

Hidden among bromeliads in the Brazilian semiarid: first records of *Phyllopezus lutzae* for the Caatinga domain and its predation by *Tropidurus hispidus*

Alcéster Diego Coelho-Lima¹, Oberdan Coutinho Nunes^{1,2,3}, George Washington Neves Soares¹, Tarcísio Jesus Santana¹, Ericarla Barbosa Santana¹, Alexandre Magno Pais Araújo¹, Elaine Larissa Cardoso Lima¹, Vashtir Ramalho dos Santos Braga¹, Cristiano Eduardo Amaral Silveira-Júnior¹, Arthur de Souza Magalhães¹, Lyse Panelli de Castro Meira¹, Maria José Pereira Fernandes⁴, Daniel Cunha Passos⁵

¹ Bioconsultoria Ambiental LTDA., Caetité, Bahia, Brazil.

² Brazilae Consultoria Ambiental - BRAZILAE, Lauro de Freitas, Bahia, Brazil.

³ Centro Universitário UNIFAS/UNIME, Lauro de Freitas, Bahia, Brazil.

⁴ AES Brasil, Guanambi, Bahia, Brazil.

⁵ Universidade Federal Rural do Semi-Árido, Centro de Ciências Biológicas e da Saúde, Departamento de Biociências, Programa de Pós-Graduação em Ecologia e Conservação, Laboratório de Ecologia e Comportamento Animal, Mossoró, Rio Grande do Norte, Brazil.

Recibida: 04 Febrero 2022

Revisada: 12 Abril 2022

Aceptada: 03 Junio 2022

Editor Asociado: J. Goldberg

doi: 10.31017/CdH.2022.(2022-006)

ABSTRACT

During wildlife rescue and monitoring activities, we recorded 142 individuals of *Phyllopezus lutzae* in the municipalities of Tucano and Nova Soure, state of Bahia, Northeastern Brazil. These records are the first of this species in the Caatinga domain. Moreover, an adult individual of *Tropidurus hispidus* was recorded attempting to subdue an adult *P. lutzae*. Beyond to expand the known distribution range of the species, our records show that *P. lutzae* inhabits an ecological and climate domain different from Atlantic Forest where it was previously known, and that it is a potential prey of *T. hispidus*.

Key Words: Caatinga; Distribution; Predator-prey interaction; Squamata.

The Caatinga domain (Queiroz *et al.*, 2017) was recognized as little diverse in Squamata reptiles, being represented by a set of species shared with other domains of the diagonal of open formations in South America (Vanzolini, 1974, 1988). In recent years, this comprehension has changed, with an increase in the number of known species and endemisms for Caatinga (Guedes *et al.*, 2014; Mesquita *et al.*, 2017). Currently, it is known that the heterogeneity of vegetation types and morphoclimatic conditions within the Brazilian semiarid region contribute to a representative diversity, one of the most important among semiarid areas around the world (Silva *et al.*, 2017a). However, there are still deep scientific gaps

about the composition and geographic distribution of species, the Wallacean Shortfall (Lomolino, 2004), including regarding reptiles.

Phyllodactylidae comprises 160 species belonging to 10 genera (Dubeux *et al.*, 2022; Uetz *et al.*, 2022), of which 14 species are recorded in Brazil (Costa *et al.*, 2022 “2021”; Dubeux *et al.*, 2022). *Phyllopezus* comprises eight species distributed throughout South America (Dubeux *et al.*, 2022; Gamble *et al.*, 2012; Uetz *et al.*, 2022), six of which occur in the Brazilian territory (Costa *et al.*, 2022 “2021”; Dubeux *et al.*, 2022). *Phyllopezus lutzae* (Loveridge, 1941) (Fig. 1A) is endemic to Brazil and has its distribution restricted to the Northeastern

