

THE DISTRIBUTION OF *HEMIDACTYLUS*
(SAURIA: GEKKONIDAE) IN NORTHERN
PENINSULAR FLORIDA

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ABSTRACT: *Four species of Hemidactylus geckos have been introduced into Florida. Presently, only the Indo-Pacific (H. garnotii) and Mediterranean (H. turcicus) geckos occur in northern peninsular Florida; however, their distributions and ecological status are poorly known. We combined records from the literature, systematic collections, and field surveys to summarize the distributions of H. garnotii and H. turcicus in northern peninsular Florida. Herein, we document 16 previously unreported county records and one significant distributional record for these two species.*

Key Words: Gekkonidae, *Hemidactylus garnotii*, *Hemidactylus turcicus*, gecko, introduced species, Florida

FLORIDA HAS a well-documented exotic herpetofauna (Duellman and Schwartz, 1958; King and Krakauer, 1966; Wilson and Porras, 1983; Dalrymple, 1994; Butterfield et al., 1997; Townsend et al., 2002). Prominent members of Florida's introduced herpetofauna are geckos, primarily the genus *Hemidactylus* of Old World origin. Four species of *Hemidactylus* have been introduced in Florida: the common house gecko (*H. frenatus* Duméril and Bibron, 1836), Indo-Pacific gecko (*H. garnotii* Duméril and Bibron, 1836), tropical house gecko (*H. mabouia* [Moreau de Jonnés, 1818]), and Mediterranean gecko (*H. turcicus* [Linnaeus, 1758]). *Hemidactylus frenatus* is native to Africa, Asia, Australia, and Polynesia (Welch, 1994), and has been introduced in North America and throughout Central and South America. In Florida, *H. frenatus* is currently limited to Key West and Stock Island, Monroe County (Meshaka et al., 1994b), and Ft. Myers, Lee County. *Hemidactylus garnotii* is native to northeastern India, southern China, the Malay Peninsula, Indonesian archipelago, Philippines, and Oceania (Welch, 1994). King and Krakauer (1966) first reported *H. garnotii* as established in Miami-Dade County, Florida, prior to 1964, and they stated that its introduction likely resulted from being transported by researchers upon their return from the 1960-1963 International Indian Ocean Expedition. *Hemidactylus garnotii* expanded its range rapidly and has subsequently been recorded in the Florida Keys and southern peninsula (Wilson and Porras 1983), and northern peninsula (Stevenson and Crowe, 1992; Reppas, 1999; Lindsay and Townsend, 2001). *Hemidactylus mabouia* is found in central and southern Africa, the east coast of South America from Uruguay north to Suriname, the Amazon Basin west to its headwaters in Bolivia, Peru, and Ecuador, and the Caribbean in Trinidad

and Tobago and throughout the Lesser Antilles (Powell et al., 1998). Presently, *H. mabouia* is found throughout the Florida Keys (Lawson et al., 1991) and the southern peninsula (Meshaka et al., 1994a), with records as far north as Orange County (Butterfield et al., 2000). *Hemidactylus turcicus* is native to coastal regions of the Mediterranean in Europe and Africa, the Red Sea in Egypt, Somalia, Arabian Peninsula, and Persian Gulf, to western India along the Indian Ocean (McCoy, 1970). The introduction of this species has been reported from Arizona, California, Louisiana, Texas, and along the Gulf of Mexico south to the northwestern Yucatan Peninsula (Lee, 2000). Fowler (1915) first reported the introduction of *H. turcicus* (as *H. mabouia*, ANSP 18035) in 1910 from Key West, Monroe County, Florida. *Hemidactylus turcicus* has subsequently been recorded throughout the Florida Keys (Duellman and Schwartz, 1958), southern peninsula (King and Krakauer, 1966), northern peninsula (King, 1958; Meylan, 1977; Wise, 1993; Townsend and Reppas, 2001; Townsend et al., 2002), and panhandle (Nelson and Carey, 1993).

Presently, *Hemidactylus garnotii* and *H. turcicus* are the only two members of that genus known to occur in northern peninsular Florida, but their geographic distributions are poorly known. While conducting recent surveys, it became apparent that *H. garnotii* and *H. turcicus* were even more widespread in the northern peninsula than had previously been reported in the literature. Herein, we document the geographic distributions of these two species in northern peninsular Florida.

METHODS—Surveys were conducted from 14 June to 15 November 2001 throughout northern Florida. Additionally, we obtained records from the literature and systematic collections throughout the United States. These geckos are nocturnal and easily observed around lights at night in urban settings (King, 1958; Punzo, 2001); thus, we surveyed the outside walls of buildings after dark between 2000 and 0200 hrs. Voucher specimens were deposited in the Florida Museum of Natural History (FLMNH), University of Florida (UF collection). The region referred to herein as the northern peninsula follows Engle (1997). Source acronyms follow Leviton and co-workers (1985).

