

New and significant reptile departmental records for the Oriental Region of Paraguay

Nouvelles et importantes données d'occurrence départementales de reptiles pour la région orientale du Paraguay

Matthew T OWEN⁽¹⁾, Mart JJ VAN DE WEGE^(1,2), Jorge AYALA SANTACRUZ⁽¹⁾, Brody RESLER-MILLER⁽¹⁾, Wout HENDRIKS^(1,2), Melissa MORRISSON^(1,3), Matías SILVERA⁽⁴⁾, José MACIEL MÉNDEZ⁽⁵⁾, Hans HOSTETTLER⁽⁶⁾, Jeremias ESCOBAR⁽¹⁾, Tomas ESPINOLA⁽¹⁾, Sergio GALEANO⁽⁷⁾, Carlos DAVID ORTEGA⁽⁸⁾ & Paul SMITH^(1,9)

⁽¹⁾ Fundación Para La Tierra, Centro IDEAL, Pilar, Paraguay. www.paralatierra.org

⁽²⁾ HAS University of Applied Sciences, s-Hertogenbosch, Netherlands

⁽³⁾ Queen's University Belfast, Belfast, Northern Ireland

⁽⁴⁾ One Earth Conservation, Concepción, Paraguay

⁽⁵⁾ Universidad Nacional de Asunción, Facultad de Ciencias Veterinarias, Departamento de Recursos Faunísticos y Medio Natural, filial Caazapá, Paraguay.

⁽⁶⁾ Estancia Nueva Gambach, Alto Vera, Itapúa, Paraguay

⁽⁷⁾ Encargado de Investigación y Monitoreo del Programa de Reservas y Biodiversidad del Sector Medio Ambiente de la Entidad Binacional Yacyretá, Ayolas, Paraguay

⁽⁸⁾ Ministerio del Ambiente y Desarrollo Sostenible, Dirección de Áreas Silvestres Protegidas, Parque Nacional Cerro Corá, Paraguay.

⁽⁹⁾ FAUNA Paraguay, Encarnación, Paraguay. www.faunaparaguay.com

Corresponding author: Matthew Owen (matthew@paralatierra.org)

Abstract – We present fourteen new reptile records across nine departments of Paraguay. Four of these species are nationally categorised as “Endangered”. New records are *Phalotris shawnella* (Colubridae) in Amambay; *Hemidactylus mabouia* (Gekkonidae) in Caaguazú, Caazapá and Paraguari; *Amphisbaena darwini* (Amphisbaenidae), *Mussurana bicolor* (Colubridae) and *Phimophis guerini* (Colubridae) in Caazapá; *Urostrophus longicauda* (Leiosauridae) in Concepción; *Phalotris matogrossensis* (Colubridae) in Guairá; *Phrynos hilarii* (Chelidae) in Itapúa; *Philodryas aestiva* (Colubridae) in Misiones and Ñeembucú; and *Ameiva ameiva* (Teiidae) and *Erythrolamprus jaegeri* (Colubridae) in Ñeembucú. We also report an additional record of *Phrynos hilarii* (Chelidae) in Ñeembucú. These findings highlight the need for further research on the distribution of threatened species in the country. Moreover, the new records of common species emphasise the importance of continued herpetological inventory throughout Paraguay.

Keywords – Colubridae, Distribution, Herpetology, Lizards, Neotropics.

Résumé – Nous présentons quatorze nouvelles observations de reptiles dans neuf départements du Paraguay. Quatre de ces espèces sont classées au niveau national comme en danger. Les nouvelles observations sont *Phalotris shawnella* (Colubridae) dans le département de Amambay; *Hemidactylus mabouia* (Gekkonidae) dans les départements de Caaguazú, Caazapá et Paraguari; *Amphisbaena darwini* (Amphisbaenidae), *Mussurana bicolor* (Colubridae) et *Phimophis guerini* (Colubridae) dans le département de Caazapá; *Urostrophus longicauda* (Leiosauridae) dans le département de Concepción; *Phalotris matogrossensis* (Colubridae) dans le département de Guairá; *Phrynos hilarii* (Chelidae) dans le département de Itapúa; *Philodryas aestiva* (Colubridae) dans les départements de Misiones et Ñeembucú; et *Ameiva ameiva* (Teiidae) et *Erythrolamprus jaegeri* (Colubridae) dans le département de Ñeembucú. Nous rapportons également une observation supplémentaire de *Phrynos hilarii* (Chelidae) dans le département de Ñeembucú. Ces découvertes soulignent la nécessité de poursuivre les recherches sur la distribution des espèces menacées dans le pays. Ces nouvelles données d'espèces communes mettent en évidence l'importance d'un inventaire herpétologique continu à travers le Paraguay.

Mots-clés – Colubridés, Distribution, Herpétologie, Lézards, Néotropiques.

INTRODUCTION

Since the publication of Cacciali *et al.* (2016), which provided a comprehensive synthesis of the distribution of Paraguayan reptiles and highlighted major knowledge gaps, many publications have addressed the country's reptile fauna. These publications have documented new departmental records (Motte *et al.* 2016, Atkinson *et al.* 2017, Buongermini & Cacciali 2017, Zaracho *et al.* 2017, Martínez *et al.* 2018, 2019, Sforza & Cacciali 2019, Zárate *et al.* 2019, Cañete *et al.* 2020, Martínez *et al.* 2020a, b, Mendoza Galeano *et al.* 2020, Ríos *et al.* 2020, Goosen & Martínez 2021, Motte *et al.* 2021, Bueno-Villafañe *et al.* 2022, Hicks *et al.* 2022, Vetter *et al.* 2022, Cacciali *et al.* 2023, Cacciali 2024, Maciel Méndez 2024, Smith *et al.* 2024a, b), new country records (Atkinson *et al.* 2018, Carosini *et al.* 2021, Smith *et al.* 2021, Cacciali & Ortega 2023), and new species to science (Cacciali *et al.* 2017, 2018a, b, Cabral & Cacciali 2021, Smith *et al.* 2022a). However, documentation of the 17 Paraguayan departments remains insufficient, particularly in the central Oriental Region.

Here we provide photographic documentation of fourteen additional departmental occurrence records for eleven reptile species: *Phrynops hilarii* (Duméril & Bibron, 1835) (Chelidae), *Hemidactylus mabouia* (Moreau de Jonnés, 1818) (Gekkonidae), *Urostrophus longicauda* (Boulenger, 1891) (Leiosauridae), *Ameiva ameiva* (Linnaeus, 1758) (Teiidae), *Amphisbaena darwini* Duméril & Bibron, 1839 (Amphisbaenidae), *Erythrolamprus jaegeri* (Günther, 1858), *Mussurana bicolor* (Peracca, 1904), *Phalotris matogrossensis* Lema, D'Agostini & Cappellari, 2005, *Phalotris shawnella* Smith, Brouard & Cacciali, 2022, *Philodryas aestiva* (Duméril, Bibron & Duméril, 1854), and *Phimophis guerini* (Duméril, Bibron & Duméril, 1854) (Colubridae). We also provide an additional report of the nationally threatened species *Phrynops hilarii* from Pilar, Ñeembucú.

