

First record of the invasive gecko, *Lepidodactylus lugubris* Duméril & Bibron, 1836 in mainland Chile (Squamata, Gekkonidae)

Felix A. Urra^{1,2}, Alejandro Zúñiga^{3,4}, Alejandro Bruno Miranda-Calle⁵, Nel Melero⁶

¹ Programa de Farmacología Molecular y Clínica, Instituto de Ciencias Biomédicas (ICBM), Facultad de Medicina, Universidad de Chile

² Network for snake venom research and drug discovery, Santiago, Chile

³ Departamento de Ciencias Químicas y Biológicas, Universidad Bernardo O'Higgins, Santiago, Chile

⁴ Instituto de Ciencias Naturales, Universidad de Las Américas, Santiago, Chile

⁵ Colección Boliviana de Fauna, Instituto de Ecología, Universidad Mayor de San Andrés, c. 27 de Cota Cota, La Paz 10077, Bolivia

⁶ C/Del Río Deva 3,32, 33570 Panes, Asturias, España

<http://zoobank.org/08EB5F35-6263-4BE4-97C0-EFB644D8808C>

Corresponding author: Felix A. Urra (felixurraf@u.uchile.cl)

Academic editor: Günter Gollmann ♦ Received 25 April 2020 ♦ Accepted 13 June 2020 ♦ Published 15 July 2020

Abstract

In Chile, the presence of Mourning Gecko, *Lepidodactylus lugubris* Duméril & Bibron, 1836 has been recognized for Easter Island (Rapa Nui) from late 19th century. Here, we report the first observation of a juvenile specimen of *L. lugubris* in an urban zone of Santiago, Región Metropolitana, mainland Chile, representing the southernmost non-insular record in America for this invasive species. Moreover, an updated distributional map of *L. lugubris* for South America and the Antilles is provided.

Key Words

lizards, Mourning Gecko, new records, non-native species

The Mourning Gecko or Common Smooth-Scaled Gecko *Lepidodactylus lugubris* Duméril & Bibron, 1836 is a small lizard with a great capacity for colonization thanks to parthenogenetic reproduction, synanthropic behaviors, and resistance of its eggs to desiccation and saltwater spray (Cuellar and Kluge 1972; Brown and Duffy 1992; Griffing et al. 2018). This nocturnal species is widely distributed throughout the Indo-Pacific region (Bauer and Henle 1994). It has been detected in Nicaragua, Costa Rica, Panama, Suriname, and the USA (Florida), as well as in more remote locations including the Galapagos Islands and Hawaii (Hoogmoed and Avila 2015). The only islands of the Antilles where this species has been recorded to date are Guadeloupe (Lorvelec et al. 2011; Parmentier et al. 2013, Gomès and Ibéné 2013; Borroto-Páez 2018), the Bahamas (Krysko and MacKenzie-Krysko 2016; Johnson et al.

2018; Giery et al. 2019; Liebgold et al. 2019; Ruhe and Ruhe 2019), Cayman (Goetz and Burton 2018; Liebgold et al. 2019), Turks and Caicos (Ruhe and Ruhe 2019) Cuba (Bosch and Paez 2017; Velazco and González 2019), and Curaçao (Behm et al. 2019). In the last decade, *L. lugubris* has been also reported in new locations in South American countries: Carabobo and Caracas, Venezuela (Guerreiro and Graterol 2012; Señaris et al. 2017), Cauca Valley, Sucre, and Bolívar, Colombia (Daza et al. 2012; Montes et al. 2012; Mendoza et al. 2018), and several new records in Belém and Pará, Brazil (Hoogmoed and Avila 2015).

Although early naturalistic reports mention the presence of lizards on Easter Island (Chile) in the late 19th century, Garman confirms the presence of *Lepidodactylus lugubris* for this locality in 1908. Later, Fuentes (1914) collected the first specimen of this species, describing it

