

## Confirmation of the presence of *Philodryas nattereri* STEINDACHNER, 1870, in Paraguay

*Philodryas nattereri* STEINDACHNER, 1870 is a diurnal, semi-arboreal snake associated with the semi-arid Cerrado and Caatinga biomes of central Brazil (MESQUITA et al. 2011). Though it was frequently cited as occurring in Paraguay (COPE 1895; PETERS & OREJAS-MIRANDA 1970; TALBOT 1979; VANZOLINI et al. 1980; BÖCKELER 1988; TIPTON 2005), the authors of the present note were not able to locate any specimens from the country. CACCIALI (2010) did not list it in the latest publication dealing with the ophidiofauna of Paraguay, and the species was also omitted from earlier major reviews of the herpetofauna of Paraguay (SERIÉ 1915; BERTONI 1914, 1939; SCHOUTEN 1931).

The earliest mention of the species associated with Paraguay appears to be that of COPE (1895) which is merely an illustration with the caption “Paraguay” without further details (plate 28, figure 6). In the next citation for Paraguay (PETERS & OREJAS-MIRANDA 1970), there was again no specimen reference, and no Paraguayan specimens of this species are at the United States National Museum. TALBOT (1979), in a Paraguayan checklist, lists the species without further comment, and BÖCKELER (1988) lists the species for Paraguay citing PETERS & OREJAS-MIRANDA (1970). Below details of what are apparently the first specimens from Paraguay, viz. from the Reserva Natural de Laguna Blanca (RNLB) are presented thereby confirming the species’ presence in the country.

The Reserva Natural de Laguna Blanca (RNLB, 23°47'S, 56°17'W) is located in the Cerrado zone of central Paraguay, Departamento San Pedro. It is a small 804 hectare reserve consisting of over 400 hectares of Cerrado, a patch of degraded Atlantic Forest and areas of transitional semi-deciduous, semi-humid forest. The four main Cerrado ecotopes are present at RNLB and grow on a predominantly sandy substrate (EITEN 1972, 1978). The reserve is based around an eponymous freshwater lake of 157 hectares which,

geologically-speaking, is possibly the only true lake in Paraguay (GUYRA PARAGUAY 2008).

Fieldworkers from Para La Tierra Research Station (PLT) based at RNLB collected the following three specimens of this species during their ongoing herpetological inventory work. Scale counts of the specimens are presented in Table 1. CZPLT (Colección Zoológica Para La Tierra) 017 (31 July 2010, 23°47'25.6"S, 56°17'44"W). Female, found dead in a Sherman trap placed for small mammals in *sensu stricto* Cerrado (low bushy vegetation, bare sandy soils and no grass cover). Snout-vent-length (SVL) 880 mm, tail-length (TL) 377 mm. CZPLT 295 (16 November 2011, 23°47'53.1"S, 56°17'35.5"W). Female, captured by hand in campo sucio cerrado (mixture of bushes, trees and grassy vegetation on bare sandy soils). SVL 985 mm, TL 340 mm. CZPLT 310 (3 December 2011, 23°48'40.6"S, 56°17'47.9"W). Male, captured by hand taking refuge in a shed next to the PLT accommodation in a transition zone from Cerrado to semi-deciduous gallery forest. SVL 804 mm, TL 248 mm.

Photographic images of specimen CZPLT 017 (FPREP 421-430) and one of an uncollected live individual (FPREP 501) photographed at the same location are stored in the FAUNA Paraguay reptile image database (see References). Casual field observations suggest that the species is fairly common within the reserve and the most frequently encountered of the five *Philodryas* species documented as occurring there.

