

First record of *Lithodytes lineatus* (Schneider, 1799) (Anura: Leptodactylidae) in northeastern Brazil

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ABSTRACT: In this paper, we report the first record of *Lithodytes lineatus* (Schneider, 1799) in the state of Maranhão Brazil. This is the first record of this species in the northeastern region of Brazil, extending its geographic distribution in 425 km northeast of its nearest known distribution, in the Biological Reserve of Tapirapé in Pará state, Brazil.

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Lithodytes is a monotypic genus, including only *L. lineatus* (Schneider, 1799). This is a leaf-litter frog with snout-vent ranging from 33-45.0 mm in males and 44-56.0 in females (Rodríguez and Duellman 1994; Beirne and Whitworth 2011). *Lithodytes lineatus* is found in primary and secondary tropical rainforest, and pasture (Bernarde and Kokubum 2009; La Marca *et al.* 2010). Some studies report an association between this species with ant nests (*Atta* spp.) (e.g. Schlüter and Regös 1981; Lamar and Wild 1995; Schlüter *et al.* 2009).

This species is known from the Amazon region in northern Bolivia (Harvey 1998), Peru (Rodríguez and Duellman 1994; Icochea *et al.* 2001; Schlüter *et al.* 2004; May *et al.* 2008), Ecuador (Duellman 1978; Almendáriz 1987; Cisneros-Heredia 2003; Vigle 2008; Beirne and Whitworth 2011; Ron and Read 2013), Colombia (Cochran and Goin 1970; Lynch 2005, 2006), French Guiana (Lescure and Marty 2000), Guyana (Ernst *et al.* 2005; Reynolds and MacCulloch 2012; Cole *et al.* 2013), Suriname (Ouboter and Jairam 2012) and Venezuela (Rivero 1961; Barros and Barrios 2001; Señares *et al.* 2002; Amorós 2004). In Brazil, it occurs in the states of Acre (Souza 2009; Bernarde *et al.* 2011, 2013), Rondônia (Bernarde 2007; Bernarde and Macedo 2008), Mato Grosso (São-Pedro *et al.* 2009), Amazonas (Lima *et al.* 2006; França and Venancio 2010; Rojas-Ahumada and Menin 2010; Ilha and Dixo 2010; Waldez *et al.* 2013; Prudente *et al.* 2013), Tocantins (Cintra *et al.* 2014) and Pará (Bernardo *et al.* 2012; Pinheiro *et al.* 2012).

During fieldwork in the biological reserve Gurupi, Bom Jardim municipality, State of Maranhão, Brazil (Figure 1), on 18 January 2013; we collected a single specimen of *Lithodytes lineatus* (Figure 2) in pitfall traps (04°00'20" S, 46°46'41" W). No specimen was found on the forest leaf litter or temporary ponds during active search. Nine arrays of pitfall traps containing five 60 L plastic buckets, with buckets connected by fence (17.5 m long, 50 cm high), were installed in the study area. Each arrays of pitfall traps remained open four nights per month, totaling a sampling effort of 540 buckets/day. These collects were conducted in the implementation of the project "Survey of Herpetofauna" at biological reserve Gurupi (ICMBIO-SISBIO 36669-1). During three months 38 specimens of frogs were captured in pitfall traps, where only *Lithodytes lineatus* was represented by one specimen (2.6% of captured frogs). This may suggests low local abundance in the study period. The specimen of *L. lineatus* collected was killed and fixed in accordance with guidelines of the American Society of Ichthyologists and Herpetologists and were deposited in the Herpetological Collection of the Universidade Federal Rural de Pernambuco (CHP-UFRPE 1815).

This is the first record for the state of Maranhão, and the first for the northeastern region of Brazil (Figure 2), extending the known distribution of the species by more than 425 Km northeast from the nearest locality, in the Reserva Biológica de Tapirapé, Pará state, Brazil (Bernardo *et al.* 2012).