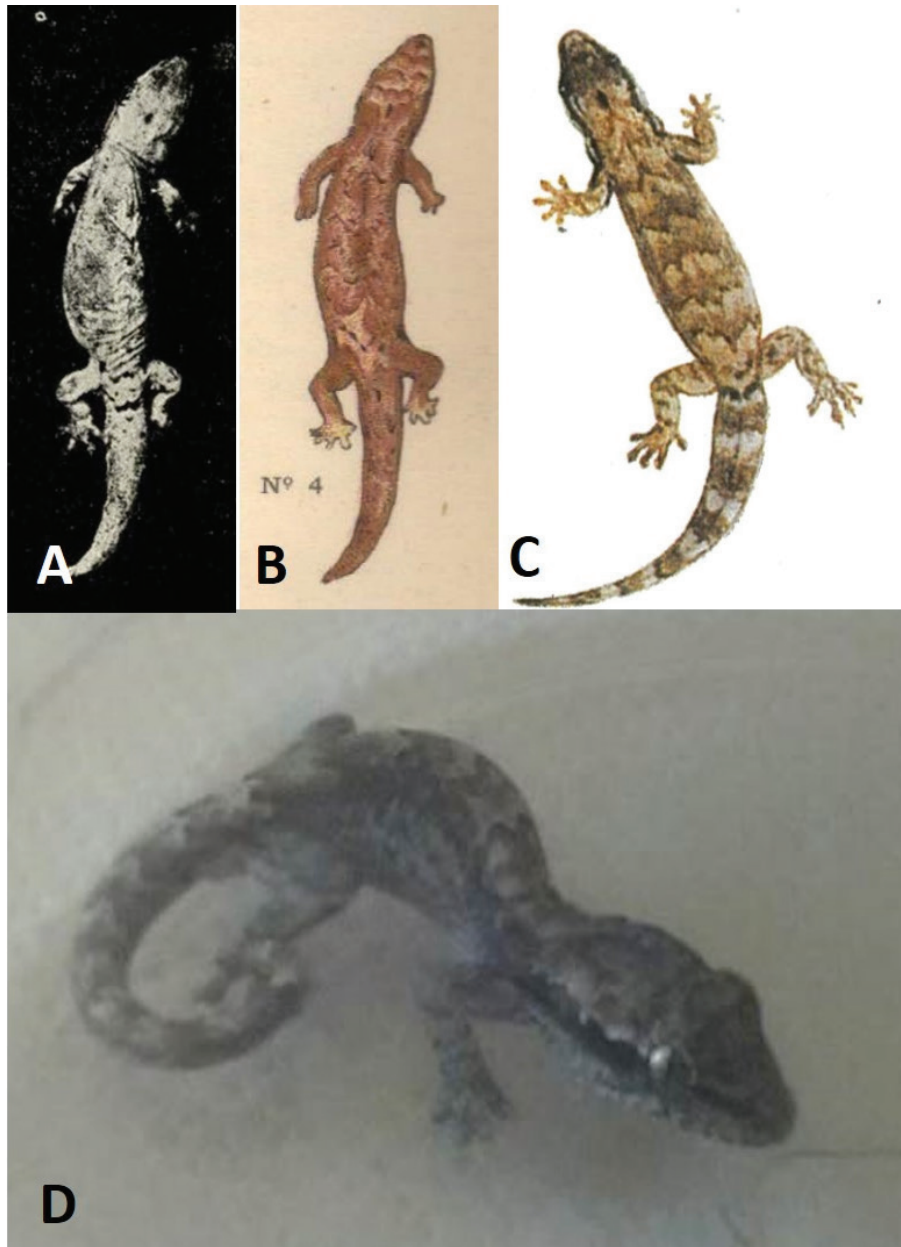


Figure 1. *Lepidodactylus lugubris* reported in Chile. **A** First photography published of a specimen from Easter Island, Chile (Fuentes 1914). **B, C** Color variations in *L. lugubris*. Illustrations by Donoso-Barros (1950), based on Fuentes (1914) and Donoso-Barros (1966). **D** Specimen (SSUC-Re 779) collected in Santiago, Region Metropolitana, mainland Chile.

with light gray coloration and nocturnal activity (Fig. 1A). Subsequently, Donoso-Barros (1950, 1966) presented illustrations of the material collected on Easter Island (Fig. 1B, C). Despite this, the information about this species in Chile is scarce (Pincheira-Donoso 2007). This population is only restricted to Rana-Roraco and Hanga Roa localities in Easter Island (Donoso-Barros 1950; Peters and Donoso-Barros 1970), which probably arrived on the Island in commercial ships (Fuentes 1914). Here, we present the discovery of *L. lugubris*, in mainland Chile.

