

throughout the arid south, and northwards along the rift valley in the east and the Mediterranean coastal dunes in the west. These are small, nocturnal terrestrial geckos that forage at night for arthropods. Here, we describe a case of tail bifurcation in an adult *S. sthenodactylus* from Mamshit, Israel. During a field trip we came across several *S. sthenodactylus* under scattered man-made objects near the road leading from Road 25 to Mamshit National Park in the North Eastern Negev (31.0349°N, 35.0654°E; WGS 84; 470 m asl). The animals appeared to be sleeping in a cool (15°C), overcast morning (0845 h). One of them, an adult female (50.9 mm SVL, 4 g), had a regenerated tail of 18.5 mm, but with an upwards facing dorsal bifurcation 3.6 mm long, 7.8 mm from the base of the tail (Fig. 1). The animal was measured and weighed, under permit #2019/42139 from the Israeli Nature and Parks Authority, photographed, and released immediately at the point of capture. It looked to be healthy and in good physical condition. Only 4 of 48 conspecifics we measured throughout its distribution range in Israel between 2011 and 2019 were heavier (max = 5.5 g) and four were of equal weight, eight animals of 54 were longer (max SVL = 56.6 mm; S. Meiri, unpubl. data). To the best of our knowledge this is the first reported case of tail bifurcation in the genus *Stenodactylus*.

**EYAL OFER** (e-mail: maeyalam@gmail.com), **RAN SHOSHANI** (e-mail: rnsh33@gmail.com), **EFRAIM HURWITZ** (e-mail: hurwitz.efrat@gmail.com), **KASPIT ISHLACH** (e-mail: kaspiti@mail.tau.ac.il), **SHADA KADIVA** (e-mail: shathak@mail.tau.ac.il), **IDA ROTER** (e-mail: idarotter@mail.tau.ac.il), **REVITAL ZAMSKY** (e-mail: zamsky93@gmail.com), **AMIR LEWIN** (e-mail: amirlewin@gmail.com), and **SHAI MEIRI**, School of Zoology, Tel Aviv University, Tel Aviv, 6997801, Israel (e-mail: uncshai@tauex.tau.ac.il).

**TRACHYLEPIS ATLANTICA (Noronha Skink). NEST SITE and HATCHLING.** *Trachylepis atlantica* is an endemic species of lizard from the island of Fernando de Noronha in northeastern Brazil. It is one of four reptile species present on the island and it is the most conspicuous element of the Fernando de Noronha herpetofauna, being practically ubiquitous and very abundant locally (Rocha et al. 2009. J. Herpetol. 43:450–459). Previous studies



FIG. 1. A) *Trachylepis atlantica* eggs in the nest inside a fallen log in Fernando de Noronha, Brazil; B) *T. atlantica* eggs; C) *T. atlantica* hatchling.

on *T. atlantica* provide information with emphasis on activity patterns, microhabitat use, thermal ecology, and feeding habits, variation in some morphological, diet, predation by introduced species, and cannibalism, but no nesting information has been published about this lizard species (Travassos 1946. Bol. Mus. Nac. 60:1–56; Silva et al. 2005. Herpetol. Rev. 36:62–63; Gasparini et al. 2007. Herpetol. Bull. 100:30–33; Rocha et al. 2009. J. Herpetol. 43:450–459; Ribeiro et al. 2018. Herpetol. Rev. 49:122).

At 1036 h on 5 May 2019, during entomological research in the archipelago of Fernando de Noronha, Brazil, a *T. atlantica* nest was found within a fallen log at the trail “Mirante dos Golfinhos” (3.858152°S, 32.446218°W; WGS 84). The fallen log was of a large tree and it was in an advanced decomposition stage. The nest was found in a small hole (ca. 5 cm depth) in the bark (Fig. 1A), containing two eggs stuck together (Fig. 1B). The eggs ranged in width from 16–18 mm and from 29–33 mm in height. During the handling of the eggs, one of them hatched (Fig. 1C). The *T. atlantica* hatchling was ca. 45 mm SVL and 43 mm tail length. It had the same coloration as the adults. To the best of our knowledge, this is the first description of the nest site of the *T. atlantica*, including data on egg size, clutch size, and hatchling size.

