





First records of the Tokay Gecko, *Gekko gecko* (Linnaeus, 1758) (Squamata, Gekkonidae), in Mexico

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Abstract

We report the first records of the invasive Tokay Gecko, *Gekko gecko* (Linnaeus, 1758), in Mexico, based on the discovery of five specimens from Reynosa, Tamaulipas.

Keywords

Invasive lizard; new country record; geographic distribution; exotic species; urban areas

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Introduction

The main causes of biodiversity loss in the world are changes land use and invasive species (Vié et al. 2008). In Mexico, invasive species are the main cause of the extinction of vertebrates (Ceballos and Márquez-Valdelamar 2000), and human activities have increased the dispersal of invasive species by the modernization of transportation and the creation of new commercial routes. Introductions have recently increased because some species are considered valuable and desirable by the international pet trade (McNeely et al. 2001; National Advisory Committee on Invasive Species 2010).

Invasive alien species can affect native species through competition for resources, predation, and transmission of infectious diseases (McNeely et al. 2001). A growing number of studies have documented invasive

species of amphibians and reptiles, with lizards having the highest rate of successful establishment globally, and most of these invasions are by members of the family Gekkonidae (Kraus 2009). Several gecko species have established populations in the Americas, and some have been reported in the wild in Mexico, such as *Gehyra mutilata* (Wiegmann, 1834), *Hemidactylus frenatus* (Duméril & Bibron, 1836), *Hemidactylus mabouia* (Moreau de Jonnés, 1818), *Hemidactylus turcicus* (Linnaeus, 1758), *Lepidodactylus lugubris* (Duméril & Bibron, 1836), *Sphaerodactylus argus* (Gosse, 1850), and *Tarentola mauritanica* (Linnaeus, 1758) (Álvarez-Romero et al. 2008; González-Sánchez et al. 2021).

The Tokay Gecko, *Gekko gecko* (Linnaeus, 1758) is heavily exploited for traditional medicine in its

geographic range and is reportedly a successful invader in many habitats (Caillabet 2013). This gecko is native to Cambodia, China, India, Indonesia, Malaysia, Nepal, Philippines, Singapore, Thailand, and Vietnam, and has been introduced to Belize (González-Sánchez et al. 2021), Brazil (Rocha-Junior et al. 2015), United States of America including Hawaii (Means 1996), Madagascar, and Martinique, where is highly invasive (Caillabet 2013).

Methods

During night fieldwork in search of invasive rodents at Reynosa, Tamaulipas, a city in northeastern Mexico, we accidentally observed an adult *Gekko gekko* on a wall in late February 2018. Four days later, we conducted a detailed search for more individuals sampling at night in a completely modified urban habitat. One specimen of five was collected by hand and euthanized with sodium pentobarbital, fixed in 10% formalin, preserved in 70% alcohol, and deposited at the Zoological Collection in Universidad Autónoma de Aguascalientes (CZUAA-703). The specimen was collected under permit issued by Secretaría de Medio Ambiente y Recursos Naturales (SGPA/DGVS/05874/17).

Results

Gekko gekko (Linnaeus, 1758)\

Figure 1

New records. MÉXICO – Tamaulipas • Reynosa; 26.0732°N, 098.2645°W, WGS 84, 36 m elev.; 3.II.2018; Iván Villalobos-Juárez leg., 1 adult, sex indet., UAA-703 (Fig. 1) • Reynosa; 26.0821°N, 098.2720°W, 34 m elev.; 7.II.2018, Iván Villalobos-Juárez obs., 2 juvenile and 2 adult individuals, sex indet. Both records were made in the same neighborhood, 1 km apart (Fig. 2).

Identification. The dorsum of the collected specimens has prominent tubercles and irregular red spots, and the tail is rounded with six rows of lateral and mid-dorsal tubercles of similar size. The specimens collected in Tamaulipas correspond to *G. gekko*, and the specimens were identified following Krysko and Daniel (2005) and Powell et al. (2012).

Discussion

We present the first report of the invasive *G. gekko* in Mexico, and this record represents the eighth invasive gecko species for Mexico (Álvarez-Romero et al. 2008; Ramírez-Reyes 2017; González-Sánchez et al. 2021). Apparently, a small population is established in Reynosa, because we found them in two houses in the same neighborhood. This invasion represents a potential environmental problem for the conservation of native fauna because this gecko is a generalist species that feeds on a variety of prey, both invertebrates (Meshaka et al. 1997)

and vertebrates, including other geckos (Meshaka et al. 2004; Aowphol et al. 2006), snakes (Love 2000), and rodents (Bucol and Alcalá 2013).

We do not know how this gecko arrived in Mexico. However, we hypothesize two possibilities: (1) introduction of geckos in the pet trade, or (2) introduction through the importation of goods to the country such as the species *Hemidactylus frenatus* (Duméril & Bibron, 1836), *H. mabouia* (Moreau de Jonnés, 1818) and *H. turcicus* (Linnaeus, 1758) that entered the country through seaports (Ramírez-Reyes 2017; González-Sánchez et al. 2021). We recommend a monitoring program of the *G. gekko* population to prevent further colonization in Mexico.

