino Enciso. A juvenile individual was photographed (Fig. 24) on 19 February 2024 at Puerto Carmelo Peralta (21°40'15.3"S 57°59'0.3"W) by HN, extending the range of the species 172.3 km northeast into the Humid Chaco ecoregion from the closest previous record at Reserva Privada Campo María, Presidente Hayes department (22°34'S, 59°21'W) (Cacciali et al., 2016b). The species is considered to be "Vulnerable" in Paraguay (Martínez et al., 2020c).

Boa Constrictor, ***Boa occidentalis***
Philippi, 1873

Formerly treated as a subspecies of *Boa constrictor* and recently split (González, Bezerra de Lima, Passos, Silva, 2024). An individual of this species was photographed (Fig. 25) on 2 February 2024 at Cruce Don Silvio, Boquerón department (22°04'52.9"S 62°07'57.5"W) by MF, (and was also observed by PS and PC). This extends the range of the species westwards in the Paraguayan Chaco and into the northern Pilcomayo region, 109.2 km southwest of the nearest known locality, Transchaco Road (Ruta IX) km 613 (Cacciali et al., 2016b). The species is considered to be "Vulnerable" in Paraguay (Martínez et al., 2020c).

Fig. 24. *Epicrates alvarezi* juvenile, Puerto Carmelo Peralta, Alto Paraguay department (Harald Nicolay 19 February 2024).

Fig. 25. *Boa occidentalis*, near Cruce Don Silvio, Boquerón department (Marcela Ferreira 2 February 2024).

Alligatoridae

Yacare Caiman, *Caiman yacare*
(Daudin, 1802)

Two skulls of individuals hunted locally at the Prefectura Naval de Pozo Hondo (22°18'30.3"S 62°31'53.5"W) (one collected CZPLT-H 2443, Fig. 26) document the species presence in the northern reaches of the Paraguayan Pilcomayo River, and represents the first specimen of the species from Boquerón department. The only previous published report for Boquerón department (Ziegler, Unger, Feiler, Lehr, 2002) refers to sight records at Fortín Toledo (where the species is common and from where there is now a specimen available CZPLT-H 1091). The specimen reported here represents an extension of 132 km west from this, the closest previously reported locality for the species in Paraguay. A subadult individual was also observed at the Prefectura Naval de Militar Pozo Hondo 1 to 3 February 2024 by PS, PC, MF and SDR. The species is considered to be of "Least Concern" in Paraguay (Martínez et al., 2020c).

Fig. 26. *Caiman yacare* CZPLT-H 2443, Prefectura Naval de Pozo Hondo, Boquerón department (Nicole Stepan).

Colubridae

Scorpion Racer ***Philodryas agassizii***
(Jan, 1863)

This species is known from very few reported specimens in Paraguay, one with no specific locality data (MNHNP 9534), and two with localities reported by Ríos et al. (2020): 1) 12 km W San Ignacio Guazú on Ruta IV, Misiones department (CZPLT-H 1544); 2) 3.5 km W Ybycuí, Paraguarí department (CZPLT-H 1353). Additionally, an individual was photographed at 4 km E of Laguna Capitán, Presidente Hayes department (Smith and Clay, 2015). Here we report a fourth Paraguayan specimen (Fig. 27) collected at Quiíndy, Paraguarí department (26°00'30.8"S 57°14'24.3"W) on 23 January 2024 by JM and which will be deposited in the MNHNP shortly. Identification was confirmed on examination of the specimen by colour pattern and the presence of 13 mid-dorsal scale rows (Cacciali 2024). This is a minor range extension of 17.23 km. The species is considered to be "Data Deficient" in Paraguay (Martínez et al., 2020c).

Fig. 27. *Philodryas agassizii*, Quiíndy, Paraguarí department (José Maciel 23 January 2024).

