Introduced population of the Cuban Treefrog, *Osteopilus septentrionalis* (Duméril & Bibron), on St. Eustatius, Caribbean Netherlands

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The Caribbean Islands biogeographic region is a biodiversity hotspot with 1,030 species of amphibians and reptiles, 82% endemic to the region (Hedges *et al*. 2019; Hedges 2025). However, many of these species are locally extirpated or face extinction, primarily by habitat destruction (deforestation), but also by introduced diseases and invasive species (Roy *et al*. 2023). In particular, St. Eustatius (Caribbean Netherlands; 21 km2) has faced several introductions of non-native herpetofauna, including the Montserrat Whistling Frog *(Eleutherodactylus montserratae*; Yuan *et al*. 2022; Hedges 2022; Powell *et al*. 2015), the Tropical House Gecko (*Hemidactylus mabouia*; Powell *et al*. 2015), the Green Iguana (*Iguana iguana* species complex; Debrot *et al*. 2022; van den Burg *et al*. 2018), and the Brahminy Blindsnake (*Indotyphlops braminus*; Powell *et al*. 2015). More recently, the establishment of the Common House Gecko (*Hemidactylus frenatus*) and the Smooth-scaled Tegulet *(Gymnophthalmus underwoodi*) has been described (Thibaudier *et al*. 2023). Here, we report another newly introduced species on St. Eustatius, the Cuban Treefrog, *Osteopilus septentrionalis*.

The Cuban Treefrog is native to Cuba, The Bahamas, and the Cayman Islands but it is widely established throughout the Caribbean region, including the Lesser Antilles (Lindsay and Cooper 2008; Heinicke *et al*. 2011; Witt *et al*. 2024). Successful and rapid establishment of the species after invasion has been attributed to their high fecundity, generalist diet, generalist habitat preference, and tolerance to environmental stochasticity (Witt *et al*. 2024; Haggerty and Crisman 2015; Johnson 2007; Owen 2005). The Cuban Treefrog has established populations in Florida and on St. Maarten, which are the two main supplying ports for St. Eustatius (Powell *et al*. 1992; Johnson 2007; Heinicke *et al*. 2011).

On 25 January 2025, E.J. incidentally observed a Cuban Treefrog in a residential garden (17.48823, -62.95704). Subsequent surveys on 3 and 9 February 2025 at the same site yielded an adult male (snout-urostyle length, SUL, = 60 mm; Figure 1; voucher in the Naturalis Biodiversity Center, RMNH.RENA.53769) and three juveniles (SUL < 20mm) of unknown sex. On 21 and 30 May 2025, two additional adult males were found in the same garden. Following subsequent outreach of St. Eustatius National Parks (STENAPA) on social media, a resident of St. Eustatius sent a photograph of an adult Cuban Treefrog taken in November 2022. This frog was observed in a palm that was part of a live plant shipment from Florida, ordered and received by a resort directly adjacent to the garden where the six captured specimens were found. In total we completed 18 person hours of night surveys in the area between January and May 2025. However, efficiency of search effort was impeded due to the surveys taking place in the dry season (January-June), when Cuban treefrogs are less active.