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Authors' Contribution

Conceptualization: IVJ. Data curation: IVJ. Funding acquisition: JS. Investigation: IVJ. Methodology: IVJ. Supervision: EGP. Validation: EGP, JS. Visualization: IVJ. Writing – original draft: IVJ. Writing – review and editing: GVJ, EGP, JS.

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Figure 1. Adult *Gekko gekko* (UAA-703) collected in the municipality of Reynosa, Tamaulipas, Mexico. Scale bar: 10 mm.

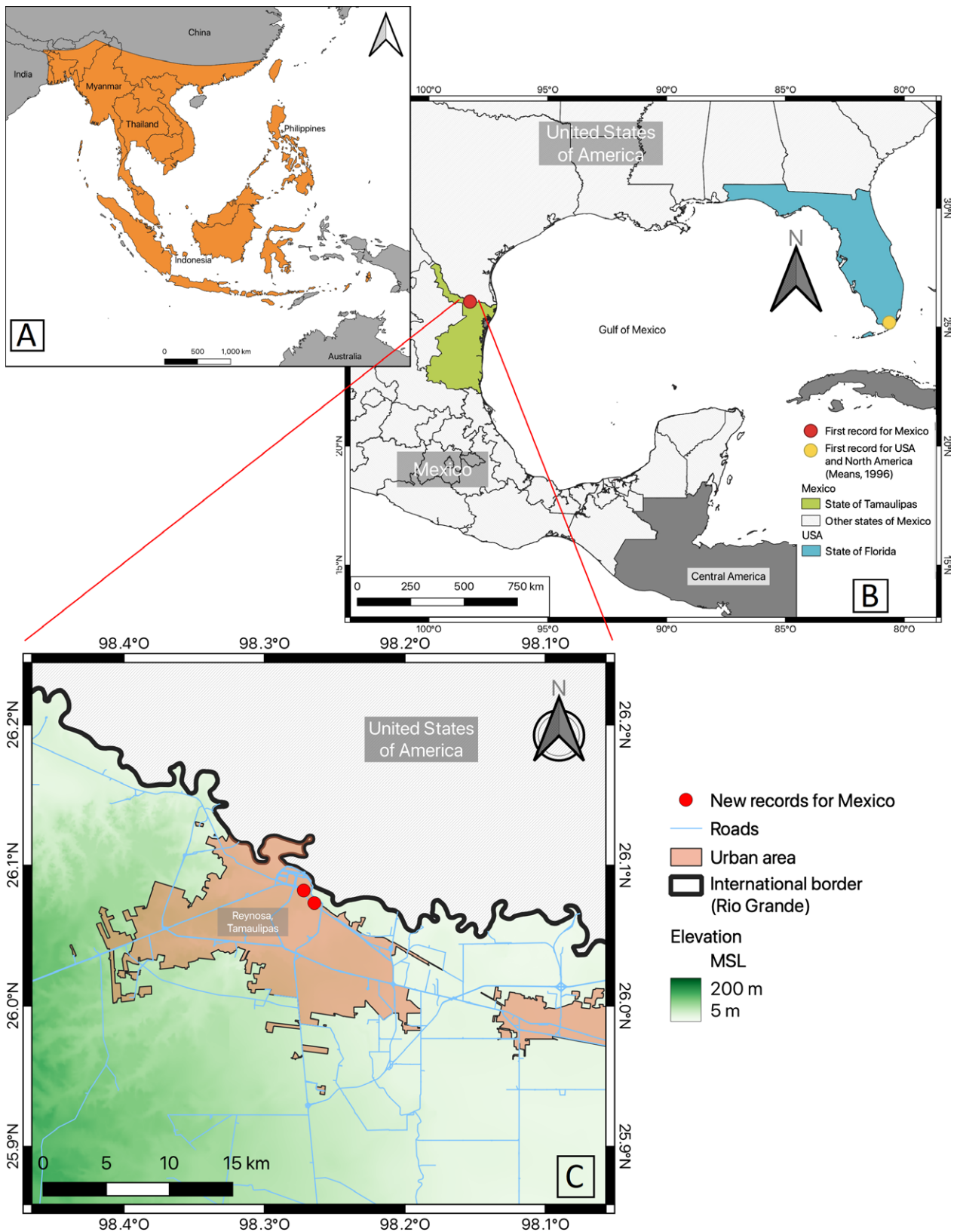


Figure 2. A. Distribution of *Gekko gecko* in its native range in southeastern Asia (in orange). **B.** Distribution in Mexico and the mainland USA (Florida) **C.** City of Reynosa, Tamaulipas, Mexico, showing the location of the new records.

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