



# Interspecific Communal Oviposition by the Native Puerto Rican Eyespotted Geckolet (*Sphaerodactylus macrolepis*) and Invasive House Gecko (*Hemidactylus* sp.) in Puerto Rico

Alberto R. Estrada<sup>1</sup> and Rafael Borroto-Páez<sup>2</sup>

<sup>1</sup>13355 SW 9th CT APT 415H, Pembroke Pines, Florida 33027, USA (peleuth@gmail.com)

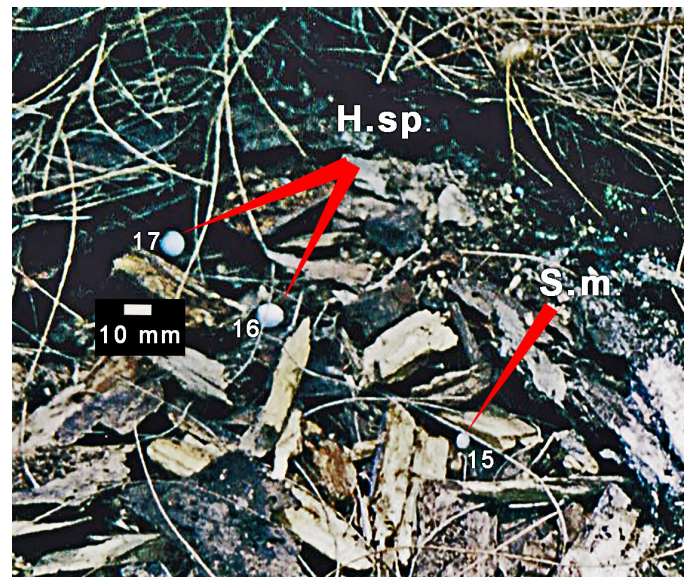
<sup>2</sup>Instituto de Geografía Tropical, Calle F No. 302 entre 13 y 15, Vedado, La Habana, Cuba (rborroto@geotech.cu)

Interspecific communal oviposition (ICO) is less frequently observed than conspecific communal oviposition (CCO), which is relatively common in many lizards, especially geckos (e.g., Rivero 1998; Krysko et al. 2003; Doody et al. 2009; Alfonso et al. 2012; Bernstein et al. 2016). We are aware of only one previous report by Krysko et al. (2003) of an ICO involving invasive and native species of geckos (e.g., invasive *Hemidactylus* and native *Sphaerodactylus*).

We encountered examples of communal oviposition between 1000 and 1030 h on 10 July 2003 in a stand of invasive Australian Pines (*Casuarina equisetifolia*) on the southern side of Route PR-187 in the western sector of the Piñones



**Fig 1.** Interspecific communal oviposition site (14 eggs) of house geckos (*Hemidactylus* sp.) (11 large eggs) and Puerto Rican Eyespotted Geckolets (*Sphaerodactylus macrolepis*) (3 small eggs) under dry logs on leaf litter comprised of dry twigs of Australian Pine (*Casuarina equisetifolia*) in the western sector of the Piñones State Forest. Eggs 11 (*S. macrolepis*) and 12, 13, and 14 (*Hemidactylus* sp.) have hatched. Photograph by the senior author.



**Fig 2.** A second interspecific communal oviposition site (3 eggs) of house geckos (*Hemidactylus* sp.) and Puerto Rican Eyespotted Geckolets (*Sphaerodactylus macrolepis*) in Australian Pine (*Casuarina equisetifolia*) litter in the Piñones State Forest, Puerto Rico. Photograph by the senior author.

State Forest (18°27'10.74"N, 65°58'08.81"W). The most frequently encountered geckos at this locality are native Puerto Rican Eyespotted Geckolet (*Sphaerodactylus macrolepis*) and the invasive Tropical House Geckos (*Hemidactylus mabouia*). Eggs were collected in hopes of recording data on hatchlings, but all were contaminated by fungi and were not viable.

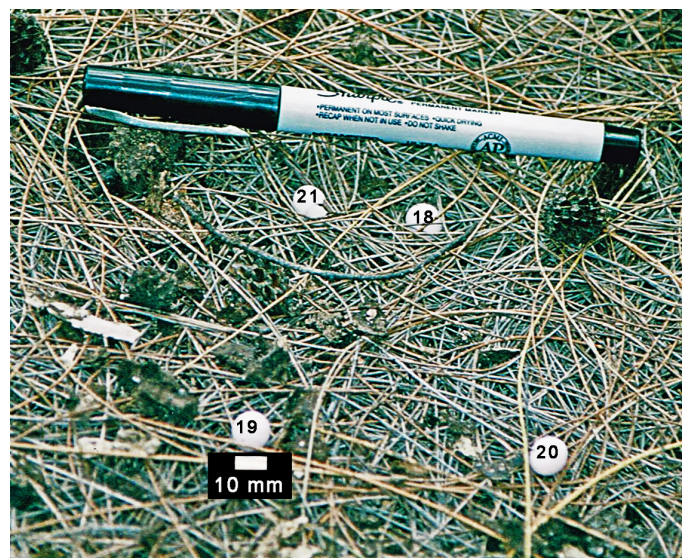
We found two ICO sites involving *Sphaerodactylus macrolepis* and *Hemidactylus* sp. (probably *H. mabouia*) under dry logs on leaf litter comprised of dry twigs of the invasive Australian Pine tree (Figs. 1 & 2). The first contained 14 eggs, three of *S. macrolepis*, one of them hatched, and 11 of *Hemidactylus* sp., three of which had hatched (Fig. 1). The