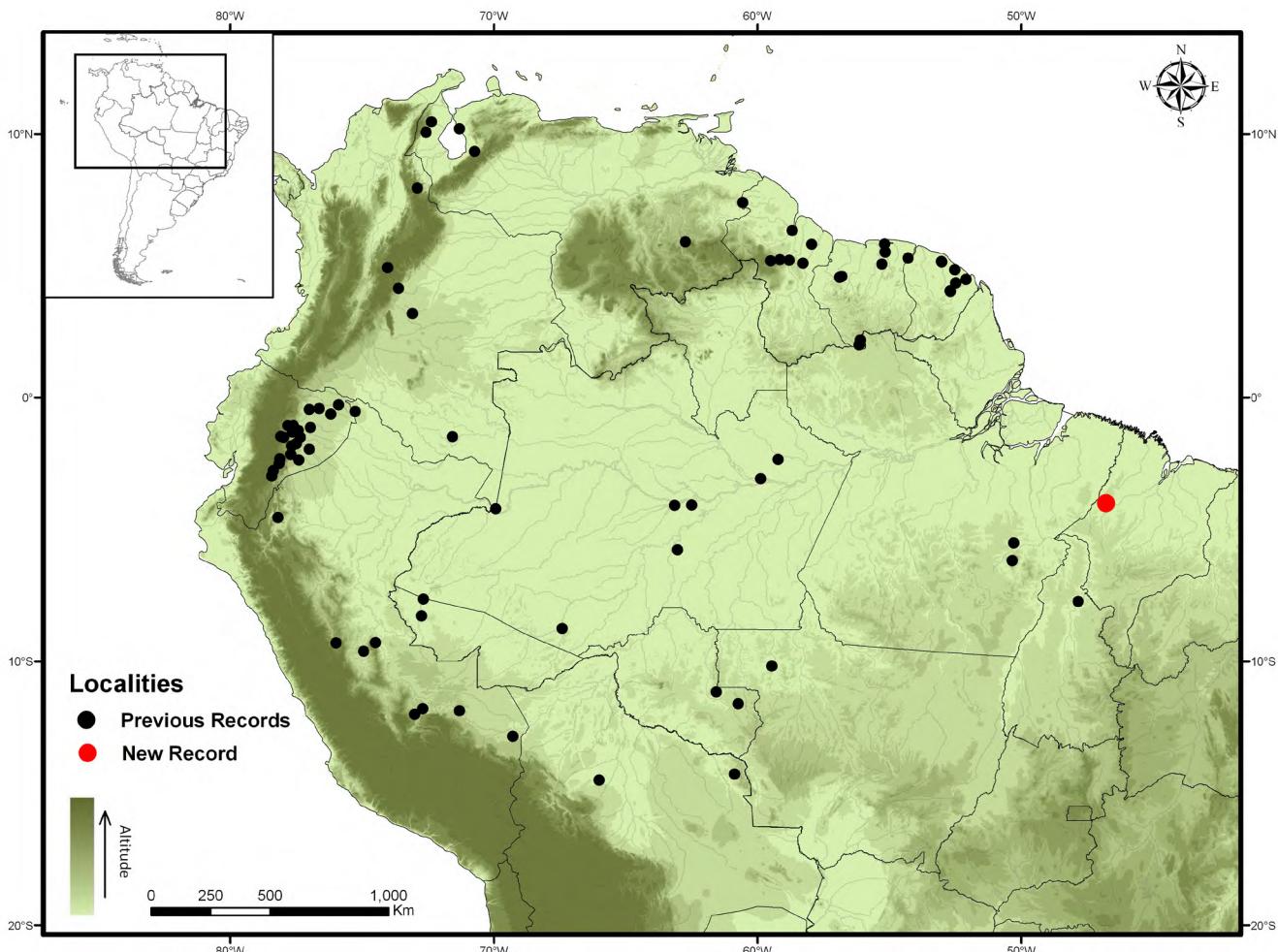


FIGURE 1. Map of the known distribution of *Lithodytes lineatus*. Records from the literature are indicated by black dots and the new locality by a red dot.



FIGURE 2. *Lithodytes lineatus* (CHP-UFRPE 1815) collected in the biological reserve of Gurupi, Maranhão state, Brazil (Photo by Marco Antonio de Freitas).