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**ALBERTO MOREIRA SILVA NETO** (e-mail: bio.alberto@gmail.com) and **DIEGO MATHEUS DE MELLO MENDES**, Laboratório de Entomologia Sistemática Urbana e Forense, Instituto Nacional de Pesquisas da Amazônia - Campus II, Av. André Araújo, 2936, 69080-971 Manaus, Amazonas, Brazil (e-mail: diego.mello.mendes@gmail.com); **RAFAEL SOBRAL**, Laboratório de Sistemática e Ecologia de Invertebrados de Solo, Instituto Nacional de Pesquisas da Amazônia - Campus II, Av. André Araújo, 2936, 69080-97, Manaus, Amazonas, Brazil (e-mail: rafaelsobralves@gmail.com); **JOSÉ ALBERTINO RAFAEL**, Laboratório de Entomologia Sistemática Urbana e Forense, Instituto Nacional de Pesquisas da Amazônia - Campus II, Av. André Araújo, 2936, 69080-971 Manaus, Amazonas, Brazil (e-mail: jara-rael@inpa.gov.br).

**TRACHYLEPIS ATLANTICA (Noronha Skink). REPRODUCTION.** Viviparity has evolved from oviparity at least 115 times independently in squamates (Blackburn 2015. J. Morphol. 276:961–990). These multiple transitions have raised several functional and evolutionary questions and attracted considerable scientific interest (Stewart and Blackburn 2014. In Rheubert et al. [eds.], Reproductive Biology and Phylogeny of Lizards and Tuatara, pp. 448–563. CRC Press, Boca Raton, Florida). Ideally, testing hypotheses on the evolution of viviparity requires focusing on closely related taxa that exhibit both reproductive modes. The genus *Trachylepis* includes oviparous, viviparous, and reproductively bimodal species (Weinell et al. 2019. Mol. Phylogenet. Evol. 136:183–195), thus forming an excellent system for investigating the evolution of viviparity. However, the reproductive mode of many *Trachylepis* remains undocumented (Weinell et al. 2019, *op. cit.*). The Noronha Skink, *Trachylepis atlantica*, is endemic to the Fernando de Noronha Archipelago, 354 km off northeastern Brazil, and has been mentioned as viviparous (Travassos 1946. Bol. Mus. Nac., Nova sér., Zool. 60:1–56) and oviparous (Silva-Jr



FIG. 1. Embryo at stage 30 found in an oviductal shelled egg of *Trachylepis atlantica* from the Fernando de Noronha Archipelago, north-eastern Brazil.

et al. 2005. *Herpetol. Rev.* 36:62–63; Weinell et al. 2019, *op. cit.*), but empirical evidence supporting either reproductive mode is lacking. Here, we provide evidence that *T. atlantica* is oviparous, laying shelled eggs with partially developed embryos.

Two female *T. atlantica* were collected at the Fernando de Noronha Archipelago (3.8710°S, 32.4216°W; WGS 84) as part of a more extensive reproductive study. Each female had two oviductal eggs surrounded by thick, opaque, and leathery shells typical of most oviparous squamates (Schleich and Kästle 1988. *Reptile Egg Shells, SEM Atlas*. Gustav Fischer Verlag, Stuttgart. 123 pp.). Eggs of one female had no visible embryos. One egg of the other female was apparently atresic and had no visible embryo. The other egg had a developing embryo (Fig. 1), which was visible only after the eggshell was removed. The embryo had reached developmental stage 30 (according to Dufaure and Hubert 1961. *Arch. Anat. Microsc. Morphol. Exp.* 50:309–328), which falls within the range of stages at oviposition (i.e., stages 26–32) observed in most oviparous squamates (Blackburn 1995. *J. Theor. Biol.* 174:199–216), suggesting that egg-laying might be close to occurring. However, it should be noticed that embryos staged from oviductal eggs may represent at least the minimum stage attainable in uterus. Indeed, two oviparous congeners (*T. margaritifera* and *T. homalocephala*) were found to contain more developed oviductal eggs (stage 32) than *T. atlantica* (Visser 1975. *Zool. Afr.* 10:209–213). Thus, female *T. atlantica* may retain eggs longer and lay eggs at more advanced stages than observed here.