In Brazil, the species is widespread and frequently abundant in Caatingas and Cerrados in the states of Piauí (ALVES DA ROCHA & COSTA PRUDENTE 2010), Paraíba (ARZABE et al. 2007), Maranhão (MIRANDA 2007), Ceará (SCHMIDT & INGER 1951; MESQUITA & BORGES-NOJOSA 2009), Pernambuco (VITT 1980), Alagoas (QUEISSADA 2009), Rio Grande do Norte (SCHMIDT & INGER 1951; ALMEIDA et al. 2008), Tocantins (BEÇAK et al. 2003), Sergipe (CARVALHO et al. 2005), Bahia (ARAUJO & COLLI 1999), Minas Gerais (RECODER & NOGUEIRA 2007), Goiás (ARAUJO & COLLI 1999; VAZ-SILVA et al. 2007; MOREIRA et al. 2009; VALDUJO et al. 2009), Distrito Federal (ARA-



Figure 1: Location of specimens reported here from Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay (●) and closest Brazilian specimen records from Aquidauana, Mato Grosso do Sul State (■), based on museum vouchers CZPLT-017, 295, 310 (Laguna Blanca) and ZUFMS-REP 2032 (Aquidauana).

UJO & COLLI 1999; FRANÇA et al. 2008), São Paulo (LOBO & SCROCCHI 1994), Mato Grosso (STEINDACHNER 1870; ARAUJO & COLLI 1999) and Mato Grosso do Sul (SILVA et al. 2009). FRANÇA et al. (2006) did not list the species amongst a collection of 48 species of snakes from the Amazonian savannas of Amapá, Amazonas, Pará, Rondônia, and Roraima in the Coleção Herpetológica da Universidade de Brasília and the northern extent of its range is possibly limited by humid Amazonia.

This species was described from "Matto Grosso", Brazil (STEINDACHNER 1870) and this locality was copied by BOULENGER (1896) and probably KOSLOWSKY (1898). However, these publications date from a time when the present day Mato Grosso and Mato Grosso do Sul formed a single large state (Matto Grosso) and they

leave no indication as to how close to the Paraguayan border the species was recorded. Three specimens of this species exist in the Coleção Zoológica da Universidade Federal de Mato Grosso do Sul (ZUFMS), from two nearby localities in the State of Mato Grosso do Sul: Anastácio ( $20^{\circ}31'S$ ,  $55^{\circ}48'W$ ; ZUFMS-REP 2030, 2031) and Aquidauana ( $20^{\circ}31'S$ ,  $55^{\circ}48'W$ ; ZUFMS-REP 2032), and apparently represent the closest documented records of the species to Paraguay.

The specimens described here represent the first documented records of this species in Paraguay and extend the known range of the species about 365 km to the southwest of Anastácio, the closest known location in Brazil (Fig. 1). The species might reasonably be assumed to be present in suitable habitats in other Cerrado areas in

Table 1: Scale counts for three specimens of *Philodryas nattereri* STEINDACHNER, 1870 from Reserva Natural Laguna Blanca, Departamento San Pedro, Paraguay. CZPLT - Colección Zoológica Para La Tierra.

Specimen number	Sex	Dorsal longitudinal scale rows	Ventral	Subcaudals
CZPLT 017	Female	21-21-17	207	124
CZPLT 295	Female	21-21-17	215	105
CZPLT 310	Male	21-21-17	204	123

Paraguay to the north of Laguna Blanca, thus forming a more or less continuous distribution with its known Brazilian range.