LITERATURE CITED

- Almendáriz, A. 1987. Contribución al conocimiento de la herpetofauna centroriental ecuatoriana. *Revista Politécnica* 12: 77–133.
- Amorós, C.L.B. 2004. Amphibians of Venezuela systematic list, distribution and references, an update. *Review of Ecology in Latin America* 9(3): 1–48 (<http://www.bio-nica.info/biblioteca/Barrios2004AnfibiosVenezuela.pdf>).
- Barros, T. and C.L. Barrios. 2001. *Lithodytes lineatus*: Trujillo, Venezuela. Geographic Distribution. *Herpetological Review* 32(2): 114.
- Beirne, C. and A. Whitworth. 2011. *Frogs of the Yachana Reserve*. Global Vision International. Exeter, Reino Unido. 110 pp.
- Bernarde, P.S. and Macedo, L.C. 2008. Impacto do desmatamento e formaçao de pastagens sobre a anurofauna de serapilheira em Rondônia. *Iheringia, Série Zoologica* 98(4): 454–459 (doi: 10.1590/S0073-47212008000400006).
- Bernarde, P.S. and Kokubum, M.N. 2009. Seasonality, age structure and reproduction of *Leptodactylus (Lithodytes) lineatus* (Anura, Leptodactylidae) in Rondônia state, southwestern Amazon, Brazil. *Iheringia, Série. Zoologica* 99(4): 368–372 (doi: 10.1590/S0073-47212009000400005).
- Bernarde, P.S. 2007. Ambientes e temporada de vocalização da anurofauna no município de Espigão do Oeste, Rondônia, Sudoeste da Amazônia – Brasil (Amphibia: Anura). *Biota Neotropica* 7(2): 87–92 (<http://www.biota-neotropica.org.br/v7n2/pt/fullpaper?bn01507022007+pt>).
- Bernarde, P.S., R.A. Machado and L.C.B. Turci. 2011. Herpetofauna da área do Igarapé Esperança na Reserva Extrativista Riozinho da Liberdade, Acre – Brasil. *Biota Neotropica* 11(3): 117–144 (doi: 10.1590/S1676-06032011000300010).
- Bernarde, P. S., S. Albuquerque, D.B. Miranda, and L.C.B. Turci. 2013. Herpetofauna da floresta do baixo rio Moa em Cruzeiro do Sul, Acre, Brasil. *Biota Neotropica* 13(1): 220–244 (doi: 10.1590/S1676-06032013000100023).
- Bernardo, P.H., R.A. Guerra-Fuentes, W. Matiazzi and H. Zaher. 2012. Checklist of Amphibians and Reptiles of Reserva Biológica do Tapirapé, Pará, Brazil. *Check List* 8(5): 839–846. <http://www.checklist.org.br/getpdf?SL037-12>.
- Cintra, C.E.D., H.R.L. Silva and N.J. Silva Júnior. 2014. First record of *Lithodytes lineatus* (Schneider, 1799) (Anura:Leptodactylidae) in the state of Tocantins, ecotone zone Amazon-Cerrado biomes, with notes on its natural history. *Herpetology Notes* 7: 179–184 (http://www.herpnotes.sehherpetology.org/Volume7_PDFs/Cintra_HerpetologyNotes_volume7_pp179-184.pdf).
- Cisneros-Heredia, D.F. 2003. Herpetofauna de la Estación de Biodiversidad Tiputini, Amazonía Ecuatoriana: Ecología de una comunidad taxonómicamente diversa con comentarios sobre metodologías de inventario; pp. 1–21, in: S. De la Torre and G. Reck. (ed.). *Ecología y Ambiente en el Ecuador: Memorias del I Congreso de Ecología y Ambiente, Ecuador país megadiverso*. CD. Universidad San Francisco de Quito. Quito.
- Cochran, D.M. and C.J. Goin. 1970. Frogs of Colombia. *Bulletin of the United*

