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Rapid Communication

First record of the tropical house gecko *Hemidactylus mabouia* (Moreau de Jonnès, 1818) in Texas

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Abstract

Invasions of the tropical house gecko *Hemidactylus mabouia* (Moreau de Jonnès, 1818) in the tropical Americas are well documented. While this gecko has been reported as well established and expanding its range in Florida, here we document the first record in the United States outside of this state. We detected a small reproducing population in Cameron County, Brownsville, Texas. We expect a rapid colonization of buildings by this species in southern Texas. We consider that this potential invasion poses novel obstacles to the continued presence of the earlier invasive Mediterranean gecko *Hemidactylus turcicus* (Linnaeus, 1758) across Texas.

Key words: reptilian, invasive, colonization, Rio Grande Valley, *Hemidactylus turcicus*, displacement

Introduction

Among reptilians, geckos from the genus *Hemidactylus* have the most extensive long-distance dispersal. Although phylogenetic studies suggest a long history of natural colonizations in this group, the majority of large range extensions are likely anthropogenic (Carranza and Arnold 2006). One of the most successful colonizers of this genus is *Hemidactylus mabouia* (Moreau de Jones, 1818), commonly known as tropical house gecko (Rocha et al. 2011; Short and Petren 2011). Native to sub-Saharan Africa, Madagascar and the Mozambique Channel Islands, it is now naturalized thorough the Caribbean and most tropical South America, and is well established in the southern Gulf of Mexico coastal region (Powell et al. 1998; Rödder et al. 2008). In the United States, it has been recorded for more than two decades, only in peninsular Florida and the Keys (Short and Petren 2011).

Hemidactylus mabouia is a nocturnal building-dwelling gecko, usually found in anthropic environments (Howard et al. 2001) where they use areas close to artificial lighting as hunting

grounds. It has a life history similar to other geckos of this genus also invading the tropical and subtropical Americas like *Hemidactylus turcicus* (Linnaeus, 1758), *Hemidactylus angulatus* Hallowell, 1852, *Hemidactylus frenatus* Schlegel, 1836, and *Hemidactylus garnotii* Duméril and Bibron, 1836 (Meshaka 2000; Rödder et al. 2008). Here, we present the first record of the tropical house gecko in Texas and briefly discuss the potential impact of this invasion on *H. turcicus*, another invasive gecko.

Methods

Several geckos were found on walls of various buildings in an urban area of Brownsville, Texas (Figure 1), within a 100 m radius of exact location specified in Table 1. Specimens were spotlighted and captured by hand during early evening hours; four were documented and preserved (Table 1). We surveyed about 10 evenings in October 2013 when weather was relatively fair and warm. Captured specimens were identified using the key to geckos from Krysko and Daniels (2005). Specific characters observed include vertical pupil,

Table 1. Specimens of *Hemidactylus mabouia* collected in 2013 in Brownsville, Texas.

Catalogue number	Location	Coordinates	Date	Total length (mm)	Snout-to-vent length (mm)	Gender
TNHC 86213	Brownsville, TX; near Walmart Boca Chica	N 25.93 W 97.488	October 4	118	59	Female
TNHC 86214	Brownsville, TX; near Walmart Boca Chica	N 25.93 W 97.48	October 10	95	43	Juvenile
TNHC 86215	Brownsville, TX; near Walmart Boca Chica	N 25.93 W 97.48	October 23	125	62	Female
TNHC 86216	Brownsville, TX; near Walmart Boca Chica	N 25.93 W 97.48	October 24	122	56	Male