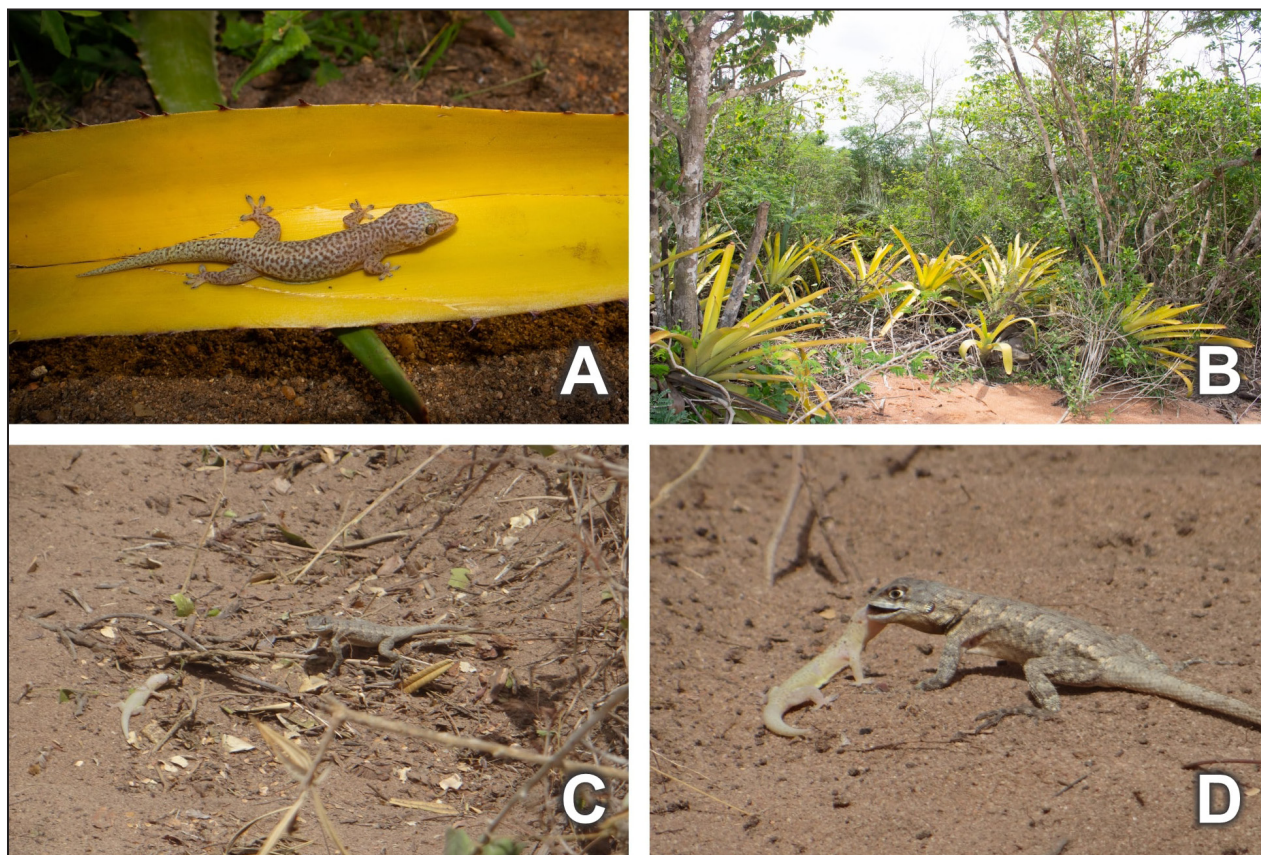


Figure 1. A. Adult individual of *Phyllopezus lutzae* registered in Tucano, Bahia, Northeastern Brazil; B. Clump of *Aechmea* bromeliads in the studied area; C. Adult male of *Tropidurus hispidus* approaching of an adult *P. lutzae*; D. A *T. hispidus* biting *P. lutzae* on the head in an attempted predation.

Atlantic Forest, occurring from the state of Paraíba to Southern Bahia (Albuquerque *et al.*, 2019) (Table 1, Fig. 2). This species inhabits rainforests and restinga habitats (vegetation types with marine influence and associated with coastal sand deposits; Costa *et al.*, 2018), intimately associated with bromeliads (Albuquerque *et al.*, 2019; Loveridge, 1941). Here, we report the first records of this species in the Brazilian semiarid and its attempted predation by the lizard *Tropidurus hispidus* (Spix, 1825).

During wildlife rescue and monitoring activities for the installation of wind power plants (Complexo Eólico Tucano) between February and November 2021, 141 individuals of *P. lutzae* were registered in the municipality of Tucano (11°11' 58.80" S, 38°46'57.02" W, 405 m elevation) and one in the municipality of Nova Soure (11°17'04.67" S, 38°28'07.14" W, 239 m elevation), in the Raso da Catarina ecoregion (Veloso *et al.*, 2002; Silva *et al.*, 2017b), Bahia, Brazil. The region is located in the part of Brazil most affected by drought, known as the "Polygon of Droughts" (Ab'Sáber, 2003). The

climate of both municipalities is classified as DdA 'a' according Thornthwaite (1948), with average annual rainfall of 561.2 mm in Tucano and 891 mm in Nova Soure (SEI, 1999). During the wildlife rescue, the individuals were captured manually during vegetation suppression activities, and later they were released in areas close to the activity sites. For wildlife monitoring activity, individuals were recorded during nocturnal searches. The specimens were always found associated to ground bromeliads, on the leaves, inside rosettes or in the vicinities of them when felled during vegetation removal.