Burrowing Snake ***Phalotris tricolor*** form ***"punctatus"***
(Lema, 1979)

Phalotris punctatus (Lema 1979) was described based on specimens from northwestern Argentina, and distinguished from *P. tricolor* mainly by the spotted dorsal pattern on an ochre background (versus unspotted on a red background in *P. tricolor*). The two were later synonymized by Lema, D'Agostini, Cappellari (2005), before being revalidated again in a confused publication by Martins and Lema (2017). The latter publication is unclear on whether "*P. punctatus*" is being reported from Paraguay, with the Paraguayan data presented in the map, texts and species examined sections contradicting each other, and the sole Paraguayan specimen of "*P. punctatus*" examined also listed in duplicate with the same data under *P. tricolor*. Whilst we prefer to wait for additional data before recognizing "*P. punctatus*" as a distinct species, we attempt to clarify some confusion by confirming the presence of a specimen corresponding phenotypically with "*P. punctatus*" from the Paraguayan Chaco, noting that it was collected in an area from which *P. tricolor* is well-documented. The roadkill individual was photographed (Fig. 28) and collected (CZPLT-H 2475) on the road between Loma Plata and Filadelfia close to the Comunidad Indigena Pesempo'o (22°21'12.7"S 59°52'20.1"W), Boquerón department on 3 March 2024. *Phalotris tricolor* is considered to be "Endangered" in Paraguay (Martínez et al., 2020c).

Fig. 28. *Phalotris "punctatus"*, between Loma Plata and Filadelfia close to the Comunidad Indigena Pesempo'o, Boquerón department (Paul Smith 3 March 2024).

DISCUSSION AND CONCLUSION

The records documented here further expand our knowledge of reptile distribution in Paraguay. The value of reporting documented records even of common species should not be under-estimated. Whilst at the most basic level it provides a more complete understanding of the herpetofauna of the country, it also assists in constructing biogeographical and evolutionary theories for some poorly known groups, as well as providing the bedrock of data to be considered for national conservation assessments and faunal management plans that are based on them.

Though recent publications have added numerous records to the departmental herpetofauna of the most poorly-known departments (Fig. 29), Caaguazú, Caazapá and Guairá (Smith et al., 2024; Maciel in press), these continue to be chronically under-sampled compared to other departments, and the continued publication and documentation of additional reptile records in the central Oriental region is to be encouraged.