- States National Museum* 288: 1–655.
- Cole, J.C., C.R. Townsend, R.P. Reynolds, R.D. MacCulloch and A. Lathrop. 2013. Amphibians and reptiles of Guyana, South America: illustrated keys, annotated species accounts, and a biogeographic synopsis. *Proceedings of the Biological Society of Washington* 125(4): 317–578 (doi: 10.2988/0006-324X-125.4.317).
- Duellman, W.E. 1978. The biology of an equatorial herpetofauna in Amazonian Ecuador. *Miscellaneous Publications Museum Natural History, University of Kansas* 65: 1–352.
- França, F.G.R. and N.M. Venâncio. 2010. Reptiles and amphibians of a poorly known region in southwest Amazonia. *Biotaemas* 23(3): 71–84 (doi: 10.5007/2175-7925.2010v23n3p71).
- Harvey, M.B. 1998. Reptiles and Amphibians of Parque Nacional Noel Kempff Mercado; pp. 144–153, in: T.J. Killeen and T.S. Schulenberg (ed.). *A Biological Assessment of Parque Nacional Noel Kempff RAP Working Papers 10*. Washington: Conservation International.
- Icochea, J., E. Quisipitupac, A. Portilla and E. Ponce. 2001. Assessment of amphibians and reptiles of the Lower Urubamba Region, Peru; pp. 129–142, in: Alonso, A., F. Dallmeier, P. Campbell (ed.). *Urubamba: The Biodiversity of a Peruvian Rain Forest*. Washington D.C.: Smithsonian Institution.
- Ilha, P. and M. Dixo. 2010. Anurans and Lizards, Rio Preto da Eva, Amazonas, Brazil. *Check List* 6(1): 17–21 (<http://www.checklist.org.br/getpdf?SL008-09>).
- La Marca, E., C. Azevedo-Ramos, L.A. Coloma, S. Ron and J. Hardy. 2010. *Leptodactylus lineatus*. In: IUCN 2013. *IUCN Red List of Threatened Species*. Version 2013.2. Accessible at www.iucnredlist.org. Captured on 07 March 2014.
- Lamar, W.W. and E.R. Wild. 1995. Comments on the natural history of *Lithodytes lineatus* (Anura: Leptodactylidae), with a description of the tadpole. *Herpetological Natural History* 3(2): 135–142.
- Lima, A., W.E. Magnusson, M. Menin, L.K. Erdtmann, D.J. Rodrigues, C. Keller and W. Hodl. 2006. *Guia de sapos da Reserva Adolpho Ducke — Amazônia Central*. Manaus: Áttema Design Editorial. 168 pp.
- Lynch, J.D. 2005. Discovery of the richest frog fauna in the world an exploration of the forest to the Nort of Leticia. *Revista de la Academia Colombiana de Ciencias Exactas, Físicas y Naturales* 29(113): 581–588 (http://zoologia.puce.edu.ec/vertebrados/Recursos/publicaciones/Cientifica/Lynch_2005.pdf).
- Lynch, J.D. 2006. The amphibian fauna in the Villavicencio region of Eastern Colombia. *Caldasia* 28(1): 135–155 (<http://www.biologia.unal.edu.co/publicaciones/art/170/28-N1/Zoo7.pdf>).
- May, R.V., K.S.T.J.M. Jacobs, M.M. Muller, G. Gagliard, L. Rodriguez and M.A. Donnelly. 2008. Species diversity and conservation status of amphibians in Madre de Dios, Southern Peru. *Herpetological Conservation and Biology* 4(1): 14–29 (http://www.herpconbio.org/Volume_4/Issue_1/vonMay_et.al_2009.pdf).
- Pinheiro, L.C., Y.O.C. Bitar, U. Galatti, S. Neckel-Oliveira and M.C. Santos-Costa. 2012. Amphibians from southeastern state of Pará: Carajás Region, northern Brazil. *Check List* 8(4): 693–702 (<http://www.checklist.org.br/getpdf?SL014-12>).
- Prudente, A.L.C., M.J. Sturaro, A.E.M. Travassos, G.F. Maschio and M.C. Santos-Costa. 2013. Anurans of the Urucu Petrol Basin, municipality of Coari, State of Amazonas, northern Brazil. *Check List* 9(3): 601–606 (<http://www.checklist.org.br/getpdf?SL066-12>).