**SERENA N. MIGLIORE**, Programa de Pós-graduação em Anatomia dos Animais Domésticos e Silvestres, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Brazil (e-mail: serenanaajara@usp.br); **HENRIQUE B. BRAZ**, Laboratório de Ecologia e Evolução, Instituto Butantan, Av. Dr. Vital Brazil, 1500, CEP 05503-900, São Paulo, Brazil (e-mail: h.braz@hotmail.com); **VINICIUS P. GASPAROTTO**, Laboratório de Epidemiologia e Bioestatística, Departamento de Medicina Veterinária Preventiva e Saúde Animal, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Brazil (e-mail: vpo.gasparotto@gmail.com); **RICARDO DIAS**, Laboratório de Epidemiologia e Bioestatística, Departamento de Medicina Veterinária Preventiva e Saúde Animal, Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Brazil (e-mail: ricardodias@usp.br); **SELMA MARIA ALMEIDA-SANTOS**, Laboratório de Ecologia e Evolução, Instituto Butantan, Av. Dr. Vital Brazil, 1500, CEP 05503-900, São Paulo, Brazil (e-mail: selma.santos@butantan.gov.br).

**TRACHYLEPIS ATLANTICA (Noronha Skink). TOE LOSS.** The loss of toes is a deformity occasionally found among lizards under natural conditions. Fungal infections and aggressive interactions are commonly considered as reasons for toe loss (Hudson 1996. *J. Herpetol.* 30:106–110; Vervust et al. 2009. *Funct. Ecol.* 23:996–1003). It has been shown that fungal infection on toes producing dermatophytosis or sporotrichosis can result in digital necrosis with a toe (or toes) being partially or extensively lost (e.g., Hazell and Eamens 1985. *J. Wildl. Dis.* 21:186–188; Orós et al. 2013. *J. Comp. Pathol.* 149:372–375). In addition, missing toes may occur as result of aggressive encounters between individuals and, in this case, mostly occur among males of the population (e.g., Vervust et al. 2009, *op. cit.*). Here, we report two documented records of toe loss in *Trachylepis atlantica*, an endemic and very abundant diurnal lizard from Fernando de Noronha Archipelago, Brazil (Rocha et al. 2009. *J. Herpetol.* 43:450–459).



FIG. 1. First *Trachylepis atlantica* observed with toe loss from Boldró Beach, Fernando de Noronha Archipelago, Brazil.



FIG. 2. Second *Trachylepis atlantica* observed with toe loss from Boldró Beach, Fernando de Noronha Archipelago, Brazil.

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PHOTO BY GERMANO COELHO



Fernando de Noronha (3.85°S, 32.41667°W; WGS 84) is an archipelago of volcanic origin located ca. 360 km off the northeastern Brazilian coast (Rocha et al. 2009, *op. cit.*). On 6 July 2018, an adult female was observed foraging on rocks, exposed to the sun (32.4°C body temperature) at 1130 h less than 10 m from the sea at Boldró Beach (3.84°S, 32.4294°W; WGS 84). It was a large individual for the species (85 mm SVL, 10.75 g) and appeared in good body condition apart from complete or partial digits missing from all four limbs (Fig. 1). Even so, it moved, fed and interacted with other skinks without apparent issues. Body temperature, size, and mass were in accordance with individuals with no injuries (Rocha et al. 2009, *op. cit.*).

On 1 April 2019, another adult individual with digits missing was observed foraging on rocks at 1400 h, at the same beach (Fig. 2). This individual was also observed interacting with other individuals, with no apparent issues. Since the lizards were not collected for epidemiological investigations, at this point we are unable to infer on the possible causes of digit loss. However, considering that the loss was extensively present in all toes the individuals recorded, it seemed unlikely that it was due to aggressive encounters, but instead fungal infection may be more likely. Further studies are needed to understand the causes of this deformity on this endemic lizard.

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**LUISA MARIA DIELE-VIEGAS**, Universidade Federal da Bahia, Salvador, Bahia, Brazil (e-mail: luisa.mviegas@gmail.com); **THIAGO FILADELFO**, Projeto Aves de Noronha, Arquipélago de Fernando de Noronha, Pernambuco, Brazil (e-mail: thiago\_bioufba@yahoo.com.br); **VANDERLAINE AMARAL DE MENEZES**, Centro Universitário da Zona Oeste, Rio de Janeiro, Brazil (e-mail: va.menezes@gmail.com); **GERMANO COELHO**, Programa Brasileiro de Conservação das Tartarugas Marinhas-TAMAR, Arquipélago de Fernando de Noronha, Pernambuco, Brazil (e-mail: gecsdk@hotmail.com); **CECILIA LICARIÃO**, Projeto Aves de Noronha, Arquipélago de Fernando de Noronha, Pernambuco, Brazil (e-mail: licariaocbl@gmail.com); **CARLOS FREDERICO DUARTE ROCHA**, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil (e-mail: cfdrocha@gmail.com).

