

First record of the Mourning Gecko (*Lepidodactylus lugubris*) on Guadeloupe, French West Indies

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The Mourning Gecko, *Lepidodactylus lugubris* (Duméril and Bibron, 1836), is a complex of several diploid or triploid lineages of parthenogenetic females (Pasteur et al., 1987). These clones are the result of independent hybridization events (Moritz et al., 1993; Volobouev et al., 1993). According to Radkey et al. (1995), Boissinot et al. (1997), and recently Fujita and Moritz (2009), hybridization events have occurred between a Micronesian bisexual species, *Lepidodactylus moestus*, and an undescribed bisexual species from the Central Pacific. Only a few individuals with male phenotype, considered sterile and not attributable to these other species, are observed among *L. lugubris*

(Radkey et al., 1995; Yamashiro and Ota, 1998).

Lepidodactylus lugubris is distributed broadly throughout some parts of the mainland of the Indo-Malayan Region, on numerous tropical islands of Indian and Pacific Oceans including Near and Remote Oceania, and in a few Neotropical locations (e.g., Ineich, 1987; Bauer and Henle, 1994; Ineich, 1999; Röhl, 2002; Lever, 2003; Kraus, 2009). The limits of its current longitudinal distribution relative to this core area of distribution are the Seychelles (Vinson, 1964) in the west and Suriname (Bauer et al., 2007) in the east. The species has a great capacity for colonization given its parthenogenetic reproduction, its synanthropic behaviours, and the resistance of its eggs to dessication and salt water spray (Brown and Duffy, 1992). In most of its range, the species is not demonstrably native or introduced, and corresponds with the definition of a cryptogenic species (Carlton, 1996). However, in some zones, notably peripheral ones, the species is generally considered to be introduced (Lever, 2003; Kraus, 2009). This is the case for the few confirmed records in the Neotropical Region, i.e., Galapagos Islands (Hoogmoed, 1989; Sengoku, 1998) and coastal locations in the American mainland: Nicaragua (Henderson, Villa and Dixon, 1976), Costa Rica (Auth, 1994; Ineich, 1999), Panama (Smith and Grant, 1961), Colombia (Mechler, 1968; Ineich, 1999), Ecuador (Schauenberg, 1968), Peru (Ineich, 1999), and Suriname (Bauer et al., 2007). On the American mainland, it appears that there are no

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Figure 1. *Lepidodactylus lugubris* (Grande Terre, Guadeloupe, FWI). Photograph: A. Levesque.



Figure 2. Specimens of *Lepidodactylus lugubris* (Grande Terre, Guadeloupe, FWI). Photograph: O. Lorvelec.

confirmed records prior to the twentieth century. Girard (1858a) mentioned the occurrence of this species in Rio de Janeiro (Brazil) under the name *Peropus neglectus*, but the author himself subsequently emphasized the uncertainty associated with the locality of the specimen (Girard, 1858b). The species was first observed in the Caribbean in 1976, in the city of Bluefields on the Caribbean coast of Nicaragua, and on Big Corn Island, a continental island located about fifty kilometres off the coast (Henderson, Villa and Dixon, 1976). This is the first record of the species on a Caribbean island. Bauer *et al.* (2007) recorded the species in the coastal city of Paramaribo, Suriname, based on specimens captured in 2004. There is a significant geographic gap between the localities of Central America, the Pacific coast of South America, and this far eastern record on the Atlantic coast.

One of us (AL) observed a single *L. lugubris* for the first time November 4, 2010 at his residence in Guadeloupe, French West Indies (location: Grande-Terre, Municipality of Les Abymes, District of Dugazon, 16.247, -61.520; elevation: 40 m). The species was syntopic with the larger *Hemidactylus mabouia*, another edificarian gecko that is very common in Guadeloupe. Two *L. lugubris* specimens were captured on January 6 and 9, 2011, preserved in alcohol (Fig. 1 and 2), and deposited at the Muséum national d'Histoire naturelle of Paris (MNHN 2011.0001, MNHN 2011.0002). We confirmed the species identification of the specimens and their gender, and identified them to diploid clone A (Ineich, 1987, 1988), the most widely distributed clone (Ineich, 1999), based on colour pattern. We have subsequently observed no other individuals, but no

systematic surveys have been conducted. At present, we have no information on the date or mode of introduction of *L. lugubris* into Guadeloupe, or on the current local distribution of the species.