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**REFERENCES:** ALMEIDA, W. O. & GUEDES, T. B. & FREIRE, E. M. X. & VASCONCELLOS, A. (2008): Pentastomid infection in *Philodryas nattereri* STEINDACHNER, 1870 and *Oxybelis aeneus* (WAGLER, 1824) (Squamata: Colubridae) in a caatinga of northeastern Brazil.- Brazilian Journal of Biology, São Paulo; 68: 193-197. ALVES DA ROCHA, W. & DA COSTA PRUDENTE, A. L. (2010): The snake assemblage of Parque Nacional de Sete Cidades, State of Piauí, Brazil.- South American Journal of Herpetology, São Paulo; 5: 132-142. ARAUJO DE, A. F. B. & COLLI, G. R. (1999): Biodiversidade do cerrado - Herpetofauna. In: CAVALCANTI, R. B. (Ed.): Ações prioritárias para a conservação da biodiversidade do cerrado e pantanal; Workshop held on March 23-27, 1998 in Brasília (FUNATURA, Conservation International do Brasil, Fundação Biodiversitas e Universidade de Brasília). ARZABE, C. & SKUK, G. & SANTANA, G. G. & DELFIM, F. R. & DE LIMA, Y. C. C. & ABRAGANTES, S. H. F. (2007): Herpetofauna da área de Curimatá, Paráiba; pp. 259-273. In: ARAÚJO DE, F. S. & RODAL, M. J. N. & BARBOSA, M. R. DE V. (eds): Análise das variações da biodiversidade do bioma Caatinga: Suporte a estratégias regionais de conservação; Brasília (Ministério do Meio Ambiente, Secretaria de Biodiversidade e Florestas). BEÇAK, M. L. & BEÇAK, W. & PEREIRA, A. (2003): Somatic pairing, endomitosis and chromosome aberrations in snakes (Viperidae and Colubridae).- Anais da Academia Brasileira de Ciências, Rio de Janeiro; 75: 285-300. BERTONI, A. DE W. (1914): Catálogos sistemáticos de los vertebrados del Paraguay. Descripciones físicas y económicas de Paraguay; Asunción (Gráfica M. Brossa), pp. 86. BERTONI, A. DE W. (1939): Catálogos sistemáticos de los vertebrados de Paraguay.- Revista de la Sociedad Científica de Paraguay, Asunción; 4: 3-60. BÖCKELER, W. (1988): Viboras del Chaco Paraguayo. Kleiner Führer über Schlangen des Paraguayischen Chaco. A Small Guide to Snakes of the Paraguayan Chaco. Kiel, Germany (Zoologisches Institut der Universität Kiel), pp. 97. BOULENGER, G. A. (1896): Catalogue of the snakes in the British Museum; Vol. 3; London (Taylor & Francis), pp. 727. CACCIALI, P. (2010): Guía para la identificación de 60 serpientes del Paraguay; Asunción (Guyra Paraguay), pp. 218. CARVALHO, C. M. & VILAR, J. C. & DE OLIVEIRA, F. F. (2005): Reptiles e anfíbios; pp. 39-61. In: CARVALHO, C.

M. & VILAR, J. C. (eds): Parque Nacional Serra de Itabaiana, levantamento da biota; Aracaju (Ibama, Biología General Experimental). COPE (1895): The classification of the Ophidia.- Transactions of the American Philosophical Society, new series, Philadelphia; 18 (2) art. 3: 186-219, pls. 14-33. EITEN, G. (1972): The cerrado vegetation of Brazil.- Botanical Review, New York; 38: 201-341. EITEN, G. (1978): Delimitation of the cerrado concept.- Vegetatio, The Hague; 36: 169-178. FAUNA Paraguay reptile image database: *Philodryas nattereri*; WWW document available at <http://www.faunaparaguai.com/philodryasnattereri.html>; (last accessed: 28 February 2012). FRANÇA, F. G. R. & MESQUITA, D. O. & COLLI, G. R. (2006): A checklist of snakes from Amazonian savannas in Brazil, housed in the Coleção Herpetológica da Universidade de Brasília, with new distribution records.- Occasional Papers of the Sam Noble Oklahoma Museum of Natural History, Norman; 17: 1-13. FRANÇA, F. G. R. & MESQUITA, D. O. & NOGUEIRA, C. C. & ARAÚJO, A. F. B. (2008): Phylogeny and ecology determine morphological structure in a snake assemblage in the central Brazilian cerrado.- Copeia, Washington; 2008: 23-38. GUYRA PARAGUAY (2008): Áreas importantes para la conservación de las aves del Paraguay. Asunción (Guyra Paraguay), pp. 470. KOSLOWSKY, J. (1898): Ofidios de Matto-Grosso (Brasil).- Revista del Museo de La Plata, La Plata; 8: 3-32. LOBO, F. & SCROCCHI, G. (1994): Osteología craneal del género *Philodryas* (Serpentes: Colubridae).- Cuadernos de Herpetología, Buenos Aires; 8: 104-111. MESQUITA, P. C. M. D. & BORGES-NOJOSA, D. M. (2009): *Philodryas nattereri* (Paraguay Green Racer). Ophidiological.- Herpetological Bulletin, Athlon; 108: 36-37. MESQUITA, P. C. M. D. & BORGES-NOJOSA, D. M. & PASSOS D. C. & BEZERRA C. H. (2011): Ecology of *Philodryas nattereri* in the Brazilian semi-arid region.- Herpetological Journal, London; 21: 193-198. MIRANDA, J. P. (2007): Ecología e conservación de la herpetofauna del Parque Nacional dos Lençóis Maranhenses, Maranhão, Brazil; São Paulo (PhD Thesis, Universidade Estadual de Campinas), pp. 142. MOREIRA, L. A. & FENOLIO, D. B. & RODRIGUES-SILVA, H. L. & DA SILVA JR., N. J. (2009): A preliminary list of the herpetofauna from termite mounds of the cerrado in the Upper Tocantins River Valley.- Papéis Avulsos de Zoologia, São Paulo; 49: 183-189. PIETERS, J. A. & OREJAS-MIRANDA, B. (1970): Catalogue of the Neotropical Squamata Part 1: snakes.- Bulletin of the United States National Museum, Washington; 297: 1-347. QUEISSADA, I. C. S. T. (2009): Diversidade da herpetofauna de uma área da Mata Atlântica do estado de Alagoas: A Reserva Particular da Usina Porto Rico, Campo Alegre; São Paulo (Masters Thesis, Universidade Estadual Paulista), pp. 84. RECODER, R. & NOGUEIRA, C. (2007): Composição e diversidade de répteis squamata na região sul do Parque Nacional Grande Sertão Veredas, Brasil Central.- Biota Neotropica, Campinas; 7: 267-278. SCHMIDT, K. P. & INGER, R. F. (1951): Amphibians and reptiles of the Hopkins-Branner Expedition to Brazil.- Fieldiana Zoology, Chicago; 31: 439-465. SCHOUTEN, G. (1931): Contribuciones al conocimiento de la fauna herpetológica del Paraguay y de los países limítrofes.- Revista de la Sociedad Científica de Paraguay, Asunción; 3: 5-32. SERIÉ, P. (1915): Nota sobre la herpetología de Paraguay.- Physis, Buenos Aires; 1: 573-582. SILVA DA, N. J. & CINTRA, C. E. D. & SILVA, H. L. R. & COSTA, M. C. & SOUZA, C. DO A. & PACHECHO, A. A. &