The taxonomic determination of individuals was based on the following diagnostic characters: presence of undivided interdigital lamellae, absence of dorsal tubercles, rudimentary or absent pollex, and the dorsal typical color pattern of the species (gray to orange dorsal background with darker small marks, almost regular in size and spacing; Loveridge, 1941; Dubeux *et al.*, 2022). We collected five individuals between 20 and 22 November 2021 in the municipality of Tucano as voucher specimens. They

Table 1. Details of the geographic records of *Phylllopezus lutzae*. The present record is highlighted in bold. * Type Locality.

Municipality	State	Latitude (S)	Longitude (W)	Reference
Flexeiras	Alagoas	09°22'00.0"	035°45'00.0"	Avila et al., 2010
Ibateguara	Alagoas	09°00'02.0"	035°51'12.0"	Silva, 2008
Quebrangulo/Chã Preta/Lagoa do Ouro	Alagoas/Pernambuco	9°13'54.37"	36°25'38.6"	Roberto et al., 2015
Cairú	Bahia	13°36'47.1"	038°56'11.6"	Dias and Rocha, 2014
Camaçari	Bahia	12°38'03.0"	038°04'32.0"	Dias and Rocha, 2014
Cruz das Almas	Bahia	12°40'25"	39°06'05"	Protázio et al., 2021
Cumuruxatiba	Bahia	17°06'00.0"	039°11'00.0"	Rodrigues, 1987
Jandaíra	Bahia	11°40'28.0"	037°29'03.0"	Dias and Rocha, 2014
Lauro de Freitas	Bahia	12°53'9.6"	38°18'30.0"	Freitas, 2014
Maraú	Bahia	14°06'22.6"	038°59'23.0"	Dias and Rocha, 2014
Mata de São João	Bahia	12°31'40.9"	038°18'03.1"	Couto-Ferreira et al., 2011; Freitas, 2014; Gamble et al., 2012
Prado	Bahia	17°19'56.6"	039°13'31.1"	Vrcibradic et al., 2000
Salvador*	Bahia	12°38'03.0"	038°04'32.0"	Loveridge, 1941; Dias and Rocha, 2014; Freitas, 2014
Santa Cruz Cabralia/Porto Seguro	Bahia	16°23'13.0"	039°10'11.4"	Franco et al., 1998; Reis, 2017
Saubara	Bahia	12°50'00.0"	038°49'00.0"	Soeiro, 2013
Simões Filho	Bahia	12°50'00.0"	038°25'00.0"	Vrcibradic et al., 2000
Trancoso	Bahia	16°39'00.0"	039°06'00.0"	Vrcibradic et al., 2000
Nova Soure	Bahia	11°17'4.67"	38°28'7.14"	Present study
Tucano	Bahia	11°11'58.80"	38°46'57.03"	Present study
Caaporã	Paraíba	07°25'40.2"	34°57'51.6"	Albuquerque et al., 2019
Pedras de Fogo	Paraíba	07°24'53.2"	34°57'56.3"	Albuquerque et al., 2019
Iguarassu	Pernambuco	07°50'00.0"	34°54'00.0"	Vanzolini, 1972
Recife	Pernambuco	08°05'45.6"	34°57'04.9"	Oliveira et al., 2016; Santos et al., 2017
São Lourenço da Mata	Pernambuco	08°02'09.6"	35°11'56.4"	Albertim et al., 2010; Teixeira et al., 2013
Areia Branca	Sergipe	10°45'54.6"	037°20'19.4"	Carvalho et al., 2005

were euthanized with lidocaine injection, had muscle tissue samples preserved in 100% alcohol, were fixed in 10% formalin and are preserved in 70% alcohol at the Coleção Herpetológica do Semiárido, Universidade Federal Rural do Semi-Árido, Mossoró, Rio Grande do Norte, Brazil, under following identification codes: CRSAR 1870 (38.7 mm snout-vent length [SVL]), 1871 (44.3 mm SVL), 1872 (60.6 mm SVL), 1874 (39.0 mm SVL) and 1876 (50.5 mm SVL).

These present records constitute the first occurrence of *P. lutzae* outside the Atlantic Forest and the first record for the Caatinga domain. Our records in Tucano and Nova Soure municipalities extend the species distribution range 151 and 116 km, respectively, Northwest of Jandaíra, Bahia, the

closest record reported in the literature (Dias and Rocha, 2014). The area where *P. lutzae* was found can be defined as a mosaic of Caatinga and Cerrado vegetation and has a high density of bromeliads of the genus *Aechmea* Ruiz & Pav. (Fig. 1B). The majority of records were made in Tucano because most of the wildlife rescue and monitoring activities are focused there, but the species can also be abundant in Nova Soure and other sites in the region with high density of bromeliads.