To our knowledge, this is the first record of *L. lugubris* on Guadeloupe. The species has not been reported in recent syntheses relating to this archipelago (Malhotra and Thorpe, 1999; Breuil, 2002; Lorvelec et al., 2007), and this, therefore, constitutes the first record of the mourning gecko on an oceanic island in the Atlantic Ocean. Presence of the species on the Atlantic coast of South America (Paramaribo), on the Caribbean coast of Central America (Bluefields), and on two islands in the Caribbean Sea (Big Corn Island, Grande-Terre) indicates an ongoing colonization of Neotropical Atlantic Islands and, more generally, confirms its pantropical progress.

Acknowledgements. We thank Dr. Thierry Frétey (association RACINE, Rennes, France) for his help with bibliographic research and Professor Hidetoshi Ota (University of Hyogo, Japan) for his review of the manuscript.

References

- Auth, D.L. (1994): Checklist and bibliography of the amphibians and reptiles of Panama. *Smithson. Herp. Inf. Serv.*, Washington **98**: 1-59.
- Bauer, A.M., Henle, K. (1994): Das Tierreich 109, Gekkonidae (Reptilia, Sauria). Part I. Australia and Oceania. Berlin, Walter De Gruyter.
- Bauer, A.M., Jackman, T.R., Greebaum, E., Papenfuss, T.J. (2007): First record of *Lepidodactylus lugubris* in Suriname. *Appl. Herpetol.* **4**: 84-85.
- Boissinot, S., Ineich, I., Thaler, L., Guillaume, C.-P. (1997): Hybrid origin and clonal diversity in the parthenogenetic gecko, *Lepidodactylus lugubris* in French Polynesia. *J. Herpetol.* **31**: 295-298.
- Breuil, M. (2002): Histoire Naturelle des Amphibiens et Reptiles Terrestres de l'Archipel Guadeloupéen. Guadeloupe, Saint-Martin, Saint-Barthélemy. Paris, Muséum National d'Histoire Naturelle.
- Brown, S.G., Duffy, P.K. (1992): The effects of egg-laying site, temperature, and salt-water on incubation time and hatching success in the gecko *Lepidodactylus-lugubris*. *J. Herpetol.* **26**: 510-513.
- Carlton, J.T. (1996): Biological invasions and cryptogenic species. *Ecology*, **77**: 1653-1655.
- Duméril, A.M.C., Bibron, G. (1836): Erpétologie Générale ou Histoire Naturelle Complète des Reptiles. Vol. 3. Paris, Librairie encyclopédique de Roret.
- Fujita, M.K., Moritz, C. (2009): Origin and evolution of parthenogenetic genomes in lizards: current state and future directions. *Cytogenet. Genome Res.* **127**: 261-272.
- Girard, C. (1858a): Descriptions of some new species of reptiles, collected by the United States Exploring Expedition, under the command of Capt. Charles Wilkes, U.S.N. Fourth Part. *Proc. Acad. Nat. Sci. Philad.* **9**: 195-199.
- Girard, C. (1858b): United States Exploring Expedition, During the Years 1838, 1839, 1840, 1841, 1842, Under the Command of Charles Wilkes, U.S.N. Vol. XX. Herpetology. Philadelphia, Sherman & Son.
- Henderson, R.W., Villa, J., Dixon, J.R. (1976): *Lepidodactylus lugubris* (Reptilia: Gekkonidae). A recent addition to the herpetofauna of Nicaragua. *Herp. Rev.* **7**: 173.
- Hoogmoed, M.S. (1989): Introduced geckos in Puerto Ayora, Santa Cruz, with remarks on other areas. *Not. Galápagos* **47**: 12-16.