MATERIAL AND METHODS

Specimens were encountered using a variety of methods including pitfall trapping, roadkill/dead specimens, active searching, and incidental observation. Only species that could be unequivocally identified based on external morphological characteristics, including general colouration/pattern, scale counts, and morphometrics, were included in this work. Identifications were made following the original species descriptions, and relevant taxonomic revisions and identification literature (Cei

1993, Cacciali 2008, 2024). Taxonomy follows the online Reptile Database (<https://reptile-database.reptarium.cz/>). Figure 1 shows the locations of all records reported here. Background colours represent the terrestrial ecoregions of Paraguay and adjacent regions following Olson *et al.* (2001).

RESULTS

Testudines *Chelidae*

Saint-Hilaire's Side-Necked Turtle *Phrynops hilarii* (Duméril & Bibron, 1835)

An adult was photographed on Isla Yacyretá (27°26'04.9"S, 56°45'18.5"W), Itapúa department on 01 July 2024 by **S.G.** (Fig. 2A) (<https://www.inaturalist.org/observations/275610015>). This record slightly extends the Paraguayan distribution of this species within the Upper Paraná River Basin. Previously published departmental records within Paraguay are from Alto Paraguay/Presidente Hayes (Krieg 1948), Concepción (Marano 2011), Misiones (Smith *et al.* 2024b), and Ñeembucú (Giraud & Contreras 1994), all within the Paraná-Paraguay River watershed (Cacciali *et al.* 2016). *Phrynops hilarii* can readily be distinguished from the two other Paraguayan *Phrynops* species, *Phrynops williamsi* Rhodin & Mittermeier, 1983 and *Phrynops geoffroanus* (Schweigger, 1812), by its elongated bicoloured barbels, fine black ocular stripe, and pale jaws and throat bearing distinct black spotting (McCord *et al.* 2001).

In December 2024, four individuals were observed inhabiting a highly debris-polluted sewage pond in Pilar, Ñeembucú (26°51'18.9"S, 58°18'06.3"W) (Fig. 2B) (<https://www.inaturalist.org/observations/389161869>). Although there was significant plastic pollution at the locality where the species was found, the water tested negative for metal and pesticide contamination, to which the species is known to have a low tolerance (Boccioni *et al.* 2024). This sighting confirms the species' presence in Ñeembucú department, as does the discovery of a previously overlooked specimen (CZPLT-H 2670) collected in Pilar by Julio Contreras, but lacking a date and precise locality data. The only other report from the department is an unsupported literature reference dating back more than 30 years (Giraud & Contreras 1994). Given that *P. hilarii* is nationally recognised as "Endangered" (Martínez *et al.* 2020c) and that its Paraguayan distribution remains

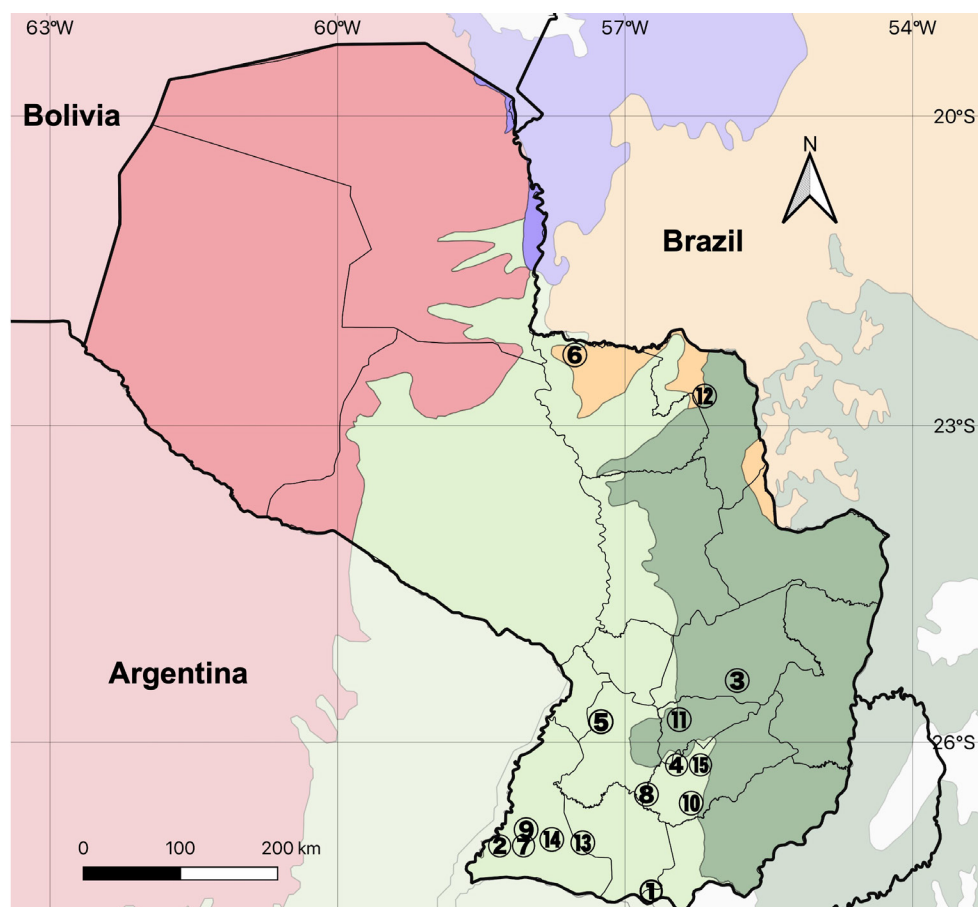


Figure 1 - Distribution of the 15 reptile records reported in this study. Circled numbers correspond to the records in the order in which they are presented in the text: ①–② *Phrynosoma hilarii* (Itapúa and Ñeembucú); ③–⑤ *Hemidactylus mabouia* (Caaguazú, Caazapá and Paraguari); ⑥ *Urostrophus longicauda* (Concepción); ⑦ *Ameiva ameiva* (Ñeembucú); ⑧ *Amphisbaena darwini* (Caazapá); ⑨ *Erythrolamprus jaegeri* (Ñeembucú); ⑩ *Mussurana bicolor* (Caazapá); ⑪ *Phalotris matogrossensis* (Guairá); ⑫ *Phalotris shawnella* (Amambay); ⑬–⑭ *Philodryas aestiva* (Misiones and Ñeembucú); ⑮ *Phimophis guerini* (Caazapá). Background colours represent the terrestrial ecoregions of Paraguay and adjacent regions following Olson *et al.* (2001): red = Dry Chaco; light green = Humid Chaco; orange = Cerrado; purple = Pantanal; and dark green = Alto Paraná Atlantic Forest.

Figure 1 - Répartition des 15 mentions de reptiles rapportées dans cette étude. Les numéros encadrés correspondent aux mentions dans l'ordre de leur présentation dans le texte : ①–② *Phrynosoma hilarii* (Itapúa et Ñeembucú) ; ③–⑤ *Hemidactylus mabouia* (Caaguazú, Caazapá et Paraguari) ; ⑥ *Urostrophus longicauda* (Concepción) ; ⑦ *Ameiva ameiva* (Ñeembucú) ; ⑧ *Amphisbaena darwini* (Caazapá) ; ⑨ *Erythrolamprus jaegeri* (Ñeembucú) ; ⑩ *Mussurana bicolor* (Caazapá) ; ⑪ *Phalotris matogrossensis* (Guairá) ; ⑫ *Phalotris shawnella* (Amambay) ; ⑬–⑭ *Philodryas aestiva* (Misiones et Ñeembucú) ; et ⑮ *Phimophis guerini* (Caazapá). Les couleurs de fond représentent les écorégions terrestres du Paraguay et des régions adjacentes selon Olson *et al.* (2001) : rouge = Chaco sec ; vert clair = Chaco humide ; orange = Cerrado ; violet = Pantanal ; et vert foncé = forêt atlantique du Haut Paraná.

unclear (see below), confirmed records are crucial for clarifying its national distribution.