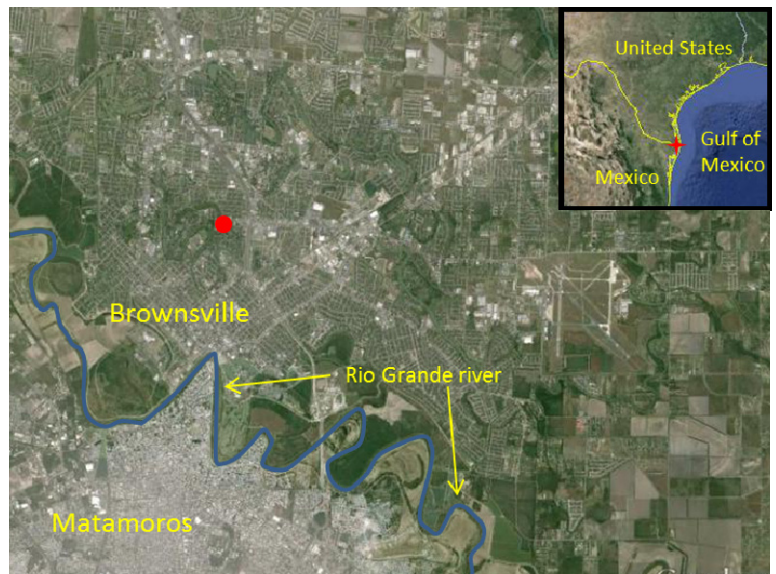


Figure 1. Location in Brownsville, Texas where the specimens of *Hemidactylus mabouia* were collected (Google Earth 2014).



Figure 2. A) arrow showing subdigital lamellae not extending to base of digit IV. B) adult female specimen showing the characteristic darker chevron bands.

digits with widened subdigital lamellae, subdigital lamellae of digit IV do not extend to base of digit (Figure 2A), and darker chevron markings (Figure 2B). Total length, snout-to-vent (SVL) length and gender were recorded. The specimens were euthanized by deep hypothermia, fixed with 95% ethyl alcohol and stored in 70% ethyl alcohol for at least 7 days prior to shipping to the Texas Natural History Collections at the University of Texas at Austin, where they were deposited and given a catalogue number (Table 1).

Results and discussion

We could observe a total of about 15 *H. mabouia* specimens, all around one site (with a radius of about 100m), whereas *H. turcicus* was present in all sectors of the city that we surveyed. The six *H. mabouia* specimens that we captured were of various sizes/ages ranging from 43 to 62 mm SVL, four were preserved (Table 1). The means of arrival for *H. mabouia* to Brownsville, Texas remains unknown. Nevertheless, we speculate that either the transportation of bricks from Mexico or ornamental plants from Florida by cargo trucks are likely pathways. To support this notion, there has been a recent increase in the development of apartment complexes and corresponding growth in the arrival of cargo trucks to the area (A. Rentfro, pers. obs.).

H. mabouia, and many gecko species, have a series of traits that represent advantages for long-distance and overseas dispersal, including eggs which are resistant to desiccation, relatively long incubation periods (1–2 months), and effective digital adhesive structures (Gamble et al. 2010; Anjos and Rocha 2008). We found evidence that individuals are surviving and reproducing (juveniles, egg clutches) near the possible site of introduction. Therefore, according to the unified framework for biological invasions (Blackburn et al. 2011), *H. mabouia* has already overcome the first three barriers in the process of invasion in Texas (geography, survival and reproduction), and is on the verge of entering the stage of spread. According to a climate envelope model, Brownsville Texas is at the northern margin of the potential distribution for this species (Rödger et al. 2008).

In Texas, two other *Hemidactylus* geckos have been reported. The Mediterranean gecko (*H. turcicus*) was first detected in downtown Brownsville, Texas as early as 1950, and dispersed quickly through south and south-central Texas (Davis 1974). More recently, *H. turcicus* has also

been found to be abundant in northeastern Texas (Jadin and Coleman 2007). The common house gecko (*H. frenatus*), has been reported around Dallas Zoo since the early 1990's (McAllister et al. 1990) and recently in Corpus Christi (LaDuc, personal communication). *Cyrtopodion scabrum* Heyden, 1827, another building-dwelling exotic gecko, is well established in the Galveston Texas area (Bloom et al. 1986).

When *H. mabouia* colonizes a region already invaded by another *Hemidactylus* gecko, it tends to displace it, apparently due to competitive exclusion (Meshaka 2000). In peninsular Florida and the Keys, the once abundant *H. turcicus*, followed by *H. garnotii*, are being replaced by *H. mabouia* (Townsend and Krysko 2003). In central and western Cuba, *H. mabouia* is apparently displacing *H. angulatus*, another closely related invasive gecko (Iturriaga and Marrero 2013). It is then likely that in the Rio Grande Valley of Texas and the southern Texas Gulf Coast, the ubiquitous *H. turcicus* will be displaced by the newcomer *H. mabouia*. There is evidence that *H. mabouia* can also colonize natural environments far from buildings and other human made structures (Rocha et al. 2011). However, this exotic by exotic replacement may well be the only significant impact of this invasion. No native building-dwelling geckos are known from the lower Rio Grande Valley of Texas.

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