Bromeliads are recognized as a suitable environment for shelter and foraging for many species, as the arrangement of their leaves allows the accumulation of water and form a microenvironment that supports the development of invertebrates and

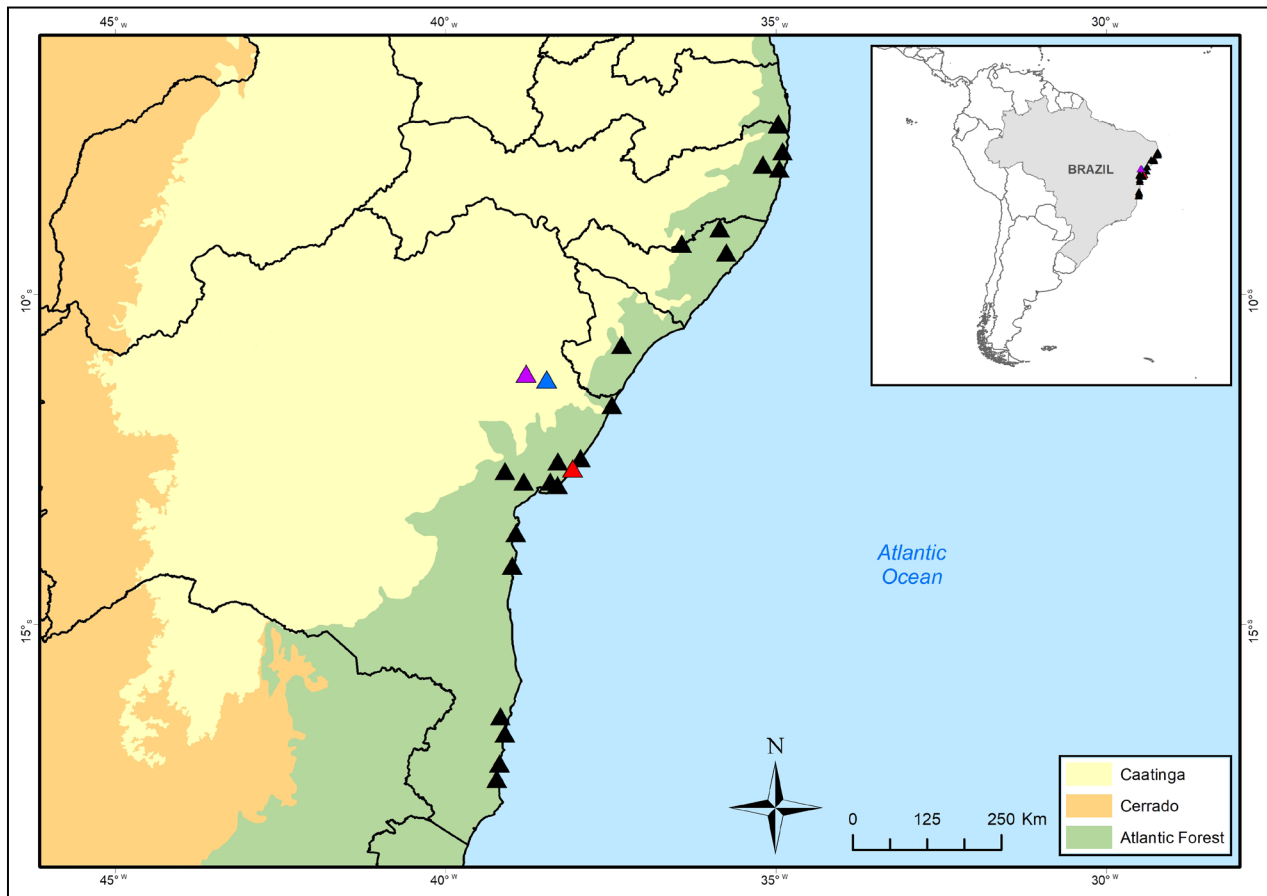


Figure 2. Updated distribution map of *Phyllopezus lutzae*. Red triangle = Type locality, black triangles = previously known records, purple triangle = new record in Tucano municipality, blue triangle = new record in Nova Soure municipality.

vertebrates (Rocha *et al.*, 2000; Jorge *et al.*, 2020; Jorge *et al.*, 2021a; Jorge *et al.*, 2021b). As *P. lutzae* was always recorded in association with bromeliads, we suggest that the presence and high population density of bromeliads in the sampled area is the main factor that allows the species inhabiting this semiarid region. These findings highlight the importance of bromeliads irrespective the considered domain (Schneider and Teixeira, 2001; Sabagh *et al.*, 2017; Jorge *et al.*, 2021a), and show how the suitable management of fauna during licensing activities can be important sources of knowledge about biodiversity.