Despite these new confirmed records, some historical Paraguayan records remain uncertain, particularly those along the Paraguay River north of Asunción (Krieg 1948, Marano 2011). The Turtle Taxonomy Working Group (2021) considered these reports possibly “introduced” individuals, but based on their geography and date, we consider this highly unlikely, at least for the Krieg (1948) record. The Concepción record of Marano (2011) is based

on a personal communication from the editor to the author stating that an unpublished photograph existed, taken by a third party (Dirk-Peter Gärtner), but no supporting data were provided, nor is there any indication that the photograph was ever examined by the author. Krieg (1948) mentioned the presence of turtles “mostly of the genera *Platemys* and *Phrynosoma*” on the Riacho Mosquito and illustrated the head of a *Phrynosoma hilarii* but identified it as *Platemys* sp. without reference to a specimen or locality. Consequently, Cacciali *et al.* (2016) interpreted this record as *P. hilarii*, perhaps



Figure 2 - Reptile records from Paraguay. **A-B.** *Phrynops hilarii* (Chelidae): **A.** Isla Yacyretá, Itapúa department, on 01 July 2024 (Photograph: Sergio Galeano). **B.** Pilar, Ñeembucú department, on 22 December 2024 (Photograph: Matthew Owen). **C-E.** *Hemidactylus mabouia* (Gekkonidae): **C.** Doctor Juan Manuel Frutos, Caaguazú department, on 07 January 2025 (Photograph: Tomas Espinola). **D.** City of Caazapá, Caazapá department, on 23 February 2025 (Photograph: José Feliciano Maciel Méndez). **E.** Carapeguá, Paraguari department, on 08 January 2025 (Photograph: Perla Santa Cruz). **F.** *Urostrophus longicauda* (Leiosauridae), Reserva Natural Estrella Saite, Concepción department, on 19 October 2024 (Photograph: Matías Silvera). **G.** *Ameiva ameiva* (Teiidae), Yegros Paso, Ñeembucú department, on 14 July 2025 (Photograph: Melissa Morrisson). **H.** *Amphisbaena darwinii* (Amphisbaenidae), Moisés Bertoni, Caazapá department, on 14 April 2025 (Photograph: José Feliciano Maciel Méndez).

Figure 2 - Mentions de reptiles du Paraguay. **A-B.** *Phrynops hilarii* (Chelidae) : **A.** Isla Yacyretá, département d'Itapúa, le 1 juillet 2024 (Photographie : Sergio Galeano). **B.** Pilar, département de Ñeembucú, le 22 décembre 2024 (Photographie : Matthew Owen). **C-E.** *Hemidactylus mabouia* (Gekkonidae) : **C.** Doctor Juan Manuel Frutos, département de Caaguazú, le 7 janvier 2025 (Photographie : Tomas Espinola). **D.** Ville de Caazapá, département de Caazapá, le 23 février 2025 (Photographie : José Feliciano Maciel Méndez). **E.** Carapeguá, département de Paraguari, le 8 janvier 2025 (Photographie : Perla Santa Cruz). **F.** *Urostrophus longicauda* (Leiosauridae), Reserva Natural Estrella Saite, département de Concepción, le 19 octobre 2024 (Photographie : Matías Silvera). **G.** *Ameiva ameiva* (Teiidae), Yegros Paso, département de Ñeembucú, le 14 juillet 2025 (Photographie : Melissa Morrisson). **H.** *Amphisbaena darwinii* (Amphisbaenidae), Moisés Bertoni, département de Caazapá, le 14 avril 2025 (Photographie : José Feliciano Maciel Méndez).