RESULTS—Five new distributional records were collected during our surveys: one county and one mainland record for *Hemidactylus garnotii*, and three county records for *H. turcicus*. The county record for *H. garnotii* was from Bradford County, Hampton, on the wall of a store at the junction of SR 301 and CR 18, on 27 September 2001 (UF 128022). The mainland record for *H. garnotii* was from Levy County, Bronson, on the wall of a store at the junction SR 500 and Gilbert Street, on 15 October 2001 (UF 128024). The Levy County record for *H. garnotii* is significant because this species had previously only been recorded in Levy County from Cedar Key (Table 1). New county records for *H. turcicus* were from Bradford County, Starke, on the wall of a shopping center north of the junction of SR 301 and CR 100-A, on 27 September 2001 (UF 128023); Clay County, Keystone Heights, City Municipal Building, on 27 September 2001 (UF 128020–21); and Marion County, Ocala, on the wall of a shopping center at the junction of US 441 and SW 7th Street, on 16 Oct 2001 (UF 128025–28).

A search of systematic collections produced twelve previously unreported county records, including *Hemidactylus garnotii* from Alachua (UF 87825–27), Baker (UF 94949), Hernando (UF 99771–72), Levy (UF 87721), Orange (UF

Table 1. Distributions of the Indo-Pacific (*Hemidactylus garnotii*) and Mediterranean (*H. turcicus*) geckos in northern peninsular Florida. Specimens with no citation under source have not been previously reported in the literature.

Species	County	Locality	Date	Source
<i>H. garnotii</i>	Alachua	Gainesville	4 Sep 1993	UF 87825–27
	Baker	Macdenny	6 Nov 1994	UF 94949
	Bradford	Hampton	27 Sep 2001	UF 128022
	Citrus	Camp Cove Campground	9 May 1991	Stevenson and Crowe, 1992 (UF 80802)
	Flagler	The Whitney Laboratory	13 Jun 2001	Lindsay and Townsend, 2001 (UF 124688)
	Hernando	Hernando Beach	15 Jul 1995	UF 99771–72
	Levy	Cedar Key	22 Aug 1993	UF 87721
	Levy	Bronson	15 Oct 2001	UF 128024
	Orange	Orlando	27 Mar 1983	UF 53909
	Putnam	Palatka	10 Jan 1991	UF 79999
	Seminole	WDW Environmental Protection Lab	20 Mar 1980	UCF 1314
	St Johns	Anastasia Island	23 Jun 1988	UF 69310
	Volusia	South Daytona	22 Nov 1998	Reppas, 1999 (UF 116050)
<i>H. turcicus</i>	Alachua	Gainesville	25 Oct 1956	King, 1958 (UF 8917)
	Bradford	Starke	27 Sep 2001	UF 128023
	Citrus	Inverness	2 Oct 1999	Townsend <i>et. al.</i> , 2001 (CAS 210987)
	Clay	Keystone Heights	27 Sep 2001	UF 128020–21
	Columbia	Ellisville	25 Jun 2001	Townsend and Reppas, 2001 (UF 124750)
	Duval	Jacksonville	Apr–May 1970	Meylan, 1977 (UF 37275)
	Hernando	Weeki Wachee Gardens	15 Jul 1995	UF 99770
	Levy	Cedar Key	22 Aug 1993	UF 87725–26
	Marion	Ocala	16 Oct 2001	UF 128025–28
	Orange	Orlando	20 Oct 1983	MCZ 166912
	Putnam	Melrose	30 Aug 1997	UF 123265
	Seminole	Sanford	29 Oct 1981	UCF 1321–23
	St Johns	Madeira Heights	24 Jan 1993	Wise, 1993 (UF 86816)

53909), Putnam (UF 79999), Seminole (UCF 1314), and St. Johns (UF 69310) counties, and *H. turcicus* from Hernando (UF 99770), Orange (MCZ 166912), Putnam (UF 123265), and Seminole (UCF 1321–23) counties (Table 1). *Hemidactylus turcicus* had been recorded in 1997 from Cedar Key, Levy County (Means, 1999), however museum records indicate the presence of *H. turcicus* on Cedar Key as early as 1993 (UF 87725–26).

DISCUSSION—In Florida, *Hemidactylus* exhibits a stratified diffusion invasion

pattern (Shigesada and Kawasaki, 1997), likely a result of man-assisted transportation along trucking routes (Davis, 1974; Godley et al., 1981; Meshaka, 1995). This pattern is similar to the one exhibited by the introduced brown anole (*Anolis sagrei*) in Florida (Campbell, 1996). Moreover, *H. garnotii* has apparently replaced the longer-established *H. turcicus* in much of southern Florida (Meshaka, 1995; Butterfield et al., 1997), and it appears that *H. mabouia* may now be displacing *H. garnotii* in those same areas (Krysko, pers. obs.). With the colonizing success that *Hemidactylus* has had in Florida until now, these geckos will likely continue to disperse throughout the state in future years.

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