On April 11, 2018, during fieldwork at Paris-Londres neighborhood (33°26'40.86"S, 70°38'54.27"W), an urban zone of Santiago, Región Metropolitana, Chile, at 10.00 h, we observed a *Lepidodactylus lugubris* speci-

men at the edge of a wall while some rubble were being removed (Fig. 1D). It escaped to a crack in the wall rock and was then captured. This specimen had an elongated and depressed body, small dorsal scales, depressed pentadactyl limbs, cylindrical and slightly flattened tail, and eyes with vertical pupils. The dorsal coloration was grayish-brown with dark gray transverse bands. All these morphological characteristics were coinciding with those previously described for *L. lugubris* (e.g. Schauenberg 1968; Hoogmoed and Avila-Pires 2015).

The specimen was deposited in the "Colección de Flora y Fauna Profesor Patricio Sánchez Reyes" of the Pontificia Universidad Católica de Chile (SSUC) under the catalog number SSUC-Re 779. Measurements of head length

(HL), snout-vent length (SVL), and tail length (TL) were taken with a Goldtool GMC-190 Digital Vernier Caliper (0.01 mm precision) and the record locations for *L. lugubris* were obtained from the literature (Suppl. material 1: Table S1). Given the limited formal information about the *L. lugubris* population in the Easter Island, we included the iNaturalist records available for the species. Distributional map showing 167 records (Suppl. material 1: Table S2) was done using ARCGIS v10.7 (ESRI) software.

A series of six adult specimens of *Lepidodactylus lugubris* from Easter Island were reported by Donoso-Barros (1966), whose dimensions were (expressed as mean \pm standard deviation): HL = 11.42 \pm 0.49 mm, SVL = 37.12 \pm 2.18 mm, and TL = 37.25 \pm 2.04 mm. The dimensions of SUCC-Re 779 from the new locality were as follow: HL = 7.0 mm, SVL = 20.1 mm and, TL = 19.0 mm, suggesting that this was a juvenile specimen. Visits to the collection site were made during the summer of 2019, without finding evidence of more *L. lugubris* specimens.

To our knowledge, this is the first report of *Lepidodactylus lugubris* in mainland Chile, being the southernmost

non-insular record in South America for this invasive species (Fig. 2). Our record is ca. 3650 km straight-line distanced from the southern record of the species, which corresponds to Torrez-Carvajal et al. (2019) (Jungle Lodge, El Jardín Alemán, vía Puerto Misahuallí – Puente Pununo, Napo, Ecuador at 01°01'58,68"S, 77°40'9,65"W). Since the native gecko species (*Garthia* and *Phyllodactylus* species) are not present in Santiago city (Chile), several aspects related to our report remain open, especially whether there is a stable population in this urban area. Considering the abundance of hotels and tourism services, along with buildings of ancient architecture, a passive transport of *L. lugubris* specimens could occur during trips to Easter Island from tourists staying at hotels located at the observation site. The presence of another invasive gecko, *Tarentola mauritanica* Linnaeus, 1758, was recently reported in the Región Metropolitana, Chile (Arredondo and Núñez 2014), inhabiting public buildings and places inhabited by humans (Huerta-Vera 2016). Similarly, *L. lugubris* is considered a species with high adaptability, even inhabiting human constructions (Hen-