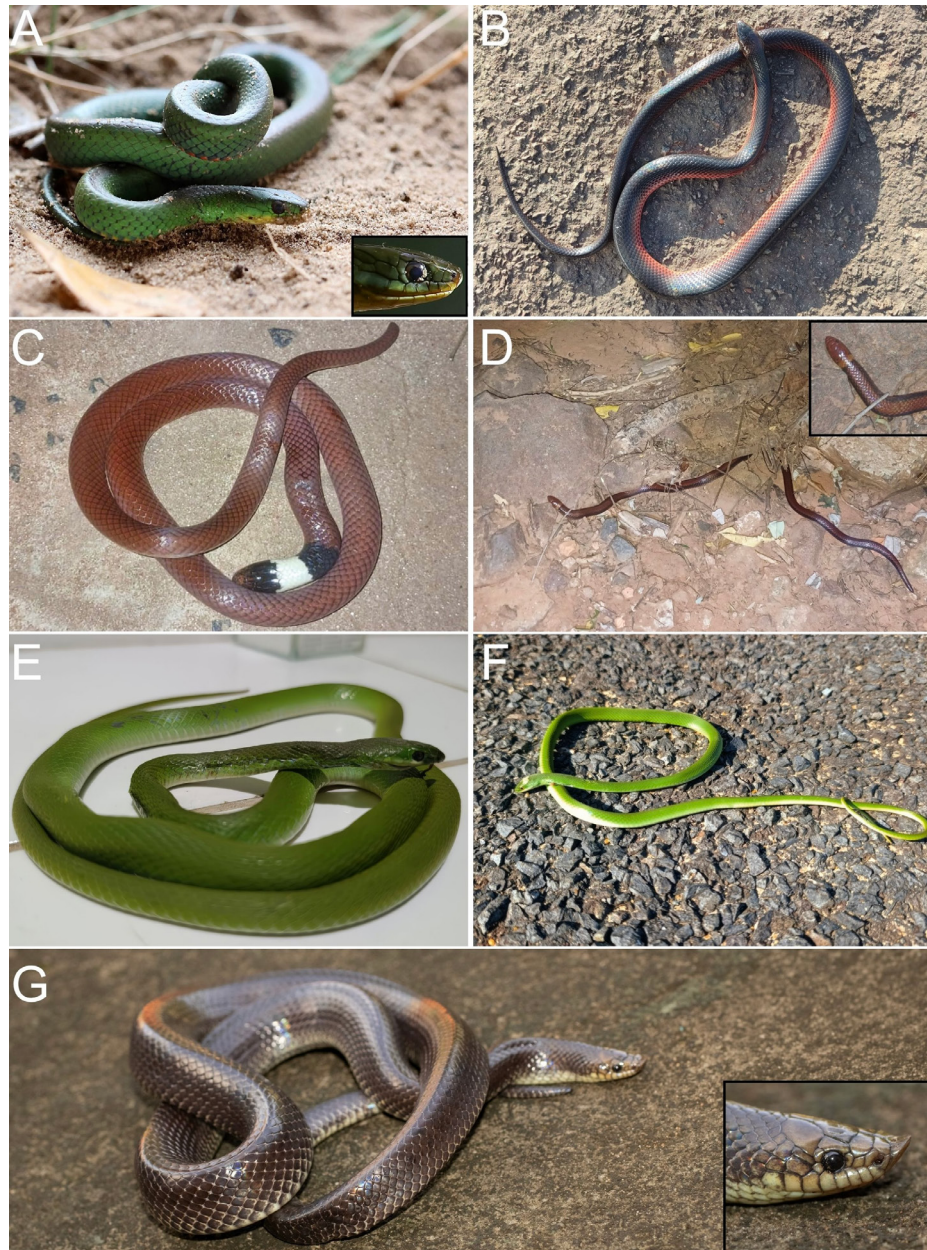


Figure 3 - Snake records from Paraguay. **A.** *Erythrolamprus jaegeri* (Colubridae), Estancia Santa Ana, Ñeembucú department, on 16 October 2024 (Photograph: Matthew Owen). **B.** *Mussurana bicolor* (Colubridae), Ruta PY-08, 1 km north of San Antonio, Caazapá department, on 06 November 2024 (Photograph: José Feliciano Maciel Méndez). **C.** *Phalotris matogrossensis* (Colubridae), Villarrica, Guairá department, on 04 November 2024 (Photograph: Jeremias Escobar). **D.** *Phalotris shawnella* (Colubridae), Parque Nacional Cerro Corá, Amambay department, on 23 March 2025 (Photograph: Carlos David Ortega). **E-F.** *Philodryas aestiva* (Colubridae): **E.** Ruta IV, 44 km west of San Ignacio, Misiones department, on 03 May 2026 (Photograph: Paul Smith). **F.** Ruta IV, 82 km west of San Ignacio, Ñeembucú department, on 04 May 2026 (Photograph: Paul Smith). **G.** *Phimophis guerini* (Colubridae), Caazapá City, Caazapá department, on 24 November 2024 (Photograph: José Feliciano Maciel Méndez). Insets in **A**, **D** and **G** provide enlarged views of the head of the respective individuals.

Figure 3 - Mentions de serpents du Paraguay. **A.** *Erythrolamprus jaegeri* (Colubridae), Estancia Santa Ana, département de Ñeembucú, le 16 octobre 2024 (Photographie : Matthew Owen). **B.** *Mussurana bicolor* (Colubridae), Ruta PY-08, 1 km au nord de San Antonio, département de Caazapá, le 6 novembre 2024 (Photographie : José Feliciano Maciel Méndez). **C.** *Phalotris matogrossensis* (Colubridae), Villarrica, département de Guairá, le 4 novembre 2024 (Photographie : Jeremias Escobar). **D.** *Phalotris shawnella* (Colubridae), Parque Nacional Cerro Corá, département d'Amambay, le 23 mars 2025 (Photographie : Carlos David Ortega). **E-F.** *Philodryas aestiva* (Colubridae) : **E.** Ruta IV, à 44 km à l'ouest de San Ignacio, département de Misiones, le 3 mai 2026 (Photographie : Paul Smith). **F.** Ruta IV, à 82 km à l'ouest de San Ignacio, département de Ñeembucú, le 4 mai 2026 (Photographie : Paul Smith). **G.** *Phimophis guerini* (Colubridae), ville de Caazapá, département de Caazapá, le 24 novembre 2024 (Photographie : José Feliciano Maciel Méndez). Les encadrés en **A**, **D** et **G** présentent des vues agrandies de la tête des individus correspondants.

giving the text a false impression of certainty. Furthermore, in a footnote, Krieg (1948) states that he “also knows” *P. hilarii* from the Paraná “around Rosario” (Argentina). While this implies that *P. hilarii* was seen by the author in both Argentina and the Riacho Mosquito, Paraguay, it does not state this explicitly, introducing uncertainty about whether his Paraguayan observations referred to *P. hilarii* or the morphologically similar *P. geoffroanus*, which is known in this area. We therefore treat these historical records with caution pending confirmation.

Squamata Gekkonidae

Tropical House Gecko *Hemidactylus mabouia* (Moreau de Jonnès, 1818)

Hemidactylus mabouia is a common, non-native species in Paraguayan urban areas (Rödger *et al.* 2008). We provide confirmation of the presence of this species in the following Paraguayan departments: 1) Caaguazú: a dead specimen photographed by **T.E.** in the town of Doctor Juan Manuel Frutos (25°22'53.9"S, 55°49'46.2"W) on 07 January 2025 (Fig. 2C) (<https://www.inaturalist.org/observations/389289932>); 2) Caazapá: a live individual photographed by **J.M.** in the city of Caazapá (26°11'35.4"S, 56°22'12.9"W) on 23 February 2025 (Fig. 2D) (<https://www.inaturalist.org/observations/391001039>); 3) Paraguari: a live individual photographed by Perla Santacruz in the city of Carapeguá (25°46'05.9"S, 57°15'03.4"W) on 08 January 2025 (Fig. 2E) (<https://www.inaturalist.org/observations/389290280>). The specimens were identified as *H. mabouia* using the diagnostic characters of Cacciali *et al.* (2017), including dilated infradigital lamellae, weak dorsal tuberculation, and overall body morphology. These photographs represent the first documented records of this familiar peri-urban species in the three departments. Although widespread across Paraguay, documentation of this species remains unconfirmed in the department of Alto Paraguay (Cacciali & Motte 2009, Bauer *et al.* 2016, Cacciali *et al.* 2016, Zaracho *et al.* 2017, Mackenzie & Vladimirova 2022, Smith *et al.* 2024a).

Leiosauridae

Long-Tailed Tree Lizard *Urostrophus longicauda* (Boulenger, 1891)

An individual photographed (Fig. 2F) at Reserva Natural Estrella Saite (22°14'42.6"S, 57°31'26.4"W) by **M.S.** on 19 October 2024 is the first species record for Concepción department (<https://www.inaturalist.org/observations/389288877>). Identification was confirmed by the light brown colouration, dark lateral stripe, and distinctive long tail, a unique combination among Paraguayan squamates (Etheridge & Williams 1991). It is an elusive species due to its camouflage and inconspicuous behaviour (Ávila *et al.* 2013), resulting in limited available information about its ecology and distribution. This is the northernmost record in Paraguay, where it has previously been documented only in Itapúa and San Pedro departments (Cacciali *et al.* 2016, Sforza & Cacciali 2019). This record significantly extends its Paraguayan distribution 256 km northward along the Paraguay River floodplain at the interface of the Humid Chaco and Cerrado ecoregions. This record is also the second confirmed report of *U. longicauda* north of 24°S, with the only Brazilian record from São Paulo state, approximately 562 km east (Rodrigues *et al.* 2014). It is considered to be “Endangered” (Martínez *et al.* 2020c) in Paraguay and listed as globally “Vulnerable” by the IUCN (Arzamendia *et al.* 2017).

Teiidae

Green Jungle Runner *Ameiva ameiva* (Linnaeus, 1758)

A juvenile was photographed on 07 October 2024 by **M.V.D.W.** at Yegros Paso, Pilar, Ñeembucú department (26°51'59.1"S, 58°16'31.3"W). Multiple sightings from the same locality since then confirm its presence within the department (Fig. 2G) (<https://www.inaturalist.org/observations/389291203>). The species is easily identifiable amongst Paraguayan teiids due to its large body size, elongated tail, distinctive green-brown dorsal colouration and characteristic lateral mottling (Harvey *et al.* 2012). *Ameiva ameiva* is widespread throughout Paraguay mainly in the Chaco and Cerrado ecoregions, with only limited incursion into the former extent of the Atlantic Forests (Cacciali *et al.* 2016). This represents the southernmost confirmed occurrence in Paraguay, with all previous reports being north of or only slightly south of 26°S latitude. It has now been recorded in every department except Caazapá,

Guairá, Misiones, and Itapúa (Cacciali *et al.* 2016, Núñez *et al.* 2022), making this an important yet expected record that fills a distributional gap, as the species occurs in Argentina south of the Paraná River. The species is currently classified as “Least Concern” in Paraguay (Martínez *et al.* 2020c).