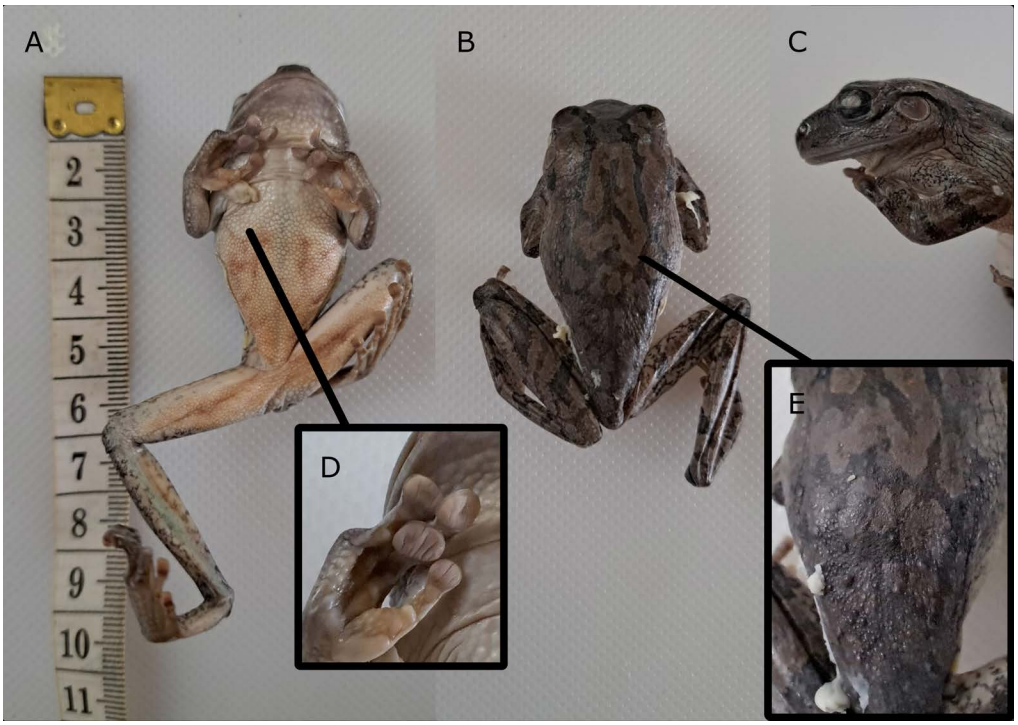

Figure 1. Ventral **(A)**, dorsal **(B)**, and lateral **(C)** side of an adult Cuban Treefrog *Osteopilus septentrionalis* captured (3 February 2025) on St. Eustatius (voucher No.: RMNH.RENA.53769). Inset of deterministic characteristics, the large toepads **(D)** and warts on its lower back **(E)**. Photos: Julian Thibaudier.

Due to the timing of the first adult record in 2022, and presence of both adults and juveniles during 2025, we argue the observations suggest that the resort's gardens harbor a breeding population of Cuban treefrogs. This is strengthened by the fact that the resort has publicly stated it imported large numbers of plants in shipment containers from all over the world, including palms from Florida. Despite outreach on social media and opportunistic surveys around the island, there are currently no further observations of this species elsewhere on St. Eustatius. The gardens of the resort are heavily planted and well-watered in an otherwise relatively dry region of the island, as is the adjoining garden. Thus, it is likely that the establishment of the Cuban Treefrog on St. Eustatius has remained confined to the resort and surrounding garden and is in an early stage. This invasion pathway is reminiscent of those on Antigua and Dominica, although in those cases the species has dispersed throughout the islands since their introduction (van den Burg *et al*. 2020; Lindsay and Cooper 2008).

The impact of the Cuban Treefrog on the native herpetofauna of St. Eustatius is arguably negative, given its generalist diet, suspected locally high population densities, and relatively large body size (Witt *et al*. 2024; Johnson 2007; Meshaka 2001). Namely, from other areas where the species is introduced it is known to mainly predate on invertebrates, and occasionally vertebrates like frogs, lizards, and snakes (Glorioso *et al*. 2010; Meshaka 2001). Therefore, it is possible that this species would impact the islands native geckolets (*Sphaerodactylus sabanus* and *S. sputator*), and anoles (*Anolis bimaculatus* and *A. schwartzi*), especially given the niche overlap and large maximum prey sizes (e.g., Reyes Pérez and Borroto-Páez 2022; Portal Ríos *et al*. 2020). Furthermore, through its toxicity, the Cuban Treefrog might cause injury or death to native predators such as red-bellied racers *Alsophis rufiventris* (Goetz *et al*. 2017). Apart from these native species, the Cuban Treefrog likely preys upon introduced *Eleutherodactylus montserratae* and potentially functions as a disease reservoir transmitting ranavirus and other infections, at risk of St. Eustatius' current frog population (Galt *et al*. 2021). Besides this ecological damage, the Cuban Treefrog

is known to be a nuisance to humans through high local population density, loud noise, and poisoning pets, and can cause economic damage to infrastructure through short circuiting utility poles (Johnson 2007). They are also known carriers of rat lungworm *Angiostrongylus cantonensis* (Chase *et al*. 2022) which can cause eosinophilic meningitis.

With the introduction of the Cuban Treefrog, six out of 15 terrestrial species of herpetofauna established on St. Eustatius are non-native (Powell *et al*. 2015; Thibaudier *et al*. 2023). This emphasizes the need for improving biosecurity at the harbors that supply goods to Caribbean islands. The arrival of another introduced species on St. Eustatius again highlights the responsibility of stakeholders, such as harbor authorities and importers. This responsibility goes beyond the prevention of introductions, but also includes active intervention after initial incursions. Given that the Cuban Treefrog was first observed in 2022 but the local nature authority (STENAPA) was alerted only recently, we advocate for improvement of communication between stakeholders. Furthermore, we call for a comprehensive tightening of biosecurity, especially during shipments of live plants, to prevent future introductions of non-native species. To address the potential spread of Cuban Treefrogs into other parts of the island, STENAPA anticipates continuing surveys in and around the resort.

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