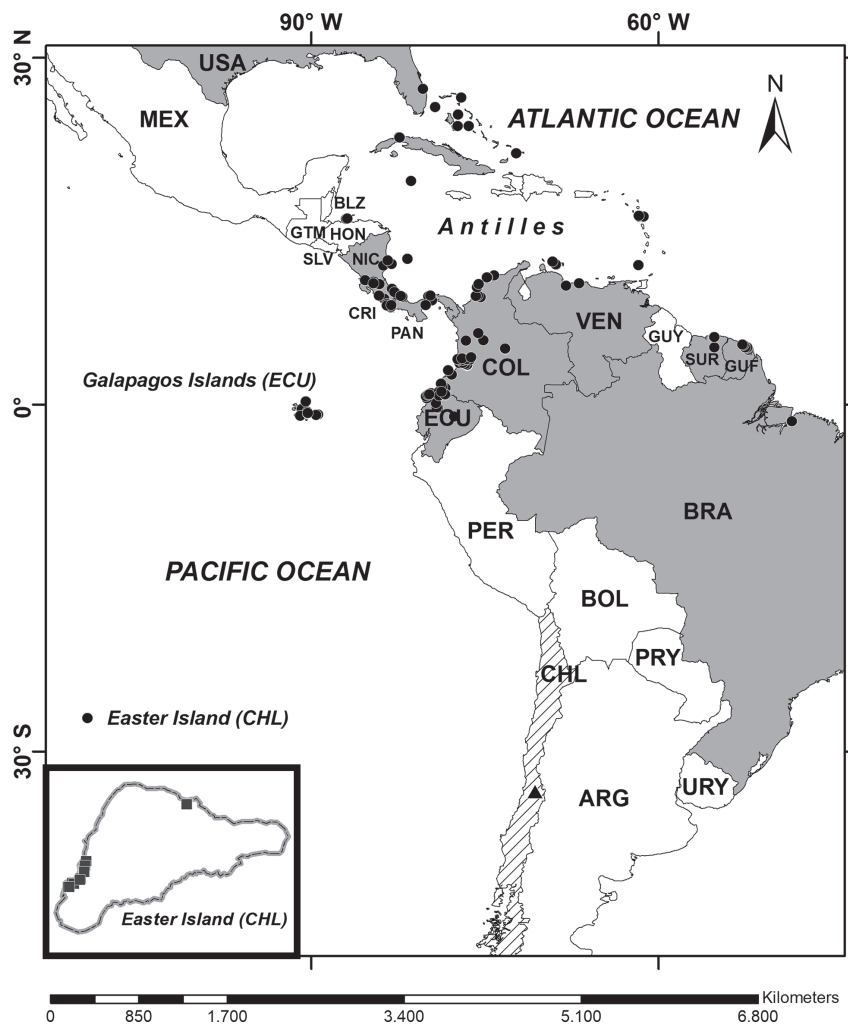


Figure 2. Geographical distribution of *L. lugubris* in America and the Antilles. The map includes literature records (circles), iNaturalist records (squares), and the new locality recorded in mainland Chile (triangle). Grey shading represents its presence in the mainland of the previously reported countries, and in simple hatch fill the new record in mainland Chile. Abbreviations of the countries follow ISO 3166 Alpha-3 code.

derson et al. 1976; Señaris et al. 2017). Further studies are required to confirm a permanent population of *L. lugubris* in mainland Chile, whose presence could have effects not predicted in the native species that inhabit urban areas.

Acknowledgements

This work was supported by CONICYT PCI-Biotechnology #Redbio0027 (FAU).