**Table 1.** Sizes and shapes of eggs of Puerto Rican Eyespotted Geckolets (*Sphaerodactylus macrolepis*) and house geckos (*Hemidactylus* sp.) in two interspecific communal oviposition (ICO) sites and one conspecific communal oviposition (CCO) site in Australian Pine (*Casuarina equisetifolia*) litter in the Piñones State Forest, Puerto Rico. All measurements are in mm. Means are presented ± one standard deviation. Numbers of eggs as in Figs. 1–3. S.m. = *Sphaerodactylus macrolepis*. H.sp. = *Hemidactylus* sp.

Site	Species	Number	Minimum Diameter	Maximum Diameter	Min/Max Diameter
ICO 1	S. m.	1	4.9	6.9	0.71
		2	4.4	6.4	0.69
	H. sp.	3	9.9	10.4	0.96
		4	8.9	9.9	0.90
		5	8.8	9.4	0.94
		6	9.4	9.9	0.95
		7	7.9	8.8	0.89
		8	8.8	10.4	0.85
		9	8.8	9.4	0.95
		10	9.4	10.4	0.90
ICO 2	S. m.	15	5.2	6.2	0.84
	H. sp.	16	8.6	10.0	0.86
		17	9.0	10.5	0.86
CCO	H. sp.	18	8.4	9.8	0.86
		19	10.2	10.7	0.95
		20	9.6	10.5	0.91
All	S. m.	n = 3	4.83 ± 0.40	6.5 ± 0.36	0.75 ± 0.08
	H. sp.	n = 13	9.05 ± 0.63	10.0 ± 0.55	0.91 ± 0.04

second ICO had only three eggs, two of *Hemidactylus* sp. and one of *S. macrolepis* (Fig. 2). Table 1 provides the sizes of the intact eggs. Those of *Sphaerodactylus* are smaller and more ovoid, whereas those of *Hemidactylus* are twice as large and rounded. The eggs of both species are white, smooth, and have fragile shells.

If we consider an interclutch interval of 16 days (Bock 1996), an incubation time of two months, and a clutch size of two (Krysko et al. 2003) for *H. mabouia*, the 11 eggs (three hatched) at the first site could have been deposited by a single female over a period of about three months. Alternatively, considering a clutch size of one for *S. macrolepis* (S.B. Hedges in Henderson and Powell 2009), a maximum number of females would be three *S. macrolepis* and six *Hemidactylus* sp. The second ICO with only three eggs must have involved only one female of each species. We also found a CCO of *Hemidactylus* sp. (probably *H. mabouia*) within ~4 m of the two ICOs (Fig. 3); it contained only four eggs deposited by one or two females.



**Fig 3.** A conspecific communal oviposition site of house geckos (*Hemidactylus* sp.) in Australian Pine (*Casuarina equisetifolia*) litter in the Piñones State Forest, Puerto Rico. Egg 21 had hatched. Photograph by the senior author.



The relative number of eggs in the two ICOs (13 *Hemidactylus* and four *Sphaerodactylus*) could be indicative of competitive interference, with use of a site by a female *Hemidactylus* suppressing the use of the same site by native *Sphaerodactylus macrolepis*. Lending some support to the latter contention are the difference in sizes of the two species (female SVL to 35 mm in *S. macrolepis* and 61 mm in *H. mabouia*; Henderson and Powell 2009) and observations by us of *H. mabouia* displacing *S. elegans* on walls of homes in Habana, Cuba.

In the Florida Keys, Krysko et al. (2003) described an ICO involving three invasive species (*Hemidactylus frenatus*, *H. mabouia*, and *Sphaerodactylus elegans*) and another ICO with two invasive species (*H. mabouia* and *S. elegans*) and a native species (*S. notatus*). Alfonso et al. (2012) described a Cuban ICO involving three native species (*S. armasii*, *Tarentola crombiei*, and *Anolis argillaceus*). In all three cases, the number of sphaerodactyl eggs was equal to or exceeded those of the other species. Bernstein et al. (2016) reported a CCO involving two species of *Sphaerodactylus* in Puerto Rico and the Bahamas and Rivero (1998) listed an example of a CCO involving sphaerodactyls in Puerto Rico. In all of these, the total number of eggs exceeded those in our observations.

The implication of native and invasive species engaging in communal oviposition is unknown. However, if an invasive species (like the larger house geckos in these instances) benefitted in some way (e.g., interference or competition for oviposition sites or other resources, predation on eggs or hatchlings; Bolger and Case 1992; Wickramasinghe and

Somaweera 2008; Kusuminda and Athukorala 2013), the potential negative effects on native species should receive more attention in future studies.

### Acknowledgements

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