On 24 February, 2021, at around 10 a.m., during a wildlife rescue in the municipality of Tucano, an adult male of *Tropidurus hispidus* was found approaching an adult of *P. lutzae* disturbed after vegetation removal (Fig. 1C). The *T. hispidus* began to subdue *P. lutzae* with bites on the head (Fig. 1D), but released the prey and ran away after perceiving the approach of observers.

Tropidurus hispidus is one of the most common Squamata species in the Brazilian semiarid region

(Passos *et al.*, 2016a). It is a diurnal sit-and-wait predator with a primarily insectivorous but generalist diet (Kolodiuk *et al.*, 2010; Ribeiro and Freire, 2011), including many vertebrate prey. For instance, anurans (Beltrão-Mendes, 2017), birds (Guedes *et al.*, 2017), mammals (Virgínio *et al.*, 2017), snakes (Santos *et al.*, 2017), and lizards (Zanchi *et al.*, 2012; Passos *et al.*, 2016b; Pergentino *et al.*, 2017), including conspecifics (Sales *et al.*, 2011; Sousa *et al.*, 2021) are among the documented prey of *T. hispidus*. Despite the behavioral interaction observed was an unsuccessful predation attempt, this finding provides evidence that *P. lutzae* also composes the list of potential prey of *T. hispidus*. In this regard, other phyllodactylid lizards as *Gymnodactylus geckoides* and *Phyllopezus pollicaris* were already consumed by *T. hispidus* (Pergentino *et al.*, 2017; Dubeux *et al.*, 2020).

Our new records of *P. lutzae* not only expand its known distribution range, but demonstrate that it may inhabit an ecological and climate dominion different than was reported in the scientific literature

so far. The prey-predator interaction reported also highlights the predator potential of *T. hispidus*, reinforcing this species is able to prey upon any smaller vertebrate. The semiarid of North of the state of Bahia still has areas with little known biodiversity and our findings constitute one of the first works on reptiles from this region.

Acknowledgments

We are grateful to AES Brasil for allowing the use of the information presented on this manuscript, and Bioconsultoria Ambiental LTDA. for the technical responsibility and execution of wildlife rescue and monitoring. We thank Flásio Carvalho for helping with the preparation of the map, to Jáckson Ministro for helping with the pictures, and Lander Alves and Denise Loureiro for helping with the characterization of the area. We also thank the Instituto de Meio Ambiente e Recursos Hídricos (INEMA) by decrees nº 21,970 and nº 22,262 that allowed the management of fauna in the area of the project and the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio) for authorizing the collection of zoological material (License number 57169-3).