References

- Arredondo C, Núñez H (2014) *Tarentola mauritanica* (Linnaeus, 1758), a new species of lizard for Chile (Reptilia, Phyllodactylidae). Boletín del Museo Nacional de Historia Natural, Chile 63: 73–76. <http://publicaciones.mnhn.gob.cl/668/w3-article-70521.html>
- Bauer AM, Henle K (1994) Das Tierreich 109 (Part). Familia Gekkonidae. Part I. Australia and Oceania. Walter de Gruyter, Berlin. <https://doi.org/10.1515/9783110885958>
- Behm JE, van Buurt G, DiMarco BM, Ellers J, Irian CG, Langhans KE, McGrath K, Tran TJ, Helmus MR (2019) First records of the mourning gecko (*Lepidodactylus lugubris* Duméril and Bibron, 1836), common house gecko (*Hemidactylus frenatus* in Duméril, 1836), and Tokay gecko (*Gekko gecko* Linnaeus, 1758) on Curaçao, Dutch Antilles, and remarks on their Caribbean distributions. Bioinvasions Records 8: 34–44. <https://doi.org/10.3391/bir.2019.8.1.04>
- Borroto-Páez R (2018) High abundance of the introduced Mourning Gecko (*Lepidodactylus lugubris*) in southwestern Grande Terre, Guadeloupe, French West Indies. IRCF Reptiles and Amphibians 25: 184–187. http://www.ircf.org/journal/wp-content/uploads/2018/11/RA-25.3_184-187_Borroto-Páez.pdf
- Bosch RA, Páez RB (2017) First record from Cuba of the introduced Mourning Gecko, *Lepidodactylus lugubris* (Duméril and Bibron, 1836). BioInvasions Records 6: 297–300. <https://doi.org/10.3391/bir.2017.6.3.16>
- Brown SG, Duffy PK (1992) The effects of egg-laying site, temperature, and salt-water on incubation time and hatching success in the gecko *Lepidodactylus lugubris*. Journal of Herpetology 26: 510–513. <https://doi.org/10.2307/1565135>
- Cuellar O, Kluge AG (1972) Natural parthenogenesis in the gekkonid lizard *Lepidodactylus lugubris*. Journal of Genetics 61: 14–26. <https://doi.org/10.1007/BF02984098>
- Daza J, Travers S, Bauer A (2012) New records of the Mourning Gecko *Lepidodactylus lugubris* (Duméril and Bibron, 1836) (Squamata: Gekkonidae) from Colombia. Check List 8: 164–167. <https://doi.org/10.15560/8.1.164>
- Donoso-Barros R (1966) Reptiles de Chile. Santiago: Univ. Chile, 458 pp.
- Donoso-Barros R (1970) Catálogo herpetológico chileno. Boletín del Museo Nacional de Historia Natural (Chile) 31: 49–124. <http://publicaciones.mnhn.gob.cl/668/w3-article-64036.html>
- Duméril AMC, Bibron G (1839) Erpétologie générale ou histoire naturelle complete des reptiles. Tome 3. <https://www.biodiversitylibrary.org/item/99940#page/9/mode/1up>
- Fuentes M (1914) Fauna de la Isla de Pascua. Boletín del Museo Nacional de Historia Natural (Chile) 7: 285–319.
- Garman S (1908) The reptiles of eastern island. Bulletin of the Museum of Comparative Zoology, Harvard 52: 3–15.
- Giery ST, Pita-Aquino JN, Kolbe J, Piovio-Scott J (2019) Mourning Geckos (*Lepidodactylus lugubris*) established on Abaco Island, The Bahamas. IRCF Reptiles and Amphibians 26: 161–162.
- Goetz M, Burton F (2018) First record of the Mourning Gecko, *Lepidodactylus lugubris* (Duméril & Bibron 1836), on Grand Cayman, Cayman Islands. IRCF Reptiles and Amphibians 25: 158–159.
- Gomès R, Ibéné B (2013) *Lepidodactylus lugubris* (Mourning Gecko). Distribution. Caribbean Herpetology 44: 1–1. <https://doi.org/10.31611/ch.44>
- Griffing AH, Sanger TJ, Matamoros IC, Nielsen SV, Gamble T (2018) Protocols for husbandry and embryo collection of a parthenogenetic gecko, *Lepidodactylus lugubris* (Squamata: Gekkonidae). Herpetological Review 49: 230–235.
- Guerreiro M, Graterol G (2012) Primer registro de *Lepidodactylus lugubris* Duméril & Bibron, 1836 (Reptilia: Gekkonidae) para Venezuela. Herpetotropicos 6: 15–16.
- Henderson RW, Villa J, Dixon JR (1976) *Lepidodactylus lugubris* (Reptilia: Gekkonidae). A recent addition to the herpetofauna of Nicaragua. Herpetological Review 7: 1–173. <https://ssarherps.org/herpetological-review-pdfs/>
- Hoogmoed MS, Avila-Pires TCS (2015) *Lepidodactylus lugubris* (Duméril & Bibron 1836) (Reptilia: Gekkonidae), an introduced lizard new for Brazil, with remarks on and correction of its distribution in the New World. Zootaxa 4000: 90–110. <https://doi.org/10.11646/zootaxa.4000.1.4>
- Huerta-Vera S (2016) Registros de Gecko Mediterráneo, *Tarentola mauritanica* (Linnaeus 1758) (Squamata, Phyllodactylidae), en zona semi-urbana de Peñalolén, Región Metropolitana. Boletín Chileno de Herpetología 3: 24–25.
- Johnson S, Buckner S, Knowles D (2018) Another parthenogenetic species of gecko on New Providence Island, The Bahamas. IRCF Reptiles and Amphibians 25: 215–216.
- Krysko KL, MacKenzie-Krysko C (2016) First report of the Mourning Gecko, *Lepidodactylus lugubris* (Duméril & Bibron 1836), from The Bahamas. Caribbean Herpetology 54: 1–2. <https://doi.org/10.31611/ch.54>
- Liebgold EB, Liebgold HL, Ransom MJ, Ransom TS (2019) The spread of the parthenogenetic Mourning Gecko, *Lepidodactylus lugubris* (Duméril and Bibron, 1836) to Paradise Island, The Bahamas, with comments on citizen science observations of non-native herpetofauna. BioInvasions Records 1: 45–49. <https://doi.org/10.3391/bir.2019.8.1.05>
- Lorvelec O, Levesque A, Bauer AM (2011) First record of the Mourning Gecko (*Lepidodactylus lugubris*) on Guadeloupe, French West Indies. Herpetology Notes 4: 291–294.
- Montes AG, Díaz PJ, Gaviria BJ (2012) Primer registro de *Lepidodactylus lugubris* (Sauria: Gekkonidae) para el Departamento de Sucre, Colombia. Revista Colombiana de Ciencia Animal – RECIA 4: 163–167. <https://doi.org/10.24188/recia.v4.n1.2012.304>
- Mendoza JS, Gomez-Sanchez DA, Rodriguez C (2018) Geographic Distribution: *Lepidodactylus lugubris* (Asian Mourning Gecko). Herpetological Review 49: 286–287.
- Parmentier P, Ibéné B, Gomès R (2013) *Lepidodactylus lugubris* (Mourning Gecko). Distribution. Caribbean Herpetology 47: 1–1. <https://doi.org/10.31611/ch.47>