Amphisbaenidae

Darwin’s Amphisbaenid *Amphisbaena darwinii* Duméril & Bibron, 1839

An adult *Amphisbaena darwinii* was captured and photographed (Fig. 2H) by **J.M.** at Moisés Bertoni, Caazapá department (26°26'54.5"S, 56°46'37.2"W) on 14 April 2025 (<https://www.inaturalist.org/observations/391002387>). This observation represents the first confirmed departmental record for Caazapá. The specimen was found beneath a fallen tree trunk in riverine forest habitat. It was easily identifiable by its distinctive morphology, including a tuberculate tail, 14 caudal annuli, four pre-cloacal pores, and uniform ventral colouration (Smith *et al.* 2022b). Previously, *A. darwinii* had only been reported from the southern departments of Ñeembucú and Itapúa (Cacciali *et al.* 2016, Cabral *et al.* 2020, Smith *et al.* 2022b); therefore, this sighting extends the confirmed Paraguayan distribution approximately 43 km northward. Taxonomic uncertainty persists within the *A. darwinii* species complex, which includes the proposed species *A. darwinii* Duméril & Bibron, 1839, *A. heterozonata* (Burmeister, 1861), and *A. trachura* (Cope, 1885). Paraguayan specimens appear to exhibit intermediate characteristics among these proposed taxa (Montero 2016, Smith *et al.* 2022b) and Cacciali *et al.* (2016) recommended the continued use of *A. darwinii* for Paraguayan populations pending resolution of the existing taxonomic questions. We follow this here. The species is classified as “Least Concern” nationally (Martínez *et al.* 2020c).

Colubridae: Dipsadinae

Jaeger’s Ground Snake *Erythrolamprus jaegeri* (Günther, 1858)

An adult was photographed by **M.V.D.W.** and **B.R.M.** at Estancia Santa Ana, Ñeembucú department on 04 October 2024 under a termite mound in an area of Humid Chaco grassland (26°50'36"S, 58°01'55"W), with another photographed at the same locality on 16 October 2024 (Fig. 3A) (<https://www.inaturalist.org/observations/389164956>). This is the first departmental record of the species, with previous

records from Caaguazú, Caazapá, Canindeyú, Concepción, Cordillera, Guairá, Itapúa, Misiones, Presidente Hayes, and San Pedro (Smith & Clay 2015, Cacciali *et al.* 2016, Hicks *et al.* 2022). This represents an expected record given that the species is common across much of the Atlantic coast of the Southern Cone. It is also known from adjacent areas of Argentina along the Paraná River (Nogueira *et al.* 2019). The specimen was identified on the basis of its distinctive green dorsal colouration, red ventral colouration, a reddish vertebral line, a divided anal plate, and its pholidosis (Ceï 1993). It is considered “Least Concern” in Paraguay (Martínez *et al.* 2020c).

Bicoloured Mussurana *Mussurana bicolor* (Peracca, 1904)

A road-killed adult specimen was photographed (Fig. 3B) on Ruta PY-08, 1 km north of San Antonio (26°31'48.7"S, 56°18'35.6"W) on 06 November 2024 by **J.M.**, representing the first record for Caazapá department (<https://www.inaturalist.org/observations/391005007>). The species is widely distributed throughout the Paraná River Basin across Argentina, Bolivia, Brazil, and Paraguay. In Paraguay, the species has been previously recorded in Alto Paraguay, Boquerón, Central, Concepción, Cordillera, Itapúa, Ñeembucú, Presidente Hayes, and San Pedro departments (Cacciali *et al.* 2016, Smith *et al.* 2024b). This record is located approximately 46 km north of the nearest known locality in Itapúa, suggesting the species also occurs in more inland areas of the Oriental Region. The specimen was readily distinguished from the closely related *Mussurana quimi* (Franco, Marques & Puerto, 1997) by the distinct demarcation between the light ventral and dark dorsal colouration (Franco *et al.* 1997). This species is considered to be “Least Concern” in Paraguay (Martínez *et al.* 2020c).

Mato Grosso Burrowing Snake *Phalotris matogrossensis* Lema, D’Agostini & Cappellari, 2005

A dead specimen was photographed in Villarrica, Guairá department (25°44'56"S, 56°26'05"W), on 04 November 2024 by **J.E.**, representing the first departmental record (Fig. 3C) (<https://www.inaturalist.org/observations/389288576>). This finding supports the idea that the species is restricted to the hilly central belt of the Oriental Region of Paraguay, with previous records only from the departments of Central, Cordillera, and Paraguairí (Cacciali & Motte 2007, Cacciali *et al.* 2016). The specimen can be readily assigned to the *Phalotris*

tricolor species group (Jansen & Köhler 2008) by its uniform dorsal colouration and distinctly reddened snout. It can be distinguished from other members of the group, particularly *Phalotris tricolor* (Duméril, Bibron & Duméril, 1854), by the presence of a short black nuchal collar approximately five to six scales in length, a head clearly distinct from the neck, and laterally expanded white collar markings (Lema *et al.* 2005; Cacciali & Motte 2007). It is a rare fossorial species that appears to be present only in forested areas and is currently classified as “Endangered” in Paraguay (Martínez *et al.* 2020c, Cacciali 2024).

Shawnella’s Burrowing Snake *Phalotris shawnella* Smith, Brouard & Cacciali, 2022

An adult photographed (Fig. 3D) by **C.O.** at Parque Nacional Cerro Corá (22°41'26.5"S, 56°00'12.5"W), Amambay department on 23 March 2025, is the first record of this Paraguayan endemic species outside of the department of San Pedro (<https://www.inaturalist.org/observations/268099248>). This semi-fossorial snake was identified by the lateral black bands, reddish head, and pale nuchal collar, a diagnostic combination that differentiates it from the closely related sympatric *Phalotris nigrilatus* Ferrarezzi, 1993 (Smith *et al.* 2022a). The species was recently described from two localities separated by just 90.5 km and was suggested to be globally Endangered. This record is the third known locality, extending its range by 127.5 km to the north within the Cerrado ecoregion. Despite this, the species still qualifies for the designation of Endangered (B1a, biii).

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

A road-killed individual (Fig. 3E) was examined and photographed on 03 May 2026 along Ruta IV, 44 km west of San Ignacio, Misiones department (26°53'56.7"S, 57°26'26.8"W) by **P.S.** (<https://www.inaturalist.org/observations/389286320>). A second specimen was examined and photographed on 04 May 2026, also along Ruta IV, 82 km west of San Ignacio, Ñeembucú department (26°52'05.6"S, 57°46'52.4"W) by **P.S.** (Fig. 3F) (<https://www.inaturalist.org/observations/389287148>). The species was readily identifiable by the absence of a lateral black line bisecting the eye, keeled dorsal scales, and green colouration, a unique combination among Southern Cone snakes (Waltrick & Giasson 2021). Both individuals were encountered approximately 38 km apart in swampy habitats within the Humid Chaco, representing the first documented records

of *P. aestiva* from both Misiones and Ñeembucú departments. Together with previous records from the departments of Caazapá, Canindeyú, Caaguazú, Central, Guairá, and Itapúa, these specimens extend the known Paraguayan distribution southwestward beyond the Atlantic Forest ecoregion, with which Paraguayan specimens are typically associated (Cacciali *et al.* 2016, Smith *et al.* 2024b). These records fill an important distributional gap, as *P. aestiva* is also known from the adjacent Argentine provinces of Corrientes and Formosa bordering these departments (Cei 1993). *P. aestiva* is considered “Least Concern” in Paraguay (Martínez *et al.* 2020c).