Literature cited

- Ab'Sáber, A.N. 2003. Os domínios da natureza no Brasil: potencialidades paisagísticas. Ateliê Editorial, São Paulo.
- Albertim, K.M.; Andrade, E.V.E.; Melo, Í.V.C. & Moura, G.J.B. 2010. Anuros e lagartos associados a bromélias em um fragmento de Mata Atlântica no Estado de Pernambuco, Nordeste brasileiro. *Sitientibus Série Ciências Biológicas* 10(2-4): 289-298.
- Albuquerque, P.R.A.; Morais, M.D.S.R.; Moura, P.T.S.; Santos, W.N.S.; Costa, R.M.T.; Delfim, F.R. & Pontes, B.E.S. 2019. *Phyllopezus lutzae* (Loveridge, 1941) (Squamata, Phyllodactylidae): new records from the Brazilian state of Paraíba. *Check List* 15(1): 49-53.
- Ávila, R.W.; Anjos, L.A.; Gonçalves, U.; Freire, E.M.X.; Almeida, W.O. & Silva, R.J. 2010. Nematode infection in the lizard *Bogertia lutzae* (Loveridge, 1941) from the Atlantic Forest in north-eastern Brazil. *Journal of Helminthology* 84(2): 199-201.
- Beltrão-Mendes, R. 2017. *Tropidurus hispidus* (Neotropical Ground Lizard). Diet and prey capture. *Herpetological Review* 48: 201-202.
- Carvalho, C.M.; Vilar, J.C. & Oliveira, F.F. 2005. Répteis e anfíbios: 39–61. In: Carvalho, C.M. & Vilar, J.C. (eds.), Parque Nacional Serra de Itabaiana — Levantamento Biot. Biologia Geral e Experimental, IBAMA. Aracajú.
- Costa, G.M.; Pereira, J.S.; Martins, M.L.L. & Aona, L.Y.S. 2018. Florística em fitofisionomias de restinga na Bahia, Nordeste do Brasil. *Revista de Biologia Neotropical/ Journal of Neotropical Biology* 15(2): 78-95.
- Costa, H.C.; Guedes, T.B. & Bérnils, R.S. 2022 “2021”. Lista de répteis do Brasil: padrões e tendências. *Herpetologia Brasileira* 10(3): 110-279.
- Couto-Ferreira, D.; Tinôco, M.S.; Oliveira, M.L.T.D.; Ribeiro, H.C.B.; Fazolato, C.P.; Silva, R.M.D.; Barreto, G.S. & Dias, M.A. 2011. Restinga lizards (Reptilia: Squamata) at the Imbassá Preserve on the northern coast of Bahia, Brazil. *Journal of Threatened Taxa* 3(8): 1990-2000.
- Dias, E.J. & Rocha, C.F. 2014. Habitat structural effect on Squamata fauna of the restinga ecosystem in northeastern Brazil. *Anais da Academia Brasileira de Ciências* 86(1): 359-371.
- Dubeux, M.J.M.; Gonçalves, U.; Palmeira, C.N.S.; Nunes, P.M.S.; Cassimiro, J.; Gamble, T.; Werneck, F.P.; Rodrigues, M.T. & Mott, T. 2022. Two new species of geckos of the genus *Phyllopezus* Peters, 1878 (Squamata: Gekkota: Phyllodactylidae) from northeastern Brazil. *Zootaxa* 5120(3): 345-372.
- Dubeux, M.J.M.; Oliveira, P.M.A.; Mello, A.V.A.; Matias, I.T.A. & Santos, W.N.S. 2020. *Phyllopezus pollicaris* (Rock Gecko). Predation. *Herpetological Review* 51(2): 334.
- Franco, F.L.; Skuk, S.G.O.; Porto, M. & Marques, O.A.V. 1998. Répteis na Estação Veracruz (Porto Seguro, Bahia). Publicação Técnico-Científica No. 3. Veracel Celulose S.A. Eunápolis.
- Freitas, M.A. 2014. Squamate reptiles of the Atlantic Forest of northern Bahia, Brazil. *Check List* 10(5): 1020-1030.
- Gamble, T.; Colli, G.R.; Rodrigues, M.T.; Werneck, F.P. & Simons, A.M. 2012. Phylogeny and cryptic diversity in geckos (*Phyllopezus*; Phyllodactylidae; Gekkota) from South America's open biomes. *Molecular Phylogenetics and Evolution* 62(3): 943-953.
- Guedes, T.B.; Miranda, F.H.; Menezes, L.; Pichorim, M. & Ribeiro, L.B. 2017. Avian predation attempts by *Tropidurus hispidus* (Spix, 1825) (Reptilia, Squamata, Tropiduridae). *Herpetology Notes* 10: 45-47.
- Guedes, T.B.; Nogueira, C. & Marques, O.A. 2014. Diversity, natural history, and geographic distribution of snakes in the Caatinga, Northeastern Brazil. *Zootaxa* 3863(1): 1-93.
- Jorge, J.S.; Freire, E.M.X. & Caliman, A. 2021a. The rupicolous bromeliad (*Encholirium spectabile*) as a keystone species for Brazilian semiarid biodiversity. *Ecology* 102(9): e03357.
- Jorge, J.S.; Sales, R.F.; Santos, R.L. & Freire, E.M. 2020. Living among thorns: herpetofaunal community (Anura and Squamata) associated to the rupicolous bromeliad *Encholirium spectabile* (Pitcairnioideae) in the Brazilian semi-arid Caatinga. *Zoologia (Curitiba)* 37: e46661.
- Jorge, J.S.; Sales, R.F.D.; Silva, V.T.C. & Freire, E.M.X. 2021b. Lizards and bromeliads in the Neotropics: literature review and relevance of this association to conservation. *Symbiosis* 1-12.
- Kolodiuk, M.F.; Ribeiro, L.B. & Freire, E.M.X. 2010. Diet and foraging behavior of two species of *Tropidurus* (Squamata, Tropiduridae) in the Caatinga of northeastern Brazil. *South American Journal of Herpetology* 5(1): 35-44.
- Lomolino, M.V. 2004. Conservation biogeography: 293-296. In: Lomolino, M.V. & Heaney, L.R. (eds.), *Frontiers of Biogeography: new directions in the geography of nature*. Sinauer Associates Inc. Massachusetts.
- Loveridge, A. 1941. *Bogertia lutzae* – a new genus and species of gecko from Bahia, Brazil. *Proceedings of the Biological*