- Reynolds, R.P. and R.D. MacCulloch. 2012. Preliminary checklist of amphibians and reptiles from Baramita, Guyana. *Check List* 8(2): 211–214 (<http://www.checklist.org.br/getpdf?SL003-12>).
- Rivero, J.A. 1961. Salientia of Venezuela. *Bulletin of the Museum of Comparative Zoology* 126(1): 1–207 (<http://www.biodiversitylibrary.org/page/2811325>).
- Rodriguez, L.O. and W.E. Duellman. 1994. Guide to the Frogs of the Iquitos Region, Amazonian Peru. *The University of Kansas Natural History Museum Special Publication* 22: 1–80.
- Rojas-Ahumada, D.P. and M. Menin. 2010. Composition and abundance of anurans in riparian and non-riparian areas in a forest in Central Amazonia. *South American Journal of Herpetology* 5(2): 157–167 (doi: 10.2994/057.005.0210).
- Ron, S.R. and M. Read. 2013. *Lithodytes lineatus*. In: S.R. Ron, J.M. Guayasamin, M.H. Yanez-Muñoz, A. Merino-Viteri and D.A. Ortiz. *AmphibiaWebEcuador*. Version 2014.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. Accessible at <http://zoologia.puce.edu.ec/vertebrados/anfibios/FichaEspecie.aspx?Id=1513/>. Captured on 7 May 2014.
- São-Pedro, V.A., H.C. Costa and R.N. Feio. 2009. *A Herpetofauna do AHE Dardanelos, Aripuanã, Mato Grosso*. Viçosa: UFV. 40 pp.
- Schlüter, A., J. Icochea and J.M. Perez. 2004. Amphibians and reptiles of the lower Río Llullapichis, Amazonian Peru: updated species list with ecological and biogeographical notes. *Salamandra* 40(2): 141–160 (http://www.salamandra-journal.com/index.php?option=com_docman&Itemid=70).
- Schlüter, A., J. Regös. 1981. *Lithodytes lineatus* (Schneider, 1799) (Amphibia: Leptodactylidae) as a dweller in nests of the leaf cutting ant *Atta cephalotes* (Linnaeus, 1758) (Hymenoptera: Attini). *Amphibia-Reptilia* 2: 117–121 (doi: 10.1163/156853881x00159).
- Schlüter, A., P. Löttker and K. Mebert. 2009. Use of an active nest of the leaf cutter ant *Atta cephalotes* (Hymenoptera: Formicidae) as a breeding site of *Lithodytes lineatus* (Anura: Leptodactylidae). *Herpetology Notes* 2: 101–105 (http://www.herpetologynotes.sehherpetology.org/Volume2_PDFs/Schluter_et.al_Herpetology_Notes_Volume2_pages101-105.pdf).
- Señares, J.C., E. Marca and C. Molina. 2002. *Lithodytes lineatus*. Bolívar, Venezuela. Geographic Distribution. *Herpetological Review* 33(2): 145–146.
- Souza, M.B. 2009. *Anfíbios. Reserva Extrativista do Alto Juruá e Parque Nacional da Serra do Divisor, Acre. Série Pesquisa e Monitoramento Participativo em Áreas de Conservação Gerenciadas por Populações Tradicionais Volume 2*. Rio Branco: Centro de Ciências Biológicas e da Natureza, Universidade Federal do Acre. 77 pp.
- Vigle, G.O. 2008. The amphibians and reptiles of the Estación Biológica Jatun Sacha in the lowland rainforest of Amazonian Ecuador: a 20-year record. *Breviora* 514: 1–30 (doi: 10.3099/0006-9698-514.1.1).
- Waldez, F., M. Menin and R.C. Vogt. 2013. Diversidade de anfíbios e répteis Squamata na região do baixo rio Purus, Amazônia Central, Brasil. *Biota Neotropica*. 13(1): 300–316 (doi: 10.1590/S1676-06032013000100029).

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