**TROPIDURUS HISPIDUS** (Neotropical Lava Lizard). **DIET.** *Tropidurus hispidus* (Spix, 1825) is a neotropical lizard with wide geographic distribution, occurring in northeastern Brazil up to Venezuela (Vanzolini 1980. Répteis das Caatingas. Academia Brasileira de Ciências, Rio de Janeiro, Brazil. 161 pp.). Their diet consists primarily of arthropods such as beetles, termites, insect larvae, and ants (Van Sluys et al. 2004. J. Herpetol. 38:606–611). The ingestion of small vertebrates may occur occasionally, such as anurans (Ribeiro and Freire 2009. Herpetol. Rev. 40:228) and lizards (Pergentino et al. 2017. Herpetol. Notes 10:225–228). Here, we present the first record of this species preying on the invasive gecko, *Hemidactylus mabouia*.

On 11 August 2019, an adult *T. hispidus* was observed preying on an adult *H. mabouia* in a sandbank in the Municipality of



FIG. 1. Adult *Tropidurus hispidus* preying on an adult *Hemidactylus mabouia* in Bahia, Brazil.

Salvador, Bahia, Brazil. When first observed, the *H. mabouia* had not been eaten, which allowed us to identify the species. This record is important as this observation suggests that native species may exhibit some population control over this invasive species.

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**GUILHERME SOUZA PAGEL** (e-mail: guilherme.pagel@ucsal.edu.br), **ANDRÉ KAUFER LEITE**, **LARA COSTA C. DE OLIVEIRA**, and **MÓACIR SANTOS TINÓCO**, Centro de Ecologia e Conservação Animal, Universidade Católica do Salvador, Av. Prof. Pinto de Aguiar, 2589, 41740-090, Pituçu, Salvador, Bahia, Brazil.

**TROPIDURUS HISPIDUS** (Neotropical Lava Lizard). **DIET.** Predation is one of the main negative pressures affecting natural populations (Passos et al. 2016. Biota Neotropica 16:1–5), but it can also be of extreme importance to reduce prey population densities (Vitt and Lacher 1981. Herpetologica 37:53–63; Rocha and Vrcibradic 1998. Revista Ciência e Cultura 50:364–368; Teixeira 2001. Atlântica 23:121–132). Saurophagy events have been reported in several families of Neotropical lizards (Siqueira and Rocha 2008. S. Am. J. Herpetol. 3:82–87; Rodrigues et al. 2015. Rev. Bras. Zool. 16:123–127; Campbell et al. 2018. Herpetol. Rev. 49:115–116), such as ingestion of *Hemidactylus mabouia* by *Tropidurus torquatus* (Galdino and Van Sluys 2004. Herpetol. Rev. 35:173) and the predation of *Cnemidophorus ocellifer* by *T. hispidus* (Zanchi et al. 2012. Herpetol. Rev. 43:141–142). *Tropidurus hispidus* (Spix, 1825), the largest species of the genus, has a wide geographic distribution in northeastern South America, from Venezuela south to Minas Gerais, where it occurs mainly in open formations (Rodrigues 1987. Arq. Zool. 31:105–230; Rodrigues et al. 1988. Pap. Avulsos de Zool. 36:307–313). In addition, *T. hispidus* is a generalist, opportunistic species and a sit-and-wait forager (Costa et al. 2010. Herpetol. Rev. 41:87; Silva et al. 2013. Herpetol. Notes 6:51–53; Santana et al. 2014. Neotrop. Biol. Conserv. 9:55–61), feeding on insects, as well as leaves, flowers, and fruits (Vitt et al., 1996. J. Trop. Ecol. 12:81–101; Kolo-diuk et al. 2010. S. Am. J. Herpetol. 5:35–44; Ribeiro and Freire 2011. Sér. Zool. 101:225–232). Vertebrates have been reported as food items in the diet of *T. hispidus*, mostly amphibians and lizards (Vitt et al. 1996. J. Trop. Ecol. 12:81–101; Kiefer and Sazima 2002. Herpetol. Rev. 33:136; Dias and Rocha 2004. Herpetol. Rev. 35:398; Ribeiro and Freire 2009. Herpetol. Rev. 40:228; Sales et