A. Coelho-Lima *et al.* — Distribution extension of *P. lutzae*

- Society of Washington* 54: 195-196.
- Mesquita, D.O.; Costa, G.C.; Garda, A.A. & Delfim, F.R. 2017. Species composition, biogeography, and conservation of the Caatinga lizards: 151-180. *In: Silva, J.M.C.; Leal, I.R. & Tabarelli, M. (eds.), Caatinga: the largest tropical dry forest region in South America.* Springer, Cham.
- Oliveira, C.N.; Muniz, S.L.S. & Moura, G.J.B. 2016. Reptiles of an urban Atlantic Rainforest fragment in the state of Pernambuco, northeastern Brazil. *Herpetology Notes* 9: 175-183.
- Passos, D.C.; Mesquita, P.C.M.D. & Borges-Nojosa, D.M. 2016a. Diversity and seasonal dynamic of a lizard assemblage in a Neotropical semiarid habitat. *Studies on Neotropical Fauna and Environment* 51(1): 19-28.
- Passos, D.C.; Monteiro, F.A.C. & Nogueira, C.H.D.O. 2016b. Dangerous neighborhood: saurophagy between syntopic *Tropidurus* lizards. *Biota Neotropica* 16(1): e20150062.
- Pergentino, H.E.S.; Nicola, P.A.; Pereira, L.C.M.; Novelli, I.A. & Ribeiro, L.B. 2017. A new case of predation on a lizard by *Tropidurus hispidus* (Squamata, Tropiduridae), including a list of saurophagy events with lizards from this genus as predators in Brazil. *Herpetology Notes* 10: 225-228.
- Protázio, A.S.; Protázio, A.S.; Silva, L.S.; Conceição, L.C.; Braga, H.S.; Santos, U.G.; Ribeiro, A.C.; Almeida, A.C.; Gama, V.; Vieira, M.V.S.A. & Silva, T.A. 2021. Amphibians and reptiles of the Atlantic Forest in Recôncavo Baiano, east Brazil: Cruz das Almas municipality. *ZooKeys* 1060:125-153.
- Queiroz, L.P.D.; Cardoso, D.; Fernandes, M.F. & Moro, M.F. 2017. Diversity and evolution of flowering plants of the Caatinga domain: 23-63. *In: Silva, J.M.C.; Leal, I.R. & Tabarelli, M. (eds.), Caatinga: the largest tropical dry forest region in South America.* Springer, Cham.
- Reis, R.R. 2017. Fauna de Squamata da Reserva Particular do Patrimônio Natural Estação Veracel, Litoral Sul do Estado da Bahia, Brasil. Master's thesis. Universidade Federal do Espírito Santo. Espírito Santo.
- Ribeiro, L.B. & Freire, E.M. 2011. Trophic ecology and foraging behavior of *Tropidurus hispidus* and *Tropidurus semitaeniatus* (Squamata, Tropiduridae) in a caatinga area of northeastern Brazil. *Iheringia. Série Zoologia* 101: 225-232.
- Roberto, I.J.; Ávila, R.W.; Melgarejo, A.R.; Studer, A.; Nusbaumer, L. & Spichiger, R. 2015. Répteis (Testudines, Squamata, Crocodylia) da Reserva Biológica de Pedra Talhada: 357-375. *In: Studer, A.; Nusbaumer, L. & Spichiger, R. (eds.), Biodiversidade da Reserva Biológica de Pedra Talhada Alagoas, Pernambuco-Brasil.* Boissiera: mémoires des Conservatoire et Jardin botaniques de la Ville de Genève, (68).
- Rocha, C.F.D.; Cogliatti-Carvalho, L.; Almeida, D.R. & Freitas, A.F.N. 2000. Bromeliads: biodiversity amplifiers. *Journal of Bromeliad Society* 50(2): 81-83.
- Rodrigues, M.T. 1987. Sistemática, ecologia e zoogeografia dos *Tropidurus* do grupo *torquatus* ao sul do Rio Amazonas (Sauria, Iguanidae). *Arquivos de Zoologia* 31(3): 105-230.
- Sabagh, L.T.; Ferreira, R.B. & Rocha, C.F.D. 2017. Host bromeliads and their associated frog species: further considerations on the importance of species interactions for conservation. *Symbiosis* 73(3): 201-211.
- Sales, R.F.D.; Jorge, J.S.; Ribeiro, L.B. & Freire, E.M.X. 2011. A case of cannibalism in the territorial lizard *Tropidurus hispidus* (Squamata: Tropiduridae) in Northeast Brazil. *Herpetological Notes* 4: 265-267.
- Santos, A.S.; Meneses, A.S.O.; Horta, G.F.; Rodrigues, P.G.A. & Brandão, R.A. 2017. Predation attempt of *Tropidurus torquatus* (Squamata, Tropiduridae) on *Phalotris matogrossensis* (Serpentes, Dipsadidae). *Herpetology Notes* 10: 341-343.