Common Miner Snake *Phimophis guerini* (Duméril, Bibron & Duméril, 1854)

An adult was photographed by **J.M.** in the city of Caazapá, Caazapá department (26°10'34.9"S, 56°21'14.3"W) on 24 November 2024 (Fig. 3G) (<https://www.inaturalist.org/observations/391003967>). This new record is the first time *P. guerini* has been documented in the department, with previous records from Central, Concepción, Misiones, Paraguari, and San Pedro (Cacciali *et al.* 2016, Atkinson *et al.* 2017). This extends its range southeastward within the Oriental Region and further supports the apparent biogeographic separation between the two Paraguayan *Phimophis* species, with *Phimophis vittatus* (Boulenger, 1896) restricted to west of the Paraguay River and *P. guerini* known only from east of the river. The genus is easily recognisable by its distinctive facial shape and upturned snout adapted for fossorial behaviour (Abdala 1990, Cacciali 2024). *Phimophis guerini* can be distinguished from the congeneric *P. vittatus* by its uniform dorsal colouration lacking the distinct longitudinal striping characteristic of the latter species. *P. guerini* is listed as “Least Concern” in Paraguay (Martínez *et al.* 2020c).

DISCUSSION AND CONCLUSION

The departmental records presented here contribute to a clearer understanding of reptile distribution in Paraguay. Notably, the new records for *Phrynops hilarii*, *Urostrophus longicauda*, *Phalotris matogrossensis*, and *Phalotris shawnella* underscore the need for targeted efforts on Endangered and lesser-known taxa. In line with this, we included an additional documented record of *Phrynops hilarii* to help clarify the distribution of this nationally Endangered species. Additionally, the significant range extension for *Ameiva ameiva* and the three new

departmental records for *Hemidactylus mabouia* demonstrate that knowledge gaps persist even for commonly encountered and widespread species.

Despite a recent increase in publications focusing on the distribution of Paraguay's herpetofauna, the central Oriental departments of Caaguazú, Caazapá, and Guairá remain chronically under-sampled (Maciel Méndez 2024, Smith *et al.* 2024a, b). This is underscored by the fact that six of the new records presented here come from these departments, with all but one nationally classified as "Least Concern". We recommend increased surveying efforts in these areas to strengthen the national database, which is essential for improving the accuracy of future conservation assessments and the effectiveness of the management proposals that are based on them.

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All listed authors participated in data collection. M.O. and P.S. wrote the manuscript. All authors contributed critically to its drafts and approved the final version for publication.

REFERENCES

Abdala V. (1990). Morfometría en dos especies del género *Phimophis* Cope (Ophidia: Colubridae). *Acta Zoologica Lilloana*, **39**: 85-89.

Arzamendia V., Fitzgerald L., Giraudo A.R., Kacolis F.P., Montero R., Pelegrin N., Scrocchi Manfrini G.J. & Williams J.D. (2017). *Anisolepis longicauda*. The IUCN Red List of Threatened Species, 2017: e:T203135A2761080. <http://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T203135A2761080.en>

Atkinson K., Smith P., Sarvary J. & Matthews A. (2017). New and noteworthy snake species records (Colubridae and Dipsadidae) for the Reserva Natural Laguna Blanca, eastern Paraguay. *Check List*, **13**: 1-5. <https://doi.org/10.15560/13.1.2027>

Atkinson K., Smith P., Dickens J. & Lee-Zuck C. (2018). Rediscovery of the 'lost' snake *Phalotris multipunctatus* (Serpentes: Dipsadidae) in Paraguay with behavioural notes and reference to the importance of "Reserva Natural" Laguna Blanca for its conservation. *Current Herpetology*, **37**: 75-80. <https://doi.org/10.5358/hsj.37.75>

Avila L.J., Martínez L.E. & Morando M. (2013). Checklist of lizards and amphisbaenians of Argentina: an update. *Zootaxa*, **3616**: 201-238. <https://doi.org/10.11646/Zootaxa.3616.3.1>

Bauer F., Martínez N. & Kochalka J.A. (2016). Cuando comer mata: *Hemidactylus mabouia* y la selección de una presa peligrosa. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **20**: 43-45.

Boccioni A.P.C., Peltzer P.M., Attademo A.M., Leiva L., Colussi C.L., Repetti M.R., Russell-White K., Di Conza N. & Lajmanovich R.C. (2024). High toxicity of agro-industrial wastewater on aquatic fauna of a South American stream: Mortality of aquatic turtles and amphibian tadpoles as bioindicators of environmental health. *Water Environment Research*, **96**: e11010. <https://doi.org/10.1002/wer.11010>

Bueno-Villafañe D., Bóveda Á., Valiente E., Schaerer G., Baez C., Feltes-González O., Vuletich J.E., Irala Melgarejo R., Cantero N., Yanosky A. & Pérez de Molas L. (2022). New distributional records of *Colobosaura modesta* and *Micrablepharus maximiliani* (Reptilia: Gymnophthalmidae) in Paraguay. *Revista Latinoamericana de Herpetología*, **5**: 77-82. <https://doi.org/10.22201/fc.25942158e.2022.4.545>

Buengermini E. & Cacciali P. (2017). Notas sobre un muestreo herpetológico en un ambiente ripario en el Chaco Húmedo de Paraguay. *Kempffiana*, **13**: 119-126.

Cabral H. & Cacciali P. (2021). A new species of *Homonota* (Squamata: Gekkota: Phyllodactylidae) from Paraguay. *Holotipus*, **2**: 95-107. <https://doi.org/10.53561/KAYV6367>

Cabral H., Ferreira M. & Santana D.J. (2020). Rediscovery of *Amphisbaena prunicolor* (Cope, 1885) (Squamata, Amphisbaenidae) in Paraguay. *Oecologia Australis*, **24**: 217-222. <https://doi.org/10.4257/oeco.2020.2401.21>

Cacciali P. (2008). Guía para la identificación de 60 serpientes del Paraguay. Asunción: Guyra Paraguay. Paraguay. 218 p.

Cacciali P. (2024). Guía para la identificación de las serpientes del Paraguay. 2nd Ed. Asunción: Guyra Paraguay. Paraguay. 395 p.

Cacciali P., Scott N.J., Aquino A.L., Fitzgerald L.A. & Smith P. (2016). The reptiles of Paraguay: literature, distribution and an annotated taxonomic checklist. *Special Publication of the Museum of South-western Biology*, **11**: 1-373.