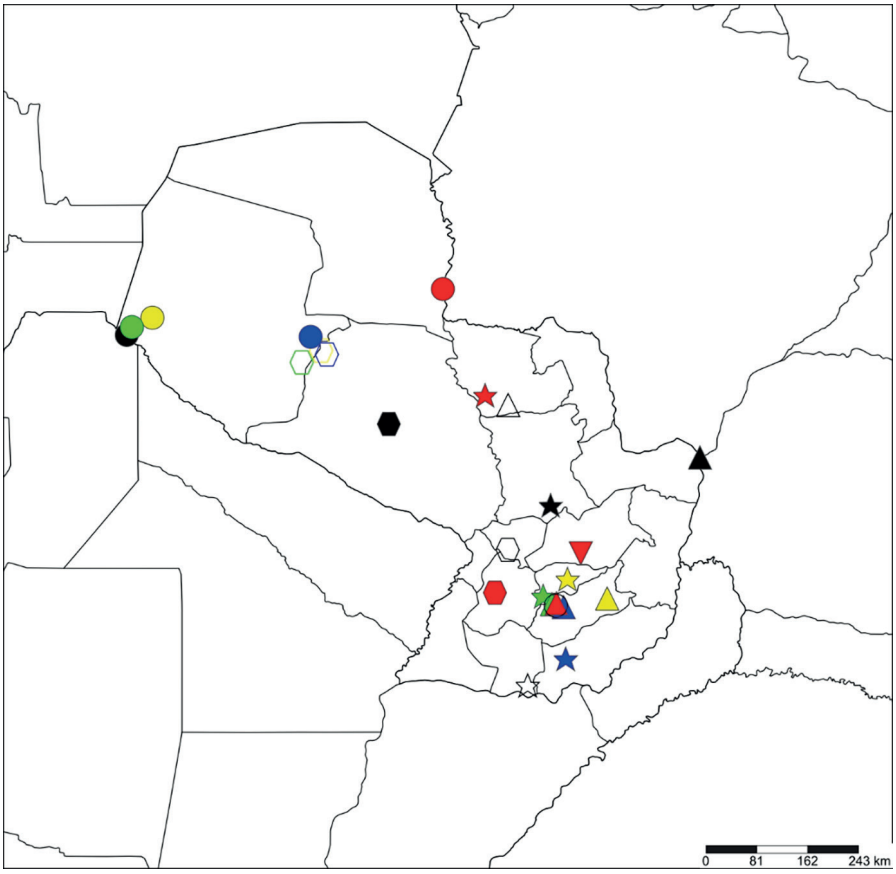

Fig. 29. Map of 23 localities cited for the significant records reported in this work. CIRCLES: (Red) 1 Puesto Carmelo Peralta, Alto Paraguay department (21°40'15.3"S 57°59'0.3"W); (Blue) 2 between Loma Plata and Filadelfia close to the Comunidad Indigena Pesempo`o, Presidente Hayes department (22°21'12.7"S 59°52'20.1"W); (Green) 3 close to Estancia Las Gringas, c 12.5 km northeast of the Prefectura Naval de Pozo Hondo, Boquerón department (22°12'54.04''S 62°25'32.3''W); (Yellow) 4 Cruce Don Silvio, Boquerón department (22°04'52.9"S 62°07'57.5"W); (Black) 5 Prefectura Naval de Pozo Hondo, Boquerón department (22°19'37.8''S 62°29'57.3''W); (Open) 6 Barrio San

Roque, Caazapá, Caazapá department (26°11’35’’S 56°22’12’’W); TRIANGLES: (Red) 7 Compañía 20 de Julio, Caazapá department (26°09’36’’S 56°21’41’’W); (Blue) 8 Compañía Ñaumby, Boquerón – Caazapá, Caazapá department (26°12’53.3’’S 56°15’32.5’’W); (Green) 9 Compañia Solalinde, Coronel Maciel, Caazapá department (26°10’26.5”S, 56°25’32.4”W); (Yellow) 10 Puesto Enramadita, Parque Nacional Caazapá, Caazapá department (26°05’60’’S 55°37’22’’W); (Black) 11 Costanera de Salto del Guairá, Canindeyú department (24º04’43.9”S 54º18’42.8”W); (Open) 12 Horqueta, Concepción department (23°19’41’’S 57°03’05’’W); STARS: (Red) 13 San José Obrero, near Loreto, Concepción department (23°11’18.7’’S 57°22’49.3’’W); (Blue) 14 General Artigas, Itapúa department (26°57’06’’S 56°13’46’’W); (Green) 15 Compañía Isla Perú, Iturbe, Guairá department (26°03’32’’S 56°33’02’’W); (Yellow) 16 Yvyty Mirí, Santa Cecilia, Guairá department (25º48’49.6”S 56º12’12.4”W); (Black) 17 Villarrica, Guairá department (24°45’35’’S 56°26’40’’W); (Open) 18 Ruta Nacional XX, c4km north of the entrance to Ayolas at the crossroads towards Atinguy, Misiones department (27°19’49.0”S 56°46’19.2”W); HEXAGONS: (Red) 19 Quiíndy, Paraguarí department (26°00’30.8’’S 57°14’24.3’’W); (Blue) 20 5.5 km E of Buena Vista 2, Presidente Hayes department (22°36’20.5”S 59°38’25.5”W); (Green) 21 Chaco Lodge, Presidente Hayes department (22°43’08.5”S 59°59’58.3”W); (Yellow) 22 Laguna Capitán, Presidente Hayes department (22°32’56.1”S 59°43’20.6”W); (Black) 23 Pirahú, Presidente Hayes department (23°35’60.0”S 58°45’20.1”W); (Open) 24 Caacupé/Compañia Kapi`ipe, Barrero Grande, Cordillera department (25°23’49’’S 57°03’29’’W); INVERSE TRIANGLES: (Red) Universidad Nacional de Caaguazú, Caaguazú department (25°26’44.6’’S 56°00’49.5’’W).

Fig. 30. Map showing the political departments of Paraguay. Departments as follows: Chaco region – Alto Paraguay (APY), Boquerón (BOQ), Presidente Hayes (PHA); Oriental region – Amambay (AMA), Alto Paraná (APA), Caaguazú (CAA), Canindeyú (CAN), Caazapá (CAZ), Central (CEN), Concepción (CON), Cordillera (COR), Guairá (GUA), Itapúa (ITA), Misiones (MIS), Ñeembucú (ÑEE), Paraguarí (PAR), San Pedro (SPE).

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