- Ineich, I. (1987): Recherches sur le Peuplement et l'Évolution des Reptiles Terrestres de Polynésie Française. Doctoral dissertation. Montpellier, Université des Sciences et Techniques du Languedoc.
- Ineich, I. (1988): Mise en évidence d'un complexe unisexué-bisexué chez le Gecko *Lepidodactylus lugubris* (Sauria: Lacertilia) en Polynésie française. *C. R. Acad. Sci. Paris, Ser. II* **307**: 271-277.
- Ineich, I. (1999): Spatio-temporal analysis of the unisexual-bisexual *Lepidodactylus lugubris* complex (Reptilia, Gekkonidae). In: Tropical Island Herpetofauna: Origin, Current Diversity, and Conservation, p 199-228. Ota, H, Ed., Amsterdam, Elsevier.
- Kraus, F. (2009): Alien Reptiles and Amphibians, a Scientific Compendium and Analysis. Dordrecht, Springer.
- Lever, C. (2003): Naturalized Reptiles and Amphibians of the World. New York, Oxford University Press.
- Lorvelec, O., Pascal, M., Pavis, C., Feldmann, P. (2007): Amphibians and reptiles of the French West Indies: inventory, threats and conservation. *Appl. Herpetol.* **4**: 131-161.
- Malhotra, A., Thorpe, R.S. (1999): Reptiles and Amphibians of the Eastern Caribbean. London, Macmillan Education Ltd.
- Mechler, B. (1968): Les gekkonidés de la Colombie. *Rev. Suisse Zool.* **75**: 305-371.
- Moritz, C., Case, T.J., Bolger, D.T., Donnellan, S.C. (1993): Genetic diversity and the history of some Pacific island house geckos (*Hemidactylus* and *Lepidodactylus*). *Biol. J. Linn. Soc.* **48**: 113-133.
- Pasteur, G., Agnese, J.-F., Blanc, C.P., Pasteur, N. (1987): Polyclony and low relative heterozygosity in a widespread unisexual vertebrate, *Lepidodactylus lugubris* (Sauria). *Genetica*, **75**: 71-79
- Radtkey, R.R. Donnellan, S.C., Fisher, R.N., Moritz, C., Hanley, K.A., Case, T.J. (1995): When species collide: the origin and spread of an asexual species of gecko. *Proc. R. Soc. Lond. B* **259**: 145-152.
- Röll, B. (2002): *Lepidodactylus lugubris* (Duméril & Bibron). Sauria, Suppl., Berlin **24** : 545-550.
- Schauenberg, P. (1968): Sur la présence de *Lepidodactylus lugubris* (Duméril et Bibron, 1836) (Reptilia, Gekkonidae) en Équateur. *Rev. Suisse Zool.* **75**: 415-417.
- Sengoku, S. (1993): *Lepidodactylus lugubris* (Mourning Gecko). Ecuador: Galapagos Islands: Isla Santa Cruz in Puerto Ayora. 14 June 1997. *Herp. Rev.* **29**: 110.
- Smith, H.M., Grant, C. (1961): The mourning gecko in the Americas. *Herpetologica* **17**: 68.
- Vinson, J. (1964): Quelques remarques sur l'île Rodrigues et sur sa faune terrestre. *Proc. R. Soc. Arts Sci. Maurit.* **2**: 263-277.

- Volobouev, V., Pasteur, G., Ineich, I., Dutrillaux, B. (1993): Chromosomal evidence for a hybrid origin of diploid parthenogenetic females from the unisexual-bisexual *Lepidodactylus lugubris* complex (Reptilia, Gekkonidae). *Cytogenet. Cell Genet.* **63**: 194-199.
- Yamashiro, S., Ota, H.. (1998): Discovery of a male phenotype of the parthenogenetic gecko, *Lepidodactylus lugubris*, on Ishigakijima Island of the Yaeyama Group, Ryukyu Archipelago. *Japanese J. Herpetology* **17**: 152-155.