

# A Failed (?) Introduction of Lizards and Frogs on St. Vincent

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In late October 2010, quarantine officers working in Layout, St. Vincent, discovered two Cuban Brown Anoles (*Anolis sagrei*) and three Greenhouse Frogs (*Eleutherodactylus planirostris*) in a container of ornamental plants shipped by Plantation Spice Growers in Goulds, Miami-Dade County, Florida. Photographic vouchers for *A. sagrei* and specimens of *E. planirostris* are deposited in the Milwaukee Public Museum (MPM-P754 and MPM 33993–5, respectively). Robert Powell confirmed the identity of the anoles and Kenneth L. Krysko that of the frogs from photographs. Robert W. Henderson confirmed the identification of the frogs after examining specimens.

Both species are native to Cuba, most Bahamian islands, and at least some of the Cayman Islands. Both have been present in Florida, the origin of this and presumably most other introductions of both species, for over a century (Meshaka et al. 2004). *Anolis sagrei* has been documented from a number of locations outside its natural distribution and is already established on St. Vincent (Henderson and Powell 2005, Treglia et al. 2008, Eales and Thorpe 2010) and elsewhere in the region (Powell et al. 2011). Although effects on native anoles have to date been limited (Treglia et al. 2008), largely

because of the relatively restricted distribution of *A. sagrei* on St. Vincent, that species has expanded its range to the point where eradication is likely to be impossible. However, augmenting established populations or introducing lizards to new sites (such as Layout) should be avoided in order to prevent more widespread competitive interactions with native congeners.

Introduced populations of *Eleutherodactylus planirostris* are established on Great Inagua Island (Bahamas), Jamaica, and the Caicos Islands, and have been introduced to Grenada and possibly Guadeloupe, but are not known to be established there (Powell et al. 2011). If *E. planirostris* became established, it would probably interact most intensely with *E. johnstonei*, which is ubiquitous at low elevations on St. Vincent, phenomenally abundant in urban areas and disturbed habitats, and is itself an introduced species (e.g., Mallery et al. 2007, Powell and Henderson 2007). Although *E. planirostris* is generally considered to be more terrestrial than *E. johnstonei*, the latter is quite abundant in terrestrial situations (under rocks and debris in ditches and on the ground) on St. Vincent (Mallery et al. 2007), and frogs in at least some populations of *E. planirostris* are routinely found in arboreal situations (e.g., bromeliads; Henderson and Powell



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This male Cuban Brown Anole (*Anolis sagrei*) is part of an established population in the Montrose neighborhood in Kingstown, St. Vincent and the Grenadines. Individuals shipped into Layout could have founded an additional colony if not for the actions of the quarantine officers.



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These Greenhouse Frogs (*Eleutherodactylus planirostris*) were discovered in a shipment of ornamental plants from Florida.

2009). However, in its native range *E. planirostris* reaches elevations that, if exploited on St. Vincent, could result in contact with endemic *Pristimantis shrevei*, which is listed as Endangered on the IUCN Red List (Hedges and Powell 2004) and already is threatened by competition with *E. johnstonei* and ongoing declines in habitat quality and extent.

Individuals of either species are unlikely to have escaped detection, but the organization that received the plants (Nature Care SVG) has been instructed by quarantine officers to monitor them closely while still on-site and after any sales and relocations.

### Acknowledgements

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# The Pacific Coast Giant Musk Turtle, *Staurotypus salvinii* Gray 1864 (Kinosternidae), a New Non-indigenous Species in Florida

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Photographs by the senior author.

The Pacific Coast Giant Musk Turtle, *Staurotypus salvinii* Gray 1864, is indigenous to the Pacific lowlands of Oaxaca and Chiapas, Mexico, ranging eastward into El Salvador and Guatemala (Ernst and Barbour 1989). This species feeds on fishes, invertebrates, and amphibians, and lives in slow-moving, soft bottom lakes, rivers, and other waterways with aquatic vegetation (Ernst and Barbour 1989).

On 2 October 2010 at 1400 h, an adult (270 mm carapace length [CL]) female *Staurotypus salvinii* (Fig. 1; photographic voucher UF 160342) was collected on the property of Zoo Miami, Miami-Dade County, Florida, along the perimeter fence of a hoof-stock exhibit adjacent to a 0.85-km-long man-made lake (25.60276°N, 80.40123°W, WGS84 datum). This *S. salvinii* was placed in the zoo's quarantine facility for a future exhibit, where it was kept in a 300-gallon enclosure. On 26 October 2010, the animal was radiographed because of unusual behavior and discovered to contain two calcified eggs (Fig. 2). On 15 November 2010, this *S. salvinii* oviposited the two eggs in substrate of

sand and leaf litter in the enclosure. These eggs (10.1 g, 39.5 x 20.8 mm; 9.9 g, 39.5 x 19.7 mm, respectively) were removed and placed on vermiculite substrate and incubated within a GQF 1550 Hatcher Incubator (Savannah, Georgia) at 28.6 °C with a humidity of approximately 80%. On 2 December 2010, the two eggs appeared to have failed to develop and were discarded.

On 1 November 2010 at 1210 h, a juvenile (107 mm CL) female *Staurotypus salvinii* (Fig. 3; photographic voucher UF 162276) was collected crossing a zoo service road between exhibits (25.61079°N, 80.40068°W), 0.9 km north of the first individual. The nearest water source to this location is a 0.13-km-long man-made lake, which is not connected to the larger, 0.85-km lake where the first individual was found. This *S. salvinii* was also placed in the zoo's quarantine facility for a future exhibit, where it was kept in a separate enclosure.

Zoo Miami contains approximately 300 ha of pine rockland, approximately 133 ha of which are developed for the institution. Although much