GONÇALVES, F. A. (2009): Herpetofauna, Ponte de Pedra hydroelectric power plant, States of Mato Grosso and Mato Grosso do Sul, Brazil.- Check List, São Paulo; 5: 518-525. STEINDACHNER, F. (1870): Herpetologische Notizen (II). Über einige neue oder seltene Reptilien des Wiener Museums.- Sitzungsberichte der Akademie Wissenschaften in Wien. Mathematisch-Naturwissenschaftliche Klasse, Wien; 61:336-350. TALBOT, J. J. (1979): Una nueva lista sistemática de reptiles del Paraguay.- Informes Científicos del Instituto de Ciencias Básicas, Asunción; 2: 76-94. TIPTON, B. (2005): Snakes of the Americas, checklist and lexicon; Malabar (Krieger Publishing Company), pp. 477. VALDUJO, P. H. & NOGUEIRA, C. DE C. & BAUMGARTEN, L. & RODRIGUES, F. H. G. & BRANDÃO, R. A. & ETEROVIC, A. & RAMOS-NETO, M. B. & MARQUES, O. A. V. (2009): Squamate reptiles from Parque Nacional das Emas and surroundings, cerrado of central Brazil.- Check List, São Paulo; 5: 405-417. VANZOLINI, P. E. & RAMOS-COSTA, A. M. M. & VITT, L. J. (1980): Repteis das Caatingas; Rio de Janeiro (Academia Brasileira de Ciencias), pp. 161. VAZ-SILVA, W. & GUEDES, A. G. & AZEVEDO-SILVA, P. L. & GONTIJO, F. F. & BARBOSA, R. S. & ALOÍSIO, G. R. & GOMES DE OLIVEIRA, F. C. (2007): Herpetofauna, Espora hydroelectric power plant, State of Goiás, Brazil.- Check List, São Paulo; 3: 338-345. VITT, L. J. (1980): Ecological observations on sympatric *Philodryas* (Colubridae) in northeastern Brazil.- Papéis Avulsos de Zoologia, São Paulo; 34: 87-98.

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