Cacciali P., Morando M., Medina C., Köhler G., Motte M. & Avila L.J. (2017). Taxonomic analysis of Paraguayan samples of *Homonota fasciata* Duméril y Bibron (1836) with the revalidation of *Homonota horrida* Burmeister (1861) (Reptilia: Squamata: Phyllodactylidae) and the description of a new species. *PeerJ*, **5**: e3523. <https://doi.org/10.7717/PeerJ.3523>

Cacciali P., Lotzkat S., Gamble T. & Köhler G. (2018a). Cryptic diversity in the Neotropical gecko genus *Phyllopezus* Peters, 1878 (Reptilia: Squamata: Phyllodactylidae): a new species from Paraguay. *International Journal of Zoology*, **2018**, **1**: 1-14. <https://doi.org/10.1155/2018/3958327>

Cacciali P., Morando M., Avila L.J. & Köhler G. (2018b). Description of a new species of *Homonota* (Reptilia, Squamata, Phyllodactylidae) from the central region of northern Paraguay. *Zoosystematics and Evolution*, **94**: 147-161. <https://doi.org/10.3897/zse.94.21754>

- Cacciali P., Rodríguez J. & Motte M. (2023). Nuevo registro de la rara *Philodryas nattereri* (Squamata: Dipsadidae) para Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **27**: 34–37.
- Cacciali P. & Motte M. (2007). Variación intraespecífica en *Phalotris matogrossensis* y *P. tricolor*: una evaluación de sus caracteres diagnósticos (Squamata: Colubridae). *Cuadernos de Herpetología*, **21**: 75–82.
- Cacciali P. & Motte M. (2009). Nuevos registros de *Hemidactylus mabouia* (Sauria: Gekkonidae) en Paraguay. *Cuadernos de Herpetología*, **23**: 41–44.
- Cacciali P. & Ortega C. (2023). First record of *Xenodon nattereri* (Steindachner, 1869) (Reptilia, Squamata, Dipsadidae) from Paraguay. *Check List*, **19**: 231–234. <https://doi.org/10.15560/19.2.231>
- Cañete L., Martínez N. & Bauer F. (2020). A new record of *Micrurus corallinus* (Merrem, 1820) for Paraguay. *Herpetology Notes*, **13**: 713–714.
- Carosini A., Bueno-Villafañe D., Caballero-Gini A. & Netto F. (2021). First formal records of *Stenocercus doellojuradoi* (Friebert, 1944) (Squamata, Tropicuridae) from the Paraguayan Chaco. *Cuadernos de Herpetología*, **35**: 183–185. <https://doi.org/10.31017/CdH.2020.2020-067>
- Cei J.M. (1993). Reptiles del noroeste, nordeste y este de la Argentina. Herpetofauna de las Selvas Subtropicales, Puna y Pampas. *Monografía XIV. Museo Regionale di Scienze Naturale*, Torino, 1–949.
- Etheridge R. & Williams E.E. (1991). A review of the South American lizard genera *Urostrophus* and *Anisolepis*: (Squamata: Iguania: Polychridae). *Bulletin of the Museum of Comparative Zoology*, **152**: 317–361.
- Franco F.L., Marques O.A.V. & Puerto G. (1997). Two new species of colubrid snakes of the genus *Clelia* from Brazil. *Journal of Herpetology*, **31**: 483–490. <https://doi.org/10.2307/1565599>
- Giraud A.R. & Contreras A.O. (1994). Lista preliminar de los reptiles registrados en el Departamento de Ñeembucú, Paraguay. *Boletín de la Asociación Herpetológica Argentina*, **10**: 1–4.
- Goosen T. & Martínez N. (2021). Un nuevo registro de *Amphisbaena mertensi* Strauch, 1881 en Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **25**: 162–164.
- Harvey M.B., Ugueto G.N. & Gutberlet Jr R.L. (2012). Review of teiid morphology with a revised taxonomy and phylogeny of the Teiidae (Lepidosauria: Squamata). *Zootaxa*, **3459**: 1–156. <https://doi.org/10.11646/Zootaxa.3459.1.1>
- Hicks G., Burró A.V., Wang J., Dickens J., David H-P., Brouard J-P., Rios S.D., Santacruz J.A. & Smith P. (2022). New and significant distributional records of Paraguayan reptiles and amphibians from Alto Paraguay, Misiones, Ñeembucú, Presidente Hayes and San Pedro departments. *Historia Natural*, **12**: 21–36.
- Jansen M. & Köhler G. (2008). A new species of *Phalotris* from the eastern lowlands of Bolivia (Reptilia, Squamata, Colubridae). *Senckenbergiana Biologica*, **88**: 103–110.
- Krieg H. (1948). Zwischen Anden und Atlantik. Reisen eines Biologen in Südamerika. Munich, Germany, Carl Hanser Verlag. 491 p.
- Lema T.D., D'Agostini F.M. & Cappellari L.H. (2005). Nova espécie de *Phalotris*, redescoberta de *P. tricolor* e osteologia craniana (Serpentes, Elapomorphinae). *Iheringia. Série Zoologia*, **95**: 65–78. <https://doi.org/10.1590/S0073-47212005000100010>
- Mackenzie C. & Vladimirova V. (2022). Food in the city: the urbanised diets of *Rhinella diptycha* (Anura: Bufonidae), *Hemidactylus mabouia* (Squamata: Gekkonidae), and *Tropidurus torquatus* (Squamata: Tropiduridae) in Pilar, Paraguay. *Herpetology Notes*, **15**: 523–532.
- Maciel Méndez J.F. (2024). Contribución al conocimiento de la ofidiofauna del departamento de Caazapá, Paraguay. *Revista Latinoamericana de Herpetología*, **7**: e1004–161. <https://doi.org/10.22201/fc.25942158e.2024.4.1004>
- Marano P. (2011). Die Froschkopfschildkröte *Phrynops hilarii* in Argentinien. *Schildkröten im Fokus*, **8**: 25–33.
- Martínez N., Motte M. & Bauer F. (2018). Nuevo registro de *Caiman latirostris* (Daudin, 1802) en una localidad de la Región Oriental del Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **22**: 42–44.
- Martínez N., Espinola V., Bauer F. & Ortiz B. (2019). Ampliación del área de distribución de *Oxyrhopus guibei* Hoge and Romano, 1977 en Paraguay. *Cuadernos de Herpetología*, **33**: 87–89.
- Martínez N., Bauer F., Espinola V. & Goossen T. (2020a). First record of *Aspronema dorsivittatum* (Cope, 1862) in Pozo Colorado, Paraguay (Squamata: Scincidae). *Herpetology Notes*, **13**: 905–906.
- Martínez N., Bauer F., Espinola V. & Motte M. (2020b). A new record of *Drymarchon corais* (Boie, 1827) for Paraguay. *Herpetology Notes*, **13**: 281–282.
- Martínez N., Cacciali P., Bauer F., Cabral H., Tedesco M., Vinke S., Vinke T., Vazquez D., Ramos E. & Motte M. (2020c). Estado de conservación y lista roja de los reptiles del Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **24**: 1–128.
- McCord W.P., Joseph-Ouni M. & Lamar W.W. (2001). Taxonomic reevaluation of *Phrynops* (Testudines: Chelidae) with the description of two new genera and a new species of *Batrachemys*. *Revista de Biología Tropical*, **49**: 715–764.
- Mendoza Galeano M., Nuñez K., Zárate G., Ortiz F. & Weiler A. (2020). Ampliación de la distribución de *Atractus reticulatus* (Boulenger, 1885) (Reptilia: Serpentes: Dipsadidae) en Paraguay. *Cuadernos de Herpetología*, **34**: 131–133.
- Montero R. (2016). On the validity of several Argentinian species of *Amphisbaena* (Squamata, Amphisbaenidae). *Journal of Herpetology*, **50**: 642–653. <https://doi.org/10.1670/15-048>
- Motte M., Barreto R. & Martínez N. (2016). Aportes al conocimiento de la distribución de *Eunectes murinus* (Serpentes: Boidae) en Paraguay. *Reportes Científicos de la FaCEN*, **7**: 47–50.