- Peters JA, Donoso-Barros R (1970) Catalogue of the Neotropical Squamata. Part II. Lizards and Amphisbaenians. Bulletin United States National Museum. Washington 297: 1–293. <https://doi.org/10.5479/si.03629236.297.1>
- Pincheira-Donoso D (2007) Los geckos de Chile (Scleroglossa, Gekkonidae, Gekkoninae) I parte. Síntesis histórica de los estudios taxonómicos y sistemáticos. Noticiario Mensual del Museo Nacional de Historia Natural 358: 4–12. https://www.mnhn.gob.cl/613/articulos-5310_archivo_01.pdf
- Quijada B (1916) Catálogo sistemático de los reptiles chilenos i extranjeros conservados en el Museo Nacional de Historia Natural. Boletín del Museo Nacional de Historia Natural (Chile) 9: 22–47. <http://publicaciones.mnhn.gob.cl/668/w3-article-63691.html>
- Ruhe BM, Ruhe AR (2019) First record of the Mourning Gecko, *Lepidodactylus lugubris* (Duméril & Bibron), from the Turks and Caicos Islands with additional observations from the Bahamas. Caribbean Herpetology 66: 1–3. <https://doi.org/10.31611/ch.66>
- Ruiz De Gamboa M (2016) Lista actualizada de los reptiles de Chile. Boletín Chileno de Herpetología 3: 7–12. http://www.boletindeherpetologia.com/uploads/3/2/2/9/32291217/3._ruizdegamboa2016.pdf
- Schauenberg P (1968) Sur la présence de *Lepidodactylus lugubris* (Duméril & Bibron, 1836) (Reptilia, Gekkonidae) en Equateur. Revue Suisse de Zoologie 75: 415–417. <https://doi.org/10.5962/bhl.part.97039>
- Señaris C, Rojas-Runjaic FJM, Aristeguieta MM, García-Señaris G (2017) Second record of the invasive gecko *Lepidodactylus lugubris* (Duméril & Bibron, 1836) (Squamata: Gekkonidae) from Venezuela. Check List 13(2): 1–4. <https://doi.org/10.15560/13.2.2082>
- Torres-Carvajal O (2019) *Lepidodactylus lugubris*. In: Torres-Carvajal O, Pazmiño-Otamendi G Salazar-Valenzuela D (2019) Reptiles del Ecuador. Version 2019.0. Museo de Zoología, Pontificia Universidad Católica del Ecuador. <https://bioweb.bio/faunaweb/reptiliaweb/FichaEspecie/Lepidodactylus%20lugubris>.
- Velazco K, Gonzalez A (2019) *Lepidodactylus lugubris*. Geographic distribution. Havana City, Cuba. Herpetological Review 50: 1–747.

Supplementary material 1

Tables S1, S2

Authors: Felix A. Urra, Alejandro Zúñiga, Alejandro Bruno Miranda-Calle, Nel Melero

Data type: Data of distributional map

Explanation note: GPS data used for elaboration of the distributional map of *L. lugubris*.

Copyright notice: This dataset is made available under the Open Database License (<http://opendatacommons.org/licenses/odbl/1.0/>). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: <https://doi.org/10.3897/herpetozoa.33.e53625.suppl1>

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Herpetozoa](#)

Jahr/Year: 2020

Band/Volume: [33](#)

Autor(en)/Author(s): Urra Felix A., Zuniga Alejandro, Miranda-Calle Alejandro Bruno, Melero Nel

Artikel/Article: [First record of the invasive gecko, *Lepidodactylus lugubris* Duméril & Bibron, 1836 in mainland Chile \(Squamata, Gekkonidae\) 125-129](#)