- Santos, E.M.D.; Correia, J.M.D.S. & Barbosa, V.D.N. 2017. Guia de Répteis do Parque Estadual de Dois Irmãos. EDUFRPE. Recife.
- Schneider, J.A.P. & Teixeira, R.L. 2001. Relacionamento entre anfíbios anuros e bromélias da restinga de Regência, Linhares, Espírito Santo, Brasil. *Iheringia. Série Zoologia* (91): 41-48.
- SEI - Superintendência de Estudos Econômicos e Sociais da Bahia. 1999. Balanço hídrico do estado da Bahia. SEI. Salvador.
- Silva, J.M.C.; Barbosa, L.C.F.; Leal, I.R. & Tabarelli, M. 2017b. The Caatinga: understanding the challenges: 3-19. *In: Silva, J.M.C.; Leal, I.R. & Tabarelli, M. (eds.), Caatinga: the largest tropical dry forest region in South America.* Springer, Cham.
- Silva, J.M.C.; Leal, I.R. & Tabarelli, M. (eds.). 2017a. Caatinga: the largest tropical dry forest region in South America. Springer.
- Silva, U.G.D. 2008. Diversidade de espécies e ecologia da comunidade de lagartos de um fragmento de Mata Atlântica no nordeste do Brasil. Master's thesis. Universidade Federal do Rio Grande do Norte. Natal.
- Soeiro, M. 2013. Notas Sobre a Herpetofauna da Ilha do Monte Cristo, Saubara, Bahia. Undergraduate thesis. Universidade Federal da Bahia. Salvador.
- Sousa, J.D.; Lima, J.H.A.; Almeida, M.E.A.; Almeida, J.F. & Kokubum, M.N.C. 2021. Novel behavioral observations of the lizard *Tropidurus hispidus* (Squamata: Tropiduridae) in Northeastern Brazil. *Cuadernos de Herpetología* 35(2): 305-317.
- Teixeira, D.F.F. & Moura, G.J.B. 2013. *Bogertia lutzae*. Predation by *Leptophis ahaetulla*. *Herpetological Review* 44(4): 670.
- Thorntwaite, C.W. 1948. An approach toward a rational classification of climate. *Geographical review* 38: 55-94.
- Uetz, P.; Freed, P.; Aguilar, R. & Hošek, J. (eds.). 2022. *The Reptile Database*. Available in: <http://www.reptile-database.org>. Last access: 13 April 2022.
- Vanzolini, P.E. 1972. Miscellaneous notes on the ecology of some Brazilian lizards (Sauria). *Papéis Avulsos de Zoologia* 26(8): 83-115.
- Vanzolini, P.E. 1974. Ecological and geographical distribution of lizards in Pernambuco, northeastern Brazil (Sauria). *Papéis Avulsos de Zoologia* 28: 61-90.
- Vanzolini, P.E. 1988. Distribution patterns of south American lizards: 317-343. *In: Heyer, W.R. & Vanzolini, P.E. (eds.), Proceedings of a workshop on Neotropical distribution patterns.* Academia Brasileira de Ciências. Rio de Janeiro.
- Velloso, A.L.; Sampaio, E.V.B. & Pareyn, F.G.C. 2002. Ecorregiões propostas para o bioma Caatinga. Associação Plantas do Nordeste. Instituto de Conservação Ambiental The Nature Conservance do Brasil. Recife.
- Virginio, F.; Jorge, J.S.; Maciel, T.T. & Barbosa, B.C. 2017. Attempt to opportunistic consumption of *Mus musculus* Linnaeus, 1758 (Rodentia: Muridae) by *Tropidurus hispidus*

(Spix, 1825) (Squamata: Tropiduridae) in an urban area in Brazil. *Revista Brasileira de Zoociências* 18(3): 207-210.
Vrcibradic, D.; Hatano, F.H.; Rocha, C.F.D. & Sluys, M.V. 2000. Geographic distribution *Bogertia lutzae*. *Herpetological*

Review 31(2): 112.

Zanchi, D.; Passos, D.C. & Borges-Nojosa, D.M. 2012. *Tropidurus hispidus* (Calango). Saurophagy. *Herpetological Review* 43(1): 141.

© 2022 por los autores, licencia otorgada a la Asociación Herpetológica Argentina. Este artículo es de acceso abierto y distribuido bajo los términos y condiciones de una licencia Atribución-No Comercial 4.0 Internacional de Creative Commons. Para ver una copia de esta licencia, visite <http://creativecommons.org/licenses/by-nc/4.0/>