Motte M., Bauer F., Martínez N., Bogarín T. & Goosen T. (2021). Confirmación de la presencia de *Stenocercus caducus* (Squamata: Tropiduridae) en Asunción, Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **25**: 165-167.

Nogueira C.C., Argôlo A.J., Arzamendia V., Azevedo J.A., Barbo F.E., Bérnills R.S., Bolochio B.E., Borges-Martins M., Brasil-Godinho M., Braz H. & Buononato M.A. (2019). Atlas of Brazilian snakes: verified point-locality maps to mitigate the Wallacean shortfall in a megadiverse snake fauna. *South American Journal of Herpetology*, **14**: 1-274. <https://doi.org/10.2994/SAJH-D-19-00120.1>

Núñez K., Zárate-Betzel G., Ortiz F., Mendoza M., Vera M., Weiler A. & Duré M. (2022). Diversidad alfa, beta y gamma de ensambles de los anuros y reptiles de humedales del Ypoá, Paraguay. *Neotropical Biodiversity*, **8**: 89-98. <https://doi.org/10.1080/23766808.2022.2040277>

Olson D.M., Dinerstein E., Wikramanayake E.D., Burgess N.D., Powell G.V.N., Underwood E.C., D'Amico J.A., Itoua I., Strand H.E., Morrison J.C., Loucks C.J., Allnutt T.F., Ricketts T.H., Kura Y., Lamoreux J.F., Wettengel W.W., Hedao P. & Kassem K.R. (2001). Terrestrial ecoregions of the world: A new map of life on Earth. *BioScience*, **51**: 933-938. [https://doi.org/10.1641/0006-3568\(2001\)051\[0933:TEOTWA\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2001)051[0933:TEOTWA]2.0.CO;2)

Ríos S.D., Bascoulès S., Vera A. & Smith P. (2020). Primeros ejemplares con localidades de *Philodryas agassizii* (Jan, 1863) [Serpentes: Dipsadidae] en la región oriental del Paraguay. *Nótulas Faunísticas 2da Serie*, **298**: 1-4.

Rodrigues M.T., Bertolotto C.E.V., Amaro R.C., Yonenaga-Yassuda Y., Freire E.M.X. & Pellegrino K. C. M. (2014). Molecular phylogeny, species limits, and biogeography of the Brazilian endemic lizard genus *Enyalius* (Squamata: Leiosauridae): An example of the historical relationship between Atlantic Forests and Amazonia. *Molecular Phylogenetics and Evolution*, **81**: 137-146. <https://doi.org/10.1016/j.ympev.2014.07.019>

Rödger D., Solé M. & Böhme W. (2008). Predicting the potential distributions of two alien invasive Housegeckos (Gekkonidae: *Hemidactylus frenatus*, *Hemidactylus mabouia*). *North-Western Journal of Zoology*, **4**: 236-246.

Sforza L. & Cacciali P. (2019). Presence of *Anisolepis longicauda* (Boulenger, 1891) (Reptilia: Squamata: Leiosauridae) in the Guyra Reta Reserve Complex. *Paraquaria Natural*, **7**: 43-45. [https://doi.org/10.32525/ParaquariaNat.2019.\(7\):43.58](https://doi.org/10.32525/ParaquariaNat.2019.(7):43.58)

Smith P. & Clay R.P. (2015). Six new or important departmental herpetological records for Paraguay. *Paraquaria Natural*, **3**: 20-22.

Smith P., Hicks G. & Brouard J.-P. (2021). *Trilepida koppesi* (Amaral, 1955) (Leptotyphlopidae) First Paraguayan record of the genus and species, with an illustrated key to Paraguayan blind-snakes (Scoleophidia). *Acta Biologica Paranaense*, **50**: 163-174. <https://doi.org/10.5380/abp.v50i1-4.82940>

Smith P., Brouard J.-P. & Cacciali P. (2022a). A new species of *Phalotris* (Serpentes, Colubridae, Elapomorhini) from Paraguay. *Zoosystematics and Evolution*, **98**: 77-85. <https://doi.org/10.3897/zse.98.61064>

Smith P., Ayala J., Hicks G. & Brouard J.P. (2022b). The distribution of *Amphisbaena prunicolor* (Cope, 1885) in Paraguay and its diagnosis from *A. darwini* Duméril & Bibron, 1839. *Studies on Neotropical Fauna and Environment*, **59**: 44-51. <https://doi.org/10.1080/01650521.2022.2041322>

Smith P., Nicolay H., Vera Burró A., Hurtado M.R., Smith R., Ayala J., Ramírez O., Derna R., Vera A., Rojas F., Saldivar M., Ottiger-Wittig F., Bielke C., Concepción Ramírez Y. & Owen M. (2024a). Significant new reptile records for Paraguay from Boquerón, Caazapa, Canindeyú, Guairá, Itapúa, Misiones, Ñeembucú and Presidente Hayes departments. *Historia Natural*, **14**: 53-73.

Smith P., Maciel J., Hurtado M.R., Galeano S., Stepan N., Brouard J.P., Ríos S.D., Riveros M.F., Smith R.L., Owen M., Nicolay H., Derna R., Vera Burró A., Lahaye T. & Cacciali P. (2024b). Twenty-eight new and significant departmental reptile records for Paraguay. *Acta Zoológica Lilloana*, **68**: 347-385. <https://doi.org/10.30550/j.azl/1954>

Turtle Taxonomy Working Group: Rhodin A.G.J., Iverson J.B., Bour R., Fritz U., Georges A., Shaffer H.B. & van Dijk P.P. (2021). Turtles of the World: Annotated Checklist and Atlas of Taxonomy, Synonymy, Distribution, and Conservation Status (9th Ed.). In Rhodin A.G.J., Iverson J.B., van Dijk P.P., Stanford C.B., Goode E.V., Buhlmann K.A. & Mittermeier R.A. (Eds). *Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN SSC Tortoise and Freshwater Turtle Specialist Group*. *Chelonian Research Monographs*, **8**: 1-472. <https://doi.org/10.3854/crm.8.checklist.atlas.v9.2021>.

Vetter J. R., Bauer F. & Martínez N. (2022). A new record of the South American Snake-necked Turtle, *Hydromedusa tectifera* (Testudines: Chelidae), in Caazapá Department, Paraguay, with notes on some symbiotic organisms. *Herpetology Notes*, **15**: 621-623.

Waltrick C.S. & Giasson L.O.M. (2021). Taxonomic key to the snakes (Squamata: Ophidia) species of the Itajaí Valley, Santa Catarina, Brazil. *Papéis Avulsos de Zoologia*, **61**: e20216120. <https://doi.org/10.11606/1807-0205/2021.61.20>

Zaracho V.H., Tedesco M.E., Motte M. & Yanosky A. (2017). First record of *Liolaemus azarai* and *Hemidactylus mabouia* for Ñeembucú department, Paraguay. *Cuadernos de Herpetología*, **31**: 65-67.

Zárate G., Núñez K., Ortiz F., Mendoza M. & Weiler A. (2019). Nuevos registros para la herpetofauna de los departamentos Central y Paraguari, procedentes de humedales asociados al Complejo Ypoá, Paraguay. *Boletín del Museo Nacional de Historia Natural del Paraguay*, **23**: 27-37.

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